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# Effect of Short Term Yoga on Cardiorespiratory Fitness in Middle Aged Females

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## ABSTRACT

**Context:** Regular and continuous yoga exercise is one of the most important nonpharmacological method of improving aerobic capacity and physical fitness. **Aims:** The present study was conducted to ascertain whether a short-term practice of yoga training had improvements in cardiorespiratory functions in middle aged females.

**Materials and method**: This interventional study was conducted in the Department of Physiology of local Medical College, Pune

Thirty five females in the age group of 30-40 years, fulfilling the inclusion and exclusion criteria underwent sixty minutes of daily yoga programme for 8 weeks taught by a certified yoga teacher. Pre and post yoga cardio respiratory functions, were assessed by recording pulse rate, systolic blood pressure, diastolic blood pressure and ventilatory lung function tests.

**Statistical analysis:** The parameters were analyzed by paired 't' test.

**Results**: Results showed statistically significant reduction in pulse rate and systolic blood pressure. FVC, $FEV_1$ / FVC and MVV showed definite improvement which was also statistically highly significant.

**Conclusion**: This study showed significant improvement in cardiorespiratory parameters after training course for two months. These changes highlight the positive effect of short duration yoga training on physical fitness in sedentary females.

***Keywords:*** *Blood pressure, pulse rate, ventilatory lung function tests, FVC, $FEV_1$, MVV*

## INTRODUCTION

Yoga is the cultural heritage of India from time immemorial. It is an unparallel, distinctly recognized system of mental and spiritual culture. Yoga is a practice of the mind and body with its roots deeply implanted in the ancient Hindu culture. Initially yoga was practiced mainly for meditative purposes but it also provided strength and flexibility to the body while relaxing the mind as well.[1]

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The practicing of Asana & Pranayama is also called as Hathayoga. Asanas are different postures of the body stabilizing mind & body where as pranayama regulates respiration.[2]

In a professional college teaching is very demanding both physically and mentally. Teachers are engaged all the time in academic and administrative activities. Most of the day time, they are busy at working place. Also lack of exercise and environmental pollution affects the respiratory system in urban area. Cardiovascular diseases are more prevalent after 40 years in females. Thus in order to make them aware about their health status and encourage them to improve the fitness a training program in yoga was conducted in a professional college.

The aim of the study was to ascertain whether a short-term practice of yoga training had improvements in cardiorespiratory functions in middle aged females.

## MATERIALS AND METHOD

The healthy teaching and non-teaching female staff members (n = 35) who volunteered to engage in the practice of yoga were included in the study. They were subjected to clinical examination. Data on physical characteristics was obtained such as age, height and weight. Nobody was involved in any other active exercise during or before the period of yogic training.

On detail history, all subjects were nonalcoholic, non-smokers, not taking any drug and were having similar dietary habits, physical and mental activities in working atmosphere. Those having been clinically diagnosed with asthma, chronic obstructive pulmonary disease or other chronic pulmonary diseases, hypertension, diabetes and taking any treatment for cardiac or respiratory diseases were excluded.

All study participants gave written informed consent. The research protocol was approved by the Institutional Ethical committee. 25 Yogic postures & 5 ways of pranayama were taught to the subjects. These were practiced for 60 minutes per day for 5 days in a week for two months.

Each 60-minute yoga session included 10 minutes of warm-up and breathing exercises, 40 minutes of yoga postures, and 10 minutes of cool down exercises. The postures were performed with closed eyes in order to have full concentration and to avoid competitive element or any distraction. At the end of the practices shavasana was performed for 5 minutes.

Pre and post yoga training cardiorespiratory fitness tests were repeated. cardiovascular functions were assessed by recording pulse rate, systolic blood pressure and diastolic blood pressure. All the volunteers were asked to relax physically and mentally for 15 minutes in supine position in a silent room after which the pulse rate and the blood pressure were recorded. The pulse rate in beats per minute was recorded in the right radial artery by palpatory method for whole one minute. The arterial blood pressure was recorded with a sphygmomanometer (Diamond), in the right upper limb by auscultatory method.

Pulmonary functions were recorded on a computerized portable Schiller lung function unit SP-

1(RS 232). The recorded parameters were compared with the inbuilt pulmonary function norms for the Indian population depending upon the age, sex, height, and weight. The spirometer was calibrated daily using calibration syringe of 2 liters.

Recording of static and dynamic pulmonary function tests was conducted on motivated volunteers in standing position. For each volunteer three satisfactory efforts were recorded according to the norms given by American Thoracic Society. These tests were recorded at noon before lunch, as expiratory flow rates are highest at noon.[3] The essential parameters obtained were, forced vital capacity (FVC), timed vital capacity ($FEV_1$), and maximum ventilatory volume (MVV). Pulmonary function tests were conducted in one sitting on the same day before beginning of the study and after completion of yoga practices.

## RESULTS

The average age of the volunteers was $30 \pm 4.5$ years, average weight was $57 \pm 3.3$ Kg and average height was $153 \pm 3.2$ cm .

**Table - I: Effect of yoga on physical fitness parameters**

| Parameter | Before (n=35) | After (n=35) | P value |
|---|---|---|---|
| Pulse Rate/min | 81.7 ± 7.7 | 73.5 ± 17.4 | <0.05* |
| Systolic Blood Pressure (mm of Hg) | 114.5 ± 8.15 | 103.1 ± 7.21 | <0.05* |
| Diastolic Blood pressure (mm of Hg) | 75.1 ± 5.06 | 67.7 ± 5.05 | <0.1 |

Not significant        < 0.1

*   Significant        < 0.05

**Table II: Effect of yoga on pulmonary function tests**

| Parameter | Before (n=35) | After (n=35) | P value |
|---|---|---|---|
| FVC (Lit) | 2.43 ± 0.23 | 3.21 ± 0.26 | <0.001** |
| $FEV_1$ % | 85.3 ± 3.55 | 91.1 ± 5.18 | <0.001** |
| MVV (Lit/ min) | 96.5 ± 12.3 | 117.4 ± 16.0 | <0.001** |

** p<0.001  Highly significant

**Statistical analysis-**

The ventilatory lung function tests were compared before and after the yoga training by the 'paired t' test. Data were expressed as Mean±SD. Statistical significance was indicated by 'P' value <0.05

## DISCUSSION

Table I showed reduction in heart rate and systolic blood pressure. Similar results were observed by Santha Joseph et al[4] and Anand BK et al[5]. They reported that the change in heart rate and blood pressure might be due to predominant parasympathetic activity. Selvamurthy et al[6] reported that this modulation of autonomic nervous system activity might have been mediated through the limbic system and higher areas of central nervous system.

In this study reduction in systolic blood pressure was significant statistically but reduction in diastolic blood pressure was not significant. This might be due to short duration of yoga training. It has been observed that yoga in long duration affects hypothalamus and brings about decrease in the systolic and diastolic BP through its influence on vasomotor centre, which leads to reduction in sympathetic tone and peripheral resistance.[7] Shavasana alters the proprioceptive and exteroceptive influences to the hypo-thalamus, which reduces the sympathetic activity and hence a decrease in basal heart rate and blood pressure was observed.

As shown in Table II statistically significant increase in FVC, $FEV_1$ & MVV was observed. Many studies have demonstrated effect of yoga on improving respiratory parameters.[8,9,10] The respiratory muscles become more functional due to postures like shalabhasana, naukasama and pranayama. Pranayama trains the subject to make full use of diaphragm, & abdominal muscles.[8]

Increased $FEV_1$ could be due to increase in respiratory muscle strength. Also due to increased parasympathetic activity bronchiolar smooth muscle tone is reduced causing bronchodilatation. Maximum inflation of lungs closer to total lung capacity releases surfactant[11] and prostaglandins in to alveolar spaces which increases lung compliance.[12] It is due to the increased muscular activity & increased pressures in lungs which open more alveoli increasing the area for transport of gases. It also opens the dormant capillaries which increases area for transport. All these effects lead to an increase in ventilatory function tests.

## CONCLUSION

Thus in a nutshell, with this study, it is proved that regular practice of yoga and pranayama for 8 weeks is beneficial in improving cardio respiratory functions even in middle aged women. Further research with large sample size will be useful for motivating more population to practice yoga in general.

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# Study of Primary Infertility in Cases of Bilateral Vaginal Hydrocele

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## ABSTRACT

The study was conducted on three hundreds and forty-five cases of bilateral hydrocele, who were operated by Jaboulay's technique. Out of these 345 cases only 12 cases fell truly within the definition of primary infertility. The azoospermia was found only in three cases and oligospermia in two cases. In seven cases, the true nature of infertility could not be found even after the thorough investigations of the spouses. Taking into account the incidence of infertility in general male population without any obvious hydrocele we conclude that bilateral hydrocele has no effect on male fertility.

***Keywords****: Hydrocele, Spermatogenesis, Infertility.*

## INTRODUCTION

The cases of bilateral vaginal hydrocele are quite common in Bihar and eastern Uttar Pradesh. We frequently come across cases of bilateral hydrocele with infertility. This prompted us to take up this study and evaluate the effect of bilateral hydrocele on the spermatogenesis of men. Male infertility is much less explored subject all over the world and particularly in India. Bilateral hydrocele leading to infertility is not well studied topic across the globe. The work on the subject is quite scanty. Also the acceptability of infertility in male is less as compared to the female. One of our azoospermic patients had married thrice in hope of getting a baby instead of getting himself investigated.

## MATERIAL AND METHOD

The study was conducted in Mayo Institute of Medical Sciences, Barabanki in the period from September, 2013 to Jan, 2016. The cases were pooled from the private clinic of the first author also. The detailed history and thorough clinical examination was carried out. Only the cases of primary infertility were taken into account. All the twelve patients without any issue were subjected to seminal analysis prior to surgery. The morphology of the testes was assessed with ultrasonography in all these infertile males. It was used as the initial imaging investigation in male infertility. Assessment was aimed at evaluation of testicular morphology, patency and anomalies of the efferent ducts and also prostatic anomalies. Erectile dysfunction was also assessed. Bilateral testicular biopsies were done in all the cases of azoospermia and oligospermia. The spouses were also investigated as and when required.

The cases of unilateral hydrocele and those associated wih varicocele were excluded from the study. The cases of bilateral hydrocele in unmarried males or married within one year or with small size of the hydrocele were also excluded from the study. The patients with erectile dysfunction and the cases of Filarial Scrotal Tumour and very large bilateral hydrocele, which were not conducive to normal penile sex were also considered as exclusion criteria.

## RESULT

Out of 345 cases the youngest was 27 years old while the oldest was 53 years of age. The average age of the patient was 34 years. Out of the twelve cases of infertility, the youngest was 28 years of age and the oldest was 49 years of age. The mean duration of hydrocele in infertile group was 5.1 years while in rest it was 4.8 years.

All the 12 cases of infertility were subjected to

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ultrasonography and seminal analysis. In four cases of infertility, we found thickened tunica albuginea on both the sides. Bilateral testicular biopsy were done in azoospermic patients. In one case there was total arrest of spermatogenesis. In one of the azoospermic patient there was no development of vas deference on either side. The size of the hydrocele did not correlate with the morphological changes in testes.

### DISCUSSION

Primary Infertility is defined as a failure to achieve pregnancy during one year of frequent, unprotected intercourse[1]. **Secondary infertility** is defined as the inability to become pregnant, or to carry a pregnancy to term, following the birth of one or more biological children. The birth of the first child does not involve any assisted reproductive technologies or **fertility** medications. Infertility is a worldwide problem, and it affects 8-10% of couples that have unprotected intercourse. As per the WHO, the overall prevalence of primary infertility ranges between 3.9% and 16.8% in India[2]. In general, 50% of infertility cases are due to a solely female factor, pure male factor accounts for 20-30% of the problem, and the remaining 20-30% is due to a combination of both male and female factor[3]. In our series 3.3 % of the patients with large bilateral hydrocele were infertile. The prerequisites for successful male fertility are normal spermatogenesis, successful epididymal maturation and storage of sperm, normal sperm transport and normal accessory gland function. The absence of both spermatozoa and spermatogenic cells in semen and post-ejaculate urine is termed azoospermia. We used new WHO criteria for leveling a patient azoospermic. A man with reference values of greater than 15 million sperm, greater than 5% normal morphology, and 40% progressive motility would be considered normal[4].

A careful history and physical examination of each partner can suggest a single or (more usually) multifactorial aetiology and directs further investigation .The three main imaging modalities used for investigation of the male reproductive system are ultrasound, MRI and invasive techniques such as venography and vasography. Imaging plays a vital role in identifying potentially correctable causes of infertility especially congenital anomalies and disorders that obstruct sperm transport. Scrotal ultrasound is excellent for initial evaluation of the scrotum and can directly demonstrate abnormalities within the testis and the peritesticular structures, such as

varicocoeles and epididymal abnormalities, as well as visualising secondary changes caused by distal genital duct obstruction[5]. Ultrasound was the most utilized initial imaging investigation in male infertility in the current series. It evaluates morphology of testis as well as patency of efferent duct. However only two of our cases with infertility gave consent for transrectal ultrasound examination.

Azoospermia was leveled when there was no spermatozoa in two spaced samples of semen on microscopic examination. In all the azoospermic and one oligospermic patints we found the thickened tunica albugenia. There was a distortion of the shape of the seminiferous tubules in two cases of azoospermia. These findings were similar to the study of Shrinath C but in addition we found total arrest of spermatogenesis in one case of azoospermia and partial arrest in another one case with oligospermia. Shrinath C has conducted the study simply to see the pressure effect of hydrocele on testis and has not taken infertility in account[6]. There was bilateral agenesis of vas deference in one case of azoospermia, which could be confirmed by MRI. While another study on effect of large hydrocele on spermatogenesis found no pressure effect from the hydrocele on the structure of the testis in 70 per cent, a flattening of testis in 22 per cent, and atrophy of testis in 8 per cent of cases[7]. Azoospermia is found in approximately 1% of all men and up to 15% of infertile men, depending upon the demographic nature of the infertile cohort[8].

We conclude that bilateral hydrocele does not affect the spermatogenesis. Even the positive structural changes found in scrotal or transrectal ultrasound in the testes of infertile male did not affect the spermatogenesis significantly. There were also possibilities of hormonal and others factors contributing to infertitily which was not included in this study. The sample size of the study was small. There is need to take up the study further with larger sample size and a control group of normal population of the same locality.

**Conflict of Interest** : The authors declare that there is no conflict of interest.

**Ethical Clearance:** Not needed

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# Television Viewing Pattern among Adolescents of Udupi District

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## ABSTRACT

**Introduction:** Television is an audio visual media and technology which serves multiple purpose of disseminating information, education and entertainment. Viewing television can cause both positive and negative effects which influences their attitude and behavior. This study investigates the pattern of usage of television and its influence on attitude and behaviour among the adolescents.

**Materials and Method:** The study included 400 adolescents in the age group of 13 to16 years studying in selected CBSE and ICSE schools of Udupi district, Karnataka. This cross sectional survey used structured questionnaire to collect data from school children. Data analysis was done using SPSS v16.0.

**Results:** All the 400 adolescents were viewing television and most had positive attitude towards it. With regard to television usage, majority 257 (64.2%) had moderate usage, 107 (26.8%) had low usage and 36 (9%) had severe usage. Majority had poor eating, sleeping behaviors while viewing television

**Conclusion:** The study concluded that most of the adolescents view television and it has an influence on their attitude and behaviour. Awareness on the negative effects and health problems associated with the sedentary viewing of television need to be addressed.

***Keywords:*** *Television, television viewing, usage, attitude, behaviour, adolescents.*

## INTRODUCTION

Television, a mass media communication first came to India as a national television network called 'Doordarshan' way back in 1959. In a span of 50 years, it has reached almost all the houses with a population of about 480 million viewing it.[1] It is an entertainment not only for the children but most of the family members also spend their time viewing it. Children are influenced by the television but it can create both positive and negative effects affecting the social and cognitive domain[1].

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Teenagers spend their leisure time using the electronic media like television. Sports, physical activity, community service, cultural pursuits, reading and family time have decreased since they spent most of their time using electronic media.[2] Children in the United States watch about four hours of television every day rather than spending their time on other activities. In India, it is found that children spent their time viewing television more than two hours in a day. A child watches 15000 to 18000 hours on television by 18 years compared to attending 12000 hours at school.[2]

Television is viewed by adolescents at an early age as a form of entertainment and also as a media of propagating information. But the deleterious effects lead the child to physical inactivity which paves the way for the health problems like obesity.[3]

Television viewing pattern studied by Gurleen and Sukmani[4] in Northern India in 2011 revealed that about

79% of the respondents in the age group of 16-20 watch television either, "Most often" or "Sometimes". Most youngsters spent either most of the time or sometimes in front of television. Females spend more time in front of television than males. The total duration of time spent was about 3-5 hours daily. The reasons for usage was for improving knowledge and learning, for relaxation and time pass, uplifting hidden talents and also for reducing stress. It was also suggested that as the age increases the amount of time spent watching television decreases.

The influence of adolescent on television viewing was 96.31% in an urban slum in Delhi and most of them preferred watching television. Children watched for a mean hour of 3.56 and the girls watched more time (3.73 h) compared to boys (3.47 h).[3] The present study aimed to explore the television viewing pattern and investigate the adolescent's attitude and behaviour towards the usage of television among the adolescents studying in selected schools of Udupi district.

## MATERIALS AND METHOD

Using cross sectional design, we investigated the television viewing pattern and explored its influence on the attitude and behaviour of 400 adolescents studying in Indian Certificate of Secondary Education (ICSE) and Central Board of Secondary Education (CBSE) schools of Udupi district, Karnataka. Students in the age group of 13 to 16 years, who are willing to participate in the study were included. A multi stage cluster random sampling technique was used to select the schools from the Udupi district and identify the participants. A total of five schools were selected from the Udupi block randomly and the participants from the standard eight, nine and ten of each school was a cluster and were selected proportionately based on the total population in each school. The proportion of the student strength was calculated for each school and the same proportion was taken for the samples from each school.

The tools consisted of demographic proforma to collect the background information; a structured questionnaire with five items in a eight point scale to collect information on television usage pattern, which was categorized as less usage (0-14), moderate usage (15-27) and severe usage (28-40); an attitude scale with seven items in a five point scale to assess the attitude towards television viewing and a behaviour scale with nine items in a four point scale to assess the behaviour

towards television viewing. Content validity, pretesting and reliability were assessed and the tools were found to be highly reliable. After obtaining the administrative permission, ethical approval from the Institutional Ethics Committee of Kasturba hospital Manipal, administrative permission from Block Education Officer, Udupi block and Principals of CBSE and ICSE schools of Udupi district the data was collected from 8th to 10th standard students of the selected schools. The researcher approached the students after enquiring with the school office regarding their break hours or free periods. The students were selected based on those who met all the eligibility criteria and willing to participate in the study. The purpose of the study was explained and written consent was obtained from parents and assent from students. The students were assured about confidentiality of their responses.

## RESULTS

Data analysis was done based on the objective of the study, using descriptive (frequency and percentage) statistics and analysed using SPSS v16.0.

### Sample Characteristics

Sample characteristics showed that out of 400 adolescent students, majority 162 (40.5%) of the students belonged to 14 years of age, 121 (30.2%) were 15 years, 86 (21.5%) were 13 years and 31(7.8%) were 16 years. Majority 209 (52.2%) users were male students. Most of the students 140 (35%) were studying in 9th standard and were from Hindu religion 317 (79.2%). In 8th standard there were 129 (32.2%) and 10th standard 131(32.8%) students. Majority 396 (99%) of the students stayed in their home.

### Pattern of television usage:

All the children had viewed the television. Among the 400 adolescents, 397 (99.2%) of the children watched television at home and three of them (0.8%) watched from their neighbours home. With regard to television usage, majority 257 (64.2%) had moderate usage, 107 (26.8%) had low usage and 36 (9%) had severe usage. The item wise frequency and percentage distribution of television usage is described in table 1.

### Attitude towards television viewing:

The attitude of adolescents towards television viewing was measured using an attitude scale which contained seven items. It helps to identify what the

adolescents feel about using television. The item wise frequency and percentage distribution of attitude towards television usage is described in table 2. This shows that majority of the students 248 (62%) strongly agreed that watching television more time would damage the eyes and 277 (69.2%) strongly agreed that watching programs like news, informative channels will improve their knowledge.

**Behaviour towards television viewing:**

The behaviour of the adolescents viewing television was assessed by using validated a self-reported behaviour assessment scale under different sub areas like eating behaviour, sleeping behaviour, and manners. The behaviours are described in a frequency and percentage in a five point likert scale and presented in table 3, 4, and 5. Most of the students 228 (57%) agree that they eat snacks while watching television, 142 (35.5%) students think about movies they watched before sleeping and 129 (32.2%) were irritated when their parents switched off the television and asked them to read.

**DISCUSSION**

The present study signified that majority 257 (64.2%) of students had moderate usage, 107 (26.8%) had low usage and 36 (9%) had severe usage of television. The

findings also showed that most of the students watch television shows, video clips, movies on a television set most frequently. They also watch news, educational and informative channels in television frequently.

In a study on electronic media usage among higher education students conducted by Arulchelvan and Viswanathan[5] in 2006 showed that in a week 65.36% watch television every day, 12.74% watch 4 to 5 days, 5.83% watch once, 5.48% watch rarely and 4.64% do not watch television. It was also found that 20.60% watch television less than 30 minutes, 29.17% watch for 30 minutes to 1 hour, 21.07% watch between 1 to 2 hours, 16.90% watch from 3 to 5 hours and 7.62% watch television for more than 5 hours.

Television viewing among adolescent and school children was significantly associated with higher consumption of snacks, drinks advertised in television[6] which supports the present study findings where the students expressed and agreed to eating snacks while watching television. Also, television viewing has an impact on the increased calorie intake of additional 167 kcal/d by the youth and an increased consumption of food items advertised in the television.[7] This shows the impact the television has created among the adolescents and this study also supports the findings given in the previous studies.

**Table 1: Frequency and percentage distribution of television usage**

n = 400

| Statements | Never | Less frequently | Frequently | Most frequently |
|---|---|---|---|---|
| Watch TV shows video clips, movies, etc. on a TV set | 11  (2.8%) | 76  (19%) | 139 (34.8%) | 174 (43.5%) |
| Watch sports  channels | 53 (13.2%) | 135 (33.8%) | 117 (29.3%) | 95 (23.7%) |
| Watch news in   TV set | 53 (13.2%) | 117 (29.3%) | 164 (41%) | 66 (16.5%) |
| Watch educational and informative channels | 31 (7.8%) | 134 (33.5%) | 138 (34.4%) | 97 (24.3%) |
| Watch cartoons in channels | 131(32.8%) | 115(28.8%) | 85 (21.2%) | 69 (17.2%) |

**Table 2: Frequency and percentage distribution of attitude towards television usage  n=400**

| Statements:<br><br>I feel that,<br>Television: | Strongly Agree | Agree | Uncertain | Disagree | Strongly disagree |
|---|---|---|---|---|---|
| television is a necessity in every house. | 120 (30%) | 222 (55.5%) | 43 (10.8%) | 14 (3.5%) | 1 (0.2%) |
| watching television more time would damage the eyes. | 248 (62%) | 139 (34.8%) | 7(1.8%) | 1 (0.2%) | 5 (1.2%) |
| It is good to spend most of the time watching television. | 15 (3.8%) | 23 (5.8%) | 79 (19.8%) | 199 (49.8%) | 84 (21%) |
| watching programs like news, informative channels will improve knowledge. | 277(69.2%) | 107 (26.8%) | 8 (2%) | 4 (1%) | 4 (1%) |
| it is good to eat food and watch television simultaneously | 19 (4.8%) | 35 (8.8%) | 87 (21.8%) | 147 (36.8) | 112 (28%) |
| it is not good to watch the channels which are not supposed to be watched. | 232 (58%) | 72 (18%) | 16 (4%) | 26 (6.5%) | 54 (13.5%) |
| watching television is a waste of time | 25 (6.2%) | 65 (16.2%) | 143 (35.8%) | 95 (23.8%) | 72 (18%) |

**Table 3: Frequency and percentage distribution of eating behaviour n=400**

| Statements: | Strongly Agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I eat more food when I am watching television | 37 (9.2%) | 127 (31.8%) | 178 (44.5%) | 58 (14.5%) |
| I take more time to eat while watching television | 96 (24%) | 158 (39.5%) | 78 (19.5%) | 68 (17%) |
| I like eating while watching television | 92 (23%) | 164 (41%) | 88 (22%) | 56 (14%) |
| I eat snacks while watching television | 94 (23.5%) | 228 (57%) | 42 (10.5%) | 36 (9%) |

**Table 4: Frequency and percentage distribution of sleeping behaviour**                    **n=400**

| Statements: | Strongly Agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I watch television late night | 33 (8.2%) | 72 (18%) | 179 (44.8%) | 116 (29%) |
| I think about movie I have seen before sleeping | 47 (11.8%) | 142 (35.5%) | 129 (32.2%) | 82 (20.5%) |

**Table 5: Frequency and percentage distribution of manners n=400**

| Statements: | Strongly Agree | Agree | Disagree | Strongly disagree |
|---|---|---|---|---|
| I fight with my parents/ siblings for remote control | 29 (7.2%) | 89 (22.2%) | 133 (33.2%) | 149 (37.2%) |
| I get irritated when my parents switch off television and tell me to study | 55 (13.8%) | 129 (32.2%) | 134 (33.5%) | 82 (20.5%) |
| I do not obey my parents for the time scheduled to watch television | 132 (33%) | 183 (45.8%) | 63 (15.8%) | 22 (5.5%) |

## CONCLUSION

Television usage among children has been increasing from the younger generation to the elders. The purpose of usage range varies among different age groups. Among children, the adolescent age group has been found to have an increased use of these media. They have a positive attitude towards viewing television. However, the television viewing has also influenced the adolescent behaviour like eating, sleeping and manners. Awareness should be created among the adolescents about the positive and negative effects of it, so that the harmful effects can be removed and the behaviour can be modified. Hence, a healthy television viewing pattern can be followed by the adolescents.

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# Study of Hyponatremia and its Prognostic Implications in Hospitalized Patients with Cirrhosis of Liver

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## ABSTRACT

**Background-** Hyponatremia is the most common electrolyte abnormality observed in hospitalized patients with cirrhosis of liver. Low serum sodium concentration is an independent predictor of mortality in patients with cirrhosis, but its prevalence and clinical significance is unclear. **Aims and Objectives**-1) The aim of the present study was to assess the frequency of low serum sodium in hospitalized patients with cirrhosis of liver.2)To study the correlation between the serum sodium levels and complications of cirrhosis.3) To assess the outcome in cirrhosis of liver with hyponatremia. **Material and Method**- The study was conducted in 100 patients with cirrhosis of liver. All the patients diagnosed as cirrhosis of liver on the basis of clinical examination and imaging were included as subjects. Patients with Cardiac failure and Chronic kidney disease were excluded. The data was collected in a pre typed proforma. The patients demographics, clinical presentation and the severity of cirrhosis were assessed. Serum Sodium levels was done in all the patients and the values correlated with various complications of cirrhosis and outcome. Serum sodium less than 135 meq/L was considered as hyponatremia.The enrolled patients were followed up during hospital stay and the outcome at the time of discharge noted. **Results**- This prospective study included 100 patients out of which 76 were males and 24 females. 88%(88) cases were between 20-60 years. Prevalence of hyponatremia was 46%. Hepatic encephalopathy was observed to be highly significantly associated with low serum sodium levels. 22 (84.6%) and 4 (15.4%) patients with hyponatremia and normal sodium levels respectively had encephalopathy. P value-<0.001. 5 (83.3%) patients with hepatorenal syndrome had hyponatremia and 1 (16.7%) patient with hepatorenal syndrome (HRS) had normal sodium levels. Hepatorenal syndrome also showed significant relationship with hyponatremia. P value< 0.05 .Overall mortality was11 (11%).10 (90.9%) patients amongst those who expired had hyponatremia. Pvalue =0.002 **Conclusions-** Hyponatraemia is frequent in cirrhotic patients .Serum sodium levels should be closely monitored in patients experiencing complications of cirrhosis. Low serum sodium levels in cirrhosis are associated with high frequency of hepatic encephalopathy and hepatorenal syndrome with high morbidity and mortality.

*Keywords-* *Cirrhosis, Complications, Hyponatremia.*

## INTRODUCTION

In recent years, hyponatremia has attracted interest as a possible prognostic factor for liver cirrhosis.

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Hyponatremia is an alteration in patients with advanced liver disease. Hyponatremia is the most common electrolyte abnormality observed in hospitalized patients. Patients with cirrhosis may develop hyponatremia due to either hypovolemia (example: loss of extracellular fluid due to diuretics) or hypervolemia (expanded extracellular fluid volume due to the inability of the kidneys to excrete solute-free water proportionate to the amount of free water). Mostly affecting the productive age group of the male population cirrhosis of liver is a

burden to the society. Low serum sodium concentration is an independent predictor of mortality in patients with cirrhosis, but its prevalence and clinical significance is unclear.[1]

Patients with liver cirrhosis develop progressive circulatory dysfunction, which induces activation of the renin–angiotensin–aldosterone system (RAAS), activation of the sympathetic nervous system and increased activity of antidiuretic hormone. Such activation results in renal fluid retention, ascites and dilutional hyponatremia.[2] Prognosis is an essential part of the baseline assessment of any disease Hyponatremia in cirrhosis is associated with increased morbidity and mortality.[3]

## AIMS AND OBJECTIVE

1) The aim of the present study was to assess the frequency of low serum sodium in hospitalized patients with cirrhosis of liver.

2) To study the correlation between the serum sodium levels and complications of cirrhosis.

3) To assess the outcome in patients with liver cirrhosis with hyponatremia.

## MATERIAL AND METHOD

The study was conducted in 100 patients with cirrhosis of liver admitted in JA Group of hospitals Gwalior from August 2014 to October 2015. Ethical clearance was obtained from ethical society of G.R.Medical College. Informed consent was obtained from all patients enrolled for the study. All the patients diagnosed as cirrhosis of liver on the basis of clinical examination and imaging were included as subjects. Patients with Cardiac failure and Chronic kidney disease were excluded. Serum sodium levels were done in all the selected patients in addition to routine biochemistry. The data was collected in a pre typed proforma. The patients demographics , clinical presentation and the severity of cirrhosis were assessed according to Child Pugh Score. Serum Sodium level was done in all the patients and the values correlated with various complications of cirrhosis and outcome. Serum sodium less than 135 meq/L was considered as hyponatremia.The enrolled patients were followed up during hospital stay and the outcome at the time of discharge noted. Correlation was made and the data was analyzed using Statistical Package for the Social Sciences (SPSS) Software. Descriptive statistical

analysis was carried out in the present study. Results on continuous measurements were presented as Mean ± SD and results on categorical measurements were presented in percentage. Chi square test/ Fisher exact test were used to find the significance of the study parameters on categorical scale between two or more groups.

## RESULTS

This prospective study included 100 patients out of which 76 were males and 24 females. Mean age was 44.29±12.6 years (range 18-88 years).

Age wise distribution showed that 2 (2%) cases were less than 20years, 88%(88) cases were between 20-60 years and 10 (10%) were more than 60 years. Table-1

Serum Sodium was less than 135 meq/ L in 46 (46 %) and the sodium level was normal( between 135- 145 meq/L) in 54 (54%).Prevalence of hyponatremia was 46%.Table-2

65 (65%) patients had alcohol related hepatitis, and 27 (27%) were cryptogenic, 8 (8%) were positive for hepatitis B and none of them had hepatitis C.

Maximum number of patients 91 (91%) presented with abdominal distension, 86% with jaundice, 76 (76%) with pedal oedema, 30(30%) with altered sensorium, 12 (12%) with gastrointestinal bleed and 1 (1%) with seizures. Table-3

Complications observed were ascites in 88 (88%), portal hypertension in 57 (57%),hepatic encephalopathy 26 (26%), gastrointestinal bleed 12 (12%)and hepatorenal syndrome (HRS) in 6 (6%).

Hepatic encephalopathy was observed to be highly significantly associated with low serum sodium levels. 22 (84.6%) and 4 (15.4%) patients with hyponatremia and normal sodium levels respectively had encephalopathy. P value-<0.001 (Table-4)

5 (83.3%) patients with hepatorenal syndrome had hyponatremia and 1 (16.7%) patient with hepatorenal syndrome (HRS) had normal sodium levels. Hepatorenal syndrome also showed significant relationship with hyponatremia. P value< 0.05 (Table-4)

Mean Child Pugh Score was 11.26±2.4 in those with hyponatremia( serum sodium < 135 meq/L )and 8.70±2.7 in those with normal (serum sodium 135-145 meq/L).P Value <0.001

Maximum (82%) of the study participants had decompensated cirrhosis as compared to 18% with compensated cirrhosis.

Overall mortality was11 (11%).10 (90.9%) patients amongst those who expired had hyponatremia. P value =0.002 (Table-5)

## DISCUSSION

Cirrhosis of liver was predominantly seen in males and amongst the most productive age group (20-60 years). 76 (76%) were males. Gender associated difference exists.

65 (65%) patients had alcohol related hepatitis, and 27 (27%) were cryptogenic, 8 (8%) were positive for hepatitis B and none of them had hepatitis C. Screening for alcohol abuse and other risk factors in all adult patients presenting to hospital can decrease both morbidity and mortality due to cirrhosis.

In the initial clinical presentation abdominal distension was present in (91) 91%, and Jaundice in (86) 86%.

Prevalence of hyponatremia was 46% in our study.Prevalence of hyponatremia was 49.4% as per a study conducted by Angeli P et al .[1]

Portal hypertension, diuretics, large volume paracentesis without albumin, infection, and multiple medications are responsible for the development or worsening of hyponatremia.[4]

In our study serum sodium levels were strongly associated with the occurrence of some of the major complications of cirrhosis. Hyponatremia was also associated with numerous complications in liver disease patients, including severe ascites, hepatic encephalopathy.[5]

Hyponatremia and renal failure may develop in patients with cirrhosis due to causes other than portal hypertension. Hyponatremia is important both therapeutically and prognostically.[6]

The frequency of hepatorenal syndrome (HRS) in cirrhotics was 6(6%). 5 (83%) patients with hyponatremia compared to 1 (13.7%) with normal serum sodium had HRS. HRS showed significant association with sodium levels.(p value <0.05) .Hyponatremia and hepatorenal syndrome are severe complications in patients with cirrhosis and ascites resulting from circulatory abnormalities (splanchnic and systemic vasodilatation) that develop with portal hypertension. Both conditions are associated with an increased risk of death. [5]

Hepatorenal syndrome is now regarded as a potentially reversible disorder, as systemic vasoconstrictors with concomitant albumin administration are emerging as a promising management.[7]

In the present study the frequency of hepatic encephalopathy observed was 26 (26%). 22 (84.6%) with hepatic encephalopathy had hyponatremia and 4 (15.4%) with hepatic encephalopathy had normal sodium levels. Hepatic encephalopathy was observed to be highly significantly associated with serum sodium levels. (p value <0.001) Table-4

There is evidence suggesting that hyponatremia predisposes to hepatic encephalopathy. In advanced cirrhosis there is a reduction in the brain concentration of many organic osmolytes, particularly myo-inositol (MI). Hyponatremia could theoretically aggravate these changes as a result of hypo-osmolality of the extracellular fluid.[8]

Inclusion of serum sodium to Model for end stage liver disease (MELD) identified a subgroup of patients with poor outcome in a more efficient way than MELD alone and significantly increased the efficacy of the score to predict mortality.[9]

Addition of serum sodium to MELD increases the ability to predict 3- and 6-month mortality in patients with cirrhosis.[10]

.Persistent ascites and low serum sodium identify patients with cirrhosis with high mortality risk despite low MELD scores.[11]

Mean Child Pugh Score was 11.26±2.4 in those with hyponatremia( serum sodium < 135 meq/L) and 8.70±2.7 in those with normal (serum sodium 135-145 meq/L).p value <0.001

The serum sodium level was strongly associated with the severity of liver function impairment as assessed by Child-Pugh.

Prognosis is an essential part of the baseline assessment of any disease . Despite of several limitations, recent large systematic review showed that Child-Pugh

score was still robust predictors .[12]

Hyponatremia in cirrhosis of liver is associated with increased morbidity and mortality. Although survival is significantly reduced in patients with cirrhosis, a reduced sodium concentration cannot be considered as a independent predictor of the risk for death.[13]

Hyponatremia was present in (10) 90.9% of patients who died as compared to1 (9.1%) who survived. This was found to be statistically significant (p value <0.002)

Several studies have shown that serum sodium levels correlate with survival in cirrhotic patients. Little is known, however, regarding the relationship between the degree of dilutional hyponatremia and development of cirrhotic complications [14]

There is a possibility of a potentially negative impact of low serum sodium levels, even a mild reduction on the clinical course of cirrhosis.

To sum up,the presence of hyponatremia has a poor prognosis for survival in patients with cirrhosis and ascites. Effective and safe treatments are needed to improve prognosis in patients with cirrhosis.

**Table-1: Showing frequency of cirrhosis according to age groups**

| AGE GROUP IN YEARS | FREQUENCY (%) OF CIRRHOSIS n=100 |
|---|---|
| < 20 | 2 (2%) |
| 20—60 | 88 (88%) |
| >60 | 10 (10%) |

**Table-2: Distribution of patients with chronic liver disease according to sodium levels**

| SODIUM LEVELS | N=100 |
|---|---|
| < 135 | 46 (46%) |
| 135-145 | 54 (54%) |
| ➢       145 | 0 |

**Table-3: Clinical presentation at the time of admission**

| Sr No | PRESENTATION | NUMBER OF CASES |
|---|---|---|
| 1. | ABDOMINAL DISTENSION | 91 (91%) |
| 2. | SWELLING IN LOWER LIMBS | 76 (76%) |
| 3. | JAUNDICE | 86 (86%) |
| 4. | ALTERED SENSORIUM | 30 (30%) |
| 5. | GASTROINTESTINAL BLEED | 12 (12%) |
| 6. | SEIZURE | 01 (1%) |

**Table-4 : Showing serum sodium levels in patients with various complications of cirrhosis**

| S. No | COMPLICATIONS OF CHRONIC LIVER DISEASE | SERUM SODIUM <135 meq/L (N=46) | SERUM SODIUM 135-145meq/L (N=54) | P VALUE |
|---|---|---|---|---|
| 1. | ASCITES (N=88) | 39(44.3%) | 49(55.7%) | 0.361 |
| 2. | PORTAL HYPERTENSION (N=57) | 30(52.6%) | 27 (47.4%) | 0.126 |
| 3. | HEPATIC ENCEPHALOPATHY(N=26) | 22 (84.6%) | 4 (15.4%) | <0.001 |
| 4. | GASTROINTESTINAL BLEEDING(N=12) | 7 (58.3%) | 5 (41.7%) | 0.361 |
| 5. | HEPATORENAL SYNDROME(N=6) | 5(83.3%) | 1 (16.7%) | <0.05 |

**Table-5: Showing outcome in patients with chronic liver disease and hyponatremia Legend**

| OUTCOME | SERUM SODIUM < 135 meq/L (N=46) | SERUM SODIUM 135-145 meq/L (N=54) |
|---|---|---|
| SURVIVED 89 | 36 (40.4%) | 53 (59.6%) |
| EXPIRED 11 | 10 (90.9%) | 1 (9.1%) |

P-VALUE-0.002

## CONCLUSIONS

Hyponatraemia is frequent in cirrhosis of liver. Serum sodium levels should be closely monitored in patients experiencing complications of cirrhosis. Low serum sodium levels in cirrhosis are associated with high frequency of hepatic encephalopathy and hepatorenal syndrome with increased morbidity and mortality.

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# A Study of Xerophthalmia and Associated Bio-social Factors in a Population of Tribal Residential School Children of Odisha

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## ABSTRACT

**Objective** – The Present study was done to assess the prevalence of xerophthalmia in a population of tribal residential school children and identify different bio-social factors associated with it. **Materials and method** – This was a cross sectional descriptive study, conducted in a residential tribal school of Odisha. The study population comprised of five hundred children in the age group of 5 to 10 years, studying in class 1 to class 5, chosen by random sampling. A structured proforma was used to collect the information and ophthalmological examination was done to diagnose xerophthalmia. Xerophthalmia was diagnosed if there was history of night blindness, or there were signs of cojunctival xerosis, Bitot's spots, corneal xerosis and keratomalacia on clinical examination. Statistical analysis was done using the SPSS windows version 14.0 software. **Results** – The overall prevalence of xerophthalmia was found out to be 6.01%, though isolated conjunctival xerosis was seen in 35% of cases. The results were comparable in boys (6.2%) and girls (5.7%). It was found to increase with increasing age, reaching the highest at 9 to 10 years of age (10.1%). Moderate to severe malnutrition and large family size (>6) were found to be significantly associated with it (P < 0.05). **Conclusion** – Xerophthalmia is a major public health problem in tribal children staying in residential school.

**Keywords** : *Xerophthalmia, Vitamin A deficiency, School children, Tribal children.*

## INTRODUCTION

Vitamin A is an important micronutrient essential for vision, growth and development, maintenance of epithelial integrity, immune function and reproduction.[1] It also helps in regulating gene expression and cell differentiation. Its deficiency continues to be a major contributor of childhood morbidity and mortality in developing countries. As per WHO, the term "xerophthalmia" refers to a spectrum of ocular manifestations due to systemic vitamin A deficiency, which includes night blindness (XN), conjunctival xerosis (X1A), Bitot's spots (X1B), corneal xerosis (X2), corneal ulcer (X3A) and keratomalacia (X3B).[1]

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Vitamin A deficiency (VAD) is a major public health problem in 118 developing countries.[2] Approximately one third of world's pre-school age population is estimated to be viamin A deficient; with highest prevalence (44-50%) being reported from Africa and South-East Asia.[2] Though one of the main causes of xerophthalmia is poor intake of vitamin A rich foods, it is also associated with poverty, ignorance, faulty feeding habits among the entire population but young children in particular.[3] Globally it has been estimated that 127 million preschool children are vitamin A deficient (serum retinol level < 0.7 µmmol/l or having abnormal impression cytology) of whom 4.4 million have xerophthalmia.[2] So the prophylactic interventional programme is targeted towards the age group of 6 months to 5 years. However, studies have shown a high prevalence of xerophthalmia among school aged children.[2] Further it is more common in slum children, where poverty, overcrowding and malnutrition prevail.[4] Children residing in traditional boarding schools are vulnerable to vitamin A deficiency diseases (VADD).[5] These children may go undetected unless specifically sought.

There are few studies regarding prevalence of xerophthalmia in residential school children in India, and that too in a tribal school. So the present study was undertaken to know the prevalence of xerophthalmia and its association with different social factors in a population of tribal children in a residential school of Odisha.

## MATERIALS & METHOD

This was a cross sectional study, conducted among children aged 5 to 10 years, residing in a residential tribal school. The tribal school is one of the biggest in the state and harbours around 15000 tribal children. The study was carried out for three months, after getting the approval from institutional ethics committee and permission from school authorities. The study population comprised five hundred children in the age group of 5 to 10 years. A detailed list of students from class 1 to class 5 was collected and hundred children from each class were included in the study, by using simple random sampling method. Eighteen students were excluded from the study due to presence of chronic diseases like tuberculosis, bronchial asthma and sickle cell anemia.

A structured proforma was used to collect socio-demographic characteristics like age, sex, family size, occupation of the parents etc. All the children were enquired about the presence of night blindness in the local language. Anthropometric measurements were recorded as per the standard WHO guidelines. The socio-economic status of the study subjects was identified as per modified Kuppuswamy's socioeconomic scale. Nutritional assessment was done as per Indian Academy of Pediatrics classification, based on weight for age. Ocular examination was done with the help of a bright illuminant torch in natural light by a trained ophthalmic assistant. Xerophthalmia was diagnosed if there was history of night blindness, or there were signs of cojunctival xerosis, Bitot's spots, corneal xerosis and keratomalacia on clinical examination.[6]

As per WHO, conjunctival xerosis (X1A) is not recommended for community diagnosis.[1] Hence, only when accompanied by Bitot's spots(X1B), it was included as a positive clinical sign of xerophthalmia in the present study. Children diagnosed having xerophthalmia were given two lakh IU of vitamin A on the spot.

Statistical analysis was done using the SPSS windows version 14.0 software. Test of significance (Pearson's Chi-squared test) was applied to find out the association.

P values <0.05 were considered significant.

## RESULTS

Out of the total study population of 482, 274 (56.4%) were boys and 208 (43.6%) were girls. Their age ranged between 5 and 10 years. 96.6% were Hindus and the rest 3.4% were Christians. All belonged to scheduled tribe population from different districts of Odisha. The prevalence of isolated conjunctival xerosis was found out to be 35%. No case of active corneal involvement was seen. The overall prevalence of xerophthalmia was found out to be 6.01%. It was comparable both in boys (6.2%) and girls (5.7%). It was found to be higher among children aged 8 years and above (8.7%), while it was low among children aged 7 years and below (4.1%). It was found to increase with increasing age, reaching the highest at 9 to 10 years of age. Bitot's spots were found to be more common in children of older age group i.e. more than 9 years of age (Table-1).

Forty four (9.1%) were found out to be from middle socioeconomic status and the rest 438 (90.9%) were from low socioeconomic status. There is no significant difference between these two groups (P > 0.05) (Table-4).

Out of 482 children examined, 477 (99%) were malnourished. 79% were found to have grade II and III malnutrition (moderate and severe) and 21% were normal or having grade I malnutrition (mild). No child was found to have grade IV malnutrition (very severe). Prevalence of xerophthalmia in moderate to severe malnutrition group was found to be 7.38 %, whereas it is 0.99% in children with mild malnutrition, which is statistically significant (P < 0.05 ) (Table-3). No evidence of xerophthalmia was found in nutritional normal children. Xerophthalmia was found to be more common (8.33%) in children with family size of 6 or more. Only 3 (1.76%) children with family size 6 or less were found to have xerophthalmia and the difference is statistically significant.

## DISCUSSION

Vitamin A deficiency is one of the important causes of preventable blindness world over. In India alone 52000 children go blind every year on account of vitamin A deficiency.[7] Data are few regarding prevalence, severity and health consequence of vitamin A deficiency in school age children of India. Tribal population contributes to about 8% of Indian population and their socio-

demographic characteristics are different from other. Many tribal children are now staying in government and private sponsored residential schools where overcrowding, bad sanitation and malnutrition prevail. The study was undertaken in one such school to know the prevalence of xerophthalmia among them and factors associated with it.

In our study we found the prevalence of xerophthalmia to be 6.01%. V Singh and KP West Jr, in their study based on population survey and study reports have estimated the prevalence of vitamin A deficiency (based on serum retinol level) and mild xerophthalmia (night blindness or Bitot's spots) to be 23.4% and 10.9% respectively in school-aged children of South-eastern Asia.[2] They have also estimated the national prevalence of xerophthalmia for India to be 2.8%.[2]

Abdeloneim et al did a study on xerophthalmia in a traditional Quran boarding school in Sudan and found out the prevalence of night blindness, conjunctival xerosis and Bitot's spots were 24%. 12.5% and 1% respectively.[5] Desai et al and Sharma et al found the prevalence of mild and severe xerophthalmia in school-aged children to be 9.9% and 9.6% respectively.[8,9] Khan et al found the overall prevalence of VAD in school children of Bareilly to be 6.37%, whereas Chauhan et al found it out to be 2.9% among school children of urban slums of Ahmedabad.[10,11]

Isolated conjunctival xerosis in our study population was found to be very high (35%). This could be due to subclinical vitamin A deficiency, malnutrition or previous eye infection. Estimation of serum retinol level would have thrown more light in to the real picture which could not be done due to financial constraints.

Not a single case of corneal xerosis (X2), corneal ulcer (X3A), keratomalacia (X3B) or corneal scar (XS) was found out in our study. This could be due to small sample size or good medical care at school setup.

In the present study, prevalence of xerophthalmia was found to be little higher in boys (56.4%) than girls (43.6%), although this is not statistically significant. Similar trends have been reported in other studies.[11,12] All the children belonged to scheduled tribe population of Odisha.

The prevalence of Bitot's spots was found out to be higher in older age group ( >9 years). This could be due to more demand of vitamin A during the growth spurt in pre-adolescent period or a manifestation of chronic vitamin A deficiency. A prevalence of 34% was reported among school attending adolescents in Nigeria.[13] We also found a rising trend in the prevalence of xeophthalmia with increasing age. Similar trend has been reported by Sachdeva et al.[14]

The association between various socio-demographic factors like low socio-economic status, maternal illiteracy, high birth order, large family size etc. and xerophthalmia have been shown by various studies.[15,16] In the current study, prevalence of xerophthalmia was found to be more in severely underweight children which is in concordance with previous studies.[17] This may be because of the fact that undernutrition is usually associated with low calorie intake including low intake of micronutrients. Further, various infections and worm infestations, which are prevalent in these children, can precipitate vitamin A deficiency when stores are marginal. Our study showed a significant association between xerophthalmia and large family size (>6). This may be due to inadequate vitamin A reserve in these children due to poor availability in the family diet as a result of poverty and overcrowding. Similar results have been shown in previous studies.[15,16]

We could not establish any relationship with literacy status of parents, birth order, previous history of measles, vitamin A prophylaxis and dietary habit. This is because of the fact that, they were all staying in a residential school taking a common meal and parents were not available at the time of examination for a proper history.

The merit of the study is that, this is one of the very few study done to know the prevalence of xerophthalmia in a population of tribal school children, who are underprivileged and often neglected. There are limitations too. Firstly, sample size is less and secondly, as this was a school based study, the results cannot be applied to the general population.

The study shows that xerophthalmia is at a level of major public health significance in children of a tribal residential school from Odisha. The universal vitamin A supplementation (UVAS) programme is mainly targeted towards the preschool children. The school-aged children, mostly from the poor and underprivileged society are often neglected by the policymakers in this regard. Though keratomalacia has almost disappeared and there is a sharp decline in the prevalence of Bitot's spots in last 4 decades,

recent surveys has indicated it to be high in a few isolated geographical pockets which are socio-economically backward with poor health infrastructure.[18,19,20] The nutritional programmes should be targeted towards these weaker sections of the society instead of being universal. Nutritional education regarding regular intake of vitamin A rich foods should be strengthened among students, parents and teachers. The concept of kitchen garden should be adopted by all the residential schools, so that the children should get enough of green leafy and yellow vegetables. Provision of safe drinking water, maintaining proper sanitation and hygiene in the school premise, providing regular health care and immunization of the children should be considered of utmost importance by the school authorities. Xerophthalmia screening should be made an essential part of every school health programme so as to ensure early detection and prevention of complications. Further larger studies are required to know the exact prevalence of xerophthalmia in tribal children of Odisha.

### Table-1: Prevalence of different manifestations of xerophthalmia across age.

| AGE GROUP | NUMBER. OF STUDY SUBJECTS | ONLY NIGHT BLINDNESS (XN) | ONLY BITOT'S SPOT (X1B) | BOTH XN AND X1B | TOTAL NUMBER WITH XEROPHTHALMIA |
|---|---|---|---|---|---|
| 5 - 6 | 98 | 2 (2.04) | 0 | 0 | 2 (2.04) |
| 6 -7 | 95 | 2 (2.1) | 1 (1.05) | 1 (1.05) | 4 (4.2) |
| 7 - 8 | 94 | 2 (2.12) | 1 (1.06) | 2 (2.12) | 6 (6.3) |
| 8 - 9 | 96 | 1 (1.04) | 4 (4.16) | 3 (3.1) | 7 (7.2) |
| 9 - 10 | 99 | 2 (2.02) | 5 (5.05) | 3 (3.03) | 10 (10.1) |
| TOTAL | 482 | 9 (1.86) | 11 (2.28) | 9 (1.86) | 29 (6.01) |

### Table -2: Prevalence of xerophthalmia in comparison with WHO cut-off level.

| CLINICAL SYMPTOMS | NUMBER OF ASES | PREVALENCE (%) | WHO CUT OFF LEVEL (%) |
|---|---|---|---|
| NIGHT BLINDNESS (XN) | 9 | 1.86 | 1 |
| CONJUNCTIVAL XEROSIS (X1A) | 168 | 35 | 10 |
| BITOT'S SPOTS (X1B) | 11 | 2.28 | 0.5 |
| CORNEAL XEROSIS (X2) | 0 | 0 | 0.01 |
| CORNEAL ULCER (X3A) | 0 | 0 | 0.01 |
| KERATOMALACIA (X3B) | 0 | 0 | 0.01 |
| CORNEAL SCAR (XS) | 0 | 0 | 0.05 |

### Table -3: Distribution of children with xerophthalmia according to nutritional status.

| NUTRITIONAL STATUS | TOTAL STUDENTS (%) | PREVALENCE OF XEROPHTHALMIA NUMBER (%) | CHI-SQUARE | P VALUE |
|---|---|---|---|---|
| **Normal or Mild malnutrition** | 101 (20.95) | 1 (0.99) | | |
| **Moderate or Severe malnutrition** | 381 (79) | 28 (7.35) | 5.709 | 0.017* |
| **Total** | 482 | 29 (6.01) | | |

*P<0.05

**Table 4: Prevalence of xerophthalmia as per different socio-demographic factors.**

| SOCIO-DEMOGAPHIC FACTOR | NO.OF SUBJECTS Number (%) | XEROPHTHALMIA Number (%) | CHI-SQUARE | P-VALUE |
|---|---|---|---|---|
| GENDER | | | | |
| MALE | 274 (56.4) | 17 (6.2) | | |
| FEMALE | 208 (43.6) | 12 (5.7) | 0.039 | 0.842 |
| SCIOECONOMIC STATUS | | | | |
| MIDDLE | 44 (9.1) | 2 (4.5) | | |
| LOWER | 438 (40.9) | 27 (6.2) | 0.185 | 0.669 |
| FAMILY SIZE | | | | |
| <6 | 170 (35.3) | 3 (1.76) | | |
| >6 | 312 (64.7) | 26 (8.33) | 8.397 | 0.004* |

*P<0.05

## CONCLUSION

To conclude, xerophthalmia in its various forms may be a problem of public health significance in school-aged children of tribal residential schools of Odisha. Proper nutrition, good health care, maintaining sanitation and hygiene and above all, Government policies targeting these vulnerable groups will go a long way to prevent xerophthamia, a major cause of blindness in children.

**Conflict of Interest** – Nil

**Ethical Clearance** – Yes

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# A Portrayal of Childhood Injury among Under- Five Year Children

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## ABSTRACT

**Introduction**: Children and injuries are always closely associated. Injuries to children irrespective of its seriousness will affect the whole family function. One of the major reasons for childhood morbidity and mortality are injuries.

**Method:** A cross sectional house to house survey was conducted in Udupi Taluk to identify the major types of childhood injuries. The study also tried to find the association between the age of the child and the common injuries.

**Results:** The present study used a sample subject of 2040 for the survey. The mean age of children included in the study were 2.60 (SD $\pm$ 1.16) years. Majority of children included in the survey were males 52.5%. The overall injury identified in survey was 14%. Fall from stairs (92%), burn with hot water/food (41%), injury with a sharp knife (72%), accidental ingestion of medicine (3%), injury during play (94%) and foreign body in ear and nose (79%) were identified as the most common injuries among children of 2 to 5 years.

**Conclusion:** This article establishes the need for a detailed prevalence survey. A detailed survey will help in planning an intervention for caregivers which can reduce the injuries in children.

*Keywords: childhood injury, prevalence, cross sectional survey, fall, burn, injury*

## INTRODUCTION

Children are very special and precious in each house. Injuries to children irrespective of the seriousness, affects the whole family function. World Health Organization reports injuries as one of the major reasons for disability and mortality among children[1]. In India the style of injury among children varies from place to place. Since there is no registry maintained yet, the burden and seriousness of injury among children are not clearly available.

Home is the place where majority of children below 5 years of age spend most of their time, so most of the injuries among these children happen at home. The curiosity of children and the unawareness of the environmental hazards make them susceptible for various kinds of injuries [2].

Approximately 3.9 million children every year die only because of injuries, this number is three times higher than the next major reason of deaths among children, that is congenital anomalies [3].

Injuries leading to mortality among children were only the tip of the iceberg[4]. The non-fatal injuries among children may have lifelong effects like disability and restriction in performing activities. The lack of reporting and the deep rooted belief that certain amount of aches and pains are part of normal growth and development

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restricts the visibility of the serious issue of injury.

This article is trying to find the most common injuries among children between the age of 2 to 5 years of age in their houses. In this article the authors are explaning the child related factors for the most common injuries and its association with age.

## MATERIALS AND METHOD

A cross sectional house to house survey was conducted in 34 villages of Udupi Taluk. In every house the caregiver of the children between the age of 2 to 5 years were directly interviewed by the researcher. Villages were selected using population proportion method. Houses were selected after identifying a land mark on each village proceeding to right side whichever is the house that had a child meeting the selection criteria-age between 2 years to 5 years, without having a chronic disability and the child was staying at the place for the past three months. A pre prepared structured questionnaire was used for data collection. The main purpose of the survey was to identify the major areas of injuries among children. The survey was conducted in the month of April and May 2014. After obtaining the informed consent from the caregiver the researcher collected the data through a personal interview. The interview took around 10 minutes per family. The information were collected using the local language.

## DATA ANALYSIS

The collected data were entered using IBM SPSS 20 version. The data were entered and the accuracy of the entry was made sure by verifying it with the help of another researcher. Descriptive statistics frequency and percentages were used for the presentation of the data.

## FINDINGS

The major findings of the study are presented in three tables. The data are presented including the sample characteristics of the child, the most prevalent injuries reported and an association of the age of the child and various injuries.

**Table 1: Frequency and Percentage Distribution of Children based on Socio-demographic Characteristics**

**N = 2040**

| Variables | f | % |
|---|---|---|
| Age (in Years) | | |
| 2 | 483 | 23.7 |
| 3 | 488 | 23.9 |
| 4 | 428 | 21.0 |
| 5 | 641 | 31.4 |
| Gender of the child | | |
| Male | 1071 | 52.5 |
| Female | 969 | 47.5 |
| Type of family | | |
| Nuclear | 602 | 29.5 |
| Extended | 1438 | 70.5 |
| Number of children in the house | | |
| 1child | 559 | 27.4 |
| 2 children | 941 | 46.2 |
| 3 and more | 540 | 26.4 |
| Number of siblings of the child | | |
| No | 688 | 33.7 |
| 1 | 1058 | 51.9 |
| 2 | 275 | 13.5 |
| 3 and more | 19 | 0.9 |
| Gender of siblings (n = 1352) | | |
| Male | 540 | 39.9 |
| Female | 632 | 46.8 |
| Male & Female | 180 | 13.3 |
| Age of first child (in Years) | | |
| Under 5 | 1096 | 53.7 |
| School Age | 871 | 42.7 |
| Adolescent | 63 | 3.1 |
| Early Adult | 10 | 0.5 |
| Birth order | | |
| First | 1105 | 54.2 |
| Last | 810 | 39.7 |
| In between | 125 | 6.1 |

This Table 1 presents the characteristics of 2040 samples. The survey included children between the age of 2 years to 5 years. Among the 2040 samples 31.4 % belonged to 5 years of age and the mean age was 2.60 ($SD \pm 1.16$). The frequencies of two year and three year old children were almost similar; that is 23.7% and 23.9% respectively. The majority (52.5%) of the children in the survey were males and from extended family (70.5%). The number of children in the family varied from one child to nine children in the house. Most of the houses had two children (46.2%). The table also presents the data of number of siblings for the child; 33.7% of them were not having siblings and a majority (51.9%) of them had one

sibling. Female siblings were more than (46.8%) male siblings. There were 13.3% of children who had male and female sibling. The survey also found that 53.7% children below five years were the first child in the house.

**Table 2: Most Prevalent Childhood Injuries**

**N = 2040**

| Area | Prevalence % | 95% CI |
|---|---|---|
| Fall from stairs /window | 92.0 | [91.1, 93.5] |
| Burn from hot water /food | 41.0 | [39.4, 43.6] |
| Injury with sharp knife/ scissors/blade | 72.0 | [70.5, 74.3] |
| Accidental ingestionof medicine kept in the house | 3.0 | [2.0, 3.4] |
| Play injury | 94.0 | [93.1, 95.1] |
| Foreign body in nose and ears | 79.0 | [77.3, 80.9] |

The overall prevalence from six types of injuries were identified as 14.2%, 95% CI [14.1, 14.3]. Among the six types of injuries the highest injuries occurred while playing which was 94.0%, 95% CI [93.1, 95.1]. Various kinds of falls accounted the second highest reason of injury 92.0%, 95% CI [91.1, 93.5]. The survey also showed that children took medicines which were kept in the house which was 3%, 955 CI [2.0, 3.4].

**Table 3: Association between Age of the Child and Most Prevalent Injuries    N = 2040**

| Variable | Age in years | | | | p |
|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | |
| Fall | | | | | |
| Absent | 53 | 38 | 29 | 37 | .01 |
| Present | 430 | 450 | 399 | 604 | |
| Burn | | | | | |
| Absent | 327 | 266 | 270 | 331 | .001 |
| Present | 156 | 222 | 158 | 310 | |
| Sharp injury | | | | | |
| Absent | 174 | 112 | 120 | 157 | .001 |
| Present | 309 | 376 | 308 | 484 | |
| Accidental intake of medicine | | | | | |
| Absent | 480 | 476 | 413 | 615 | .004 |
| Present | 3 | 12 | 15 | 26 | |
| Play injury | | | | | |
| Absent | 67 | 20 | 14 | 20 | .001 |
| Present | 416 | 468 | 414 | 621 | |
| Insertion of foreign body | | | | | |
| Absent | 135 | 102 | 88 | 102 | .001 |
| Present | 348 | 386 | 340 | 539 | |

*p* <.05

The Table 3 shows that there was a statistically significant association between the age of children and the injuries related to fall $\chi^2$ *(3, M = 2040)* = 11.1, *p* = .01), burn $\chi^2$ *(3, M= 2040)* = 36.2, *p* < .001), wound with sharps $\chi^2$ *(3, M= 2040)* = 25.5, *p* = .01), accidental intake of medicine $\chi^2$ *(3, M= 2040)* = 13.3, *p* < .001), play injury $\chi^2$ *(3, M= 2040)* =72.02, *p* < .001) and insertion of foreign body in ear and nose $\chi^2$ *(3, M= 2040)* < 24.2, *p* < .01). Hence it can be interpreted that the age of the children and injury related to fall, burn, sharp object injury, accidental intake of medicine, play related injury and foreign body insertion in nose and ear were not by chance. As the age advances the injuries are reducing.

The study couldn't find any association with the gender of the child, number of children in the house and the most prevalent injuries.

**DISCUSSION**

The survey included a total of 2040 sample subjects of 2 to 5 years old from Udupi Taluk of Udupi District. The mean age of the group was 2.60 (*SD* $\pm$ 1.16) years. The children between the age of 3 and 4 years were more prone for injury as reported in other studies [5, 6]. In this survey 52.5% of children included were males and only 47.5% were females. The high inquisitiveness of boys made them at high risk of injuries [7]. The present study could not find association between the gender and number of the children and injuries. This findings were contrary to the findings of the study by Ray et al. (8).

Falls and burns were the most common causes of injury reported by Pant, Towner, Pilkington & Ellis [9]. The study from Pakistan reports that 11% of burn related injury and 9.6% of fall related injuries leads to mortality in children below 5 years of age [10]. Even though the rates were very high, the researchers could not explore any fall or burn related mortality in the present study. The probable reason could be, in this study identified a child in the house first and then started collecting the data.

An overall injury rate of 24.6%, 95% CI [21.4, 28.3] were reported in a study from Nepal [9]. The present study reported the prevalence of injury from six types of injuries as 14.2%, 95% CI [12.3, 15.9]. The finding of the present study was exactly same of the finding of another study from Tamil Nadu which reported injury prevalence as 14% [7]. This can be interpreted that the finding of the study go hand in hand with the other studies of a different state in India.

The injury reported by caregiver, irrespective of seeking medical attention was reported in another study[9]. The study from Nepal by Pant et al also report that majority of fall related injuries occur while playing. This finding was similar to the present study findings. The explanation for this can be that play is the work f children. During play children were not able to identify the safe and unsafe practices.

The present study finding of association of age of the child with various types of injury were supported by other study from China[11]. An explanation for this could be the motor activity of the child increases as per the age. There could be another possible reason also which could be considered; that is the adults give less attention to older children, where as they pay more attention when child is small.

### Strength

This study is one of the first studies which was conducted through house to house survey of one Taluk in Udupi District using the population proportion to size sampling. From each village 60 children were included for the survey.

### Limitation

The study did not use any follow up. There was no way to counter check the reporting of the caregiver.

**Informed Conset**: The researcher obtained written participant (caregiver) consent before collecting the data from each participant.

**Ethical Clearance**: The study was approved by institutional ethical committee (IEC/07/2014).

### CONCLUSION

This study was an initial attempt before doing a detailed prevalence survey on exploring various kinds of injuries among children of age 2 to 5 years. The detailed prevalence survey will help the investigators to plan an intervention which will be beneficial for the community. This aspect of the survey itself make clear how serious the issue and how much of attention required for the care of children.

**Conflict of Interest** : Nil

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# Prevalence of Anaemia among Urban High School Children in Belagavi

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## ABSTRACT

**Background**: Anaemia in school children is a global health problem with a need of serious public health concern. Anaemia is a threat during this development phase, i.e. the schooling phase as it can adversely affect cognitive performance, behavior and motor development, and scholastic performance. So, there is need for more studies related to anaemia in school children particularly in urban area due to increased urbanization and increased incidence of neglect by the working parents in urban area.

**Methodology**: All Government aided schools coming under area Ramnagar UHC were selected for the study. Students of class 8th, 9th and 10th standard were the study sample, total 400 students participated in this study. A predesigned and pretested questionnaire was used to collect data regarding socio-demographic profile, dietary intake and Environmental history. Hemoglobin estimation was done in all students of the study by using Sahli's Acid Hematin method. Detailed clinical examination was done and Anthropometry was measured. **Results**: The prevalence of anaemia among high school children in urban Belagavi was 43%. Prevalence was more among girls and was found to be 50% compared to boys i.e. 37%. Increased prevalence was seen among those who have attained menarche (66.7%). 63.4% prevalence of anaemia was seen in thin (undernourished) children i.e. BMI <5th percentile. Illiteracy of the mother, low SES, open air defecation, vegetarian diet, decreased consumption of green leafy vegetables and fruits were significantly associated with prevalence of anaemia with p<0.001. **Conclusion**: The present community based study, reported a higher prevalence of anaemia among urban high school children. Prevalence of anaemia was more among girls. The urban area in our study fall in to community of severe public health significance (prevalence >40%).

***Keywords***: *Anaemia, Urban, Prevalence, School children*

## INTRODUCTION

Anaemia in school children is a global health problem with a need of serious public health concern. Prevalence of anaemia in developing countries is 77%, which is three to four times higher than developed countries[1]. An estimated 30% of world's population is anaemic, with global prevalence of anaemia among school children being 36%[2].

Anemia in India primarily occurs due to iron deficiency and is the most widespread nutritional deficiency disorders in the country today. According to NFHS –III data over 55 percent of both adolescent boys and girls are anemic. Adolescent girls in particular are more vulnerable to anemia due to rapid growth of the body and loss of blood during menstruation.

Although school children constitute approximately 25% of total population in India, few studies have been done to estimate their blood hemoglobin for anaemia detection. Anaemia prevalence among children of school going age varies from region to region. Prevalence rates for adolescent school children is close to that of adult females. Moderate and severe anaemia is seen even among educated families both in urban and rural areas. There are inter-state differences in prevalence of anaemia that are perhaps attributable partly to dietary intake and partly to access to health care[3]. Countries, which realized the magnitude of the problem and identified the associated risk factors, were able to intervene directly. At the same time, the application of intervention programs by several countries, for the last twenty years, resulted in a worldwide decrease in the occurrence of anaemia.

Those programs were based on methods of anaemia diagnosis that combined ease of use, swiftness and reliability in diagnosis [4, 5].

With lot of urbanization around and more of neglect of urban children by their parents makes urban children more prone for anaemia. With National urban health mission in a development phase, it becomes a need to estimate the burden of anaemia in urban children for proper actions to be implemented from the very beginning. This study was thus undertaken to throw a light on urban scenario of anaemia prevalence.

## MATERIALS AND METHOD

Government aided schools from urban area Ramnagar of Belagavi were selected for this cross sectional study. Children belonging to VIIIth, IXth and X[th] standards formed the sample.The study was conducted between Jan 2014 to Dec 2014. Assuming 50% to be the prevalence of anemia in urban area and 5% relative error sample size was calculated to be 400. Probability proportionate to the size sampling technique was used to select sample from each school. Students were selected from each class (8th -10th Std) by simple random sampling using the student register till desired sample size was met. Permission was obtained from respective Heads of the schools before initiation of the study. Written consent from the Head of the school was taken. Student's assent was also obtained. A predesigned and pretested questionnaire was used to collect data regarding socio-demographic profile, dietary intake and environmental history. Hemoglobin estimation was done in all students of the study by using Sahli's Acid Hematin method. Detailed clinical examination was done and Anthropometry[6] was be measured.

Anemia was classified into three degrees according to WHO's criteria into mild, moderate and severe[7]. The Hb cut-off values of mild anemia were 10.0-11.9 g/dl, for moderate anemia were 7.0-9.9 g/dl and for severe anemia was <7.0g/dl.

The study was approved from Institutional Ethics Committee for Human Subject's Research, Jawaharlal Nehru Medical College, Belagavi.

## RESULTS

Among the 400 children, boys were 224 (56 %) and girls were 176 (44 %). Majority of them were Hindus belonged to class III socioeconomic status. Almost 70% of them belonged to Joint family. (TABLE 1)

Prevalence of Anaemia in Urban area was found to be 43% (172). It was more among girls (50%) when compared to boys (37.5%). Mean hemoglobin level among girls was 11.14±1.56 and that among boys was 11.86±1.63. Majority of the anaemic children were asymptomatic (72.1%), 20.4% of them had tiredness, 4.6% complained of breathlessness and 2.9% had palpitations

Majority of girls i.e. 67%, who had attained menarche were anaemic. Most of the children belonging to Class V (87.5%) and Class IV (67%) socio-economic status were found to be anaemic and least was seen among those of Class I (9%) SES. This difference was found to be statistically significant. A high prevalence of 70.2% was seen among children of illiterate mothers compared to those who had completed High schooling or above (18.7%).This trend was found to be statistically significant. (TABLE 2).

A Significantly higher prevalence of 62.2% was seen among vegetarian children. 63.4% prevalence was seen in thin children (BMI<5th percentile), 46.7% was seen at risk overweight children (BMI >85th percentile) .This difference was found to be statistically significant, p<0.001. The trend in prevalence was also found to be statistically significant.

Anaemia was only 29% among those who consumed Green leafy vegetables daily when compared to 58.9% among those who consumed weekly and 60.7% among those consuming on monthly basis(60.7%) and this was found to be statistically significant . Decreased frequency of consumption of GLV tend to increase prevalence of anaemia. This trend was found to be statistically significant. A Significantly decreased prevalence of 9% was seen among children who consumed fruits daily compared to those consuming on weekly and monthly basis (TABLE 3).

Among the study participants, those who followed open air defecation, majority (83%) of them were anaemic. It was also seen that 83% of the children who had one or the other morbidity in past three months were anaemics.

## DISCUSSION

Prevalence of anaemia in urban area high school children was found to be 43%. As per WHO guidelines the prevalence of anaemia in this study is of severe public

health significance. Prevalence of 52.8% was seen in a study conducted in Kattankulathur , Tamilnadu among school children of 8-16 years. 38% prevalence was seen among boys and 67.7% was seen among girls[8]. Another study conducted among urban school children in Punjab showed 51.5% prevalence of anaemia[9]. These findings are in par with urban children of our study. Another study conducted in Multannagar, Meerut showed prevalence of 31.6% among adolescent boys and 52.8% among girls.[10]

In the present study prevalence of anaemia in urban girls who have attained menarche was 66.7% and in those who have not attained, it was 19.4%.This difference was found to be statistically significant. A study from urban school children of Punjab showed prevalence of 36.4% among menarcheal girls.[9] Another study from Rishikesh, Uttrakhand, India witnessed a prevalence of 36.5% prevalence of anaemia among menarcheal girls.[11] These findings in context to ours showed decreased prevalence may be because the proportion of girls (5-15 years) attaining menarche was less in their study compared to ours.

In our study prevalence of anaemia in urban children was more in joint family i.e. 52.9% than that of nuclear family (38.7%). It may be because of availability of quantitatively as well as qualitatively adequate food in nuclear families. In a study conducted in urban Meerut prevalence was more in joint families than nuclear ones (52.7% vs 31.5%), which was found to be significant.

Highest prevalence of 70.2% was seen in children of illiterate mothers, followed by 55.4% in those who had completed primary education, 13.4% and 18.7% among those who studied up to high school and above respectively and difference was statistically significant. Illiterate mothers attribute to anaemia among their children. Lack of knowledge regarding nutrition, medical care, child care and the ways to combat them are generally seen among less educated mothers. Awareness, holds the key, which can be imparted to them, for prevention of such instances further. A study conducted in urban Meerut[12] also showed similar findings to that of our study.

In our study, highest anaemia prevalence of 87.5% was seen in Class V SES and least prevalence of 1% was seen in children belonging to Class I SES. This difference was found to be statistically significant p<0.001. Purchasing power and standard of living plays a vital role in the causal of anaemia. An urban study in Meerut[13],

another study in Multan nagar[10] also showed similar trend of prevalence of anaemia in relation to SES as that of our study.

In the present study it was seen that prevalence of anaemia was more among those who did not have breakfast before going to school. Skipping of breakfast can be a strong factor for undernutrition, which in turn is a causal route for anaemia. Majority of the schools opens as early as 8 to 9 am, where majority of the children tend to miss the breakfast for sake of being on time. School opening timings of around 10am may provide a considerable time for the children to have the breakfast before coming to school. A study conducted in Menoufiya, Egypt showed 42.9% prevalence of anaemia among those children who did not have their breakfast daily.[14] Another study in Multan nagar, Meerut[10] and International Centre For Research on Women (ICRW)[15] also documented that anaemia to be significantly more in those who eat two or fewer meals per day.

In this study 63.4% prevalence of anaemia was seen in thin children (BMI<5th percentile), 46.7% was seen in overweight children (BMI >85th percentile) and 22.7% was seen in normal children. This difference was found to be statistically significant. The trend in prevalence was also found to be statistically. A study conducted in urban Meerut among adolescent boys also showed increased prevalence of anaemia in undernourished group (45.2%) compared to normal (40%)[13]. These findings are similar to that of ours.

In this study majority of children who rarely consumed GLV and fruits were found to be anaemic. GLV are rich source of iron, hence IDA is less seen among those who consume it more frequently. Vitamin C present in the fruits helps the body to absorb iron. The iron in non-meat based food is not absorbed as the iron in meat based food, so taking source of Vit C with or after meals will alter chemical make-up of iron and help in its absorption.[16] Similar relation have been shown by various studies.[10,17]

## RECOMMENDATIONS

Weekly Iron and Folic acid Supplementation Programme should be evaluated on regular basis with training of teachers for the same. Health programs for housewives on utilization of easily available and affordable iron rich diet and use of kitchen garden need to be promoted. Though initiation of Iron fortification has

been done, it should be in commonly reachable vehicles like salt, sugar and available for all, which doesn't demand individual co-operation. Ensuring adequate food consumption and regular intake of iron rich and vitamin C rich foods during early childhood period, deworming the child periodically, food fortification, supplementary feeding and nutrition education of parents are some of the strategies that can prevent nutritional anaemia in children.

Measures aimed at preventing transmission–for example, providing safe water and sanitation facilities, and promoting hand-washing, use of latrines and wearing footwear should also be included in the deworming Programme. Processes for involving teachers, parents and local communities in planning and maintaining order are important for the sustainability of activities

**Table 1: Sociodemographic profile of participants**

| Variables | Description | Number (%) |
|---|---|---|
| SEX | Boys | 224 (56) |
| | Girls | 176 (44) |
| RELIGION | Hindu | 273 (68.25) |
| | Muslim | 116 (29) |
| | Others | 11 (2.75) |
| SOCIO ECONOMIC STATUS | Class I | 11 (2.75) |
| | Class ii | 103 (25.75) |
| | Class iii | 143 (35.75) |
| | Class iv | 135 (33.75 |
| | Class v | 8 (2) |
| MOTHERS EDUCATION | Illiterate | 84 (21) |
| | Primary school | 166 (41.5) |
| | High school/diploma | 134 (33.5) |
| | Graduate and above | 16 (4) |
| TYPE OF FAMILY | Nuclear | 121 (30.25) |
| | Joint | 279 (69.75) |

**Table 2: Factors affecting anaemia**

| Determinants | Number of Children | Anaemic Children | Prevalence (%) | p value |
|---|---|---|---|---|
| ATTAINMENT OF MENARCHE | | | | |
| Attained | 114 | 76 | 66.7 | P<0.001 |
| Not attained | 62 | 12 | 19.4 | |
| SOCIO-ECONOMIC STATUS | | | | |
| CLASS I | 11 | 1 | 9.1 | P<0.001 |
| CLASS II | 103 | 20 | 19.4 | |
| CLASS III | 143 | 56 | 39.2 | |
| CLASS IV | 135 | 88 | 65.1 | |
| CLASS V | 8 | 7 | 87.5 | |
| EDUCATIONAL STATUS OF MOTHER | | | | |
| Illiterate | 84 | 59 | 70.2 | P<0.001 |
| Primary school | 166 | 92 | 55.4 | |
| High school | 134 | 18 | 13.4 | |
| > High school | 16 | 3 | 18.7 | |

**Table 3: Factors affecting anaemia**

| Determinants | Number of Children | Anaemic Children | Prevalence % | p value |
|---|---|---|---|---|
| DIET | | | | |
| VEGETERIAN | 45 | 28 | 62.2 | P=0.006 |
| MIXED | 355 | 144 | 40.6 | |
| **BMI PERCENTILE** | | | | |
| < 5$^{TH}$ | 191 | 121 | 63.4 | P<0.001 |
| 5$^{TH}$-85$^{TH}$ | 194 | 44 | 22.7 | |
| >85$^{TH}$ | 15 | 7 | 46.7 | |
| FREQUENCY OF GREEN LEAFY VEGETABLES | | | | |
| DAILY | 214 | 62 | 29 | P<0.001 |
| WEEKLY | 158 | 93 | 58.9 | |
| MONTHLY | 28 | 17 | 60.7 | |
| FREQUENCY OF FRUITS | | | | |
| DAILY | 134 | 12 | 9 | P<0.05 |
| WEEKLY | 156 | 93 | 59.6 | |
| MONTHLY | 99 | 61 | 61.6 | |
| RARELY | 11 | 6 | 54.5 | |
| RECENT MORBIDITY (3 MONTHS) | | | | |
| YES | 41 | 34 | 82.9 | P<0.05 |
| NO | 359 | 138 | 38.4 | |
| SANITARY FACILITY | | | | |
| HOUSEHOLD LATRINES | 290 | 115 | 39.7 | P= 0.006 |
| PUBLIC LATRINES | 98 | 47 | 48 | |
| OPEN AIR DEFECATION | 12 | 10 | 83.3 | |

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# Knowledge, Attitude and Prevalence of Blood Donation among College Students in Chennai

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## ABSTRACT

**Background:** Blood saves lives of people who suffer from certain specific chronic hematological diseases, who undergo major surgeries and in certain acute emergencies. For high quality blood transfusion services, we need to have the adequate blood and blood components.

**Methodology:** Cross sectional descriptive study was conducted among college students. The list of colleges was obtained from the office of the Director of Collegiate Education and twenty-one colleges were selected by simple random sampling. The total number of students in the selected colleges was 28,902. Using proportionate sampling method the number of students to be selected from each college was calculated as 59.

**Results:** Of the 525 students, who participated in the study, 57% were females and 43% were male. Majority were Hindus (73.6%). 151 (28.7%) students had donated blood, out of the 525 studied (95% CI = 24.83 to 32.57). Of them, 47.7% had donated more than once. The practice of blood donation was found to be low among females.

**Conclusion:** These donors have to be motivated to become regular voluntary blood donors. If they donate blood regularly i.e. at least twice a year up to the maximum age i.e. 60 years, there will be no dearth for blood and its components. Such regular donors also tend to keep themselves free of high risk behaviours which may make them ineligible for blood donation.

***Keywords:*** *Regular, Voluntary, Blood donors, HIV Infection, Transfusion*

## INTRODUCTION

'Safe Blood starts with me, blood saves life' is the World Health Organization (WHO) day theme for the year 2000. Blood saves lives of people who suffer from certain specific chronic hematological diseases, who undergo major surgeries and in certain acute emergencies. For high quality blood transfusion services, we need to have adequate blood and blood components. A country's need for blood depends upon the stage of development of its health care structure, its use of substitution or supportive therapy (e.g. in thalassemia, hemophilia and leukemia) and the type of surgeries performed[1]. In advanced health care systems, such as those in the developed countries, the need for cellular components of blood can be met if the number of blood units donated annually corresponds to approximately 5% of the population, although more blood may be collected for other purposes. In an expanding service, the number of new donors is relatively

high, but in a fully developed system, the majority should be regular donors. Taking all blood donors and donation into account, the average number of annual donations should be 2 per donor/year in a society where the demand for blood is met. This means that when about 3% of the population is active blood donors, all the need for cellular blood products can be satisfied. In a study conducted by WHO, the number of blood donations per 1000 population was found to average 52 in highly industrialized countries but only 10 in middle income countries and 1 in low income countries[2].

According to WHO's principles regarding blood donor recruitment, the donors should be volunteers and shall not be paid[3]. The voluntary donor base is small and even in metropolitan cities only about 30% units of blood are obtained from voluntary donations. Professional donors generally practice high-risk behavior[4] and have a greater likelihood of carrying transfusion transmitted

infections. Hence professional blood donation has been banned since 1.1.1998. Replacement donors are under social pressure from their friends and relatives and may hide their high-risk behavior if any. There is an urgent need to increase regular voluntary donation. It would significantly improve the quality of blood.

The youth have a great role to play in the blood transfusion services[3]. They are the donors of the present and future. This is especially important in a country like ours which has high proportion of young people. Very few studies have been conducted in other parts of the world. In India, only attitude aspect has been studied in a limited population. Hence this study will help to bring out the aspects of prevalence, knowledge and the factors influencing the blood donation among college students of Chennai city.

## MATERIALS AND METHOD

Cross sectional descriptive study was conducted among college students of Chennai city. Based on a report by Hosain, G., et al[5]., a sample size of 525 was calculated considering a prevalence rate of 16%, and an allowable error of 20%. Chennai region of Madras University includes government, self financing, government aided colleges & teacher training institutes. The list of colleges was obtained from the office of the Director of Collegiate education and also the number of students in each college was also obtained. Using lottery method of simple random sampling, twenty-one colleges were selected. Permission to conduct the study was obtained from the Director of Collegiate Education & the Principals of the selected colleges. The total number of students in the selected colleges was 28,902. Using proportionate sampling method the number of students to be selected from each college was calculated as 59. The first year students were excluded because most of them would not have completed 18 years of age, the minimum age limit for blood donation. Continuous numbers were assigned to the list of students obtained from each college. Using the simple random table, the requisite numbers of students were selected.

**Data collection procedure**: A new questionnaire was made after reviewing relevant earlier studies regarding blood donation and blood safety. In each of the selected college, the help of the National Service Scheme Programme officer was sought. A brief discussion was conducted with the NSS programme officer/the professor in charge of blood donation activities of the college.

With the help of the NSS programme officer and NSS volunteers, the selected students were located and made to assemble in a convenient place.

The students were asked to choose the questionnaire either in English or Tamil according to their preference. The students took about 20-25 minutes to fill it up. Any clarifications sought were made then & there. The students filled up the questionnaire under direct supervision of the investigator to avoid discussions among themselves. After the students completed the questionnaire they were thanked for their cooperation.

**Statistical Analysis:** The results obtained were analyzed with Epi-Info6 package and the prevalence rate of blood donation and the details about knowledge and attitude were obtained.

## RESULTS

Of the 525 students, who participated in the study, 57% were females and 43% were male. 73.6% were Hindus, 14.9% were Christian and 9% were Muslims. 1.34% were proud to call themselves as Indians and did not want to be attached to any religion. 1.16% belonged to other religions.

151 (28.7%) students had donated blood, out of the 525 studied (95% CI = 24.83 to 32.57). Of these, 79 students (52.3%) had donated only once and 33 students (21.8%) had donated twice, and 39 students (25.9%) had donated three times and more than that (Table 1). 74.8% of the donors were male students and 25.2% were female students.

**Table 1: Frequency of blood donation**

| Frequency of donations | No. of Students | Percentage |
|---|---|---|
| 1 | 79 | 52.3% |
| 2 | 33 | 21.8% |
| 3 | 17 | 11.3% |
| 4 | 12 | 7.9% |
| 5 | 6 | 3.9% |
| ≥6* | 4 | 2.8% |
| **Total** | **151** | **100.0%** |

**Knowledge about blood donation:** The students who knew their blood group was 60%. Those who knew that both males and females can donate blood

were 98.8%. Those who knew minimum age for blood donation to be 18 years was 70.9%. Only 15.7% knew the maximum age for blood donation to be 60 years. The students who knew both the correct minimum and maximum age for blood donation were 15%. Majority of the students were knowledgeable about various blood transfusion related diseases (Table 2).

**Table 2: Conditions in which blood should not be donated**

| Conditions | No. of Students Aware of it |
|---|---|
| Jaundice | 268(51%) |
| STD | 367(70%) |
| Fever | 341(65%) |
| Male Homosexuality | 168(32%) |
| HIV Infection | 446(85%) |
| Drug addict | 444(84.6%) |

Situations that need blood transfusion were known to 40% of students. The situations quoted were medical emergencies, surgery, accidents and bleeding. 9.4% of the students knew some conditions when blood is needed to be transfused repeatedly. The conditions quoted were cancer, platelet deficiency, haemophila, thalassemia, and bone marrow disease. 46.1% knew that a minimum interval of 3 months is necessary between two blood donations.

The students who felt that blood donation does not make a person weak was 74.3%, 14.2% felt that it makes an individual very weak and it may take a long time to regain original strength. 68% felt that blood donation poses no hazard to one's health. 55.1% of the students knew that a person will not get HIV infection by donating blood.

Majority **(**85.8%) were aware that blood is being tested for certain infections before being transfused and only 62.6% knew that blood can be preserved. 39% were aware that blood can be separated into its components and used for more than one patient.

All the students had heard about blood donation. The sources of information were mass media (38.8%), friends (25%), faculty (14.8%), national service scheme (0.8%) and National Cadet Corps(0.6%) and 20% had learnt from more than one source.

Comparing the knowledge levels of arts and science group students, statistically significant difference was seen in aspects regarding the safety of blood donation (p<0.05) and the preservation and usage of the donated blood (p<0.05).

On comparing the knowledge level of male and female students, statistically significant difference was seen in aspects regarding conditions in which blood should not be donated –STD(P<0.05) and Fever (p<0.05).

**Attitude:** 93.7% of the students felt it was necessary to know one's blood group. 84.6% of the students have a positive attitude about blood donation and are willing to donate blood (even if they had not donated blood so far). This is in accordance with the results of the study conducted in Dhaka University where 82% have shown a positive attitude[5]. 293 (78.3%) intended to donate blood in future. 86% were ready to motivate others to donate blood.

The relatives' or friends of 404 (77%) of students had donated blood. Of these students, 395(97.9%) admired their friends'/relatives' humanitarian deed. 165(41%) of them, in addition to admiring them, also wanted to donate blood sometime, and 18(4.7%) of them had donated blood following their relatives/friends example. Only 2.1% were worried that blood donation may affect the health of the donor.

Factors associated with Blood donation:

Majority of the male students have donated blood when compared with females. The difference is found to be statistically significant (p<0.001). There is not much difference between different religious groups with regards to the practice of blood donation. Proportion of blood donation was found to be high among Arts students (30.9%) compared to Science students (25.3%). Significantly higher proportion of students (40.2%) staying in hostels have donated blood. Interestingly if the fathers were educated up to middle school, the chance of blood donation by their children is significantly high compared to children of graduates.  (Table 3).

**Table 3: Factors associated with Blood donation**

| Sl. No | Characteristic | Blood Donated N (%) | Not donated N (%) | OR (95% CI) | P Value |
|---|---|---|---|---|---|
| 1 | **Sex** Male Female | 113 (50.2) 38 (12.7) | 112 (49.8) 261 (87.3) | 1 0.14 (0.09-0.22) | **<0.001** |
| 2 | **Religion** Hindu Muslim Christian Others | 108 (27.9) 16 (34.0) 24 (30.8) 3 (23.1) | 279 (72.1) 31 (66.0) 54 (69.2) 10 (76.9) | 1 1.33 (0.70-2.54) 1.15 (0.68-1.95) 0.78 (0.21-2.87) | > 0.05 |
| 3 | **Course of study** Arts Science | 101 (30.9) 50 (25.3) | 226 (69.1) 148 (74.7) | 1 0.76 (0.51-1.12) | > 0.05 |
| 4 | **Place of Stay** Day scholar Hosteler | 108 (25.8) 43 (40.2) | 310 (74.2) 64 (59.8) | 1 1.93 (1.24-3.01) | **<0.01** |
| 5 | **Father's Education** Graduates PUC SSLC Middle School | 59 (31.6) 24 (21.4) 40 (24.2) 28 (45.9) | 128 (68.4) 88 (78.6) 125 (75.6) 33 (54.1) | 1 0.59 (0.34-1.02) 0.69 (0.43-1.11) 1.84 (1.02-3.32) | **< 0.01** |
| 6 | **Mother's Education** Graduates PUC SSLC Middle School | 26 (23.9) 24 (29.3) 42 (25.8) 59 (34.5) | 83 (76.1) 58 (70.7) 121 (74.2) 112 (65.5) | 1 1.32 (0.69-2.53) 1.11 (0.63-1.95) 1.68 (0.98-2.89) | >0.05 |
| 7 | **Father's Occupation** Professionals Working in government or private concerns Businessmen Agriculturists Daily Laborers Retired Persons | 4 (19.1) 78 (31.3) 36 (28.6) 17 (30.9) 8 (16.0) 8 (33.3) | 17 (80.9) 171 (68.7) 90 (71.4) 38 (69.1) 42 (84.0) 16 (66.7) | 1 1.94 (0.63-5.95) 1.70 (0.54-5.40) 1.90 (0.56-6.51) 0.81 (0.22-3.05) 2.13 (0.53-8.45) | >0.05 |
| 8 | **Mother's Occupational** Working outside Housewives | 26 (51.0) 125 (26.4) | 25 (49.0) 349 (73.6) | 1 0.34 (0.19-0.62) | **<0.01** |

## DISCUSSION

In our study the proportion of voluntary blood donation was found to be low compared to a study done by the department of gastroenterology, G.B.Pant Hospital, New Delhi which shows 39.3%[6]. However our observation is similar to other studies done by various authors in Tanzania[7] and Iran[8]. In other studies it was found to be ranging from 15%-19% [5,9,10].

But in our study, 47.7% of the donors had donated more than once which means they can be motivated to become regular voluntary blood donors. In the present study the role of women in blood donation was found to be high when compared to other studies[11].

The knowledge about the hazards of blood transfusion with respect to spread of HIV infection to the recipient is good. Among voluntary donors 80% did not have significant knowledge about AIDS[12]. A study by Olaiya, M. et al[13]., found that, 52·4% of the donors believe they can contract human immunodeficiency virus (HIV). Misconceptions about the effects of blood donation are widespread, even among educated persons[14]. A study among Saudi population revealed that, 88.5% of participants believed that the blood donation is not harmful to the donor because of the screening tests done in blood banks prior to donation, although, 11.5%, the majority of who were females, believed that blood donation is harmful because of the risk of acquiring an infectious disease[15]. In our study, 55.1% of the students knew that HIV will not be acquired by donating blood. As found in other study by Bharatwaj, R. et al[16] present study showed that a good proportion of the participants were willing to donate blood.

Blood donation was found to be correlated with gender, place of birth, occupation and knowledge about donation in Greece[17]. In the present study the practice of blood donation was found to be low among females. Similar finding was observed by other authors[11,18]., where the prevalence of blood donation was low among women. As found in another study[19] there is a disparity between attitude and practice of blood donation.

## CONCLUSION

As per the study results, 28.7% have donated blood, of them 47.7% had donated more than once. These donors have to be motivated to become regular voluntary blood donors. If they donate blood regularly i.e. at least twice a year up to the maximum age i.e. 60 years there will be no dearth for blood and its components. Such regular donors also tend to keep themselves free of high risk behaviors which may make them ineligible for blood donation.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Obtained from Ethical Committee, Madras Medical College.

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# A Study to Assess the Mobile Phone Dependence Level and Sleep Quality among Students of Selected Colleges of Moradabad

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## ABSTRACT

Mobile phones nowadays can be considered as more necessary than the basic needs of individuals. Mobile phone use in India is very common in well-educated young population. With all advance applications, mobile phone affects the sleep quality in many individuals. Hereby this study was done to assess the mobile phone dependence level and sleep quality and to find out the relationship between them among 100 engineering students of selected college who were selected by simple random sampling technique. The tool designed to collect the data were socio demographic Performa, dependence on mobile phone scale and Pittsburgh sleep quality index. Finding of this study indicated that , out of 100 sample, 46% participants belonged to age group 20-21 years, and 54% of them were female. In terms of mobile phone dependence, 21% of students reported severe dependence in mobile phone, 35% students reported moderate dependence, 28% of students reported mild dependence, whereas only 16% students reported no dependence in mobile phone. Level of sleep quality was good for 37% students, whereas 63% of students had poor sleep quality. The correlation score between mobile phone dependence and sleep quality, indicate moderately positive correlation between mobile phone dependence & sleep quality . Occupation of father and presence of family problem are significantly associated with level of mobile phone dependence. Whereas the type of family significantly associated with level of sleep quality. Mobile phone dependence has been found to be an issuing public health problem. There is need to identify it early so as to generate enough awareness and plan educational/treatment interventions.

***Keywords:*** *Engineering students, Mobile phone dependence, sleep quality.*

## INTRODUCTION

Mobile phone contains so many characters and features that prepare it very attractive to both young and old[1], whether sitting in a garden, or delivering food or at the film theatres, it seems that cell phones find a means to disrupt the atmosphere. In developing country cell phones are becoming more valuable than money as they are being paid in minutes instead of money[2]. With the progression of innovative applied science and in particular mobile technology it is no wonder that cellular

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phone phones and their popularity are on the climb. It is perhaps because of their ease of use and their ability to facilitate other applications[3]. Smart phone contains all advance applications like messenger, mobile games, online purchasing applications, mobile banking, internet access, etc. which made our life easy and comfortable as well. But Including all the advance applications it brings too many hazards like headache, insomnia, tumors and other physical and psychological health problems[4].

The prevalence rate of mobile phone dependence in adolescent age between 11-14 years from Britain is estimated at 10% where adolescent consider them expert users of this technology.[5] complimentary to this in India it is estimated of among as 39-44% .[6] Some researches reveal an association between mobile phone use and certain neuro and salivary gland tumours. Lennart Hardell et.al (2009) done a meta-analysis of 11

researches which were taken from peer-reviewed journals and they concluded that mobile phone usage continuously for at least 10 years "almost doubles the chances of brain tumor[7]

Dr Hussain reported people now a days uses smartphone on a daily basis for so many works, and it is important to know about the psychological effects of mobile phone over use[8]. The average individual checks their mobile phone 100 times a day, ultimately it is counted as 9 hours /day[9]. A cross sectional study among students to find out prevalence of nomophobia in the Indian setting while keeping on mind about drastic increment in the mobile phone users in last decade. Result reveals that there were 53% males and 47% females and out of all investigated sample 18.5% were reported as nomophobic[10].

A cross-sectional school-based study among 13723 students in China was conducted to find the relationship between adolescents and their problematic Internet use including physical and psychological symptoms with directly assessment of possible contribution of sleep quality, by using Multidimensional Sub-health Questionnaire, the Pittsburgh Sleep Quality Index and Young Internet Dependence Test. The result of the study reveals that Prevalence rates of Problematic internet use were 11.7%, symptoms of physical ailments were 24.9%, symptoms of psychological alteration were 19.8%, and poor sleep quality were 26.7%. The risk factor for physical and psychological symptoms expected was Poor sleep quality. If there is two altered health outcome, which took place because of over use of mobile phone, the sleep quality is considered as the medial factor[11]. Sleep is a basic need of humankind , it is vital for sound health and quality of life. Sleep is described as a important factor responsible for growth and development, furthermore it improves the academic performance too. The quality of Sleep is altered by many elements like lifestyle of individual, the factors related to environment, work pattern, social life, financial condition, general health condition and presence of any stress in life[12]. In this era of modernization the mobile phone can be consider as strong factor which affects the sleep quality in so many ways[13] .

## MATERIAL AND METHOD

A quantitative research approach was used. The research design adopted for the present study was descriptive correlation design.

**Sample selection:** This cross sectional study was carried out in engineering college in Moradabad, in last week of January 2016. Before actual collection of data, Official permission was obtained from principal of the college of engineering Moradabad , and List of classes of engineering college was provided to the investigator, and with the help of lottery method investigator had selected 2 classes out of 20 . The investigator has introduced herself to the participants from selected classes. The attendance register was used to select the desired 100 sample by simple random sampling technique , Students who were not willing to participate were excluded from the study. The objectives of the study were explained to the adolescent students and their informed consent was taken.

**Data collection :** All questionnaire were distributed to the participants in classroom setting , and were collected after 20 minutes.

The questionnaire contained 2 parts :

• **Part A -**Performa for collecting demographic data.

• **Part B-**

o **Part $B_1$-** Dependence on mobile phone scale (details are given below)

o **Part $B_2$-** Pittsburgh sleep quality index.

Dependence on mobile phone scale is 5 point likert scale including 30 statements and the response varies from strongly disagree to strongly agree. Scores were awarded for Strongly Disagree- 1, Disagree - 2, Neutral- 3, Agree- 4, Strongly Agree -5. The interpretation of Score was divided into 4 types depending upon the level of mobile phone dependence i.e < 90 no dependence in mobile phone, 91 -110 Mild Dependence , 111-130 Moderate Dependence, 130- 150 Severe Dependence. The tool was tested for reliability by administering it 10 engineering students (pilot study) who met the selection criteria. The Reliability of mobile phone dependence scale was computed by using Karl Pearson's correlation coefficient and spearman brown formula. The reliability of dependence on mobile phone scale is 0.929 which is statistically significant & reliable.

Pittsburgh sleep quality index is a standardize tool which measure the sleep quality and disturbance over a 1 month time interval. The due permission was obtained from Dr Daniel J.Buysee (University of Pittsburgh school of Medicine) for using this standardize Tool.

And the Score interpretation of tool was: If Global PSQI score is more than "5" than sleep quality is indicated as "POOR".

**Statistical analysis:** Collected data was analyzed manually as well as with SPSS version 20. Socio demographic variables, level of mobile phone dependence and sleep quality level have been denoted by frequency table and percentage table. Collected data was analyzed in terms of descriptive (frequency, mean, median, standard deviation) statistics. Co-relation was calculated to determine the relation between mobile phone dependence level and level of sleep quality. Chi-square test was performed to fine out the association between mobile phone dependences, level of sleep quality with selected demographic variables.

## RESULTS

Socio demographic characteristics of the study population are given below, whereas , mobile phone dependence level, level of sleep quality are depicted in table no 1 and 2  Correlation between Mobile phone dependence level and level of sleep quality is shown in figure .

**Sociodemographic characteristics of study participants**

Out of selected 100 study participants,  46% of the study participants belong to the age group of above 20-21 years. 54% of the study participants were female. And 38% study participants have 2 sibling .  65% of study participants belong to joint family. Mother of 91% of study participants were house wife . Father of 47% of study participants were employee. family income of 68% of study participants were above 20,000/ month. 63% study participants belonged to urban area. 97% study participants did not report any health problem. 97% study participants did not report any emotional problem. 99% study participants did not report any family problem.

**Table 1:  Mobile phone dependence level among study participants  (n=100)**

| Level of Dependence | Score Range | Percentage |
|---|---|---|
| No Dependence | <90 | 16 |
| Mild Dependence | 91-110 | 28 |
| Moderate Dependence | 111-130 | 35 |
| Severe Dependence | 131-150 | 21 |

*source dependence on mobile phone scale

**Table 2:  Level of sleep quality among study participants.  (n=100)**

| Level Of Sleep Quality | Score Range | Percentage |
|---|---|---|
| Good | <5 | 37 |
| Poor | ≥5 | 63 |

*source : Pittsburgh sleep quality index

Correlation between mobile phone dependence level and level of sleep quality was calculated by using Carl Pearson Roh Formula , and the score was 0.861 which indicated moderately positive correlation between  mobile phone dependence level and level of sleep quality (Depicted in figure 1).
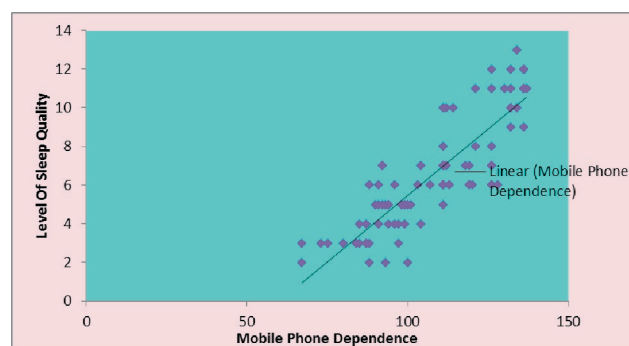


**Figure 1: Scatter diagram showing relation between mobile phone dependence and level of sleep quality.**

Then, factors associated with mobile phone dependence and level of sleep quality were investigated, for which the chi square test was performed. Occupation of father and presence of family problem are significantly associated with level of mobile phone dependence and type of family significantly associated with level of sleep quality ($P$ value <0.05), Whereas Age in years, Gender, No of sibling, Occupation of mother, Family income / month, Domicile, presence of Health problem and Emotional problem were not found to be associated factors with mobile phone dependence and level of sleep quality.

## DISCUSSION

In this present study the absence of mobile phone dependence was found in only 16% of the participants, mild dependence was found in  28% of participants, moderate dependence was found in 35% participants, whereas severe dependence on mobile phone was found in 21% of the participants. Similar result found

in study where researcher examined the patterns of uses of mobile phone and the result of the study reveals that there were 58% of the sample who said that without mobile phone for even a day , they will not able to manage the things[14].

In this study the mobile phone dependence score is higher is female students, there is contradictory result found in a study that in terms of mobile phone addiction there was no difference in male and female. The main use of mobile phone for female was maintaining communication, where as watching movies, or playing games were the main purpose of using mobile phone by male[15]. Complimentary to this result, there is similar pattern of use of mobile phone among male and female[16].

In this present study the level of sleep quality were good for 37% students, where as 63% of student had poor sleep quality level. Similarly result found in a seminal article that 26% of adolescents in their sample received 6.5 hours of sleep or less on school nights[17].

In this present study there was moderately positive correlation found between mobile phone dependence and level of sleep quality which states that as the mobile phone dependence level is increasing the level of sleep quality becomes poor. similar result found in a study, which reported positive association between device use after lights out and sleep disturbance[18]. Similarly a great majority of the students cannot sleep enough due to mobile phone use in at least one day of the week[19]. Similar results were found in study, where researcher found that college students who used cell phone technology after sleep onset reported being awake an extra 46 minutes per week. Forty-seven percent of students awoke after sleep onset to answer text messages and 40% to answer cell phone calls. Importantly, greater levels of tech use during sleep time predicted lower sleep quality, and lower sleep quality increased depressive/anxious symptomology[20]. Similarly, pathological Internet use and cellular phone use were associated with insomnia and sleep disturbance, particularly in female college students[21]. Interestingly, students who engaged in increased mobile phone use, pathological texting, and problem texting, experienced increased sleep disturbance and decreased sleep quality[22].

## CONCLUSION

The finding of the study  is indicative that Mobile phone dependence is an important health problem in students. The sleep quality deteriorates with increasing dependence level. New studies are required to assess the real problem and thereby take appropriate steps to tackle the growing problem. It is concluded that referring the students with suspected dependence to advanced healthcare facilities, performing occasional scans for early diagnosis and informing the students about controlled mobile phone use are required for the purposes of definitive diagnosis and treatment. It may be required to give priority to this matter, conduct more studies and evaluate them.

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# A Study on Body Mass Index among College Students and its Association with Anaemia and Hypertension

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## ABSTRACT

**Background:** Iron deficiency anaemia is the most common micronutrient deficiency in the world affecting more than 2 billion persons. Of all the age groups, adolescent and young age groups were more vulnerable to get anaemia and other nutritional disorders. Adverse eating habits in this age group in long run it affect the certain non communicable diseases commonly hypertension because of one area education stress and another area is lack of awareness about food pyramid concept and lack of nutritive value consciousness. **Objectives:** 1. To estimate the body mass index among college students 2. To find the association with body mass index and anaemia 3. To determine the association of body mass index with hypertension. **Materials & Method:** A cross sectional study was conducted from June 2015 to July 2015 among Undergraduate and Postgraduate College students of Ch.S.D.St.Theresa's Autonomous College for Women between the age group of 19-23 years. A total of 278 students were participated and all the explained about the importance of the study and informed consent was taken from the participants. Haemoglobin estimation was performed by Sahli's Haemoglobinometer and observations were interpreted as per WHO criteria. Necessary statistical tests were applied. **Results:** Out of 278 students, 87.4% were in the age group of 19-20 yrs and only 12.6% were in 21-22 yrs age group. Out of 278 students, 12.2% (34/278) were obese/ overweight. Among them 55.9% were in the age group of 21-22yrs and 44.1% were in 19-20 yrs. There was statistically significant association was found between age group and body mass index. Those students BMI < 25, the prevalence of anaemia was 28.2% and other students BMI > 25, the prevalence of anaemia was 8.8%. Decreasing BMI increases the anaemia prevalence. Increasing BMI increases the hypertension and 9.7% of the students were in the pre hypertension stage where life style modifications to addressed properly. **Conclusions:** Based on the above study results, prevalence of anaemia is relatively low as it is comparatively national average anaemia prevalence among young age group students. On the other hand Body mass index is increasing and also BMI significantly associated with hypertension (P<0.01). Low BMI people have high prevalence of anaemia in the study population.

*Keywords: Age, Anaemia, BMI, Hypertension.*

## INTRODUCTION

Youth - the critical phase of life, is a period of major physical, physiological, psychological and behavioural changes with changing patterns of social interactions and relationships. Youth is the window of opportunity that sets the stage for a healthy and productive adulthood and to reduce the likelihood of health problems in later years. A myriad of biological changes occur during puberty including increase in height and weight, completion of skeletal growth accompanied by an increase in skeletal mass, sexual maturation and changes in body composition. The succession of these events during puberty is generally consistent among the adolescents often influenced by age of onset, gender, duration, along

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with the individual variations. These changes are also accompanied by significant stress on young people and those around them, while influencing and affecting their relationships with their peers and adults [1].

Available evidence indicates that young people are prone to a number of health impacting conditions due to personal choices, environmental influences and lifestyle changes including both communicable and non-communicable disorders and injuries. Others include substance use disorders (tobacco, alcohol and others), road traffic injuries (RTIs), suicides, sexually transmitted infections (STI) including human immunodeficiency virus (HIV) infection, teen and unplanned pregnancies, homelessness, violence and several others. Of all the health problems, increasing the obesity leads to the certain health hazards. Obesity that itself leads to development of non communicable diseases like hypertension, diabetes etc. Hypertension itself leads to stroke and other neurological conditions. On the other hand malnutrition leads to disfigurement of the person, infections and tend to develop anaemia in adolescent and teenage girls especially.

Nutritional anaemia is a worldwide problem with the highest prevalence in developing countries. It frequently occurs due to inadequate iron intake, chronic blood loss or disease, malabsorption or a combination of all these factors. It affects one's development, growth and resistance to infections and is associated with mortality among children younger than two years old. The most affected population groups are infants aged between four and twenty four months old, School age children, female adolescents, pregnant women and nursing mothers. Nutritional anaemia affects all age and sex groups in India. Nutritional anaemia is prevalent all over the world with an estimated two billion people being iron deficient and is one of the most common nutritional disorders in the developing world. With an average prevalence of 40% among the general population that affects nearly two third of pregnant and one half of the non pregnant women which is three to four times higher than in the developed countries. The Present study is an attempt to assess the prevalence of nutritional anaemia among College students in order to sensitize the masses about its impacts.

### OBJECTIVES

1. To estimate the body mass index among college students

2. To find the association with body mass index and anaemia

3. To determine the association of body mass index with hypertension

### MATERIALS & METHOD

The present institutional based cross sectional study was conducted at Ch.S.D.St.Theresa's Autonomous College for Women, Eluru, Andhra Pradesh, during the period from April 2015 to July 2015. Before conducting the study in this college, all the degree students are briefed about the importance of the study, purpose of the study explained in the class before collection of the data. After successful orientation of the programme, instructed them to undergo the anthropometry and other clinical and laboratory examination. Student name and her data kept Confidential till the completion of the study as this college is exclusively women,s college. At the time of the study, there were 20 batches available in the college, randomly selected 7 graduate batches and one post graduation batch by lottery method. From those batches, a total of 278 individuals were selected from the different classes of degree and post graduate students for this study. The blood sample was taken from them with sterile needle and blood haemoglobin level is estimated with the help of Sahli's Haemoglobinometer and to calculate the body mass index height and weight of the individual was taken and Quitelet's formulae applied and also blood pressure recorded by sphygmomanometer. The observations were interpreted as per WHO criteria. Results were analyzed and necessary statistical tests like proportions and chi square tests were applied [2].

### RESULTS

**Table – 1: Education status of study population:**

| Education | Number of the persons | Percentage |
|---|---|---|
| Degree pursuing | 258 | 92.8% |
| Post graduation pursuing | 20 | 7.2% |
| **Total** | **278** | **100%** |

In the study population, 92.8% were degree studying individuals and only 7.2% were studying post graduation.

**Table - 2: Body mass index (BMI) in relation to age**

| BMI | 19-20 yrs | 21-22 yrs | Total |
|---|---|---|---|
| < 18.5 | 14 (70%) | 6 (30%) | 20 (100%) |
| 18.5 to 25 | 212 (94.6%) | 12 (5.4%) | 224 (100%) |
| 25 – 30 | 15 (44.1%) | 19 (55.9%) | 34 (100%) |
| Total | 243 (87.4%) | 35 (12.6%) | 278 (100%) |

$X^2$- 70.5, 2df, P<0.001

Out of 278 students, 12.2% (34/278) were obese/ overweight. Among them 55.9% were in the age group of 21-22yrs and 44.1% were in 19-20 yrs. There was statistically significant association was found between age group and body mass index.

**Table – 3: Classification of Anaemia in study population**

| Classification | Number of the students | Percentage |
|---|---|---|
| Mild (10-12 Hb gms) | 45 | 45/278=16.2% |
| Moderate (7-10 Hb gms) | 27 | 45/278=9.6% |
| Severe (<7 Hb gms) | 0 | 0% |
| Total | 72 | 72/278=25.8% |

Out of 278 study population, 25.8% were anaemic. Of which, 16.2% were mild anaemia and 9.7% were moderate anaemia.

**Table - 4: BMI in relation to Anaemia in study population**

| BMI | Anaemia | No anaemia | Total |
|---|---|---|---|
| < 25 | 69 (28.2%) | 175 (71.8%) | 244 (100%) |
| >25 | 3 (8.8%) | 31 (91.2%) | 34 (100%) |
| Total | 72 (25.8%) | 206 (74.2%) | 278 (100%) |

$X^2$- 5.89, 1df, P<0.01

Out of 278 students, those students BMI < 25, the prevalence of anaemia was 28.2% and other students BMI > 25, the prevalence of anaemia was 8.8%. Decreasing BMI increases the anaemia prevalence.

**Table - 5: BMI in relation to Hypertension in study population**

| BMI | Hypertension present | Hypertension absent | Total |
|---|---|---|---|
| < 25 | 8 (3.2%) | 236 (96.8%) | 244 (100%) |
| >25 | 5 (14.7%) | 29 (85.3%) | 34 (100%) |
| Total | 13 (4.6%) | 265 (95.4%) | 278 (100%) |

$X^2$- 8.74, 1df, P<0.01

Those students who were having BMI > 25, the prevalence of hypertension was 14.7% and students were having < 25 BMI, the prevalence of hypertension was 3.2%. There was statistically significant association was found between body mass index and hypertension.

**Table - 6: Status of pre hypertension in study population**

| Study population | Number of the people | Percentage |
|---|---|---|
| Normal people | 238 | 85.6% |
| Pre Hypertension | 27 | 9.7% |
| Hypertension | 13 | 4.6% |
| Total | 278 | 100% |

About 9.7% of the students were in pre hypertension stage and 4.6% were hypertension stage.

## DISCUSSION

The present institutional based cross sectional study was conducted during the period of April 2015 to July 2015 and found that 87.4% were in the age group of 19-20 yrs and only 12.6% were in 21-22 yrs age group. Adolescence or early adulthood is one of the most vulnerable periods to anaemia in human life when nutritional requirements increases due to the growth spurt. In India, recent data from the District Nutrition Project (ICMR) in 16 districts and 11 states on prevalence of anaemia in non pregnant adolescent girls (11-18 years) showed rates as high as 90.1% with severe anaemia (Hb ≤7 gm/dl) in 7.1% (Teoteja G.S, Singh P. 2002). Numerous studies (Vasanthi and pawashe, 1994; Chaturvedi and Kapil[6], 1996; Seshadri, 1997; Agarwal, 1998; Rajanathan et al, 2000; Sivakumar, 2001; Gawarikar et al, 2002; Sidhu et al, 2005) among adolescent girls have shown that prevalence of anaemia ranges from 22.00-96.50% in India. In a multicountry study (Kunt and Johnson, 1994) on the nutritional status of adolescents carried out by the International Centre for Research on Women, anaemia was found to be widespread nutritional problem and its prevalence ranged from 32-55%[14]. By far the most frequent cause of nutritional anaemia is iron deficiency, and less frequently folate or vitamin B 12 deficiencies. In the present study an attempt has been made to report the prevalence of anaemia among College students of Eluru, district West Godavari, Andhra Pradesh and to draw out its correlation with their body mass index and hypertension. Anaemia is established if the haemoglobin is below the cut off points as recommended by WHO and for adult nonpregnant females-12.0 gm/dl). WHO Criteria for detection of various grades of Anaemia Indicator Hb non anaemic (gm/dl) ≥ 12 (for female) Grade 1 (mild) anaemia 10.0 – 11.9 Grade 2 (moderate) anaemia 7.0-9.9 Grade 3 (severe) anaemia ≤ 7.

In our study, Out of 278 students, those students BMI < 25, the prevalence of anaemia was 28.2% and other students BMI > 25, the prevalence of anaemia was 8.8%. Decreasing BMI increases the anaemia prevalence. The prevalence of anaemia among underweight (BMI≤18.5) was 63.33% and Normal (BMI 18.5-24.99) of 6.67% and overweight (BMI ≥25) have prevalence of 0.83% [7]. This also suggests that anaemia prevalence decreases as nutritional status of subject increases. The Prevalence of anaemia among underweight students was 63.33% and in students with normal BMI was 6.67% and overweight has prevalence of 0.83% This also suggests that anaemia prevalence decrease as nutritional status of subject increases.

In the present study among the College students, there were mild anaemia among 16.2% students followed by moderate anaemia among 9.6% students but there was no student having severe anaemia. The findings corresponds to an ICMR study by Teoteja GS and Singh P[10] who obtained data from 16 districts of 11 states through District Nutrition projects, where prevalence of anaemia among adolescent girls has been found to be as high as 90.1%. Bulliyy et al found 96.5% prevalence among non school going adolescent girls in three districts of Orissa, of which 45.2%, 46.9%, 16.9% and 4.4% had mild anaemia, moderate and severe anaemia[5]. They found significant association between Hb concentration and educational level of girls, their parent family income, and body mass index.

Similar, studies on anaemia prevalence from different states of rural India, reported high prevalence of anaemia from 46-98%. A study carried out among 265 adolescent girls of Amritsar in 2005 by Sharda Sindu also discovered high prevalence (70-75%) of anaemia including 12.83% girls who had severe anaemia. A study by Passi & Malhotra (2002) found that with the onset of menarche at puberty & in the absence of adequate dietary intake, young girls become highly susceptible to anaemia. After the analysis, it was found that anaemia is more prevalent among the students who are underweight and overweight students have less prevalence of anaemia. Numerous studies (Vasanthi and pawashe, 1994; Chaturvedi and Kapil [6], 1996; Seshadri, 1997; Agarwal, 1998; Rajanathan et al, 2000; Sivakumar,

2001; Gawarikar et al, 2002; Sidhu et al, 2005) among adolescent girls have shown that prevalence of anaemia ranges from 22.00-96.50% in India.

## CONCLUSIONS

Nutritional anaemia, especially iron deficiency anaemia is more prevalent among females' especially adolescent girls due to causes like menstrual blood loss, poor diet and under nutrition as compared to males. In the present study, high prevalence of BMI is increasing and also inversely associated with anaemia. High BMI significantly associated with hypertension and pre hypertension stage also increasing. The students should be motivated and educated to take balanced diet rich in green leafy vegetables and fruits to combat nutritional anaemia and keep normal body mass index which will keep the person healthy. Taking all this into consideration, young adult female students should be made aware about high prevalence of anaemia and its hazards and regular checking of hemoglobin level should be ensured among them.

## RECOMMENDATIONS

• Frequent screening of students

• Periodical and routine health check-up and haemoglobin estimation & BMI estimation

• Balanced diet

• Control of parasites and nutrition education.

• Correction of Anaemia and keeping normal BMI

**Source of Funding:** None

**Conflict of Interest:** None

**Ethical Clearance:** Taken from the institute.

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# A Study to Find the Effectiveness of Structured Teaching Programme on Knowledge Regarding Medico-Legal Aspects in Care of Terminally Ill Patients among Staff Nurses at Selected Hospitals, Moradabad

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## ABSTRACT

A nurse is responsible to ensure that the standard of the nurse's practice conforms with professional standards with the object of enhancing the safety of the individual, any significant other person and colleagues and it has been very important for the nurses to safeguard themselves & their clients against negligence and to be aware about medico-legal aspects. Objectives: To evaluate the effectiveness of structured teaching programme on knowledge regarding medico-legal aspects in care of terminally ill patients among staff nurses and to find the association between the knowledge of staff nurses regarding medico-legal aspects in care of terminally ill patients with their socio-demographic variables. A Quasi-experimental with pre test -post test design was used, on 60 staff nurses. Result: The majority (70 %) of the staff nurses had inadequate knowledge regarding medico legal aspects in care of terminally ill patient. There was no significant association between the level of knowledge of the staff nurses and their socio-demographic variables. There was significant difference between pretest and posttest mean knowledge scores. Conclusion: With the view of findings, structured teaching programme was organized and implemented on knowledge regarding medico-legal aspects which in turn helped the staff nurses in acquiring a better, efficient & vigil in their services.

*Keywords: Medico-legal aspects, terminally ill patient, structured teaching programme, staff nurses.*

## INTRODUCTION

Nurses worldwide need to continually look for "solutions, choices and outcomes for patients that represent the best available knowledge internationally" to continuously improve and authenticate nursing care.[1]As the leaders in the nursing profession know that we are legally responsible for what we do in our action likewise nowadays the public are aware about law.[2] Thus it is essential as a nursing professional we should be alert in our daily routine nursing care. Though in our nursing syllabus less importance is given to the legal aspects. But nurses must know the legal issues and the law that governs their profession to avoid lawsuits against them. Nurses who have the knowledge of the law and are aware of legal rights & obligations will provide effective care for clients.[3]

Nurses must take many precautions during their daily shifts. One of the most common ways to make sure on the path with patients and in the right is recording, documenting and reporting daily routines and decisions. The nurses learn in school about how to take care of a patient is not only making the right decision but also doing proper documentation and reporting.[4] This will help nurses to be aware about the legal responsibilities & obligations, and to provide better care to the patient. [5]

Nurses may come across many issues, (which can be legal or ethical in nature) and they would be not oriented to deal with such issues and therefore land up into ethical issues when question is raised. In today's world, every nurse must be aware of ways to protect themselves from these ethical issues. Thus to prevent all the legal issues it's the responsibility of we as a nurse to be aware

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about the legal responsibilities which is becoming more important in today's health care industry.[2]

## MATERIAL AND METHOD

A Quantitative research approach was used. Quasi-experimental study (with pre and post test) was adopted as research design. 60 staff nurses were surveyed by Non-probability sampling technique using of Nonrandomized Control group method to find the effectiveness of structured teaching programme on knowledge regarding medico-legal aspects in care of terminally ill patients among staff nurses. Structured questionnaire were prepared; Part A:-Performa for collecting socio-demographic characteristic (contains 6 questions which include age, gender, qualification, source of information, experience, and area of work);

Part B:-Structured questionnaire (contains 30 questions which include definition, medico-legal aspects, ethical principle, responsibility, and rights of patient) to assess knowledge regarding medico-legal aspects in care of terminally ill patients among staff nurses. The coefficient of internal consistency was used to check the level of knowledge by using Kuder and Richardson formula (r=0.8). The data obtained was analyzed by both descriptive and inferential statistics on the basis of the study. To compute the data, a master data sheet was prepared by the investigator. The demographic variables were analysed using descriptive measures (frequency and percentage). The level of knowledge was assessed by using descriptive measures (mean, standard deviation). While the association between the knowledge and socio-demographic variables were assessed using Chi-Square test.

## FINDINGS

**Table 1: Association of pre-test knowledge score with their selected demographic variables.    N=60**

| S.No | Demographic Variable | Chi Square | D.f | Table Value | Inference |
|------|----------------------|------------|-----|-------------|-----------|
| 1. | Age | 2.15 | 4 | 9.49 | NS |
| 2. | Gender | 0.43 | 2 | 5.99 | NS |
| 3. | Qualification | 0.05 | 4 | 9.49 | NS |
| 4. | Source of Information | 3.67 | 8 | 15.51 | NS |
| 5. | Experience | 3.39 | 6 | 12.59 | NS |
| 6. | Area of work | 5.05 | 6 | 12.59 | NS |

**Keys:-** Table value of $\chi^2$ at 5% level, NS=Not significant

The table no.1 indicates that there was no association of pre-test knowledge score with their selected socio-demographic variables.

The Hypothesis was tested at 0.05 level of significance. The major findings of the study obtained were: In Age:- majority (70%in experimental and 90% in control group) of staff nurses were below 30years; in Gender:- majority (66.67% of male in experimental and 66.67% of females in control group); in Qualification: - majority (86.67%in experimental and 80% in control

group) of staff nurses had qualification of G.N.M; in Source of information:- majority (43.33% got information from in-service education in experimental and 46.67% got information from in-service education and books in control group) of staff nurses; in Experience: - majority (36.67% had experience of 0 – 2 years and 3-5years in experimental and 96.67% had experience of 0-2 years in control group) of staff nurses; and in Area of work:- majority (66.67% in experimental and 73.33% in control group) of staff nurses worked in ward.

**Table 2: Frequency and percentage distribution of sample according to their Pre test and Post test level of knowledge in experimental and control group**

| Level of Knowledge | Range | Experimental group | | | | Control group | | | |
|--------------------|-------|--------------------|--|--|--|---------------|--|--|--|
| | | Pre test | | Post test | | Pre test | | Post test | |
| | | F | % | F | % | F | % | F | % |
| Inadequate | 0 - 10 | 12 | 40 | - | - | 16 | 53.33 | 19 | 63.33 |
| Moderate | 11 - 20 | 18 | 60 | 9 | 30 | 14 | 46.67 | 11 | 36.67 |
| Adequate | 21 - 30 | - | - | 21 | 70 | - | - | - | - |

**Keys:-** F= Frequency, %= Percentage

The table no.2 indicates that in pre test experimental group, majority (60%) of the staff nurses had moderate level of knowledge (range 11-20), whereas in post test experimental group, majority (70%) of the staff nurses had adequate level of knowledge (range 21-30),

The table no.2 indicates that in pre test control group, majority (53.33%) of the staff nurses had inadequate level of knowledge (range 0-10), whereas in post test control group, majority (63.33%) of the staff nurses had inadequate level of knowledge (range 0-10).

**Table 3: Effectiveness of structured teaching programme by comparison of pre - test and post - test knowledge scores of experimental group    N=30**

| Test | Mean score | Standard deviation | Mean difference | 't' value |
|------|-----------|-------------------|-----------------|-----------|
| Pre – test | 10.47 | 2.6 | 11.57 | 20.39* |
| Post – test | 22.03 | 3.7 | | |

**Keys:-** $T_{29}$=2.05, p < 0.05; *Significant

The table no. 3 indicates that in the pre test the mean score of experimental group was 10.47, the standard deviation was 2.6,whereas in post test the mean score was 22.03, the standard deviation of 3.7 was obtained. The mean difference obtained between the pre test and post test was 11.57. The 't' value obtained was 20.39 and p<0.05. It shows that there was significant difference between pre test knowledge and post test knowledge. Hence the hypotheses was accepted.

## DISCUSSIONS

The present study showed that, there was significant difference in the pre-test and post-test mean score knowledge (from 10.47 to 22.03) of experimental group regarding medico-legal aspects in care of terminally ill patients among staff nurses. In previous study conducted in 2014 on "Knowledge and Attitude of Nurses on Legal Aspects in Patient Care", Pondicherry. The results revealed that 44.5% (227) of nurses had poor knowledge, 24.1% (123) of nurses had average knowledge, 21.2% (108) of nurses had good knowledge, 8.6% (44) of nurses had very good knowledge and 1.6% (8) of nurses had excellent knowledge.[6]

This study showed that, there was significant effectiveness of structured teaching programme on knowledge (as the 't' calculated value is 20.39 whereas

the 't' table value is 2.05 at p <0.05) regarding medico-legal aspects in care of terminally ill patients among staff nurses. An attempt was made to compare similar study conducted in 2014, on "Effect of Self Instructional Module on Knowledge Regarding Medico Legal Responsibilities among Nurses", Dombivli (E), India. The result implies that a specialized training program intended to impart knowledge regarding medico legal responsibilities to the staff nurses need to be organized and implemented.[5]

## RECOMMENDATIONS

In view of the present study findings, following recommendations were offered for further research. A similar study can be conducted on large sample for the purpose of generalization and to get valid study results. A study can be conducted with other areas of medico-legal aspects which may include critical aspects or views to answer or to solve the various issues when the problem or the need for patient or staff nurses arises. A study can be conducted in different research design and also in different settings.

## LIMITATIONS

The study was limited to, staff nurses with the sample size of 60; nonrandomized controlled group design; quantitative approach and was also limited for 4 weeks.

## CONCLUSION

Based on the results from the study, most of the staff nurses had inadequate knowledge regarding the medico-legal aspects for which they are accountable, legally responsible and may land up into the legal and ethical issues. Thus to avoid these issues, to safeguard them and to provide the best quality care to the patients, it's the responsibility of each nurse to be aware about the medico-legal aspects which are meant for medical and legal welfare of the patients.

With the emergence of new technologies and advancement in the scientific field, the common public are aware about their rights and responsibility in every aspects of life. By reviewing the literature, it discusses about the legal and ethical issues of nurses, and every time or the coming year the doctors will not be responsible for the negligence committed by the nurse. Also most of the nurses are going abroad for their job, where the legal rules are strictly followed.  So, being a

staff nurse or the health care provider, it's our duty to be competent in all areas of our profession.

Above all, the healthcare workers or the staff nurses should be competent enough, and for that they should receive periodic training or in-service education on medico-legal aspects, its rights and responsibility, with a view on improving the overall safety of patients and healthcare providers from legal and ethical constraints.

**Conflict of Interest:** The author has no conflict of interest related to the conduct and reporting of this research

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**Ethical Clearance:** Before conducting the study, written permission was obtained from the Teerthanker Mahaveer University, Moradabad. Consent and willingness was established from all the subjects who meet inclusion criteria of this study.

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# The Prevalence of Internet Addiction among the Students in a Western U.P. Medical College

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## ABSTRACT

**Introduction:** Internet addiction is defined as mismanagement of internet use that causes mental, social and occupational problems. Thus, the assessment of prevalence of this disorder can lead to preventive measures and appropriate treatment to prevent its spread.

**Method:** In this cross-sectional study, prevalence of internet addiction disorder was assessed in Saraswathi Institute of Medical Sciences, Hapur (U.P), India in 2015. Stratified random sample was used to select 192 students. Demographic data were recorded and Internet Addiction test Test (IAT) questionnaire was administrated.

**Results:** Out off 192 students participating in the study, 128 (66.67%) were males and 64 (33.33%) were female with a mean age of 21.05± 0.1 years. Most of the students (42.4%) were using the internet "less than one hour" and the lowest of students (4%) were using the internet "More than six hours". Mean test score of IAT was 24.81 ± 1.08 (mild addiction). In terms of internet addiction, 69 (35.94%) cases were normal users, 109 (56.77%) had mild addiction, 12 (6.25%) showed moderate addiction and 2 (1.04%) were cases of severe addiction which are lower compared to previous studies.

**Conclusion:** The rate of internet addiction among students of Saraswathi Institute of Medical Sciences, Hapur (U.P), India is lower than the previous reports. It is still necessary to curb the spread of this problem due to its complications.

***Keywords:** Prevalence, Internet Addiction {IA}, Saraswathi, Students.*

## INTRODUCTION

Rapidly increasing use of smart phones, tablets, and computers has made internet an indispensable part in modern society. The negative impact of excessive, maladaptive or addictive internet use has attracted much research attention. In particular, internet addiction (IA) has become a major public health issue worldwide and brought about a dramatic proliferation of research in this area[1–7]. IA is defined as a pathological pattern of internet use, which is also described as internet dependence, compulsive internet use, problematic internet use, internet abuse, and pathological internet use[8]. The user cannot self-control the use of internet, resulting in significant impairments at school, home, work, health or interpersonal relationships[1]. They may find it difficult to stop using the internet due to its anonymity, convenience and accessibility and may use it as a way to escape reality[9]. The types of activity involved in IA include online gaming, social networking, online gambling, online shopping, virtual sex and information overload.

The internet is one of the most accessible media in the world and it is different from other types of media. Reasons for this are: (i) the internet has many activities that its users can engage with; (ii) the internet offers an opportunity to communicate with people all over the world without any limitation. Furthermore adolescents have become an important target of this commercial market[10,11]. Internet technologies and activities, that are progressing rapidly have attracted adolescents, leading

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to the over-use of the internet and maladaptive internet behavior called ''Internet addiction''[12]. Many studies have shown the association between internet over-use and other psychopathological syndromes[13].

The term of ''addiction'', though traditionally used to describe a physical dependence on a substance[14], has been applied to the over use of the internet. Internet addiction disorder is described as excessive computer use that interferes with daily life and can impair daily function[15,16]. Internet addiction is characterized as a form of addiction, and people who suffer from it, cannot control themselves when they are using the internet. This phenomenon results in serious impairments in psychosocial functioning such as poor school functioning[17]. 'Internet addiction' is considered as a psychiatric disorder in the DSM-5 [18].

Studies described excessive computer use as ''Internet addiction'' [19, 20], "pathological Internet use" [21], and ''problematic Internet use'' [22]. Researchers have described various symptoms displayed by people who suffer from internet addiction. These symptoms include preoccupation with the use of internet [23, 24], being online most of the time, compulsive use of the internet, believing that everything except the internet is boring, increased irritability if disturbed while online, decreased communication with others, and increased depressive behaviors [25].

The prevalence of internet addiction is reported from 1.5% to 25% in different countries [26-29]. In Iran, internet addiction is reported as approximately 11% which is higher than countries such as Italy, China and Australia [30], which are 5%, 4.4% and 8.1% respectively[31,33]. The mechanism of internet addiction resembles drug addiction. According to previous studies, the increase of activity in orbitofrontal cortex and the decrease of activity in anterior cingulate were contributing factors of internet addiction, but however, more studies are necessary [34]. Methods to treat this disorder include cognitive therapy, behavioral treatment, and exposure therapy by keeping them offline.

Education on the risks of internet addiction can improve the condition[12]. This study intends to measure the prevalence of internet addiction among the students of Saraswathi Institute of Medical Sciences, Hapur (U.P).

## METHOD

This is a cross-sectional study aimed to assess the prevalence of internet addiction disorder among students of Saraswathi Institute of Medical Sciences. The period of study was from September to December 2015, medical students were chosen for study. According to previous studies [26-28], sample size was calculated with a = 0.5, p=0.06, d=0.03, q=0.94, n = 240 and $a$ = 0.5, p=0.05, d=0.03, q=0.95, n = 209. Sample size was obtained 192 to 200 but for more reliability 250 students were recruited into this study. Stratified sampling method was used in this study. Subjects included comprised students from 1st Professional, 3rd Professional and 4th Professional. After obtaining approval from the ethical committee of Saraswathi Institute of Medical Sciences, Hapur, the information on internet addiction was gathered using a questionnaire which consists of 2 parts. First part recorded demographic information including age, date of diagnosis and educational level. For research reasons, personal information was not been revealed.

Second part was the Internet Addiction Test (IAT) by Young which is one of the most reliable tests for evaluating internet addiction. Scores are divided into 4 levels including normal (less than 21), mild dependency (21-49), moderate dependency (50-79) and severe dependency (80-100). Finally, all the responses to the 20 questions are calculated .Statistical analysis was done using the SPSS version 18 software. Chi-square test was used for analysis with P value < 0.05 considered as a significant level.

## RESULTS

A total of 192from 200 students responded to the questionnaire (response rate was 96.0%).

There were 192 respondents, of which, 128 (66.67%) were male and 64 (33.33%) were female, with a mean age of 21.05±0.1.For their age range, 17 %, 77.7% and 5.4% were of ages between 18-20, 21-24 and 25-30 years respectively. 40 (20.83%) were first professional students, 60 (31.25%) were third professional students, 92 (47.92%) were fourth professional students participated in our study.

**Table 1. Comparison between severities of addiction by sex**

| | | Female Number (percent) | Male Number (percent) | Total Number (percent) | $x^2$ | Degree of freedom | p-value |
|---|---|---|---|---|---|---|---|
| Severity of addiction | Normal | 20 (29.41) | 49 (39.52) | 69 (35.94) | | | |
| | Mild addiction | 40 (58.82) | 69 (55.65) | 109 (56.77) | | | |
| | Moderate addiction | 4 (3.22) | 8 (11.77) | 12 (6.25) | 12.265 | 3 | 0.005 |
| | Severe addiction | 0 (0.00) | 2 (1.61) | 2 (1.04) | | | |
| Total | | 64(100) | 128(100) | 192 (100) | | | |

Functional impairment or unpleasant feeling in a period of 12 months were found severe in 4 subjects (2.08%), moderate in 4 subjects (2.08%) and mild in 26 subjects (13.54%) while 158 cases (82.30%) did not have any problems. Most students believed that life without internet is boring and this can show that internet dependency in the new generation. Severe internet addiction was seen in 2 (1.04%) male students but it was not seen among female students. Overall, severe and moderate internet addiction among males were higher than females (P=0.005). Internet addiction among students who are between 21-30 years of age was more frequent but it was not significant.

Mean score in IAT was 24.81±1.08. We found that 69 (35.94%) students were not addicted to internet while 109 (56.77%) cases have mild addiction, 12 (6.25%) students have moderate addiction and 2 (1.04%) of them has severe addiction to internet.

**DISCUSSION**

This study evaluated the prevalence of internet addiction in students of Saraswathi institute of Medical Sciences. We used IAT for measuring internet addiction. We found that 69 (35.94%) students were not addicted to internet while 109 (56.77%) cases have mild addiction, 12 (6.25%) students have moderate addiction and 2 (1.04%) of them has severe addiction to internet in our study and prevalence of internet addiction has been reported between 1.5-25% and in previous studies it is 11% [26-30].

The majority of participants have more than one goal in internet use. As we showed in Figure, internet usage for entertainment is in the second rank. The population, who were evaluated, were medical students . Therefore, education on internet use is necessary. Fortunately, frequency of internet usage for scientific issues is high.

**Table 2. Frequency of internet usage for various purposes**
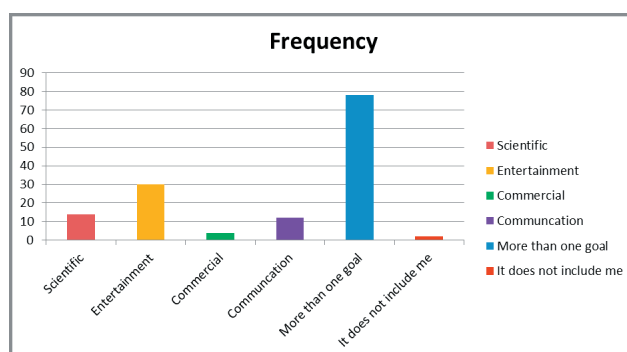


In this study majority of participants reported that they did not neglect their work when they were online to internet. Although at youth age, communication is very important.

But results from this research showed that most of the participants preferred to be with friends, rather than being online in the Internet. Participants also are more likely to communicate physically rather than using the virtual communication, and the frequency of isolation was noted less in this research. While, previous results of one study in Iran, showed that the addicted group are more alone than the other groups [39]. This study also shows that the students use the internet in a very safe protected way and they will not be angry when others disturbed them. The complications of internet addiction in this study were low. Kraut et al showed that internet

use leads to the decrease inequality of life but in our study, the decrease in quality of life is not prominent[40]. Another study showed that the frequency of sleep problems was high in internet addicts but it was not similar with our results [41]. Overall, severe and moderate internet addiction in males was higher than the females. These results on this study were similar with Sipal's study [42].

According to their professional that they study in, this amount used of time can cause problems in their study. We suggest that a study is designated to evaluate the relationship between internet addiction and the number of failed terms. We found that the frequency of internet usage for entertainment is high [42]. As it has been shown in a previous study, our study also showed that internet addiction has some reasons that are similar to the pathophysiology of substance addiction [43]. We suggest that others researches been made to evaluate the relationship between internet addiction and substance abuse.

## CONCLUSION

We concluded that the prevalence of internet addiction between students of Saraswathi institute of Medical Sciences is lesser than the previous studies. However, it is necessary to plan for prevention of increasing internet addiction and its complication.

**Conflict of Interest:** None

**Source of Funding:** Nil

**Ethical Clearence:** Taken

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# Prevalence of Musculo-skeletal Disorders in Army Personnel in Meerut, India- A Cross Sectional Study

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## ABSTRACT

**Background:** In India, research done on army personnel related to their musculo-skeletal problems is scarse. Thus, aim of this cross-sectional study was to find out the prevalence of musculo-skeletal disorders in army personnel in Meerut, India.

**Material and Method:** Study design: Cross-sectional study (December 2009)

Study population: Army Personnel in Meerut. The study was done by means of a questionnaire. Data was analysed using descriptive statistics.

**Results:** Total subjects in the study were 119. Thirty seven individuals complained of pain (31.09%). Out of thirty seven army personnel, fourteen (37.8%) complained of low back pain, twelve (32.4%) complained of knee pain, five (13.5%) complained of shoulder pain, two (5.4%) complained of metatarsal pain, two (5.4%) complained of abdominal pain, two (5.4%) complained of pain in the calf region and shaft of tibia, one (2.7%) each complained of elbow pain, pain at toes, headache, hip pain, pain at index finger etc.

**Conclusion:** Low back pain was found to be the most prevalent disorder in army personnel followed by knee pain, shoulder pain, metatarsal pain and others.

*Keywords: army personnel, musculo-skeletal disorder, overuse injuries, pain, back pain.*

## INTRODUCTION

Army personnels require higher level of physical exertion and fitness than a civilian of the same age. Training usually involves substantial amount of marching, running etc. which again is associated with increased risk of overuse injuries. The most common injuries among men are low back pain, tendinitis, sprains, strains and stress fractures.[1]

Musculo-skeletal problems are the commonest cause of Morbidity in Army personnels. They represent the second biggest reason for untimely discharge from military service in Finland. Disorders of the back and the knee were most frequently recurrent conditions (44% for both).[2]

Research on military populations indicates that musculoskeletal-related disorders represent a prevalent source of outpatient visits, lost work time, hospitalization, and disability. The study done in USA in 1997 analyzed 41,750 disability cases and found that back-related disorders represent the most prevalent sources of disability and certain occupations were associated with higher disability risk. These findings highlighted the need to consider the interaction between workplace factors and gender on disability in the military work force.[3]

In the U.S. Army, certain occupations were associated with a higher-than-average risk of disabilities, especially back complaints, such as infantryman, wheeled vehicle driver, heavy construction equipment operator, construction equipment repairer, heavy antiarmor infantryman, generator repairer, multichannel

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transmission systems operator, man-portable air defense systems crew, and unit wheeled vehicle mechanic.[4]

In India, research done on army personnel related to their musculo-skeletal problems is scarce. Thus, aim of this cross-sectional study was to find out the prevalence of musculo-skeletal disorders in army personnel in Meerut, India.

## MATERIAL AND METHOD

Study design: Cross-sectional study (December 2009)

Study population: Army Personnel in Meerut

The study was done by means of a questionnaire using camp approach. This questionnaire consisted of demographic information like name, age, gender, duration of service, type of work, location of pain if any and type of shoes used by them.

Data was analysed using descriptive statistics.

## RESULTS

Total subjects in the study were 119. The details are as follows:

Age: Age of the individuals ranged from 21-48 years

Gender: In the study, all subjects were male.

Type of work: Documentation (2/119), heavy weight lifting (13/119), trade work (11/119), physical work (14/119), training (1/119), running (1/119), sports (1/119), computer operator (1/119), general duty (10/119), driving (15/119), paper work (1/119), store keeper (1/119), clerical job (1/119), standing job (1/119), related to vehicle (13/119), guard duty (1/119), technical work (4/119), supervisory job (2/119) and few of them did not mention about their type of work (26/119).

Pain: Thirty seven individuals complained of pain (31.09%). Eight individuals did not mention about pain.

Location of pain: Out of thirty seven army personnel, fourteen (37.8%) complained of low back pain, twelve (32.4%) complained of knee pain, five (13.5%) complained of shoulder pain, two (5.4%) complained of metatarsal pain, two (5.4%) complained of abdominal pain, two (5.4%) complained of pain in the calf region and shaft of tibia, one (2.7%) each complained of elbow

pain, pain at toes, headache, hip pain, pain at index finger, pain below umbilical cord, eye pain. Location of pain is depicted in figure 1.

Type of shoes: All were using DMS shoes given to them by armed force.

## DISCUSSION

This was a cross-sectional study to find out the prevalence of musculo-skeletal disorders in army personnel. Back pain was found to be the most prevalent disorder in these individuals followed by knee pain, shoulder pain, metatarsal pain and others. This finding is in agreement with the studies done by Cowan D[1] and Taanila H et al in 2009 where they also found that back pain and knee pain are the most frequent recurrent disorders in army personnel.[2]

Back pain was common in individuals involved in physical work, driving, computer operational work and supervisory work. This is in agrement with the study done by Reza M and Jahani in 2002.[4] Back pain could be due to their wrong postures while working on the computer or while driving. This can also be due to not following the ergonomical advice while doing the physical work.

Knee pain was seen in individuals involved in trade work, physical work and driving. Shoulder pain was common in individuals involved in physical work and standing job. Metatarsal pain was seen in individual involved in sports activities.
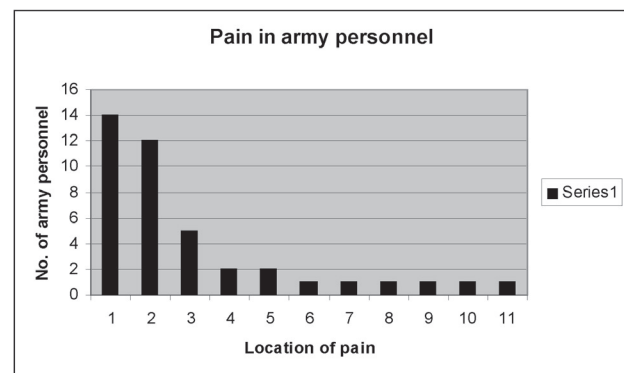


Figure 1. Location of pain in army personnel (n=119)

## CONCLUSION

Low back pain was found to be the most prevalent disorder in army personnel followed by knee pain, shoulder pain, metatarsal pain and others.

Limitation of the study:

Intensity, duration and frequency of pain were not asked. Since it was a cross-sectional study, cause and effect relationship could also not be found.

Future Research:

It will be worthwhile to understand the functioning of every section in armed force.

There is a need to understand the job demands of each sector. If possible, observational analysis of every section should be done and should be seen whether they are following postural and ergonomical advices.

Since army personnel are prone to musculo-skeletal disorders, they should be educated regarding their prevention and treatment.

**Competing Interests:** None declared

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# Clinical Profile of Chronic Hepatitis B in Patients Co-infected with Human Immunodeficiency Virus

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## ABSTRACT

**Introduction:** Chronic hepatitis B virus (HBV) infection is quite common in our country. Co-infection with HIV is not uncommon in similar risk population. HIV co-infection may modify the natural history of chronic hepatitis B. The aim of this study was to assess the effect of HIV co-infection on disease activity in chronic hepatitis B in Indian subjects.

**Material and Method:** A total of 58 subjects were divided into 2 groups [HBV monoinfection (42/58) and HBV-HIV co-infection (16/58)]. Study of various biochemical and histological parameters was carried out in both the groups. Results were analysed by using one way analysis of variance (ANOVA) and Post Hoc tests.

**Results:** Mean serum transaminases levels were significantly lower in HBV-HIV co-infection compared to HBV monoinfection, however there was no statistically significant difference in serum bilirubin, serum albumin levels, prolongation of PT, and histological activity index in both the groups.

**Conclusion:** We conclude that HIV co-infection does not significantly alter the clinical profile of chronic hepatitis B. Serum transaminases though considered as surrogate markers of hepatic parenchymal injury do not always correlate with histopathologic findings and severity of liver disease. All patients of chronic hepatitis B irrespective of their HIV status should undergo liver biopsy for assessment of disease activity and deciding therapy.

***Keywords:*** *Chronic HBV, HIV co-infection, transaminase level, liver biopsy, disease activity.*

## INTRODUCTION

Chronic hepatitis B virus (HBV) infection is quite common all over the world including our country. Worldwide more than 350 million people (5-7% of the world population) suffer from chronic hepatitis B. India has more than 40 million people with HBV carrier state[1, 2, 3]. HBV and HIV are transmitted mainly by sexual or parenteral route, therefore, HBV-HIV co-infection is common in similar risk population. The epidemiology of the two infections overlap so much that up to 90% of persons with AIDS have some markers of past or current HBV infection[4,5]. The destruction of HBV-infected hepatocytes with consequent clearance of HBV is thought to be mediated by cytotoxic T lymphocytes. HIV infection produces immunosuppression and results in diminished cytotoxic T cell function secondary to impairment of CD4^{+} T lymphocytes and monocytes. There is unfettered replication of HBV and relatively more normal liver functions and histology in patients with suppressed immune functions [6, 7]. The outcome of chronic hepatitis B depends on a balance between HBV infection and host's immune response to it. Therefore, co-infection with HIV may modify the natural history of HBV infection. The aim of the present study was to assess the effect of HIV co-infection on clinical profile of chronic hepatitis B.

## MATERIAL AND METHOD

This study was carried out at HIV Immunosurveillance Centre and Gastroenterology Department of a tertiary care hospital in Delhi for two consecutive years. Patients found to have HBV with

or without HIV co-infection for more than 6 months and having active viral replication confirmed by HBV DNA irrespective of age and sex were included in this study. Patients unwilling for liver biopsy, having history of alcohol intake (consumption of 50 gm or more of ethanol per day for at least 1 year), infected with hepatitis C virus, history of any other associated liver disease or illness like malignancy not related to HBV or HIV infection (likely to affect the course of the disease), in advanced stage of disease due to AIDS defining illness, or having major illness like chronic kidney failure, leukaemia, lymphomas, or conditions requiring frequent transfusions like thalassaemia and haemophilia were excluded from study.

Liver function tests were considered deranged if serum bilirubin was found to be > 0.8 mg/dl, and serum AST/AST > 40 U/L. Chronic HBV infection was defined as patients having positive HBsAg status for more than 06 months duration before inclusion in the study. HIV infection was defined as patients who were positive for HIV by ELISA and Western blot method. Child-Pugh-Turcotte classification was used to assess clinical severity of liver disease. Knodell-Ishak system of scoring the histological activity index was used to grade the activity of chronic HBV infection in histopathologic specimen.

Consecutive 58 patients having HBV alone or in combination with HIV co-infection were included in the study. Patients were divided in two groups (42 with HBV monoinfection and 16 with HBV-HIV co-infection). Patients were tested for HBV, HCV and HIV infection by ELISA. Patients positive for HBsAg were tested for HBeAg and HBV DNA. Patients positive for HIV by ELISA were confirmed by Western blot method. Patients were evaluated by estimation of serum bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), albumin, and prothrombin time (PT). Liver biopsy was done in patients who tested positive for markers of active viral replication. Liver biopsy was done in only 56 patients. Biopsy could not be done in 2 cases (one each in both groups) because of severely deranged prothrombin time.

## RESULTS

In HBV monoinfection 36 out of 42 patients had normal serum bilirubin while 6 patients had abnormal serum bilirubin, however, mean serum bilirubin level of all the patients in this group was 0.79±0.46 SD. All the patients with HBV-HIV co-infection had normal serum bilirubin levels (table 1). In HBV monoinfection 20 out 42 patients had normal serum AST levels while 22 patients had abnormal levels. Mean serum AST level of all patients was 60.45±49.95 SD. Higher levels of serum AST in patients with HBV monoinfection were statistically significant in comparison to the serum AST levels in patients with HBV-HIV co-infection. In HBV-HIV co-infection group 15 out of 16 patients had normal serum AST levels with a mean value of 28.81±7.85 SD (table 2). In HBV monoinfection group 12 out 42 patients had normal serum ALT levels while 30 patients had abnormal levels. Mean serum ALT level of all patients in this group was 83.47±91.29 SD. Higher levels of serum ALT in patients with HBV monoinfection were statistically significant in comparison to the serum ALT levels in patients with HBV-HIV co-infection. In HBV-HIV co-infection group 15 out of 16 patients had normal serum ALT levels with a mean value of 25.38±9.78 SD (table 3). There was no statistically significant difference in serum albumin levels (table 4), prolongation of prothrombin time (table 5), and Child–Turcotte–Pugh score of patients (table 6) in two groups. There was no statistically significant difference in disease activity and stage of fibrosis in two groups. The grade of histological activity index (HAI) was 4.41±3.01 in HBV group and 5.20±2.83 in HBV-HIV co-infection group. The stage of fibrosis was 0.90±1.18 in HBV group and 0.73±0.96 in HBV-HIV co-infection group (table 7).

**Table 1: Serum bilirubin levels in patients in both groups**

| S. bilirubin (mg/dl) | HBV | HBV-HIV |
|---|---|---|
| No. of patients | 42 | 16 |
| Mean±SD | 0.79±0.46 | 0.61±0.12 |
| Normal | 36(86%) | 7(100%) |
| Abnormal | 6 (14%) | Nil |

**Table 2: Serum AST in patients in two groups**

| Serum AST (U/L) | HBV | HBV-HIV |
|---|---|---|
| No. of patients | 42 | 16 |
| Mean±SD | 60.45±49.95 | 28.81±7.85 |
| Normal | 20(47%) | 15(94%) |
| Abnormal | 22 (53%) | 1(6%) |

**Table 3: Serum ALT in patients in both groups**

| Serum ALT (U/L) | HBV | HBV-HIV |
|---|---|---|
| No. of patients | 42 | 16 |
| Mean±SD | 83.47±91.29 | 25.38±9.78 |
| Normal | 12(29%) | 15(96%) |
| Abnormal | 30(71%) | 1(6%) |

**Table 4: Serum albumin levels in both groups**

| S. albumin( gm/dl) | HBV | HBV-HIV |
|---|---|---|
| No. of patients | 42 | 16 |
| Mean±SD | 4.23±0.41 | 3.92±0.17 |
| Normal | 41(98%) | 16(100%) |
| Abnormal | 1(2%) | Nil |

**Table 5: Prolongation of PT in both groups**

| Prolongation of PT | HBV | HBV-HIV |
|---|---|---|
| No. of patients | 42 | 16 |
| 1-4 seconds | 15 | 5 |
| 4-6 seconds | 2 | 2 |
| > 6 seconds | 2 | 1 |
| Normal PT | 23 | 8 |

**Table 6: Child score of patients in different groups**

| Child score | HBV | HBV-HIV |
|---|---|---|
| No of patients | 42 | 16 |
| Class A | 40 | 16 |
| Class B | 2 | Nil |
| Class C | Nil | Nil |

**Table 7: Histologic activity index (HAI) in both groups**

| (HAI) | HBV | HBV-HIV |
|---|---|---|
| Grade (Mean±SD) | 4.41±3.01 | 5.20±2.83 |
| Stage of fibrosis (Mean±SD) | 0.90±1.18 | 0.73±0.96 |

## DISCUSSION

In our study mean serum bilirubin was 0.9 mg/dl in HBV group. However 14/20 (70%) patients in HBV, all patients in HBV-HIV group had normal serum bilirubin levels but had abnormal liver histology. The study shows that there is no co-relation between normal serum bilirubin and disease activity. However in HBV monoinfection group patients are more likely to have abnormal serum bilirubin levels as compared to HBV-HIV co-infection patients, but this difference was statistically insignificant. The prolongation of prothrombin time was comparable in both groups. There was no difference in serum albumin levels in both groups. All the patients except 1 in HBV-HIV co-infection group had normal levels of serum albumin. Colin *et al* [8] assessed the influence of HIV infection on chronic hepatitis B and found that anti HIV positive and anti HIV negative patients were not different for serum bilirubin and prolongation in prothrombin time, however they observed that HIV sero-positive patients had lower serum albumin levels. The reason for this observation could be different host response to infection in Indian subjects as compared to that in the Western population.

Serum transaminase levels were significantly lower in patients with HBV-HIV co-infection compared to the patients with HBV monoinfection. In fact serum transaminase levels were normal in patients co-infected with HIV. The low serum transaminases levels in HBV-HIV co-infection, probably related to immunodeficiency in HIV co-infected patients, are consistent with immunological pathogenesis of hepatocellular damage in chronic hepatitis B. Bodsworth *et al* [9] observed that HIV infection was associated with lower serum alanine aminotransaminase levels, and suggested that chronic hepatitis B may be less severe when accompanied by HIV infection. Colin *et al* [8] found that anti HIV positive and anti HIV negative patients were not different for serum AST, however anti HIV positive patients had lower serum ALT levels. Krogsgaard *et al*[10] found that serum transaminase levels in chronic HBV infection were significantly lower in HIV infected individuals as compared to individuals not infected with HIV.

In our study it was observed that in chronic hepatitis B histological activity index was higher in patients who were co-infected with HIV as compared to HIV negative patients. However this difference was not statistically significant. Colin *et al*[12] also found that HIV sero-positive and HIV sero-negative patients were not different for histological activity index in chronic hepatitis B. It is also observed that serum transaminase levels did not have any correlation with histological

findings. Two patients in HBV group with normal serum ALT levels had histological activity index of 14/18 and 12/18 while other two patients in HBV group with normal liver biopsy had deranged ALT levels in the range of 2-3 times UNL. All patients who were co-infected with HIV had abnormal liver biopsy with normal serum transaminases levels.

## CONCLUSION

Elevated transaminases though considered as surrogate markers of hepatic parenchymal injury do not always correlate with histopathologic findings. Patients with normal or slightly raised transaminases may have features of advanced liver disease whereas patients with more elevated transaminases may have mild liver disease on liver biopsy. Serum transaminase levels are significantly lower in chronic HBV infected patients who are co-infected with human immunodeficiency virus. Serum bilirubin, serum albumin, and prolongation in prothrombin time do not differ in HBV-HIV co-infection and HBV monoinfection. Disease activity on liver biopsy in chronic Hepatitis B infection is more in HIV co-infected patients than in HIV sero-negative patients, though statistically insignificant. Liver biopsy remains the gold standard for the assessment of the severity of the chronic liver disease in all patients infected with HBV irrespective of HIV co-infection.

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# An Interventional Study on Smartphones Usage Pattern among Dental Student of District Meerut, (UP)

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## ABSTRACT

**Background:** Smart phones have become a ubiquitous part of our daily lives. The use of mobile technology in medical education is a welcome development especially because it offers a good platform for continuous self-directed learning, an important skill for all health practitioners.

**Objectives:** (1) to find out usage pattern of smart phones among dental students. (2) To assess the effects of Smartphone on their physical, social, and psychological health.

**Results:** In this study, before educational intervention 34% of students used their Smart phones for less than 4 hrs, 50% used for voice calling, 31% for gaming, 15% for news and Infotainment, 75% for social networking, 61% for music and 14% for other uses. 21% students had productive impact, 56% feel happy, 7% feel grateful, 21% distracted, 3% feel frustrated and 4% feel angry. 72% students kept it with themselves, 37% had positive and 63% had negative impact, 37% kept it beneath the pillow, 24% kept it on charging dock and 44% kept it on side table. Smart phones newer affects in 25% students, affect sometimes in 67%, often in 6% and always in 2%. 88% of the students were aware of the harmful effects of Smart phones. Pre and post differences were found not statistically significant in this study.

**Conclusions:** Applications on smart phones are very popular and instant messaging is an upcoming form of communication for students. In spite of some knowledge on unfavorable health effects, mobile phones are gaining popularity among young medical and dental students.

*Keywords: Smartphone, dental students, health effects, educational intervention.*

## INTRODUCTION

Smart phone is a advance technology in late three decades.[1] The additional features of Smartphone have attracted people across all walks of life including the students.[2] Initially, mobile phones were used only as a communication tool. But, these days, also support a wide range of other services such as music player, internet, video camera, calculator, alarm clock, text messaging, E-mail, internet access, short-range wireless communications (infrared, Bluetooth), business

applications, gaming, photography and many more other perceived benefits as increased accessibility and social connectivity, reduced loneliness, and security in emergency situations. [3]

Inappropriate use of mobile phone by students presents many deleterious effects, for example, poor academic performances[4] accidents while driving, [5] damaged relationships owing to preference to phone calls by ignoring other members, [6] and increased freedom from parents [7] along with decreased social freedom. [8]

Dental/Medical students may also show cognitive/ behavioral salience in which they constantly think about their phones when they are not using it or keep

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on checking their mobile phones for missed calls or messages. [9] Almost 87-90% of the population in an advanced country like the USA, use cell phones, and a sizeable number of these is school and college going students. [10]

Smart phones are now in use in medical education for various purposes as sources of medical information, reference and, a guide in problem-based learning. [11] and journals. [12] Some medical schools are facilitating this by offering tablets or Smart phones to their medical students. [13]

**The objective of this study was-**

(1) To find out usage pattern of smart phones among dental students.

(2) To assess the effects of Smartphone on their physical, social, and psychological health.

## MATERIALS AND METHOD

This present cross sectional study was carried out in Subharti Dental College of Meerut. The study population consisted of 100 students. Study was conducted during September and October 2015. After taking informed consent of participants, data collection was carried through interview using pre-designed, pre-tested semi-structured interview schedules. After the submission of pre intervention forms from all students a one hour presentation regarding usage of smart phone was teach to all respondents through lectures and other learning materials.

After one week of the presentation students were asked to fill the same questionnaire again. Prevalence of usage of smart phone and its effects on health and intervention was expressed as percentage. Association between variables was assessed with Chi-square test. Variables showing statistically significant association with the outcome variables (p- value of less than 0.05) were considered using software statistical package (SPSS version. 21.0).

## RESULTS

**Table No.1: Frequency of Hours of using Smartphone**

| Smart Phone usage in a Day | Pre Intervention | Post Intervention |
|---|---|---|
| < 4 Hrs | 34 | 40 |
| 4-8 hrs | 35 | 38 |
| 8-12 hrs | 18 | 13 |
| >-12 hrs | 13 | 09 |

**Table No.2: Frequency for using Smartphone**

| Voice calling | 50 | 48 |
|---|---|---|
| Gaming | 31 | 28 |
| News & Infotainment | 15 | 13 |
| Social networking | 75 | 72 |
| Music & Videos | 61 | 64 |
| Others | 14 | 16 |

**Table No.3: Frequency of Emotional Impact of Smart Phone**

| Productive | 21 | 24 |
|---|---|---|
| Happy | 56 | 54 |
| Grateful | 7 | 6 |
| Distracted | 21 | 26 |
| Feel frustrated | 3 | 5 |
| Angry | 4 | 2 |

**Table No.4 Frequency of Smart Phone Kept on while Studying before and after intervention**

| Unitrin Self | 72 | 66 |
|---|---|---|
| Keep Away from study place | 28 | 34 |

**Table No.5: Frequency of Smartphone Effect on Studying**

| Positive Effect | 37 | 40 |
|---|---|---|
| Negative Effect | 63 | 66 |

**Table No.6: Frequency of Smart Phone Spot while sleeping**

| Beneath Pillow | 31 | 27 |
|---|---|---|
| Charging dock | 24 | 23 |
| Side Table | 44 | 49 |

**Table No.7: Frequency of Smartphone Effect on Eating & Sleeping habits**

| Never | 25 | 26 |
|---|---|---|
| Sometimes | 67 | 64 |
| Often | 6 | 7 |
| Always | 2 | 3 |

**Table No.8: Frequency of awareness with Smartphone harmful effects**

| Yes | 88 | 94 |
|---|---|---|
| No | 11 | 6 |

1. Before pre intervention, 34% of students used their Smart phones for less than 4 hrs, 35% for 4-8 hrs, 18% for 8-12 hrs and 13% for more than 12 hrs. 40% used their Smart phones for less than 4 hrs, 38% for 4-8 hrs, 13% for 8-12 hrs and 9% for more than 12 hrs were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=2.14 (p-Value=.543) Not Significant

2. Before pre intervention, 50% students used Smart phones for voice calling, 31% for gaming, 15% for news and Infotainment, 75% for social networking, 61% for music and 14% for other uses. 48% for voice calling, 28% for gaming, 13% for news and infotainment, 72% for social networking, 64% for music and 16% for other uses were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=.552 (p-Value=0.990) Not Significant

3. Before pre intervention, 21% students had productive impact, 56% feel happy, 7% feel grateful, 21% distracted, 3% feel frustrated and 4% feel angry . 24 had productive impact, 54% feel happy, 6% feel grateful, 26% feel distracted, 5% feel frustrated and 2% feel angry were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=1.90 (p-Value=0.862) Not Significant

4. Before pre intervention, 72% students kept their smart phones with themselves and 28% kept their phones away from the study place. 66% kept their Smart phones with themselves and 34% kept them away from the study place were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=.841 (p-Value=.359) Not Significant

5. Before pre intervention, 37% students had positive and 63% had negative impact of Smart phones on their studies. 40% had positive impact and 60% had negative impact were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=0.011(p-Value=.913) Not Significant

6. Before pre intervention, 37% students kept it beneath the pillow, 24% kept it on charging dock and 44% kept it on side table. 27% kept it beneath the pillow, 23% kept it on charging dock and 49% keep it on side table were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=.566 (p-Value=.753) Not Significant

7 Before pre intervention, Smart phones newer affects the sleeping and eating habits of 25% Students, affect sometimes in 67% , often in 6% and always in 2%. Smart phones never affect the sleeping and eating habits of 26% of students, affect sometimes in 64%, often in 7% and always in 3% were found after educational intervention. Pre and post differences were found not statistically significant. *$X^2$=.365 (p-Value=.947) Not Significant

8. Before pre intervention, 88% of the students were aware of the harmful effects of Smart phones and 94% got aware of the harmful effects of Smart phones were found after educational intervention. . Pre and post differences were found not statistically significant. *$X^2$=1.66 ( p-Value=..197) Not Significant

## DISCUSSION

The findings of this study suggest many students use specific mobile phone. In a study conducted in Delhi by Gupta N, et al. observed that each medical student have three or more smart phones. [14]

In our study, maximum 35% of students used their Smart phones for 4-8 hrs. In a study conducted by Jamal A et al. (2012) observed that many students were spent more than 3 hrs on calling, messages, games, music, videos, Internet, WhatsApp. [15] In our study, 50% students used Smart phones for voice calling, 31% for gaming, 15% for news and Infotainment, 75% for social networking, 61% for music and 14% for other uses. A study conducted by Jambulingam M, et al. (2013) observed that majority of the students used their smart phones for taking pictures, recording videos, playing games, listening to music, and Internet surfing. [16] In another study conducted by Hooper V, et al. observed that majority of the students used their phones for social interaction and sharing of thoughts with their parents and friends. [17] In a study conducted by Church K, et al. (2013) observed that majority of students used their smart phones for receive images, videos, audios, and text messages instantaneously to individuals and groups of friends. [18]

In our study, 37% students had positive and 63% had negative impact of Smart phones on their studies. In a study conducted by Auckerman W, et al. (2001) observed that Smart phones may also potentially affect students' academic performance. [19] In a study conducted by Noshahr RB, et al. (2014) observed that students get

poor sleep as they are stressed owing to possibility of being called during late night. [20] A study done by Kumar S (2014) suggested that mobile phone-related stress could be interruptions of work [21] . [21]A study conducted by Khatoon et al. (2014) revealed that dental sciences students had a positive impact on their education (55%). [22] In a study conducted by Moses Muia Masika et al. (2015) observed that nearly all students who owned a smart device used it for regular study, revising for exams, taking notes or images and accessing research journals. [23] A study carried out by Balakrishnan V, et al. (2012) observed that 18% of students were using mobile phones in classrooms where they exchange text messages rather than voice calls. [24] A study conducted by Strayer DL, et al. (2004) observed that mobile phones were also used by some students during driving, which is risky and may lead to accidents. [25]

In our study, 37% students kept it beneath the pillow, 24% kept it on charging dock and 44% kept it on side table. In a study conducted by Bulck JVD , et al. (2007) observed that only few students switched off their phones during sleeping. [26]

In our study, Smart phones use affects the sleeping and eating habits in 25% of students, In a study conducted by Dixit S, et al. (2010) observed that some of the students were also using the phone while eating and never affect the sleeping and eating habits. [27] In a study done by Massimini M et al. (2009) revealed that talking on a cell phone, using e-mail, messaging services, and browsing the Internet were found to be the reasons for a significant amount of class tardiness and sleep deprivation. [28] In another study done by Brown FC, et al. (2002) revealed that sleep disturbances and poor sleep quality show negative impact on general health and poor academic performance. [29] In a study conducted by Dixit S, et al. (2010) observed that used most of the students to keep their phone on bed or table near bed as is also found in other studies. [30]

## CONCLUSION

Smartphones are the most popular choice among dental students. In India, Smart phones are becoming increasingly common in both personal and professional spheres. College students use the internet nearly as much for social communication as they do for their education.

Unfortunately, communication technology has some negative effects also. Excessive Smartphones use has been found to be associated with mental and physical health problem in people of all age groups.

Dental students are aware of the fact that mobile phone is responsible for ecosystem disturbances and health ailments. But, they did not reduce the usage of mobile phones by students.

There's need to apply more effort in developing mobile technologies that fit the needs of students.

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# Strategies for Retaining Health-Care Professionals in Rural Areas of India

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## ABSTRACT

**Background:** Retention of skilled health workforce in rural and remote areas is a global problem. While global literature is expanding towards rural retention, however, in the developing countries like India, there is little information available on relevant strategies for implementation of universal healthcare policies and provision of equitable health care distribution. In this review article, the current strategies to retain health-care professionals are generally be grouped into educational, financial, regulatory and supportive strategies. After that, we document and debate two cadres (i.e. physicians and nurses) involved in primary health care in India and the strategies adopted for improved rural retention in these cadres. We also provide ample evidence to support these strategies and analyze their rationale in augmenting health workforce distribution in India. Lastly, we propose pragmatic ways to deal with future human resource for health reforms.

**Methods:** Literature search was conducted in various electronic databases such as Google Scholar, MEDLINE, PUBMED and EMBASE with relevant key words such as doctors, nurses, health workers, health care professionals, human resources for health, *etc*. Additional studies were also identified through cross-references and websites of official agencies.

**Results:** We found that, in educational strategy, reservation for post-graduation seats for medical graduates and in-service physicians (doctors currently working in primary health centres) have been employed in various states of India for rural service. The financial incentive strategy includes incentivizing rural service for both medical doctors and nurses. Under regulatory strategies, better workforce management such as transparent posting mechanisms, shorter recruitment procedures and rotational postings in difficult areas have been employed. Apart from this, other types of health workers such rural medical assistants (RMAs) and alternative medicine (Ayurveda, Yoga, Unani, Sidha and Homeopathy) – collectively known as AYUSH have also been trained and recruited for rural health care practice.

**Conclusion:** In India, rural retention strategies are predominately focused towards physicians. However, state-based evidence and international literature suggest that by providing appropriate financial incentives for rural service to nurses and other cadres such as AYUSH and RMAs is cost-effective and less challenging than the allopathic cadre. Hence, there is an advantage on strengthening rural incentive strategies in these cadres. Further, for these cadres, along with salary, other non-monetary incentives (such as better working conditions, children's education, good rural living conditions and safety) are needed that can increase rural retention.

***Keywords:*** *Human resources for health, health worker, physicians, nurses, retention, rural retention, recruitment, primary health care, India.*

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## INTRODUCTION

In India, health service delivery is severely compromised by the absence of qualified health-care professionals. The trained health care providers mainly physicians and nurses are concentrated in major cities

of India whereas, the semi-qualified or unqualified practitioners are more skewed towards rural areas[1,2,3]. The national survey also revealed that up to 63% of practitioners serving in rural areas of India do not have adequate training[2]. Further, India has been identified as one of the 57 countries in the world that face a substantial scarcity of human resources for health[4]. Indeed, the density of medical doctors, nurses and midwives is one fourth of the WHO benchmark of 2.5 per 1000 population required to achieve 80% coverage of health care services in cross country comparisions[2,5]. Further, the recent estimates in India states that, there are 3.8 (11.3 in urban areas and 1.2 in rural areas) physicians per 10,000 population. Also, there are 1.7 (4.3 in urban areas and 0.7 in rural areas) nurses per 10,000 population in India[2]. This represents a large difference in the distribution of health workers in urban versus rural areas of India.

In this paper, the current strategies to retain health-care professionals are generally be grouped into educational, financial, regulatory and supportive strategies. After that, we document and debate two cadres (i.e. physicians and nurses) involved in primary health care in India and the strategies adopted for improved rural retention in these cadres. We also provide ample evidence to support these strategies and analyze their rationale in augmenting health workforce distribution in India. Lastly, we propose pragmatic ways to deal with future human resource for health reforms.

## MATERIALS AND METHODS

We searched the relevant literature in electronic databases such as Google Scholar, MEDLINE, PUBMED and EMBASE. The key words such as "doctors", "nurses", "midwives", "health workers", "health care professionals" and "human resources for health" have been extensively used. Further combination of key word such as "health workforce" in combination with "India" "rural" "remote" "difficult to reach", "retention policy", "retention strategy", "financial incentives", "retention", "deployment", "personal development" or "professional development", etc. have been used to ensure that the larger data base can be viewed that added more refinement to search strategy. Cross references from identified articles mainly Indian government policy documents and reports were also used to expand the coverage. Also, websites of official agencies such as WHO, ILO and National Rural Health

Alliance were accessed for related information. Only literatures written in English and published until 2015 were considered for review.

## RESULTS

**Educational strategies**

For doctors

Post-graduation seat reservation for rural service

States such as Assam, Chhattishgarh, Kerala and Tamil Nadu have adopted post-graduation seat reservation for physicians who complete some years of rural service. There is an intense competition between specializations among undergraduate medical students to go for post-graduation programme and therefore linkages of rural service and post-graduation education seems to be a predominantly lucrative incentives for retaining physicians to rural jobs. The very recent reports have provided information on various types of post-graduate schemes that different states have implemented[6].

Compulsory rural service

Several states of India like Odisha, Meghalaya, Manipur, Assam, West Bengal, Tamil Nadu, Arunachal Pradesh, Gujarat and Chhattisgarh have started compulsory rural service for all fresh medical graduates. This mandatory rural service period required up to 5 years for graduates to engage in rural practice against a financial bond[7]. There are some states such as Kerala, Mizoram, Uttarakhand and Odisha have kept additional marks for post-graduation studies for doctors who have completed mandatory rural service period[6].

For nurses

The "Swalamban Yojana (self-reliance plan) launched in Madhya Pradesh state in 2006-2007 with a prime objective to address the shortages of staff nurse. Rural women from underserved districts were selected and given them to nursing education. After completion of the nursing course, they were bonded to serve in rural and remote areas for 7 years or need to pay a penalty of 200 000 Indian rupees (US$ 2980) if they violate the contract. Another pioneer evidence in this regard is from the West Bengal state, where the state faced severe challenges to recruit 10 000 auxiliary nurse midwives during the 5 years project implementation. In first step, the state revived 24 auxiliary nurse midwives

government schools and another 18 schools were made partnership with private hospitals. After that, the local governance body (village panchayats) were given power to choose a women from the village to train as an auxiliary nurse midwives for that village which was employed by the local government. By 2009, the state appointed more than 4000 auxiliary nurse midwives and many more with on-going training to be filled up lateral days[8]. The initial findings of all these strategies are encouraging but the effectiveness of such programmes on nurses still needs to be measured.

### Financial incentive strategies

In India, financial incentives for rural practice is widely used strategy to attract physicians to work in underserved areas. Various states define their categorization of areas that are underserved. These underserved areas are based on the distance from urban areas, accessibility, difficult to reach areas, geographical terrain, tribal areas and areas of conflict. Various states given incentives based on the cadre of health worker and on the way each state categorizes underserved areas. The most recent article provided information on monthly financial incentives given to doctors and nurses working in rural and underserved areas[8]. Interestingly, it is seen that most of the financial incentives working in rural areas are mainly focused to medical doctors.

### Regulatory strategies

Improvement in workforce management practice

Indian states like Haryana have started simple recruitment procedure to hire medical doctors through walk-in interviews[9]. This have reduced prolong stays of appointment experienced through the normal process, such as advertising the posts, conducting state public service commission exams, announcing list of candidates and sending acceptance letter. At present the interested candidates simply present themselves in the health departments, complete selection process and if successful, offer letter were issued along with their appointment. The state governments claimed that this procedure has led reduction in vacancies in health sector of Haryana[9] and is still being practiced. The states like Tamil Nadu and Karnataka found that the morale of the doctors can be improved by providing rotational posting in underserved areas to ensure that all doctors spend some years in rural areas, after which they could choose to be transferred to other areas[8].Currently, government

is also trying to encourage different states to adapt transparent transfer policy and timely placement for doctors and nurses.

### Production of new types of Non-physician Clinicians (NPC)

In India, the other types of health workers have been added in the public health systems. These workers receive formal medical training within certain period and perform clinician role as anticipated from doctors. For instances, Chhattisgarh introduced 3 year of formal medical training (instead of 5 years for MBBS study) for RMAs in 2001 and students upon completion of this course were employed in Primary Health Centres (PHCs)[6,10]. A similar course for rural health practitioner has been offered in Assam state since 2004[10]. Under the National Rural Health Mission, another form of NPCs, AYUSH doctors are equipped with alternative medicine and employed in PHCs to mainstream Indian systems of medicine[2,3].

### Personal and professional strategies

Some of the states such as Chhattisgarh, Uttarakhand and West Bengal has provided group housing facilities for physicians[8]. At present, government is trying to provide better residential infrastructure for both physicians and nurses, so that they can retain and work in rural areas.

### DISCUSSION

Our study is based on the review that represents varied strategies adopted by pluralistic Indian states to attract health workers in rural areas. Hence, in this chapter, we use evidence from both local and international studies to discuss some of these strategies and offer their significance in improving distribution of health workforce in India.

### Educational strategies

It has been found that different states in India implemented various types of post-graduate scheme for physicians to attract them for rural service. The effectiveness of post-graduation scheme have been evaluated through a case study approach in Andhra Pradesh state of India and the findings are also encouraging[11]. To be eligible for this scheme, a physician was required to work 2 years in the tribal area, 3 years in the rural areas or altogether of 5 years

of experience in the government sector. Further, a doctor have to serve 5 years in the state governments after completion of post-graduate programme against a monetary bond. The outcome of this scheme reveled that although in 2007, 209 PHCs in Andhra Pradesh had no doctors, they are now reduced to zero[11]. In addition, only 2% of government sanctioned posts are vacant with modest progress in filling the specialist posts which have been envisioned mainly due to induction of post-graduate scheme. This post-graduate scheme case study in Andhra Pradesh appears to have potential effect and appeal, hence requires to scale up in other states where predominant number of medical schools with ample post-graduation seats are reserved for government physicians. In addition, the eligible criteria for availing such scheme like total number of years required to work in underserved areas before and after completion of post-graduation study, need to be finely tuned, so that the scheme remains attractive.

The rural service for mandatory period (up to five years) for all fresh medicine graduates to involve in rural practice appears to be a welcome step by the various state governments of India. However, there is scarce evidence on the effectiveness of the compulsory rural scheme in India. Frehywot 2010 reviewed the various compulsory programmes adopted across the globe to retain health-care professionals. This review found that more than 70 countries have been adopted compulsory service programme including Ghana, Nigeria, Cuba, Congo, Bolivia, Educator, Mexico, Norway and Russia. However, effectiveness of this compulsory service programme have not been affectively measured by many countries and the outcome of this study have resulted a mixed results with respect to retention of skilled health workers in rural areas[12]. Health workers after completion of rural service period were not sure to be able to continue in the same job, thus such scheme impedes the continuity of care provided to community[12]. This negative experience may cause an adverse effect towards career decision of health-care professionals to work in rural areas[13]. Further, other international studies have also highlighted the inclusion of compulsory rural service with other incentive measures and support mechanisms to health workers[14,15]. This international evidence suggest that we should be careful while implementing such schemes in India. It is a herculean task for Indian government to implement such scheme. The anecdotal evidence suggests that the state where such scheme is initiated or implemented, there is difficulty to monitor the scheme. In such a situation, it is difficult to argue whether the effectiveness of such scheme improves the shortages of rural health posts or population health by providing adequate healthcare provision to the communities. Like for the nursing cadre, the states like Andhra Pradesh initiates to upgrade the general nursing degree to a bachelor's degree equivalent[16]. This finding is consistent with other studies that show educational incentives for nurses could work in international settings[17], but in Indian context there is little information about the effectiveness of such incentives on nurses.

**Financial incentive strategies**

In India, monetary incentives is commonly used strategy to attract physicians and nurses to serve in underserved areas. Indian studies found that though financial incentives are important, at the same time inclusion of other benefits such as improvement in living conditions, better housing, schooling and access to transport are also needed. The qualitative findings from India suggest that better salary for underserved areas are critical to attract and motivate doctors to serve in rural areas[16]. However, the effectiveness of financial incentives have not been widely studied in India. International evidence have also shown limited role towards its effectiveness especially when nominal monetary incentives are given to health-care professionals. The systematic review of 10 studies conducted by Sempowski 2004 investigated the effectiveness of the financial incentives in exchange of return of rural service commitments revealed that a short term benefit may be envisaged for financial return of service programme but the long term impact was unclear[18]. Further, one prospective cohort studies included in this review mentioned that voluntarily rural service opted physicians were more likely to stay in underserved areas than those doctors serving in rural areas due to return of service commitments[18]. Similarly, one study conducted in India on the effects of higher salary on the uptake of rural jobs by trainee and in-service doctors and nurses[19] found that for every salary level, a considerable proportion of nursing students and nurses were willing to join a rural job as compared with medical students and physicians (Figure 1). The study also revealed that the supply of medical students and in-service doctors for rural jobs were not responsive towards increase in salary, particularly at lower salary levels. However, the supply of nursing students and

nurses for rural posts were much more responsive towards increase in salary, particularly at lower salary level as compared to medical students and physicians. Also some states in India offer financial incentives to nurses[8] which is congruence with international evidence[17] stating that such incentives could work in international arena, but the effect of these incentives on nurse is poorly captured in Indian context.



FIGURE 20.5   Supply of Trainee and In-service Doctors and Nurses
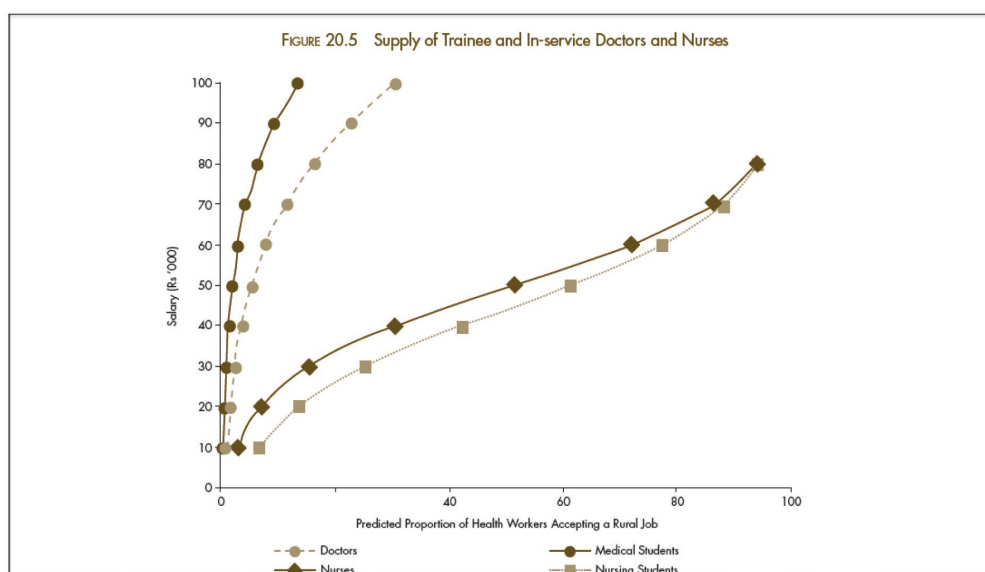
**Source: Rao et al. 2013c[19]**

### Regulatory strategies

Our study found some of the states have adapted better management reforms such as shorter recruitment procedures, transparent posting mechanisms and rotational postings in difficult areas for physicians. However, one of the major organizational constraint that state governments face today is the imprecise policy for transfer and posting within the state health services. Most states don't have a workforce policy that guarantees doctors to be rotated between rural and non-rural postings, giving rise to the perception that once posted to a rural areas it is difficult to return to urban locations. Hence, better management practice requires transparent recruitment process leading to a better rural recruitment and this have been evidenced in states like Haryana[9]. Such a practice need to be piloted and replicated to other states too.

Further, our study highlights two states of India, Assam and Chhattisgarh have trained NPCs commonly known as RMA to provide primary health care and they have been successfully addressing the shortages of physicians and nurses in rural India. This local evidence is supported with other international literatures that argues that NPCs has now increasingly viewed

as a cost effective way of offering basic rural health care in the absence of physicians[20,21,22]. A number of countries like Sri Lanka, Nepal, Bangladesh and 25 countries in Sub-Saharan Africa out of 47 countries, NPCs are the prime provider of rural health, sometimes even deliver specialist services[23,24,25]. This international evidence shows positive results about the effectiveness of such cadre. This evidence is also in consistent with Indian studies. For instances, an evaluation of RMAs in Chhattisgarh observed that the competence level of RMAs are equal with that of physicians to diagnosis common rural ailment generally prevalent in PHCs[26]. Another study examined the satisfaction level of households with clinical service delivered by RMAs have also seen equal with physicians[27]. Such evidences clearly indicates that RMAs with adequate training can provide primary health care and well competent with physicians.

Another type of health worker i.e. AYUSH doctors have been appointed in Indian health care system to provide primary health care. However, there are limited information available on competence and effectiveness of AYUSH physician located in rural areas. The study of Department of AYUSH, Ministry of Health and Family Welfare (MoHFW) highlights the need for strengthening

the regulatory frameworks and operational guidelines within which AYUSH doctor can operate[28]. Preliminary findings from the Chhattisgarh state have revealed that the competency level between AYUSH doctors and allopathic physicians are not huge with respect to provision of allopathic primary care[26]. However, inclusion of additional training programme are needed for AYUSH providers to achieve the level of allopathy.

## CONCLUSION

Our study observed that the reservation for post-graduate education incentives for physicians can be considered as a powerful mechanism to bring physicians to underserved areas for a temporary period. Consequently, provision of sufficient monetary benefits may act as a powerful tool for retaining allopathic doctors in rural areas. Further, it seems that Indian government's incentivizing rural service for nursing profession is less challenging than that of allopathic cadre. However, at present, the government offer few rural incentives to nursing cadre. Thus, there is worth in strengthening rural retention strategies for nursing profession in taking more promising role for rural health.

The fundamental question is whether we are focusing on choosing the right types of health worker. The experience says that the personal and professional ambitions of allopathic doctors are not well-suited with the life of a rural practitioner. Physicians aim to become specialists and after specialization there is less likelihood that a physician would be attracted towards the rural practice. In such situations, it would appear that alternatives to health worker is in the form of NPCs who can provide the rural health care for longer periods. Nurses trained to provide clinical care is another substitutions for rural service. It has been seen that nurses are more amenable to join government jobs than the medical doctors and can be easily placed in rural and remote areas. Hence, NPCs can be an important human resources for health for providing equitable health care services in the rural and underserved areas.

Notes: 1 US dollar = 67 Indian rupees at the time of study

**Conflict of Interest:** The authors declare that there is no conflict of interest

**Source of Support:** No

**Ethical Clearance:** As the study is a review and did not involve any drug trail or invasive procedure, no ethical clearance from intuitional review board was required. However, the study was approved by doctoral committee member of Faculty of Public Health, Mahidol University in order to partial fulfillment of the requirements for the degree of Doctor of Public Health, Faculty of Graduate Studies, Mahidol University.

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# Clinical Predictors of Associated with Influenza A (H1N1) during Epidemic 2015 at Tertiary Care Hospital, Ahmedabad

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## ABSTRACT

**Background**: Influenza is a viral infection that can lead to serious complications and death(s) in vulnerable groups if not diagnosed and managed in a timely manner. This study was conducted to improve the accuracy of predicting influenza through various clinical and statistical models.

**Material and Method**: A retrospective cross sectional analysis was done on demographic and epidemiological data collected from January 2015 to March 2015. Patients were classified as ILI or SARI using WHO case definitions. Respiratory specimens were tested by rRT-PCR. Clinical symptoms were analyzed using by CDC Epi info 7.

**Results**: In the first approach, analysis compared children (12) and adults (12). Of 1782 cases, 938 (52.64%) tested positive for novel influenza A(H1N1) and the proportion were 43.93 and 55.39% respectively. Symptoms predicted in children: fever (OR 1.909, 95% CI 0.99–3.794), cough (OR 1.762, 95% CI 1.114-2.816), and shortness of breath (OR 1.453, 95% CI 0.98-2.158). In adults, the strongest clinical predictor was fever (OR 1.448, 95% CI 1.046-2.007) and coughs (OR 1.594, 95% CI1.219-2.087). In the second instance, patients were separated into two groups: SARI 1398 and ILI 384 cases. Chi-square test showed that fever, cough, sore throat and shortness of breath were significant predictors.

**Conclusion:** Studies in a primary care setting should be encouraged focused on patients with influenza-like illness to develop sensitive clinical case definition that will help to improve accuracy of detecting influenza infections. Formulation of a standard ''one size fits all' case definition that best correlates with influenza infections can help guide decisions for additional diagnostic testing and also discourage unjustified antibiotic prescription and usage in clinical practice.

***Keywords***: *Influenza A H1N1, Epidemic, rRT- PCR, ILI (influenza like illness), SARI (severe acute respiratory illness)*

## INTRODUCTION

Swine flu was a major global pandemic of the century that hit the headlines in recent times.[1] The Swine "2009flu pandemic" is a global outbreak of a new strain of influenza A virus H1N1 that is highly contagious disease of respiratory tract and has become a public health problem. The new strain is thought to be the result of reassortment of strains of influenza A virus subtype (H1N1). The new reasserted strain has acquired two new capabilities; human to human spread and enhanced virulence.[2]

Precipitous spread of novel influenza A(H1N1) virus highlighted yet again the need for availability of appropriate and prompt diagnostic tools with equivalent emphasis on both clinical and laboratory facilities to prevent disease transmission and institute successful treatment. Even though several laboratory tests, including real-real time-polymerase chain reaction (RT-PCR), became available quite rapidly to provide

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confirmatory diagnosis for novel influenza A(H1N1) but laboratory tests were not always accessible during outbreaks and clinical judgment of attending physicians became a major factor in the timely identification of new influenza cases. This highlights the necessity to determine clinical predictors of influenza infection for diagnosis in patients presenting with respiratory illness, in order to direct appropriate antiviral therapy, and to prevent unwarranted antibiotic use.

Symptomatic predictors of the etiology of an infectious illness are particularly valuable when actions need to be taken quickly, but when a specific diagnosis cannot be made rapidly[3] Several studies have highlighted differences in clinical predictors of influenza in adults and children with influenza-like illness . In contrast to adults, children play a primary role in transmission of seasonal influenza, due to their increased susceptibility to influenza infections and prolonged viral shedding.[4]

Although the clinical features and course of illness in patients during influenza outbreaks have been previously described, data comparing disparities in clinical presentations between influenza A(H1N1), seasonal influenza and ARIs is quite limiting.[22] The unique genetic and antigenic features of variant influenza strains resulted in a dramatically rapid global spread since it first appeared  but most illnesses were acute and self limiting, with the highest attack rates among children and young adults [3]. The purpose of this study was to define better clinical predictors for Influenza among influenza A(H1N1) cases on the basis of age groups and secondly, by case definitions of outpatient (ILI) and inpatient (SARI) groups.

## MATERIALS AND METHOD

A total of 1782 throat/ nasopharyngeal swabs were collected and tested from suspected H1N1   (Influenza A) cases (case definitions for ILI & SARI)  who visited outpatient department or admitted in Tertiary Care Hospital, Ahmedabad from January 2015 to March 2015.

Demographic details and clinical history were obtained and recorded in laboratory request forms. Specimens were collected from all patients by using sterile nylon flocked swab. Samples were placed in 3-ml viral transport medium. All samples were checked for cold chain maintenance and quality of samples. All cases with no clinical information or those that did not meet inclusion criteria (case definitions for ILI & SARI) were excluded from the study.

The influenza A H1N1 virus was detected with the use of a real time RT-PCR assay in accordance with the protocol from the US centres for Disease Control and Prevention, as recommended by the WHO [6].

RNA extraction was performed using QIAgen Mini RNA extraction kit. Extracted RNA was subjected to one step RTPCR reaction using 4 target sequences i.e. Influenza A (InfA), swine A (SwA), swine H1 (SwH1), and ribonucleoprotein (RNP). Master Mix was prepared by using AgPath one step RTPCR kit by Applied Biosystems.

Interpretation of result was done as follows:

| Inf A | Sw A | Sw H1N1 | RNP | Interpretation |
|---|---|---|---|---|
| - | - | - | + | Negative for Influenza A virus |
| + | + | + | + | Positive for Influenza A H1N1 |
| + | - | - | + | Positive for seasonal Influenza A virus |
| - | - | - | - | Invalid test |

-    denotes no amplification

+    denotes amplification

Amplification in RNP target sequence was used as an internal quality control. A test was considered valid only if amplification in RNP was obtained. Samples are routinely stored at70 C after testing for a period of one year.

### Case Definition

The cases selected for influenza testing were screened as either influenza-like illness (ILI) or Severe Acute Respiratory Illness(SARI). The standard WHO case definitions were used; ILI case was defined as a person with Acute Respiratory Illness, measured temperature of 38°C and cough within past seven days of onset. The SARI cases were defined as those with Acute Respiratory Illness, measured fever of 38°C, cough within past seven days of onset and requiring hospital admission [5].

**Statistical Analysis**

Data on gender, age and clinical symptoms was analyzed for patients of influenza like illness (ILI) and severe acute respiratory illness (SARI). Various parameters were compared between influenza positive and negative cases. The aim of the statistical analysis was to find the best clinical predictors of influenza infection for children and adults. The analysis was carried out on children (12) and adults(>12) separately/ independently. Calculation of odds ratio (OR) and 95% confidence interval (CI) was performed to determine the best clinical predictors. A p-value less than 0.05 was considered to be statistically significant.

Data analysis was done by CDC Epi info 7.

## FINDINGS

**RESULT**

During the study period 1782 specimens were tested by Real-time RT-PCR; 938 (52.64%) were positive for novel influenza A (H1N1). The peak influenza activity was found in month of February (57.64%) also maximum number of cases and positivity rate is higher in this month (Figure 1).
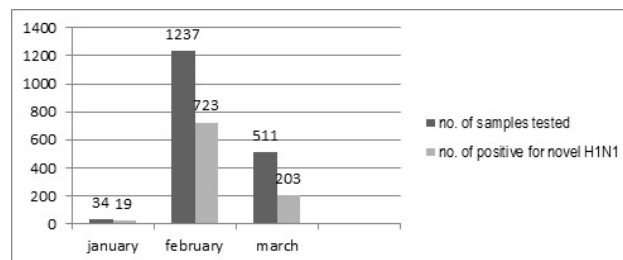


**Figure 1    ( Distribution of Samples according to Months)**

Higher positivity rate was observed for adults (56%) as compared to children (44%). Mean age for children was 3.025±3.2 years and 42.32±16.38years in adults. Gender ratios M: F amongst children and adults were1: 0.74 and 1:1.07respectively.(Table 1).

**Table 1 (Comparative analysis of demographic factors between children and adult)**

| GROUPS | NO. (%) | Influenza A H1N1 positive NO. (%) | Male | | Female | |
| --- | --- | --- | --- | --- | --- | --- |
| | | | Total | Positive(%) | Total | Positive(%) |
| Children12 | 428 (24.01) | 188 (43.93) | 245 | 104(42.45) | 183 | 84(45.90) |
| Adult>12 | 1354 (75.99) | 750 (55.39) | 653 | 333(51) | 701 | 471(67.19) |
| P value | 0.00003* | | 0.0007* | | | |

*= significant

By 2x2 table analysis,analysis in children showed that fever , cough, shortness of breath had significant association with influenza positivity i.e. detection of influenza  A(H1N1) (p<,0.05). However rhinorrhea and sore throat were less common in children. On the other hand, in adults group fever, cough and sore throat  were significantly related to influenza infection (p<0.05) (Table 2).

**Table 2:  (2X2 Table analysis of clinical symptom of Influenza positive children and adult)**

| SYMPTOMS | CHILDREN | | | ADULTS | | |
| --- | --- | --- | --- | --- | --- | --- |
| | OR | CI (95%) | P value | OR | CI (95%) | P value |
| FEVER | 1.909 | 0.99-3.794 | 0.02* | 1.448 | 1.046-2.007 | 0.025* |
| COUGH | 1.762 | 1.114-2.816 | 0.01* | 1.594 | 1.219-2.087 | 0.0006* |
| SORETHROT | 1.77 | 1.203-2.609 | 0.003* | 1.258 | 1.002-1.58 | 0.04* |
| RHINORRHOEA | 1.065 | 0.295-3.708 | 0.9 | 0.3847 | 0.262-0.56 | 0.00003 |
| SHORTNESS OF BREATH | 1.453 | 0.98-2.158 | 0.03* | 1.2 | 1.002-1.540 | 0.05* |

OR =Odds ratio, CI = Confidence Interval, *= significant Of the 1782 patients, 938 (52.63%) had laboratory confirmed influenza, of whom, 748 (79.75%) were SARI, 190(20.25%) were ILI and the proportion of laboratory-confirmed influenza A(H1N1) cases. From the total positive cases 29(3.09%) were anti natal cases (ANC)/ postnatal cases (PNC) ,among them 2 were normal delivered, 1 by LSCS, 1 case of pre term labour and 14 ANC were expired.

In comparison with SARI patients, the incidence of cough, sore throat and rhinorrhea were higher in ILI patients (Table 3).

**Table 3: (Clinical Symptoms of the Hospitalized (SARI) and Non-Hospitalized (ILI) Cases)**

| SYMPTOMS | SARI (%) n= 1398 | ILI (%) n= 384 |
|---|---|---|
| Fever | 1231 (88) | 338 (88.02) |
| Cough | 1084 (77.53) | 325 (84.63) |
| Sore throat | 821 (58.72) | 283 (73.69) |
| Rhinorrhea | 117 (2.861) | 25 (6.51) |
| Shortness of breath | 705 (56.87) | 189 (49.21) |

Hospitalized (SARI) and Non-Hospitalized (ILI) Cases

All fatal cases of novel influenza A(H1N1) were 189 (20.14%) in positive cases of hospitalized patients and among them 19 and 170 were respectively in children and adults. Mortality was higher in adults (22.66%) as compare to children (10.11%). Mortality was significantly higher in ANC patients (50%).

## DISCUSSION

During the previous century influenza virus with pandemic and epidemic influenza potential demonstrated highly variable pattern of spread, disease severity and mortality rates. Early and accurate diagnosis in potential epidemic situation can help ensure prompt and appropriate treatment that ultimately decreases the economic and public health burden.[7]

Revdiwala S et al. [8] showed that H1N1 infection was more in males than females. Male:female ratio in positive cases was 2.6:1 and Castillo-Palencia et al [9] showed that H1N1 infection was not gender specific but in our study showed that females re more affected than male, which was may be due to chance or Societal and behavioural differences between males and females contribute to differences in exposure to and outcome of infl uenza virus infection.[12]

During the A novel influenza A(H1N1) pandemic, young adults and middle age individuals had higher infection rates as compared to other age groups. Conversely, during seasonal epidemics influenza mortality is classically highest in the elderly population.[10] This shift of mortality toward younger age group is a signature feature of pandemics and is particularly important as young adults constitute productive age group and therefore early intervention and treatment may reduce economical losses substantially.[11] This age based data can help public health authorities to better organize appropriate response strategies to prevent future epidemics.

In our study mortality in ANC patients shows higher (50%), because the risk of complications resulting from influenza infection increases during the second and third trimesters, the physiological changes associated with pregnancy, including the stress associated with increased demands on cardiovascular output, are often cited as primary reasons for increased disease severity. Changes in immune function and hormone concentrations associated with pregnancy may play an equally important role in explaining the increased disease severity.[12]

In this study we also compared clinical features between the inpatients presenting with SARI (Severe Acute Respiratory Illness) and outpatients or ILI (Influenza Like Illness) cases.sAdults are more affected than children from laboratory confirmed cases influenza H1N1 infections among hospitalized SARI cases. In contrast other studies have documented higher hospitalization rates in children as compared to adults.[13-14]

Our study showed that novel influenza A(H1N1) cases were more likely to present with fever and cough in both children as well as adults and also to have sore throat and shortness of breath. In congress to our findings, many other studies have reported that fever and cough increased the probability of infection with novel influenza A(H1N1) in all age groups.[18-20] Similarly, Monto et al. and Michiels et. al. have reported fever and cough as best predictors and suggested that physicians could correctly diagnose influenza in over 60–70% of

their patients on the basis of clinical symptoms alone.
[15-18]

### Limitations of Study

Our analysis was conducted using 12 years age cut off which is different from age based reports by other groups may not be comparable. As we did not analyze other subtypes of influenza viruses, nor did we analyze non-viral respiratory pathogens, arguably the proposed clinical predictors/criteria may be relevant only to influenza A(H1N1) infections and not applicable to epidemics with other influenza strains and respiratory pathogens. Secondly, the retrospective nature of our data analysis limits it utility.

### CONCLUSION

Definition of influenza-like illness varies considerably from country to country, Most definitions of Influenza-like illness include fever, feverishness, myalgia, general weakness, headache and respiratory symptoms.[20,21] This symptom complex overlaps amongst various respiratory pathogens in addition to influenza such as adenovirus, parainfluenza virus, respiratory syncytial virus or enteroviruses and may be difficult to differentiate clinically alone. The CDC and WHO ILI criteria used during 2009 pandemic were specific enough to differentiate suspected cases but were not sensitive enough to detect all cases.

In daily practice, it is impractical, expensive and time consuming to swab and test all patients with acute respiratory symptoms suggestive of an influenza infection. Implementation of sentinel surveillance systems to detect the influenza virus in the community through a combination of epidemiological, clinical and virological information can help to evaluate these predictive tools in local and regional settings.

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# Psychological Distress among Infertile Couples in a Rural Area

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## ABSTRACT

**Background:** Infertility is a global health issue, affecting approximately 8-10% couples worldwide. **Method:** The present cross sectional study was conducted at Kumabalgodu Primary Health Centre area from January 2012-August 2013.Complete enumeration of the entire Kumbalgodu Primary Health Centre area was done to determine the psychological distress among infertile couples. Data was collected using predesigned pretested structured proforma by interview technique. **Results:** Prevalence of infertility in the study area was 8.1%.Psychological distress was high among females with infertility compared to males.

*Keywords: Primary infertility, Secondary infertility, prevalence, psychological distress.*

## INTRODUCTION

Infertility is a public health problem. The main patterns in infertility is primary and secondary infertility.[1]

Infertility is divided into primary and secondary infertility. The operational definition, put forth by World Health Organization (WHO), using a two year reference period, defines primary infertility as the lack of conception despite cohabitation and exposure to the risk of pregnancy (in the absence of contraception) for a period of two years or more. Secondary infertility is defined as the failure to conceive following a previous pregnancy despite cohabitation and exposure to the risk of pregnancy (in the absence of contraception, breastfeeding or post partum amenorrhea) for a period of two or more years.[2]

Census of 1981 estimates infertility in India around 4-6 percent.[4]According to DLHS survey Karnataka, women who had primary and secondary infertility constitute 5.9 and 1.7 percent respectively of ever married women between 15-49 years.[5]

Infertility is a hidden social problem where the females and not the males are solely held responsible for this lifetime problem of having no child.[6]The stigma associated with male and female infertility in traditional societal interactions cause a high level of psychosocial distress with a direct impact on the couple's marital and sexual relations.[7]

Infertility is not merely a health problem it is also a matter of social injustice and inequality.[2]

Infertility is a life crisis with invisible losses and its consequences are manifold. Childless women experience stigma and isolation. Infertility can threaten a woman's identity, status and economic security and consequently, be a major source of anxiety leading to lowered self-esteem and a sense of powerlessness.[2]

The consequences of infertility in developing countries range from economic hardship, to social isolation, violence and denial of proper death rites. A psychological crisis may occur when reproduction appears impossible.[8]

Psychodynamic-oriented model emphasizes the role of psychogenic elements among the causes of infertility ('psychogenic' hypothesis).[9]The stress hypothesis is embraced by those who consider infertility as a psychosomatic disorder. They have outlined the impact

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of emotional state, ability of coping with stress and neuroendocrinological state on pregnancy rates.[10]The second model is fostered by those supporting the theory that psychological distress is secondary to infertility.[11] Several descriptive studies in infertile couples suggested a greater susceptibility to anxiety and depression as a factor that reduces the ability to conceive[12].

In this background present study will be undertaken to determine the psychological distress among infertile couples.

## OBJECTIVES

1. To estimate the prevalence of infertility in the study population.

2. To describe the socio demographic characteristics prevailing among infertile couples.

3. To assess the psychosocial factors prevailing among the infertile couples.

## METHODOLOGY

Preliminary discussions were held with medical officer of Primary Health Centre, health worker male and female, ASHA (Accredited Social Health Activist) and Anganwadi workers explaining them the objective of the study.Area map of PHC with details of two sub centre (Kumbalgodu and H. Gollahalli) and 16 villages was obtained. Pre-designed, pretested, structured proforma in English was translated to local language Kannada with the consultation of Department of Kannada  and

back translation was done from Kannada to English with consultation of Department of English.

The study protocol was reviewed and approved by the ethics committee of the teaching Institute and informed consent was obtained from study subjects ensuring them that all the information will be kept strictly confidential and will be used only for research purposes.

A total of 26,120 people were accessed from 6,335 households. House to house survey was done covering all the villages so as to completely enumerate the eligible couples. Among these eligible couples, couples with primary and secondary infertility were enumerated based on WHO epidemiological definition. These couples were included in the study after they fulfilled inclusion criteria.

Evaluation of psychological distress

The evaluation instrument used in the study to assess psychological distress among the infertile couples was the Kessler's Psychological Distress Scale translated into local language Kannada. The original validated English version was translated into local language Kannada and then back translated into English by independent language experts. The English back translation was then compared to the original Kessler scale in English. The pretesting of proforma was done to check the clarity of items, ambiguity of the language and feasibility whether the scale can be applied at the field level.

**Scoring Procedure**

**Kessler's Psychological Distress Scale**

| Serial No | Symptoms | None of the time (Score 1) | | A little of the time (Score 2) | | Some of the time (Score 3) | | Most of the time (Score 4) | | All of the time (Score 5) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | F | M | F | M | F | M | F | M | F |
| 1 | In the past 4 weeks, about how often did you feel tired out for no good reason? | | | | | | | | | | |
| 2 | In the past 4 weeks, about how often did you feel nervous? | | | | | | | | | | |
| 3 | In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down? | | | | | | | | | | |
| 4 | In the past 4 weeks, about how often did you feel hopeless? | | | | | | | | | | |

Cont...

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | In the past 4 weeks, about how often did you feel restless or fidgety? | | | | | | | | | | |
| 6 | In the past 4 weeks, about how often did you feel so restless you could not sit still? | | | | | | | | | | |
| 7 | In the past 4 weeks, about how often did you feel depressed? | | | | | | | | | | |
| 8 | In the past 4 weeks, about how often did you feel that everything was an effort? | | | | | | | | | | |
| 9 | In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up? | | | | | | | | | | |
| 10 | In the past 4 weeks, about how often did you feel worthless | | | | | | | | | | |

The Kessler's psychological distress scale is a five-point scale which includes ten questions detecting the negative emotional states experienced during the past 4 week period leading to the assessment of emotional reactions to infertility-related stressors. Participants were interviewed alone in order to prevent that partners would influence each other and give them the opportunity to speak frankly. The scale has options: for each item there is a five-level response scale based on the amount of time the respondent reports experiencing the particular problem.

Low scores indicate low levels of psychological distress and high scores indicate high levels of psychological distress. Study subjects with score between 10-19 were classified as likely to be well, between 20-24 were classified as having mild psychological distress, between 25-29 were classified as having moderate psychological distress and those with score between 30-50 were classified as having severe psychological distress.

## RESULTS

**Prevalence of primary infertility   =   4.5%**

**Prevalence of secondary infertility =   3.6%**

**Prevalence of infertility=8.1%**

**Table 1: Distribution of infertile couples according to socio demographic characteristics.**

| Age | Males(n=62) | Females(n=62) | Males(n=49) | Females |
|---|---|---|---|---|
| 15-19 | - | 04(6.5) | - | 01(02.1) |
| 20-24 | 04(06.5) | 26(41.9) | - | 10(20.4) |
| 25-29 | 21(33.9) | 12(19.4) | 11(22.4) | 17(34.7) |
| 30-34 | 14(22.6) | 08(12.9) | 13(26.5) | 11(22.4) |
| 35-39 | 10(16.1) | 09(14.5) | 10(20.4) | 06(12.2) |
| 40-44 | 11(17.7) | 03(04.8) | 10(20.4) | 04(08.2) |
| 45-49 | 02(03.2) | - | 04(8.2) | - |
| >50 | | | 01(2.0) | - |
| **Education** | **Males** | **Females** | **Males** | **Females** |
| Graduate | 08(12.9) | 02(3.2) | 07(14.29) | 03(06.12) |
| Intermediate | 05(08.1) | 04 (6.5) | 03(6.12) | 01(02.04) |
| High school | 16(25.8) | 18(29.0) | 19(38.78) | 09(18.37) |
| Middle school | 13(21.0) | 12(19.4) | 09(18.37) | 14(28.57) |
| Primary school | 09(14.5) | 11(17.7) | 06(12.24) | 09(18.37) |
| Illiterate | 11(17.7) | 15(24.2) | 05(10.20) | 13(26.53) |

**Cont... Table 1: Distribution of infertile couples according to socio demographic characteristics.**

| Occupation | Males | Females | Males | Females |
|---|---|---|---|---|
| Unemployed | 03(04.84) | 44(70.96) | 01(02.04) | 37(75.51) |
| Labourer | 27(43.55) | 08(12.90) | 21(42.86) | 04(08.16) |
| Business | 13(20.97) | 04(06.45) | 09(18.37) | 03(06.12) |
| Farmer | 10(16.13) | 04(06.45) | 08(16.33) | 03(06.12) |
| Government Service | 05(08.06) | 01(01.61) | 06(12.24) | 02(04.08) |
| Professional | 04(06.45) | 01(01.61) | 04(08.16) | - |

**Note:** Figures in parenthesis indicates percentages.

Males among couples with primary infertility were highest 21(33.9%) in the age group of 25-29 years and females were highest 26(41.9%) in 20-24 yrs. Males among couples with secondary infertility were highest 13 (26.5%) in 30 -34 years and females were highest 17(34.7%) in the age group of 25-29 years.

Most of males 16(25.8%) and females 18(29.0%) among couples with primary infertility had education up to high school. Majority of males 19(38.78%) with secondary infertility had education up to high school and 14(28.57%) females had education till middle school. Majority of males among infertile couples were labourers and females were housewives.

**Table 2: Association between psychological distress in males and females among couples with primary infertility.**

| Psychological Distress | Males (n=62) | Females (n=62) | Chi-square value | P value |
|---|---|---|---|---|
| Low | 49(79.03) | 16(25.81) | 36.326 | <.0000001 |
| Moderate | 04(06.45) | 07(11.29) | | |
| High | 08(12.90) | 35(56.45) | | |
| Very high | 01(01.61) | 04(06.45) | | |

**Note:** Figures in parenthesis indicates percentages.

49(79.03%) of males had low level of psychological distress, 4(6.45%) had moderate level of distress, 8(12.9%) had high level of psychological distress and 1(1.61%) had very high level of psychological distress. Among females with primary infertility 35(56.45%) had high level of psychological distress, 16(25.81%) had low level of psychological distress, 7(11.29%) had moderate level of psychological distress and 4(6.45%) had very high level of psychological distress. Significant association was found between psychological distress in males and females among couples with primary infertility.

**Table 3: Association between psychological distress in males and females among couples with secondary infertility**.

| Psychological Distress | Males (n=49) | Females (n=49) | Chi-square value | P value |
|---|---|---|---|---|
| Low | 46(93.88) | 23(46.94) | 26.402 | .000007857 |
| Moderate | 01(02.04) | 03(06.12) | | |
| High | 01(02.04) | 16(32.65) | | |
| Very high | 01(02.04) | 07(14.29) | | |

**Note:** Figures in parenthesis indicates percentages.

46(93.88%) males among couples with secondary infertility had low level of psychological distress and 1(2.04%) had moderate, high and very high level of psychological distress. 23(46.94%) of females among couples with secondary infertility had low level of psychological distress, 16(32.65%) had high level of psychological distress, 3(6.12%) of females had moderate level of psychological distress and 7(14.29%) had very high level of psychological distress. Significant association was found between psychological distress in males and females among couples with secondary infertility.

**Table 4: Psychosocial factors among couples with infertility**.

| Sl. No. | Life events | Primary infertility | | Secondary infertility | |
|---|---|---|---|---|---|
| | | Males (n=62)* | Females (n=62)* | Males (n=49)* | Females (n=49)* |
| 1 | Marital conflict. | 01(1.6) | 08(12.9) | 01 (02.04) | 07 (14.29) |
| 2 | Conflict with in laws. | 04(6.5) | 09(14.5) | 01(02.04) | 03 (06.12) |
| 3 | Financial loss or problems | 10(16.9) | 27(43.5) | 06 (12.24) | 07 (14.29) |
| 4 | Illness of family member | 01(1.6) | 06(9.7) | 02 (04.08) | 03 (06.12) |
| 5 | Trouble at work | 03(4.8) | 03(4.8) | - | - |
| 6 | Prophecy of astrologer or palmist | 01(1.6) | 04(6.5) | - | 01 (02.04) |
| 7 | Conflict over dowry | - | 01(1.6) | 01 (02.04) | - |
| 8 | Marriage of dependent sister | 03(4.8) | 02(3.2) | - | 03 (06.12) |
| 9 | Family conflict | 01(1.6) | 06(9.7) | - | 03 (06.12) |
| 10 | Change in working condition or transfer | - | 02(3.2) | 2 (04.08) | - |
| 11 | Postponement in childbearing in favour of perceiving education/ economic factors | 2(3.2) | 4(6.5) | 1 (02.04) | 02 (04.08) |
| 12 | Eating disorders | - | 1(1.6) | - | 02 (04.08) |
| 13 | Marital distress/ dissolution/ abandonment | 6(9.7) | 29(46.7) | 03 (06.12) | 7 (14.28) |
| 14 | Lowered life satisfaction | 9(14.5) | 36(58.1) | - | 10 (20.41) |
| 15 | Loss of social status | 6(9.7) | 30(48.4) | 01 (02.04) | 06 (12.24) |
| 16 | Reduced job performance | 8(12.9) | 28(45.2) | - | 09(18.37) |
| 17 | Social isolation | 6(9.7) | 30(48.4) | - | 05(10.20) |
| 18 | Fear of labour | - | 1(1.6) | - | 01 (02.04) |
| 19 | Urgent need to have baby | 1(1.6) | 4(6.5) | - | 01(02.04) |
| 20 | Excessive exercise | - | 2(3.2) | - | - |

**Note:** Figures in parenthesis indicates percentages.* **Multiple response**

Predominant psychosocial factors among males with primary infertility include financial loss or problems 10(16.9%), lowered life satisfaction 9(14.5%) reduced job performance 8(12.9%), loss of social status 6(9.7%), social isolation 6(9.7%), marital distress 6(9.7%).

Predominant psychosocial factors among females with primary infertility 36(58.1%) had lowered life

satisfaction, loss of social status 30(48.4%), social isolation 30(48.4%), marital distress in 29(46.7%) and reduced job performance 28(45.2%).

Among males with secondary infertility 6(12.24%) had financial problems because of infertility and 3(06.12%) had marital distress. Among females with secondary infertility, 10(20.41%) had lowered life

satisfaction, 9(18.37%) had reduced job performance, 6(12.24%) had loss of social status and 7(14.29%) had marital conflict.

## DISCUSSION

In the present study, the overall prevalence of infertility was 8.1%. Prevalence The estimate of infertility in the present study area is higher than NFHS 3 survey which reported the prevalence of infertility in Indian women to be 4%.[4]present study findings is similar to DLHS survey in Karnataka where they found the prevalence of primary infertility to be higher than the secondary infertility.[5]

In the present study couples with primary infertility were common in 20-24 years age group 41. 94% which is almost similar to study conducted by Paul CA et al in Mysore on prevalence of primary infertility where majority 55.8% were found in this age group.[3]While in case of couples with secondary infertility highest 34.69% were present in age group of 25-29 years. The highest prevalence of the infertility was among the highly reproductive age group.

In the present study couples educated till high school had highest prevalence of infertility which is similar to study conducted by Nicole JW et al.[8] With increase in level of education among women, total fertility rate decreases, however, infertility rate increases.[4]

In the present study majority of males with primary infertility had low level of psychological distress while most of females had high level of psychological distress using Kessler's Psychological Distress Scale. Most of males and females with secondary infertility had low level of psychological distress. It was observed that psychological distress was higher in females than males among couples with infertility. Significant statistical association was found between psychological distress in males and females among couples with infertility. Infertile couples underwent higher level of psychological distress due to their infertility problem. Though infertility affects both men and women but the overall consequences and effects tend to be higher among women as compared to men. Earlier researches revealed that infertile women exhibited a significant higher level of psychopathology. The results of present study are consistent with earlier studies.[13]

A comparative study was conducted to evaluate gender differences in the psychological responses of infertile couples. The study results showed that women showed higher psychosocial distress than their partners. The differences between couples in psychiatric symptoms reached statistical significance of P<0.05.[14]

In the present study it was observed that 12.9% of females and 1.6% of males among couples with infertility had marital conflicts and 6.5% of males and 14.5% of females among couples with primary infertility had problem with in laws while in case of secondary infertility 2.04% of males and 14.29% of females complained of marital conflict and 2.04% of males and 6.12% of females had conflict with in laws.58.1% of had lowered life satisfaction,9.7% experienced loss of social status, 45.2% had reduced performance of work, 48.4% experienced social isolation and 41.9% had marital distress. In many low resource settings infertility is common and frequently associated with negative psychological consequences including marital instability, divorce, social isolation and stigmatization.[15]

## CONCLUSION

• Prevalence of infertility in the study area was 8.1%.

• Psychological distress was high among females with infertility compared to males.

• Predominant psychosocial factors among

• Males with primary infertility were lowered life satisfaction, reduced job performance, loss of social status, social isolation and males with secondary infertility was marital distress.

• Females with infertility were lowered life satisfaction, loss of social status, reduced job performance, social isolation and marital distress.

Sympathetic counseling, emotional support and the adoption of stress management program with life coping skills are essential for couples with infertility.

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# Comparative Evaluation of Delmopinol with Chlorhexidine Mouthrinse as an Anti-plaque Agent-a Clinical Study

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## ABSTRACT

**Aim and Objectives:** This study evaluated the comparative efficacy of Delmopinol over Chlorhexidine as an anti-plaque agent and also determined that chemical plaque control has an additive effect over mechanical plaque control when used alone. **Settings and Design:** A randomized comparative, prospective, interventional, comparative, cross-over design was conducted ( with institution and university approval for dissertation) to evaluate the efficacy of Delmopinol over Chlorhexidine as an anti-plaque agent and also to evaluate that chemical plaque control has additive effect over mechanical plaque control on two variables. **Materials and Method:** 30 consecutive consenting patients were randomly selected irrespective of sex and an age range of 20-30 years, with overt gingivitis having gingival score ($\geq 2$). Clinical parameters like Plaque index, Gingival index, Probing depth and stain index were assessed. All the data were checked for normality at baseline and were found to be following a normal distribution (Kolmogorov-Smirnov test). **Results:** Analysis of data demonstrated that there were statistically significant reduction in plaque index, gingival index, probing depth and stain index in both the groups but plaque index was more reduced in Group I than Group II and equal reduction in Gingival index in both the groups. **Conclusions:** The study indicates that the adjunctive use of chemical plaque control agents over mechanical oral hygiene resulted in more reduction in clinical parameters than mechanical oral hygiene measures alone. However, both are equally effective in reducing gingivitis.

*Keywords: Plaque, Gingivitis, Mechanical plaque control, chemical plaque control-CHX and Delmopinol.*

## INTRODUCTION

Throughout life, all the interface surfaces of the body are exposed to microbiota, live in harmony with the host. Constant renewal of the surfaces by shedding prevents the accumulation of large masses of microorganisms. The accumulation and metabolism of bacteria on hard oral surfaces is considered the primary cause of dental caries, gingivitis, periodontitis, peri-implant infections, and stomatitis.[1] Classical experiments have demonstrated that accumulation of bacteria on teeth reproducibly induces an inflammatory response in associated gingival tissues. (Löe et al. 1965)[2]

Dental plaque is a specific but highly variable structural entity resulting from sequential colonization of microorganisms on the tooth, restorations and consisting of variable species of microorganisms embedded in the extracellular matrix. (W.H.O.1961)[3].

"Gingivitis" is defined as a reversible inflammatory condition in soft gingival tissues surrounding the teeth (gingival margin) without loss of periodontal supporting tissues. "Periodontitis" is an inflammation –based infection of the supporting structures of the teeth characterized by progressive destruction of the periodontal ligament and alveolar bone that may result in tooth loss[4]. The current hypothesis is that the subgingival microbial community because of various

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reasons increases its metabolic activity and starts to grow. This results in an imbalance of the host-bacterial ecosystem in the subgingival site (Marsh, 2003).[5] The prevention of periodontal disease is targeted at the control of dental plaque, mainly by two methods[6]:

- Mechanical Method

- Chemical Method

Tooth brushing remains the mainstay of oral health measures universally.[7,8] However, in areas where tooth brushing is difficult, chemical plaque control may be justified. Hence, this study was planned to evaluate the comparative effectiveness of Delmopinol with Chlorhexidine mouthrinse.

## MATERIAL AND METHOD

The present study was designed as a prospective, interventional, comparative, cross-over study involving 30 subjects irrespective of sex and an age range of 20-30 years, with overt gingivitis having gingival score more than or equal to two ($\geq 2$). The study aimed at comparing the efficacy of two anti-plaque agents including Delmopinol 0.2% in the form of toothpaste and Chlorhexidine 0.2% in the form of mouthwash. The patients were selected from out-door patient department of Periodontics, Moradabad. A case history proforma was designed for recording of the clinical parameters and an informed consent was obtained and was approved by the Ethical committee.

**Inclusion criteria:** Subjects with minimum of 20 teeth without crowns, bridges or defective dental restoration having a Gingival index score of $\geq 2$ and having probing pocket depth $\leq 5mm$ at any of the sites per tooth.

**Exclusion Criteria:** Subjects who were excluded from the study were those with removable partial denture; having probing pocket depth $\geq 5mm$ at any of the sites per tooth. Subjects with known hypersensitivity to any drug and medically compromised patients were excluded.

30 subjects were randomly selected, and were divided into two groups: Group I and Group II as follows:

**Group I (n=15)** – Patients were asked to use Chlorhexidine mouthwash along with their routine oral hygiene practice.

**Group II (n=15)**- Patients were asked to use Decapinol toothpaste along with their routine toothpaste.

A detailed case history and consent of patient was taken. The regimes were explained to the patient as follows:

**Regime I**- Brushing with regular dentifrice for 7 days.

**Regime II**- In Group I Brushing with regular dentifrice along with CHX mouthwash for 2 weeks and in Group II Brushing with regular dentifrice along with Decapinol toothpaste for 2 weeks

**Regime III**- Cross-over of the two products after wash-out period of 2 weeks in each group.

Oral hygiene instructions were then given to the selected subjects. Before the commencement the patients were subjected to scaling procedure. After the administration of each regime a wash-out period of 3 months was given before the change of regime. The following clinical parameters were recorded after one week which was considered as baseline parameters, after Two weeks in each group which served as I[st] follow-up, after Three months (wash-out period) which served as IInd follow-up and after Two weeks of the cross-over of the two agents which served as IIIrd follow-up.

**Statistics:** The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean±SD.

## RESULTS

A total of 30 subjects were randomly divided into two groups. Mean age of subjects in Group I was 21.87±1.92 years whereas the same in Group II was 22.47±1.88 years. In Group I, 4 (26.7%) subjects were <20 years of age while in Group II, there were 2 (13.3%) subjects who were <20 years of age. Statistically, there was no significant difference between two groups for any of the variables.

**Baseline:** The graph 1 below shows that the mean plaque index of Group II (2.28±0.65) was higher as compared to that of Group I while mean gingival index and mean probing pocket depth of Group I were higher as compared to Group II but the difference between two

groups was not significant statistically (p>0.05). At baseline all the samples were stain-free.
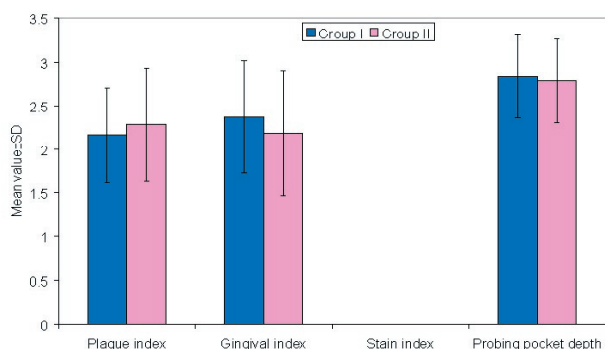


**GRAPH-1 Baseline**

**Evaluation of Clinical Parameters in two groups after two weeks of use of anti-plaque agents – First follow up:**

At first follow up evaluation, statistically no significant intergroup difference was observed for any of the three parameters studied (p>0.05) except stain index. The mean plaque index of Group II (1.17±0.50) was higher as compared to that of Group I while mean gingival index and mean probing pocket depth of Group I were higher as compared to Group II but the difference between two groups was not significant statistically (p>0.05). However, the stain index in Group I was observed to be significantly higher as compared to Group II (p<0.001).

**Evaluation of Clinical Parameters in two groups at second follow-up (3months of wash out period after first follow up) :**

This evaluation shows that at second follow up evaluation statistically no significant intergroup difference was observed for any of the four parameters studied (p>0.05). The mean plaque index of Group II (1.95±0.49) was higher as compared to that of Group I while mean gingival index and mean probing pocket depth of Group I were higher as compared to Group II but the difference between two groups was not significant statistically (p>0.05). The stain index in Group I was 1.73±0.46 whereas in Group II it was 1.47±0.52. However, the difference between groups was not significant statistically (p=0.146).

**Evaluation of Clinical Parameters in two groups (after 2 weeks of interchange of regimes) – Third Follow up:**

The graph-2 below shows that at third follow up evaluation ,statistically no significant intergroup difference was observed for any of the three parameters studied (p>0.05). The mean plaque index of Group II (1.05±0.27) and Gingival index (1.21±0.38) was higher as compared to that of Group I (1.11±0.35 and 1.21±0.38 respectively) while mean probing pocket depth of Group I (1.07±0.24) was higher as compared to Group II (1.00±0.35) but the difference between two groups was not significant statistically (p>0.05). Stain Index in Group II (0.80±0.53) was significantly higher as compared to that in Group I (p<0.001).
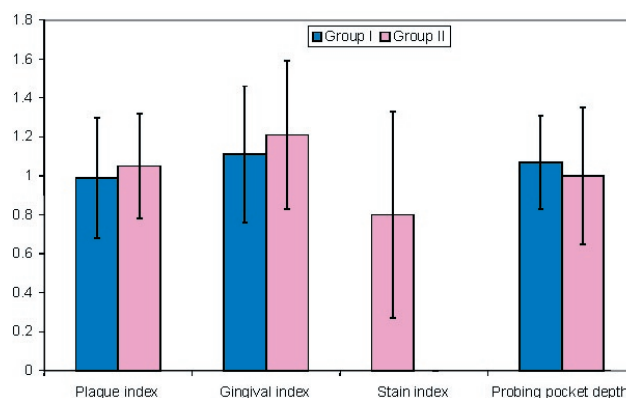


**GRAPH-2 Evaluation of Clinical Parameters during Third Follow-up**

Within Group Difference at different time intervals:

The graph-3 below shows that In Group I, as compared to baseline the mean reduction in plaque index was significant statistically at all the three follow up intervals (p<0.05). An increase in mean plaque index (0.77±0.44) was observed between first to second follow up intervals which was also significant statistically. As compared to first follow-up at third follow up there was a mean change of -0.09±0.24 but the change was not significant statistically (p=0.150). Comparison between second to third follow up intervals revealed a mean reduction of 0.87±0.29 which was also significant statistically. Thus apart from change between first follow up to third follow up interval, all the changes were significant statistically (p<0.05).

However, in Group II, as compared to baseline the mean reduction in plaque index was significant statistically at first and third follow up intervals only. The change between baseline and second follow up showed a reduction in plaque index but the change was not significant statistically (p=0.087). An increase in mean plaque index (0.79±0.44) was observed

between first to second follow up intervals which was also significant statistically (p<0.001). As compared to first follow-up at third follow up there was a mean change of -0.11±0.34 but the change was not significant statistically (p=0.220). Comparison between second to third follow up intervals revealed a mean reduction of 0.90±0.30 which was also significant statistically. Thus apart from change between baseline to second follow up and first follow up to third follow up interval, all the changes were significant statistically (p<0.05).
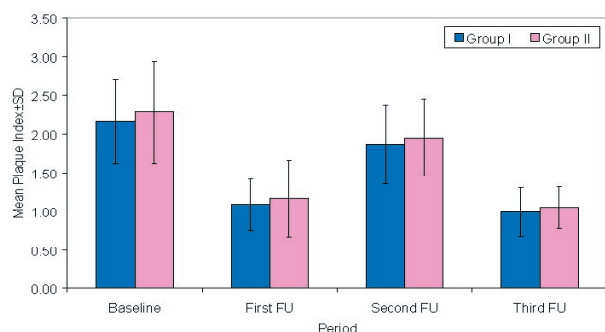


**GRAPH-3 Change in Plaque Index at different time Intervals**

Change in Gingival Index at different time intervals:

The graph-4 below shows that in Group I, as compared to baseline the mean reduction in gingival index was significant statistically at all the three follow up intervals (p<0.05). An increase in mean gingival index (0.65±0.56) was observed between first to second follow up intervals which was also significant statistically. As compared to first follow-up at third follow up there was a mean change of -0.11±0.44 but the change was not significant statistically (p=0.334). Comparison between second to third follow up intervals revealed a mean reduction of 0.76±0.26 which was also significant statistically (p<0.001). Thus apart from change between first follow up to third follow up interval, all the changes were significant statistically (p<0.05).

However, in Group II, as compared to baseline the mean reduction in gingival index was significant statistically at first and third follow up intervals only (p<0.001). The change between baseline and second follow up showed a reduction in gingival index but the change was not significant statistically (p=0.076). An increase in mean gingival index (0.75±0.48) was observed between first to second follow up intervals which was also significant statistically (p<0.001). As compared to first follow-up at third follow up there

was a mean change of 0.12±0.46 but the change was not significant statistically (p=0.328). Comparison between second to third follow up intervals revealed a mean reduction of 0.63±0.47 which was also significant statistically. Thus apart from change between baseline to second follow up and first follow up to third follow up interval, all the changes were significant statistically (p<0.05).
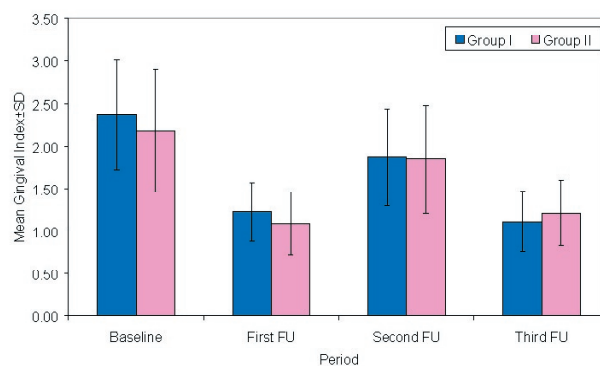


**GRAPH-4 Changes in Gingival Index at different time intervals**

Change in Stain Index at different time intervals:

The graph-5 below shows that in Group I, all the changes were significant statistically (p<0.001), except for change between first to third follow up interval (p=0.565). In Group II, no change in mean stain index was observed between baseline to first follow up and significant difference between baseline to third follow up. However, there was no change in stain index between first to third follow up intervals. All the other changes were significant statistically (p<0.001).
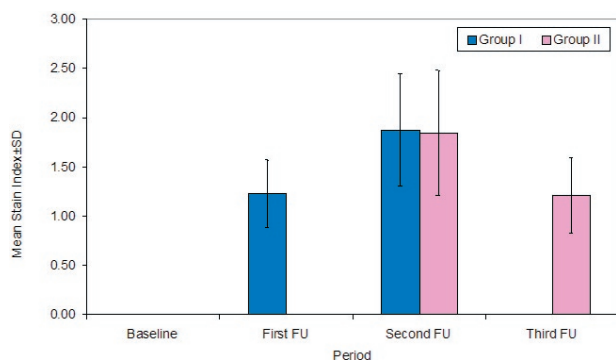


**GRAPH-5 Changes in Stain Index at different time intervals**

**Change in Probing Pocket Depth at different time intervals**

Graph-6 below shows that in Group I, as compared to baseline the mean reduction in probing pocket depth was significant statistically at all the three follow up intervals (p<0.05). An increase in mean probing

pocket depth (1.13±0.64) was observed between first to second follow up intervals which was also significant statistically (p<0.001). As compared to first follow-up at third follow up there was a mean change of -0.14±0.19 which was also significant statistically (p=0.012). Comparison between second to third follow up intervals revealed a mean reduction of 1.27±0.62 which was also significant statistically (p<0.001). Thus all the changes were significant statistically (p<0.05).

Similarly, in Group II, as compared to baseline the mean reduction in probing pocket depth was significant statistically at all the follow up intervals (p<0.05). An increase in mean probing pocket depth (1.11±0.60) was observed between first to second follow up intervals which was also significant statistically (p<0.001). As compared to first follow-up at third follow up there was a mean change of -0.13±0.37 but the change was not significant statistically (p=0.201). Comparison between second to third follow up intervals revealed a mean reduction of 1.23±0.63 which was also significant statistically. Thus apart from change between first follow up to third follow up interval, all the changes were significant statistically (p<0.05).
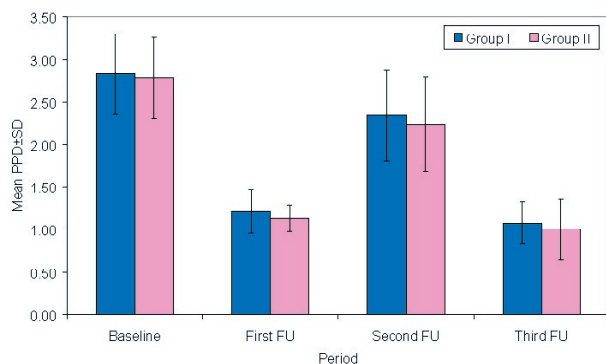


**GRAPH-6 Changes in Probing Depth at different time intervals**

## DISCUSSION

Plaque is considered to be the main etiologic factor for gingivitis. The observation that removal of newly formed plaque would result in the reversal of gingivitis, and that this major effect could be accomplished by a toothbrush and dental floss, was a preventive message heard round the world.[9] Not as well recognized was the sequel to this research that demonstrated the ability of antibacterial rinses to interrupt plaque development on a newly cleaned tooth surface. This series of experiments promoted the concept that dental plaque, the main disease-provoking culprit, could be modified by rinsing

with chemotherapeutic agents.

Long considered the **GOLD STANDARD**[10], the 0.2% chlorhexidine is effective in inhibiting new plaque formation and controlling the clinical signs of gingivitis. However due to its prolonged side-effects, third-generation agents have begun to emerge. Delmopinol has been shown to inhibit plaque and gingivitis, despite being almost devoid of bactericidal or bacteriostatic actions in vitro or in vivo. Hence, this study was planned.[11]

## CONCLUSION

Clinical observations indicate that the adjunctive use of chemical plaque control agents over mechanical oral hygiene resulted in more reduction in clinical parameters than mechanical oral hygiene measures alone. However, both are equally effective in reducing gingivitis.

**Declaration of Patient consent:** The authors certify that they have obtained all appropriate patient consent forms.

**Source of Support:** None

**Conflict of Interest:** None

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# Efficacy of Levamisole as a Steroid Sparing Drug in Children Suffering from Frequently Relapsing and Steroid Dependent Nephrotic Syndrome

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## ABSTRACT

The purpose of the study was to evaluate the efficacy of levamisole in children suffering from primary nephrotic syndrome (NS) who were steroid dependent (SDNS) or frequently relapsing (FRNS). It was observed that addition of levamisole to alternate day prednisolone therapy and continuing it after the prednisolone therapy was stopped significantly reduced the relapse rate. This also resulted in significantly reduced use of corticosteroids. There were minimal side effects due to levamisole. It is therefore concluded that levamisole reduces the incidence of relapses. This results in more disease free life and less steroid requirements.

***Keywords:-*** *Nephrotic Syndrome, Levamisole, Steroid, Relapses .*

## INTRODUCTION

Nephrotic syndrome is a common renal problem in children. Its incidence is 2 to 7 new cases per 100,000 populations per year.[1] It is characterized by massive proteinuria, hypoalbuminemia and edema. Heavy proteinuria is the basic abnormality leading to hypoalbuminemia and edema. Most of the cases (>90%) of pediatric primary (idiopathic) nephrotic syndrome respond clinically to treatment with high dose corticosteroids by normalization of proteinuria.[2] However, relapses of significant proteinuria are common which require repeat courses of corticosteroids. Though the relapses again respond to treatment but these cause increased morbidity and steroid toxicity.

High doses of steroids for prolonged period may result in short stature, obesity and diabetes in children.[3] Some other drugs like cyclophosphamide and cyclosporine can be used in place of corticosteroids. Levamisole, an anthelmintic drug, has immunomodulatory effects.

It prevents relapses in frequently relapsing nephrotic syndrome (FRNS) and even acts as a steroid sparing drug in patients with steroid dependent nephrotic syndrome (SDNS).[4] This study also concluded that use of levamisole prevented relapses in frequently relapsing nephrotic syndrome and reducing steroid requirements in patient with steroids dependent nephrotic syndrome

## OBJECTIVE

To evaluate the efficacy of levamisole as a steroid sparing drug in children with steroid dependent nephrotic syndrome and frequently relapsing nephrotic syndrome.

## MATERIAL & METHOD

In this prospective study, 30 children with FRNS or SDNS were included. Levamisole was added to the treatment regimen on achieving remission from current relapse. The levamisole was continued for 6 months for more while steroids were gradually tapered and stopped. Inclusion criteria were age of onset of disease between 1 to 8 years, initially being steroid responsive, being SDNS or FRNS follow up period more than 6 months.

Exclusion criteria were NS secondary to

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other systemic disease, onset after age of 8 years, glomerulonephritis or significant disease in renal biopsy.

## DEFINITIONS[5]

N.S: Proteinuria more than $1g/m^2/day$, hypoalbuminemia, edema and hyperlipidemia.

SSNS: Remission within 4 weeks of starting corticosteroids

SDNS: - Relapsing during steroid taper or within 14 days of stopping steroid therapy.

FRNS: Two or more relapses within 6 months, 4 or more in a year.

Levamisole Responder: response to levamisole within 3 month of starting treatment.

Levamisole Resistance: No response to levamisole even after 3 month of treatment.

Response to Levamisole: No relapse during 1 year of treatment with levamisole.

## STATISTICAL ANALYSIS

Statistical analysis was carried out using SPSS 20 software. Data were analyzed, mean and Standard deviation was derived. The risk was expressed as odds ratio with 95% confidence interval. The paired test analysis was done to compare the difference between steroid dose before and after levamisole treatment. In order to examine differences between groups chi-square test and student "t" test were employed. When chi-square test and student "t"test were applied all P values were two tailed and a P value less than 0.05 were considered significant.

## RESULTS

Baseline characteristics:-

A total number of 30 patients were included in the study. These were 22 (77.33%) boys and 8 (26.67%) girls. The mean age was $6\pm 2.07$ years at the time of inclusion in the study. The mean age of onset of nephrotic syndrome was $4.03\pm 1.65$ years. The baseline characteristics are listed in table 1.

**Table 1: Depicts baseline characteristics of patients.**

| Characteristics | Value |
|---|---|
| Number of patients | 30 |
| Mean age, in years | $6\pm2.07$ |
| Gender<br>Boy<br>Girl | 30(100%)<br>22(73.33%)<br>8(26.67%) |
| Type of steroid dependence<br>Frequent relapsers(FR)<br>Steroid dependent(SD)<br>Both FR and SD | <br>19(63.3%)<br>9(30.0%)<br>2(6.7%) |

Out of the 30 patients, 19(63.3%) were suffering from frequent relapses, 9(30%) were steroid dependent and 2 (6.7%) were both FRNS and SDNS. Mean baseline steroid dose before start of the levamisole therapy was $16.23\pm 5.52$ mg/m²/day and mean baseline relapse rate per month was $0.24\pm0.08$ .Table 2 shows the reduction of steroid requirement during levamisole therapy.

There were a significant correlation between duration of levamisole treatment with both reduction in corticosteroid dose and reduction of relapses (P<0.001) Table

The mean steroid dose with levamisole therapy was $3.74\pm4.98$ mg/m²/day (compared to $16.23\pm5.52$) with the mean reduction in dose being $12.49\pm0.54$ mg/m²/day.

The mean relapse rate per patient per month reduces from $0.07\pm0.10$ to $0.24\pm0.08$. Mean baseline steroid dose is mg/m², day $16.23\pm 5.52$. Mean baseline relapse rate per month $0.24\pm0.08$.

**Table 2: Shows the reduction of steroid requirement during levamisole therapy**

| | Steroid dose (mg/m²/d) | |
|---|---|---|
| | Mean±SD | Range |
| Before levamisole therapy | 16.23±5.52 | 8.19±30.10 |
| During levamisole therapy | 3.74±4.98 | 0-15.55 |

**Table 3: Relapse rate in patients before and during levamisole therapy.**

| | Number of relapses per patient month | |
|---|---|---|
| | Mean±SD | Range |
| Before levamisole therapy | 0.24±0.08 | 0.14-0.5 |
| During levamisole therapy | 0.07±0.10 | 0-0.33 |
| P value | p<0.001( highly significant) | |

## DISCUSSION

The majority of NS pediatric patients are steroid responsive. However, SDNS and FRNS patients require steroid sparing agents as the doses of steroids required are high which cause significant side effects. Most steroid sparing drugs like cyclosporine and cyclophosphamide are immunosuppressants. These drugs increase the risk of significant infection. However, levamisole is an immunostimulant. It improves the functioning of the cellular arm of immune system. It increases neutrophil mobility, adherence and chemotaxis. It enhances T cell activation and proliferation and also improves monocyte-macrophage function. The likely mechanism of immunostimulation is by mimicry of thymic hormone thymopoietin. Chemically, levamisole may form a thymopoietin- mutant tertiary structure which either may stimulate lymphocytes by its imidazole component or be metabolized to a complex reducing compound which effects oxygen radical scavenging in multiplying lymphocytes.

Fu LS et al assessed the efficacy of daily levamisole in 36 children with SDNS and FRNS after therapy relapses and prednisolone doses decreased. The study concluded that daily levamisole may be considered when responses to alternate day steroid are unsatisfactory.[6] Sumegy V et al shows in a retrospective study in 44 children showed that proteinuria significantly decreased and more relapses occurred in about 75 % patients during levamisole treatment.[7] In 24 month follow period after discontinuation of levamisole, 28 children remained in total remission, while 6 had relapses. In order to evaluate the treatment strategies and outcome of NS over passed two decades, Abeyagunawardena AS et al undertook a retrospective notes review in a cohort of children with SDNS and FRNS who were treated at the Great Ormond Street Children Hospital between 1980 and 2000.The review highlighted that levamisole was prescribed as the first steroid sparing drug for 65 children and disease control was achieved in 30%. Levamisole was also used in 40 children who has post cyclophosphamide steroid dependence. In these, disease control was achieved in 32(66%).[8] Donia AF et al showed that in a prospective uncontrolled study treated 20 patients with SDNS with levamisole at the end of 6 month treatment period (i.e. after 4 months of steroid discontinuation), ten patients (50%) were maintaining remission on levamisole alone. At the end of 12 month study period (i.e. after 6 months of Levamisole discontinuation), five patients(25%) were still in remission without any treatment for previous 6 months.[9] Madani et al evaluated the efficacy of levamisole among 304 children and showed its efficacy in both SDNS and FRNS.

In our study use of levamisole resulted in significant improvement in terms of requirement of corticosteroids and relapse rate.

## CONCLUSION

In the end, it is wise to use levamisole as an effective steroid sparing drug in children in SDNS and FRNS

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# Methamphetamine Injection among People Who Inject Drugs in Bangkok, Thailand

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## ABSTRACT

**Background:** Studies have indicated 34% - 49% of methamphetamines injections among people who inject drugs in Thailand. Essential blood-borne viral and bacterial infections prevention services targeting people who inject drugs should be included in interventional efforts. The aims of the present study were to determine a demographic profile and factors associated with methamphetamine injection within people who inject drugs population in Bangkok, Thailand.

**Method:** Ninety-one people who inject drugs who reported injecting drugs in the previous six months and no kind of drug treatment were eligible in this study. Univariate and multivariate logistic regression was used to analyse respondents who reported injection of methamphetamine and those who did not.

**Results:** Most of the respondents (87%) were male with an average age of 39 years. They had been injecting drugs for 20 years. Around one-third (32%) reported inject methamphetamine in the past month. Four factors were found to be significantly associated with methamphetamine injection which were sex (AOR = 0.16; 95% CI = 0.03 – 0.83), age (AOR = 7.88; 95% CI = 1.76 – 35.27), period of injecting drugs (AOR = 0.14; 95% CI = 0.03 – 0.62) and inject drugs in combination (AOR = 16.39; 95% CI = 1.94 – 137.87).

**Conclusions:** Our findings suggested that methamphetamine injectors in Bangkok, Thailand were older male and had longer period of injection. Methamphetamine injections were associated with injecting in combination with other drugs. Therefore, harm reduction interventions for methamphetamine injectors should be tailored to this specific group of population.

***Keywords:*** *Methamphetamine, people who inject drugs, harm reduction.*

## INTRODUCTION

Globally, methamphetamine use has increased continuously and effected health and social challenges. Recently, Southeast Asia have reported a spread of methamphetamine use and the number of people requiring treatment is also increasing.[1] In Thailand, methamphetamine locally known as Yaba is usually found in crystal and pill forms.[2,3] Many factors related to injection initiation include less time spending when injecting occurred, social acceptability and association with current injectors.[4,5] Methamphetamine injection provide higher peak effects than other route of administration, and increase risk of dependence.[6] Drug injection has become a main social and public health concern driving the blood-borne viral and bacterial infections epidemics in many countries around the world.[5,7,8,9]

The approximated number of people who inject drugs in Thailand and Bangkok is 40,300 and 4,200 respectively.[10,11] Methamphetamine injection in Thailand was reported differently in each region; 15% in the northern part and 3% in the southern part of the

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country.[12,13] In Bangkok, a study found that 49% of people who inject drug had injected methamphetamine and 34% of them reported at least daily injection.[14,15]

Methamphetamine injectors may be more likely to engage in risky injecting practices than those injecting other drugs.[5] It was independently associated with syringe sharing.[16] This group was highly unlikely to have accessed treatment.[15] High rates of methamphetamine use also associated with sexually transmitted infections.[3] A study reported that injecting methamphetamine was associated with more frequent use patterns, treatment demand, higher levels of risky behaviour and other health and psychiatric consequences.[17]

Essential blood-borne viral and bacterial infections prevention services targeting people who inject drugs should be included in interventional efforts. Specific interventions to address methamphetamine injection in Thailand such as harm reduction program should be implemented. The limited data means there is a need to better understand the factors associated with these behaviors. Therefore, the aims of the present study were to determine a demographic profile and factors associated with methamphetamine injection within people who inject drugs population in Bangkok, Thailand.

## METHOD

### STUDY DESIGN AND RESPONDENTS

The study was part of a larger project to develop a harm reduction intervention implemented with people who inject drugs to reduce injecting frequency, improve harm reduction behaviors and self-efficacy in Bangkok, Thailand. A quasi-experimental study consisting of individual interviews with people who injecting drugs was used to collect data between October and November of 2014. Eligible respondents were people who inject drugs in Bangkok and its vicinity, reported having injected any kind of drug in the previous six months, older than 18 years old, and not currently receiving any kind of drug treatment. Respondents were recruited through announcements posted at the drop-in centers in Bangkok. Ninety one respondents passed the screening criteria and provided informed consent for data collection.

## INSTRUMENTS AND MEASURES

Respondents completed an interviewer-administered questionnaire interviewed by trained interviewers. The questionnaire covered demographic characteristics, drug use behaviors, injecting behaviors, and harm reduction self-efficacy. Drug injecting behaviors were collected consisting of the period and frequency of drugs injection, the type of drugs being used, and injecting behaviors in the previous month. Information related to experiences of drug treatment, incarceration, and non-fatal drug overdose were also gathered. Content validity was conducted by consultation with an expert panel of 5 multicultural academicians, practitioners and service providers in the community. Translation was done from English to Thai and completed back translation by English language expert. The questionnaire was pilot tested with 30 people who inject drugs in other province who were excluded from this study.

Dichotomous variables considered in the analyses included: sex, age ($\leq$39 or >39), education level (lower than secondary school or higher than secondary school), marital status, employment, period of drug injection (<20 years or $\geq$20 years), frequency of drug injections per week in the past month (<10 times per week or $\geq$10 times per week), drugs injection in combination ('Yes' or 'No'), drug mixing in each injection ('Yes' or 'No'), having ever received drug treatment ('Yes' or 'No'), having ever been in prison because of drug related crimes ('Yes' or 'No'), and injection at the groin ('Yes' or 'No').

## STATISTICAL ANALYSIS

Descriptive analyses were completed to characterize respondents. Data were analysed for demographics, drug use, and injection variables. Univariate and multivariate logistic regression was used to analyse respondents who reported injection of methamphetamine and those who did not. A multivariate logistic regression model included all variables that were associated with methamphetamine injection at the $p\leq$0.05 level in univariate analyses.

## ETHICAL STATEMENT

This study was approved by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University.

## RESULTS

Most of the respondents were male (87%) with an average age of 39 years. Most of them had a secondary school and lower education (73%) and married (64%). More than half of them (63%) reported employed. They had been injecting drugs for an average of 20 years. The number of drugs injections per week was 10 times. Respondents reported having injected the following drugs in the month prior to the questionnaire: midazolam (73%), heroin (48%) and methamphetamines (32%). More than half of respondents (59%) reported injecting more than one kind of substance or injection in combination and 51% of respondents reported mixing more than one drugs for each injection. Most respondents (82%) reported having received some form of drug treatment. 84% reported having been in prison as a result of drug related charges. Almost one-third (29%) reported having experienced a non-fatal drug overdose. With regards to injection sites, 45% of respondents reported injecting at the groin. Characteristics of the respondents as shown in Table 1.

Results from final multivariate logistic regression analysis of factors associated with methamphetamine injection in the past month were presented in Table 3. Methamphetamine injections in the month prior to the questionnaire were associated with sex (adjusted odd ratio [AOR] = 0.16; 95% CI = 0.03 – 0.83), age (AOR = 7.88; 95% CI = 1.76 – 35.27), period of injecting drugs (AOR = 0.14; 95% CI = 0.03 – 0.62) and inject drugs in combination (AOR = 16.39; 95% CI = 1.94 – 137.87). Four factors were found to be significantly associated with methamphetamine injection in the multivariate model. Respondents who were male and older were more likely to inject methamphetamine (0.2 and 8 times respectively). Moreover, those who have injected drugs for a longer period of time were 0.1 times more likely to inject methamphetamine than those who had injected less than 20 years. Injecting drugs in combination were also found to be significant predictors. They were 16 times more likely to inject methamphetamine.

**Table 1: Characteristics of the respondents**

| Characteristic | n | % |
|---|---|---|
| Sex | | |
| Male | 79 | 87 |
| Female | 12 | 13 |
| Age | | |
| ≤39 | 49 | 54 |
| >39 | 42 | 46 |
| Education | | |
| Lower than Secondary School | 66 | 73 |
| Higher than Secondary School | 25 | 27 |
| Marital Status | | |
| Married | 58 | 64 |
| Single/Divorced/Widowed | 33 | 36 |
| Employment | | |
| Employed | 57 | 63 |
| Unemployed | 34 | 37 |
| Period of injecting drugs | | |
| <20 years | 36 | 40 |
| ≥20 years | 55 | 60 |
| Frequency of injecting drugs | | |
| <10 times per week | 60 | 66 |
| ≥10 times per week | 31 | 34 |
| Inject drugs in combination | | |
| Yes | 54 | 59 |
| No | 37 | 41 |
| Drug mixing | | |
| Yes | 46 | 51 |
| No | 45 | 49 |
| Injection at groin | | |
| Yes | 41 | 45 |
| No | 50 | 55 |
| Ever been in drug treatment | | |
| Yes | 75 | 82 |
| No | 16 | 18 |
| Ever been in prison because of drug related | | |
| Yes | 76 | 84 |
| No | 15 | 16 |
| Ever experienced drug overdose | | |
| Yes | 26 | 29 |
| No | 65 | 71 |
| Drugs injection in the past month | | |
| Midazolam | 66 | 73 |
| Heroin | 44 | 48 |
| Methamphetamine | 29 | 32 |

**Table 2: Bivariate analyses of factors associated with methamphetamine injection in the past month among people who inject drugs in Bangkok, Thailand**

| Characteristics | Methamphetamine Injection | | Odds Ratio (95% CI) | p value |
|---|---|---|---|---|
| | Yes n (%) | No n (%) | | |
| **Sex** | | | 0.16 (0.32 – 0.83) | 0.025 |
| Male | 20 (69) | 59 (95) | | |
| Female | 9 (31) | 3 (5) | | |
| **Age** | | | 7.99 (1.49 – 42.79) | 0.015 |
| ≤39 | 11 (38) | 38 (61) | | |
| >39 | 18 (62) | 24 (39) | | |
| **Education** | | | 0.24 (0.04 – 1.48) | 0.123 |
| Lower than Secondary School | 24 (83) | 42 (68) | | |
| Higher than Secondary School | 5 (17) | 20 (32) | | |
| **Marital Status** | | | 0.25 (0.04 – 1.45) | 0.121 |
| Married | 10 (35) | 23 (37) | | |
| Single/Divorced/Widowed | 19 (66) | 39 (63) | | |
| **Employment** | | | 6.28 (1.12 – 35.11) | 0.036 |
| Employed | 22 (76) | 35 (57) | | |
| Unemployed | 7 (24) | 27 (44) | | |
| **Period of injecting drugs** | | | 0.11 (0.02 – 0.61) | 0.011 |
| <20 years | 16 (55) | 20 (32) | | |
| ≥20 years | 13 (45) | 42 (68) | | |
| **Frequency of injecting drugs** | | | 3.23 (0.60 – 17.36) | 0.171 |
| <10 times per week | 21 (72) | 39 (63) | | |
| ≥10 times per week | 8 (28) | 23 (37) | | |
| **Inject drugs in combination** | | | 82.03 (4.39 – 153.23) | 0.003 |
| Yes | 21 (72) | 33 (53) | | |
| No | 8 (28) | 29 (47) | | |
| **Drug mixing** | | | 0.04 (0.003 – 0.63) | 0.021 |
| Yes | 14 (48) | 32 (52) | | |
| No | 15 (52) | 30 (48) | | |
| **Injection at groin** | | | 0.21 (0.05 – 0.92) | 0.039 |
| Yes | 9 (31) | 32 (52) | | |
| No | 20 (69) | 30 (48) | | |
| **Ever been in drug treatment** | | | 0.16 (0.03 – 0.90) | 0.038 |
| Yes | 20 (69) | 55 (89) | | |
| No | 9 (31) | 7 (11) | | |
| **Ever been in prison because of drug related** | | | 8.05 (0.62 – 104.29) | 0.110 |
| Yes | 25 (86) | 51 (82) | | |
| No | 4 (14) | 11 (18) | | |

**Table 3: Multivariate logistic regression analysis of factors associated with methamphetamine injection among people who inject drugs in Bangkok, Thailand**

| Variable | Adjusted Odds Ratio (95% CI) | p value |
|---|---|---|
| Sex | | |
| (Male vs Female) | 0.16 (0.03 – 0.83) | 0.029 |
| Age | | |
| (≤39 vs >39) | 7.88 (1.76 – 35.27) | 0.007 |
| Employment | | |
| (Employed vs Unemployed) | 3.38 (0.85 – 13.50) | 0.084 |
| Period of injecting drugs | | |
| (<20 vs ≥20) | 0.14 (0.03 – 0.62) | 0.009 |
| Inject drugs in combination | | |
| (Yes vs No) | 16.39 (1.94 – 137.87) | 0.010 |
| Drug mixing | | |
| (Yes vs No) | 0.20 (0.03 – 1.50) | 0.119 |
| Injection at the groin | | |
| (Yes vs No) | 0.35 (0.10 – 1.24) | 0.103 |
| Ever been in drug treatment | | |
| (Yes vs No) | 0.24 (0.05 – 1.13) | 0.070 |

## DISCUSSION

In this study, almost one third of people who inject drugs in Bangkok reported having injected methamphetamine. This result was not different with many studies that reported 34% to 49% of methamphetamine injection among this vulnerable population.[14,15] In Thailand, smoking is an important route of administration and methamphetamine users were found to be a much younger and different population from other drugs.[18] In contrary, our findings suggested that methamphetamine injectors were older male and had longer period of injection. Methamphetamine injections were associated with injecting in combination with other drugs. While the most drugs injection were midazolam and heroin, it is important to have a specific intervention with methamphetamine injectors.

Methamphetamine injection in combination with other drugs has many effects. Methamphetamine toxicity is increased when it is combined with alcohol, cocaine or opiates. The combination of alcohol and methamphetamine can increase blood pressure, placing greater burden on the heart.[19] Factors such as parenteral route of administration and poly drug use related to the risk of a drug overdose.[20] Methamphetamine can also increase the risk of heroin overdose, as the effects of heroin might be dulled by the methamphetamine effects and more heroin could be used than intended.[21]

The findings of this study suggested that harm reduction interventions for people who inject methamphetamine should be strengthened. Intervention strategies should include a focus on reducing unsafe methamphetamine injection behavior by designing a program tailor to a specific segment of population. Efforts should be made to further reach out to this segment of the population and providing harm reduction program especially knowledge on health consequences of methamphetamine injection including risk of injection in combination with other drugs.

There were a number of limitations that should be considered in the conclusions of this study. The study sample was selected by using convenience sampling with a small sample size and as such may not be representative of the people who inject drug population in Bangkok. Findings were based on self-reported information that may have been influenced by social desirability. Focusing on drug use behavior over the 30-day period prior to the interview minimized recall error. These findings should be followed up to reduce risks of methamphetamine injectors in Thailand.

## CONCLUSIONS

The findings from this study suggested that methamphetamine injectors in Bangkok, Thailand were older male and had longer period of injection.

Methamphetamine injections were associated with injecting in combination with other drugs. Therefore, harm reduction interventions for methamphetamine injectors should be tailored to this specific group of population. Intervention strategies should include a focus on reducing unsafe methamphetamine injection behaviors and providing harm reduction knowledge especially on health consequences of methamphetamine injection including injection in combination with other drugs.

**Conflict of Interest:** All authors declared no conflicts of interest.

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# Role of MRI and MR Spectroscopy in Carcinoma Prostate

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## ABSTRACT

**Introduction-** Prostate cancer (PCa) is a high-profile disease due to its incidence, the large number of men dying yearly from the disease, the considerable debate surrounding the benefit and risks of early detection, and the amount of research currently ongoing in its detection, diagnosis and management. PCa is now recognized as one of the most important medical problems facing the male population. **Aims and Objectives**- Present study aim to see for capability of MR imaging in diagnosing prostate carcinoma in patients with raised PSA level. To asses role of MR for staging and extension of carcinoma prostate in biopsy proven cases. Correlation of MR spectroscopy findings with MRI findings in carcinoma prostate. **Material and Method**- The present study was conducted in the Department of Radiodiagnosis, SVBP Hospital, LLRM Medical College Meerut, Department of Radiodiagnosis, Muzaffarnagar Medical College, Muzaffarnagar, and Om Imaging and Diagnostic Centre, Meerut. Type of study- Prospective Analytical-Observational study. With Informed consent for our study, we identified 40 consecutive patients who, from January 2014 to July 2015 underwent combined preoperative MR imaging and proton MR spectroscopic imaging performed with commercially available acquisition and processing software and for whom histopathologic maps were available for comparison with imaging findings. **Observations-**The 12 prostatic areas were combined into apex, base, central, and peripheral zone to facilitate statistical calculations. Histopathologic analysis Pathological examination of RP specimens detected cancer foci in 96 areas out of a total of 160 areas (40 patients multiplied by 4 areas). **Conclusion-**The role of MRI and MR spectroscopy in carcinoma prostate which were confirmed for carcinoma prostate on biopsy. Based on the observations made in the course of the study, the following conclusion was made that with high sensitivity and high positive predictive value MRI is quite accurate in diagnosing and looking for the extent of the carcinoma. Proton MR spectroscopy of human prostatic tissue can depict subtle chemical differences associated with different cellular component.

*Keywords-* *Magnetic resonance imaging, MR Spectroscopy, T1 & T2 weighted images.*

## INTRODUCTION

With ageing of the population, the development of the prostate specific antigen (PSA) test, and the continuing decline in other common cancers such as lung and stomach since the mid 1980s, prostate cancer

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has become the most common cancer among men , accounting for about one in four (24%) of all new male cancers diagnosed in 2008. There were 40,841 newly diagnosed PCa cases in 2009, compared to 22,846 cases of lung cancer and 22,097 cases of colorectal cancer. The prevalence of prostate cancer is high, occurring in 42% men aged 50 yrs or older, but the risk of dying of this disease is only 3.6%. It is the most common non cutaneous cancer among males. Prostate cancer continues to be diagnosed with increasing frequency, although overall, there has been a slight decline in mortality in the past decade. 1 Prostate cancer is the second leading cause

of cancer death for men, but mortality rates have been declining since the mid-1990s
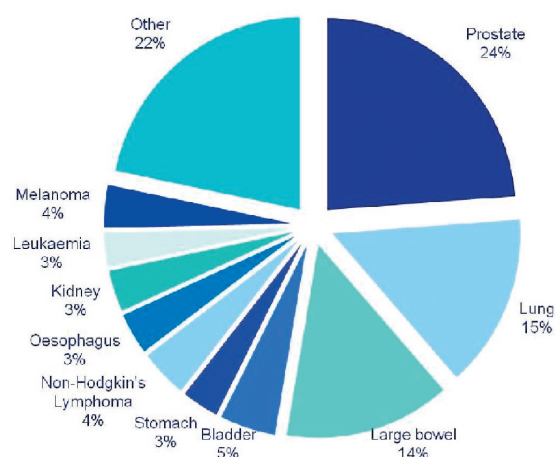


**Figure 1. Distribution of male cancer types in 2009**

Latent carcinoma of the prostate is found in a large proportion of elderly men with a clinically normal prostate. Autopsy studies have shown that between 15-40% of men aged 50 years and over have small, well differentiated tumours within the peripheral zone of the prostate gland that never presented clinically and would not otherwise have been detected. By the age of 80, microscopically detected prostatic adenocarcinoma is present in 70-80% of all men. In another autopsy study, the authors found a 38.8% prevalence of incidental prostate cancer with an increasing age-related incidence, reaching 86.6% in the age group between 81 and 95 years.

**Normal appearances of prostate on MRI-**The normal prostate has a homogeneous low-intermediate signal on T1-weighted images. Zonal anatomy comprises a low signal central zone and higher signal peripheral zone. The transition zone and central zone appear of similar signal intensity and are loosely termed the central gland. The prostate doesn't have a well defined capsule but is enveloped by a variable band of condensed fibro muscular tissue. The peri-prostatic plexus can be visualized as a thin rim of highly signal intensity anterolateral to the peripheral zone. Denonvilliers' fascia can be resolved on sagittal images separating the prostate from the rectum. The neurovascular bundles are sited posteriorly at 5 and 7 o'clock position on transverse section of the prostate.

**MR spectroscopy of prostate:** In MR spectroscopy of prostate also several key metabolites are readily identifiable. Principle among these is that of citrate, a metabolite found in relatively high concentrations in prostate tissue owing to its presence in prostatic

secretions. The citrate resonance is found at 2.6 ppm. Other resonance of interest are creatine and choline, the later being a metabolite that is elevated in malignant tissue. These metabolites resonate at 3.0 and 3.2 ppm respectively. Depending on the quality of the prostate MR spectroscopy examination, these resonance peaks may overlap partially. In addition, resonance from polyamines (another component of prostatic secretions) is also found in these secretions. As such choline and creatine peaks may merge and may be hard to identify as separate peaks in the MR spectra.

MRSI of the prostate allows the reader to obtain metabolic information from distinct regions of the prostate. Because normal and cancerous prostate tissue contains distinct MR spectra signals, the information from MRSI can be used to supplement that of MR imaging to identify areas of tumor involvement in the prostate.

## MATERIALS AND METHOD

The present study was conducted in the Department of Radiodiagnosis, SVBP Hospital, LLRM Medical College Meerut, Department of Radiodiagnosis, Muzaffarnagar Medical College, Muzaffarnagar and Om Imaging and Diagnostic Centre, Meerut. TYPE OF STUDY: Prospective Analytical-Observational study. INCLUSION CRITERIA: Patients with clinically (palpable firmness or nodule at digital rectal examination) and /or biochemically suspicious (PSA >4ng/mi) prostate cancer and biopsy proven cases of prostate cancer were included in the study. EXCLUSION CRITERIA for the study were previous hormonal, surgical, or radiation therapies for prostate diseases, and cases in which a MR with a complete MRSI was not possible. EQUIPMENT : Magnetom symphony a tim system (siemens) with magnetic field strength of 1.5 tesla. Vereo (siemens) with magnetic field strength of 3.0 tesla.

With Informed consent for our study, we identified 40 consecutive patients who, from January 2014 to July 2015 underwent combined preoperative MR imaging and proton MR spectroscopic imaging performed with commercially available acquisition and processing software and for whom histopathologic maps were available for comparison with imaging findings. Patients with clinically (palpable firmness or nodule at digital rectal examination) and /or biochemically suspicious (PSA >4ng/mi) prostate cancer and biopsy proven cases of prostate cancer. The median patient age was 60 years

(range, 44–69 years), and the median baseline serum prostate-specific antigen level was 5.4 ng/ml (range, 0.6 –24.ng/ml).
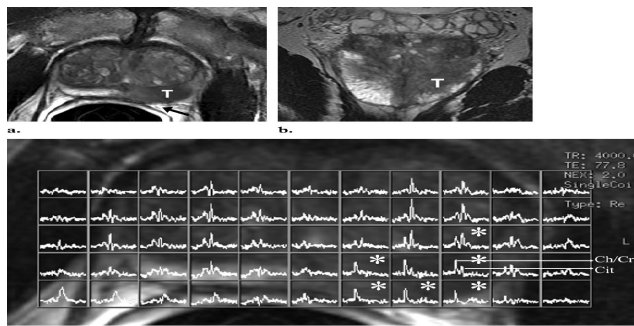


**Figure 2. MR Spectroscopic Imaging Features**

## OBSERVATION

All recruited patients eligible for the study (40) presenting with symptoms of lower urinary tract symptoms, infections, urinary retention, hematuria or asymptomatic which were suspicious of carcinoma prostate on clinical (digital rectal examination) or biochemical basis (raised prostate specific antigen) underwent MRI and spectroscopy and were followed.

**Table1: Age Distribution of Cases**

| Age limit (year) | Number of patient |
|---|---|
| 50-55 | 4 |
| 56-60 | 10 |
| 61-65 | 13 |
| 66-70 | 11 |
| >71 | 2 |

The 12 prostatic areas were combined into apex, base, central, and peripheral zone to facilitate statistical calculations. Histopathologic analysis Pathological examination of RP specimens detected cancer foci in 96 areas out of a total of 160 areas (40 patients multiply by 4 areas). The number of cases with cancer involvement in individual areas is detailed in.

**Table 2: Anatomical Distribution of Lesions**

| Location | Number | Percentage |
|---|---|---|
| Apex | 76 | 47.9 |
| Base | 48 | 30.1 |
| Central gland | 107 | 67.1 |
| Peripheral zone | 155 | 97.3 |

Mapping tumour presence on pathology slides showed that the peripheral zone is most commonly affected by cancer compared to central gland, base and apex. 90.4% had 2 or more tumour foci in the prostate gland. While the majority affected the peripheral zones, only two cases had a central gland tumour only. In 64.4% cases tumour was present in both peripheral zones and central gland. In 16.4% of cases all prostate areas had tumour involvement. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of tumour localisation were determined after combining the regions into apex, base, central gland, and peripheral zones. The results are shown in Table.

**Table 3: Gleason Scoring of the Cases**

| Gleason Score | Number of patients (percentage) |
|---|---|
| 3+3=6 | 10 (27.4%) |
| 3+4=7 | 20 (57.5%) |
| 4+3=7 | 2 (5.4%) |
| 4+4=8 | 1 (2.7%) |
| 4+5=9 | 3 (6.8%) |

Tumour localisation using T2 weighted imaging demonstrated estimation of cancer presence in the peripheral zones signified by the high sensitivity and low specificity. This may be as a result of low signal intensity changes secondary to haemorrhage following prostate biopsy, leading to high false positive rate. On the other hand, studying the central gland, there is under-estimation of cancer with low sensitivity. This is most likely due to the difficulty in identifying cancer separate from benign disease leading to a high false negative rate.

## DISCUSSION

An early in vitro study revealed higher PA levels in the spectra of normal PZ extracts than in benign prostatic hyperplasia and cancer. Jung et al used only high-quality data and included voxels with clear-cut concordance between imaging and histopathologic findings (ie, a high percentage of cancer in the voxels) in the analysis, possibly resulting in higher sensitivity. Our findings, obtained by using a larger population of consecutive patients, commercially available software, and a statistically based decision-making rule, reinforce these results[1].

One hundred and sixteen prostate cancers were

subsequently obtained. Axial, coronal, and sagittal T2 and T1 weighted MR images with gadopentetate dimeglumine were independently reviewed by radiologists. Eighty six lesions in the transition zones were analysed histopathologic analysis showed 53 cancers and 33 benign lesions[2].

Combined T2 and DWI MRI is better than T2 imaging alone in the detection of significant cancer (Gleason score $\geq$ 6 and diameter > 4 mm) within the peripheral zone of the prostate. T2-weighted imaging and DWI (b value = 600 s/mm$^2$) were performed in 49 patients before radical prostatectomy using an endorectal coil at 1.5 T in this prospective trial. T2 images alone and then T2 images combined with apparent diffusion coefficient (ADC) maps (T2 + DWI) were scored for the likelihood of tumor and were compared with whole-mount histology results. Only tumors with an area of more than 0.13 cm$^2$ (> 4 mm diameter) and a Gleason score of $\geq$ 6 were considered significant. The area under the receiver operating characteristic curve (A$_z$) was used to assess accuracy. For the whole prostate, sensitivity was significantly higher ($p$< 0.001) with T2 plus DWI (81% [120/149]) than with T2 imaging alone (54% [81/149]), with T2 plus DWI showing only a slight loss in specificity compared with T2 imaging alone (84% [204/243] vs 91% [222/243], respectively)[3].

Combined use of MR spectroscopy and diffusion-weighted MRI increases the specificity for prostate cancer detection while retaining the sensitivity compared with MR spectroscopy alone or diffusion-weighted MRI alone. Forty-two men (mean age $\pm$ SD, 69.3 $\pm$ 4.7 years) with prostate cancer were studied using endorectal T2-weighted imaging, 2D chemical shift imaging (CSI), and isotropic apparent diffusion coefficient (ADC) maps[4].

Morphometric features of prostate cancers in the anterior compartment of prostate by dynamic contrast enhanced imaging to subsequent histopathologic finding. They prospectively performed DCE MRI before biopsy in patients with suspected prostate cancer and selected those showing both a suspicious lesion at MRI and positive biopsies in the anterior compartment of gland. Tumors were classified by the site of origin on histopathology. Study comprised of 43 patients and they concluded good relationship between DCE-MRI and histopathology for localization, morphologic description and volume distribution of anterior prostate cancers[5].

Prostate MRI, using a high magnetic field with a multi sequences technique, has flourished in its role in prostate cancer diagnosis, management and prognostication. In this research, each study was described in a separate chapter and had different cohort of patients. These were analysed in different time scale during the 2 years of the research. Although there was some overlap of patient cohorts between each chapter and some patients' MR data were used in more than one study. Prostate MRI can achieve a diagnostic localisation accuracy of 80% using dynamic contrast enhancement, with a sensitivity of 79% and a specificity of 83%. The detection rate is particularly good in the peripheral zones where sensitivity reaches 90% and specificity 71%.[6]

Multiparametric MRI offers the single most accurate imaging assessment of local prostate cancer and regional metastatic spread and aids in many aspects of prostate cancer management, including initial detection, biopsy guidance, treatment planning, and follow-up and has further potential emerging roles to replace TRUS biopsy for patients undergoing active surveillance and to initially evaluate patients with suspected prostate cancer before TRUS biopsy. Multiparametric MRI is the current standard because no single MRI sequence is entirely sufficient to characterize prostate cancer. However, the optimal combination and interpretation approach of anatomic and functional MRI sequences still needs to be established. Radiologists need to understand the advantages, limitations, and potential pitfalls of the different sequences to provide optimal assessment of prostate cancer[7].

The present study comprising of forty patients presenting with symptoms of lower urinary tract symptoms, infections, urinary retention, hematuria or asymptomatic which were suspicious of carcinoma prostate on clinical (digital rectal examination) or biochemical basis (raised prostate specific antigen) underwent MRI and spectroscopy and were followed. Out of forty patients (all male patients) the mean age of the patient was 61 years. All patients had elevated prostate specific antigen. In our study, the decision-making rule had high sensitivity and high positive predictive value for the detection of prostate cancer—a trend that has been found in other MR spectroscopic imaging studies. The specificity indicates that the rule is good at identifying benign voxels; that is, if the (Cho _ Cr)/Cit is low and the PA peak is higher than the Cho peak, the voxels is very likely benign. The low sensitivity may be due to several

factors.

Patients in the study showed variable clinical stages and Gleason scores. It has been reported that the sensitivity of MR spectroscopic imaging in cancer detection increases with tumor grade.

The accuracy of the (Cho _ Cr)/ Cit for cancer detection is significant.

## CONCLUSION

Prostate cancer is a high-profile disease due to its incidence, the large number of men dying yearly from the disease, the considerable debate surrounding the benefit and risks of early detection, and the amount of research currently ongoing in its diagnosis and management.

Current study is a prospective observational study conducted from January 2014 to July 2015. 40 patients having clinical symptoms of hematuria, urinary obstruction or biochemical evidence (increased prostate specific antigen level) or suspicious of malignancy on Digital rectal examination underwent MRI and Spectroscopy

MR spectroscopy is rapid; less than 5 minutes are required to collect the data, and the entire process may be automated. Once appropriate statistical classification strategy classifiers are developed from databases with correct disease, MR spectroscopy of the biopsy specimen may become an independent modality to aid in the determination of the patient's diagnosis and prognosis in lesser time.MR prostate and spectroscopy are evolving techniques and which have the potential to provide such diagnostic and prognostic information.

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# Evaluation of Student's Hand Washing Knowledge, Practices and Skills in a College Setting

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## ABSTRACT

**Background:** Hand washing is an effective way to prevent infections and diseases. This study aimed to evaluate the student's social hand washing knowledge, practices, skills and related factors.

**Materials and method:** All existing 3rd year students in the institute were eligible for the study. Participants filled in a questionnaire. The questionnaire tested the students social hand washing knowledge (questions 7), practices (questions 15), and skills (questions 9) which was prepared using previous studies. Participants received 1 point for each correctly answered question concerning their knowledge, practice and skill in respect of investigated issue.

**Results:** In all 100 students that have participated in the study majority of the students wash their hand 6to 10 times (45.3%). Students who skipped the hand wash feel that there is no need of hand wash (24.7%). Most of them feel hot water is better for hand washing (76.7%). Around 95 to 99% of the participants wash their hand before and after food. 98% of participants wash their hands after using the rest rooms and 25.3% of them wash their hand even before using rest room. 76.7% of participants wash their hand after reaching home.

**Conclusion:** The present study stresses on necessity of stressing the hand hygiene protocols in tutorials and clinical settings. It recommends the need for campus based health education programs, development of hand-hygiene promotion programs for the dental student.

***Keywords:*** *Hand washing, Knowledge, Practice, Skills, College setting.*

## INTRODUCTION

Hand washing is one of the most critical control strategies in outbreak management. It is defined as the act of cleaning one's hand with or without the use of water or another liquid, or with the use of soap for the purpose of removing soil, dirt and or microorganisms.[1] Hand washing is an incredibly simple way to reduce one's exposure to potentially disease causing germs and reduce chances of getting sick. The human body can fight with germs, but might lose the battle sometimes and that's

when human being acquires infections.[2] The amount of time taken to wash hands is important to reduce the transmission of pathogens to other person, through food, water, inanimate objects, etc. Wet hands have been known to transfer pathogens much more rapidly than dry or unwashed hands.

Many diseases and conditions spread by not washing hands with soap and water. If soap and water are not available any alcohol based hand sanitizer that contains 60% of alcohol can be used to clean hands.[3] Hand sanitizer is the best way to reduce the number of germs on hands in most situations but they do not eliminate all types of germs. Germs from unwashed hands get into foods and drinks, multiply there and cause various diseases. Removing germs through proper hand washing technic thus prevents diarrhea, respiratory, skin and

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eye infections.[4] Infectious diseases are still the most common and deadly group of diseases for developing world. Annually, more than 3.5 million children under five die from diarrhea and acute lower respiratory-tract infections.[5, 6] In case proper hand washing technic is followed, there would be a significant reduction in the incidence of these diseases.[7, 8] Currently, concept of proper hand washing is not as widespread as it is desired worldwide. It has been reported that the frequency of hand washing with soap before handling food or after using a toilet was observed in only between 0% to 34.0% cases.[8] Center for Disease Control and Association for Professionals in Infection Control and Epidemiology have created guidelines for hand washing.[9] Moreover, in order to emphasize the importance of hand washing, October 15 has been declared as the Global Hand Washing Day by UNICEF since 2008.[10] Knowledge of hand washing is very important for dental students especially when they start their clinical posting in 3rd year of their academic course to prevent the spread of infection through hands because they work in highly contaminated oral cavity with their hands coming in contact with micro bialy saturated saliva. Hence the present study was conducted.

## AIMS AND OBJECTIVES

1. To study the pattern of hand washing technique and practice among students of dental college.

2. To study the awareness about hand washing practice among the students.

## MATERIALS AND METHOD

A total number of 150 students participated in the study. The sampling frame consisted of all 3rd year students of the institute, consented to participate in the study. Ethical clearance was obtained by Institutional Ethics committee and informed written consents from all participants were obtained. Participants were asked to fill in a structured questionnaire which was validated.[11] A total of 31 questions were included, 7 questions to evaluate hand washing knowledge, 15 questions to assess hand washing practice, and 9 questions to estimate hand washing skills. Participants received 1 point for each correctly answered question concerning their knowledge, practice and skill in respect of investigated issue. Frequency of the answers were calculated in percentage using SPSS for Windows 17th Version for statistical analysis.

## RESULTS

Frequency of the answers along with the questionnaire have been tabulated in Table 1, 2, 3 & 4.

Majority of the students wash their hand 6to 10 times (45.3%). Students who skipped the hand wash feel that there is no need of hand wash (24.7%).

Most of them feel hot water is better for hand washing (76.7%). Around 80% of the people agree to remove the watch, bracelet and rings. They also feel that hands have to be washed at least for15 seconds and up to the wrist.

Around 95 to 99% of the participants wash their hand before and after food. 98% of participants wash their hands after using the rest rooms and 25.3% of them wash their hand even before using rest room. 76.7% of participants wash their hand after reaching home.

Most of the participants agree that they have to wash their hands using soap after public transport, touching animals, before preparing meals, after touching garbage, after blowing nose and after touching the sick.

## DISCUSSION

This study evaluated dental student's social hand washing knowledge, practices and skills. It is not possible to define the universally recommended number of daily hand washings to ensure proper hand hygiene as it depends on type of daily activities, however, approximately one third of the students in this study wash their hands less than 5 times a day which is insufficient number for proper hand hygiene. Our study is in agreement with the study conducted by Uner S et al.[12] These findings may indicate widespread insufficient hand hygiene in this population. Also, low scores related to participants' social hand washing knowledge, practice and skills may indicate a need of an extensive public health education program on the topic.

Participants who skip the hand washing believe that there is 'no need of' and 'keep forgetting' to wash the hands. Which is in accordance with similar other studies.[11, 12, 13] Around 10 to 25% of the participants feel that there is no need to remove watches, rings and bracelet while washing hands which is against the WHO guidelines on hand hygiene in health care 2006.[14] Most of the participants agree (95 to 99%) that hands have to be washed with soap before and after meals, after handling garbage, after using a restroom and other daily routines

that may soil their hands which is in agreement with other study.[12, 15, 16]

The results of the present study indicate the necessity of campus based health education programs & creating hand-hygiene promotion programs to the dental students.

**Table 1: Answers to the questions about participants hand washing**

| Questions | Answers | Frequency n (%) |
|---|---|---|
| 1. How many times a day do you wash your hands? | Never | 1  (.7) |
| | 1-2 times | 4  (2.7) |
| | 3-5 times | 61 (40.7) |
| | 6-10        Imes | 68 (45.3) |
| | 11 and over | 16 (10.7) |
| 2. Main reason for skipping hand washing | Far from the sink | 13 (8.7) |
| | No need | 37 (24.7) |
| | No time | 25 (16.7) |
| | Side effects | 4 (2.7) |
| | Keep forgetting | 34 (22.7) |
| | Others | 37(27.7) |

**Table 2: Answers to the questions about participants hand washing knowledge**

| | AGREE n (%) | DISAGREE n (%) | DO NOT KNOW n (%) |
|---|---|---|---|
| Cold water should be used for hand washing | 40 (26.7) | 60 (40) | 50 (33.3) |
| Medium hot water should be used for hand washing | 115 (76.7) | 12 (8) | 23 (15.3) |
| Hot water should be used for hand washing | 29 (19.3) | 89 (59.3) | 32 (33.3) |
| No need to remove watches and bracelets | 20 (13.3) | 125 (83.3) | 5 (3.3) |
| Need to remove rings | 110(73.3) | 35 (23.3) | 5(3.3) |
| No need to wash the wrists | 16 (10.7) | 130 (86.7) | 4 (2.7) |
| Hands should be washed at least for 15 seconds | 124 (82.7) | 16 (10.7) | 10        (6.7) |

**Table 3: Answers to the questions on participants hand washing practices**

| | AGREE n (%) | DISAGREE n (%) | DO NOT KNOW n (%) |
|---|---|---|---|
| I wash my hands before meals | 143 (95.3) | 7 (4.7) | 0 |
| I wash my hands after meals | 149 (99.3) | 1 (0.7) | 0 |
| I wash my hands before using the restroom | 38 (25.3) | 108 (72) | 4 (2.7) |
| I wash my hands after using the restroom | 147 (98) | 3 (2) | 0 |
| I wash my hands when come home. | 115 (76.7) | 34 (20.7) | 4 (2.7) |
| I wash my hands after handshaking | 16 (10.7) | 228 (85.3) | 6 (4) |
| I wash my hands after using public transportation | 109 (72.7) | 33 (22) | 8 (2.7) |
| I wash my hands after touching animals. | 137 (91.3) | 11 (7.3) | 2 (1.3) |

**Cont... Table 3: Answers to the questions on participants hand washing practices**

| | | | |
|---|---|---|---|
| I wash my hands only when they are soiled. | 44 (29.3) | 104 (69.3) | 2 (3.3) |
| I wash my hands before preparing meals. | 138 (92) | 9 (6) | 3 (2) |
| I wash my hands after money exchange | 25 (16.7) | 115 (76.7) | 10 (6.7) |
| I wash my hands after blowing nose | 141 (94) | 6 (4) | 3 (2) |
| I wash my hands after touching garbage | 148 (98.7) | 2 (1.3) | 0 |
| I wash my hands before touching sick people | 74 (49.3) | 64 (42.7) | 12 (8) |
| I wash my hands after touching sick people | 145 (96.7) | 4      (2.7) | 1(.7) |

**Table 4: Answers to the questions on participants hand washing skills**

| | AGREE n (%) | DISAGREE n (%) | DON'T KNOW n (%) |
|---|---|---|---|
| Folding sleeves and removing jewellery such as rings and watches | 125 (83.3) | 24 (14) | 1 (2.7) |
| Getting some soap on hand | 142 (94.7) | 4 (2.7) | 4 (2.7) |
| Turning the faucet on | 133 (88.7) | 2 (6.7) | 3 (4.7) |
| Making some soap lather with some water | 147 (98) | 3 (2) | 0 |
| Turning off the faucet and rubbing the hands | 111 (74) | 35 (23.3) | 0 |
| Clenching the fingers cleaning between the fingers of both hands (without forgetting the thumb) | 128 (85.3) | 15 (10) | 7 (4.7) |
| Cleaning hands by rubbing wrists. | 116 (77.3) | 27 (18) | 7 (4.7) |
| Turning on the faucet and washing hands by rubbing and removing all foam on hands | 140 (93.3) | 8 (5.3) | 2 (3.3) |
| Shedding some water on the tap and turning off the tap | 137 (91.3) | 10 (6.7) | 3 (2) |

## CONCLUSION

The present study indicates the necessity of stressing the hand hygiene protocols in tutorials and clinical settings. And recommends the need for campus based health education programs, development of hand-hygiene promotion programs for the dental student.

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# A Study to Assess the Effectiveness of Awareness Programme in Term of Knowledge Regarding Early Symptoms  of Myocardial Infarction among Bank Employees of Selected Banks at Moradabad, U.P

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## ABSTRACT

**Introduction**:  In the developing countries like India, Myocardial Infarction is one of the leading causes of deaths. The prevalence of Myocardial Infarction has increased from 40 per 1000 in 1968 to nearly 110 per 1000 in 2001. The prevalence of coronary heart disease in urban population has increased from 3.5 per cent in 1960's to 9.5 per cent in 1990's and in rural areas it has been increased from 2 per cent in 1970's to 4 per cent in 1990's. In the year 2005, it was estimated that 30 per cent of deaths in India were due to coronary syndrome.

**Method:** A quantitative research approach was used. The research design adopted for the present study was Qausi experimental design. The target population for the study was bank employees of selected banks of  moradabad. There were two groups (experimental and control group). Sample were bank employees and sample size were 30 in experimental group and 30 in control group. The sampling technique used for this was non probability purposive sampling. The structured knowledge questionnaire was prepared to assess the knowledge regarding early symptoms of MI. Data analysis was done by both descriptive and inferential statistics on the basis of objectives and hypothesis of study.

**Results**: The result show that in experimental group 66.67% of the bank employees were having moderate knowledge, 26.67% of the bank employees had inadequate knowledge and 6.66% of the bank employees had adequate knowledge in pre test . Whereas 96.67% of the bank employees had adequate  knowledge, 3.33% of the bank employees had moderate knowledge in post test. On the other hand in control group, 2/3rd (70%) of the bank employees had moderate knowledge 20% of the bank employees had inadequate knowledge and 10 % of the bank employees had adequate knowledge in pre test. Whereas 66.67% of the bank employees had moderate knowledge, 23.34% of the bank employees had inadequate knowledge test, 10 % of the bank employees had adequate knowledge in post test. In experimental group mean pre-test knowledge scores 13.94 of bank employees was lesser than the  post test mean score 25.77. The mean difference obtained between the pretest and post test was 11.83 while the 't' value was statistically significant at 0.05 level. The post test mean score of experimental group was 25.77 while the mean score of control group was 13.56. The mean difference between the post test knowledge score of experimental group and control group was 12.21. The 't' value was statistically significant at 0.05 level. It shows that there was a significant difference between post test knowledge of experimental group and control group. There is significant association between knowledge regarding early symptoms of MI with their selected demographic variables is self education and presence of disease.

**Conclusion:** The conclusion of this study stated that , there are majority of bank employees at high risk of MI , and bank employees were not having sufficient knowledge regarding early symptoms of myocardial infarction  and the health awareness programme was effective in terms of increment in knowledge among bank employees.

*Keywords : Awareness programme, early symptoms, Myocardial Infarction, bank employees*

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## INTRODUCTION

Myocardial infarction   is a life threatening heart disease and   a major public health problem all over the

world. Every 29 second an American suffers a coronary disease event and approximately every one minute someone dies of coronary event[1]. Among the ethnic groups in the world, Indians run the highest risk of coronary artery disease (CAD). The risk of cardiovascular disease among the Indians are four times higher than that of White Americans, six times more than that of Chinese and 20 times greater than that of Japanese[2]. Prevalence of coronary artery disease has progressively increased in India during the last half of the 20th century particularly among the urban population and is expected to become the most important cause of morbidity and mortality over next two decades.[3] The vulnerability of urban Indian to myocardial infarction is possibly related to different nutritional, environmental and life style factors. Increased incidence is associated with sedentary life styles, higher consumption of calories, saturated fats, salt, tobacco and alcohol. These factors contribute to obesity, dyslipidemia, hypertension, hyperurecemia and diabetes mellitus.[4] Currently, the Cardio vascular diseases is a leading causes of death in India atherosclerotic changes begin in the early ages and progress to great extent during adolescence . many condition makes people to vulnerable to coronary artery disease like Physical inactivity, unhealthy habits, eating fast food, unhealthy competition and stress[5]. It is being notics that nearly 95% of people who a fatal cardiovascular diseases cleared the major risk factors: high blood pressure, smoking, sedentary life style, and diabetes beside a poor diet and over weight, through which the Atherosclerotic plaque and subsequent thrombus formations are the most common causes of MI[6]. India have the highest rates of CHD all over the world is 5 to 10 times higher in those below 40 years of age and 2 to 4 times higher at all ages[7]. According to WHO reported that the cardiovascular diseases are the world's largest killers disease[8]. the American Heart Association published a position statement on exercise that stated, "There is a relation between physical inactivity and cardiovascular mortality, and inactivity is a risk factor for the development of coronary artery disease." A sedentary life style contributes to obesity, hypertension and increased cholesterol[9]. The absence of elevation of these risk factors, than coronary heart disease is rare cause of death[10]. Other relative risk of myocardial infarction increased with tobacco consumption in both men and women and was higher in inhalers than in non-inhalers[11].

## OBJECTIVES

1. To identify the number of bank employees at high

risk of myocardial infarction.

2. To assess the knowledge regarding early symptoms of myocardial infarction among bank employees at high risk of myocardial infarction of selected banks of Moradabad.

3. To determine the effectiveness of Health awareness programme in term of knowledge regarding early symptoms of myocardial infarction among bank employees at high risk of myocardial infarction**.**

4. To determine the association between the knowledge of bank employees on early symptoms of myocardial infarction, with their selected socio-demographic variables.

## MATERIAL AND METHOD

A quantitative research approach was used. The research design adopted for the present study was Qausi experimental design. The target population for the study was bank employees of selected banks of Moradabad. There were two groups (experimental and control group). Sample were bank employees and sample size were 30 in experimental group and 30 in control group. The sampling technique used for this was non probability purposive sampling. 30 Structured knowledge questionnaire was prepared ( Test retest reliability of the tool was r= 0.97) to assess the knowledge regarding early symptoms of MI. Content validity of the tool established by the experts from the field of medical surgical Nursing. Data analysis was done by both descriptive and inferential statistics on the basis of objectives and hypothesis of study. Effectiveness of health awareness programme was calculated by mean, standard deviation and 't' value and chi square test was used to determine the association between knowledge regarding early symptoms of MI with their selected demographic socio variables.

## FINDINGS

### SECTION A

High risk group of MI among bank employees

Finding revealed that after the pre survey half of the ( 56.04%) bank employees belonged to high risk group, 17.26% bank employees belonged to moderate risk group, 26.70% bank employees belonged to low risk group.

### SECTION B

Demographic profile

**Table1: Percentage distribution of bank employees as per Demographic characteristics. $N_1 = 30$, $N_2 = 30$**

| Demographic characteristics | Experimental group ( $N_1$ %) | Control group ($N_2$ %) |
|---|---|---|
| **Age** | | |
| 36 year- 40 year | 13.34 | 3.33 |
| 41 year- 45 year | 16.65 | 20 |
| 46 year- 50 year | 13.34 | 13.34 |
| 51year – 55 year | 26.67 | 33.33 |
| 56 year- 60 year | 30 | 30 |
| **Gender** | | |
| Male | 80 | 80 |
| Female | 20 | 20 |
| Education | | |
| Senior secondary | 10 | 6.66 |
| Graduation | 23.34 | 26.67 |
| Post graduation | 66.67 | 63.34 |
| Others | 0 | 3.33 |
| **Marital status** | | |
| Married | 90 | 83.34 |
| Unmarried | 6.67 | 3.33 |
| Divorce | - | 6.67 |
| Widow/Widower | 3.33 | 6.66 |
| **Family Income** | | |
| 10,001-15,000 | 6.67 | 6.67 |
| 15,001- 20,000 | 3.33 | 3.33 |
| More than 20,000 | 90 | 90 |
| **Job experience** | | |
| Below 5 years | 3.33 | 0 |
| 6 - 10 years | 13.34 | 13.34 |
| 11 -15 years | 20 | 23.33 |
| More than 15 years | 63.33 | 63.33 |
| **Presence of disease** | | |
| Yes | 80 | 80 |
| No | 20 | 20 |

**SECTION C**

Level of knowledge among bank employees in experimental and control group.

In pre test of experimental group, 66.67% of the bank employees respondents were having moderate knowledge ( range 11-20) in pre-test, where as 26.67% of

the bank employees respondents were having inadequate knowledge (range 0-10) in pre- test, followed by 6.66% of the bank employees respondents were having adequate knowledge (range 21-30) in pre- test. In post test of experimental group, 96.67% of the bank employees respondents were having the Adequate knowledge (range 21- 30) in post-test, where as 3.33% of the bank employees respondents were having moderate knowledge (range 11-20) in post- test. In pre test of control group, 70% of the bank employees respondents were having moderate knowledge (range 11-20) in pre-test, followed by 20% of the bank employees respondents were having inadequate knowledge (range 0-10 ) in pre- test, followed by 10 % of the bank employees respondents were having adequate knowledge ( range 21-30) in pre- test. In post test of control group, 66.67% of the bank employees respondents were having moderate knowledge (range 11-20) in post-test, followed by 23.34% of the bank employees respondents were having inadequate knowledge (range 0-10 ) in post- test, where as 10 % of the bank employees respondents were having adequate knowledge ( range 21-30) in post- test.
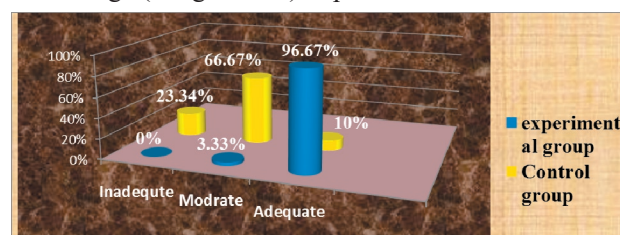


**Figure1. cylindrical graph showing difference between post test knowledge regarding early symptoms of MI among bank employees in experimental and control group**

**SECTION D:**

Effectiveness of health awareness program in experimental group.

Comparison of pre-test and post- test knowledge scores paired't' test was used.

**Table 2: Mean, standard deviation, mean difference and't' value of pre- test and post- test knowledge scores in the experimental group. N= 30**

| Test | Mean Score | Standard deviation | Mean difference | 't' value |
|---|---|---|---|---|
| Pre- test | 13.94 | 5.78 | 11.83 | 18.78* |
| Post- test | 25.77 | 2.90 | | |

$T_{29} = 1.699$,    * Significant

**SECTION E**

Comparisons of post- test knowledge score in the experimental and control group.

To test the statistical significance between the post- test knowledge scores in the experimental and control group In depended' test was computed and the following null hypothesis $H_{02}$ was stated.

**Table 3: Mean, standard deviation, mean difference and 't' value of post- test knowledge scores of the experimental and control group $N_1= 30$, $N_2= 30$**

| Test | Mean score | Standard deviation | Mean difference | 't' value |
|------|-----------|--------------------|-----------------|-----------|
| Experimental group | 25.77 | 2.90 | 12.21 | 16.44* |
| Control group | 13.56 | 4.54 | | |

$T_{58}= 1.671$ $p< 0.05$     * Significant

**SECTION F**

Association between pre-test knowledge scores and selected socio demographic variables

**Table 4. Chi square distribution of pre test knowledge score on early symptoms of MI among bank employees with their demographic variables. N= 60**

| Sno | demographic characteristics | Knowledge | | | $\chi^2$ | d.f | p- value | Inference |
|-----|------------------------------|-----------|----------|------------|----------|-----|----------|-----------|
| | | Adequate | moderate | inadequate | 6.91 | 8 | 15.51 | NS |
| 1. | **Age in years** | F | F | F | | | | |
| | a.36-40 | - | 7 | 1 | | | | |
| | b.41-45 | - | 9 | 3 | | | | |
| | c.46-50 | - | 6 | 2 | | | | |
| | d.51-55 | 2 | 12 | 3 | | | | |
| | e.56-60 | 1 | 10 | 4 | | | | |
| 2. | **Sex** | | | | 1.906 | 2 | 5.99 | NS |
| | a. Male | 5 | 33 | 11 | | | | |
| | b. Female | - | 8 | 3 | | | | |
| 3. | **Self education** | | | | | 8 | 15.51 | S |
| | a.Sen. secondary | - | - | | | | | |
| | b. Graduation | - | 14 | 4 | 21.133 | | | |
| | c.Post Graduation | 5 | 26 | 2 | | | | |
| | d. Other | - | 1 | 5 | | | | |
| | | | | - | | | | |
| 4. | **Marital status** | | | | | | | |
| | Married | 5 | 34 | 13 | 2.90 | 6 | 12.59 | NS |
| | Unmarried | - | 3 | - | | | | |
| | Divorce | - | 2 | - | | | | |
| | Widow/ widower | - | 2 | 1 | | | | |
| 5. | **Family income** | | | | | | | |
| | 10,001-15,000 | - | - | 4 | | | | |
| | 15001-20,000 | - | - | 1 | 5.041 | 6 | 12.59 | N S |
| | More than 20,000 | 5 | 41 | 9 | | | | |
| 6. | **Job experience in years** | | | | | | | |
| | Below 5 | - | 1 | - | 5.849 | 6 | 12.59 | NS |
| | 6 to 10 | - | 4 | 4 | | | | |
| | 11 to 15 | - | 10 | 3 | | | | |
| | More then 15 | 5 | 26 | 7 | | | | |
| 7. | **Presence of disease** | | | | | | | |
| | Yes | 5 | 35 | 7 | 9.166 | 2 | 5.99 | S |
| | No | - | 6 | 7 | | | | |

Table value of $\chi^2$ at 5% level    NS= Not significant S=Significant

Table 4 indicate association of pre test knowledge score on early symptoms of MI among bank employees with their demographic variables. There was significant association between knowledge regarding early symptoms of MI with their selected socio demographic variables i.e. self education and presence of disease.

## DISCUSSION

The study was done to evaluate the effectiveness of health awareness program in term of knowledge regarding early symptoms of MI among bank employees in selected banks at Moradabad U.P. Study reveals that after the pre survey 56.04% of bank employees belonged to high risk group, 17.26% bank employees belonged to moderate risk group and 26.70% bank employees belonged to low risk group. Adding to this, the study reveals that during pre-test assessment, in experimental group 66.67% of the bank employees had moderate knowledge, 26.67% of the bank had inadequate knowledge, and 6.66% of the bank employees had adequate knowledge. On the other hand in control group, 70% of the bank employees had moderate knowledge and 20% of the bank employees had inadequate knowledge and only 10 % of the bank employees had adequate knowledge. In terms of effectiveness of Health awareness programme, study reveals that in experimental group mean pre-test knowledge value was 13.94 and the standard deviation was 5.78. In post test mean score was obtained 25.77 and the standard deviation was 2.90. The mean difference obtained between the pretest and post test was 11.83. The 't' value obtained was 18.78, which is statistically significant at 0.05 level of significance. Health awareness program was effective in increasing the knowledge level of bank employees in experimental group. The post test mean score of experimental group was 25.77 and the standard deviation was 2.90, while the mean score of control group was 13.56, and the standard deviation was 4.54. The mean difference between the post test knowledge score of experimental group and control group 12.21. The 't' value obtained was 16.44 and p< 0.05. It shows that there was a significant difference between post test knowledge of experimental group and control group. In terms of the association between the knowledge of bank employees, with their selected socio-demographic variables, findings revealed that there was significant association between knowledge regarding early symptoms of MI with self education and presence

of disease among study participants .

**The finding was supported by following studies:**

Similar result found in a study, conducted to assess the Effectiveness of planned teaching on knowledge of early signs and symptoms and immediate treatment of MI among patients. Result reveals that 82% were males and 38% sample 51-60 years of age group, and they had habits of alcoho, chewing tobacco, and. Smoking. Samples were having Ischemic Heart Disease 72% and Diabetes with Ischemic Heart Disease 28%. In posttest evaluation 80 to 100% samples were knowledge of the heart structure and function, disease process, risk factors, disease meaning and also about the signs and symptoms, medications, action of drugs, doses of drugs and complications of MI[12].

A cohort study with a socio demographic interview to identify cardiovascular risk factors. A total 1,047 workers were assessed in which 87% were male with a mean age of 36-38 years. The frequency of sedentary lifestyle was 83% and 63% was overweight 45% were in the pre-hypertension range. Result of this study was Overweight and sedentary lifestyle is the main cardiovascular risk factors in a population of industry workers[13].

## CONCLUSION

The conclusion of this study stated that, there are majority of bank employees at high risk of MI, and bank employees were not having sufficient knowledge regarding early symptoms of myocardial infarction and the health awareness programme was effective in terms of increment in knowledge among bank employees.

**Conflict of Interest:** No such conflict of interest Exists.

**Source of Finding:** It is a self funded study

**Ethical Clearance:** No such ethical issue exists

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# Generation of District Level Life Table for India

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## ABSTRACT

The importance of constructing life table at the district level lies in the fact that it helps to generate other life tables relating to work force, educational level, health status etc which will benefit the policy makers to evaluate and monitor the overall scenario of quality of life of the people residing in the districts of India. In the present study in addition to the analysis of $e_0^0$ for both the sexes at the district level of the selected states, temporary expectation of life are also estimated to study the level of mortality in different phases of life. The results highlighted that in all selected phases of life the districts of Kerala are in a better position in comparison to the other districts for both the sexes.

**Keywords**: *Life expectancy at birth, Temporary expectation of life, Regression, India, District.*

## INTRODUCTION

Life table is a powerful tool for illustrating and describing the demographic phenomenon. Data on mortality by age, sex and cause are primary inputs for assessing population health status and a cornerstone of the evidence base for health policy in combination with other epidemiological and socio-economic information[1]. The expectation of life is perhaps the most well known, widely used, widely cited and widely studied statistic[2]. Over the years life expectancy at birth and at adult ages as well have been used as an index of health status and level of mortality in a population. Changes over time in the level of life expectancy at birth (LEB) can result from changes in mortality risks at different stages of life[3]. For analyzing mortality, LEB is the most commonly used indicator which is defined as the average number of years that a new born can expect to live if the current mortality conditions prevail during the rest of his or her life. According to World Mortality Report 2013, in the early 1950s, global life expectancy stood at 46.9 years while in 2010-2015 it reached 70 years. Availability of proper health care facilities and also change in the demographic

factors might be possibly the reason for the gains in life expectancy over the 40 years. Moreover it does not necessarily mean that a change in life expectancy will imply the change in the mortality rates in the same magnitude at all ages. Usually, most age groups will register a decline in mortality and hence will contribute to increased life expectancy; but for some age groups, mortality may have even increased and would have a counteracting effect on the increase in life expectancy[4]. Generally, four periods namely infancy, childhood, working life and old age have been adopted to study the mortality pattern in different phases of life. The division of the periods helps to understand the fluctuations in the age pattern and also is useful for analytical purposes as there are various factors which affect mortality in the different phases of life. The level of mortality in these phases is measured by an index known as temporary life expectancy[5]. Temporary expectation of life (TLE) is interpreted as the average number of years lived between ages $x$ and $x+n$ under life table mortality conditions by those, who are alive at exact age $x$[5]. Due to the lack of reliable statistics in some countries it is found that sometimes in published life table, mortality at old ages does not represent the actual mortality of those ages but instead a simplistic assumption based on a model life table or a mathematical function. This problem can be avoided by the use of temporary life expectancies (life expectancies between two specific ages)[4]. It is found that health care studies are very limited at district level

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in India. For health care planning knowledge of mortality rates at the district level is important as districts are the basic territorial units of administration and as well as the keystone of the whole administrative structure.

## OBJECTIVES

1.    To compare sex-wise LEB at the district level of some selected states from various zones of India namely Assam (North-East), Rajasthan (North), Kerala (South), West Bengal (East), Gujarat (West), Uttar Pradesh (Central) respectively based on 2001 census.

2.    To calculate temporary life expectancy (TLE) at the district level of the above mentioned states for both the sexes based on 2001 census.

## DATA AND METHODOLOGY

Calculation of TLE requires life tables. The construction of a life table requires reliable data on the age-specific death rates (ASDRs) calculated from information on deaths by age and sex (from vital registration system) and population by age and sex (from population censuses)[6]. But in many developing countries of Asia, Africa and Latin America that basic data is not available due to the poor vital registration system and incompleteness of coverage or errors in reporting.  In India, sample registration system (SRS) provides national and state level ASDRs but not for the districts[6]. In small subpopulations due to the insufficiency of vital and demographic data, life expectancy is difficult to estimate. Indirect demographic techniques may be made to investigate the mortality experience in such a situation.

Choudhury and Sarma (2011) developed a method for constructing female life tables for both the sexes and for females at district level when the only information available was LEB[7]. But life tables for male at the district level are not available. So for the construction of ordinary life table for males, SRS data covering a period of more than 35 years from 1970-75 to 2009-13 for India and its major states have been used in this study. The SRS based life tables are available only for 16 states. In the present study, state-wise regression models for males have been developed by clubbing the data for all the years together. Two sets of regression models have been exploited. First by taking the LEB ($e_0^0$) as independent variable and expectation of life at ages 1, 5, 10 and so on as dependent variable and secondly $e_0^0$ as independent variable and the probability of deaths at ages 0, 1, 5 and so on as dependent variable. Both the sets constitute 16 regression equations corresponding to the age group 0-1, 1-5, 5-10,….,65+. Next to each regression equation, the coefficient of determination ($R^2$) which explains the admissibility of the model are also supplied. It is seen that $_nq_x$ are related to $e_0^0$ by various functions (linear, quadratic or cubic) for different $x$ with very high $R^2$. But the function with maximum $R^2$ has only been retained. After estimating the probabilities of death if it is found that $_nq_x$ results in negative value for some $x$ we changed the function and selects the one with the next highest $R^2$. This is repeated till all the values are calculated up to $x$=65+. In a similar way expectation of life for the respective age groups has been calculated. The estimates of LEB at the district level of India have been taken from a study by Choudhury and Sarma (2012)[8].

After calculating the $_nq_x$ and $e_x^0$, the other life table functions are calculated as:

$$d_x = q_x l_x \; for \; x = 1, 5, \dots, 65 + \; and \; l_0 = 100000$$

$$l_{x+n} = l_x - d_x$$

$$_1L_0 = 0.276 l_0 + 0.724 l_1$$

$$_4L_1 = 0.034 l_0 + 1.184 l_1 + 2.782 l_5$$

$$_5L_5 = -0.003 l_0 + 2.242 l_5 + 2.761 l_{10}$$

The values of $_5L_x$ from ages 10 and above are obtained as $_5L_x = T_x - T_{x+5}$ and $T_x = e_0^x / l_x$.

Finally, TLE between the exact ages $x$ and $x+n$ is given by

$$_nE_x = \frac{T_x - T_{x+n}}{l_x}$$

**Table 1:  Sex- wise comparison of probability of death at age 0 and expectation of life at birth at the district level of the selected states, 2001.**

| States | No. of districts | Districts with | | | | |
|---|---|---|---|---|---|---|
| | | Probability of death/ expectation of life at age 0 | Highest $e_0^0$ | Lowest $e_0^0$ | Highest $_1q_0$ | Lowest $_1q_0$ |
| Assam | 23 | Male | Dibrugarh (62.6) | Dhubri (53.6) | Dhubri (0.124) | Dibrugarh (0.0790) |
| | | Female | Nalbari (62.16) | Darrang (56.13) | Darrang (0.08566) | Nalbari (0.06516) |
| Gujarat | 25 | Male | Amreli (66.80) | Dohad (57.30) | Dohad (0.1135) | Amreli (0.06600) |
| | | Female | Amreli (70.25) | Dohad (59.74) | Amreli (0.03295) | Dohad (0.08970) |
| Kerala | 14 | Male | Pathanamthitta (78.30) | Wayanad (65.80) | Wayanad (0.0578) | Pathanamthitta (0.0078) |
| | | Female | Pathanamthitta (79.23) | Wayanad (67.90) | Wayanad (0.03728) | Pathanamthitta (0.00333) |
| Rajasthan | **32** | Male | Jhuhunun (64.2) | Banswara (50.3) | Banswara (0.1078) | Jhuhunun (0.0522) |
| | | Female | Jhuhunun (67.06) | Banswara (53.31) | Banswara (0.11615) | Jhuhunun (0.05360) |

**Ccont... Table 1: Sex- wise comparison of probability of death at age 0 and expectation of life at birth at the district level of the selected states, 2001.**

| | | | | | | |
|---|---|---|---|---|---|---|
| Uttar Pradesh | 70 | Male | Baghpat (67.40) | Philibit (53.7) | Philibit (0.1328) | Baghpat (0.0506) |
| | | Female | Ballia (64.37) | Balrampur (51.28) | Balrampur (0.12862) | Ballia (0.06887) |
| West Bengal | 18 | Male | Kolkata (67.9) | Maldah (55.4) | Maldah (0.0788) | Kolkata (0.0413) |
| | | Female | Kolkata (68.86) | Maldah (57.25) | Maldah (0.09140) | Kolkata (0.03567) |

Table 1 reveals that among all the districticts of the selected states, Pathanamthitta district of Kerala had achieved the highest LEB with 78.30 years and lowest LEB is attained in Banswara district of Rajasthan with 50.3 years for males. District-wise female infant mortality rates and LEB are taken from Choudhury and Sarma (2011). Comparing the mortality rates at age 0 for both the sexes it is seen that death rates among the females are lower than males. According to 2001 census, national level LEB for male and female are 62.3 years and 64.6 years respectively. The above table showed that only in Kerala, all the districts had LEB over 65 years for both the sexes which are higher than LEB at the national level. High mortality rates may be possibly the cause behind lowering the expectation of life at birth for some districts.

**Table 2: Number of districts in different intervals with respect to percentage of ratios of TLE to maximum possible years in different phases of life for both the sexes, 2001.**

| States | Sex | Percentage of ratios of TLE to maximum possible years in different phases of life. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $_0E_{15}$ | | | $_{45}E_{15}$ | | | $E_{60+}$ | | |
| | | <80% | 80-95% | >95% | <80% | 80-95% | >95% | <20% | 20-30% | >30% |
| Assam | Male | 0 | 1 | 22 | 0 | 23 | 0 | 1 | 21 | 1 |
| | Female | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 23 | 0 |
| Gujarat | Male | 0 | 0 | 25 | 0 | 24 | 1 | 0 | 25 | 0 |
| | Female | 0 | 5 | 20 | 0 | 15 | 10 | 22 | 3 | 0 |
| Kerala | Male | 0 | 0 | 14 | 0 | 0 | 14 | 0 | 14 | 0 |
| | Female | 0 | 0 | 14 | 0 | 0 | 14 | 0 | 14 | 0 |
| Rajasthan | Male | 0 | 0 | 32 | 0 | 19 | 13 | 1 | 23 | 1 |
| | Female | 0 | 32 | 0 | 0 | 32 | 0 | 1 | 31 | 0 |
| Uttar Pradesh | Male | 0 | 0 | 70 | 0 | 65 | 5 | 0 | 69 | 1 |
| | Female | 27 | 38 | 5 | 0 | 70 | 0 | 47 | 23 | 0 |
| West Bengal | Male | 1 | 0 | 17 | 0 | 18 | 0 | 0 | 18 | 0 |
| | Female | 0 | 17 | 1 | 0 | 12 | 6 | 0 | 18 | 0 |

In the present study considering 0-15 as age group of children, 15-60 as adulthood and 60+ as old age, TLE for the respective age groups have been calculated to study the mortality variation at district level. The above table presents the number of districts falling in different interval with regards to the percentage of the ratio of TLE to maximum possible years of life in the various phases of life for both the sexes. From table 2, it is found that all the 14 districts of Kerala had achieved over 95 % to the maximum possible years of life in the 0-15 age group for both the sexes. In case of males almost in all the districts of the selected states had achieved highest percentage (>95%) of the maximum possible years of life in this age group. But the performance of one district of West Bengal is very poor (<80%) for males. The situation of females in almost all the districts of the selected states except Kerala is also not satisfactory as females of many districts have not touched over 95% of maximum possible years of life in the age group 0-15. The worst situation has been found among the females in the districts of Uttar Pradesh as out of 70 districts, 38% of the districts showed very low percentage of ratio of TLE to maximum possible years of life in this age group. Higher level of infant and child mortality rates might be one of the factors which resulted in low TLE during the age group 0-15. Due to lack of proper nutrition and high incidence of infectious disease also leads to high levels of mortality among the children.

In the age range 15-60, almost all the districts of the selected states achieved above 80 % of the maximum possible years of life in case of both males and females. The situation in all the districts of Kerala is much favorable as both males and females of those districts had attained over 95% of the maximum possible years of life in the age group 15-60. Comparing the two age groups 0-15 and 15-60 respectively, it is seen from the table 2 that the percentage values of ratio of TLE to maximum possible years of life for males in the districts of Assam, Gujarat, Rajasthan, Uttar Pradesh and West Bengal was more satisfactory in the 0-15 age group rather than 15-

60.Similar situation among the females have also been found in the districts of Assam and Uttar Pradesh. The factor behind lowering the value of TLE in this phase of life among the man might be possibly due to heavy consumption of alcohol, smoking, drinking etc.and also hard work. Deaths of women during the reproductive and child bearing period may be the reason for low value of TLE among the females in this age group. The principal causes of death in this phase of life are accidents and violence, tuberculosis, heart disease, influenza and malaria[5] .The percentage values of the ratio of TLE to maximum possible years of life in the old age (60+) are not at all satisfactory for both the sexes .The situation of females in this age sector in the districts of Uttar Pradesh is very unfavorable as more than half of the districts had the value of percentage of ratio of TLE to the maximum possible years is <20%.

Due to the lack of sufficiency of reliable data, we are unable to calculate district wise ordinary life tables for the year 2011. Comparing the SRS abridged life table for the period 1999-2003 and 2009-13 (as 2001 and 2011 are the centered periods) for both the sexes, it is observed that male LEB in 2001(2011) was 62.3 (65.8 ) years while female LEB in 2001 (2011)was 64.6(69.3) years at the national level. It is noticed that LEB for male (female) has gained for almost 4 (5) years from 2001 to 2011 at the national level. Similar situation has also been observed at all the selected states .For instance, in Gujarat LEB for male (female) was 63.0 (67.2) years in 2001 while it was 66.0 (70.5) years in 2011.The gain of years in the LEB for male (female) was 3(3.3) years. The difference between the gain in LEB at the national level and Gujarat for male (female) is 1(1.7) years which is very less. Assuming that states followed the pattern as the national level, it may be expected that expectancy of life at birth at the district level will also follow the similar pattern from the respective states. Estimates of expectation of life at birth falling in different intervals under this assumption for the year 2011 for both the sexes are shown in the following table.

**Table 3: Number of districts of the selected states in different intervals of LEB (male, female) for 2001 and 2011.**

| LEB Interval | Male | | Female | |
|---|---|---|---|---|
| | Number of Districts(2001) | Number of Districts(2011) | Number of Districts(2001) | Number of Districts(2011) |
| Below 50 | 0 | 0 | 0 | 0 |
| 50-60 | 75 | 26 | 85 | 18 |
| 60-70 | 107 | 143 | 85 | 130 |
| Above 70 | 0 | 13 | 12 | 34 |
| **Total** | **182** | **182** | **182** | **182** |

## CONCLUSION

The importance of constructing life table at the district level lies in the fact that it helps to generate other life tables relating to work force, educational level, health etc through which it the policy makers will be benefitted to evaluate and monitor the overall scenario of quality of life of the people residing at the district level. The findings of the result will also help the policy makers to take the necessary steps in a serious manner especially for those districts with high mortality rates. It is believed that provision of good medical facilities along with proper nutritional status will certainly contribute in reducing the death rates and will give a better healthier life to the people.

**Ethical Clearance:** Not applicable as the paper is based on secondary data from different published sources.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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# An Assessment of Injection Practices of Health Care Providers in a Semiurban Areas of Ghaziabad UP

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## ABSTRACT

**Background:** Unsafe injection practices are commonly associated with transmission of blood-borne pathogens. Around 16 billion injections are administered each year in developing and transitional countries, most of these are unnecessary and unsafe. The re-use of needles and syringes are common public health problem.

**Method:** A cross-sectional study was done on injection practices among health care providers in Ghaziabad UP. Predesigned pretested Proforma was filled by interviewing injection providers. Microsoft Excel was used for analysis. Chi-square test was used as test of significance and p value of less than 0.05 was considered as significant.

**Results:** Practice of (37.5%) hands washing, (40.0%) checked expiry date of drugs on vials or ampules, at the time of giving injection. (45.0%) used gloves, (72.5%) used disposable syringes and needles and (27.5%) glass syringe. (87.5%) used spirit swab, (15.0%) touch the syringes or needles before or after giving injection. (75.0%) participants were doing harmful practices like recapping of needles and re-use of syringes, (27.5%) used needle destroyer by hub cutter soon after injection procedure. (22.5%) of the participants used color coded bags for proper disposal of syringes and needles.

**Conclusion:** The results indicated prevalent unsafe injection practices in survey area. In addition interventions are needed to improve injection safely.

*Keywords:* *Health care providers, Safe injection practices, Injection Procedure.*

## INTRODUCTION

It is well known that prevention is always better than cure. On one hand we are immunizing to prevent diseases and on the other hand if we do not follow the safe injection practices there will be introgenic transmission of blood born diseases.

Out of the injections which are administered in day to day practice of medicine, a significant percentage has been found to be unsafe. These unsafe injections will continue to add disease burden and loss of life. Injection

Safety has been an area of high focus for the Indian Academy of Pediatrics. WHO defines safe injection practices as one that does not harm the recipient, does not expose the provider to any avoidable risk and does not result in waste that is dangerous to other people. [1]

This is achieved by administering an injection using a sterile device (syringe, needle, etc), adopting sterile technique by a qualified and well trained person and discarding the used devices in a puncture proof container specially designed for appropriate disposal. Any breach in the process makes the injection unsafe. [2]

Available information suggests that the use of injections in developing countries is common and often unnecessary. [3]

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Healthcare workers in developing countries inconsistently practice universal precautions and are commonly exposed to blood in the course of their work via needle-stick injuries, splash incidents and direct contact.[4]

The widespread incidences of blood borne diseases, which are often result of infection due to unsafe injection practices, have been an important public health problem worldwide. [5] Sizeable studies in India have identified prevalent unsafe practices and significance percentage of blood borne viral infections have been attributed to unsafe injection practices. [6]

Thus this study was conducted to assess the prevalent injection practices among injection providers in a semi urban area of district Ghaziabad.

## MATERIAL AND METHOD

It was a qualitative study to assess the injection practice skills of health care providers by interviewing and observing them during injection procedure about their preparation injection and disposal system during injection procedure.

Study was conducted between Jan 2016-April 2016 in semi urban area of Ghaziabad ( Pilkhuwa, Dasna, Mussorie and Dholana) covering health care providers . A total of around 80 health care providers were participated in this study regarding their views and experiences related to injection safety.

A prior written consent was obtained from all study participants. The consent form were prepared in local language. The interviews were conducted using predesigned and pretested questionnaire.

The responses and observations were recorded on paper with later entered on databases. Microsoft MS-excel was used for analysis. Chi-square test was used as test of significance and p value of less than 0.05 was considered as significant.

## RESULTS

**Table 1: Frequency distribution according to age, sex, cader of staff and working experience**

| VARIABLE | FREQ | % |
|---|---|---|
| **Age (in years)** | | |
| 20-29 | 17 | 21.3 |
| 30-39 | 31 | 38.8 |
| 40-49 | 23 | 28.8 |
| >=50 | 9 | 11.3 |
| **Sex** | | |
| Male | 34 | 42.5 |
| Female | 46 | 57.5 |
| **Cadre of staff** | | |
| Doctors | 4 | 5.0 |
| Nurses | 35 | 43.8 |
| CHEW & EHO | 22 | 27.5 |
| Laboratory Staff & Auxiliary Medical Staff | 19 | 23.8 |
| **Work Experience (in years)** | | |
| <1 | 14 | 17.5 |
| 1—5 | 17 | 21.3 |
| 6—10 | 31 | 38.8 |
| >10 | 18 | 22.5 |
| **TOTAL** | **80** | **100.0** |

**Table 2: Frequency distribution according to injection giving practices**

| SN | INJECTION GIVING PRACTICES (N=80) | YES | % |
|---|---|---|---|
| 1 | WASHING HANDS BEFORE GIVING THE INJECTION | 30 | 37.5 |
| 2 | CHECKED EXPIRY DATE OF DRUGS ON VIALS OR AMPULES AT THE TIME GIVING INJECTION | 32 | 40.0 |
| 3 | WEARING GLOVES DURING GIVING INJECTION | 36 | 45.0 |
| 4 | GIVING INJECTION WITH A DISPOSABLE SYRINGE AND NEEDLES | 58 | 72.5 |
| 5 | GIVING INJECTION WITH A GLASS SYRINGE | 22 | 27.5 |
| 6 | USE SPIRIT SWAB BEFORE AND AFTER INJECTION PROCEDURE FOR CLEANING THE SITE | 70 | 87.5 |
| 7 | TOUCHING THE SYRINGES / NEEDLES | 12 | 15.0 |
| 8 | RECAPPED NEEDLE AND RE-USE OF SYRINGE SOON INJECTION PROCEURE | 60 | 75.0 |
| 9 | SYRINGES/ NEEDLES DESTROYED BY HUB CUTTER SOON INJECTION PROCEDURE | 22 | 27.5 |
| 10 | USE OF COLOR CODED BAGS FOR DISPOSAL OF THE NEEDLES AND SYRINGES | 18 | 22.5 |

**Table 3: Association between injection giving practices and age, sex, cader of staff and working experience**

| VARIABLE | CAT1* (N=12) | | CAT2* (N=36) | | CAT3* (N=32) | | TOTAL (N=80) | |
|---|---|---|---|---|---|---|---|---|
| | FREQ | % | FREQ | % | FREQ | % | FREQ | % |
| **AGE (IN YEARS)** | | | | | | | | |
| 20-29 | 3 | 17.6 | 5 | 29.4 | 9 | 52.9 | 17 | 100.0 |
| 30-39 | 3 | 9.7 | 11 | 35.5 | 17 | 54.8 | 31 | 100.0 |
| 40-49 | 5 | 21.7 | 13 | 56.5 | 5 | 21.7 | 23 | 100.0 |
| >=50 | 1 | 11.1 | 7 | 77.8 | 1 | 11.1 | 9 | 100.0 |
| χ²- VALUE = 12.03 p-VALUE= 0.061 (NS) | | | | | | | | |
| **Sex** | | | | | | | | |
| Male | 5 | 14.7 | 17 | 50.0 | 12 | 35.3 | 34 | 100.0 |
| Female | 7 | 15.2 | 19 | 41.3 | 20 | 43.5 | 46 | 100.0 |
| χ²- VALUE = 0.659 p-VALUE= 0.719 (NS) | | | | | | | | |
| **CADRE OF STAFF** | | | | | | | | |
| Doctors | 2 | 50.0 | 1 | 25.0 | 1 | 25.0 | 4 | 100.0 |
| Nurses | 5 | 14.3 | 19 | 54.3 | 11 | 31.4 | 35 | 100.0 |
| CHEW & EHO | 3 | 13.6 | 10 | 45.5 | 9 | 40.9 | 22 | 100.0 |
| Laboratory Staff & Auxiliary Medical Staff | 2 | 10.5 | 6 | 31.6 | 11 | 57.9 | 19 | 100.0 |
| χ²- VALUE = 7.74 p-VALUE= 0.257 (NS) | | | | | | | | |
| **WORK EXPERIENCE (IN YEARS)** | | | | | | | | |
| <1 | 1 | 7.1 | 2 | 14.3 | 11 | 78.6 | 14 | 100.0 |
| 1--5 | 2 | 11.8 | 6 | 35.3 | 9 | 52.9 | 17 | 100.0 |
| 6--10 | 5 | 16.1 | 22 | 71.0 | 4 | 12.9 | 31 | 100.0 |
| >10 | 4 | 22.2 | 6 | 33.3 | 8 | 44.4 | 18 | 100.0 |
| χ²- VALUE = 21.52 p-VALUE= 0.002 (SIG) | | | | | | | | |

- CAT1= ALL PRACTICES (GIVEN IN TABLE 2) DONE DURING INJECTION GIVING
- CAT2= MINIMUM FOUR PRACTICES (GIVEN IN TABLE 2) DONE DURING INJECTION GIVING
- CAT3= UPTO THREE PRACTICES (GIVEN IN TABLE 2) DONE DURING INJECTION GIVING

A total of 80 health care providers were co-operative throughout the study. Out of them , 34 (42.5%) were males and 46 (57.5%) were females, maximum 31 (38.8%) were seen in 30-39 years of age group. Majority nurses 35 (43.8%) , CHEW and EHO 22 (27.5%), Lab technician and other staff 19 (23.8%), and doctors 04 (05.0%) were health care providers . 31 (38.8%) were having 6-10 years and 18 (22.5%) were having more than 10 years of experience of working in health services.

1. Hand washing practice before injection administration was observed in 30 (37.5%) respondents. Differences were found statistically significant.

2. 32 (40.0%) of the respondents checked expiry date of drugs on vials or ampules at the time of giving injection. Differences were found not statistically significant.

3. 36 (45.0%) of the respondents were wearing the gloves during the injection procedure. Differences were found not statistically significant.

4. The proportion of injection giving with a disposable syringe and needles was found in 58 (72.5%) respondents. Differences were found statistically significant.

5. The proportion of injection giving with a glass syringe and needles was found in 22 (27.5%). Differences were found statistically significant.

6. 70 (87.5%) of the participants used spirit swab before and after injection procedure for cleaning the site of injection. Differences were found statistically significant.

7. 12 (15.0%) of the participants touch the syringes or needles before or after giving injection. Differences

were found statistically significant.

8. Around 60 (75.0%) of the participants were found to be harmful practices like recapping of needles and re-use of syringes after giving injection. Differences were found statistically significant.

9. 22 (27.5%) of the participants were found to be syringes/ needles destroyed by hub cutter soon after injection procedure. Differences were found statistically significant.

10. 18 (22.5%) of the participants use color coded bags for disposal the syringes and needles. Differences were found statistically significant.

## DISCUSSION

Injections are one of the most common healthcare interventions globally. WHO estimates that at least 1600 crores injections are delivered annually throughout developing and transitional countries. Injection Safety is compromised on several occasions in our healthcare settings, due to the lack of awareness. Injection Safety is not a high focus component of healthcare workers training and most of the understanding on injections is by the simple rule of on the job training. The widespread incidences of blood borne diseases, which are often the result of infection due to unsafe injection practices, have been an important public health problem worldwide.[5]

In this study, maximum (38.8%) of health care providers were seen in 30-39 years of age group. In a study of Divya Sahu and Narinder Gandhi (2015) suggested that (62.9%) of the providers were of age group 30-35 years. Rests one third were either above 35years or below 30 years.[7]

In our study , (22.5%) respondents had more than 10 years of experience of working in health services. A study conducted in Ilorin by Bolarinwa OA, et al. (2012) revealed that (57.4%) had more than ten years of experience.[8]

In this study, hand washing practice before injection administration was observed in (37.5%) respondents. A study done by Chowdhury AZ et al. (2011) suggested that hand washing practice before injection administration was absent in primary health care settings of Bangladesh. [9] A study done by study Divya Sahu, et al. (2015) finds that 29.7% hand washing and 66.9% gloves wearing practices prior to injection administration.[7]

In this study, (45.0%) of the respondents were wearing the gloves. A study done by Ashish Naik, et al. (2012) revealed that only 14 (35%) were actually wearing the gloves during the injection procedure. [10] In another study done in Benin City, Nigeria, 68.9% nursing staff used disposable gloves sometimes and 28% did not used it. [11]

All health care providers knew that gloves should be worn during the injection procedure. About reason for wearing gloves, participants replied that they use gloves for personal safety against infection and needle prick injuries, and they use gloves for both personal and patient's safety against infection possibilities. In a study done by Leena Bhargo, et al. (2014) revealed that (33.4%) of the providers were aware about the reasons for wearing the gloves for both patient and personal safety. [12]

In our study, (87.5%) of the participants used spirit swab before and after injection procedure for cleaning the site of injection. A study done by Ashish Naik et al. (2012) was observed that (80 %) of the participants use spirit swab both before and after the injection procedure.[10]

In our study, (15.0%) of the participants touch the syringes or needles before or after giving injection. A study done by Shah HD, et al. (2014) revealed that majority subjects were observed with the needle touching non-sterilized places accounted 64.14% unsafe injections.[13]

In this study, (75.0%) of the participants were found to be doing harmful practices like recapping of needles and re-use of syringes after giving injection.

Unsafe injection practices, including the recapping and re-use of unsterile needles and syringes, are commonplace in developing country health settings, and contribute substantially to the global burden of blood-borne viral disease.[14] Unsafe injections can place patients and community at risk of morbidity and may be at fatal mortality in a number of outbreaks. A reuse of injection devices without sterilization is of particular concern as it may transmit hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV), accounting for 30%, 41% and 5% of new infections respectively.[15]

An another study done by Rele M et al. (2002) have also condemned the practice of recapping needles and

offered remedial measures. [16] A study done by Ashish Naik et al. (2012) suggested that (50 %) of the nurses were found to be recapping the needle after injection. This greatly increases the chances of having needle stick injury to the health care workers.[10] Prevalence of recapping of needle after use was seen in other study such as (42.5%) in Kolkata. [17] An another study done by Sumathi Muralidhar et al. (2010) revealed that 50 % participant were found to recapping of needle. [18]

In our study, (27.5%) of the participants destroyed syringes/ needles by hub cutter soon after injection procedure. A study done by Chowdhury AZ, et al (2011) revealed that immediate disposal of used needles and syringes in a puncture proof sharps container or use of needle remover was not observed in more than two third (81.5%) of the health facilities in Bangladesh. [9] Puncture-resistant sharps containers, which have been recommended by Center for Disease Control and Prevention are not being universally adopted due to the recurrent costs and inadequate infrastructure.

(22.5%) of the participants used color coded bags for disposal the syringes and needles in our study. A study done by Ashish Naik et al. (2012) found that (75 %) of the participants disposed syringe in red bag after using injection procedure.[10]

## CONCLUSION

In the present study, unsafe injection practices, harmful practices, improper disposal of syringes and needles, not using of color coded bags for disposal was found . Even before injection preparation, washing of hands with soap and water or with antiseptic solution is a prerequisite.

Sharps waste management needs urgent attention. Intervention like supportive supervision on proper usage of injection equipments is needed. Efforts are needed to be done in this regard for the benefit of both health care worker and patients. Finally rational and safe route of treatment modality should be enforced. Interventions are needed to improve the safety of injections.

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# Evaluation of the Effect of RC-Prep, Canalizer, Maleic Acid and Citric Acid on the Microhardness of Root Canal Dentine- An *in vitro* Study

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## ABSTRACT

**Introduction:** The present study aimed to evaluate and compare the effect of RC-Prep, Canalizer, Maleic acid and Citric acid on the microhardness of root canal dentine

**Materials & Method:** Twenty intact freshly extracted single rooted maxillary and mandibular anterior human teeth were sectioned and the surfaces were prepared for microhardness tests. Samples in all the groups were treated with the specific chelating agent 1ml for 1 minute followed by final irrigation with 0.9% saline. Vicker's microhardness test was used to determine the microhardness and comparison was done before and after the application of chelating agents.

**Results:** Data collected subjected to statistical analysis. Post hoc Tukey test and paired t test were applied to check the association between groups. Microhardness value was greatly reduced for Maleic acid followed by RC prep and Canalizer with mean reduction of microhardness were 5.5983 with SD1.589303; 5.9306 with SD0.452864; 7.8441with SD0.944087 and for RC Prep, Canalizer, Maleic acid respectively.However with citric acid there was a minimum decrease in microhardness value of mean 1.45134with SD 0.53616.

**Conclusion:** The data of present study concluded teeth treated with 7% maleic acid had the maximum reduction of microhardness followed by RC Prep and then Canalizer with statistically significant difference. 10%Citric acid was least effective in reducing the microhardness of the root canal dentine.

**Keywords:** Microhardness, RC-Prep, Canalizer, Maleic acid ,Citric acid, Intracanal irrigants, chelating agents

## INTRODUCTION

The accomplishment of a successful root canal therapy depends on the disinfecting techniques by instrumentation, irrigation, disinfection, and then sealing the canals by three-dimensional obturation of the root canal system. Canal instrumentation for cleaning and shaping, either using manual or rotary instruments inadvertently produces a smear layer that shields the

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dentinal tubules.[1] Smear layer and smear plugs contain organic and inorganic particles of calcified tissue and organic elements such as pulp tissue debris, odontoblastic processes, microorganisms, and blood cells in dentinal tubules[2] A recent systematic review and meta-analysis of leakage studies concluded that the removal of the smear layer improves the fluid tight seal of the root canal system.[3] To remove the smear layer various chelating agents like EDTA, citric acid, maleic acid and MTAD, a mixture of tetracycline isomer (doxycycline), an acid (citric acid) and a detergent (Tween 80) can be used. [4-5] However, the combination of EDTA and sodium hypochlorite is commonly used in clinical scenario for smear layer removal.[6] The use of chelating agents and acids have been suggested to remove the smear layer from the root canal, because the components of this

loosely bound structure are very small particles with a large surface-mass ratio that makes them highly soluble in acids.

Chelation is a physicochemical process which prompts the uptake of multivalent positive ions by specific chemical substances. In case of radicular dentine, the agent reacts with the calcium ions of hydroxyapatite crystals. This process can cause changes in the microstructure of the dentine and changes in the calcium to phosphorus ratio. Changes in the mineral content ratio may alter the original proportion of organic and inorganic components, (1.6), which in turn reduces the microhardness, increases the permeability and solubility of the root canal dentin, and inhibits resistance to bacterial ingress and permitting coronal leakage. Arends J, ten Boscj JJ. reported a positive correlation between hardness and the mineral content of the tooth. It has been indicated that microhardness determination can provide indirect evidence of mineral loss or gain in dental hard tissues.[8]

RC-Prep(Premier® Dental Products Company,Pennsylvania,USA) introduced by Stewart et al. in 1969, contains 15% EDTA, 10% urea peroxide (UP), and glycol. Urea peroxide produces effervesce during use, resulting in an elevator action that helps to remove debris from the root canal system thereby optimising cleaning .Effervescence is caused by release of Oxygen which is set free by the reaction of RCPrep with NaOCl irrigant so that pulpal remnants and blood coagulates can be easily removed from the root canal wall.

Citric acid, a weak organic acid, has been applied previously on root surfaces altered by periodontal disease and instrumentation in order to increase cementogenesis and to accelerate healing and regeneration of a normal periodontal attachment after flap surgery (Hanes et al. 1991, Hennequin & Douillard 1995). In endodontic research, Loel (1975) used 50% citric acid alternately with 5% NaOCl during instrumentation and found that it was an effective agent for removing necrotic tissue and preparing the dentine for subsequent sealing with endodontic sealers. Miriam F. Zaccaro Sceleza et al (2004) reported that 10% citric acid irrigation was effective in the removal of the superficial smear layer when it was used for 3 minutes. 7% maleic acid in combination with 2.5% sodium hypochlorite has been found to be significantly better than EDTA in the removal of the smear layer from the root canal system.[9]Recently a combination of EDTA

and Carbamide peroxide under the trade name Canalizer (Azure research lab Pvt Ltd, Kochi, India) is introduced to be used a root canal preparation gel. Carbamide peroxide acts as an oxidising agent thereby releasing oxygen which helps in pushing the debris out of the root canal system.

Numerous commercial chelating agents with different composition create confusion for clinician. Moreover, to date, there are no studies evaluating the effect combination of EDTA and Carbamide peroxide on the microhardness of root canal dentine. Hence, it is better to evaluate these products and compare them for clinical use.

Hence, the present study aims to conduct microhardness test for different chelating agents. Thus, the purpose of this study was to evaluate and compare the effect of RC-Prep, Canalizer, 7% Maleic acid and 10% Citric acid on the microhardness of root canal dentin.

## MATERIAL AND METHOD

Prior to initiation of the study ethical clearance had been taken from institutional ethics committee. Twenty intact freshly extracted single rooted maxillary and mandibular anterior human teeth were taken and stored in physiological saline solution containing 0.1% Sodium azide until used.

### Preparation of specimens

The teeth were sectioned transversely at cemento-enamel junction by diamond disc (Suzhou Syndent Tools Co., Ltd). Crowns were discarded. After this the teeth were sectioned longitudinally (Approximately 10 mm. in length) and embedded in acrylic resin followed by polishing with different grades of sand paper and finally with alumina suspension on felt cloth, to prepare the surfaces for microhardness tests.

The samples were randomly divided in to 4 groups (n=10) based on the test solution used.

**Group I:** RC-Prep (EDTA 15%, 10% urea peroxide)

**Group II:** Canalizer (EDTA 17%, Carbamide peroxide 10%)

**Group III:** Maleic acid 7%

**Group IV:** Citric acid 10%

Samples in Group III and IV were flushed with the 1

ml of specific chelating agent for 1 minute whereas pastes were coated on to the dentin surface by a F1 Protaper in Group I and II. Finally all groups were irrigated with 5ml of 0.9% saline after their prescribed time limit.

## EVALUATION OF MICRO HARDNESS

A MicroVicker's Hardness Tester Fuel Instruments and Engineers Pvt. Ltd.,) was used to evaluate the microhardness of radicular dentin. All experiments were completed under the same conditions: 50 g load and 15 s dwell time, following the suggestions by Cruz- Filho et al. (2001).[10] In each sample, three indentations were made along lines parallel to the edge of the root canal lumen each in the coronal, middle and apical third of the root canal dentin sample. The diamond-shaped indentations were carefully observed in an optical microscope with a digital camera and image analysis software, allowing the accurate digital measurement of their diagonals. The average length of the two diagonals was used to calculate the microhardness value (MHV). At the beginning of the experiment, reference microhardness values (MHVs) were obtained for samples prior to application of the solutions (before application), so that the same samples can act as their own controls.

## STATISTICAL ANALYSIS

The data were analysed using SPSS version 16.0. P value of $<0.05$ was considered stastically significant. Post hoc Tukey test and paired t-test were applied to evaluate inter group (Table.1.)and intra group(Table.2) comaprion respectively .

## RESULTS

In the present study, All the irrigants decreased the microhardness. (Table.1.) Maleic acid showed a greatest decrease in micro hardness value within a minute of application, followed by RC prep and Canalizer (Graph.1). There was a statistical significant difference between all the groups, $(P<0.05)$ Table.1. 10% Citric acid showed minimum decrease in microhardness value at the end of the experimental time. All the experimental materials showed reduction in microhardness significantly (Table. 2).

## DISCUSSION

In endodontics, chelating agents induce an adverse softening of the calcified components of dentin, and subsequently a reduction in the microhardness is expected. Application of these chemicals leads to opening of dentinal tubules thereby increasing the surface roughness. This could be of clinical benefit as it will lead to better adhesion of sealers and cements to the dentin. It will also permits rapid preparation and negotiation of tight root canals. However, the degree of softening and demineralization may have an influence on the physical and chemical properties of this heterogenic structure. Hence the present study was conducted to evaluate and compare the efficacy of 4 commercially used chelators when used for 1 minute in the canal.

Studies have shown that if the tooth having higher mineral content, its dentin will be having higher microhardness. So if there is any mineral loss or gain it alters the microhardness of the dental hard tissues. Hence there is a positive correlation between mineral contents and microhardness of tooth structure[11] Previous investigations (Lewinstein et al. 1994, Cruz-Filho et al. 2001, Kuramatoet al. 2001) have shown the suitability and practicality of Vicker's microhardness test for evaluating surface changes of dental hard tissues treated with chemical agents. In the present study, the ability of the Vicker's microhardness test to detect surface changes after treatment with RC prep, Canalizer, Maleic acid and citric acid was demonstrated. Biological materials in general and dentine, in particular, are far less homogenous and this may lead to deviations in the results because of differences in adjacent regions of the dentine tissue. Dentin hardness is related to location, and its value decreases as the indentation tested are made closer to the pulp. Pashly *et al* reported that the microhardness of dentin decline when dentin was tested from superficial to deep regions. Thus, in the present study, the actual measurements were obtained from three indentations each in the coronal, middle and apical third of root canal dentin and their means for each sample were calculated. This approach differs from the clinical situation in which the chelator substances affect the dentine walls more strongly. However, this approach allows a much better control of experimental variables, leading to readily comparable results that are fundamental for the present study.[12] currently, there is no consensus on the optimal time a chelating agent must be in contact within the root canal to adequately remove the smear layer. However, in present study a 1-minute time interval was opted, which is in accordance with various other studies.[9,10] The significant alterations in dentin hardness after the irrigation treatment indicates potent direct effects of

these chemical solutions on the components of dentin structure. The degree of mineral content and the amount of hydroxyapatite in the intertubular substance are considerable factors in determining the intrinsic hardness profile of dentin structure.[13] In the present study 7% Maleic acid showed best results compared to other experimental groups with maximum reduction in microhardness within a minute. This is because of it reduced viscosity and increased surface energy of maleic acid compared to EDTA.[9] 7% maleic acid is highly acidic with a pH of 1.05. This acidic pH might have caused demineralization of the root canal dentin and subsequent reduction in the microhardness. Ballal et al found similar results with maleic acid decreasing the microhardness of root dentin similar to EDTA but increased the surface roughness significantly more than EDTA. Moreover; EDTA takes longer time for initiation of demineralization compared maleic acid.[14] Group I and II showed lesser decrease in microhardness may be due to their viscosity and both pastes contain EDTA. In the present study 10% citric acid showed significantly poor results may be due to the low concentration and lesser time of use in the study. Studies have shown 10% citric acid showing similar results as 17% EDTA but at 3 minutes of contact time.[15] Hence, the results of the present study recommend 7% maleic acid for faster and efficient demineralizing effect on the radicular dentin. Studies have also suggested maleic acid has lesser erosive effect on the radicular dentin compared to EDTA, due to the decrease in its efficacy with time.[9] Further clinical *in vivo* studies are required to prove the results of the present study.

**Table 1. Shows intergroup comparison of pre& post irrigation microhardness of radicular dentin treated with four chelating agents. (Tukey HSD test)**

| Multiple Comparisons | | | | | |
|---|---|---|---|---|---|
| Table 1 Tukey HSD | | | | | |
| Dependent Variable | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. |
| hardness before | RC PREP | CANALIZER | -1.2099000 | .8816326 | .524 |
| | | MALEIC ACID | -.8309000 | .8816326 | .782 |
| | | CITRIC ACID | -2.1365400 | .8816326 | .091 |
| | CANALIZER | MALEIC ACID | .3790000 | .8816326 | .973 |
| | | CITRIC ACID | -.9266400 | .8816326 | .721 |
| | MALEIC ACID | CITRIC ACID | -1.3056400 | .8816326 | .459 |
| hardness after | RC PREP | CANALIZER | -.8776000 | .8338006 | .720 |
| | | MALEIC ACID | 1.4149000 | .8338006 | .340 |
| | | CITRIC ACID | -6.2835000 | .8338006 | .000 |
| | CANALIZER | MALEIC ACID | 2.2925000 | .8338006 | .044 |
| | | CITRIC ACID | -5.4059000 | .8338006 | .000 |
| | MALEIC ACID | CITRIC ACID | -7.6984000 | .8338006 | .000 |
| DIFFERENCE | RC PREP | CANALIZER | -.3323000 | .4421390 | .875 |
| | | MALEIC ACID | -2.2458000 | .4421390 | .000 |
| | | CITRIC ACID | 4.1469600 | .4421390 | .000 |
| | CANALIZER | MALEIC ACID | -1.9135000 | .4421390 | .001 |
| | | CITRIC ACID | 4.4792600 | .4421390 | .000 |
| | MALEIC ACID | CITRIC ACID | 6.3927600 | .4421390 | .000 |

**Table 2. Pre Vs post comparison in each group of irrigants (paired t- test)**

| VAR00001 | | Mean | N | Std. Deviation | Paired Differences | | T | Df | P VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Mean | Std. Deviation | | | |
| **RC PREP** | hardness before | 57.4009 | 10 | 1.715884 | 5.5983 | 1.589303 | 11.139 | 9 | **<0.001** |
| | hardness after | 51.8026 | 10 | 1.467784 | | | | | |
| **CANALIZER** | hardness before | 58.6108 | 10 | 2.233658 | 5.9306 | 0.452864 | 41.412 | 9 | **<0.001** |
| | hardness after | 52.6802 | 10 | 2.325217 | | | | | |
| **MALEIC ACID** | hardness before | 58.2318 | 10 | 2.332929 | 7.8441 | 0.944087 | 26.274 | 9 | **<0.001** |
| | hardness after | 50.3877 | 10 | 2.123683 | | | | | |
| **CITRIC ACID** | hardness before | 59.53744 | 10 | 1.472914 | 1.45134 | 0.53616 | 8.56 | 9 | **<0.001** |
| | hardness after | 58.0861 | 10 | 1.354036 | | | | | |

## CONCLUSION

On the basis of the results obtained and experimental conditions of the present study it can be can concluded that there is a statistically significant reduction of microhardness of the root canal dentin by treatment with RC prep, Canalizer, 7% maleic acid and 10% citric acid. Overall, 7% Maleic acid showed maximum reduction in microhardness compared to Canalizer and RC prep, *suggesting* 7% maleic acid is better chelator than other experimental EDTA pastes. Citric acid 10% was least effective in reducing the microhardness of the root canal dentin.

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# Road Traffic Accidents and Road Safety Behavior in India

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## ABSTRACT

**Background:** Road traffic accidents prevalence is higher among two wheeler drivers. Road traffic injuries are the eight leading cause of death globally and the leading cause of death among 15-19 yrs. aim; - to study the road traffic accidents and road safety behavior in India, Methods;- studies related to road traffic accidents and road safety behavior were analyzed. Result; RTA prevalence is higher among two wheeler drivers. While comparing with average driving speed, the prevalence was higher among drivers whose average speed of driving was > 60 km/hr. recommendations; increase awareness about road traffic accidents prevention and road safety measures among target group of through mass media, radio, TV, role play , poster, banners, etc.

*Keywords*: Two wheeler drivers, road traffic accidents, road safety,

## INTRODUCTION

Each year nearly 1.3 million people die as a result of a road traffic collision, more than 3500 deaths each day. Moreover, twenty to fifty million more people sustain non-fatal injuries from a collision, and these injuries are an important cause of disability worldwide. Ninety percent of road traffic deaths occur in low- and middle-income countries, which claim less than half the world's registered vehicle fleet[1]

Road traffic injuries are the eight leading cause of death globally and the leading cause of death among 15-29 years. Road traffic injuries account for 2.1% of global mortality[2]

Whether the conditions, road layout vehicle characteristics are equally important in road traffic accidents.[3]

According to the World Health Report 2002, of the global burden of injury, 30.3% morbidity and 28.7% mortality occurred in the South-East Asia Region[4]

In the South East Asian region of the WHO (WHO-SEARO), India alone accounted for 73% of RTA burden[5] .According to a report published by Ministry of Road Transport and Highways, 56 accidents occur every hour on Indian roads and at least 14 people are killed in these accidents[6]

## MATERIALS AND METHOD

Studies related to road traffic accidents and road safety behavior were analyzed.

## RESULTS

In the study prevalence of road traffic accidents and driving practices among young drivers carried by Ashish Trivedi et, all Age of drivers was ranging from 15 years to 25 years with mean age of 20.28 ± 2.21. More than 54% of drivers drive both "Two Wheeler" and "Four Wheeler" while only 4.2% drive only a four wheeler. Almost half of the drivers drive with the average speed of >50 k.m. / hour. While comparing the RTA among young drivers with the type of vehicles they are driving, RTA prevalence is higher among two wheeler drivers.

While comparing with average driving speed, the prevalence was higher among drivers whose average speed of driving was > 60 km/hr. While in another study of awareness and behavioral pattern with regard to road safety among medical students in South India carried by Dr Kreeti S Jogdand et. all a total of 224 participants were included in the study. Among them 131 (58.48%) were females and 93 (41.52%) were males.

Most of the study participants,116(51.79%) used two wheelers, followed by those who used four wheelers, 57(25.45%). A few participants used both two wheelers and four wheelers 51( 22.76%). 39.73 % of students informed that they were caught for not wearing helmets,

& 24.11 % for not having license.. Students who were in habit of using mobile phones while driving were 32.59%, over speeding was done by 25.45%

## CONCLUSION

it is concluded that in study prevalence of road traffic accidents and driving practices among young drivers carried by Ashish Trivedi et. all More than 54% of drivers drive both "Two Wheeler" and "Four Wheeler" while only 4.2% drive only a four wheeler. Almost half of the drivers drive with the average speed of >50 k.m. / hour .While comparing the RTA among young drivers with the type of vehicles they are driving, RTA prevalence is higher among two wheeler drivers.

39.73 % of students informed that they were caught for not wearing helmets, & 24.11 % for not having license.. Students who were in habit of using mobile phones while driving were 32.59%, over speeding was done by 25.45% in the study of awareness and behavioral pattern with regard to road safety among medical students in South India carried by Dr Kreeti S jogdand et. all.

## RECOMMENDATIONS

Increase awareness about road traffic accidents prevention and road safety measures among target group of through mass media ,radio, TV , role play , poster, banners, etc.

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# An Exploratory Analysis of HIV Infection in Tribal Population of Bilaspur Division, Chhattisgarh

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## ABSTRACT

Worlds' second largest tribal population residing in India, located in five major tribal belts across the country in Union Territory and 35 states including Chhattisgarh. State tribes are fall under HIV vulnerable community as per the recent classification given by NACO. Bilaspur is a division of Chhattisgarh located in the eastern part of it and one of the very important and second most populous cities of the state. One fifth population of the division are tribal people, those living with poverty, unavailability of medical facilities, low socio-economic status and unawareness towards health and become most vulnerable to HIV infection. This study was conducted with the aim to assess current situation, prevalence, reasons of vulnerability and spreading factors of HIV in tribal people of Bilaspur division.

***Keywords:*** *AIDS, Bilaspur, Tribal Population, Chhattisgarh*

## INTRODUCTION

Bilaspur is located in the eastern part of Chhattisgarh and bordered by few districts of Madhya Pradesh (Anuppur and Dindori) on the west, Kawardha on the south-west, Durg and Raipur on the south and Korba and Janjgir-Champa on the east with the population of 26.62 lakhs with a sex ratio of 972 females per 1,000 males, and a female literacy rate of 60.12% with an overall literacy rate of 71.59%. Total Schedule Tribe population of Bilaspur is 397104 (19.87%) in which 366097 tribes residing in rural area[1,2]. Now days HIV infection is not present only general urban of rural population and high risk groups viz. sex workers, men having sex with men (MSM), Intravenous drug Users but also alarming in Tribal population. This fraction of population is vulnerable to HIV. Many factors are associated like their socio-economic status, culture, customs, literacy, awareness towards health, STDs, and HIV. National AIDS Control Programme III was also focused on tribal population[3]. Health infrastructure in rural area in Chhattisgarh is not well established due to difficult approach to remote area, very scattered population, small village size, deficiency of basic facilities viz. roads, electricity, dense forest and naxal problems. These factors cause poor access to health services. More over they believe to home remedies instead to go to nearly situated hospital.[4]

## MATERIALS AND METHOD

We conducted an observational study of a cohort of patients visited to ART center, Chhattisgarh Institute of Medical Sciences, Bilaspur (Chhattisgarh) from July 2013 to June 2015 to assess awareness, attitudes and behavioral practices associated with the transmission of HIV/AIDS. The study population comprised of tribal communities living in the Bilaspur division, during the study period total 2554 HIV infected patients in which 246 patients were from tribal communities registered in ART center.

**Ethical Consideration:-** Ethical clearance was obtained from institutional ethical committee. Due to very less literacy rate written consent could not be

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obtained from all the participant instead verbal informed consent was obtained from the individual participants.

## RESULT

In the present study we included all the subjects who visited ART Center, Chhattisgarh Institute of Medical Sciences, Bilaspur from January 2012 to July 2014. Total 2554 patients were registered during this period as HIV positive patients, in which 246 patients belongs to various tribal community of Bilaspur Division (Table 1). Out of 246 tribal patients, male patients (n=136 including male child) had greater extant to female (n=110 including female child) (figure 1). No transgender was registered during the study period in tribal community. Major patients were received HIV infection from heterosexual way (n=172) (Table 2). 23 tribal patients were HIV positive due to blood transfusion. Total 31 patients received HIV virus from their mother. Total 11 patients acquired HIV infection by taking drugs with unsafe injections (IVDUs). HIV infection by female sex worker was found zero. MSM & unknown cause infected 02 and 07 patients respectively (figure 2).

## DISCUSSION

Appropriate data regarding prevalence of Sexual transmitted disease, HIV or AIDS is not available because tribes are isolated and less explored communities. In the present study we tried to find out prevalence of HIV/ AIDS in tribal communities of Bilaspur district. During the study period total 2554 patients were registered in which 9.63% (n=246) patients were belongs to tribal communities. Out of 246 HIV tribal patients, major mode of transmission of HIV was heterosexuality, 69.91% (n=172) patients received HIV infection by this mode, in spite of this we found only two cases of homosexuality. This finding has positive agreement with H Singh et al[5], which reported, predominant mode of transmission was heterosexual contacts (78.8%). similar report also published by the same author in another study[6] that total percentage of mode of transmission by heterosexual contact was 94.16% in Jagdalpur district, an adjacent city of Bilaspur. In Chhattisgarh most tribal communities are strict for arrange marriage by parents only few communities allow another customs to choose life partner like fairs/Melas[7]. Homosexuality was less observed in our study. As customs and rituals are strictly followed by these communities, which prevented such type of acts. In our study only two patients were found, who received HIV infection by MSM mode, both were the student and residing in Bilaspur city area. MSM mode was less significant in tribal communities, as according to District HIV/AIDS Epidemiological Profile Fact Sheet Chhattisgarh[2] Developed by NACO in 2013, 27.86% (n=285) general population patients were infected by this mode. Tribal people came in contacts with high risk group (HRG) by migration from one city to another in search of job, which was the predominant reason to spread HIV among tribal people. As per 2001 Census[8], 10.47% of the male population were migrants, among them 39.10% migrated to other states and 25.87% migrated to other districts within the state. The top two destinations for out-of-state migration were Bhopal in Madhya Pradesh and Lucknow in Uttar Pradesh. Nagpur (MS), Shahdol (MP) and Jammu (J&K) also very much preferred by tribes to maintain their livelihood. Contractor, Truck Drivers and other outside migrants, who visited often to their area, also leaved behind such problems[9].

In our study vertical Transmission (mother to child) was reported 12.6% (n=31). Institutional delivery is not preferred by tribal communities. Some times their belief in traditional remedies and or unavailability of health centers played major role to spread HIV through mother to her child. National Family Health Survey – 3 reported only 46.7 percent of females and 63.3 percent of males knew about Vertical HIV transmission. Scheduled Tribes have least awareness about ABC approach (abstinence, being faithful & condom) for the prevention from HIV infection[10].

In the present study transmission of infection by IDUs was reported 4.47% (n=11). Out of 11 patients 09 were residing in urban area where availability of drugs is very easy. Transmission of HIV by FSW was not reported during study period, and in 0.27% (n=07) patients transmission cause was unknown as they were not given history clearly.

### Table – 1 :- Patients Registered at ART Center, CIMS, Bilaspur

| S. No. | Particulars | Male | Female | Transgender | Male Child | Female Child | Total |
|--------|-------------|------|--------|-------------|------------|--------------|-------|
| 1. | Total Registration | 1430 | 925 | 15 | 108 | 76 | 2554 |
| 2. | Tribal Patients | 119 | 103 | 0 | 17 | 07 | 246 |

**Table– 2 Mode of Transmission.**

|  | Heterosexual | BT | Mother to Child | IDU | MSM | FSW | Unknown |
|---|---|---|---|---|---|---|---|
| Total Registered Patients | 1799 | 122 | 181 | 192 | 36 | 17 | 207 |
| Tribal Registered Patients | 172 | 23 | 31 | 11 | 2 | 0 | 7 |



Figure 1 : Tribal Patients



Figure 2: Mode of Transmission of HIV in Tribal Patients
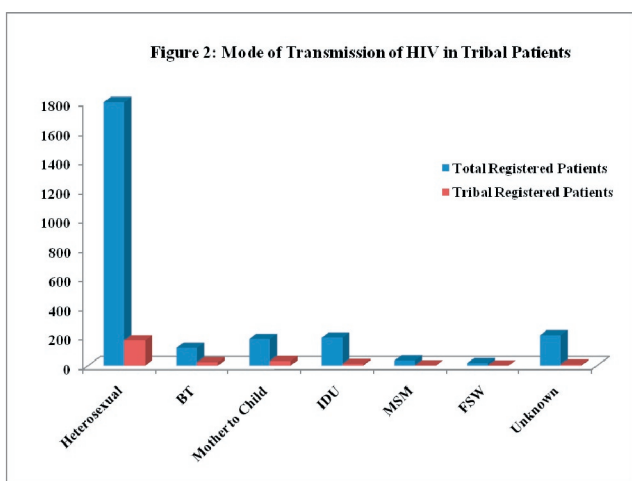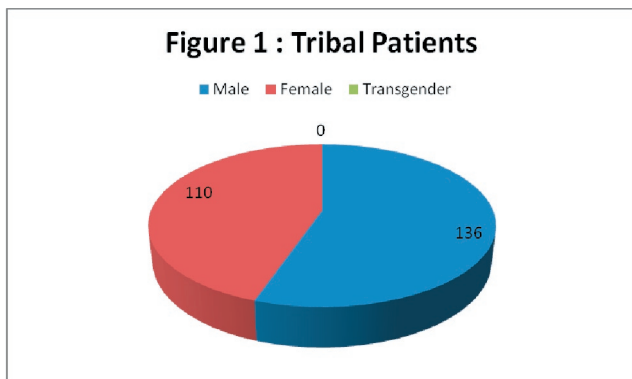
## CONCLUSION

Tribal population of Chhattisgarh are on the verge of vulnerability to HIV/AIDS. Although the available published data about prevalence of HIV in Chhattisgarh Tribes are not sufficient to conclude HIV status in the said community, but they are alarming. Therefore there is a need to do more research work to understand the exact status of HIV/AIDS in Tribal Communities.

**Conflict of Interest  :** Nil

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# The Effect of Food Simulating Liquids on the Flexural Strength of Three Composite and One Polyacid Modified Composite Restorative

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## ABSTRACT

The search for an ideal restorative material to replace tooth tissue and the demand for products with adhesive and caries protective properties together with a simple procedure for application have led to the development of restorative materials that combine conventional Glass Ionomers and light –cure composite resins. It has been demonstrated that composite resins as well as Glass Ionomers are susceptible to various modes of chemical degradation in vitro; as a result of which the mechanical properties of various composites has been tested after long term storage in solutions. As some polyacid modified composites (compomers) are now indicated for stress –bearing areas, such as posterior and Class IV restorations, the knowledge of how their strength properties are affected by food simulating liquids is important for predicting their clinical performance. The objective of this study was to investigate the effects of food-simulating liquids on the flexural strength of composite and polyacid-modified composite resins. It was seen that the detrimental effects of aqueous solutions on flexural strength appeared to be greater with polyacid modified composite resins than composite restoratives and the latter had significantly higher flexural strength after conditioning in aqueous solutions.

***Keywords:*** *Aqueous solutions, compomers, composite, conventional glass ionomers, flexural strength, food-simulating liquids, light-cure composite resins, polyacid-modified composite resins.*

## INTRODUCTION

Extensive research has been conducted for an ideal restorative material to replace the tooth tissue.[1] The restorative material should be such that it has adhesive and caries protective properties along with an easy procedure for application.

Composite restorative materials consist of a continuous polymeric or resin matrix in which an inorganic filler is dispersed. This inorganic filler phase significantly enhances the physical properties of the composite.[3] These materials are used in almost all types and sizes of restorations, are accomplished with minimum loss of tooth structure, little or no discomfort, relatively short operating time and a moderate expense to the patient.[2] Thus they are an ideal esthetic material for restoring teeth.

Materials have been developed that combine conventional glass ionomers and light cure composite resin. A polyacid modified composite resin (compomer) contains either or both of the essential components of a resin modified glass ionomer cement.

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## METHOD

Three composite (Z 250, Alpha dent and Esthet X)

and one polyacid modified composite restorative (Dyract) were selected for this study.

Flexural strength testing specimens of the restoratives were fabricated according to ISO 4049 specifications (35mm lenghthx2mm widthx2mm height) in customized steel molds and each increment of this restorative placed in the mould polymerized for 40 seconds.

25 specimens were made for each material. They were randomly divided into five groups of five and conditioned for one week at 37°C.

Group 1-Air (control)

Group 2-Distilled water

Group 3-0.02 M Citric Acid

Group 4-Heptane

Group 5-50% Ethanol water solution

At the end of the conditioning period, the flexural strength of the restoratives was assessed in an Instron Universal Testing Machine at a crosshead speed of 0.05 mm/minute until the specimens fractured. The maximum load exerted on the specimens was recorded and the flexural strength calculated in Megapascals. Using ANOVA and Tukey tests the flexural strength of the materials was statistically tested to study the effect of the food simulating liquids.[4]

## STATISTICS

ANOVA reveals statistically significant differences in flexure strength among groups for conditioning in medium Heptane, air, Citric acid and Ethanol water. Statistically no significant differences were seen among groups for deionized water.

Statistically a significant difference is seen between Ceram-X and Alpha Dent composite.

Statistically a significant difference is seen between Ceram-X and Esthet-X and Ceram-X and Alpha Dent Composite.

Statistically no significant difference is seen between Ceram-X and Esthet-X but the difference between Ceram-X and Alpha Dent and Esthet X and Alpha Dent is significant.

Statistically no significant difference is seen between Ceram-X and Esthet-X and Ceram-X and Alpha Dent but the difference between Esthet-X and Alpha Dent composite was significant.

Statistically no significant difference is seen between Alpha Dent and Esthet-X and Esthet-X and Ceram-X but the difference between Ceram-X and Alpha Dent is significant.

Overall the mean flexure strength for different material was as follows:

Alpha Dent>Esthet X>Ceram X

## RESULTS

Irrespective of the material used the flexural strength was maximum in the samples aged in Heptane and minimum in samples aged in 50% ethanol water solution. Irrespective of the medium used Alpha Dent showed the maximum flexural strength whereas Ceram X showed the minimum.[5]

## DISCUSSION

The food simulating liquids used for conditioning the restoratives in this investigation are among those recommended in the FDA guidelines to be used as food simulators.[3]

Heptane simulates butter, fatty meats and vegetable oils. The ethanol-water solution and citric acid simulate beverages, including alcohol, vegetables, fruits, sweets and syrup.

Deionised water is included to simulate the wet intraoral environment provided by saliva and water.[6]

For all the restoratives evaluated, the highest value of flexural strength was observed after conditioning in heptane as compared to conditioning in other aqueous mediums.

Conditioning in heptane also resulted in significantly higher flexural strength values than the control.

The reason is:-

1. Heptane reduces oxygen inhibition during post-curing that occurs for the specimens conditioned in air (control).

2. Heptane eliminates leaching out of silica and combined metals in fillers which may occur from conditioning in aqueous solutions.

In other aqueous solutions

When the different resin –bonded fillers are immersed in aqueous solutions the resin matrices swell and resulting tensile stresses strain the Si double bonds in the fillers making them more susceptible to stress and

corrosion attacks. Complete or partial filler debonding occurs due to stress corrosion at the surface layer of fillers and this degradation of the filler-matrix interface results in decrease in flexural strength and other physical properties.[7]

50% Ethanol Water Solution

For all the restoratives tested conditioning in 50% ethanol-water solution resulted in the lowest flexural strength. The reason for this is that the resin matrices of the various restoratives are based either on BISGMA (Bisphenol A glycidyl methacrylate) or UDMA (Urethr anedimethacrylate) which have a solubility parameter of 50%, similar to aqueous solution of ethanol water. The extent of damage depends upon the diffusion rate and molecular weight of the penetrant. The damage mechanism is attributed to the softening of the polymer matrix by ethanol water solution resulting in partial removal at the surface. This results in "prouding" of the filler particles which serve as areas of stress concentration during flexural strength testing.[9]

Dyract-AP is based on a UDMA resin and the maximum softening of this resin results from exposure to 50% ethanol water solution. This is the reason for a significant statistical difference in control and restoratives conditioned in ethanol-water in case of DyractAP. Lower flexural strength values of compomers may be due to uptake of water which is necessary for activation of acid-base reaction in the polymer matrix.[8]

**Table**
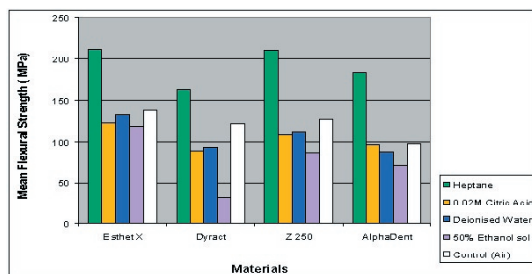


## CONCLUSIONS

The flexural strength of composites was significantly higher than their polyacid modified counterpart in all the mediums tested.

Detrimental effect of aqueous solutions was more with compomers than composite.

Compomers should be used in stress bearing areas with caution.

The highest flexural strength was obtained when the restoratives were aged in heptanes.

The lowest flexural strength was obtained when the restoratives were aged in ethanol-water.

Esthet-X was the best material as far as flexure strength was concerned.

**Ethical Clearance-** Taken from Ethical committee of Saraswati dental college

**Conflict of Interest –**None

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# Embryological Considerations and Demonstration of Imaging Findings in a Case of Diastometamyelia with Associated Spinal Anomalies

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## ABSTRACT

Diastometamyelia is an occult spinal dysraphism also known as the split cord malformation or "double-barelled spine". It was first described in 1837 and refers to an abnormality where the spinal canal is split by a fibrous, cartilaginous or bony septum creating two sleeves each containing a portion of the spinal cord which is split sagitally. [1] Vertebral anomalies lead to spinal deformity and congenital scoliosis although they remain asymptomatic. MR imaging is an excellent modality for detecting spinal dysraphism. It is noninvasive, yet provides excellent tissue discrimination in several planes. We present CT and MRI findings of a patient with Diatometamyelia and several coexisting vertebral anomalies namely congenital kyphoscoliosis, wedge vertebra, hemivertebra, butterfly vertebra and spina bifida and discuss the embryology of each one of them.

***Keywords :*** *diastometamyelia / kyphoscoliosis / wedge vertebra / hemivertebra / butterfly vertebra / spina bifida*

## CASE REPORT

A 8 year old girl with deformity of the spine since birth. She was admitted with complaints of back pain radiating to legs, radicular in character. Her symptoms have not deteriorated over time. No alleviating or exacerbating factors were described. Pain did not affect her daily life and social activities and relieved with simple analgesics and bed rest. She had no complaints related to her lumbar pathology during her life until 2 months before her admission. She had no urinary complaints or other systemic complaints. She was referred for MRI spine and a CT with 3D reconstruction was also performed. Imaging findings included scoliosis of mid-dorsal spine involving vertebrae D3-D9 causing the primary convexity to the left. Anterior wedging of D2 & D3 vertebrae with hemivertebrae at D4, D5 and a butterfly vertebra at D6

were the cause for the primary curvature. Fusion of the posterior elements from D2-D6 levels with rudimentary discs at D4-D5, D5-D6 and fusion of 3rd and 4th, 6th and 7th ribs were compensatory findings. Spina bifida from L3 vertebra downwards with splitting of a cord at D12-L3 within a single dural sac and tethering of the cord were lumbar findings. These findings were consistent with Diastometamyelia and its associated spinal anomalies.
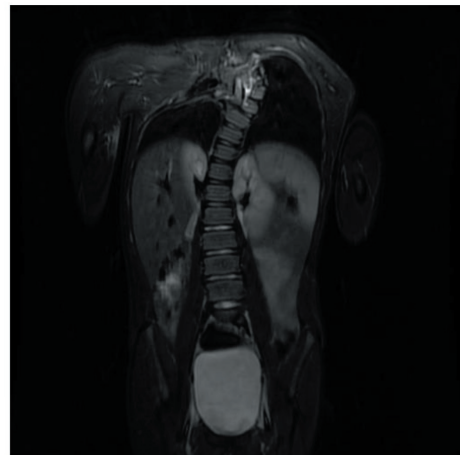


**Figure 1 Coronal STIR image showing mid- dorsal scoliosis with primary curvature to the left and compensatory secondary curvatures above and below to it**

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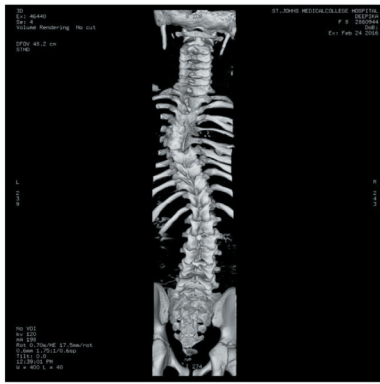
**Figure 2 Volume-rendered Coronal CT image showing fusion of posterior elements from D2-D6 vertebral levels with spina bifida from L3 vertebral level downwards to sacral vertebrae//**
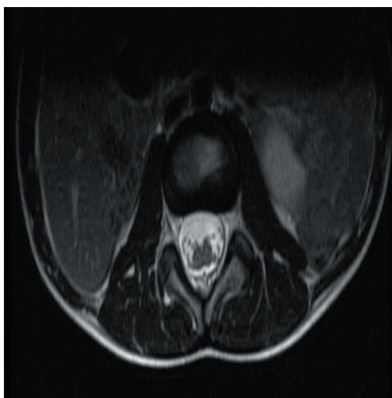


**Figure 3 Axial T2 FSE image at L3-L4 vertebral disc level showing splitting of cord with both hemicords lying in a common dural sac and spina bifida at that level**



**Figure 4 Axial CT image in bone window showing spina bifida at sacral level.**

## DISCUSSION

Diastometamyelia is a spinal dysraphic lesion and is described as a sagittal split in the spinal cord due to an osseus or fibro-cartilaginous septum in the central portion of the spinal canal which produces a complete or incomplete sagittal division of the spinal cord into two hemicords. The lesion usually occurs between T9 and L3: to the level of L1-L3 (50%), or to the level of T7-T12 (25%). This complex defect occurs in the 4th week of embryological defect and is caused by an abnormal, persistent neurenteric canal between the yolk sac and the amnion and thus enables contact between the ectoderm and the endoderm within the canal. This abnormal fistula splits later the neural canal and the notochord by forming an endomesenchymal tract. The persistence of parts of the tract, the entrapment of different structures within it, or both, explain the subsequent formation of associated malformations.

Theories proposed to explain the abnormal embryogenesis of spina bifida include : [2] a failure of organization and differentiation of the neural tube from the primitive neuroectoderm in the third or fourth week of gestation , leading to persistence of abnormal mesodermal cells within the neural tube [3, 4, 5] a persistent accessory neurenteric canal or dorsal intestinal fistula. [6] According to the latter theory, partial obliteration of the fistula may lead to such congenital anomalies as spina bifida, myelomeningocele, hemivertebra, butterfly vertebra, disordered vertebral segmentation, paravertebral cysts, and intraspinal bony spur and diastematomyelia.

Scoliosis is the presence of one or more lateral curves of the vertebral column in the coronal plane. CT and MRI play important roles in evaluating scoliosis and determining its underlying cause. Although scoliosis is idiopathic in 80% of the cases, various congenital, developmental osseus or neurologic abnormalities may lead to developmental abnormalities of the spine.[7]

Vertebra develops from a sclerotome which is a derivative of a notochord. With two ossification centres, one for the ventral half and other for the dorsal half of the body of vertebra appears by 9th week of gestation. Ossification of these centres is complete by 12th week. These centres fuse to form a single large center which later divides the body of the future vertebra into two thick plates where endochondral ossification occurs. The portions of the notochord incorporated within the body undergo atrophy and disappear. Those which lie within the intervertebral discs enlarge and persist as neuclei pulposi. Any deviation in the normal development of the body of the vertebra leads to congenital anomalies and its configurations. Vertebral anomalies arise due to failure of formation, failure of segmentation or mixed. Failure of formation may be either partial (wedge vertebra) or complete (hemivertebrae). [8] The body of a vertebra

may assume many different configurations. Some of these contour changes are disease-specific. Recognition of these vertebral body configurations greatly facilitates radiographic diagnosis. Wedge-shaped vertebrae is caused by a failure of formation or segmentation of somites during osteogenesis. One probable cause of this failure is a lack of blood supply to the vertebrae. [9] Lack of ossification of one half of the body results in a hemivertebra. Thus a right/left hemivertebra may occur. Dorsal and ventral hemivertebrae occur because of the failure of the ventral and dorsal half of the vertebral bodies to ossify.

Butterfly vertebra results from failure of fusion of lateral halves of the vertebral body because of persistent notochordal tissue between them. The involved vertebral body is widened, and the bodies above and below the butterfly vertebra adapt to the altered intervertebral discs on either side by showing concavities along the adjacent endplates.

Primary neurulation refers to the process of neural folding whereby the entire brain and much of the spinal cord is formed. In the spinal region, neurulation proceeds in a craniocaudal sequence from the future cervical region and is completed with closure of the posterior neuropore. Neural tube formation at more caudal level occurs by secondary neurulation in which the neural primordium, the medullary cord, becomes canalized directly without previous formation of neural folds. Lower spina bifida is predominantly a defect of posterior neuropore closure.[10]

MRI is the modality of choice for demonstrating diastometamyelia and the two cords are adequately seen when they are large enough to contain fatty marrow centrally. Demonstration of bony septa, spina bifida and vertebrae is done using CT.

Diastometamylia is a rare but potentially serious congenital abnormality of the spinal cord and has multiple associated spinal anomalies. Here we have given an insight into the embryology of diastometamyelia and associated spinal anomalies. Multimodal imaging is necessary for the early diagnosis and accurate characterization of this complex abnormality. CT and MRI are particularly useful in detailing bony canal anatomy, associated spinal cord dysraphism and for identifying the underlying causes of scoliosis. These evaluations are mandatory prior to surgical intervention because spinal cord tethering and diastometamyelia must be identified and released prior to

correction of curve.

**Conflict of Interest:** None

**Source of Support:** None

**Ethical Clearance:** Obtained from Institutional Ethical Review Board (IERB), St. John's Medical College, Bangalore 560 034.

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# Exploring the Dietary Habit of Medical Students' and their Perception about its Effect on Health

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## ABSTRACT

**Context:** College students live away from home. They face transition to independent living and making independent food choices. This often results in imbalanced diet. Medical students are no exceptions and their dietary habits need to be studied.

**Aims:** 1) To determine malnutrition, eating habit and physical activity and 2) To know the perception about their own health

**Settings and Design:** It's cross sectional study done in a medical college of southern part of Gujarat

**Methods and Material:** This was cross-sectional study carried out during August to September 2014 using a semi-structured self-administered questionnaire. Study variables were body mass index (BMI), eating habits, physical activity and their thoughts on their own dietary habit and life style. Data entry was done in MS Excel & data were analysed using SPSS vs 16 and Epi Info 2002.

**Statistical analysis used:** Descriptive

**Results:** Among 293 students 56% were girls & rest 44% were boys. There were 24.2% overweight & 33.1% were under-weight. More number of boys had a BMI > 23 (70.8%) whereas more number of girls had BMI < 18.5 (65.5%). Both boys and girls were of the opinion of hostel life, busy schedules and stress for increase or decrease in their weight.

*Key-words:* *Medical Student, Life style, BMI*

## INTRODUCTION

College students are highly vulnerable to malnutrition as living away from home, transitioning to independent living, attracted to new lifestyle and making their own food choices and irregular routines which often results in imbalanced diet. College students are highly exposed to unhealthy eating habits leading to body weight gain. According to WHO, obesity is generally more common among women than men. However, studies on college students revealed higher rates of obesity in males than in females.[1,2] The prevalence of obesity is increasing worldwide at an alarming rate in both developing and developed countries. One of the major causes of obesity is the changes in the diet, in terms of quantity and quality, which has become more "Westernized".[1,3] College life is also a period of psychological, social and physical transition between childhood and adulthood or initial part of adulthood. It is thus important to know about dietary habits, physical activity they are doing and which factor has influence on them.

One place to start is by learning about body mass index (BMI). Body mass index is defined as the individual's body mass (kg) divided by the square of

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his or her height (m). The body mass index, or Quetelet index, is a heuristic proxy for human body fat based on an individual's weight and height. It is a simple index of weight for height that is commonly used to classify underweight, overweight and obesity in adults.[4]

**Objective:** 1) To determine malnutrition, eating habit and physical activity and 2) To know the perception about their own health.

## MATERIALS AND METHODOLOGY

A cross- sectional study was done using semi structured self-administered questionnaire during August & September 2014 among the under graduate students of a Medical College from South Gujarat. Permission from the authority was taken prior to conducting the study. Data from 293 students were collected using purposive sampling method. Students from age group 17-23 years were selected to know their lifestyle and habits.

Our study variables were BMI, exercise and nutrition related preferences and perceptions of youth towards they life style & health. For calculation of BMI around 269 participants' forms taken into consideration after checking for the completeness of forms. To know the exercise & nutrition related preferences' close ended questions were used while to know their perceptions towards their life style & health open ended questions were used.

All the students of first, second & third year MBBS class who were present during study period & gave consent were included. Data entry and analysis was done using MS Excel 2010, Open epi & Epi info software.

Frequency & proportions were used to describe data. Chi square tests were applied to find out the significance of difference between data. Thematic content analysis to code the qualitative data was done manually. Frequencies also used to denote the qualitative data.

## RESULTS

In this study out of total 293 participants 56% (164) were girls and 44% (129) were boys with the mean age was $18.65 \pm 1.45$. Present study noted that the mean age of girls were $18.59 \pm 1.46$ while the mean age of boys were $18.69 \pm 1.46$. In this study 261 (89.1%) study participants were from Gujarat state while 32 (10.9%) study participants were from other state of India. Around 157 (53.8%) number of study participants living in hostel while 133 (45.4%) study participants were localized living at home & 3 (1.02%) forms didn't having information related to living. BMI was calculated using guidelines prepared for Asian population including Indians.[4,5]

**Table: 1 Gender wise distribution of Body Mass Index (BMI) (n=269)***

| Body Mass Index | Boys (%) | Girls (%) | Total (%) | P value |
|---|---|---|---|---|
| Underweight (< 18.5) | 28 (23%) | 61(42%) | 89(33%) | <0.001 |
| Normal ( 18.5-23) | 50(40%) | 65(45%) | 115(43%) | 0.4602 |
| Pre-Obese & obese (>23) | 46(37%) | 19(13%) | 65(24%) | <0.001 |
| Total | 124(46%) | 145(54%) | 269(100%) | |

*Forms having incomplete information about height or weight were excluded*

The difference was significant statistically between boys and girls in underweight and pre-obese & obese category (Table: 1)

**Table: 2 Gender wise distribution of dietary habits & preference of choice for going outside for eating**

| Eating habits (Boys: n=129 / Girls: n= 164) | Gender | 5 times or more in a week (%) | 3-4 times a week (%) | Less than twice a week (%) | Never (%) |
|---|---|---|---|---|---|
| Eat outside | Boys | 2 | 12 | 83 | 3 |
| | Girls | 1 | 8 | 88 | 3 |
| Skip breakfast | Boys | 2 | 6 | **86** | **6** |
| | Girls | **3** | **22** | **66** | **9** |
| Snacks | Boys | **26** | 37 | 33 | 4 |
| | Girls | **35** | 30 | 33 | 2 |
| Eat sweet | Boys | 11 | 17 | 56 | 16 |
| | Girls | 7 | 20 | 67 | 7 |

**Cont... Table: 2 Gender wise distribution of dietary habits & preference of choice for going outside for eating**

| | | | | | |
|---|---|---|---|---|---|
| Soft drinks | Boys | 12 | 17 | 57 | **14** |
| | Girls | 4 | 5 | 59 | **33** |
| **Preference of choice for going out** | | **Always (%)** | **Often (%)** | **Sometimes (%)** | **Never (%)** |
| Family | **Boys** | 19 | 31 | 46 | 4 |
| | Girls | 23 | 30 | 44 | 4 |
| Friends | **Boys** | 24 | 39 | 35 | 2 |
| | Girls | 24 | 34 | 42 | 0 |
| Alone | Boys | 4 | 4 | 42 | **50** |
| | Girls | 2 | 2 | 16 | **80** |

This study revealed more number of girls skipping their breakfast frequently and taking snacks between the major meals. And on inquiring about preference of choices for going outside for eating, in this we found major difference between boys and girls in a category of going alone for outside eating. Boys were more frequently going alone outside for eating compare to girls (Table 2).

**Table: 3 Gender wise distribution of physical activity**

| Routine activity | Gender | 5 times or more in a week (%) | 3-4 times a week (%) | Twice a week (%) | Never (%) |
|---|---|---|---|---|---|
| Exercise for 30 min | Boys | **15** | 9 | 46 | 31 |
| | Girls | **5** | 4 | 49 | 42 |
| Walk on foot | Boys | **40** | 20 | 37 | 4 |
| | Girls | **46** | 10 | 38 | 6 |
| Take stair | Boys | **36** | 29 | 22 | 13 |
| | Girls | **42** | 21 | 24 | 13 |
| Bicycle | Boys | 3 | 7 | 37 | 53 |
| | Girls | 8 | 2 | 32 | 57 |

Boys and girls both were engaged in regular routine activity like walk on foot, take stair but boys were more engaged in regular exercise for 30 minute (Table 3).

**Table: 4 Participants views for the change of weight in last 1 year**

| Change in Weight in last 1 year? | | | | |
|---|---|---|---|---|
| (22%) Decreased (n =39) | | | | (42%) Increased (n=86) |
| Due to gym + dieting + Exercise (31%) | | | | Physiological with increased weight (28%) |
| Study related work load (28%) | Same (8%) | Don't know (26%) | Didn't answer (2%) | Sedentary life (27%) |
| Hostel life (31%) | | | | Fast food + frequent outside eating (15%) |
| Health problems (10%) | | | | Exercise (7%) |
| | | | | Other (20%) |

22% of students believe that their weight was reduced in last one year and majority of them believe hostel life & study related work load was the reason, 42% of students believe that their weight increased and majority of them blame their sedentary life style & frequent outside eating was the reason ( Table 4).

**Table 5: Perception of participants about their dietary habit**

| Participants view on their dietary habit (n=272) | | |
|---|---|---|
| **(15%)** **My life style may lead me to obesity** (n=29) | **(64%)** **It`s good enough to maintain my nutritional status** (n=79) | **(20%)** It`s not good enough and I have fear it may lead to under nutrition (n=30) |
| Sedentary life style (35%) | Balance diet (73%) | Hostel life (47%) |
| Fast food outside (38%) | Exercise (09%) | Not taking healthy food (30%) |
| Live in hostel that force me for outside eating (21%) | Other (18%) | Other (23%) |

Students who believed that their life style might lead them to obesity or it may lead them to under nutrition both of this group student's majority consider hostel life & not taking healthy food as risk factor for it. Many of them believe that hostel life food quality force them to go for frequent outside eating (Table 5).

## DISCUSSION

BMI was calculated using guidelines prepared for Asian population including Indians. They had graded obesity in three grades; Underweight (<18.5), Normal weight (18.5-23), Pre-obese and Obese (>23).[4,5]

The study shows that more than half (57%) of the medical undergraduates were either underweight (33%) or obese (24%) (Table 1). WHO stated that more number of girls were obese compared to boys but in this study we found more number of boys were obese which was comparable to the result of Deshpande et al, Gamit et al, Gohel et al and Gopalakrishnan et al. [1,2,6–8]

Among the 89 (33%) students who were underweight, statistical test was applied and difference between boys and girls was statistically significant. The difference between boys & girls overweight category was also statistically significant. Present study revealed that in college going students under nutrition was more common in girls compared to boys while in case of obesity it was more prevalent in boys compared to girls (Table 1).

In study done by Deepa et al (2009), Deshpande et al (2013), Gopalakrishnan et al (2012) and Thakkar et al (2009) had reported prevalence of obesity (45.9%, 44.9%, 50.7% & 42.5%) using same cut off for BMI (≥23kg/m²).[2,6,9,10]

In this study more than 90% of boys were taking breakfast regularly while almost 1 out of 4 girls were used to skip breakfast. The study also revealed that girls were more commonly taking snacks between major meals compare to boys. Boys were also involved in more frequent outside eating compare to girls (Table 2). A study done by Shah et al among secondary & higher secondary school found that boys were more commonly going for eating junk foods compared to girls.[4]

Present study revealed that most of boys and girls were involved in some kind of routine activity but more numbers of boys were doing regular 30 minute exercise (15%) while more numbers of girls were involved in regular routine activity like walk on foot (46%), take stair (42%) (Table: 3).

We didn't observed much difference in preference of choice for going out for food with family & friends but 80% of girls had never gone outside alone compare to more number of boys were going outside alone (Table 2).

In present study around 42% of participants were having perception that their weight increased in comparison to previous year while 22% of participants think that it decreased In comparison to last year. Amongst the students who think that their weight was increased gave an increase in age as one of the reasons for physiological increase in weight, other reasons were sedentary life style, frequent outside eating. Some of the students told that care taken by their parents for their proper diet was one of the reasons for increase in their weight; some of them said they made active effort to increase weight by doing regular exercise. Amongst the student who feels that their weight was decreased gave

reasons like staying in hostel, active effort for reducing weight, study related workload & health problems (Table 4).

The present study found that 20% students has the fear of their life style may lead them to the under nutrition while 15% of students has fear of their life style may lead them to obesity (Table 5).

## CONCLUSION

All the students were used to go for frequent outside eating specially boys. While girls were more commonly used to skip breakfast and take snacks between major meals. Also, girls were not going alone for eating outside as frequently as boys were used to go. These might be the reason for more number of boys were obese compared to girls.

Present study also revealed academics &/or hostel life as a stress factor that students feel as the cause which can lead them to either under nutrition or obesity.

In study population, all the students were engaged in some kind of physical activity.

**Conflict of Interest:** Nil

**Ethical Approval:** Taken before starting the study

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# A Clinicopathological Study of Enteric Fever in Children

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## ABSTRACT

Enteric fever is one of the common communicable diseases affecting a large population, especially children. Despite a decrease in the incidence seen in the last few decades, it is still high on the list of disease causing significant morbidity and mortality in the developing countries.

**Objectives:** The present study was taken up to find a clinical and laboratory profile of children suffering from typhoid fever.

**Material and method:** The study was conducted in the Department of Pediatrics, Muzaffarnagar Medical College, Muzaffarnagar. A total of 63 inpatients children, admitted from Jan' 2015 to Dec, 2015, with clinical diagnosis of enteric fever were enrolled in the study. Each case was subjected to a detailed history, a thorough clinical examination and the relevant laboratory tests, viz. CBC, Widal test and blood culture.

**Results:** Anorexia was the most common symptom, present in three fourth of (76.2%) cases while cough was present in over half of the cases. A significant number of children had altered sensorium with a few (3.1%) showing aphasia. Speaking of the clinical signs, pallor was the most common finding, present in about two third of cases. The common type of fever was continuous and the typical step ladder pattern was not seen in any case. Another significant finding was the presence of hepatomagaly (61.9%) more frequently seen than splenomegaly (39.6%). Relative bradycardia was found only in about 12% cases, mostly in older children. While leucopenia was present only in a few cases (11.1%), the more consistent finding was eosinopenia, present in about 80% of cases with about half of all cases showing a zero eosinophil count. A positive blood culture was seen only in a few cases (3.1%), while all the cases had a positive Widal reaction.

**Conclusions:** Apart from fever, anorexia is the most common symptom. Contrary to popular belief, hepatomegaly is more frequently seen than splenomagaly. Eosinopenia is the most consistent finding with a zero eosinophil count in a substantial number of cases.

*Keywords: Enteric fever, eosinopenia, Widal test.*

## INTRODUCTION

Enteric fever is an infectious disease associated with high morbidity in the developing countries. Although mortality has significantly reduced due to antibiotic treatment, it is still a cause of concern, mainly due to increasing antibiotic resistance. The disease still remains endemic in South Asia including India. In fact, it is difficult to find out true incidence of the disease in our country because it is not a notifiable disease and moreover, most patients of prolonged fever, whatever be the etiology, are, treated, mostly at peripheries as typhoid fever. Recent students indicate that in contrast to most western countries, incidence of enteric fever in the Indian subcontinent is increasing steadily. The fact that increasing number of case are resistant to multiple drugs is particularly ominous.

Diagnosis of enteric fever usually did not pose much problem for the physician in the past as it was mainly

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based on clinical presentation, supported by laboratory investigations like total and differential leukocyte count, Widal test and culture of infected material, blood, urine and stool. However, the variability in the clinical presentation makes it more difficult to clinch the diagnosis in children,. The problem is further increased by the fact that a more serious profile of disease is being seen nowadays due to severe toxemia, associated complications, prolonged course and evolution of resistant strains of the infecting organism. There is paucity of studies on the subject in this part of the country; the present study is being carried out to identify the clinical and laboratory spectrum of the disease.

## MATERIAL AND METHOD

This study was conducted on children admitted to the Pediatric ward of Muzaffarnagar Medical College, Muzaffarnagar, from January, 2015 to December, 2015. The study comprised 63 Children aged between 3 and 12 years, with fever for 5 days or more, as suspected cases of enteric fever. A detailed history was taken in each patient regarding the habitat, socio- economic status, source of water supply, dietary habits, mode of onset and duration of illness. A thorough clinical examination including examination of central nervous system was carried out on each patient. Patients were closely monitored for appearance of new symptoms or signs, especially with reference to the following points

1. Alteration in sensorium

2. Signs of toxemia e.g. headache, restlessness, lassitude, apathy, hyperexcitability, involuntary movements

3. Pulse and blood pressure

4. Temperature record and its relation with pulse

5. Spleen and liver size

6. Detailed neurological examination in patients showing manifestations of central nervous system involvement

Diagnosis of enteric fever was made on the basis of clinical picture, Widal test. (A single titer of at least 1: 160, or an ascending titer for the 'O' antigen was considered significant) and isolation of S. typhi from blood.

All cases were subjected to the following investigations -

1. Hemoglobin estimation, total and differential leukocyte count (TLC, DLC), platelet count

2. Widal test, on admission and a repeat test after 4 days

3. Blood culture

4. Urine: microscopic examination for pus cells

## RESULTS

Age and Sex: The age and sex distribution of cases is depicted in table 1. As is evident, males outnumbered females and the maximum number of patients belonged to the higher age group

**Table 1: Distribution of cases according to age and sex**

| Age (Years) | Male | Female | Total | Percentage |
|---|---|---|---|---|
| 3 – < 6 | 14 | 7 | 21 | 33.3 |
| 6 – < 9 | 11 | 4 | 15 | 23.8 |
| 9 – 12 | 14 | 13 | 27 | 42.9 |
| **Total** | **39** | **24** | **63** | **100.0** |

Duration and type of Fever: Most patients had fever for a week or more but less than 2 weeks. Fever was continuous in 33 patients (52.3%), intermittent in 12 cases (19%) and remittent in 18 cases (28.5%). The typical step ladder pattern was not seen in any case.

Symptoms: Symptoms of the cases are summarized in table 2. As can be expected fever was a universal complaint in all 63 patients. The most common symptom, was anorexia, observed in about three fourth of patients. Diarrhea was also fairly common and seen more frequently than constipation.

**Table 2: Symptomatology**

| Symptoms | No. of Cases | Percentage |
|---|---|---|
| Fever | 63 | 100.0 |
| Anorexia | 48 | 76.2 |
| Cough | 33 | 52.3 |
| Diarrhea | 27 | 42.8 |
| Constipation | 23 | 36.5 |
| Vomiting | 21 | 33.3 |
| Pain in abdomen | 15 | 23.8 |
| Altered sensorium | 8 | 12.6 |
| Burning during micturation | 3 | 4.7 |
| Aphasia | 2 | 3.1 |
| Melena | 2 | 3.1 |

Clinical Signs: The clinical signs observed in the cases can be seen in table 3. It is clear from the table that pallor and toxemia were seen in a large number of patients. Another interesting finding was that hepatomegaly was more frequent than splenomegaly.

**Table 3: Clinical signs seen in studied cases**

| Signs | No. of patients | Percentage |
|---|---|---|
| Pallor | 42 | 66.6 |
| Hepatomegaly | 39 | 61.9 |
| Toxemia | 36 | 57.1 |
| Coated tongue | 30 | 47.6 |
| Splenomegaly | 25 | 39.6 |
| Altered sensorium | 8 | 12.6 |
| Relative bradycardia | 8 | 12.6 |
| Abdominal rigidity | 6 | 9.5 |
| Peripheral circulatory failure | 3 | 4.7 |

Total Leukocyte Count and Eosinophil Count – A great majority of children had a normal TLC and contrary to expectations, very few children showed leucopenia. However, there was a significant finding that number of eosinophils was low in most of the cases and there was a total absence of eosinophils in a large number of cases.

Other Investigations: Results of other investigations can be seen in table 4. All the cases were subjected to blood culture but surprisingly, only two cases came out positive for Salmonella *typhi*. However, all the 63 cases were Widal positive according to the criteria already determined for the study.

**Table 4: Other investigations**

| Test result | No. of Patients | Percentage |
|---|---|---|
| Blood culture positive | 2 | 3.1 |
| Widal test positive | 63 | 100 |
| 1st week | 3 | 4.7 |
| 1 week- < 2 weeks | 41 | 65 |
| > 2 weeks | 19 | 30.1 |

## DISCUSSION

Sixty three cases between the age of 3 and 12 years were included in the study. There were 39 males and 24 females with male to female of ratio of 1.62 : 1. This

is understandable as male patients usually outnumber female patient. The youngest child in the present study was three years old. Kapoor et al reported an incidence 52.2% of enteric fever below the age of five years, while in the present study, the maximum incidence (42.9%) was seen in the age group of 9 – 12 years[1].

The fever, in the present study, was continuous in 52.3% of cases, remittent in 28.5% cases and intermittent in 19% of cases; the typical step ladder pattern, as popularly described in literature, was not seen in any case in the present study. More or less similar observations were by seen by Gulati et al[2]. In the present study, anorexia was seen in majority of patients (76.2%). This finding is almost similar to Chatterjee (80%) but strikingly different from the finding of Gupta et al who reported anorexia only in 8.93% patients[3, 4]. A significant finding of the present study was the presence of aphasia which was seen in 3.1% of cases. This has been previously reported by Pohwalla[5]. The exact mechanism of occurrence of aphasia in typhoid is not known.

In the present study, a large number of patients (57.1%) had toxic look. Other studies by Kapoor et al and Chatterjee have reported the incidence of 37% and 82.5% respectively. Pallor was another common finding, seen in 66.6% cases in the present study. This is in agreement with the observations made by Srivastava et al who reported pallor in 71% of children[6].

Hepatomegaly was seen in 61.9% cases in the present study. The incidence of hepatomegaly in enteric fever has been reported ranging from 23% to 65% of cases (Butler et al, Khosla et al)[7,8]. In the present study, splenomegaly was seen in 39.6% cases. Several workers have reported the incidence of splenic enlargement in enteric fever ranging from 30% to 80% (Kapoor et al and Srivastava et). In the present study, though relative bradycardia was seen only in 12.65 of cases, this was noticed more frequently in older children (9-12 years). This is understandable as this finding is expected more in adults and older children.

Altered sensorium, a reflection of encephalopathy was seen in 12.6% of children in the present study. This is higher than the incidence reported by other workers whose figures ranged from 2.7% to 6.2% (Santhanakrishnan and Perla et al)[9,10].

Leukopenia was seen in 11.1% of cases in the present study, while Chatterjee found leukopenia only in 2.5% of

cases[4]. According to Caglar et al, leucopenia is common in enteric fever mainly affecting neutrophils with relative lymphocytosis[11].

In the present study, one significant finding was regarding the eosinophil count; while about 89% of children had a low count, about half (49.3%) had a zero count. Relative eosinopenia has been reported in 86.8% of cases of enteric fever in children (Pandey et al) [12].

Blood culture positivity was 3.1% only in the present study, while it has been reported in literature ranging from 36% to 80% (Gilman et al, Mehta et al, Srivastava et al)[13,14]. All 63 patients of our study group were Widal positive. However, out of these 63 patients, while only 3 patients (4.7%) had a positive reaction in the first week of illness, maximum number of cases (65%) showed a positive test in the second week of illness. This finding is in conformity with most other authors, e.g., Chow et al[15,16,17].

## CONCLUSIONS

Apart from fever, anorexia is the most common symptom, while cough is present in a large number of cases. Relative bradycardia and leucopenia are not reliable features for the diagnosis of enteric fever. Hepatomegaly is more frequently seen than splenomagaly. Eosinopenia is the most consistent finding with a substantial number of cases having a zero eosinophil count.

**Ethical Clearing:** Taken already

**Source of Funding:** Self

**Conflict of Interest:** None

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# Get the GIST: A Case Series on Gastrointestinal Stromal Tumors

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## ABSTRACT

This case series illustrates CT appearances of gastrointestinal stromal tumors (GIST) involving the stomach, small intestine, mesentery, peritoneum and posterior mediastinum. GIST of the stomach is the commonest with majority having an exophytic growth, but it can also have an intra-luminal growth. Necrosis is a common feature of GIST irrespective of the location resulting in heterogenous enhancement on CT.

*Keywords:* GIST / interstitial cells of kajal / FDG-PET

## INTRODUCTION

Gastrointestinal stromal tumors (GISTs) are rare but most common mesenchymal neoplasms in the gastrointestinal (GI) tract arising from the interstitial cells of Kajal. The most frequent site of occurrence is the stomach (60% of all cases) followed by the small bowel (30%) and other sites are colon and rectum (5%) and the esophagus (<5%). GISTs also may develop as primary tumors of the omentum, mesentery or retroperitoneum. CECT is the imaging modality of choice not only for diagnosing GIST but also for monitoring the effects.[1]The clinical manifestations of GISTs depend on the location and size of the tumors and are often non-specific.

The tumors can be extraluminal, intraluminal or mixed (dumbbell-shaped) pattern, while 79% of them are exophyticgrowth[2]. GIST typically grows into a well-defined exophytic mass but intraluminal masses can also be seen. Malignant GIST commonly metastasizes to the liver or peritoneum, whereas metastases to the lymph nodes and extra-abdominal metastases are rare.

**CASE 1:** 41 year old male with well definedheterogenously enhancing mass from body and cardia of stomach diagnosed as Gastric GIST.
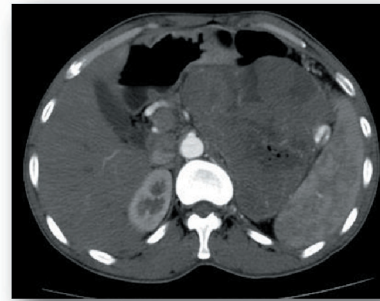


**Figure 1a: Imaging features were suggestive of gastric GIST.**

**CASE 2:** 57 year old male with large multilobulated necrotic mass arising from duodeno-jejunal junction with luminal communication diagnosed as small intestinal GIST.
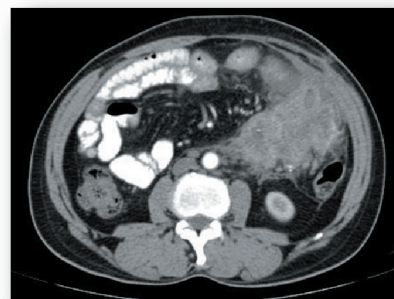


**Figure 2a: Imaging features were suggestive of small intestinal GIST arising from the DJ junction.**

**CASE 3:** 60 year old male with well definedheterogenously enhancing lesion in the proximal jejunum with necrotic areas & calcifications diagnosed as jejunal GIST.
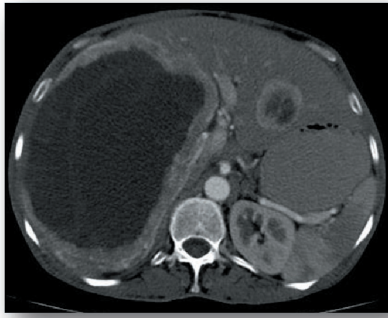
**Figure 3a: Imaging features were suggestive of jejunal GIST with necrotic areas and calcifications.**

**CASE 4:** 63 year old female with large intra-abdominal mass lesion in relation to the liver diagnosed as mesenteric GIST.
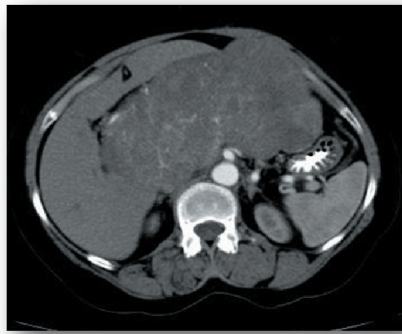


**Figure 4a: Imaging features were suggestive of mesenteric GIST in close relation to the liver.**

**CASE 5:** 27 year old female with ill-defined heterogeneously enhancing soft tissue peritoneal lesion with extensions diagnosed as peritoneal GIST.



**Figure 5a: Imaging features were suggestive of peritoneal GIST located inferior to the pancreas and anterior to the third-part of the duodenum.**

**CASE 6:** 55 year old male presented with dysphagia and a large posterior mediastinal mass showing heterogenous enhancement diagnosed as mediastinal GIST.
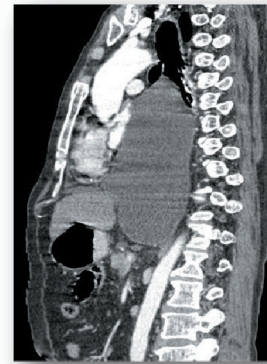


**Figure 6a: Imaging features were suggestive of mediastinal GIST located in the posterior mediastinum causing compression of the esophagus.**

## DISCUSSION

Here we have presented a case series of gastric, small intestinal, mesenteric, peritoneal and mediastinal GISTs, amongst which gastric GISTs form the majority. Miettinen and Lasota [3] estimate thefrequency of GISTs as 10–20 cases per millionpersons. Most individuals are over 50 years of age at the time of presentation, and GISTs are rarely seen in patients younger than 40 years of age.[4] Patients with neurofibromatosis type 1 (NF1) have an increased prevalence of GISTs. GISTs are now thought to derive from a precursor of the interstitial cells of Cajal, normally present in the myenteric plexus, and are clearly distinct from other mesenchymal tumors, such as leiomyomas or leiomyosarcomas[5]. Presenting signs and symptoms depend on the size and anatomic location of the tumor. GISTs most frequently occur in the stomach (70% of cases), followed by the small intestine (20%-30%), anorectum (7%), colon, and esophagus.[3]

GISTs smaller than 2 cm are generally considered benign with a very low risk of recurrence.

However, no GIST can truly be labeled benign.[6] Histologically, GISTs manifest in one of three patterns: predominantly spindle cells (most common), predominantly epithelioid cells, or a mixture of spindle and epithelioid cells. Identifying *KIT* (CD117), a tyrosine kinase receptor in the interstitial cells of Cajal,[7] is key to making a diagnosis of GIST in 95% of patients.In general, malignant GISTs are larger, more highly cellular, and more mitotically active than their benign counterparts. In the stomach, benign GISTs are three times more common than malignant ones.[3] Imaging appearance of small intestinal GISTs is very similar to that of gastric GISTs. The pattern of contrast enhancement  is variable

depending on the degree of hemorrhage and necrosis. At CECT, localized primary GISTs are typically exophytic, large, hypervascular masses. The CT features of gastric GISTs are typical which show a large mass with solid or cystic components.CT also may show ascites where the tumor has spread into the omentum or peritoneal cavity or liver. Tumors are of homogeneous density or signal and large tumors tend to show irregular lobulated margins, mucosal ulceration, central necrosis, hemorrhage, cavitation, and heterogeneous enhancement.[8]

FDG PET is indicated whenever CT findings are inconsistent with the clinical presentation or are inconclusive.[9] Recurrences typically occur first in the liver or peritoneum. Traditional criteria for progression include tumor size increase, the development of new lesions at the site of the previous disease, and the development of metastasis. Nearly 50% of patients with GISTs present with metastasis.[10] Most metastases of GISTs involve the liver and peritoneum by hematogenous spread and peritoneal seeding, respectively. Less commonly, metastases are found in the soft tissue, lungs, and pleura. Unlike gastrointestinal adenocarcinomas, GISTs metastasizing to the lymph nodes are extremely rare.

## CONCLUSION

CT is the imaging modality of choice for diagnosis and staging of GISTs at initial presentation and for monitoring the disease during and after treatment. Small mass lesions often show homogenous enhancement, while large masses show heterogenous contrast enhancement. In general, contrast-enhanced CT is as reliable as FDG PET in the evaluation of treatment responses, assuming that changes in the enhancement patterns are taken into account in addition to the traditional measure of tumor size.

**Conflict of Interest :** None

**Source of Funding :** None

**Ethical Clearance**: Institutional Ethical Review Board (IERB), St. John's Medical College, Bangalore -560 034.

**Informed Consent :** Obtained.

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# A Comparative Study on the Prevalence and Severity of Anemia among Urban and Rural Pregnant Mothers in Davangere City, India

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## ABSTRACT

**Background:** Anemia is a global public health problem. Combating anemia during pregnancy has far reaching benefits in terms of safe motherhood and healthier future generations.

**Objectives:** 1) To compare the prevalence and severity of anemia among urban and rural pregnant mothers, beyond 12 weeks of amenorrhea.

**Method:** An urban, rural based, cross – sectional, comparative study was conducted among 400 urban (210) and rural (190) pregnant mothers aged above 18 years and beyond 12 weeks of amenorrhea in the field practice areas. Hemoglobin was estimated by strip method using "Color Scale test kit

**Study period**: 1 year

**Data analysis**: Microsoft Excel, SPSS version 18

**Statistical analysis**: 'Z' test for proportion, Chi- square, Odd's ratio

**Results:** The prevalence of anemia was 74% and 59% in rural and urban mothers respectively. The severity was more among rural mothers and both the prevalence and severity were significant

**Conclusion:** Prevalence and severity of anemia was more in rural mothers. It is recommended to improve the quality of antenatal care in the field practice areas.

*Keywords: anemia, urban, rural, severity, pregnant mothers.*

## INTRODUCTION

Anemia is a global public health problem, as compelling and harmful as epidemics of infectious diseases. It is a silent epidemic. WHO defines anemia in pregnancy as hemoglobin less than 11 g/dl and hematocrit of less than 33%. It allows a fall of 0.5. g/dl and a cut off of 10.5g/dl in the 2nd trimester.[1] ICMR classifies anemia into four grades according to severity.ie Mild: 10-10.9 g/dl,Moderate: 7-9.9 g/dl,Severe: 7-4 g/dl,Very severe <4 g/dl. [2]

Iron deficiency anemia accounts for 2.4% of the total global DALYs and 4.05% losses in Gross Domestic Product per annum thereby stalling social and economic development.[3] WHO estimates that over two thirds of pregnant mothers in developing countries suffer from nutritional anemia. Worldwide it is estimated that anemia contributes to 20% of maternal deaths directly and indirectly to 40% of all maternal deaths [3]Among these, about half of the global maternal deaths occur in South Asian countries, out of which 80% is contributed by India. [4]

India continues to be of the countries with the highest prevalence of anemia. National Family Health Survey 3 (NFHS-3) estimates reveal the prevalence of anemia to be 60-80% in pregnant women .[5]

In order to prevent high maternal mortality and high

incidence of low birth weight babies, Government of India launched National Anemia Prophylaxis Programme way back in 1970 targeting pregnant and lactating Subsequently, the programme was modified and renamed as National Anemia Control Programme in 1991, targeting not only pregnant and lactating women but also preschool children. Even though the programme has been operational for over 40 years, it has made little dent on the overall prevalence of anemia during pregnancy in both urban and rural areas, as per the NFHS-3 report. [6]

In this context of combating anemia during pregnancy, with far reaching benefits in terms of safe motherhood and healthier future generations, an attempt has been made to know the prevalence and severity of anemia among urban and rural pregnant mothers. This study was taken up as not many comparative studies on anemia have been done between urban and rural pregnant mothers.

## OBJECTIVES

To compare the prevalence and severity of anemia among urban and rural pregnant mothers, beyond 12 weeks of amenorrhea

## METHODOLOGY

An urban, rural based, cross – sectional, comparative study was carried out in the field practice area of a private medical college in Davangere for a period of one year. The pregnant mothers, aged above 18 years and beyond 12 weeks of amenorrhea were registered for the study. A total of 400 (210 urban and 190 rural) pregnant mothers were included in the study. The sample was calculated by the Formula, $n = 4pq/d2$ where, n = sample size, p= prevalence of anemia, ie, 70 % (NFHS 3) q= 100 – p =100-70 =30, d= admissible error (10 % of p)therefore, n = 171.4.

Pregnant mothers with systemic illness and bleeding disorders, who were non co-operative, absent on the days of visit or consuming iron and folic acid (IFA) tablets in the past three months were excluded from the study. Sampling technique employed was purposive sampling.

All the study group mothers were briefed regarding the purpose of the study and their confidentiality and anonymity was maintained. The data on socio demographic profile was collected by interview with each mother, in a predesigned, pretested, multiple response type of questionnaire, designed for the study. Ethical committee approval was taken.

The prevalence and severity of anemia was assessed by estimating hemoglobin level among the study group by using "Color Scale for Hemoglobin" device.[7]

The data was compiled and analyzed using Statistical Package for Social Sciences (SPSS 18) software. The statistical test used were 'Z' test for Proportion, Odd's ratio and Chi square test

## RESULTS

An urban, rural based, cross – sectional, comparative study was conducted among 400 urban (210) and rural (190) pregnant mothers aged above 18 years and beyond 12 weeks of amenorrhea in the field practice areas of SSIMS &RC , Davangere.Majority of the mother were less than 25 years (urban= 70%, rural =91%). In the urban area majority were Muslims (52%) and in the rural area, Hindus (61%). Majority of the women were housewives (urban:86%, rural: 84%). Literacy level was higher among urban pregnant mothers than rural mothers .Majority of mothers lived in joint families (urban:54%, rural:52%). Majority of the women were non-vegetarians(urban: 77%, rural:80%). Proportion of multigravida was almost equal in urban and rural pregnant mothers. Most of the women were primis (urban: 50%, rural: 46%). Majority of women gave birth at an interval of more than 2 years (urban: 54%, rural: 61%) and had no abortions (urban: 89%, rural: 92%).(table no.1)

## Table 1: Background characteristics of study participants

| Characteristics | urban | rural | P value |
|---|---|---|---|
| **1.     Age(years)** | | | |
| < 25 | 147(70%) | 173 (91%) | |
| 25-30 | 52 (25%) | 17 (9%) | |
| >30 | 11 (5%) | 0 (0%) | <0.001 |
| | | | |
| **2.     Religion** | | | |
| Hindu | 82 (39%) | 116 (61%) | |
| Sc-st | 19 (9%) | 61 (32%) | |
| Muslim | 109 (52%) | 13 (7%) | <0.001 |
| | | | |
| **3.     Occupation** | | | |
| Housewife | 181 (86%) | 160 (84%) | |
| Employed | 26 (13%) | 6 (3%) | |
| Agricultural Labourer | 3 (1%) | 24 (13%) | <0.001 |
| | | | |
| **4.     Literacy** | | | |
| Low | 34 (16%) | 42(22%) | |
| Middle | 101 (48%) | 97(51%) | 0.105 |
| High | 75 (36%) | 51 (27%) | |
| | | | |
| **5.     Family** | | | |
| Nuclear | 64(31%) | 48(25%) | |
| Joint | 114(54.3%) | 99(52%) | |
| 3 Generation | 32(15%) | 43 (23%) | 0.573 |
| | | | |
| **6.     Dietary Pattern** | | | |
| Vegetarian | 48 (23%) | 39 (21%) | |
| Non- Vegetarian | 162 (77%) | 151 (80%) | 0.573 |
| | | | |
| **7.     Gravida Status** | | | |
| Primi | 98 (47%) | 88 (46%) | |
| Multi | 112 (53%) | 102 (54%) | 0.94 |
| **8.     Parity** | | | |
| Para 0 | 98 (47%) | 88 (46%) | |
| Para 1 | 73 (35%) | 78 (41%) | 0.348 |
| Para 2 | 27 (13%) | 17 (9%) | |
| More than 3 | 12 (5%) | 7 (4%) | |
| | | | |
| **9.     Birth Interval** | | | |
| Less than 2 | 51 (46%) | 40 (39%) | |
| More than 2 | 61 (54%) | 62 (61%) | 0.35 |
| | | | |
| **10.     Abortion** | | | |
| Nil | 187(89%) | 174(92%) | |
| 1 | 17 (8%) | 14(7%) | |
| 2 | 5(2%) | 2(1%) | 5.82 |
| More than 3 | 1(!%) | 0 | |

The prevalence of anemia was more in the rural areas (74%) as compared to that of the urban areas (59%) and difference in the prevalence of anemia was highly significant. (p <0.001) Odds of anemia was 1.68 times more in rural than urban pregnant mothers

**Table 2: Prevalence of anemia among rural and urban pregnant mothers**

| Place | Anemic | Not anemic | Total |
|-------|--------|------------|-------|
| Rural | 141(74%) | 59 (26%) | 190 (100%) |
| Urban | 123 (59%) | 87 (41%) | 210 (100%) |

Z= 3.36   p= 0.001   OR= 1.68      CI= 1.12-2.54

41% of urban and 26% of the rural mothers were not anemic. Among the anemic urban mothers, 31% of them were mildly anemic and 1% were severely anemic. Among rural mothers almost equal percentages of them were mildly and moderately anemic and 8% of them were severely anemic (Table no.3).

**Table 3: Showing severity of anemia among urban and rural pregnant mothers**

| Severity | Urban | Rural | Total |
|----------|-------|-------|-------|
| No anemia | 87 (41%) | 49 (26%) | 136 (34 %) |
| Mild anemia | 64 (31%) | 64 (34%) | 128 (32%) |
| Moderate anemia | 57 (27%) | 61 (32%) | 118 (30%) |
| Severe anemia | 2 (1%) | 16 (8%) | 18 (4%) |
| Total | 210 (100%) | 190(100%) | 400 (100%) |

p <0.001

## DISCUSSION

Our study on the prevalence of anemia among pregnant mother in rural and urban areas shows that the prevalence was more in the rural areas (74%) as compared to that of the urban areas (59%)This was probably because of illiteracy, ignorance and walking barefoot in agricultural fields and deficiency of iron intake in the food among rural women.

Among the anemic urban mothers, 31% of them were mildly anemic and 1% were severely anemic. Among rural mothers almost equal percentages of them were mildly and moderately anemic and 8% of them were severely anemic

Whereas, Hirematt L D, Dorle A S, Ghatatrgi CH and Kulkarni K R found in their study among women in Community Health Centre, Bagalkot, Karnataka that out of 218 women, 141(64.68 %) had mild anemia, 35(16.05%) and 07(3.21%) women had moderate and severe anemia respectively.[7]

Toteja GS, et al., in a similar study on pregnant women in 16 districts of India showed that 84.9% of pregnant women were anemic out of which 13.1% had severe anemia and 60.1% had moderate anemia. [8]

Taseer et al. in their study conducted in an under developed area of Sothern Punjab found out that out of 250 pregnant mothers 138 (55.2%) were anemic and out of these 83(60.14%) and 55(39.86%) were moderately and mildly anemic respectively.[9]

Rajaratnam J, et al., in their study conducted on pregnant women in Vellore district of Tamil Nadu showed that 69.3% were anemic out of which 3.4% were severely anemic, 35.4% moderately anemic and 30.2% mildly anemic.[10]

Wadgav H V in his study conducted in 16 villages under primary health centre, Valsang, Solapur district found that out of 827 pregnant women 764 (92.38%.) were anemic out of which 328 (39.66%) were mildly anemic, 406 (49.09%) and 30( 3.63%) were moderately and severely anemic respectively.[11]

Nagraj K, in his study of multivariate analysis of risk factors of severe anemia among pregnant women in Tirupati, Andhra Pradesh, showed that out of 202 women 98.5% were anemic, 11.44% had severe anemia, whereas 78.10% and 8.9% had moderate and mild anemia respectively. [12]

Mondal B , Maiti S,Maity B, Ghosh D and Paul S in their study among pregnant Bauri women of Bankure, West Bengal showed that (91.46%) of the anaemic women had moderate anaemia, while mild and severe anaemia were recorded to be 8.54% and only 0.81%, respectively[13]

**Table 4 : Comparing results with other similar studies**

| Studies | Anemia prevalence | Mild anemia | Moderate anemia | Severe anemia |
|---|---|---|---|---|
| 1. Hirematt L D, Dorle A S, Ghatatrgi CH and Kulkarni K R | | 64.68 % | 16.05% | 3.21% |
| 2. Toteja GS, et al | 84.9% | | 60.1% | 13.1% |
| 3. Taseer et al | 55.2% | 39.86% | 60.14% | |
| 4. Rajaratnam J, et al | 69.3% | 30.2% | 35.4% | 3.4% |
| 5. Wadgav H V | 92.38% | 39.66% | 49.09% | 3.63% |
| 6. Nagraj K | 98.5% | 78.10% | 8.9% | 11.44% |
| 7. Taseer I, Mirbahar A,  Safdar S and  Awan Z | 55.2% | 39.86% | 60.14% | 0% |
| 8. Mondal B , Maiti S,Maity B, Ghosh D and  Paul S | | 8.54% | 91.46% | 0.81%, |
| This study (rural) | 74% | 34% | 32% | 8% |
| urban | 59% | 31% | 27% | 1% |

## LIMITATIONS

Since the urban area is a muslim dominant region and non probability sampling methods was used the findings of the study cannot be generalized even if it is a community based study.

## CONCLUSION

The prevalence of anemia was more in the rural area as compared to urban area. The prevalence of mild anemia was almost equal in both urban and rural areas. Whereas moderate and severe anemia was more in the rural areas.

## RECOMMENDATIONS

Qualitative and quantitative studies can be done to explore the reasons for the rural urban discrepancies in the severity of anemia.

**Conflict of Interest-** Nil

**Source of Funding-** Nil

**Ethical Clearance-** Obtained

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# Qualitative Analysis of Articular Cartilage of the Knee Joint on a 1.5 T MRI is Highly Sensitive and Correlates with Arthroscopic Assessments

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## ABSTRACT

**Background:** The prevalence of osteoarthritis is increasing with aging and increasing rates of obesity. Currently, conventional methods of imaging provide accurate means to detect morphological deterioration of cartilage in the later stages of osteoarthritis, however these methods are not sensitive to the subtle changes during early disease stages. In osteoarthritis, assessment of degenerative cartilage disease is important for recommending adequate treatment. Using a representative sample of 10 patients, this case series investigated whether there is a correlation between MRI cartilage assessment and arthroscopy findings in patients with osteoarthritis of knee.

**Method:** In a cross-sectional study as a part of the retrospective case-control study, 10 patients (mean age 53.1) with clinically suspected osteoarthritis underwent standardized MRI (Sag and Axial PD fatsat, Cor STIR, Cor T2* GRE, Sag T2 and T1, Cor and Axial T2 map) on a 1.5 T unit (GE Signa HDxt). The patients also underwent a diagnostic arthroscopy within 2 months of the MRI study to assess the grading of the articular cartilage.

**Results:** The sensitivity and specificity in the detection of 23 cartilage lesions of all arthroscopic grades were 86.9 % (20of 23 lesions) and 91.3% (21 of 23 lesions) for the MR imaging protocol with T2 maps. The addition of the T2 maps to the routine MR imaging protocol improved the sensitivity of detection among all grades of lesions. The MR imaging protocol with T2 maps had significantly higher sensitivity for detecting arthroscopic grade 1A (P < .001), arthroscopic grade 1B (P < .001), arthroscopic grade 2A (P = .004), arthroscopic grade 2B (P = .023), and all arthroscopic grades of cartilage lesions (P < .001) and significantly lower specificity for detecting all arthroscopic grades of cartilage lesions (P < .001). A tendency to underestimate the cartilage disorders on MRI images was not noticed.

**Conclusions:** According to our results there is a good correlation between MRI grading of articular cartilage and arthroscopic grading. However a diagnostic arthroscopy is of utmost importance when a crucial decision needs to be taken regarding therapeutic options in patients with osteoarthritis.

*Keywords: MRI/arthroscopy/knee joint/articular cartilage/T2 mapping.*

## BACKGROUND

Osteoarthritis is characterized by an imbalance between synthesis and degradation of the articular cartilage with degeneration of the joint. [1] MRI has revolutionized the ability to directly assess the articular cartilage non-invasively. MRI T2 mapping of the cartilage is a non-invasive functional imaging technique delivering cartography of the T2 relaxation time of the cartilage without any contrast injection. It is sensitive to tissue anisotropy, and provides compositional information on the cartilage collagen network, water content and proteoglycans concentration. Early degenerative disease may be seen on MRI as early alterations in cartilage

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contour morphology (fibrillation, surface irregularity) changes in cartilage thickness, including cartilage thinning or thickening, which may be an early feature predating cartilage volume loss; or intrachondral alterations in signal intensity potentially related to premorphologic intrasubstance collagen degeneration and increased free-water content.[2] Previous studies have shown that elevation in cartilage T2 results from a loss of structural anisotropy of the type II collagen matrix.[3] For knee osteoarthritis, it has been shown that T2 mapping is sensitive to T2 prolongation induced by cartilage degeneration, and that the cartilage T2 value increases with the severity of osteoarthritis.[4] The successful treatment of patients with osteoarthritis requires early identification of cartilage degeneration within the knee joint. Evaluation of articular cartilage in symptomatic patients undergoing routine MR imaging of the knee joint is typically performed by using sequences that assess cartilage morphology. [5]

## METHOD

All patients included in the study were clinically assessed and were treated at our hospital for the ongoing symptoms of knee osteoarthritis. Clinical relevance was defined as having lead to any treatment for the osteoarthritic symptoms. Articular cartilage at the patella, medial femoral condyle, lateral femoral condyle, medial tibial plateau, lateral tibial plateau was assessed using Modified Noye's classification. T2 maps were then used to detect areas of increased T2 relaxation time on articular surfaces that appeared normal with the routine MR imaging protocol sequences. All the patients included in the study have received conservative treatments before being referred to our hospital. Furthermore, because of the persisting symptoms which were refractory to drugs, all patients included in the study required Total Knee Replacement surgery. (TKR) Patients with previous knee trauma, such as meniscal or ligamentous tears, cartilage injuries, fractures, inflammatory joint disease as well as reactive knee joint diseases were excluded. The study was approved by the Institutional Ethical Review Board (IERB). Patients who met with the inclusion criteria and who underwent an arthroscopic evaluation within 2 months of the MRI were included for statistical analysis. The final sample size was 10 patients (5 male, 5 female) with a mean age of 53.1 years.

### MR imaging:

The average period between MRI and arthroscopy was 28 days (Range is 2 – 60 days). Patients underwent MRI using a 1.5 T scanner (GE systems). A flexible surface coil with 2 coil elements was used for imaging and was placed anteriorly and posteriorly over the knee. The following sequences were used in this study : T1-weighted-Coronal, T1-weighted (Axial, Sagittal), Proton Density – Axial, Fat Suppressed Proton Density – Sagittal, Short Tau Inversion Recovery – Coronal, T2-Weighted gradient echo (GE)-Sagittal, T2 Fat suppressed FSE, Coronal, Axial and Sagittal T2 mapping sequence (Cartigram, GE Healthcare).

**Table 1: Summary of MR parameters:**

| Parameter | Axial Fat- sat T2W- FSE | Sagittal Fat-sat T2W- FSE | Axial sequence for patella- femoral joint | Coronal sequence for femoro-tibial joints | Sagittal T2 mapping |
|---|---|---|---|---|---|
| Repetition time (msec) | 4300 | 5300 | 1000 | 1000 | 1500 |
| Echo time | | | 6.1, 14.1,22.1, | 6.1, 14.1,22.1, | 9, 18, 27, 36, |
| (msec) | 77 | 80 | 30.1, 38.1, 46.1, | 30.1, 38.1, 46.1, | 44, 53, 62, 71 |
| | | | 54.1 and 62.1 | 54.1 and 62.1 | |
| Flip angle (degrees) | 90 | 90 | 90 | 90 | 90 |
| Matrix size | 448 x 224 | 384 x 224 | 256 x 192 | 256 x 192 | 320 x 192 |
| Field of view (cm) | 18 | 14 | 16 | 16 | 16 |
| Section thickness (mm) | 3 | 3 | 3 | 3 | 3 |
| Bandwidth (kHz) | 41.7 | 41.7 | 41.7 | 41.7 | 31.3 |
| Echo train length | 21 | 20 | 19 | 19 | N/A |
| No. of signals acquired | 4 | 3 | 2 | 2 | 1 |
| Imaging time | 3 min 30 sec | 3 min 16 sec | 5 min 9 sec | 5 min 9 sec | 5 min |

**Legends:** Fat saturation T2W- FSE (T2 Weighted Fast spin echo).

T2 maps of the articular cartilage of the knee joint, with a color scale ranging between 25 and 75 msec, were created from the T2 mapping source data. All sequences in the routine MR imaging protocol were first used together to grade the articular cartilage on the patella, medial femoral condyle, lateral femoral condyle, medial tibial plateau, and lateral tibial plateau according to a modified Noyes classification system.[6,7,8] The T2 maps were then used to detect areas of increased T2 relaxation time on articular surfaces that appeared normal with the routine MR imaging protocol. [9,10,11,12,13] Articular cartilage that appeared normal with the routine MR imaging protocol but showed increased T2 relaxation time on the T2 maps was classified as a grade 1A cartilage lesion. Location and grading of all cartilage lesions were documented. When a grade 2A or 2B cartilage lesion was identified with the routine MR imaging protocol, the T2 maps were used to determine whether the partial-thickness cartilage lesion had a normal, increased, or decreased T2 relaxation time.

When a grade 1A cartilage lesion was identified on the T2 maps, the presence or absence of four features of the area of increased T2 relaxation time was determined. These features included whether the area of increased T2 relaxation time (a) was two or more color scales higher than normal, (b) was more than 1 cm in maximal diameter, (c) was present on at least two consecutive images, and (d) involved the entire thickness of the deep cartilage layer.
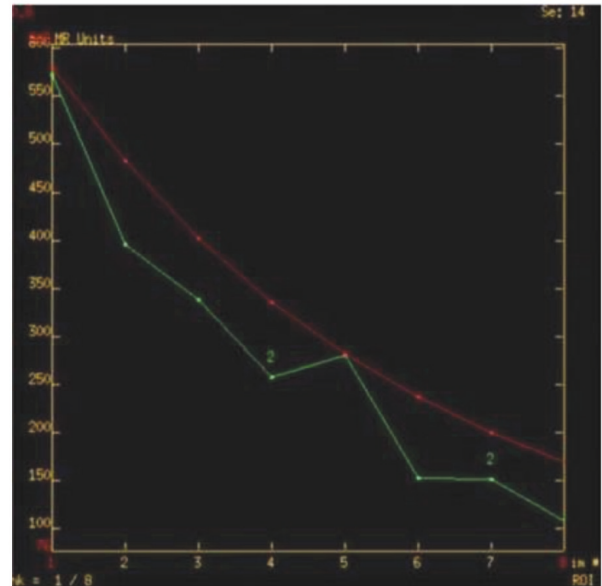


Figure 2: T2 mapping showing increased T2 relaxation time along the femoral and medial tibial plateau articular cartilage surfaces.
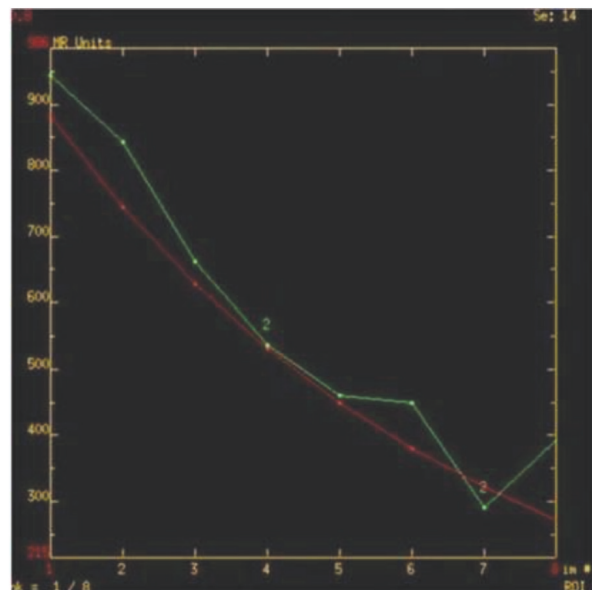


Figure 3: T2 mapping showing increased T2 relaxation times along the patellar articular cartilage



Figure 1: Cartilage maps showing degenerative changes along the femoral and medial plateau articular cartilages.

Figure 4: Tears in the patello-tibio-femoral cartilage (Grade 3)

## ARTHROSCOPIC KNEE SURGERY

Arthroscopic knee surgery was performed within 2 months of the MR examination in all 10 patients in the study group. All articular surfaces of the knee joint were visually inspected with a surgical probe at arthroscopy by an experienced arthroscopy surgeon at our hospital. Interestingly, the correlation between the MRI findings and arthroscopic findings were poorest in the patellofemoral compartment. This could be explained by the so-called "magic angle effect", which influences the visualization of the cartilage at certain orientations of collagen fibers corresponding to the magic angle of 55°.[14]

## STATISTICAL ANALYSIS

For all tests, statistical significance was considered at $P < .05$. Sensitivity, specificity, 95% confidence intervals of the estimated values were calculated using arthroscopic findings as reference standard in the detection of each arthroscopic grade and all arthroscopic grades were combined.

## RESULTS

**Table 2: Sensitivity and Specificity of the MR Imaging Protocol with T2 Maps according to Arthroscopic Grade**

| Arthroscopic Grade | Sensitivity (%), | Specificity (%) |
|---|---|---|
| 0 | Not applicable | 91.3 (21/23){90.75-91.8},(<0.001) |
| 1A | 66.7 (2/3){65.78-67.6},(<0.001) | Not applicable |
| 1B | 80.0 (4/5){79.2-80.78},(<0.001) | Not applicable |
| 2A | 83.3 (5/6){82.58-84.0}, (0.004) | Not applicable |
| 2B | 100(9/9){99.94-100},(0.023) | Not applicable |
| 3 | - | Not applicable |
| All Grades | 86.9 (20/23){86.24-87.56},(<0.001) | 91.3 (21/23){90.75-91.8},(<0.001) |

( ) – Number, { } – 95% confidence intervals, (p value).

**LEGENDS :** Grade 0 = normal cartilage, Grade 1= increased T2 signal intensity within morphologically normal cartilage, Grade 2A = superficial partial-thickness cartilage lesion less than 50% of the total thickness of the articular surface, Grade 2B = deep partial thickness cartilage lesion greater than 50% of the total thickness of the articular surface, and Grade 3 = full thickness cartilage lesion.

**Table 3: Regions of cartilage with their T2 relaxation times:**

| Cartilage region | T2 relaxation time (msec) |
|---|---|
| Deep layer on medial and lateral femoral condyles | 20-30 |
| Deep layer on medial and lateral tibial plateaus | 20-30 |
| Superficial layer on medial and lateral femoral condyles | 40-50 |
| Superficial layer on medial and lateral tibial plateaus | 40-50 |
| Deep layer on the patella | 20-30 |
| Superficial layer on patella | 40-50 |

Diagnosis using T2 Maps:

There were 23 surgically confirmed cartilage lesions within the knee joint in 10 patients. The sensitivity and specificity in the detection of all arthroscopic grades of cartilage lesions were 86.9% (20 of 23 lesions) and 91.3% (21 of 23 lesions) for the MR imaging protocol with T2 maps. The addition of the T2 maps to the routine MR imaging protocol improved the sensitivity of detection among all grades of lesions. The MR imaging protocol with T2 maps had significantly higher sensitivity for detecting arthroscopic grade 1A (P < .001), arthroscopic grade 1B (P < .001), arthroscopic grade 2A (P = .004), arthroscopic grade 2B (P = .023), and all arthroscopic grades of cartilage lesions (P < .001) and significantly lower specificity for detecting all arthroscopic grades of cartilage lesions (P < .001). Cartilage lesions on the patella, medial tibial plateau, lateral tibial plateau were picked up better on MRI imaging protocol with T2 maps. Identification of areas of increased cartilage T2 relaxation time on the T2 maps allowed for detection of 2 areas of cartilage softening, 4 areas of cartilage fibrillation, 5 superficial partial-thickness cartilage defects, and 9 deep partial-thickness cartilage defects which were not detected using the routine MRI protocol. However, 7 areas of increased cartilage T2 relaxation time on the T2 maps were found to represent normal articular cartilage at arthroscopy. Of the 14 partial-thickness cartilage lesions identified with the routine MR imaging protocol and confirmed at arthroscopy, 13 (90%) showed an increased T2 relaxation time, 1 (10%) showed a normal T2 relaxation time, and none showed a decreased T2 relaxation time on the T2 maps. Increased T2 relaxation time two or more color scales higher than normal (estimate of 2.74 with standard error of 1.02, P = .007) and increased T2 relaxation time that involved the entire thickness of the deep cartilage layer (estimate of 1.86 with standard error of 0.52, P< .001) were features that could significantly help differentiate true-positive from false-positive MR grade 1A cartilage lesions.

## DISCUSSION

T2 Mapping technique significantly increases the sensitivity for detecting cartilage lesions within the knee joint. The early degenerative changes of articular cartilage were better picked up using T2 mapping technique. T2 mapping sequences do not rely on spatial resolution to identify superficial changes in cartilage morphology but instead depict areas of increased water content and altered collagen matrix ultrastructure in degenerative cartilage [15–19]. T2 mapping sequences can also depict areas of cartilage softening with moderate sensitivity and thus can help detect changes in the composition and three-dimensional ultrastructure of degenerative cartilage even before changes in cartilage morphology occur. [5] Cartilage degeneration increases T2 relaxation time due to disruption of the collagen matrix ultrastructure. [9,10,11,12,13] The fact that some surgically confirmed cartilage lesions did not show increased T2 relaxation time suggests that T2 mapping sequences should not be used alone to evaluate articular cartilage in clinical practice or osteoarthritis studies[5] Although arthroscopy is the best available minimally invasive reference standard, its ability to depict early cartilage degeneration, especially in the deep layers of articular cartilage, has been questioned. [20]

## CONCLUSION

This study demonstrates the application of T2 mapping sequence to evaluate the articular cartilage of the knee joint in a 1.5 T MRI scanner.

## STRENGTHS AND LIMITATIONS OF THE STUDY

The authors believe that the ability to demonstrate clinically significant cartilage changes even on a 1.5T scanner makes it a clinically valuable tool. The limitations of this study were small sample size, the arthroscopic surgeon was aware of the MRI findings, arthroscopy and not histopathologic examination was used as a reference for evaluating articular cartilage. Another limitation of the study is the lower specificity of T2 mapping sequence for evaluating the articular cartilage. Nevertheless, the addition of a T2 mapping sequence to a routine MR imaging protocol can improve the detection

of early cartilage degeneration within the knee joint in symptomatic patients.

**Conflict of Interest**: None

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**Informed Consent:** Obtained

**Ethical Clearance:** Taken from Institutional Ethical Review Board, St. John's Medical College, Bangalore – 560 034.

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# Socio Demographic Profiles and Drug Use Patterns of People Who Inject Drug in Bangkok, Thailand

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## ABSTRACT

**Background:** New trends among People Who Inject Drugs (PWID) in Thailand and limited data mean that there is a need to better understand socio demographic profiles and drug use patterns. This study aims to present socio demographic profile and drug injecting behaviours of PWID in Bangkok, Thailand in order to better inform the development of the interventions for PWID in the future.

**Method:** The individual interviews with 125 PWID from the community were conducted. Ninety-one PWID who reported injecting drugs in the previous six months and no kind of drug treatment were eligible in this study. Descriptive analysis was performed using SPSS software package.

**Results:** Most participants (86.8%) were male. Mean age of participants was 41 years old (SD 8.46). PWID in Bangkok had been injecting drugs for an average of 20 years (SD 8.50). PWID reported injection of midazolam (72.5%) and heroin (48.4%) at arm (68.1%) followed by groin (45.1%). There were 82.4% of study participants reported having received some form of drug treatment but they discontinued.

**Conclusions:** The findings of this study suggested that PWID in Bangkok has a long history of drug injection and high injecting frequency. They practice unsafe injecting behaviors such as inject drugs in combination and injection at the groin. They discontinued drug treatment while still injecting drugs. Efforts should be made to further reach out PWID and provide tailored intervention to reduce harm associated with drug injection.

***Keyword:*** *Drug injection, harm reduction, drug use*

## INTRODUCTION

Worldwide, an estimated of 27 million people suffer from problem drug use reflected in the demand for drug treatment.[1] Injecting drug use is driving HIV new infections, hepatitis B and hepatitis C in many countries around the world.[2] In Thailand, an estimated of the total number of People Who Inject Drugs (PWID) was 40,300.[3] In Bangkok, the capital city of Thailand, the PWID population was estimated to be around 4,200.[4] In the past years, there were many studies reported unsafe injecting practices among PWID in Bangkok.[5, 6]

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In Thailand, drug use has been noted in the past decades and Thai Government has many strategies to deal with drug problems in the country. It was suggested that drug policy should be reformed to response to the current situations.[7] Many kinds of treatment for drug users have been developed and implemented in order to reduce the harm related to drug use including drug abstinent. Harm reduction strategies have also been implemented in Thailand to increase access to treatment and care among PWID.[8] Even there are many kinds of treatment in Thailand, drug use is still a major problem of the country.

Over the past decade, there has been an increasing concern of society in preventing and controlling drug use. Drug use patterns among PWID has been changed in terms of drug of choice and injecting patterns.[9, 10] New trends among PWID in Thailand and limited data mean

that there is a need to better understand socio demographic profiles and drug use patterns. This study aims to present socio demographic profile and drug injecting behaviours of PWID in Bangkok, Thailand in order to better inform the development of the interventions for PWID in the future.

## METHOD

Data was pulled from a quasi-experimental study to assess effectiveness of a harm reduction intervention implemented with PWID in Bangkok, Thailand. The data collection was conducted between October and November of 2014. The study participants were PWID in Bangkok who reported having injected any kind of substance in the previous six months, older than 18 years old and not currently receiving any kind of drug treatment. A 'snowball' technique was used to recruit study participants throughout the city. Screening questionnaires were used to identify eligible participants. In total, there were 125 PWID from the community completed the screening questionnaire and ninety one participants who reported no kind of drug treatment in the past six months passed the screening criteria.

Study participants completed a pretested questionnaire interviewed by trained interviewers. The questionnaire covered details regarding socio demographic and injecting behaviors in the previous month. For socio demographic, information about age, education, employment status, income and marital status were asked. Injecting behaviors included period of drug injection, number of drugs injected, frequency of drug injections, the type of drugs being used, and needle sharing. The Opiate Treatment Index (OTI) was administered in drug use domain.[11] Questions concern behaviors in the month prior to the day of interview. The intervals between days of drug use, and the amounts consumed on these days, were employed to estimate recent consumption. Experiences of drug treatment, incarceration, and non-fatal drug overdose were also collected. Content validity was conducted by consultation with five experts. Translation was done from English to Thai and completed back translation by English language specialist. The questionnaire was pilot tested with 30 PWID from outside Bangkok. Descriptive analysis was performed using SPSS software package. The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, approved this study.

## RESULTS

Most participants (86.8%) were male. Mean age of participants was 41 years old (SD 8.46). More than half of participants (64.9%) had completed education in secondary school or higher. There were 66.6% of participants reported having a full time or a part time job. Mean monthly income was 175 USD (1 USD = 35 THB). Around one-third of participants (36.2%) were married. Socio demographic of PWID in Bangkok was presented in Table 1.

**Table 1: Socio demographic characteristics of PWID in Bangkok, Thailand (n = 91)**

| Variable | n | % |
|---|---|---|
| **Sex** | | |
| Male | 79 | 86.8 |
| Female | 12 | 13.2 |
| **Age** | | |
| Younger than 31 | 3 | 3.3 |
| 31 – 40 | 49 | 53.8 |
| 41 – 50 | 26 | 28.6 |
| Older than 50 | 13 | 14.3 |
| **Education** | | |
| Primary school and lower | 32 | 35.1 |
| Secondary school and higher | 59 | 64.9 |
| Employment | | |
| Employed | 57 | 66.6 |
| Unemployed | 34 | 37.4 |
| **Income** | | |
| No income | 24 | 26.4 |
| 1 – 170 USD per month | 28 | 30.8 |
| 171 – 340 USD per month | 30 | 33.0 |
| More than 340 USD per month | 9 | 9.8 |
| **Marital Status** | | |
| Married | 33 | 36.2 |
| Single / Divorced / Separated / Widowed | 58 | 63.8 |

PWID in Bangkok had been injecting drugs for an average of 20 years (SD 8.50). Half of them (49.5%) injected two kinds of drugs. Study participants reported having injected the following drugs in the past month: midazolam (72.5%), heroin (48.4%), methamphetamines (31.9%), crystal-methamphetamines (12.1%), and methadone (7.7%). There were 44% of participants reported injecting one drug for each injection and half of participants (50.5%) reported mixing drugs for each injection. A majority of PWID reported injection at arm (68.1%), followed by groin (45.1%), hand (17.6%) and thigh (16.5%). There were 82.4% of study participants

reported having received some form of drug treatment, 83.5% reported having been in prison because of drug related charges and 28.6% reported having experienced a non-fatal drug overdose. There were 3.3% reported sharing needle in the past month. Other harm reduction behaviors taken into consideration were injection site rotation and tourniquet usage. There were 57.1% reported rotation of injection site every time in the past month and 26.4% reported using tourniquet. Pattern of drug injection of PWID in Bangkok was presented in Table 2.

**Table 2: Drug injection behaviors of PWID in Bangkok, Thailand (n = 91)**

| Variable | n | % |
|---|---|---|
| Period of drug injection | | |
| 1 – 5 years | 7 | 7.7 |
| 6 – 10 years | 7 | 7.7 |
| 11 – 15 years | 11 | 12.0 |
| 16 – 20 years | 29 | 31.9 |
| 21 – 25 years | 17 | 18.7 |
| 26 – 30 years | 13 | 14.3 |
| Longer than 30 years | 7 | 7.7 |
| Number of drug injection | | |
| 1 kind of drug | 37 | 40.6 |
| 2 kinds of drug | 45 | 49.5 |
| 3 kinds of drug | 6 | 6.6 |
| 4 kinds of drug | 3 | 3.3 |
| Type of drug injection | | |
| Midazolam | 66 | 72.5 |
| Heroin | 44 | 48.4 |
| Methamphetamine | 29 | 31.9 |
| Crystal-Methamphetamine | 11 | 12.1 |
| Methadone | 7 | 7.7 |
| Injection site | | |
| Arm | 62 | 68.1 |
| Groin | 41 | 45.1 |
| Hand | 16 | 17.6 |
| Thigh | 15 | 16.5 |
| Pattern of drug injection | | |
| Use only one kind of drug | 40 | 44.0 |
| Use many kinds of drugs but not mixing | 5 | 5.5 |
| Mix more than one kinds of drugs | 46 | 50.5 |
| Needle sharing | 3 | 3.3 |
| Injection site rotation | 52 | 57.1 |
| Tourniquet usage | 24 | 26.4 |
| Ever been in drug treatment | 75 | 82.4 |
| Ever been in prison because of drug related | 76 | 83.5 |
| Ever experienced drug overdose | 26 | 28.6 |

In this study, OTI was used in drug use domain to gather information from the study participants. OTI scale score was measured for two types of main drugs use which were heroin, and midazolam. For heroin injection, 48% (n=43) of study participants reported injecting heroin in the past month and only 39 participants responded to OTI questions. The OTI score was assessed among this group as shown in Table 3. No study participants were in abstinent category and 44.2% injected heroin more than once a day. There were 63% (n=57) of study participants reported injecting midazolam in the past month and 57 participants responded to OTI questions No study participants were in abstinent category as well. There were 35% injected midazolam more than once a day.

**Table 3: Heroin and Midazolam consumption among PWID in Bangkok, Thailand**

| OTI | Heroin injection n=43 | | Midazolam injection n=57 | |
|---|---|---|---|---|
| | n | % | n | % |
| Abstinence | 0 | 0 | 0 | 0 |
| Once a week or less | 5 | 11.6 | 5 | 8.8 |
| More than once a week | 11 | 25.6 | 14 | 24.6 |
| Daily | 8 | 18.6 | 18 | 31.6 |
| More than once a day or more | 19 | 44.2 | 20 | 35.0 |

## DISCUSSION

This study presents socio demographic profile and drug injecting behaviours of PWID in Bangkok, Thailand. The findings indicated that most PWID in Bangkok were male with an average age 41 years old and had started injecting drugs for an average of 20 years. PWID that have used drugs for a long time face complicated health situations including skin and soft tissue infection.[12]

Most participants in Bangkok reported having injected midazolam, heroin and methamphetamine in the month leading up the questionnaire. More than one-third of PWID reported injecting heroin and midazolam more than once a day. Reported midazolam injections in this study was higher than a study conducted in 2010 that reported 68% of midazolam injections.[10]

Harm reduction behaviours were also observed and found that around half of PWID rotated injection site every time and they injected at arm, groin, hand and

thigh respectively. This study reported higher rate of groin injection than a study conducted in 2011 [5]. It was found that groin injections were used when no other injection sites were inaccessible due to unsafe injection practices.[13]

Almost all study participants reported not sharing needles and injecting equipment in the past month. This may be a result of needle and syringe exchange program implemented in Thailand in the past years. A majority of participants injected drugs in combination with other drugs. The drug most commonly injected in combination were midazolam and heroin. It is a risk factor associated with drug overdose.[14] Most of PWID had ever been in drug treatment, however, they discontinued treatment for a period of time while continue injecting drugs. Most of them had experiences incarcerated because of drug related charges.

The findings of this study suggested that PWID in Bangkok has a long history of drug injection and high injecting frequency. They practice unsafe injecting behaviors such as inject drugs in combination and injection at the groin. They discontinued drug treatment while still injecting drugs. Efforts should be made to further reach out PWID and provide tailored intervention to reduce harm associated with injection.

There were a number of limitations that should be considered in this study. Firstly, this study excluded PWID who reported in any kind of drug treatment as this is part of a larger project to implement an intervention reducing unsafe injecting behaviors. Secondly, findings were based on self-reported data that may have been influenced by social desirability. These findings should be followed up to further assess socio demographic and pattern of drug use among PWID in Thailand.

## CONCLUSIONS

The findings of this study suggested that PWID in Bangkok has a long history of drug injection and high injecting frequency. They practice unsafe injecting behaviors such as inject drugs in combination and injection at the groin. They discontinued drug treatment while still injecting drugs. Efforts should be made to further reach out PWID and provide tailored intervention to reduce harm associated with injection.

**Conflict of Interest:** All authors declared no conflicts of interest.

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# Awareness of Staff Nurses and Nurse Educators on Research and its Utilization

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## ABSTRACT

The **objective** of the study was to assess the awareness regarding Nursing research and its utilization among Staff Nurses and Nurse Educators of selected institutions in Bangalore. **Method:** The descriptive research design was adopted with sample of 300 staff nurses from 8 hospitals and 200 nurse educators from 20 Nursing institutions. The validated and reliable awareness questionnaire was used as an instrument. **Results**: The awareness mean score of staff nurses were 21.54 and SD of 7.47, Nurse Educators mean score was 35.22 and the SD of 10.37, Mean difference of 13.6. With the t value 17.12, (P<0.001). **Conclusion**: It is essential for staff nurses to update their knowledge on Nursing research and its utilization for better practice.

***Keywords***: *Awareness, Knowledge, Nursing Research, Research utilization, staff Nurses, Nurse Educators.*

## INTRODUCTION

One of the important areas in the field of Nursing is Research and the research is considered as scientific approach, which is characterized by several features. Nurses are often use this approach which should be systematic, orderly, and objective methods to gather the information. "Research is the scientific method uses empirical data, which are data gathered through the sense organs. Information is gained in the form of data or facts that are obtained in an unbiased manner from some aspect of the real world"[1] (Nieswiadomy, 2009).

People are recognizing health care as a right rather than a privilege and with spiraling costs are asking various groups of health professionals to uphold the services, contributing to the total delivery of Health care. Hence interest is increased in exploring health care practices, which makes it essential for health care professionals to evaluate the effectiveness of their services.

The important purpose of Nursing research is to establish scientifically defensible reasons for Nursing practice, provide nurses both scientifically proved intervention, cost effective care, setting the standard, quality assurance, evidence based practices, develop academic curiosity among Nurses to earn the status of professional Nursing.

Several authors and organizations have asserted that research is central to good nursing practice. In the United Kingdom, the Briggs Report *was* one of the initial documents to highlight Nursing research, stating that "nursing should become a research based profession a sense of the need for research should become part of the mental equipment of every practicing nurse and midwife"[2] (Carl Thompson, 2001)

Timmins, McCabe, McSherry (2012) conducted a study on "Research awareness: among 234 registered nurses of Republic of Ireland, A Self-administered Research Awareness Questionnaire was used to collect data. In the study it was reported that nurses had lack of knowledge, confidence, time, but had positive attitude towards the research.[3]

Goodfellow, Macduff, Leslie, Copeland, Nolfi, Blackwood (2012) was done a descriptive study on "Nurse scholars' knowledge and use of electronic theses and dissertations"(ETD). Purposive sampling was done

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on specific schools of nursing from in Australia, New Zealand, the UK and the US. A total of 209 nurses participated in online interview. The Results showed that only 44% of participants were aware on how to access ETDs in their institutions' and only 18% were aware on how to access in national or international digital library. The study concluded with that the most nursing scholars do not use ETDs to their fullest possible. By reviewing the above facts and with personal experience the researcher felt opt for studying on awareness regarding Nursing Research in Indian context.[4]

## METHOD AND MATERIALS

The survey approach with descriptive research design was adopted with the sample size of 300 staff nurses and 200 Nurse Educators were selected by systematic random sampling technique from 8 hospitals (every fifth subject in the hospitals and every second subject in the nursing educational institute) from 20 Nursing institutions of Bangalore. An awareness questionnaire on Nursing research and its utilization was prepared with the support of review literature and expert validation. The awareness tool consists of 60 items which includes concept of research, types, review literature, research design, sampling, ethical principles, methods of data collection, data analysis and communication of research findings. Every correct answer was scored as one and for incorrect answer zero was assigned. The total awareness score is classified as an inadequate with score of 0-30 score, 31-45 was considered as moderate, and 46-60 was considered as adequate level of awareness on Nursing research and its utilization. The reliability of the tool was established by administering for 25 staff nurses and 25 Nurse Educators by split half method. The internal consistency was found to be 0.812 & 0.8 for both the group.

## DATA COLLECTION

The ethical permission from concerned authorities obtained from 8 hospitals and 20 Nursing educational institutions & consent obtained from the participants for the study. After selecting the sample they were gathered in convenient place in their institution & introduced the purpose of the study and also instructed on how to fill the awareness questionnaire. Allotted time duration was one hour fifteen minutes.

## RESULTS

Description of sample characteristics:

Majority of the staff nurses 199 (66.3%) were in the age group of 20-25years, and only four (1.3%) were >50 years, whereas majority of the Nurse educators 98 (49 %) were in the age groups of 20-25years and only 2% were in the age group of 46-50 years. Most of the staff nurses of the study were female 212 (70.7%) and only 88 (29.3%) were males. Whereas majority of the nurse educators of the study were (88.5%) were female and only 11.5% were males. Most of the staff nurses (93.7%) were with BSc (N) Nursing qualification. Whereas most of the Nurse educators of the study were (67%) with BSc Nursing qualification and 28% of them with MSc Nursing qualification. Most of the staff nurses (74.6%) were not TNAI members. Whereas 46.5% of Nurse educators were the members of TNAI (Professional organization). Only 46.4% of staff nurses said institution will provide support whereas only 31.5% of nurse educators said institution will provide support.

**Table-1 : Mean, Standard deviation , Mean difference and t value        (n=300+200)**

| Variables | Staff Nurses | | | Nurses educators | | | Mean difference | t value |
|---|---|---|---|---|---|---|---|---|
| | Maximum score | Mean | SD | Mean | SD | | | |
| Concepts of Research. | 6 | 2.57 | 1.2 | 3.96 | 1.44 | | | |
| Types of research | 5 | 2.04 | 1.1 | 3.12 | 1.34 | | | |
| Review of literature | 3 | 0.9 | 0.7 | 1.77 | 0.8 | | | |
| Research design | 6 | 2.19 | 1.39 | 3.32 | 1.59 | | | |
| Sampling | 7 | 2.26 | 1.35 | 3.40 | 1.57 | | 13.68 | 17.12* |
| Ethical principles | 3 | 0.80 | 0.83 | 1.56 | 0.99 | | | |
| Data collection | 6 | 1.8 | 1.73 | 3.95 | 1.60 | | | |
| Data analysis | 4 | 1.49 | 0.85 | 2.72 | 1.08 | | | |
| Communication and research utilization | 20 | 7.53 | 3.46 | 11.43 | 3.94 | | | |
| **Total** | **60** | **21.54** | **7.47** | **35.22** | **10.37** | | | **P<0.001** |

The data in table number 1 shows that the overall mean score on awareness on Nursing research and its utilization of the staff nurses was 21.54 and SD of 7.47. With regard to nurse educators, the overall mean score was 35.22 and the SD of 10.37. There was significant mean difference of 13.6. With t value 17.12 at 0.001 level of significance. It can be interpreted as the nurse educators were involved in the academics of the students hence they have better awareness on process of Nursing research and its utilization. Even it clearly demonstrates that they had inadequate awareness on ethical principles, literature review and communication and utilization of research findings.

**Table 2 : Nurse Educators level of Awareness on nursing research based on their qualification**

| Sample | N | Inadequate | % | Moderate | % | Adequate | % |
|--------|-----|-----------|-----|----------|------|----------|------|
| BSc | 134 | 20 | 15 | 79 | 59 | 35 | 26 |
| PBBSc | 10 | 1 | 10 | 7 | 70 | 2 | 20 |
| MSc | 56 | 1 | 1.7 | 20 | 35.7 | 35 | 62.6 |
| Total | 200 | 22 | 11 | 106 | 53 | 72 | 36 |

Table 2 shows that majority (62.5%) of Nurse Educators who had MSc Nursing qualification had adequate awareness compared to 26% of Nurse Educators who had BSc Nursing qualification. It is evident that as education increases the level of awareness also increases.

**Figure -1** *(n= 300+200)*



**Fig -1 Level Of awareness of staff Nurses & Nurse Educators regarding Nursing Research**

The fighure-1 shows that 164 (54.6%) staff nurses were having moderate awareness on Nursing research and its utilization and only 2 (0.7%) of the subjects were under adequate score, Whereas 36% nurse educators had adequate & 106(53%) were had moderate & only 22 (11%) of them had inadequate awareness on Nursing research and its utilization. By the above findings we understand that the Nurse educators those who were in the academics has better opportunity to update the knowledge on Nursing research but Nurses those who are at the bedside have concerns towards conducting and utilization of Nursing research.

The Chi square computed between the level of awareness and the selected variables, it showed that there was significant association between the Hospital attached with teaching institution and the level of Awareness on Nursing research and its utilization among the staff nurses ($\chi$ - 9.21, P<0.001) with this finding it can be interpreted that the nurses who are working the hospitals which is attached with teaching institution has better awareness than others.

## DISCUSSION

The present study showed that (table no 1) the overall mean score on awareness on Nursing research and its utilization of the staff nurses was 21.54 and SD of 7.47. With regard to nurse educators the overall mean score was 35.22 and the SD of 10.37. There was significance mean difference of 13.6. With the t value 17.12 at 0.001 level of significance. About 72 (36%) nurse educators had adequate & 106(53%) were had moderate & only 22 (11%) of them had inadequate awareness on Nursing research and its utilization and 164 (54.6%) staff nurses were had moderate awareness on Nursing research and its utilization and only 2 (0.7%) of the subjects were under adequate scores.

The above findings supported by the study Clara M Bensone had also observed on 148 medical Centre and 132 non-medical Centre subjects. Most of the respondents of Medical Centre 63% were having better awareness compared to the (29%) Non-Medical Centre.[4]

Timmins, McCabe, McSherry, (2012) has conducted a study on Research awareness: among the nurses of Ireland, the results showed nurses had lack of knowledge,

confidence, time, but had positive attitude towards the research. [3]

Hart P(2008) had also observed that the gap in knowledge and skill in retrieving publications, evaluating the evidence and incorporating the evidence into practice.[5]

## CONCLUSION

Above findings clearly describes that there is a need to take measures to improve the knowledge on Nursing research and utilization. Nurses need to be motivated in CNE, conferences and workshops on nursing research. To promote research in to the practice they need to be supported by their seniors and the administration and Research mentors need to be assigned for the nurses and nurse educators. We need to motivate the Nursing professionals to write papers on both the concepts and original research articles.

**Conflicting Interest:** The Author declare that there is no conflict of interest.

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# A Study of Nutritional Status of Pre School Children in Muzaffarnagar District (Uttar Pradesh)

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## ABSTRACT

Malnutrition among children is a critical problem as its effects are long lasting. Almost half of children under 5 are chronically malnourished.

**Objectives:** To study the anthropometric measurements,so as to assess the nutritional status and to find out the prevalence of Proten Energy Malnutition in Preschool children of this region.

**Material and Method:** The present study comprises of 675 apparently healthy children from the Well Baby Clinic of the Department of Pediatrics, Muzaffarnagar Medical College from 01/07/2015 to 31/03/2016. In each child information regarding age,family size and income, feeding habits and residential status were recorded on a prepared format. They were also subjected to anthropometric examination.

**Results:** Male children were heavier than their female counterparts in all age groups except 43-48 months in case of urban children where female children weighed more. The mean values for weight were higher in case of urban children than rural children in all age groups. Regarding height the mean heights in case of male children were more than female children in all age groups except between 13-18 months where female children had higher mean value for height. Again, the mean values of height were more among urban children than rural children. Regarding nutritional status, in 51.26% children, weight was more than 80% of Harvard Standard whereas 32%, 12.59%, 3.41% and 0.74% children had grade 1, grade 2, grade 3 and grade 4 malnutrition respectively.

**Conclusions:** Prevalence of malnutrition was high between 1-2 years. Prevalence of malnutrition was significantly higher in rural children than urban children. This was attributed to social customs and beliefs, poor hygiene, ignorance about the nutritional requirements of growing children among rural people.

***Keywords:***Malnutrition,Preschool Children, Anthropometry.

## INTRODUCTION

One death in every three in the world is the death of a child under five. The mortality rates among infants and preschool children are the most sensitive indices of health and socioeconomic status of a nation. It has been reported that about 13 million infants and children less than 5 years of age, die each year in developing countries and most of

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these deaths are attributed to undernutrition. Malnutrition among children is a critical problem as its effects are long lasting.Almost half of children under 5 are chronically malnourished. The percentage of underweight children under five in India is almost 20 times as high as would be expected in a well nourished population and almost twice as high as the average percentage of undernourished children in Sub-Saharan African Countries[1]. Weaned from breast feeding and left to subsist on adult diets that are starchy, young children are physically and mentally weakened thus predisposing to disease and early death. Malnutrition among children depends upon various factors like socio-demographic, environmental, reproductive, cultural and regional factors[2]. According to WHO criteria,

52% of young children, in underdeveloped countries are considered normal while 48% of them are malnourished and 10% of them are severely malnourished[3,4].

A lot of studies found that prevalence of malnutrition is more in rural area compared to urban area. Hence this study was undertaken to find out the anthropometric measurements to assess nutritional status and find out the prevalence of protein energy malnutrition among urban and rural children of preschool age in District Muzaffarnagar.

**Aims and Objectives:**

1.To study the anthropometric measurements

2. To assess the nutritional status

3. To find out the prevalence of Protein Energy Malnutrition in Preschool children of this region.

## MATERIALS AND METHOD

The study was descriptive cross-sectional study and was carried out on children between age of 1-5 yrs. A total of 675 apparently healthy children attending the well baby clinic in Department of Pediatrics, Muzaffarnagar Medical College belonging to rural and urban areas of Muzaffarnagar district were included in this study between time period 01/07/15 to 31/03/16. Anthropometric measurements that were taken were weight, height, head circumference, chest circumference and mid arm circumference. A questionnare that was modified from several studies was used to collect data and to obtain relevant information about age of child, total number of members in the family, residential status, religion, father's occupation and education and total family income.

The anthropometric measurements were taken three times and following standard protocols[5]. Anthropometric measurements taken were weight, height, head circumference, chest circumference and mid arm circumference.

For measuring weight digital weighing scale were used. The child was asked to stand straight in the middle of scale platform without touching anything and eyes looking in horizontal plane. Height was measured with the help of stadiometer. The child was asked to stand bare-footed and straight with heels, buttocks, upper part of back and occiput against the wall, eyes looking straight in Frankfurt horizontalplane while the top of stadiometer was lowered to the head. For children 1-2 years, recumbent length was measured using infantometer.

Head circumference, chest circumference and midarm circumference were measured using a flexible, non-stretchable fibreglass tape.Regarding head circumference the greatest circumference was measured by placing the tape firmly over the glabella and supra-orbital ridges anteriorly and maximal occipital protuberance posteriorly.Chest circumference was measured at the level of substernal notch in a plane at right angle to vertebral column in mid-respiration.Mid-arm circumference was measured in left arm at a level midway between acromion process of scapula and olecranon process of ulna with the arm hanging freely.

## OBSERVATIONS

The present study was carried out on children between the ages of 1-5 years. A total of 675 apparently healthy children belonging to urban and rural areas of Muzaffarnagar district were included in this study. The distribution of children in urban and rural areas according to age and sex is given in table 1.

**Table-1: Distribution of children according to age and sex**

| Age (months) | Urban | | Rural | | Total | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 13-18 | 17 | 11 | 30 | 24 | 47 | 35 |
| 19-24 | 15 | 11 | 20 | 11 | 35 | 22 |
| 25-30 | 15 | 13 | 22 | 13 | 37 | 26 |
| 31-36 | 11 | 16 | 15 | 16 | 26 | 32 |
| 37-42 | 18 | 18 | 12 | 10 | 30 | 28 |
| 43-48 | 42 | 19 | 14 | 08 | 56 | 27 |
| 49-54 | 67 | 48 | 12 | 11 | 79 | 59 |
| 55-60 | 80 | 29 | 17 | 10 | 97 | 39 |
| | 265 | 165 | 142 | 103 | 407 | 268 |

The above table shows that 430 (63.70%) children belonged to urban areas while 245 (36.30%) were rural children. Regarding the sex distribution, 407 (60.30%) were males and 268 (39.70%) were females.

**Table-2: Distribution of urban children according to mean weight in different age groups**

| Age (months) | Male | | Female | |
|---|---|---|---|---|
| | Mean weight (kg) | ±S.D | Mean weight (kg) | ±S.D |
| 13-18 | 8.76 | 1.39 | 8.50 | 0.89 |
| 19-24 | 10.03 | 1.11 | 9.77 | 1.40 |
| 25-30 | 11.47 | 1.34 | 11.00 | 1.31 |
| 31-36 | 12.23 | 1.82 | 12.03 | 1.56 |
| 37-42 | 13.39 | 1.33 | 13.17 | 1.59 |
| 43-48 | 13.54 | 1.81 | 14.02 | 1.41 |
| 49-54 | 14.53 | 1.58 | 14.46 | 1.49 |
| 55-60 | 15.61 | 1.70 | 14.47 | 1.72 |

Table 2 shows amongst Urban Children, males were heavier than females in all age groups except in age group 43-48 months which was just opposite.

**Table-3: Distribution of rural children according to mean weight in different age groups**

| Age (months) | Male | | Female | |
|---|---|---|---|---|
| | Mean weight (kg) | ±S.D | Mean weight (kg) | ±S.D |
| 13-18 | 8.73 | 1.64 | 7.83 | 1.77 |
| 19-24 | 9.28 | 0.98 | 8.09 | 1.11 |
| 25-30 | 10.32 | 1.77 | 9.92 | 1.81 |
| 31-36 | 11.47 | 1.62 | 10.97 | 1.61 |
| 37-42 | 12.92 | 1.36 | 11.90 | 1.57 |
| 43-48 | 12.82 | 1.94 | 12.50 | 1.06 |
| 49-54 | 13.08 | 1.29 | 13.00 | 1.54 |
| 55-60 | 14.18 | 1.29 | 13.80 | 1.85 |

Table 3 shows that in rural children males were heavier in all age groups than their female counterparts. Further, the mean values of weight were more in urban children than rural children in all age groups in both the sexes.

**Table-4: Distribution of urban children according to mean height in different age groups**

| Age (months) | Male | | Female | |
|---|---|---|---|---|
| | Mean height (cms) | ±S.D | Mean height (cms) | ±S.D |
| 13-18 | 74.29 | 3.82 | 75.63 | 3.05 |
| 19-24 | 80.80 | 5.03 | 78.55 | 4.84 |
| 25-30 | 85.07 | 3.05 | 83.69 | 4.36 |
| 31-36 | 89.68 | 4.13 | 87.84 | 4.10 |
| 37-42 | 97.17 | 2.62 | 94.67 | 3.53 |
| 43-48 | 98.19 | 4.82 | 98.13 | 3.57 |
| 49-54 | 101.37 | 4.38 | 100.91 | 4.55 |
| 55-60 | 104.74 | 4.04 | 102.88 | 4.53 |

Among urban children the males were taller than their female counterparts in all age groups except 13-18 months where mean height was more in females.

**Table-5: Distribution of rural children according to mean height**

| Age (months) | Male | | Female | |
|---|---|---|---|---|
| | **Mean height (cms)** | **±S.D** | **Mean height (cms)** | **±S.D** |
| 13-18 | 71.47 | 4.01 | 72.13 | 4.24 |
| 19-24 | 77.70 | 2.97 | 74.73 | 4.02 |
| 25-30 | 82.00 | 4.20 | 80.23 | 4.65 |
| 31-36 | 84.93 | 5.07 | 83.78 | 4.37 |
| 37-42 | 93.83 | 4.76 | 93.00 | 5.65 |
| 43-48 | 96.43 | 3.40 | 96.81 | 4.90 |
| 49-54 | 98.46 | 5.79 | 97.45 | 2.50 |
| 55-60 | 100.32 | 3.11 | 99.05 | 4.63 |

Table 5 depicts that the mean height was more in rural males than females in all age groups except the ages of 13-18 months and 43-48 months.

The urban children were taller than rural children in all age groups.

**Nutritional Status-**

According to the recommendation of the Nutrition Sub-committe of Indian Academy of Pediatrics (1972), the children were classified into 5 categories based on weight for age criteria.

Table6 depicts the distribution of children into various grades of nutritional status according to age and sex.

**Table-6**: **Nutritional status of children according to age and sex**

| Grade of nutritional status | Age in months | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | **13-18** | **19-24** | **25-30** | **31-36** | **37-42** | **43-48** | **49-54** | **55-60** | |
| **Normal** | | | | | | | | | |
| Male | 23 | 12 | 18 | 14 | 20 | 31 | 41 | 57 | 216 |
| Female | 10 | 05 | 10 | 14 | 18 | 18 | 37 | 18 | 130 |
| Total | 33 | 17 | 28 | 28 | 38 | 49 | 78 | 75 | 346 |
| Percentage | 40.24 | 29.82 | 44.44 | 48.28 | 65.52 | 59.04 | 56.52 | 55.15 | 51.26 |
| **Malnutrition** | | | | | | | | | |
| **Grade1-** | | | | | | | | | |
| Male | 18 | 14 | 14 | 07 | 07 | 17 | 26 | 27 | 130 |
| Female | 14 | 08 | 09 | 11 | 07 | 07 | 16 | 14 | 86 |
| Total | 32 | 22 | 23 | 18 | 14 | 24 | 42 | 41 | 216 |
| Percentage | 39.02 | 38.60 | 36.51 | 31.03 | 24.14 | 28.92 | 30.43 | 30.15 | 32.00 |
| **Grade 2-** | | | | | | | | | |
| Male | 04 | 09 | 03 | 04 | 02 | 06 | 11 | 12 | 51 |
| Female | 05 | 06 | 04 | 05 | 03 | 01 | 05 | 05 | 34 |
| Total | 09 | 15 | 07 | 09 | 05 | 07 | 16 | 17 | 85 |
| Percentage | 10.98 | 26.32 | 11.11 | 15.52 | 8.62 | 8.43 | 11.59 | 12.50 | 12.59 |
| **Grade 3-** | | | | | | | | | |
| Male | 02 | 00 | 02 | 01 | 00 | 01 | 01 | 01 | 08 |
| Female | 04 | 03 | 02 | 02 | 00 | 01 | 01 | 02 | 15 |
| Total | 06 | 03 | 04 | 03 | 00 | 02 | 02 | 03 | 23 |
| Percentage | 7.72 | 5.26 | 6.35 | 5.17 | 0.00 | 2.41 | 1.45 | 2.21 | 3.41 |
| **Grade 4-** | | | | | | | | | |
| Male | 00 | 00 | 00 | 00 | 01 | 01 | 00 | 00 | 02 |
| Female | 02 | 00 | 01 | 00 | 00 | 00 | 00 | 00 | 03 |
| Total | 02 | 00 | 01 | 00 | 01 | 01 | 00 | 00 | 05 |
| Percentage | 2.44 | 0.00 | 1.59 | 0.00 | 1.72 | 1.20 | 0.00 | 0.00 | 0.74 |

Of the children surveyed, 51.26% had weight more than 80% of the Harvard Standard (normal grade of nutrition), 32% children had grade 1 malnutrition, 12.59% children grade 2 malnutrition while 3.41% and 0.74% children had grade 3 and grade 4 malnutrition, respectively.

Among male children 216 (53.07%) had normal nutrition, 130 (31.94%) had grade 1 malnutrition while 51 (12.53%), 8 (1.97%) and 2 (0.49%) had grade 2, grade 3 and grade 4 malnutrition respectively.

Of the female children surveyed, 130 (48.51%) had normal nutrition, 86 (32.09%) had grade 1 malnutrition. 34 (12.69) grade 2 malnutrition, 15 (5.59%) grade 3 malnutrition and 3 (1.12%) grade 4 malnutrition.

**Nutritional Status in relation to residential status-**

Table 7 shows the distribution of urban and rural children into various grades of malnutrition. Of all the urban children surveyed, 60.70% had normal malnutrition (more than 80% of Harvard Standard weight for age), 29.30% had grade 1 malnutrition while 8.37% and 1.63% had grade 2 and grade 3 malnutrition. There was no child in grade 4 malnutrition. Among rural children, 34.69% had normal nutrition, 36.73% had grade 1 malnutrition, 20% had grade 2 malnutrition, 6.54% had grade 3 malnutrition and 2.04% had grade 4 malnutrition. There was a significant association between the prevalence of malnutrition and residential status of children.

**Table-7: Nutritional status of children in relation to their residential status.**

| Grade of nutritional status | Urban | | Rural | |
|---|---|---|---|---|
| | **Number** | **Percentage** | **Number** | **Percentage** |
| **Normal** | 261 | 60.70 | 85 | 34.69 |
| **Malnutrition-** | | | | |
| **Grade 1** | 126 | 29.30 | 90 | 36.73 |
| **Grade 2** | 36 | 8.37 | 49 | 20.00 |
| **Grade 3** | 07 | 1.63 | 16 | 6.54 |
| **Grade 4** | 00 | 0.00 | 05 | 2.04 |
| **Total** | 430 | 100.00 | 245 | 100.00 |

## DISCUSSION

**Weight-** We observed that the mean values for weight were higher in urban male children as compared to female in all age groups except the age groups 43-48 months, while in rural children males were heavier than females in all age groups ( Tables 2-3).

These findings are in agreement with the findings of Chaudhary and Ramakrishnan (1972)[6], I.C.M.R. studies (1972)[7], Dhamija et al (1976)[8], Bildhaiya and Bose (1977)[9], Gupta et al (1978) and Srivastava et al (1980)[10,11].

Further, it was observed that the mean values for weight were higher in case of urban children than rural children in all age groups. These findings are at a variance with the findings of Gupta et al (1978) who observed not much difference in weight of urban and rural children.

The difference between the mean values for weight between urban and rural children in the present study could be due to difference in socioeconomic status of urban and rural children in ignorance about the feeding practices amongst rural people.

The mean weights of children in this study ranged from 78.74% to 87.53% of the 50 th percentile among males and 71.19% to 88.42% among females. The values were between 82.18% to 88.42% in case of urban children while 71.19% to 87.53% in case of rural children.

**Height-** In this study males were found to have higher mean values for height as compared to their female counterparts excepting the age groups 13-18 months where females had higher mean values for height than males ( tables 4-5).

These findings are in accordance with the observations

reported by ICMR (1972)[7], Dhamija et al (1976)[8] , Gupta et al (1978) and Srivastava et al (1980)[10,11].

**Nutitional Status-** In our study,51.26 % chidren were weighing more than 80% of Harvard Standard weight for age, 32% had grde 1 malnutition, while 12.59%, 3.41% and 0.74% had grade 2,grade 3 and grade 4 malnutrition respectively.

These findings are almost in agreement with the study carried out by Naik et al (1976)[12].

## CONCLUSIONS

Male children were heavier than their female counterparts in almost all age groups.The mean values were higher in Urban children than Rural children.Similar observations were noted in height also.Prevalence of malnutrition was significantly higher in rural children.

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# Evaluation of Depression and Stress among Nurses Working in Teaching Hospitals Affiliated with Zahedan University of Medical Sciences

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## ABSTRACT

**Introduction**: Since nurses have a key role in patients care and them education this study conducted aimed to Evaluation of Depression and Stress among Nurses Working in Teaching Hospitals Affiliated with Zahedan University of Medical Sciences.

**Method**: This cross-sectional study conducted on nurses in Zahedan educational hospitals in 2011.date gathered by demographic and GHQ questioner. Data analyzed by SPSS V18.

**Results:** Of 66.2% participants were female and 17.9% of them were male. In terms of marital status, 28.5% of participants were single and 58.6% of them were married.The study results indicated that 52.4% of participants had a mild level of anxiety and only 21.4% of them were suffering from a severe or very severe level of anxiety. The mean score of depression for singles and the married was 9.71 and 8.88, respectively.

**Conclusion:** The results of this study emphasize the point that the stressfulness of nursing profession should be seriously taken into account. In addition, mental health of nurses in medical centers can be improved using the help and experience of consultants.

*Keywords: Depression, Stress, Nurses.*

## INTRODUCTION

Mental health refers to the sense of well-being and confidence in self-efficacy, self-reliance, competitive capacity, sense of intergenerational belonging, self-actualization of potential emotional and intellectual abilities, and so on. There is a consensus that mental health is something more than the absence of mental disorders. This means that one's mental health cannot be fully confirmed merely due to the absence of symptoms of mental illnesses in that person [1]. Occupation is one of the areas in which it is very important to pay special attention to mental health [2]. The workplace always affects people. In other words, occupational features and personality traits are in a constant and dynamic interaction with each other [5]. Nursing is one the jobs associated with a lot of stressors which may jeopardize health [6].

Shortage of hospital and health facilities, the need for high precision and vigilance, rotating working hours and shifts (which isolates nurses from the normal rhythm of life and community), dissatisfaction with payments, uncertainty of situations that should be dealt with (emergency situations), accountability to patients, and relationship with patients are some sources of rising

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tension in nurses [5].

On the other hand, stress at work causes heavy losses both for individuals and the organization and endangers the general health of employees as the most important factors affecting the business. As a result, given the importance of nursing, physical and mental health of nurses is directly associated with the quality of their performance in providing healthcare services to patients [6]. Williams, *et al*. state that nurses are among the working groups that are exposed to stress and psychological issues and depression, anxiety, and fatigue are their common problems [7].

Cherniss, Cary believe that certain stimuli received by a person from the environment are called stress [8]. Lazarus and Folkman define stress as one's reaction to the environment or situation that is considered threatening to their capabilities and resources or dangerous to their health [9]. Because of the low number of nurses and high working pressure, nursing itself is regarded as the primary source of stress. The nature of the duties of a nurse is also unpleasant because she deals with activities (blood, illness, etc.) that might be inconceivable for an ordinary person [5]. Long-term job stress can lead to burnout, reduced efficiency and effectiveness at work, frequent absences, decreased patient satisfaction, nursing turnover, family and marital problems, alcohol and drug abuse, depression, and even suicide [4].

Brent, quotes from Spielberger, defines anxiety as a situation with transient emotional state characterized by tension, hallucination, and increased activity of the autonomic nervous system [10]. Anxiety is an unpleasant and ambiguous feeling of worry mostly associated with symptoms of autonomic nervous system stimulation. In other words, anxiety is an unpleasant and imminent restlessness and fear with an unidentifiable source [11]. The possibility of making mistakes at work, feeling of inferiority, and managers' failure in understanding the problems of employees are the most important factors causing anxiety among nurses. A nurse who is exposed to constant anxiety loses her self-confidence in doing her duties and will be susceptible to depression [12].

Depression is a state of grief and misery associated with slowness and lethargy in physiological and psychological activities [13]. The sense of sadness, hopelessness, emptiness, and worthlessness and loss of energy are symptoms of this state. Sleep disorders and especially midnight insomnia are common among these individuals [11].

Even the most efficient nurses are also at risk of mental problems, and hospitals are among the workplaces that make individuals susceptible to stress, burnout, and depression [5]. In addition, nurses may experience depression due to dealing with people of different cultures and long and hard working hours [14]. The findings of Mehrabi show that 86% of nurses are experiencing a moderate level of stress [15].

According to the results of a study conducted by Fathi, most psychological stressors (77.13%) in special units relate to the critical atmosphere of these units. Lewin concluded that the most important sources of stress for nurses include lack of cooperation from the authorities, conflict with colleagues, lack of social support, and role ambiguity [16].

The findings of Pakniat indicate that 58.5% of nurses are suffering from moderate to severe levels of anxiety [17]. Kaplan and Sadouk state that 20-30% of patients hospitalized in different wards of hospitals suffer from depression and this itself is one the causes of depression among nurses [18]. The results of studies conducted by the Iranian Nursing Organization suggest that 20% of nurses are suffering from moderate to severe levels of depression [14].

The present research is of special importance because nurses account for more than 80% of employees in the health care system of Iran.

Given that the physical and mental health of nurses is among the factors influencing their working efficiency, the present study aims to evaluate the mental health of nurses working in teaching hospitals affiliated with Zahedan University of Medical Sciences.

## METHODOLOGY

The subjects were selected based on the census sampling. The required data and information were collected using demographic information questionnaire and DASS-42. The Depression Anxiety Stress Scales, developed by Lovibond in 1995, is increasingly used in various areas. In Iran, this scale has been used in different population and its reliability and validity have been reported to be acceptable. Using Cronbach's alpha, the reliability of this scale for the subscales of depression,

anxiety, and stress has been obtained 0.93, 0.90, and 0.92, respectively. In addition, correlation of depression with Beck Depression Inventory, Zung Self-Rating Anxiety Scale, and Stress Test has been reported to be 0.68, 0.83, and 0.76, respectively. This questionnaire consists of 14 items for each of the subscales based on a 4-point Likert scale (from 0 to 3). The minimum and maximum score for each subscale vary between 0 and 42. In addition, each of the subscales is measured in five levels of normal, mild, moderate, severe, and very severe as follows in the table.

|  | Depression | Anxiety | Stress |
|---|---|---|---|
| Normal | 9-0 | 7-0 | 14-0 |
| Mild | 13-10 | 9-8 | 18-15 |
| Moderate | 20-14 | 14-10 | 25-19 |
| Severe | 27-21 | 19-15 | 33-26 |
| Very severe | 28+ | 20+ | 34+ |

All data were statistically analyzed in SPSS using descriptive statistics such as central indices (mean, median, and mean) and dispersion indices (variance, standard deviation, and range) and analytical statistics such as the correlation coefficient, independent t-test, and ANOVA.

## RESULTS

The results showed that 66.2% of participants were female and 17.9% of them were male. In terms of marital status, 28.5% of participants were single and 58.6% of them were married. In addition, the mean age of them was 32.6, with a minimum and maximum of 21 and 60, respectively.

The study results indicated that 52.4% of participants had a mild level of anxiety and only 21.4% of them were suffering from a severe or very severe level of anxiety. This means that more than half of nurses participated in this study have a mild level of anxiety. Most nurses (69.9%) has a mild level of stress and only 10.1% of them were in the severe or very severe range of stress. In terms of depression, 56.8% of participants were in a mild range and 10.8% of them were suffering from severe and very severe levels.

The mean score of depression for singles and the married was 9.71 and 8.88, respectively. The independent t-test showed that the difference between these two groups was not significant. The mean score

of anxiety was 8.68 for singles and 8.06 for the married, which presented no significant difference. In addition, the mean score of stress for singles and the married was 9.87 and 10.21, respectively. The independent t-test showed that the difference between these two groups was not significant.

In terms of the relationship between stress and gender of nurses, the results showed that the mean score of stress in males and females was 10.11 and 10.15. The results of independent t-test indicated that there is no significant difference between males and females in this regard. The Pearson correlation coefficient showed that there is no significant relationship between age and stress (r=0.01, p=0.8), between age and depression (r=0.01, p=0.7), and between age and anxiety (r=0.02, p=0.6).

## DISCUSSION

According to the World Health Organization, the prevalence of depression in society is 15-20% and this figure among nurses is estimated to be 15-30%. In the present study, the prevalence of depression was obtained 30.6% which is not consistent with the findings of peti who reported that the prevalence of depression is 24.9% [19].

In the present study, the prevalence of anxiety was 36.8%. This figure has been reported to be 27.9% by Peti and 25% in another study among nurses [19, 20]. In this study, the prevalence of stress was obtained 24.6%. This is not consistent with the figure reported by Peti (24.8%) [19] and Ghassemi (83.53%) [23].

The study findings revealed that the relatively higher prevalence of anxiety, stress, and depression in nurses indicates that they are not in a good mental health status. In this regard, in a study conducted by Hojati *et al.*, mental health status was favorable in 52% of subjects and fairly favorable in 48% of them [20]. Fiabane *et al.* concluded that there is a significant relationship between job stress and mental health of nurses [6]. Cole believes that 93% of nurses are regularly affected by the workplace stressors which can affect their physical and mental health [15]. The results obtained in this study indicate that there is no significant difference between male and female nurses in the score of depression, anxiety, and stress. This is consistent with the findings of Bigdelli *et al.* on the mental health of nurses [6]. However, in studies conducted in the United States and Europe

on male students, it has been estimated that 9-26% of women and 5-12% of men experience some sort of major depressive disorder during their lifetime [19]. It has been also estimated that 4.5-9.3% of women and 2.3-3.2% of men may be afflicted with this disorder in a period of time [19]. This means that the prevalence of depression in women is twice more than men and this ratio has been reported in clinical populations [19]. In the present study, no significant relationship was found between marital status and the prevalence of depression, anxiety, and stress, which is consistent with the findings of Fiabane *et al.* [4, 6]. However, this is inconsistent with the results of Patti, E. and Smith who showed that single employed women are more likely to be affected by depression than married employed women [19]. According to the study findings, there was no significant relationship between job experience and the prevalence of depression, anxiety, and stress, which is consistent with the results of Frankenhauser, [4] but inconsistent with the findings of Patti, E.*et al.*, and Ritchie et *al.* [6, 19]. In addition, no significant relationship was found between age and the prevalence of depression, anxiety, and stress in the present study. In the study conducted by Patti, E., the relationship between age and the prevalence of anxiety and stress was significant, but such a relationship was not observed between age and depression [19]. Among the studies conducted on occupational stressors, the study of Khalilzadeh showed that there is a significant relationship between job stress and the occurrence of depression and anxiety [22]. The findings of Hojati *et al.* indicated that among the components of job stress, patient's death and suffering and workload obtained the highest score [203]. Habrani *et al.* stated that unavailability of physicians in emergencies, low ratio of staff to patients, and providing care to critically ill or dying patients are the main stressors for nurses. In addition, managerial stressors and interpersonal factors had the highest and the lowest intensity, respectively [4].

As an explanation to the results obtained in the present study, it should be stated that only one factor is not involved in the low or high level of anxiety and stress in a certain group of people or jobs, but many factors are effective in this regard[5]. In nursing, there are various job stressors, each of which largely contributes to the cause of stress among nurses. Some of these factors include long working hours, job insecurity, lack of proper facilities and adequate equipment, excessive workload, low payment, overtime, ignoring the real status of nurses in society, work difficulty, sudden changes in patients' conditions, working in inappropriate and nonstandard places, conflict with inexperienced physicians, conflict between colleagues, biologic parameters, continuous exposure to suffering and death, and uncertainty about treatment .

## CONCLUSION

The results of this study emphasize the point that the stressfulness of nursing profession should be seriously taken into account. In addition, mental health of nurses in medical centers can be improved using the help and experience of consultants.

**Conflict of Interest:** None declared

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# Prevention of Post-Operative Nausea and Vomiting Using Granisetron and Ondansetron in Laparoscopic Surgeries in a Comparative Clinical Study

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## ABSTRACT

Postoperative nausea and vomiting is one of the most common complication dispite of advances made in anaesthesia. The efficacy of granisetron with that of ondansetron as antiemetic is compared in 90 patients undergoing laparoscopic surgeries. The patients were devided into three groups of 30 patients each. In group- G, patients received 40 mcg/kg granisetron intravenously 3 min before induction. Group-O patients received 80 mcg/kg ondansetron intravenously 3 min prior to induction while group–C patients received 3 ml of 0.9% normal saline as control. All the patients were selected for general anaethesia and observations in the Department of Surgery & Anaesthesia of Rama Medical College & Hospital Pilakhwa Hapur, were made for pulse rate, blood pressure, nausea, vomiting and side effects of the drugs under study upto 12 hours postoperatively.The frequency of nausea was 10%, 30% and 40% in group-G, group-O and group-C respectively.The statistical analysis shows that granisetron is better for prevention of post-operative nausea and vomiting (PONV )in comparison to ondansetron and is highly significant in comparison to control group. As far as the side effects of the drugs are concerned, postoperative headache, dizziness, diplopia and shivering was significantly higher in ondansetron groups.

Thus from the present study, it is concluded that intravenous granisetron 40 mcg/kg intravenously is superior to ondansetron 80 mcg/kg as a prophylactic antiemetic in laparoscopic surgeries in controlling PONV.

*Keywords* : *PONV, granisetron, antiemetic, laparoscopic surgeries.*

## INTRODUCTION

Nausea and vomiting are most common postoperative complications and can occur after general and regional anaesthesia. In Laparoscopic surgery there is risk of PONV is pronounced due to pneumoperitoneum causing stimulation of mechanoreceptors in the gut (Sarkar M,Sarkar A)[1]. Nausea is defined as a subjective unpleasant sensation, referred to the pharynx and upper abdomen associated with desire to vomit. Now, there has been a general trend towards a decrease in the incidence and intensity of the problem because of the use of less emetic anaesthetic agents, improved pre and post operative medication (e.g. analgesics), refinement of operative techniques. However, inspite of these advances, nausea and vomiting still occur with unacceptable frequency in association with surgery and anaesthesia and the description of it as "the big little problem"(kapur p a,1991)[2]. The more severe complications which may arise from post-operative nausea and vomiting are relatively rare but some, such as aspiration pneumonitis, mendelson syndrome can be fatal, severe vomiting may also lead to dehydration and electrolyte imbalance, other complications like wound dehiscence or bleeding can creat prolonged recovery. Plenty of antiemetic drugs are

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available these days which include anticholinergic drugs (scopolamine, atropine), dopamine antagonist drugs (promethazine, prochlorperazine and metoclopromide), antihistaminic drugs (diphenhydramine, hydroxyzine), 5HT3 receptor antagonists (ondansetron, granisetron, dolasetron) and steroids (dexamethasone). In spite of plenty of antiemetic drugs available, no single drug is 100% effective in prevention of PONV and combination of have got a lot of side effects. The antiemetic commonly used at present metoclopromide, prochlorperazine, droperidol and hyoscine have limited efficacy on PONV and are associated with side effects such as sedation and extrapyramidal side effects . Granisetron is relatively new antiemetic which is selective 5-HT$_3$ antagonist agent. So the present study was undertaking to compare the antiemetic effects of IV granisetron and ondansetron for prophylaxis of PONV in patients undergoing laparoscopic gynecological surgeries.

## MATERIALS AND METHOD

The Present Study was carried out on 90 Patients in the Department of Surgery and Anaesthesia of Rama Medical College Hapur, U.P.

After approval from the institutional ethical committee and informed written consent from the patients, 90 patients of ASA Group I or II aged between 12-58 yrs weighing between 31-65 kgs are selected for the study from the routine list of Laparoscopic Surgeries. All of them were studied into three groups of thirty each as Group- G, Group- O, Group- C. All the patients were seen on the day before surgery and screened for major diseases in past, eventful previous anasethetic experiences, drug allergy, family history of anaesthetic accident or post operative complications. All the patients were examined for any preexisting heart diseases, respiratory diseases, endocrine diseases. Patients with positive history of nausea and vomiting in past were excluded from the study. All the patients of three groups were premedicated with Glycopyrrolate 4mcg/kg intramuscularly and Midazolam 20 mcg/kg intravenously 1 hr before the induction of anaesthesia . Antiemetic drugs were given 3 minutes before the induction of anaesthesia.

Group-G   : Granisetron 40 mcg/kg I/V.

Group-O   : Odansetron  80 mcg/kg I/V.

Group-C   : 3 ml of 0.9% normal saline.

Patients in all the three groups were randomly selected for general anaesthesia. Pre-induction measurement of heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP) and peripheral oxygen saturation from the anaesthesia monitor was taken as the baseline measurement. All the patients were induced with  Thiopentone sodium 5 mg/kg and succinylcholine 1.5 mg/kg IV, after preoxygenation for 3 minutes and endotracheal intubation was done. Orogastric tube was introduced  Maintenance of anaesthesia was done with 33% oxygen and 66% nitrous oxide and traces of isoflurane. Vecuranium muscle relaxation and controlled ventilation was maintained . All patient received Tramadol (1 mg/kg) for intraoperative analgesia. At the end of the surgery patients were reversed with neostigmine 0.05  mg/kg and Glycopyrrolate 8 mcg/kg  intravenously. The nasogastric tube was suctioned and then removed prior to tracheal extubation. IM Diclofenac was given for postoperative analgesia. Nausea, vomiting, pulse and blood pressures –both systolic and diastolic were recorded before premedication, after premedication, 5 minutes after induction, 15 minutes after induction and thereafter every 15 minutes interval  upto 1 hour and thereafter every 2 hours upto 12 hours of induction of anaesthesia. Nausea, vomiting incidences with side effects of the drugs like headache, drowsiness, dizziness, shivering, pain at the site of injection, malaise, fatigue, anxiety or agitation, diplopia, pruritus and urticaria was also recorded, perioperatively and postoperatively upto 12 hours.

## OBSERVATION AND RESULTS

In Group-G mean age of the patients were 26.77 years ± 5.60    with a range from 16-37 years. In Group-O mean age of the patients were 27.57 years ± 10.63 with a range from 12-58 years and in Group-C mean age of the patients were 25.37 years  ± 7.68 with a range from 14-52 years. Weight of  the patients in Group-G ranges from 45 to 65 with a mean of 50.83 kgs  ± 6.29 kgs while in Group-O mean weight 48.83 kgs ±7.58 kgs with a range of 31-65 kgs. In Group-C mean weight 47.83 kgs ±6.26 kgs with a range of 40-60 kgs as shown in table no 1.

**Table 1:Demographic data**

|  |  | Group-G | Group-O | Group-C |
|---|---|---|---|---|
| **Age (years)** | Mean | 26.77 | 27.57 | 25.37 |
|  | S.D. | ±5.60 | ±10.63 | ±7.68 |
| **Weight (kgs)** | Mean | 50.83 | 48.83 | 47.83 |
|  | S.D. | ±6.29 | ±7.58 | ±6.26 |

All the results for the changes in mean arterial pressure and pulse in group in Group-G and Group-O were very linear with the patients in group-C (table no.2). So it is evident that there is no significant changes mean arterial pressure and pulse in all the three groups. Thus in all the three groups cardiovascular changes are insignificant and suggest that study drugs are not having any effects on cardiovascular system. All the postoperative observation including nausea, vomiting, with other side effects of the drugs like drugs like drowsiness, headache, shivering, diplopia all are noticed as shown in table no 3. In Group-G, only 3 (10%) patients experienced nausea as compared to Group-O in which 9 (30%) patients experienced nausea and in Group-C 12 (40%) experienced nausea.So inGroup G incidence of nausea was less than in Group-O patients.

**Table – 2: Showing Changes observed in cardiovascular system in all three groups**

| Time | | | Group – G | Group – O | Group – C |
|---|---|---|---|---|---|
| Preoperative | | | 84.46 | 81.00 | 81.23 |
| | | | 89.33 | 90.44 | 93.33 |
| After | pulse | | 84.66 | 82.26 | 83.60 |
| Premedication | MAP | | 91.99 | 89.97 | 92.88 |
| After | pulse | | 85.20 | 84.56 | 85.06 |
| Anaesthesia | MAP | | 92.10 | 86.77 | 91.10 |
| 5min | | | | | |
| After | pulse | | 84.93 | 84.26 | 85.20 |
| Anaesthesia | MAP | 15m | 91.62 | 86.21 | 90.77 |
| in | | | | | |
| After | pulse | | 84.33 | 85.80 | 84.30 |
| Anaesthesia | MAP | | 89.99 | 85.21 | 85.42 |
| 30 min | | | | | |
| After | pulse | | 86.73 | 86.73 | 84.13 |
| Anaesthesia | MAP | | 87.32 | 85.33 | 86.21 |
| 45 min | | | | | |
| After | pulse | | 87.20 | 85.13 | 82.66 |
| Anaesthesia | MAP | | 86.43 | 84.45 | 85.55 |
| 60 min | | | | | |
| After | pulse | | 87.66 | 82.26 | 83.06 |
| Anaesthesia | MAP | | 87.43 | 84.44 | 85.21 |
| 2 Hours | | | | | |
| After | pulse | | 87.66 | 82.26 | 83.46 |
| Anaesthesia | MAP | | 87.55 | 85.21 | 86.88 |
| 4 Hours | | | | | |
| After | pulse | | 87.60 | 82.46 | 83.73 |
| Anaesthesia | MAP | | 87.66 | 86.19 | 86.99 |
| 6 Hours | | | | | |
| After | pulse | | 87.20 | 82.66 | 84.53 |
| Anaesthesia | MAP | | 87.98 | 86.21 | 88.10 |
| 8 Hours | | | | | |
| After | pulse | | 86.93 | 82.66 | 85.26 |
| Anaesthesia | MAP | | 88.39 | 85.97 | 87.55 |
| 10 Hours | | | | | |
| After | pulse | | 86.00 | 83.20 | 84.66 |
| Anaesthesia | MAP | | 86.98 | 85.86 | 88.77 |
| 12 Hours | | | | | |

**Table – 3: Showing Postoperative Observations in all three groups**

| Event | Group – G | Group – O | Group – C |
|---|---|---|---|
| Nausea | 3(10.00%) | 9(30.00%) | 12 (40.00%) |
| Vomiting | 3(10.00%) | 10 (33.33%) | 15 (50.00%) |
| Headache | - | 2(06.66%) | - |
| Drowsiness | - | - | - |
| Dizziness | - | 2(06.66%) | - |
| Shivering | - | 3(10.00%) | 1(03.33%) |
| Pain at site of Injection | - | - | - |
| Malaise / Fatigue | - | - | - |
| Anxiety / Agitation | - | - | - |
| Diplopia | - | 2(06.66%) | 1(03.33%) |
| Pruritus | - | - | - |
| Urticaria | - | - | - |
| Hypotension | - | - | - |
| Respiratory Obstruction | - | - | - |

In Group-G patients incidence of nausea was comparatively less than Group-O patients. In Group-G, only 3(10%) patients experienced vomiting in comparison to Group-O in while 10 (33.33%) experienced vomiting and in Group-C 15 (50%) patients experienced vomiting. So, in Group-G patients, incidence of vomiting was quiet less than Group-O patients. In Group-G, no patients experienced headache in comparison to 2 (6.66%) patients in Group-O. So incidence of headache is higher in Group-O patients than in patients in Group-G. Similarly incidence of dizzsiness is significantly higher in Group-O patients (2 patients, 6.66% ) as compared to Group-G in which no patients experienced drowsiness. In Group-G no patients experienced shivering and diplopia while in Group-O 3(10.00%) patients developed shivering and 2(06.66%) patients experienced diplopia. Thus incidence of shivering and diplopia is also higher in Group-O patients receiving ondansetron as premedication. In Group-C, one patient experienced shivering and diplopia.

Other side effects of the drugs like pain at the site of injection, malaise, fatigue, anxiety, agitation , pruritus, urticaria, hypotension or respiratory obstruction were also monitored and observed but these were not seen in any patients taking either granisetron or ondansetron.

**Table – 4: Showing Incidence of Postoperative Nausea and Vomiting (PONV) in Relation to the Operative Procedure**

| Operative Procedure | Technique of Anaesthesia | Group –G | | Group –O | | Group –C | |
|---|---|---|---|---|---|---|---|
| | | N | V | N | V | N | V |
| **Diagnostic Laproscopy for Gynecological Surgery** | G / A | 3 | 3 | 4 | 4 | 7 | 7 |
| **Laproscopic Appendicectomy** | G /A | - | - | 5 | 6 | 5 | 8 |
| **Total** | | 10% (3/30) | | 30% (9/30) | | 40% (12/30) | |

## DISCUSSION

As post-operative nausea and vomiting is very much distressing to the patient and is very frequently associated with anaesthesia. Inhalational anaesthetic agents such as nitrous oxide :Felts J. (1990)[5], ether and cyclopropane are liable for higher incidence of PONV : Palazzo (1984)[6]. Many of intravenous anaesthetic agents like thiopentone, ketamine, etomidate are likely to cause PONV : Smesart A (1959)[7]. There was also increased incidence of PONV when opioids like morphine, mepridine, fentanyl or sufentanyl were used for analgesia during anaesthesia. In 1972 Ratra et al[9]. found that hypoxemia at the vomiting centre was the stimulus for post operative nausea and vomiting. For various type of surgery, there are different incidences for PONV especially gynecological surgery is associated with higher incidence of PONV. As females because of higher levels of gonadotropin and progesterone plasma concentration are more prone. Subject is always at greater risk aspiration pnuemonitis, mendelson syndrome suffering from PONV. There was so many ways to control PONV. Many antiemetic drugs like prochlorperazine, metoclopromide including other benzamides like cisapride, alizopride, domperidone, clebopzide etc. droperidol, antihistaminics like cyclizine,hydroxyzine, hyosine and atropine like drugs were recommended for prophylactic as well as treatment purpose for PONV.

Now 5HT3 receptor antagonists such as granisetron, ondansetron etc. used for effective management of PONV for prophylactic as well as treatment purpose. So for present study 90 patients were selected from routine list of laproscopic surgery. Then each group was studied for the occurrence of nausea, vomiting, cardiovascular changes, side effects of the drugs upto 12 hours postoperatively. Observation shows that there is no bradycardia or tachycardia and hypotension or hypertension after granisetron or ondansetron premedication and it remains throughout stable in all three groups. Thus it is obvious that granisetron is a drug with good cardiovascular stability which implies its pharmacological property.  In Group-G, all patients received granisetron 40 mcg/kg of  and out of that 3 patients (10%) had PONV. Group-O with ondansetron, 9 patients (30%) out of 30 had PONV and in Group-C with no antiemtic, 12 patients (40%) out of 30 had PONV. Thus result shows that granisetron is highly effective in prevention of PONV in patients undergoing laparoscopic surgery under general anaesthesia. The most important postoperative observation in present study are nausea and vomiting. In gynecological procedures, incidence of PONV is higher in comparison to other procedures. These may be explained by higher incidence of PONV in females due to hormonal state. Still higher incidence occurring in laproscopic procedures is due to insufflation of air or carbon dioxide into the peritoneal cavity leading to stretching of peritoneum . A selective 5HT3 antagonist granisetron is helpful in reducing incidence of PONV. It prevents nausea and vomiting by 5HT3 receptor antagonism at two specific sites (i) centrally, in the area postrema or nucleus tractus solitarius and (ii) peripherally on vagus nerve trerminals.  Patients receiving granisetron were having less incidence of nausea than control group and ondansetron group. Incidence of nausea was lowest 3 (10%) in granisetron group compared with 9(30%) and 12(40%) in ondansetron and control groups respectively as shown in table no 2. Statistical analysis confirmed that granisetron is highly effective than ondansetron and control groups as  p value is less than 0.05. Incidence of vomiting was also lowest 3(10%) in granisetron group compared to ondansetron 10(33.33%) and control group 15 (50%). Thus it is evident that this is effective control of PONV by granisetron. Statistical analysis confirmed the results and suggests that granietron is highly significant liable drug than control group and ondansetron group. Thus it is obvious from the observation and results that granisetron is very effective in reducing severity of vomiting. There was no vomiting in first 2 hours after the injection of the drug. Similar study was done by Bhattacharaya D et al[12] in 2001. He reported lower incidence of emesis sickness in early postoperative period in patients who received intravenous granisetron in comparison to those who received ondansetron and placebo. In this study emetic episodes were 7% with granisetron as compared to 20% seen with ondansetron. This is in agreement with our study where emetic episodes were observed in 33.33% patients receiving ondansetron compared to 10% receiving granisetron. Thus the results suggest that however ondansetron is having good control over PONV but it is less than granisetron in controlling PONV  in early postoperative period upto 12 hours. Incidence of headache was 6.66% with ondansetron but no incidence noticed in granisetron and control group. Incidence of dizziness was 6.66% with ondansetron group compared to no incidence in control and granisetron groups. Incidence of diplopia  is 6.66% with ondansetron and 3.33% with control while incidence of shivering is 10% with ondansetron and 3.33% with control. In present study no other side effects of the drugs was observed.

## CONCLUSION

The present study it is obvious that selective 5HT3 anatgonist granisetron 40 mcg/kg intravenously used as premedication is very safe and highly significantly effective than ondansetron 80 mcg/kg for prevention of PONV. Granisetron is an antiemetic which appears to be safe as is not having any effect on the cardiovascular system and devoid of side effects like extrapyramidal reaction sedation.

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# Problems of Elderly Age Group in the Rural Area of Haryana (India): A Community based Study

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## ABSTRACT

**Background:** Population ageing is a global phenomenon that is both inevitable and predictable. They are an important social and economic resource and a longer life expectancy means a greater opportunity to contribute to society. Between 2000 and 2050, the proportion of the world's population over 60 years will double from about 11% to 22%. Prianamayagam A observed that prevalence of morbidity among elderly males and females was 77.6% and 90.9% respectively **Aims and Objectives:** To assess physical, economical and social problems among elderly (60+ years) in a rural block of Haryana. The study was carried out in the rural area of block Beri, district Jhajjar, Haryana, which is a field practice area attached to Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak. The study was community based epidemiological study with cross-sectional design and duration of study was August 2014 to July 2015. The study universe comprised of 400 Elderly population (60 years+) residing in the study area. **Observations:** A total of 400 subjects were included in the study and mean age of study participants was 69.33 ± 6.51 years. Most common morbidity among the study participants was diminished vision (67%) which was more prevalent in females (79.7%) as compared to males (48.8%). Dental problem was found in about half of the subjects (52%) and other prevalent problems among elderly were general body weakness, indigestion and respiratory problems. **Conclusion and Recommendations:** In India, a considerable portion of elderly population is affected by physical morbidities, economic and psychosocial problems. Special screening programme should be conducted to recognize elderly psychosocial, economic and physical problems at anganwadi, subcentre, PHC and CHC level.

*Keywords: Elderly age, Physical problems, Social problems, Economic problems.*

## INTRODUCTION

Population ageing is a global phenomenon that is both inevitable and predictable. It will change society at many levels and in complex ways, creating both challenges and opportunities. Typically as a country develops, more people survive illnesses and start living longer. Older people make important contributions as family members, volunteers and as active participants in workforce. They are an important social and economic resource and a longer life expectancy means a greater opportunity to contribute to society. These changes reinforce development and growth. But they are also the drivers behind population ageing. Unless societies adapt in ways that foster the health and participation of older people, this inevitable demographic transition may slow down future socioeconomic advances. Many of these conditions, commonly misperceived to be an unavoidable part of old age, can in fact be improved.[1]

At the moment, there is no United Nations (UN) standard criterion, but the UN agreed cutoff is 60+ years to refer to the older population.[2] Between 2000 and 2050, the proportion of the world's population > 60 years will double from about 11% to 22%. The absolute number of people aged 60 years and over is expected to increase

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from 605 million to 2 billion over the same period.[3] As the population ages its problems and needs also changes. "Geriatric Giants" is a term coined by Bernard Isaacs, and the expression refers to the principal chronic disabilities of old age that impacts physical, mental and social domains of older adults. These "Giants" includes: Cognitive Impairments (i.e. dementia, delirium or depression), Incontinence, Immobility Instability, Iatrogenic etc. Tiwari SC et al in 2013 reported that maximum elderly were suffering from physical illness (45.4% and an additional 12% with psychiatric comorbidity) followed by neuropsychiatric disorder with comorbid physical illness (6.6%)[4]. Prianamayagam A observed that prevalence of morbidity among elderly males and females was 240 (77.6%) and 258 (90.9%) respectively.[5] Ubaidulla M found that the main problem during old age was health followed by economic problems.[6] The review of various issues in elderly shows that there were many studies conducted abroad and a dearth of studies in India particularly in Haryana. This study is an attempt to bring forth various health related, economic and social problems among elderly in a rural block of Haryana.

## METHODOLOGY

The study was carried out in a rural area of block Beri, district Jhajjar, Haryana, which is a field practice area attached to Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak. The Beri block has one General Hospital, Five PHC, 25 SCs, 177 Aanganwadis. The study was community based epidemiological study with cross-sectional design and duration of study was August 2014 to July 2015. The study included the elderly population (60 years and above) residing in the study area. The sample size of this study will be 400 elderly considering the least health related problem in elderly to be 20%[7,8] (i.e hearing problem), q is 1-p, allowable error 20% (L) and 95% confidence interval. The data was collected through pre tested, semi structured interview schedule. The interview was conducted by house to house visits by the investigator herself. The interview included information on demographic profile, physical, economic and social problems. As the population of elder persons aged 60 years and above constitute 8% of the total population (average 60 persons per anganwadi), therefore, out of 177 anganwadis, 40 anganwadis were selected randomly. List of elderly persons aged 60 years and above was obtained from anganwadi worker, out of which 10 elderly persons were selected randomly to

get the sample of 400 elderly persons. **Data analysis:** Collected data was entered in the MS Excel spreadsheet, coded appropriately and analysis was carried out using SPSS for Windows version 20.0.

## OBSERVATIONS

**Table I: Socio-demographic profile of participants (n = 400)**

| Socio-demographic profile | Frequency | Percentage |
|---|---|---|
| Gender | | |
| Male | 164 | 41 |
| Female | 236 | 59 |
| Socioeconomic status | | |
| Upper middle class | 44 | 11 |
| Middle class | 120 | 30 |
| Lower middle class | 188 | 47 |
| Lower class | 48 | 12 |
| Marital status | | |
| Married | 228 | 57 |
| Widow/ Widower | 172 | 43 |
| **Total** | **400** | **100** |

In the present study, 59% of subjects were female and 41% were male which is evident by Table I. Also maximum of the subjects belonged to lower middle class (47%) followed by middle and lower class. More than half of the study subjects were married (57%).

**Table II: Gender wise distribution of morbidities among study subjects (n=400)**

| Morbidity | Male | Female | Total |
|---|---|---|---|
| Diminished vision | 80 (48.8) | 188 (79.7) | 268 (67) |
| Hypertension | 44 (26.8) | 72 (30.5) | 116 (29) |
| Diabetes | 20 (12.2) | 48 (20.3) | 68 (17) |
| Dental problems | 104 (63.4) | 104 (44.1) | 208 (52) |
| General body weakness or pain | 44 (26.8) | 52 (22) | 96 (24) |
| Sleeplessness | 20 (12.2) | 32 (13.6) | 52 (13) |
| Indigestion | 36 (22) | 44 (18.6) | 80 (20) |
| Hearing problem | 20 (12.2) | 48 (20.3) | 68 (17) |
| Respiratory problem | 40 (24.4) | 36 (15.3) | 76 (19) |
| Heart problem | 8 (4.9) | 32 (13.6) | 40 (10) |
| Genitourinary problem | 12 (7.3) | 28 (11.9) | 40 (10) |

(Figures in parenthesis indicate %)

Table II shows that the most common morbidity among the study participants was diminished vision (67%) which was more prevalent in females (79.7%) as compared to males (48.8%). Dental problem was found in about half of the subjects (52%) and it was more common among males compared to females. 29% of the subjects were hypertensive and it affected more number of females in comparison to males. The other prevalent problems among elderly were general body weakness, indigestion and respiratory problems.

**Table III: Gender wise distribution of economic problems among elderly (n=400)**

| Economic problem | Male | Female | Total |
|---|---|---|---|
| Increased medical expenditure | 116 (70.7) | 176 (74.6) | 292 (73) |
| Lack of freedom on spending | 112 (68.3) | 156 (66.1) | 268 (67) |
| Reduced personal income | 116 (70.7) | 176 (74.6) | 292 (73) |
| Lack of support from family | 48 (29.3) | 80 (33.9) | 128 (32) |
| Liability of children | 24 (14.6) | 36 (15.3) | 60 (15) |
| Payment of pending loan | 24 (14.6) | 36 (15.3) | 60 (15) |

(Figures in parenthesis indicate %)

The study found that nearly three fourth of the study subjects was facing problem of reduced personal income and increased medical expenditure. These problems were more among females in comparison to males. Also 67% of elderly reported lack of freedom on spending and this problem was equally prevalent among both males and females. 32% of subjects also reported of lack of support from family and this problem was more among females in comparison to males. Problem of liability of children and payment of pending loans was found in a small percentage of elderly population (Table III).

**Table IV: Gender wise distribution of social problems among elderly (n=400)**

| Social problem | Male | Female | Total |
|---|---|---|---|
| Declining authority | 116 (70.7) | 176 (74.6) | 292 (73) |
| Lack of respect | 76 (46.3) | 128 (54.2) | 204 (51) |
| Difference of opinion with family members | 92 (56.1) | 72 (30.5) | 164 (41) |
| Not involved in family affairs | 48 (29.3) | 80 (33.9) | 128 (32) |
| Family members hardly interact | 48 (29.3) | 80 (33.9) | 128 (32) |
| Lack of recreational facilities | 48 (29.3) | 80 (33.9) | 128 (32) |
| Children dislike their presence in peer group | 92 (56.1) | 72 (30.5) | 164 (41) |
| Lack of participation in outside activity | 48 (29.3) | 80 (33.9) | 128 (32) |

(Figures in parenthesis indicate %)

Two third of study subjects complained of declining authority (73%) followed by lack of respect (51%). These problems were almost equally prevalent among both males and females. These problems were closely followed by problem of difference of opinion with family members and children disliking their presence in peer group (41% each). These two problems were more among males (56%) in comparison to females (30%). 32% of elderly reported that they were not involved in family affairs and family members hardly interacted with them. Males and females were equally affected by these problems (Table IV)

**DISCUSSION**

The present study was conducted in the rural area of block Beri, district Jhajjar, Haryana. It was undertaken on 400 people aged 60 years and above and included information on demographic profile, physical problems, economic problems and social problems among elderly people. In present study, out of 400 study participants 59% were females rest were male. More than half of the elderly (57.6% males and 53.7% females) were in 60-69 years age group and the mean age of study participants was 69.33 ± 6.51 years. 23.7% males and

31.7% females were illiterate and maximum proportion of the study participants belonged to lower middle class (47%) and 43% of the elderly were widow/widower. (Table-I) The findings in the study are concordant to the study conducted by Banjare, Pradhan (2014, Odisha) and reported that 50.6% were females, 66.1% of the elderly were in the group of 60-70 years and 39.7% of the study subjects were either widowed/divorced or separated.[9] Thakur et al (2013, Pune) also observed similar observations.[10]

The present study observed that the common physical problems faced were diminished vision (67%) followed by dental problems (52%), hypertension (29%), general body weakness or pain (24%), indigestion (20%), respiratory problems (19%), hearing problem (17%), diabetes (17%), sleeplessness (13%), heart problems (10%) and genitourinary problems (10%). The prevalence of diminished vision, hypertension, diabetes, sleeplessness, hearing problems, heart problems and genitourinary problems was more in females as compared to males (Table II). Similar observations reported by Kumar A et al (2012)[11], Thakur et al (2013)[10] and Ubaidulla et al (2014).[6] Similarly Mahesh et al (2013) found that the most common geriatric problem reported by study population was visual problems (65%) followed by hypertension (40%), dental problems (34%), diabetes (26%), joint complaints (26%), hearing problems (22%), dyspnoea (15%), difficulty in micturition (14%), abdominal problems (11%), urinary incontinence (11%), chest pain (8%) and muscle pain (8%).[12] These findings clearly indicate that some problems like vision deterioration, dental decay, musculoskeletal problems etc. have direct relation with increasing age. As the age progresses problems like senile cataract, osteoarthritis, indigestion, urinary incontinence etc. come into play and effect the general well-being.

The economic problems faced by the elderly, the present study found that increased medical expenditure (73%) and reduced personal income (73%) were the most common problems followed by lack of freedom on spending (67%). Lack of support from family (32%), liability of children (15%) and payment of pending loan (15%) were some other economic problems. (Table -III). Similar findings reported by Mehrotra et al (2009) i.e most common economic problem was increased medical expenditure (85%) followed by lack of freedom on spending (77.50%), reduced personal income (65.0%)

lack of support from family members (37.5%), liability of children (15%) and payment of pending loans (7.5%).[13] Also Mohapatra et al (2011) reported the similar observations.[14] These observations clearly indicates that physical morbidities are the biggest economic burden on elderly and present study also pointed out that on retirement the income is suddenly reduced and this affects standard of living of the elderly.

Regarding social problems faced by the elderly, the present study revealed that the most common social problem was declining authority (73%) followed by lack of respect (51%), difference of opinion with family members (41%), children dislike their presence in peer group (41%), not involved in family affairs (32%), family members hardly interact (32%), lack of recreational facilities (32%) and lack of participation in outside activities (32%). (Table IV) The findings in the present study were in accordance to the findings in the study conducted by Mehrotra et al (2009)[13] and Mohapatra et al (2011)[14].

As the elderly population is likely to increase in the future, and there is a definite shift in the disease pattern, i.e. from communicable to non-communicable, it is high time that the health care system gears itself to growing health needs of the elderly in an optimal and comprehensive manner. There is a definite need to emphasize the fact that disease and disability are not part of old age and help must be sought to address the health problems. The concept of Active and Healthy ageing needs to be promoted among the elderly, which includes preventive, promotive, curative and rehabilitative aspects of health.

## CONCLUSION AND RECOMMENDATIONS

In India, a considerable portion of elderly population is affected by physical morbidities, economic and social problems. These problems decrease quality of life, increases dependency and mortality. Efforts by government so far are not upto satisfaction level and didn't reach this age group in rural area.

Following recommendations can be made on the basis of the results of the present study:

• Special screening programme should be conducted to recognize elderly social, economic and physical problems at anganwadi, subcenter, PHC and CHC level.

• Efforts should be made to strengthen the family system so that it continues to play the role of primary care giver in old age.

• As prevalence of chronic morbidities is high in elderly health care needs of senior citizen should be given high priority.

• As social and physical problems rate is lower in those elderly who are economically independent so it should be ensured to cover all elderly under pension scheme.

• Home care for elderly by health worker should be emphasized.

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# Study of Factors Associated with General Health of Menopausal Women in Zahedan

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## ABSTRACT

**Introduction:** Since upgrading public health is one of the important pillars for the development of communities, this research intended to study general health of menopausal women in Zahedan and the factors associated with it.

**Methodology:** This descriptive research was conducted on 330 menopausal women in Zahedan and factors associated with their menopause in 2011. Considering the geographic location of Zahedan and its administrative divisions, 10 Health and Treatment Centers were selected in the different parts of this city. Based on the population covered by each Center, the number of women selects at each one was 32. The GHQ-28 Questionnaire was employed as the tool for collecting data.

**Results:** Based on the results of the study, the estimated general health of the women was 33.8, and the estimated mean level of general health of the women was 33.8 and the mean scores for the various areas of general health were as follows: social function 9.9, physical health 8.9, anxiety 4.8, and depression 5.7. Moreover, their average score for general health had statistically significant correlations with their age, education level, history of their husbands' addiction, number of children, and number of wives their husbands had (p<0.001).

**Conclusions:** results indicated that the general health of the women was not desirable and, since women are considered the cores of the families, greater attention must be paid to them. Therefore, this research offered some strategies in this relation.

*Keywords: General health, menopausal women*

## INTRODUCTION

There is no definite border between health and sickness, and upgrading health of people is one of the important pillars for the development of communities [1]. People who enjoy general health achieve ideal conditions (self-discovery and perfection) and can turn their potential capabilities into actual ones [2]. Menopause is the stage in a woman's life when menstrual periods stop following loss of cyclic ovarian follicular activity [3]. Since menopause is unavoidable and happens in the life of every woman, knowing its dangerous complications and ways of preventing them is necessary for all women, and this knowledge can be obtained through health education [4]. Loss of fertility and menstrual function accompanying natural menopause or surgical procedures may influence feelings of well-being in women [5].

Based on studies conducted in Iran, musculoskeletal disorders (joint pain 76.6 percent), urogenital problems (vaginal dryness and decreased libido 42 percent), vasomotor problems (hot flushes 55.3 percent),

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hypertension (37.3 percent) are common in menopausal women. Moreover, these women experience stress that is related to presence or absence of social support [9, 10]. Considering women make up half the population in Iran, knowledge of the various dimensions of their situation and plans for improving their situation will influence the health of the family and of the community, and will help advance the goals for the growth and development of the country. Sistan and Baluchestan Province has special cultural conditions that can have substantial effects on general health of women, especially at the age of menopause. Among these conditions are polygamy of men, and inclination to have more children and to have sons. Considering the effects of menopause and the problems it causes in relation to women's quality of life, this research intended to determine average general health of menopausal women in Zahedan as the first stage in planning for these women and in attracting the attention of the authorities to this special sector of the community.

## METHODOLOGY

Based on previous studies and assuming p= 0.3, q = 0.7, and d=0.05, the sample volume of this cross-sectional study included 323 women who satisfied the inclusion criteria. However, to increase the accuracy of the research, this number was raised to 330. The multi-stage sampling technique was employed in selecting the participants: the population of Zahedan was divided into clusters and then samples were randomly taken from the clusters. Questionnaires were used to collect data, and interviews were conducted for illiterate women.

Ten Health and Treatment Centers in various areas of the city were first selected as clusters and then, considering the population covered by each Center, household records were randomly selected, and the related houses were visited to make up the sample volume. All information was entered into SPSS, the tables of relative and absolute frequency were drawn up first, and suitable tests such as the t-test, Pearson correlation coefficient, and Spearman's correlation coefficient were then performed.

The standard GHQ-28 questionnaire, which was used as the data collection tool, consisted of two parts related to demographic and general health information.

The international scale of GHQ, which assesses general health using 28 statements, was used in this research. This scale evaluates general health in the four dimensions of physical health, anxiety, social function, and depression. Since it is a standard questionnaire and has been employed many times in Iran, it was not necessary to determine its validity and reliability.

## RESULTS

Three hundred and thirty three women who satisfied inclusion criteria were studied in this research. Their average score for general health was 33.8 out of the maximum possible of 84, the standard deviation 10.2, and maximum and minimum scores 69 and 3. The highest average scores for general health were those for social function (9.9) and for physical health (9.8). Moreover, the mean scores for the anxiety and depression were 8.4 and 5.7, respectively. The average age of the women was 56.9 ($M \pm SD = 56.9 \pm 7.2$) with the minimum and maximum of 80 and 51. Based on Pearson's correlation coefficient, there was a significant positive correlation between general health of the menopausal women and their age so that their general health declined with increases in their age (p value<0.001; r = +0.24). Furthermore, 2.4, 82.7, 2.7, and 12.1 percent of the women were single, married, divorced, and widowed, respectively. Because of the small numbers of single and divorced menopausal women, a statistical analysis was performed between married and non-married (single, divorced, and widowed) women and, based on the t-test, no statistically significant differences were observed between general health of menopausal women and their marital status ( p value = 0.49).

Moreover, based on t-test, there were statistically significant differences between average scores for general health of menopausal women having addicted and non-addicted and polygamous husbands (p<0.001), but no significant correlation was observed between their general health and their having sons (p=0.07).

Based on Spearman's correlation coefficient, there was a statistically significant correlation between general health of menopausal women and their education level (p value<0.001; r = - 0.38).

Furthermore, based on Pearson's correlation coefficient, there was a significant positive correlation between general health of menopausal women and the number of their children so that their general health improved with increases in the number of their children (p value<0.003; r = 0.173).

## DISCUSSION

Since studies by other researchers were carried out on specific groups, the present study cannot be completely compared with them. However, results of a study entitled," Comparison of General Health of Menopausal and Fertile and Infertile Women in Arak," shoed that average score for general health of fertile women was 19.24, the standard error was 9.72 , and the mean scores for anxiety, social function, physical complaints, and depression were 6.35, 4.85, 4.41, and 3.57, respectively. In the present comparative study, there was statistically significant differences between the average score for general health in menopausal women in Zahedan and that of fertile and infertile women in Arak based on the one sample t-test ( p value < 0.001), and there were substantial differences in the four dimensions of general health too [12].

In the present study, the highest mean scores were those of social function followed by physical health, which showed lower levels of general health in the other two dimensions. In research by other researchers, it was shown that one of the very effective factors in the quality of life of menopausal women was their economic situation [13], and since occupation could effectively influence economic independence of women, it would certainly influence their feelings of social function greatly. In studies conducted by Blumel et al., it was found that housewives had a lower quality of life as compared to employed women [14]. In general, it seemed that employed people had greater knowledge of menopause and higher self-esteem, and enjoyed more support because of their increased network of social relationships. Studies have demonstrated that social activities are important in maintaining physical and mental health [15]. Williams et al. consider low socio-economic status an effective factor in relation to disorders in mental health of menopausal women [16].

In relation to this finding, we can point to the role played by the type of activity of women in this Province. In the present study, there were a number illiterate women and women who had not received high school diplomas, were mainly housewives and followed a traditional texture and a special traditional lifestyle. It is thought that these women suffer from physical problems in addition to mental and psychological ones. Moreover, the special communication system governing the families and women of this Province, the multifamily homes, and the domination governing women's lives do not give them any opportunities, or fewer than the normal level of opportunities, to think of their physical problems

In this relation, it is recommended that attention be paid to the role of the husband as the most important and closest person to his menopausal wife, and as a person who can support her by understanding correctly the situation and problems that she has to face. Various research has shown that in cultures in which the position and status of women improve in the family and in the community after menopause, and they receive social support from their family members (especially from their husbands), these menopausal women suffer mental and psychological disorders less frequently [21, 22]. Duche et al. also reached the conclusion that mental problems in post-menopausal women were related to the social support that they received [23]. Most women at menopausal age are in a situation in which they play a sensitive role in the family both in occupational and social responsibilities and in emotional responsibilities. Therefore, helping them with their mental problems is a kind of help and service provided for the family and for the community. In other words, the husband of a menopausal woman will be able to understand her better and give her more support if he has more information regarding the mental and physical conditions of his wife. Social support and access to it have useful effects on physical and mental health, and satisfaction received from social support prevents occurrence of depression symptoms in menopausal women [24].

The present research indicated that menopausal women having sons were not different from those without sons in relation to general health. We could not find any studies that had studied this point, but it seems that having sons can somehow be a determinant of mental health considering the importance of sons in the governing culture of this Province. However, our study did not confirm this, but instead found a statistically significant correlation between the scores received by menopausal women and the number of their children. In another study carried out in Kashan entitled, "Quality of Life and Factors Associated with It in Menopausal Women," it was shown that the majority of menopausal women (48.8 percent) with 1-2 children had a suitable quality of life [28]. However, in research by Khaledian, the majority of menopausal women (49.5 percent) had 2-3 children, and results indicated that the number of

children was related to the quality of life of menopausal women [25, 26].

Our findings showed that women with addicted husbands had a lower level of general health as compared to those with non-addicted husbands. Review of other studies concerning this point revealed that wives of addicted husbands suffered greater stresses and mental, physical, and psychological damages compared to other women. For example, Jalali [32] noticed that the extent of violence experienced by wives at the hand of their addicted husbands was significantly greater compared to wives of non-addicted husbands (p<0.001). In fact, limitations caused by substance abuse, impulsive behaviors of addicts, improper utilization of coping and adjustment strategies, and lack of living and social capabilities are among the most important roots of violence in the lives of women with addicted husbands compared to those with non-addicted husbands. In this regard, it is suggested that legal and psychological remedies be found to prevent disorders in mental health and to reduce intensity of these disorders because these disorders can be the source of future medical and psychiatric problems [27, 28, 29, 30, and 31].

Statistical tests indicated there was a significant correlation between general health of menopausal women and their education levels. Other studies have also shown that quality of life of menopausal women with low education levels (illiterate or having elementary school education) was lower compared to those with higher education levels (associate's degree, bachelor's degree, and higher degrees [31-32]. This difference can be attributed to increased awareness of women with higher education compared to those with lower education levels that helps them to cope with and tolerate better the complications of menopause (which will eventually improve their general health).

## CONCLUSIONS

Considering research that has been conducted in Iran, it is now time to take steps in our country in this regard and conduct research on, educate, and provide better support for this part of the female population. Health and Treatment Centers can play an important role in this relation as the source of providing primary healthcare services.

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# A Study on the Effects of Anaemia on Pregnancy Outcome in an Urban Health Centre Practice Area of Tirupati

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## ABSTRACT

**Background:** Anaemia is one of the most frequent complications related to pregnancy. Prematurity, spontaneous abortions, low birth weight, and foetal deaths are complications of severe maternal anaemia. **Objective:** To study the effect of anaemia on the outcome of pregnancy. **Materials and Method:** Haemoglobin levels of all the registered antenatal cases are measured during early and late pregnancies and followed till the outcome of pregnancy. The pregnancy outcome is measured in terms of maturity, spontaneous abortions, birth weight, APGAR score and any other complications. The outcome measured is analyzed in relation to the haemoglobin status during early and late pregnancies. **Results:** Majority were in 20-29 years age group with mean age of 22.25 years. No pregnant woman was severely anaemic during early pregnancy. No pregnant woman was normal during late pregnancy. Majority of the women in the study were moderately anaemic during early and late pregnancy. Birth weight of the newborn was normal in 77 percent of the cases while the APGAR score was normal in 84 percent. **Conclusion:** The outcome of pregnancy was significantly related to the hemoglobin status in early pregnancy. Birth weight was significantly related to the hemoglobin status in early pregnancy. APGAR score was significantly associated with hemoglobin status in late pregnancy.

*Keywords: Abortions, Anaemia, APGAR, Birth weight, Pregnancy.*

## INTRODUCTION

India is among the countries with highest prevalence of anaemia in the world. It is estimated that about 20%-40% of maternal deaths in India are due to anaemia. India contributes to about 50% of global maternal deaths due to anaemia[1]. Data from NNMB, ICMR and DLHS surveys have shown that prevalence of anaemia is very high (ranging between 80 - >90%) in preschool children, pregnant and lactating women and adolescent girls[2, 3, 4]. Anaemia remains to be major cause of maternal mortality and low birth weight in India. Pregnant women with Haemoglobin less than 8 g/dl show functional decompensation and constitute a high risk group[5].

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Anaemia is one of the most frequent complications related to pregnancy. Normal physiologic changes in pregnancy affect the hemoglobin (Hb), and there is a relative or absolute reduction in Haemoglobin concentration. The most common true anemias during pregnancy are iron deficiency anemia (approximately 75%) and folate deficiency megaloblastic anemia, which are more common in women who have inadequate diets and who are not receiving prenatal iron and folate supplements. Severe anemia may have adverse effects on the mother and the fetus. Anemia with hemoglobin levels less than 6 g/dl is associated with poor pregnancy outcome. Prematurity, spontaneous abortions, low birth weight, and fetal deaths are complications of severe maternal anemia. Nevertheless, a mild to moderate iron deficiency does not appear to cause a significant effect on foetal haemoglobin concentration. An Haemoglobin level of 11 gr/dl in the late first trimester and also of 10 gr/dl in the second and third trimesters are suggested as lower limits for Haemoglobin concentration[6].

Current study is aimed at studying the effects of the severity of the anaemia at various stages of pregnancy on the outcome of pregnancy. The study is designed to be an observational analytical follow up study.

## MATERIALS AND METHOD

All the antenatal women registered in an UHC of Tirupati during an entire year are taken into the study. ANMs do house to house visits and collect data about the pregnant women in the field practice area of the UHC. Their work is assisted by Anaganwadi workers and ASHA. Some antenatal women come to the Health centre voluntarily. Under the Antenatal care provided by the UHC, haemoglobin levels are measured during regular antenatal check-ups.

Haemoglobin status of all the registered women was checked during the early pregnancy. These women were followed till their late pregnancy. Again in late pregnancy women were checked for their haemoglobin status. Haemoglobin levels for the purpose of the study were measured by cyanmethemoglobin method, which is the accepted standard method for haemoglobin estimation. The haemoglobin status of women during early and late pregnancy is categorized into normal or anaemic and if anaemic, classified into severity of anaemia based on the ICMR guidelines[7]. Women developing complications of pregnancy other than anaemia were dropped out of the study to nullify the effects of other complications of pregnancy on the pregnancy outcome.

All the included women were followed till the end of pregnancy. The outcome of pregnancy is observed and noted. New born children were examined for birth weight, APGAR score at 1 and 5 minutes after birth and any other complications. The women and children were further followed in the postpartum period for the development of complications arising out of pregnancy and child birth. The haemoglobin status of women in early and late pregnancy was studied in relation to pregnancy outcome and newborn health status.

## FINDINGS

After eliminating pregnant women with complications other than anaemia and lost to follow up cases from the study, the total number of women who could be followed till the end was 112. The age of pregnant women ranged from 18 – 30 years with majority in the 20-29 years age (table 1). Mean age is 22.25 years with standard deviation of 3.

The haemoglobin status of women during early and late pregnancy is categorized into normal or anaemic and if anaemic, classified into severity of anaemia based on the ICMR guidelines[7]. Majority (53.6%) of the women in the study were moderately anaemic during early pregnancy, while no pregnant woman was severely anaemic during early pregnancy (table 2). Majority (60.7%) of the women in the study were moderately anaemic during late pregnancy, while no pregnant woman was normal during late pregnancy (table 2). One third normal woman who was normal during early pregnancy became moderately anaemic towards the end of pregnancy. Two thirds of normal woman who was normal during early pregnancy became mildly anaemic towards the end of pregnancy. Fifty percent of women who were mildly anaemic during early pregnancy became moderately anaemic while the rest of them stayed as such by the time they reached late pregnancy (table 2).

Of the 112 women followed till the end of pregnancy 8 were aborted before reaching full term. Out of the 104 women 75% delivered after full term and no pregnancy was continued post term (table 3). Normal vaginal delivery was the common mode of delivery followed by C-section (table 4). Birth weight of the newborn was normal in 77 percent of the cases (table 5), while the APGAR score was normal in 84 percent. Only mild depression was present in the rest of the newborn with no moderate or severe depression (table 6). When pregnancy outcome is studied in relation to haemoglobin status in early pregnancy it turned out that pregnancy outcome depends on the haemoglobin status during early pregnancy (table 7). Similarly pregnancy outcome studied in relation to haemoglobin status in late pregnancy revealed that the outcome could be independent of haemoglobin status in late pregnancy.

Birth weight studied in relation to haemoglobin status in early pregnancy showed that low birth weight depends on the haemoglobin status during early pregnancy (table 8). Similarly pregnancy outcome studied in relation to haemoglobin status in late pregnancy revealed that low birth weight could be independent of haemoglobin status in late pregnancy. APGAR score did not depend on Haemoglobin status in early pregnancy but depended on Haemoglobin status in late pregnancy.

**Table 1. Age wise distribution of Antenatal women**

| Age group (years) | Frequency | percentage |
|---|---|---|
| ≤ 19 | 12 | 10.7 |
| 20-29 | 96 | 85.7 |
| ≥30 | 4 | 3.6 |
| **Total** | **112** | **100.0** |

**Table 2. Comparison of haemoglobin status during early and late pregnancy**

| Haemoglobin status in early pregnancy | Haemoglobin status in late pregnancy | | | Total |
|---|---|---|---|---|
| | **Mild Anaemia** | **Moderate Anaemia** | **Severe Anaemia** | |
| Normal | 8 | 4 | 0 | 12 (10.7%) |
| Mild anaemia | 16 | 16 | 0 | 32 (35.7%) |
| Moderate Anaemia | 4 | 48 | 8 | 60 (53.6%) |
| Total | 28 (25%) | 68 (60.7%) | 8 (7.7%) | 104 (100%) |

**Table 3. Pregnancy outcome of antenatal women**

| Pregnancy outcome | Frequency | Percent |
|---|---|---|
| abortion | 8 | 7.1 |
| preterm | 20 | 17.9 |
| term | 84 | 75.0 |
| Total | 112 | 100.0 |

**Table 4. Type of delivery**

| Type of delivery | Frequency | Percent |
|---|---|---|
| Abortion | 8 | 7.1 |
| Assisted breach | 4 | 3.6 |
| Elective C-section | 12 | 10.7 |
| Emergency C-section | 8 | 7.1 |
| Forceps | 4 | 3.6 |
| Normal Vaginal | 76 | 67.9 |
| **Total** | **112** | **100.0** |

**Table 5. Birth weight of the newborns**

| Birth weight | Frequency | Percent |
|---|---|---|
| Normal | 80 | 76.93 |
| Low Birth Weight | 24 | 23.07 |
| **Total** | **104** | **100** |

**Table 6. APGAR scores**

| APGAR | Frequency | Percent |
|---|---|---|
| Normal | 88 | 84.62 |
| Mild depression | 16 | 15.38 |
| **Total** | **104** | **100** |

**Table 7. Haemoglobin status in early pregnancy and pregnancy outcome Cross tabulation**

| Haemoglobin status | Pregnancy outcome | | | Total |
|---|---|---|---|---|
| | **Abortion** | **Preterm** | **Term** | |
| Normal | 0 | 0 | 12 | 12 |
| Mild Anaemia | 8 | 4 | 28 | 40 |
| Moderate Anaemia | 0 | 16 | 44 | 60 |
| **Total** | **8** | **20** | **84** | **112** |

(p<0.001)

**Table 8. Haemoglobin status in early pregnancy and birth weight Cross tabulation**

| Haemoglobin status | Birth weight | | Total |
|---|---|---|---|
| | **Normal** | **Low birth weight** | |
| Normal | 12 | 0 | 12 |
| Mild anaemia | 28 | 4 | 32 |
| Moderate Anaemia | 40 | 20 | 60 |
| **Total** | **80** | **24** | **104** |

(p<0.05)

**Table 9. Haemoglobin status in late pregnancy and APGAR Cross tabulation**

| Haemoglobin status | APGAR | | Total |
|---|---|---|---|
| | Normal | Mild depression | |
| Mild anaemia | 24 | 4 | 28 |
| Moderate Anaemia | 60 | 8 | 68 |
| Severe Anaemia | 4 | 4 | 8 |
| Total | 88 | 16 | 104 |

(p< 0.05)

## DISCUSSION

In this study the pregnant women below 19 years are 10%. Current study has less percent of underage pregnancies than the National Family Health Survey 3 (NFHS 3) data for Andhra Pradesh which shows that 12.7% of urban women are pregnant between 15-19 years. This is a sign of early marriages and early pregnancies seen in low socioeconomic groups. Urban Health Centers mainly cater to the population of urban slums and urban poor. The results reflect the typical low socioeconomic scenario.

Around 90% of the women were found to be anaemic during the early pregnancy is a phenomenon found commonly in many studies in low socioeconomic countries. A WHO study found that 87% of the pregnant women in India are anaemic[8]. 7.1% percent of the pregnancies were aborted spontaneously during the course of pregnancy while the District Level Health Survey 3 (DLHS 3) of the district found it to be 8.2%. The outcome of pregnancy either as abortion or preterm or full term was significantly related to the hemoglobin status in early pregnancy than to the hemoglobin status in late pregnancy. A meta-analysis concluded that early pregnancy anemia is associated with slightly increased risk of preterm birth[9]. Another study found that risk of preterm birth was increased in women with low hemoglobin level in the first and second trimester[10]. The minimum incidence of preterm labor occurs in association with a hemoglobin concentration of 95-105 g/L[11]. The risk of preterm birth was increased steadily with the decrease of first-trimester Haemoglobin concentration. After controlling for confounding factors, women with Haemoglobin 80-99 g/L had significantly higher risk for

preterm birth (OR=1.34, 95% CI 1.16-1.55) than women with Haemoglobin 100-119 g/L. No elevated risk was noted for women with Haemoglobin > or =120 g/L[12].

Current study did not find any significant association between anemia in late pregnancy and preterm births. A meta-analysis found that there was a non-statistically significant inverse relationship between anemia during late pregnancy and preterm birth[3]. The trend toward an inverse association of anemia determined during late pregnancy with preterm birth may reflect the benefit of plasma volume expansion[3]. A cohort study found that the risk of preterm delivery was 4 times higher among anaemic women who were anaemic during labour and on two previous occasions in current pregnancy[13]. Analysis of cohort studies showed a significantly increased risk of preterm birth with first or second trimester anaemia and these results are in agreement with previous reviews of observational studies[14].

Birth weight was significantly related to the hemoglobin status in early pregnancy in this study. Available data from India and elsewhere indicate that maternal morbidity rates are higher in women with Haemoglobin below 8gm/dl and mothers with moderate anaemia delivered infants with lower birth weight and perinatal mortality is higher in these babies[15]. But the current study did not have any perinatal mortality associated with anemia in pregnancy. A significant fall in birth weight due to increase in prematurity rate and intrauterine growth retardation has been reported when maternal haemoglobin levels were below 8.0 g/dl[5]. Severe anemia is associated with the birth of small babies (from both preterm labor and growth restriction). The minimum incidence of low birth weight occurs in association with a hemoglobin concentration of 95-105 g/L[5]. The risk of LBW was increasing steadily with the decrease of first-trimester Haemoglobin concentration and after controlling for confounding factors, women with Haemoglobin 80-99 g/L had significantly higher risk for LBW (OR=1.44, 95% CI 1.17-1.78), than women with Haemoglobin 100-119 g/L[6]. No elevated risk was noted for women with Haemoglobin> or =120 g/L. This study did not find any significant relation between birth weight and hemoglobin status in late pregnancy. The meta-analysis found a non-statistically significant inverse relationship between anemia during late pregnancy and low birth weight[3]. The trend toward an inverse association of anemia determined during late pregnancy with low birth weight may reflect the benefit of plasma volume

expansion[3]. The risk of LBW among exposed group was 1.9 times higher among anaemic women who were anaemic during labour and on two previous occasions in current pregnancy of a cohort study[7].

APGAR score at 1 and 5 minutes after birth was significantly associated with hemoglobin status in late pregnancy. One cohort study found that Newborns of anaemic mothers who were anaemic during labour and on two previous occasions in current pregnancy had 1.8 times increased risk of having an APGAR score of <5 at 1 min[7]. A cross sectional study concluded that maternal Haemoglobin concentration at labour showed a significant correlation with APGAR score and birth asphyxia[16]. Current study could not find any significant association between APGAR scores at 1 and 5 minutes with hemoglobin status in early pregnancy. In a large cohort study there was no statistically significant effect of anaemia on Apgar score at one and five minutes[17].

## CONCLUSION

Majority of the women in the study were moderately anaemic during early pregnancy, while no pregnant woman was severely anaemic during early pregnancy. Majority of the women in the study were moderately anaemic during late pregnancy, while no pregnant woman was normal during late pregnancy. Anaemia worsened from early pregnancy to late pregnancy irrespective of intake of IFA supplements. The outcome of pregnancy either as abortion or preterm or full term was significantly related to the hemoglobin status in early pregnancy but not to the hemoglobin status in late pregnancy. Normal vaginal delivery was the common mode of delivery followed by C-section. Birth weight was significantly related to the hemoglobin status in early pregnancy but not to the hemoglobin status in late pregnancy. APGAR score at 1 and 5 minutes after birth was significantly associated with hemoglobin status in late pregnancy but not to hemoglobin status in early pregnancy.

**Conflict of Interest:** There is no conflict of interest involved in this study.

**Source of Funding:** Self

**Ethical Clearance:** The institutional ethics review board has approved the study. Informed consent of all the subjects participated in the study was taken.

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# Correlation of Curve of Spee and other Dental Variables in Western Uttar Pradesh Population: An *in vitro* Study

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## ABSTRACT

**Aim & Objectives:** To evaluate the correlation of curve of Spee with other dental variables and to determine sexual dimorphism in Western Uttar Pradesh population. **Study Design:** 150 subjects (males-75; females-75) aged 18-24yrs. were selected. Study models of all the subjects were made and the following dental measurements were done: Curve of Spee (COS), Intercanine width (ICW), Intermolar width (IMW), Arch length (Arch Len.), Dental arch form. Data thus obtained were subjected to statistical analysis. **Results:** The results suggested that the curve of Spee is influenced by the dental variables but it is not affected by sexual dimorphism. **Conclusion:** There is a significant correlation between mandibular curve of Spee and certain dental variables.

*Keywords:* Curve of spee, sexual dimorphism, study models, dental variables.

## INTRODUCTION

Several researchers have investigated the functional significance of curve of Spee which was first described by F Graf Von Spee. He used skulls with abraded teeth to define the line of occlusion as the line on a cylinder tangent to the anterior border of the condyle, the occlusal surface of the second molar, and the incisal edges of the mandibular incisors[1] Spee, located the center of the cylinder in the mid-orbital plane so that it had a radius[2] of 6.5 to 7.0 cm. While describing the curve, spee himself suggested that this curve was the most efficient model enabling the teeth to remain in contact during the forward and backward gliding of the mandible during chewing[3]. He was the first to suggest that this should be considered in the construction of dentures, to enable better mastication and to avoid lever effects during chewing[4]. This is a cephalometric study, designed to correlate the curve of Spee and other dental variables among western Uttar Pradesh population.

## MATERIALS & METHOD

The study was conducted in the department of Orthodontics and Dentofacial Orthopedics at Kothiwal Dental College and Research Centre, Moradabad (U.P. India). Subjects ranged in the age group of 18 to 24 yrs. were taken for the study from the out-patient department of Orthodontics and Dentofacial Orthopedics and student population of Kothiwal Dental College and Research Centre. Before starting the study name, age and sex from each subject was recorded and ethical clearance and informed consent to participate in the study was obtained from all the subjects. Study model of all the subjects were prepared in the Department of Orthodontics and Dentofacial Orthopedics. The following **inclusion criteria** were used for the selection : subjects with dental Class I molar relationship bilaterally and clinically normal arch shapes with minimal dental crowding or spacing (<2 mm), **Exclusion Criteria:** Clinically there should be no Skeletal discrepancy, no previous orthodontic treatment, no anterior or lateral crossbite, no pathologic periodontal condition, no cast restorations or cuspal coverage, no temporo mandibular disorders and no history of Orthognathic surgery and /or surgery

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for developmental disorders like cleft lip and palate. 150 subjects were selected and divided into two groups based on sex i.e. 75 males and 75 females subjects. The following measurements were taken from Cheon et al[1] for model analysis:

**1.    Occlusal plane:** Distance measured from the midpoint of the center in the right and left incisor edges to the tips of the right and left second molar's distobuccal cusp in maxillary and mandibular dental arches.

**2.    Curve of Spee (COS):** It was measured from the buccal cusp of the maxillary second premolar and from the mesiobuccal cusp of the mandibular first molar (Figure 1).
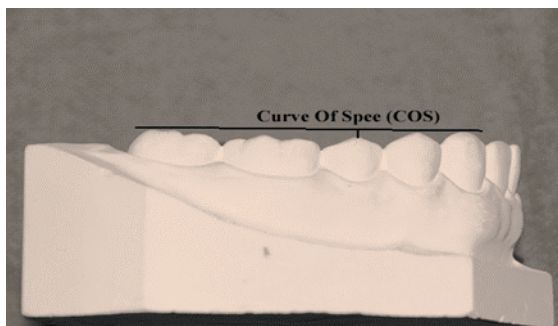


**Fig1. Showing measurement for curve of spee**

**3.    Intercanine width (ICW):** Distance measured between the tips of the right and left canines.

**4.    Intermolar width (IMW):** Distance measured between the tips of the right and left first molar's mesiobuccal cusps as shown in Fig.2.
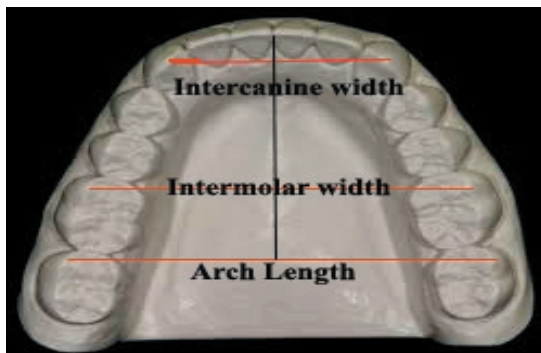


**Fig.2 Showing Intercanine width, Intermolar width and Arch length**

**5.    Arch length (Arch Len.):** Distance measured from a line connecting the tips of the right and left second molar distobuccal cusps to the midpoint of the center of the right and left incisor edges.

**6.    Dental arch form:** Symmetry of the dental arch was evaluated by using the perpendicular distance from the tips of the right and left canine and the second molar's

distobuccal cusp to the dental arch center line. The dental arch center line was drawn from the midpoint of the right and left incisor edges to perpendicularly intersect the line connected by the tips of the right and left second molar distobuccal cusps. Also measured the distances from the midpoint of the right and left incisor edges to the tips of the right and left ssecond molar distobuccal cusps to evaluate the symmetry of the dental arch. Following were the measurements:

**a)    RMx.C:** is the dental arch form at the maxillary right canine.

**b)    LMx.C:** is the dental arch form at the maxillary left canine.

**c)    RMn.C:** is the dental arch form at the mandibular right canine.

**d)    LMn.C:** is the dental arch form at the mandibular left canine.

**e)    RMx.2M:**   is the dental arch form at the maxillary right 2nd molar.

**f)    LMx.2M:** is the dental arch form at the maxillary left 2nd molar.

**g)    RMn.2M:** is the dental arch form at the mandibular right 2nd molar.

**h)    LMn.2M:** is the dental arch form at the mandibular left 2nd molar.

**i)    RMxM:** is the distance from the midpoint in the right and left incisor edge to the tip of the right second molar distobuccal cusp in the maxilla.

**j)    LMxM:** is the distance from the midpoint in the right and left incisor edge to the tip of the left second molar distobuccal cusp in the maxilla.

**k)    RMnM:** is the distance from the midpoint in the right and left incisor edge to the tip of the right second molar distobuccal cusp in the mandible.

**l)    LMnM:** is the distance from the midpoint in the right and left incisor edge to the tip of the left second molar distobuccal cusp in the mandible.

## STATISTICAL ANALYSIS

A series of parametric tests were conducted to analyze the data collected. The data were analyzed with a

software program (SPSS version 16.0, Statistical Package for the Social Science for Windows). The Pearson correlation analysis was used to determine the correlation coefficients between the mandibular arch curve of Spee and other variables. Furthermore, a multiple regression analysis was performed to determine the relationship between the curve of Spee as the variable and the other variables as the independent variables. The level of significance for all statistical tests was set at p<0.05.

## RESULTS

**Table 1: The mean value of mandibular arch curve of Spee was found to be 1.75 with standard deviation 0.61 and standard error of mean 0.04**

| Curve of Spee (mm) | Mean | S. D. | S.E.M |
|---|---|---|---|
| COS Max. | 0.70 | 0.58 | 0.04 |
| COS Mand. | 1.75 | 0.61 | 0.04 |

Shows mean, standard deviation, and standard error of mean depth of curve of Spee of maxillary and mandibular arch.

There were statistically insignificant difference was found between the males and females mandibular arch curve of Spee with p= 0.427. There was statistically insignificant correlation between maxillary arch curve of spee and mandibular arch curve of Spee in males with p=0.234.

**Table 2: On correlating, the dental arch form and dental arch symmetry with mandibular arch curve of Spee in males, mandibular canine region showed statistically significant negative correlation in males (r= -0.284[\*\*], p=0.006)**

| Dental arch form (mm) | Pearson Correlation (r) | p-value | Sig. |
|---|---|---|---|
| Mx.C | 0.179 | 0.056 | N.S |
| Mn.C | -0.284** | 0.006 | S |
| Mx.2M | 0.164 | 0.072 | N.S |
| Mn.2M | 0.120 | 0.184 | N.S |
| MxM | 0.103 | 0.214 | N.S |
| MnM | 0.044 | 0.283 | N.S |

*correlation is significant at 0.05, S= Significant, N.S= Non- significant

**Shows dental arch form, symmetry of dental arch and their correlation to the mandibular depth of curve of Spee in males.**

**Table 3: There was statistically significant correlation was found between maxillary arch curve of spee and mandibular arch curve of Spee in females with p=0.124**

| Curve of Spee (mm) | Pearson Correlation (r) | p-value | Sig. |
|---|---|---|---|
| COS Mand. | 0.531** | 0.000 | S |

*correlation is significant at 0.05, S= Significant

Shows correlation of maxillary depth of curve of Spee and mandibular depth of Curve of Spee in females.

**Table 4: On correlating, the dental arch form and dental arch symmetry with mandibular arch curve of Spee in females, no statistically significant correlation was found.**

| Dental arch form (mm) | Pearson Correlation (r) | p-value | Sig. |
|---|---|---|---|
| Mx.C | 0.159 | 0.114 | N.S |
| Mn.C | 0.068 | 0.502 | N.S |
| Mx.2M | -0.04 | 0.696 | N.S |
| Mn.2M | -0.149 | 0.139 | N.S |
| MxM | 0.061 | 0.545 | N.S |
| MnM | -0.003 | 0.974 | N.S |

*correlation is significant at 0.05.

Shows dental arch form, symmetry of dental arch and their correlation to the mandibular depth of curve of Spee in females.

**Table 5: Dental measurements and their correlation to the mandibular arch curve of Spee in females showed that maxillary and mandibular inter canine width had statistically significant negative correlation with mandibular arch curve of Spee (r= -0.251\*\*, p= 0.008; r= -0.233\*\*, p=0.025) .**

| Dental measurements (mm) | Pearson Correlation (r) | p-value | Sig. |
|---|---|---|---|
| ICW Max. | -0.251** | 0.008 | S |
| ICW Mand. | -0.233* | 0.025 | S |
| IMW Max. | 0.023 | 0.654 | N.S |
| IMW Mand. | 0.150 | 0.139 | N.S |
| Arch Len. Max. | -0.089 | 0.373 | N.S |
| Arch Len. Mand. | -0.049 | 0.682 | N.S |

*correlation is significant at 0.05, S= Significant, N.S= Non- significant

Shows dental measurements and their correlation to the mandibular depth of curve of Spee in females.

## DISCUSSION

The curve of Spee is an important characteristic of the mandibular dental arch[5]. The functional significance[6] of the curvature has not been completely understood. The morphological arrangement of the teeth in the sagittal plane has been related to the slope of the articular eminence, incisor overbite, molar cusp height, and the amount of posterior contact. A matched interaction between these features and the curve of Spee ensures balanced occlusal function[7]. The western Uttar Pradesh individuals were selected as study subjects since different ethnic or racial groups showed considerable variability in dentofacial structures as concluded in the study by Nanda and Nanda (1969)[8]. The subjects selected were of 18 to 24 years age since it was observed that dental arch dimensions and curve of Spee remains unchanged after 24 yrs. of age, supported by the studies conducted by Michelotti et al (2002)[9], Carter et al (1998)[10],

The depth of curve of Spee of maxillary arch and that of the corresponding curve in the mandibular arch was evaluated. The mean value of maxillary curve of Spee was found to be 0.70mm whereas that of mandibular curve of Spee was 1.75mm (Table 1). These findings fall in the range of norm, i.e. 0 – 2.5mm curve of Spee, as proposed by Lawrence F. Andrews[11].On conducting a comparison of males and females for mandibular curve of Spee no significant difference was found (Table 2). This finding is strongly supported by previous studies[2,5,11,12] conducted in this regard. Hence, it is thereby suggested that the mandibular curve of Spee is independent of sexual dimorphism.

Statistically significant (p < 0.05) negative correlation (r = -0.284) was found between mandibular curve of Spee in males and the mandibular canine region (Table 4). Hence this suggest that as the mandibular curve of Spee increases, the mandibular canine region decreases A possible explanation for the above interesting finding lies in the fact that as the mandibular curve of Spee deepens with time, the lower anterior teeth are forced back and up causing the intercanine width to decrease, as has been explained by Lawrence F. Andrews[11]. Whether or not the mandibular curve of Spee can be considered as a predictor of mandibular canine region is subject to further scientific verification in future research work.

Statistically significant (p < 0.05) negative correlation was found between mandibular curve of Spee in females and the maxillary intercanine width ( r = -0.251) and the mandibular inter canine width ( r = -0.233) (Table 8). Hence this finding is suggestive of the fact that with the increase in the mandibular curve of Spee in females , the maxillary and mandibular intercanine width decreases. A possible explanation for the above interesting finding lies in the fact that as the mandibular curve of Spee deepens with time, the lower anterior teeth are forced back and up causing the intercanine width to decrease, as has been explained by Lawrence F. Andrews[11]. Whether or not the mandibular curve of Spee can be considered as a predictor of maxillary and mandibular intercanine width is subject to further scientific verification in future research.

## CONCLUSIONS

From the analysis of cephalograms, measurements of dental models and results obtained, the following conclusions can be drawn:

1. The mean mandibular curve of Spee is 1.75mm. The corresponding curve in the maxillary arch is 0.70mm.

2. The curve of Spee is not influenced by sex.

3. The mandibular curve of Spee has a significant correlation with the dental measurements in females.

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**Conflict of Interest:** None

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# Effect of Rajyoga Meditation on Affective, Cognitive and Somatic Clusters of Depression

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## ABSTRACT

**Introduction:** A WHO study based on interviews of 89,000 people in 18 different countries by 20 different researchers says that nearly 121 million people are affected by depression worldwide. Meditation has shown a number of positive effects on physiology of human mind. It has shown to reduce the depression levels in humans giving a positive aspect of living.

**Method:** The study was conducted on 56 healthy subjects (29 meditators and 27 non meditators). They were further categorized into two groups on the basis of time period for which they have been doing meditation. All the subjects were asked to fill the Beck's Depression Inventory.

**Results:** We found that there was significant difference in depression levels in meditators and non-meditators. Group of meditators had much lesser depression or was not suffering from any kind of depression. It was also concluded that more the years of practice, lesser is the depression. We found that results were highly significant in affective cluster in meditators who were practicing meditation for more than 10 years and also significant in meditators practicing meditation for 2-5 years.

**Conclusion:** Cognitive cluster also gave significant results in case of group practicing meditation for more than 10 years but not significant in case of meditators practicing meditation for 2-5 years. Somatic cluster did not give any significant result in any group. With the help of Beck's Depression Inventory (BDI), we concluded that Rajyoga is a powerful tool for coping up with depression, especially the affective cluster of depression.

**Keywords:** *Rajyoga, Meditation, Affective Disorders, Depression, Disease Management, Education.*

## INTRODUCTION

Depression affects nearly 121 million people in the world. A WHO study has declared that India can be called as depression capital of the world. Major depressive episodes (MDE) lifetime incidence is about 36% in India. Women are twice likely to suffer from depression. Planned suicide is highest among those suffering from MDE. People suffering from MDE don't have the strength to conduct day to day chores and may become dysfunctional. Depression is the second most important contributor to shorter lifespan in 15 to 44 year age-group. Depression-afflicted age is rapidly decreasing[1].

The word *yoga* comes from the Sanskrit root *yuj*, which means to unite. This union describes the goal of yoga, to unite us with the ultimate consciousness, which is sometimes called the Absolute, the Self, God, or the Creator. *Raja* means king, and this form of yoga is called raja yoga because the mind is supposed to be the king among the organs. In order to understand why yoga (and hence meditation) has been used as a tool for intervention in depressive disease in this era of modern scientific medicine, it is essential to go to a little length into the recent history of modern medicine as well as what yoga is. Historically, several infectious diseases were conquered with the help of vaccines and antibiotics since the advent of modern medicine during 1900-1950. As a result, the average human life expectancy enhanced and in India, it increased from about thirty years in 1947 to more than sixty years today. People are now dying at an older age from a different set of diseases

like hypertension, heart disease, stroke, complications of diabetes and cancer. These new disorders are unlike infectious diseases and are the result of slow accumulation of damage over decades. The damage is inflicted silently in small doses by an unhealthy lifestyle of which mental stress and depression is a major accompaniment. Accordingly, there has been a search for good lifestyle and strategies for overcoming mental stress for prevention and management of disease. Both these explorations converged on the rediscovery of ancient disciplines like yoga which combine superb lifestyles with potent, infallible prescriptions for lasting mental peace[2].

Yoga is therefore the practice or art of uniting or linking the mind with God by focusing attention on him as an incorporeal being of light and thinking of nothing else but his divine qualities. This takes one into a state of absorption in bliss and peace through positive thinking. It recharges one's self or soul with light and might and fills it with creative energy[3].

Various forms of meditation have been practiced by the masses for time immemorial. Some important and popular meditation practices include Transcendental meditation(TM)[4], Zazen meditation (practiced in zen-Buddhism)[5], Yog-nidra[6], Sahajyoga, mindfulness meditation[7], Rajyoga[3] and many others.

While studies[17,18,19,20,21,22] conducted in the field of Rajyoga meditation have focused on physiological and biochemical parameters, chronic tension headache, coronary artery disease regression, positive thinking and substance abuse, none has explored its usefulness in depression.

Our study objective is to study the effects of Rajyoga meditation on depression. In Rajyoga, mind is the instrument for looking inwards and encouraging the inner self[8]. *Raja* means 'the king' and this form of yoga is called Rajyoga because the mind is supposed to be the king among the organs. Its origin goes long before any written text[8].

## METHOD

This was a randomized, controlled research design undertaken from 2013 to 2014. A total 56 healthy subjects were selected randomly between 18-45 years of age. Out of these, 29 subjects were regular practitioners of Rajyoga meditation while 27 were taken as controls. The controls included persons who were non-practitioners of any kind of meditation. The meditators were divided into 2 subgroups - first group practicing Rajyoga for 2-5 years and second group practicing Rajyoga for more than 10 years. The practitioners were selected from various Brahmakumaris' meditation centres of national capital Delhi and around. Study was conducted on healthy human volunteers of both sexes not suffering from any chronic illness like cardiac, renal and pulmonary diseases. Each of the subjects was subjected to detailed physical examination including height, weight and blood-pressure. The research was duly consented by each participant (as per ethics laid down by Indian Council of Medical Research, New Delhi) and approved by the institutional ethical committee of Saraswathi Institute of Medical Sciences, Hapur, U.P. The results have been assessed using paired t-test, paired p-test and analysed using SPSS software. There has been no conflict of interest whatsoever in conducting the study. The study has been funded by the institute. The subjects were given the Beck's depression questionnaire[9] to answer and by the assessment of their responses to all the questions, the score was taken out.

The standard cut-off's for the score is as follows:-

0-9 : indicates minimal depression or non-depression.

10-18 : indicates mild depression.

19-28 : indicates moderate depression.

29-63 : indicates severe depression.

Sub-scale scores (affective, cognitive and somatic) were also summed up and scores calculated based on the factors reported by Vanheule S et al (2008)[10,11,17].

The scores were divided into three clusters :-

Affective cluster - 1, 4, 10, 11, 12 from BDI represent the core symptoms of depressive mood[11].

Cognitive cluster - 2, 3, 5, 6, 7, 8, 9, 13, 14 from BDI assess the cognitive aspects[11].

Somatic cluster - 15, 16, 17, 18, 21 assess the somatic aspects[11].

All the measurements and recordings were done in Department of Physiology, Saraswathi Institute of Medical Sciences, Hapur, U.P.
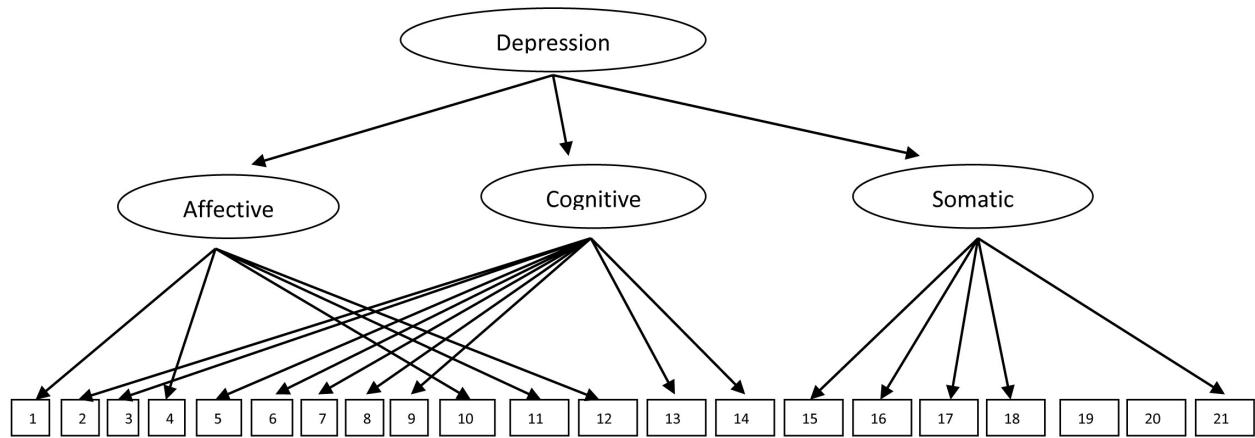
**Factor structure as proposed by Vanheule S et al[11]**

## RESULTS

The mean value of age was about 34 years for group-IA meditators (those regularly meditating for 2-5 years), and 33 years for group-IB meditators (practicing meditation for more than 10 years) and 22 years for (group-II) non-meditators.

The level of depression was noted through the score obtained in Beck's questionnaire. The depression score was classified in three clusters- 1) Affective, 2) Cognitive, and 3) Somatic. The mean value of Beck's score for meditators in both groups (2-5 years and >10 years) was lower than the value of non-meditators and it was statistically significant. The mean value of affective cluster in meditators and non-meditators was also statistically significant. However, the cognitive and somatic clusters in meditators and non-meditators were not statistically significant.

On analysing the two groups of meditators (2-5 years and >10 years), it was observed that the total mean Beck's score as well as the split-up three clusters of depression (affective, cognitive and somatic) did not vary to statistical significance. On comparing 2-5 years meditators' group with non-meditators, statistical significance was found only in the affective cluster of depression and not in cognitive and somatic clusters. Similar results were obtained on comparing >10 years meditators with non-meditators. The Beck's score in meditating males and females was also not found to be statistically significant.

**Table: 1 - Comparison of Beck's score in meditators versus non-meditators**

| Parameters | Meditators (29) Group-I | | Non-meditator (27) Group-II | | Meditators / Non-meditators | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t-value | p-value | Significance |
| Beck's score (Total) | 12.21 | 4.46 | 15.93 | 8.58 | -2.057 | < 0.05 | Significant |
| Beck's score (Affective) | 1.17 | 1.26 | 3.89 | 3.56 | -3.87 | < 0.05 | Significant |
| Beck's score (Cognitive) | 7.76 | 3.05 | 8.59 | 4.33 | -0.837 | > 0.05 | Not Significant |
| Beck's score (Somatic) | 3.28 | 1.72 | 3.44 | 2.24 | -0.316 | > 0.05 | Not Significant |

**Table: 2 - Comparison of Beck's score among the two groups of meditators**

| Parameters | Meditators (14) 2-5 years Group I-A | | Meditators (15) >10 years Group I-B | | Meditators 2-5 yrs/ Meditators >10 yrs | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t-value | p-value | Significance |
| Beck's score (Total) | 12.07 | 3.34 | 12.33 | 5.42 | -0.155 | > 0.05 | Not significant |
| Beck's score (Affective) | 1.14 | 1.03 | 1.2 | 1.47 | -0.12 | > 0.05 | Not significant |
| Beck's score (Cognitive) | 7.57 | 2.53 | 7.93 | 3.56 | -0.314 | > 0.05 | Not Significant |
| Beck's score (Somatic) | 3.36 | 1.55 | 3.2 | 1.93 | -0.24 | > 0.05 | Not Significant |

**Table: 3 - Comparison of Beck's score among the 2-5 yr group of meditators versus the non-meditators**

| Parameters | Meditators 2-5 yrs (14) Group I-A | | Non-meditator (27) Group-II | | Meditators 2-5yrs/ Non-meditators | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t-value | p-value | Significance |
| Beck's score (Total) | 12.07 | 3.34 | 15.92 | 8.57 | -0.115 | > 0.05 | Not Significant |
| Beck's score (Affective) | 1.14 | 1.03 | 3.89 | 3.56 | -2.814 | < 0.05 | Significant |
| Beck's Score (Cognitive) | 7.57 | 2.53 | 8.59 | 4.33 | -0.81 | > 0.05 | Not Significant |
| Beck's score (Somatic) | 3.36 | 1.55 | 3.44 | 2.24 | -0.13 | > 0.05 | Not Significant |

**Table: 4 - Comparison of Beck's score among the >10 yr group of meditators versus the non-meditators**

| Parameters | Meditators > 10 years (15) Group I-B | | Non-meditator (27) Group-II | | Meditators >10yrs/ Non-meditators | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t-value | p-value | Significance |
| Beck's score (Total) | 12.33 | 5.42 | 15.92 | 8.57 | -1.46 | > 0.05 | Not Significant |
| Beck's score (Affective) | 1.2 | 1.47 | 3.89 | 3.55 | -2.79 | < 0.05 | Significant |
| Beck's Score (Cognitive) | 7.93 | 3.55 | 8.59 | 4.33 | -0.502 | > 0.05 | Not Significant |
| Beck's score (Somatic) | 3.2 | 1.93 | 3.44 | 2.24 | -0.355 | > 0.05 | Not Significant |

**Table: 5 - Comparison of Beck's score among male and female meditators**

| Parameters | Meditator Males | Meditator Females | Males / Females | | | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t-value | p-value | Significant |
| **Beck's score** | 9.6 | 4.36 | 9.3 | 3.22 | 0.0923 | > 0.05 | Not Significant |

## DISCUSSION

Depression is a major health problem which causes impairment in social and occupational functioning and increased risk of psychiatric, medical illnesses and increased risk of suicide[16]. Meditation or yoga is a complex mental practice involving changes in sensory perception, cognition, hormonal and autonomic activity[11]. It is widely used in physiological and medical practices for stress management as well as stress mediated mental disorders like depression[11]. A growing body of literature has shown that meditation has profound effects on numerous physiological systems that are involved in the pathophysiology of major depressive disorder (MDD).

Several studies have proven the effect of different types of meditation on depression. Buddhist walking meditation has been shown to be effective in depression[12]. Mindfulness meditation which is a practice of focus, awareness and non-judgmental acceptance of one's thoughts (Deyo et al, 2009, Kenny et al, 2007) has shown positive effects on depression[13]. Mindfulness meditation has been found to influence cognitive functions[14]. There is a positive effect of meditation techniques on attention, memory, verbal fluency and cognitive flexibility[15] and it is suggested that meditation can help in prevention of cognitive decline in the elderly. A recent cross-sectional study (Prakash et al 2012) compared cognitive skills between long-term meditating and non-meditating persons. The study revealed that long term meditation of vihangam yoga impacted positively on various cognitive abilities[16].

The present study was contemplated to put forward the positive effects of meditation on depression through Beck's depression inventory. Comparison between male and female meditators was also done to know if sex also affects the depression. But no significant results were found. An attempt was also made to study any significant difference between the two groups of meditators (2-5 years' meditators and >10 years' meditators). They did not give any significant result.

Our study has demonstrated that regular practice of Rajyoga meditation significantly decreases the risk of affective component of depression. Further analysis had revealed that cognitive and somatic clusters of depression were not significantly improved by meditation.

Rajyoga meditation and lifestyle is being practiced by more than 12 lac people (1.2 million) through more than 8500 Brahmakumaris' Rajyoga meditation centres in 130 countries for the past 77 years. It has reported significant improvements in one's negative thinking[18], chronic tension headache[19], addiction[20], respiratory function[21], lipid profile[21] and coronary artery disease[22]. It has dampening effects on heart-rate and blood pressure[23]. In order to liberate mankind from the chronic ills of debilitating non-communicable diseases and to live 'happily ever-after', the effect of Rajyoga meditation needs to be further explored by research with dedicated funding.

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# Relationship between the Resilience and Psychological Hardiness with the Spiritual Intelligence in a Sample of Female Students

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## ABSTRACT

This study aimed to determine the role of psychological hardiness and resilience for predicting the spiritual intelligence in a sample of the 200 female students in Ahvaz in 2014 who were selected from District 2 in Ahvaz in academic year of 2014-2015 using the convenience sampling. Connor-Davidson Resilience Scale (2003), Psychological Hardiness of Ahvaz (1998), and Spiritual Intelligence Questionnaire by Abdollahzadeh (2008) were used for collecting data that each of them has acceptable reliability and validity. For data analysis, SPSS-18 software was used and results were reported in form of the descriptive statistics, Pearson correlation, and multivariate linear regression. The results showed that there was a significant positive relationship between the psychological hardiness and resilience with the spiritual intelligence. Therefore, variables of psychological resilience and psychological hardiness affect the spiritual intelligence of the students.

*Keywords:* Psychological Resilience, Psychological Hardiness, Spiritual Intelligence.

## INTRODUCTION

The importance of spirituality and spiritual growth has been substantially considered by the psychologists and mental health professionals in the past few decades. World Health Organization in defining aspects of human existence refers to the physical, mental, social, and spiritual ones and the fourth dimension including the spirituality (WHO, 2005). Literature shows that spirituality can significantly affect the mental welfare[1]. Spirituality means the self-perceptions and is a combination of the personal factors and beliefs on existence and meaning of life; these beliefs are related to the various aspects of life, including social, physical, and psychological aspects (Young and Koopsen (2005). Spirituality is one of the man's spiritual needs and some theorists consider it as one of the highest levels of cognitive, moral, emotional, development, and human attempt to explore the facts [2].

In recent years, spiritual intelligence has been considered as one of the effective factors in psychological health and improving the lifestyle[3]. Stivenz (1966) introduced the spiritual intelligence for the first time[4] and then, Emmons (2000) developed it[5]. Spiritual intelligence helps people to take the consequences of his or her actions, to set goals and to find the meaning of his or her life[6]. Amram and Dryer (2008) define the spiritual intelligence as the enrichment quality of the daily performance and health[7]. Other definition considers the spiritual intelligence beyond the mental abilities of the people[8]. Positive resilience is one of the variables affecting the spiritual intelligence. Resilience is the capacity to cope with and overcome the problem. Resilience is effective in two ways: first, it helps people to encounter the threats or serious problems and second, they achieve the positive adjustment in spite of the problems and difficulties[9]. Rutter (1999) believes that resilience includes interaction between the risk factors and protective factors. Risk factors refers to the conditions or events that lead to the incompatible consequences, however, low social-economic conditions, various social injuries or divorced parents are considered as the risk factors [10]. Protective factors refer to all events or conditions that secure

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the people against the injuries; however, personality attributes, family factor, and social support are usually known as protective factors. Hardiness is a set of the personality attributes that helps people to resist against the stressful events of life. This personality variable consists of three interdependent variables including commitment, control, and defiance. Hard people are more committed and sacrifice themselves to achieve their goals (commitment), they also think that they can control the conditions (control) and regard life changes as the challenges and opportunism for development not as the limitations or threats (defiance)[11]. Since the main feature of the hard people is to resist the life pressure, Inzlicht et al. (2006) showed that elements of hardiness improve the mental health of the people using the coping strategies including the problem-based solutions and increasing their perceptions on their abilities to cope with the stressful factors[3].

Literature shows that resilience and psychological hardiness are effective factors in the spiritiual intelligence of the people. Therefore, this study aims to investigate the relationship between the resilience and psychological hardiness with the spiritual intelligence of the female students.

**Statistical Population, Sample, and Sampling**

This is a descriptive cross-sectional study. The statistical population consisted of all female high school students of District 2, Ahvaz-Iran in the educational year of 2014-15. The research sample consisted of 200 female students who were selected using the Krejcie and Morgen (1970) table and available sampling method. The following tools were used to collect data.

**Research Tools**

1- Resilience Scale

This scale has 25 items that are scored on a Likert scale from zero (never) to four (always). The total score is 0 – 100. The higher scores indicate the higher rate of individual resilience. There is a relationship between the increased resilience scale score and higher rate of the improvement as time passes. That is the increased score of the resilience scale results in the clinical development and decreased score of the resilience scale results in the lack or low rate of the clinical development. Resilience scale has the unique psychological features and may distinguish between resilient and non-resilient people.

It shows that resilience is changeable and may be improved with the treatment or dramatically increased (Arab-Zadeh, 2008). Arab-Zadeh (2008) used the Cronbach's alpha and composition in order to determine the reliability of the Connor-Davidson's resilience scale that was 0.85 and 0.80, respectively[12].

2- Ahwaz Hardiness Questionnaire

This questionnaire was developed and validated by Kiamarsi et al (1998) in order to provide a measurement scale of psychological hardiness in Shahid Chamran University of Ahvaz. This scale has 27 items that are scored on a four-point Likert scale from zero (never) to three (often) with a score ranging from 0 to 3 (never 0, often 3). The score range of this questionnaire is 0 - 81. Obtaining a high score in this questionnaire shows the higher rate of psychological hardiness. The validity of this test was evaluated by the concurrent validity using three scale criteria of generalized anxiety, Maslow's depression, and self-actualization questionnaire. Obtained coefficients were 0.65, 0.67, and 0.62, respectively; all of the coefficients were significant at $P<0.001$. The concurrent validity was also calculated with the psychological hardiness construct and the obtained result was satisfactory[13]. In the present study, Cronbach's alpha internal consistency of the scale was calculated 0.75.

3- Spiritual Intelligence Questionnaire

This test was normalized in 2008 by Abdollahzadeh et al on the students of Payame Noor University. The preliminary questionnaire of 30 questions was developed by the test developers, and was carried out on 30 students. The test reliability using the Cronbach's alpha in the preliminary stage was 0.87. In analyzing the questions using the Loop method, question no.12 was removed, and the final questionnaire was set at 29 words. Questions are scored from 1 (strongly disagree) to 5 (strongly agree) and score range is 29 -145[14]. In this study, using Cronbach's alpha, reliability spiritual intelligence was calculated as 0.91.

**FINDINGS**

Descriptive findings on 200 female students in the average age of 17-23 are reported in this section. Descriptive results include mean and standard deviation of the variables that were reported in Table 1.

**Table 1: Mean and Standard Deviation of the research variables**

| SD | Mean | Variables | |
|----|------|-----------|---|
| 15.03 | 89.23 | Total score of resilience | |
| 11.16 | 42.55 | Total score | Psychological hardiness |
| 4.45 | 14.64 | commitment | |
| 4.2 | 14.41 | defiance | |
| 4.6 | 13.49 | control | |
| 16.82 | 107.92 | Total score | Spiritual intelligence |
| 7.61 | 47.61 | Understanding and communicating with God | |
| 10.53 | 60.31 | Spiritual life | |

For analyzing the normality of the data, one-sample Kolmogorov - Smirnov test was used. Results showed that data are normally distributed. Accordingly, Pearson correlation test was used in order to examine the relationship between variables.

**Table 2: Pearson correlation coefficients of the predictor variables and spiritual intelligence**

| Spiritual intelligence | | Variable | |
|---|---|---|---|
| Sig | correlation coefficient | | |
| 0.001 | **0.512 | Total score of resilience | |
| 0.001 | **0.402 | Total score | Psychological hardiness |
| 0.001 | **0.413 | Commitment | |
| 0.001 | **0.321 | Defiance | |
| 0.001 | **0.346 | control | |

Pearson's correlation results of the variables of resiliency, hardiness and spiritual intelligence implies that positive and significant correlation between all of these variables and spiritual intelligence of the students at P<0.001.

## DISCUSSION AND CONCLUSION

This study aimed to investigate the relationship between resilience and psychological hardiness and spiritual intelligence in a sample of female students. The results showed a positive and significant relationship between spiritual intelligence and psychological resilience. The findings of this study are consistent with those of Hatami and Aghababaei (2012) [15], Akbarizadeh (2012) [16], Ajayebi and Wilson (2005) [16], Freiburg et al (2003) [17], Bonanno (2004) [17], Karl and Chason (2004) [17]. Previous studies show that resilient people interpret negative emotions positively, for example, Freiburg et al. (2003) believe that resilient people have internal locus of control, adapted social behaviors , empathy with others and self-concept. They are optimistic and competent in organizing the daily responsibilities [17].

Beshaarat (2007) investigated resilience, vulnerability, and mental health and showed that different degrees of resilience are related to spiritual intelligence by influencing on the self-esteem, personal competence, and integrity, tolerance of negative emotions, control, and spirituality and health and psychological vulnerability indices [18]. Saadipour (2013) showed that there is a significant relationship between spiritual intelligence and mental health; also, there is a significant relationship between the spiritual intelligence and moral judgment. Mousavi Moghaddam et al. (2015) in a showed the relationship between spiritual intelligence with self-control and defense mechanisms among female students in the third year of high school and concluded that there is a significant relationship between spiritual intelligence and self-control [19].

Concerning the relationship  between resilience and spiritual intelligence can be argued that resilience includes features such as responsibility, thinking before acting, delay in the satisfying the needs, compliance with laws and norms and organizing and prioritizing the tasks.

Self-control means very active planning, organizing, and conducting the tasks in a good manner. Responsibility controls the impulsivity and in this way, resilient people can manage their behaviors in the stressful situations and crises and return to their normal balance. They also can discover creative solutions by contemplating.

Results also showed that there is a significant positive relationship between the dimensions of psychological hardiness and spiritual intelligence. This is consistent with those of Maddi (2013) [20], and Sandwich et al. (2013) [21]. The explanation can be argued that people with high hardiness, use more adaptive coping behaviors and less maladaptive coping behaviors, and positively use more the hygienic tips. Personality traits including hardiness, provides a special insight into the way people deal with various issues affecting the life. Valander and Bison concluded that resilience is a variable that can increase the quality of life of the adolescents. Tagid and Fredrickson (2004) and Carl and Chason (2004) in separate studies showed that high levels of resiliency by promoting resiliency in stressful situations can help the people to use positive emotions to undergo undesirable experiences and get balance [22].

Accordingly, it can be concluded that there is a relationship between the spiritual intelligence of the students and psychological hardiness and resiliency. This study was conducted on a limited sample of female students in Ahwaz, so results should be cautiously in generalized. Future studies should be conducted on male students and other groups including university students. Another limitation of this study is using self-report questionnaires as a single research instrument. Therefore, further studies can use the interviews, too. Predicting the spiritual intelligence of the students based on the positive psychology approach with variables of spiritual intelligence, psychological resilience, and hardiness are the advantages of this study that distinguishes this study from the previous ones.

**Ethical Clearance:** The ethics of recording data, the right of respondents to end involvement in the research, the disclosure by respondents of sensitive material, the ethics of ethnographic fieldwork, the ethics of the research interview, and ethics in the use of questionnaires, is respected all ethics principles research.

**Conflict of Interest:** Not observed.

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# Cranial Noncontrast Computed Tomography in Acute Cerebrovascular Stroke, with Special Reference to Circadian Variation in Stroke

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## ABSTRACT

**Introduction:** Neuroimaging is fundamental to stroke diagnosis and management. Non-contrast computed tomography (NCCT) has been the primary imaging modality utilized for this purpose for almost four decades. Although NCCT does permit identification of intracranial hemorrhage and parenchymal ischemic changes, insights into blood vessel patency and cerebral perfusion are limited. Advances in CT technology now permit identification of acute and chronic arterial lesions, as well as cerebral blood flow deficits.

**Objective:** To study noncontrast computed tomography findings in acute cerebrovascular stroke and to investigate the possibility that stroke has a circadian variation.

**Material & Method:** The study was conducted at the Department of Radiology, Muzaffarnagar Medical College & Hospital, Muzaffarnagar on 50 cases of acute stroke (25 cases of ischemic stroke and 25 cases of hemorrhagic stroke) aged 18-80 years, admitted in the emergency, medicine ward and intensive care unit during the period of September 2012 to September 2014. Time of onset of stroke and associated risk factors like age, sex, hypertension, smoking, diabetes mellitus and dyslipidemia were studied. The patients were thoroughly examined clinically and underwent hematological & biochemical investigations and cranial noncontrast computed tomography. All patients were followed up for a month after the onset of stroke.

**Results:** Early ischemic changes (EIC) in brain parenchyma seen on non-contrast CT (NCCT) include focal swelling (sulcal effacement) and hypoattenuation. The sensitivity of NCCT for ischemia is time-dependent; in the first 3 h, it is less than 50% and increases to 80-90% at 6 h. For the diagnosis of lacunar infarcts within the first 6 h, the sensitivity is less than 50%. There was a circadian pattern in the onset of stroke, with a significantly higher risk of ischemic stroke in the morning while hemorrhagic stroke was found predominantly in late afternoon to early evening.

**Conclusion:** Despite its shortcomings, NCCT imaging is still the most widely used modality for selection of patients for reperfusion therapy. It has the advantages of wide availability, short acquisition time and a high sensitivity for identification of intracranial hemorrhage. NCCT demonstrates areas of irreversible infarction, but in most cases provides little insight into the presence or extent of penumbral tissue. Fortunately, more advanced CT- based imaging techniques can be used to gain additional pathophysiological information.

***Keywords*:** *Computed tomography, hemorrhagic stroke, ischemic stroke, circadian variation*

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## INTRODUCTION

Stroke is defined as abrupt onset of a neurologic deficit that is attributable to a focal vascular cause. Thus, the definition of stroke is clinical; as well it includes the laboratory studies like brain imaging[1].

About eighty five percent of first ever stroke are ischemic, ten percent are due to primary intracerebral hemorrhage and about five percent are due to sub-arachnoid hemorrhage. Ischemic stroke, using clinical features, may also be classified by anatomical location into – total anterior circulation stroke, partial anterior circulation stroke, lacunar stroke and posterior circulation stroke[2].

Imaging of the brain parenchyma is critical to differentiate hemorrhagic stroke from ischemic stroke and also to rule out other structural causes which can present as stroke mimics. In the early 1970s, computed tomographic (CT) scanners made their appearance and have since become the main diagnostic tool in acute stroke[3]. Recent advances in CT technology provide the means to differentiate salvageable from the irreversibly damaged brain tissue and also to identify pathophysiological mechanisms (vascular occlusion or stenosis) of stroke. Thrombolysis trials make it clear that rapid diagnosis, with minimal delay in treatment is essential[4].

Cerebrovascular accidents and sudden cardiac death display a significant variation in the timing of onset of symptoms. Many studies in past have reported a circadian pattern in the onset of stroke, with a significantly higher risk of ischemic stroke in the morning while hemorrhagic stroke was found predominantly in late afternoon to early evening [8,9,10].

## MATERIAL AND METHOD

The study was conducted at the Department of Radiology, Muzaffarnagar Medical College & Hospital, Muzaffarnagar on 50 cases of acute stroke (25 cases of ischemic stroke and 25 cases of hemorrhagic stroke) aged 18-80 years, admitted in the emergency, medicine ward and intensive care unit during the period of September 2012 to September 2014. Time of onset of stroke and associated risk factors like age, sex, hypertension, smoking, diabetes mellitus and dyslipidemia were studied. The patients were thoroughly examined clinically and underwent hematological (complete hemogram including platelet count, bleeding time, clotting time, INR) & biochemical investigations (random blood sugar, fasting lipid profile, liver function test, renal function test, serum electrolytes) and cranial noncontrast computed tomography. All patients were followed up for a month after the onset of stroke.

## OBSERVATIONS AND RESULTS

Observations of the present study are depicted in the tables given below -

**Table 1: General variables of the cases**

| Variables | | Ischemic Stroke | | Hemorrhagic Stroke | |
|---|---|---|---|---|---|
| | | Number | % | Number | % |
| Age distribution | 18-40 years | 0 | 0 | 0 | 0 |
| | 40-50 years | 3 | 12 | 0 | 0 |
| | 50-60 years | 16 | 64 | 3 | 12 |
| | 60-70 years | 6 | 24 | 8 | 32 |
| | 70-80 years | 0 | 0 | 14 | 56 |
| Sex distribution | Male | 15 | 60 | 20 | 80 |
| | Female | 10 | 40 | 5 | 20 |
| Diabetes Mellitus | Present | 15 | 60 | 15 | 60 |
| | Absent | 10 | 40 | 10 | 40 |
| Hypertension | Present | 19 | 76 | 25 | 100 |
| | Absent | 6 | 24 | 0 | 0 |
| Smoking | Present | 15 | 60 | 20 | 80 |
| | Absent | 10 | 40 | 5 | 20 |

The mean age was lower in patients with ischemic stroke (57.28 years) than with hemorrhagic stroke (70.32 years). There was more male predominance in hemorrhagic cases (80%) than ischemic cases (60 %). There was significant hypertension in all cases of hemorrhagic stroke (100%) and majority of ischemic stroke (76%). Though, sixty percent of both ischemic and hemorrhagic cases were diabetic but it was not statistically significant. Eighty percent of hemorrhagic stroke cases were smoker while only sixty percent of ischemic stroke cases were smoker.

**Table 2: NCCT findings of the ischemic stroke patients**

| Patient | Hypoattenuating area (< or > 1/3 MCA territory) | Insular ribbon sign | Loss of definition of Basal Ganglia | Dense carotid/ MCA artery |
|---|---|---|---|---|
| 1 | - | - | - | - |
| 2 | + (< 1/3) | - | + | - |
| 3 | - | + | + | Linear |
| 4 | + (> 1/3) | + | + | - |
| 5 | - | + | - | "Dot sign" |
| 6 | + (> 1/3) | + | + | "T" |
| 7 | - | - | - | - |
| 8 | + (> 1/3) | + | + | "T" |
| 9 | - | - | - | - |
| 10 | + (< 1/3) | - | - | - |
| 11 | + (< 1/3) | + | - | - |
| 12 | + (> 1/3) | + | + | - |
| 13 | - | - | - | - |
| 14 | - | + | + | Linear |
| 15 | - | + | + | - |
| 16 | + (> 1/3) | + | + | Linear |
| 17 | - | - | - | - |
| 18 | + (< 1/3) | + | + | Linear |
| 19 | + (< 1/3) | + | + | Linear |
| 20 | + (< 1/3) | + | - | - |
| 21 | + (> 1/3) | + | + | - |
| 22 | - | + | + | Linear |
| 23 | + (< 1/3) | - | - | - |
| 24 | + (< 1/3) | + | + | - |
| 25 | - | + | + | Linear |

Hypoattenuating areas were documented on the NCCT scans in 14 subjects (14/25 – 56%), which were associated or not with the dense middle cerebral artery sign. The detection rate of the dense middle cerebral artery sign on NCCT was 40 % (10/25). It was labelled as the linear type (7/10), carotid "T" type (2/10), and "dot sign" (1/10). The noncontrast computed tomography axial scan at the basal ganglia level exhibited the loss of putaminal definition in 15 cases (15/25 – 60 %) and an insular ribbon sign in 68 % cases (17/25).

**Table 3: Circadian variation of the cases**

| Variables | Time of Onset | Stroke Cases | |
|---|---|---|---|
| | | Number | % |
| Ischemic Stroke | 6 AM-7 AM | 4 | 16 |
| | 7 AM-8 AM | 3 | 12 |
| | 8 AM-9 AM | 4 | 16 |
| | 9 AM-10 AM | 5 | 20 |
| | 10AM-11 AM | 4 | 16 |
| | 11 AM-12 PM | 5 | 20 |
| Hemorrhagic Stroke | 12 PM-2 PM | 2 | 8 |
| | 2 PM-4 PM | 10 | 40 |
| | 4 PM-6 PM | 8 | 32 |
| | 6 PM-8 PM | 4 | 16 |
| | 8 PM-10 PM | 1 | 4 |
| | 10 PM-12 AM | 0 | 0 |

In present study time of onset of both ischemic and hemorrhagic cases was noted. Ischemic stroke patients were admitted in hospital between 6 AM to 12 PM (max. between 9 AM-10 AM & 11 AM-12 PM) while hemorrhagic cases were admitted between 12 PM to 12 AM (max. between 2 PM-4 PM & 4 PM-6 PM).

## DISCUSSION

The present study focused mainly on two aspects, viz. noncontrast computed tomography (NCCT) findings in acute cerebrovascular stroke and to investigate the possibility that stroke has a circadian variation. The findings of the study are discussed below:

The mean age was lower in patients with ischemic stroke (57.28 years) than with hemorrhagic stroke (70.32 years). Similar observation was reported by Gustavo Spaassnik et al & Sandra E. Black et al [4].

There was more male predominance in hemorrhagic cases (80%) than ischemic cases (60 %), however Rothwell et al (2005) found a slightly female preponderance in their study[2].

Blood pressure is often considered as one of the most powerful risk factor for stroke and has a circadian variation that essentially parallels the circadian variation in stroke onset. There was significant hypertension in all cases of hemorrhagic stroke (100%) and majority of ischemic stroke (76%). This was in accordance with the findings of William J. Elliott et al [5].

Though, sixty percent of both ischemic and hemorrhagic cases were diabetic but it was not statistically significant. Robert D. Abbott, Richard P. Donahue & Stephen W. MacMahon found increased twelve year risk of thromboembolic stroke in diabetic subjects while no association was found between diabetes, or measures of glucose intolerance, and hemorrhagic stroke [6].

Eighty percent of hemorrhagic stroke cases were smoker while only sixty percent of ischemic stroke cases were smoker. Similar analysis of relation between cigarette smoking and stroke was conducted by Howard G. & Burke G.L. et al [7].

There was a circadian pattern in the onset of stroke, with a significantly higher risk of ischemic stroke in the morning while hemorrhagic stroke was found predominantly in late afternoon to early evening. Similar pattern was reported by Anderson K.K. & J. R. Marler, T.R. Price, J. E. Muller, Aida Lago & Lamberto Landete et al [8,9,10].

### Neuroimaging in Cerebrovascular Stroke

The emergency evaluation of hyperacute stroke patients requires team harmony to quickly detect abnormalities and correctly determine the appropriate treatment[12]. NCCT analysis has proven to be an accurate method for ruling out intracranial hemorrhage and identifying subtle early signs of brain ischemia [12,13]. However, several studies have demonstrated only poor-to-moderate inter-observer agreement in the detection of infarcts by NCCT in acute settings [14,15]. NCCT findings might indicate brain swelling as a relatively late phenomenon characterized by the loss of insular ribbon sign and obscuration of the lentiform nucleus sign, both detected at a lower rate in the first six hours than the

results from the decreased density of brain tissue often associated with an increased density of arteries [16].

Successful thrombolytic therapy depends on the selection of patients, and MDCT parameters have proven to be useful for this purpose. On the NCCT scans, the occurrence of a hyperdense artery sign predicted an intravascular filling defect[17].

**The Ischemic Penumbra:** In acute ischemic stroke, arterial occlusion results in a reduction in cerebral blood flow (CBF) within the distribution of the affected artery. The ischemic penumbra is the hypoperfused, hypoxic tissue that is structurally intact, at risk of infarction but potentially salvageable with early reperfusion. The ideal imaging technique should be able to distinguish patients with penumbra, who will benefit from recanalization, from those who do not have salvageable tissue, and may indeed be at risk for hemorrhage following thrombolytic therapy [18].

**Imaging the Parenchyma:** Early ischemic changes (EIC) in brain parenchyma seen on non-contrast CT (NCCT) include focal swelling (sulcal effacement) and hypoattenuation [19]. We define hypoattenuation as loss of differentiation of the grey matter from adjacent white matter, and hypodensity as decrease in tissue density below that of normal white matter. The sensitivity of NCCT for ischemia is time-dependent; in the first 3 h, it is less than 50% and increases to 80-90% at 6 h [20]. For the diagnosis of lacunar infarcts within the first 6 h, the sensitivity is less than 50% [23]. There is evidence that ischemic changes influence the response to reperfusion therapy, probability of hemorrhagic transformation and the clinical outcome after stroke [11,22].

The European Cooperative Acute Stroke Study (ECASS) trials first utilized the extent of early ischemic changes on CT as exclusion criteria for thrombolytic therapy. Retrospective analysis of ECASS data showed that in patients with evidence of hypoattenuation involving < 33% middle cerebral artery (MCA) territory early intravenous activated tissue plasminogen (IV-tPA) had a therapeutic benefit. Based on this data, the ECASS investigators formulated the "one-third MCA" rule, which was used to define major infarction (hypoattenuation or cerebral edema involving > 33% of the MCA territory); patients with CT changes of major infarction did not qualify for thrombolysis [23]. **NCCT Imaging in Intracerebral Hemorrhage**

CT remains the imaging modality of choice to diagnose intracerebral bleeds in most clinical settings. Acute blood is readily identifiable on CT as areas of hyperdensity, with or without surrounding edema. Following the acute phase, the blood constituents are metabolized and reabsorbed. In the chronic phase, hemorrhage cannot be differentiated from ischemic lesions as only a hypodense cavity remains as a marker of the preceding lesion [24].

## CONCLUSION

There was a circadian pattern in the onset of stroke, with a significantly higher risk of ischemic stroke in the morning while hemorrhagic stroke was found predominantly in late afternoon to early evening.

Despite its shortcomings, NCCT imaging is still the most widely used modality for selection of patients for reperfusion therapy. It has the advantages of wide availability, short acquisition time and a high sensitivity for identification of intracranial hemorrhage. NCCT demonstrates areas of irreversible infarction, but in most cases provides little insight into the presence or extent of penumbral tissue. Fortunately, more advanced CT-based imaging techniques can be used to gain additional pathophysiological information.

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# Comparison of Coping Strategies and Pain Intensity between Cancer Patients and Healthy Subjects

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## ABSTRACT

**Introduction**: Cancer is the disease of cells and the cancer pain may be tangible from the very beginning stage of the disease in some of its types such as bone cancer or testicular cancer. However, pain is often a complication of advanced cancer.

**Aim:** The present study aims to compare coping strategies and pain intensity between cancer patients undergoing chemotherapy and healthy subjects.

**Methods**: The present research was a descriptive-analytic study. The statistical population included all cancer patients undergoing chemotherapy in Imam Ali Hospital of Zahedan, Sistan and Baluchestan Province and healthy people. Using the simple random sampling, 50 cancer patients undergoing chemotherapy and 50 healthy people (with equalization) were selected as the sample. The subjects were asked to fill out two questionnaires on coping strategy and pain intensity.

**Results:** The results showed that there is a significant difference between cancer patients and healthy subjects in terms of pain intensity and avoidant, cognitive, emotion-focused, and problem-focused coping strategies ($P<0.001$).

**Conclusion:** The study results revealed the importance and necessity of identifying the risk factors and ways of coping with them and timely prevention, diagnosis, and treatment of cancer.

*Keywords: Cancer; Pain intensity; Coping strategies.*

## INTRODUCTION

More than 7 million people around the world annually lose their lives due to cancer, and the annual number of new cases of affliction is estimated to reach 15 million by 2020[1]. Several studies have also shown that negative emotions and mentally stressful events predispose a person to cancer[2]. Coping strategies are cognitive and behavioral reactions of humans to life-threatening situations and stimuli. In other words, coping strategies are cognitive and behavioral reactions that are used by people for controlling a life-threatening situation[3]. In addition, process of coping is a complex and multidimensional phenomenon with cognitive, emotional, and behavioral features. Coping is defined as a special response to stress through which the perceptions, emotions, and behaviors of a person get prepared for adaptation and change[4]. In this regard, there are is ample pieces of evidence that imply the relationship of cancer with stress and emotional factors, as an integral part of civilized societies[5]. On the other hand, reaction of individuals to stress and negative emotions and the coping strategies they choose for dealing with them may also predispose them to diseases. Researchers have also found that coping styles are involved in adaptation to chronic pains[6,7]. In a study results showed that cancer patients usually use emotion-focused coping styles such as avoidance and evasion, while healthy people

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commonly apply problem-focused coping styles such control and responsibility in the face of different events [8]. In this regard, non-application of effective coping processes by cancer patients reduces their resistance to chronic effects of the disease and declines their skills and attitude towards life with cancer. In fact, the study of lifestyle in cancer patients revealed that these patients do not use the positive coping strategies in dealing with life events [9]. Study of Pinto"Gouveia, also showed that coping style plays a major role in adaptation to pain in chronic diseases such as cancer, and patients who use more appropriate coping strategies experience less pain [10]. The findings of another study indicate that women with breast cancer, compared to healthy women, were more exposed to severe stressful events such as the death of loved ones during the past years, especially one year before the diagnosis of cancer. These women suffered from false cognitive beliefs, incorrect coping strategies, and poor quality of life[11]. Studies have also shown that the use of coping strategies against cancer pain and anxiety play a major role in adaptation to this disease[12]. In a study conducted by Morasco , it was shown that problem-focused coping styles (negatively) and emotion-focused coping styles (positively) explain the variance of pain and fatigue in cancer patients and cancer patients with higher levels of pain and fatigue usually apply emotion-focused coping styles [13]. Hence, the present study aims to compare coping strategies and pain intensity between cancer patients undergoing chemotherapy and healthy subjects in order to help better understanding of this disease and provide better preventive and diagnostic measures.

## METHOD AND MATERIAL

This descriptive-analytic study was conducted on 100 subjects; 50 cancer patients undergoing chemotherapy in Imam Ali Hospital of Zahedan and 50 healthy people which were selected using the simple random sampling. Before the selection and entering the study, healthy people were equalized with cancer patients in terms of demographic variables such as age, gender, education level, and marital status through filling out a demographic questionnaire. Based on studies in this field and consultation with a statistician, a cross-sectional sample size was calculated using statistical formulas including Cochran's formula. For collecting the required data and information, a demographic questionnaire, Billing and Moose Coping Responses Inventory [14], and McGill Pain Questionnaire[15] were used. Coping Responses Inventory (CRI) was developed by Billing and Moose in 1981 for measuring ways of coping with stress. This scale consists of 19 items and measures three coping strategies of cognitive (6 items), behavioral (6 items), and avoidant (7 items). In addition, this inventory measures two problem-focused coping strategy and emotion-focused coping strategy. Every subject answers to the items of this scale by choosing one of the options (never: 0, sometimes: 1; often: 2, and always: 3). The score range on this questionnaire varies between 0 and 57. In the study conducted by Pourshahbaz, test-retest reliability coefficient for the whole questionnaire, behavioral coping, cognitive coping, and avoidant coping was obtained 0.73, 0.77, 0.83, and 0.60, respectively [16]. Nationally validated and trusted, McGill Pain Questionnaire is among the most reliable tools for measuring chronic pains [17]. This questionnaire consists of 15 items related to sensory and emotional components on visual analogue scale (VAS) and numerical rating scale (NRS) with a score range of 0-10 and one of the five pain intensity scales (from no pain to severe pain). Maximum score on this questionnaire is 57 [17]. In addition to reliability and validity, the most important feature of this tool is its ease of use. Khosravi, Sedighi Moradi, and Zendedel reported that Cronbach's alpha coefficient of this questionnaire is 0.85 and its reliability coefficient is higher than 0.80 [18]. If patients were not able to fill out the questionnaires for any reason, the researcher helped them to do so.

### Ethical Considerations

This study was approved by the Ethics Committee of Zabol University of Medical Sciences. In addition, a written informed consent form was obtained from all subjects before the beginning of the study.

### Statistical Analysis

The data were analyzed using the conventional statistical methods (mean, standard deviation, etc.) and multivariate analysis of variance (MANOVA) in SPSS-20.

## RESULTS

According to the results, the mean age of subjects was 41.77 years. In addition, 22% of subjects were single and 78% of them were married. In terms of education level, 52%, 27%, and 21% of subjects had a degree below high school diploma, an associate's degree, and a

bachelor's degree or higher, respectively. The results showed that mean score of the two studied group was different in pain intensity, avoidant coping, cognitive coping, emotion-focused style, and problem-focused style [Table-1].

**Table-1: The mean and standard deviation of variables in two groups of cancer patients and healthy subjects**

|  | Cancer patients | Healthy subjects |
|---|---|---|
| Variables | M ±SD | M+SD |
| Pain intensity | 4.33+28.82 | 81/3+46/14 |
| Avoidant coping | 2.19+14.5 | 68/1+1/7 |
| Cognitive coping | 80/0+36/7 | 93/1+84/13 |
| Behavioral coping | 85/1+66/10 | 88/1+82/10 |
| Emotion-focused coping | 01/3+42/25 | 42/2+22/15 |
| Problem-focused coping | 57/2+52/14 | 62/2+22/25 |

Before using the parametric test of multivariate analysis of variance, homogeneity of variances was evaluated by Levene's test. The results indicated that the assumption of homogeneity of variances was realized in two variables of pain intensity and coping styles. This meant that the use of analysis of variance was allowed. In addition, the results of multivariate analysis of variance was significant for all tests (Table 2).

**Table-2:The results of multivariate analysis of variance in two groups of cancer patients and healthy subjects**

| Reference | Value | F | Sig |
|---|---|---|---|
| Pillay effect | 946/0 | 5/273 | 001/0 |
| Wilks Lambda | 054/0 | 5/273 | 001/0 |
| Hatlyng effect | 64/17 | 5/273 | 001/0 |
| Roy's root | 64/17 | 5/273 | 001/0 |

The findings showed that there is a significant difference between the two groups in pain intensity, avoidant coping, cognitive coping, emotion-focused style, and problem-focused style, while there is no significant difference between them in terms of behavioral coping style [Table-3].

**Table-3: The results of analysis of variance of intergroup effects in two groups of cancer patients and healthy subjects**

|  |  | Variable | SS | df | MS | F | Sig |
|---|---|---|---|---|---|---|---|
| Changes | Pain intensity | 2/5155 | 1 | 2/5155 | 9/316 | 001/0 | |
|  | Avoidant | 1369 | 1 | 1369 | 7/357 | 001/0 | |
| Group |  | Cognitive | 7/1049 | 1 | 7/1049 | 1/480 | 001/0 |
|  | Behavioral | 64/0 | 1 | 64/0 | 183/0 | 67/0 | |
|  | Emotion-focused | 2601 | 1 | 2601 | 9/346 | 001/0 | |
|  | Problem-focused | 2/2862 | 1 | 2/2862 | 3/424 | 001/0 | |

The post hoc test showed that the mean difference in pain intensity, avoidant coping style, and emotion-focused style is in favor of cancer patients. This means that scores of cancer patients on these variables were more than scores of healthy subjects. According to the table, the mean difference in cognitive coping style and problem-focused style is in favor of healthy subjects, which means that they obtained higher scores on these variables than cancer patients [Table-4].

**Table-4: The results of LSD post hoc test in two groups of cancer patients and healthy subjects**

| Variable | Cancer patients | Healthy subjects | Mean difference | Sig |
|----------|-----------------|------------------|-----------------|-----|
| Pain intensity | 82/28 | 46/14 | 36/14 | 001/0 |
| Avoidant | 5/14 | 1/7 | 40/7 | 001/0 |
| Cognitive | 36/7 | 84/13 | 4/6- | 001/0 |
| Behavioral | 66/10 | 82/10 | 16/- | 67/0 |
| Emotion-focused | 42/25 | 22/15 | 2/10 | 001/0 |
| Problem-focused | 52/14 | 22/25 | 7/10- | 001/0 |

## DISCUSSION

The present study aimed to compare coping strategies and pain intensity between cancer patients and healthy subjects. The results showed that mean difference in pain intensity, avoidant coping style, and emotion-focused style is in favor of cancer patients and the mean difference in cognitive coping style and problem-focused style is in favor of healthy subjects. Which means that they obtained higher scores on these variables than cancer patients. These results are consistent with the findings of many other studies [19,20]. The effect of repression and internalization of emotions on affliction with cancer has been also reported in many studies [21,22]. On the other hand, reaction of individuals to stress and negative emotions and the coping strategies they choose for dealing with them may also predispose them to diseases [23]. Therefore, it can be stated that principled and correct thinking and behavior can help individuals in reducing the effects of stress and its negative emotions. In this regard, the immune system of the body, aimed at protecting the body against the invasion of infective organisms, is in mutual interaction with other systems of the body. Therefore, dysfunction in other parts of the body also disrupts the immune system and may affect body's resistance to infection. Cohen also showed that blood cortisol and epinephrine level increases in the long term in individuals who do not have the ability to cope with stressful life events and this in turn reduces the T and B immune cells. The loss or weakening of immune cells disturbs the function of the immune system and provide grounds for a variety of cancers, especially breast and lung cancers [24]. In conflicting interpersonal situations, cancer patients or those who are at risk of cancer do not have the power to defend themselves, express their opinions and tastes, and reject unreasonable requests of others. As a result, they feel guilt and scold themselves. These individuals usually try to respond to familial, social, and occupational stressful situations by using the emotion-focused coping styles such as indifference, complacency, extreme attraction of support from the family, friends, and relatives, denial of threatening situations, engaging in other activities such as exercise, and even the use of cigarette, alcohol, and drugs [25]. These coping strategies, not only intensify their pain but also do not let them to get rid of stresses [26]. Accordingly, it can be stated that inappropriate conducts such as lack of self-expression, self-inhibition, excessive use of emotion-focused coping style, and anger repression underlie unpleasant emotional stresses. If individuals are exposed to unpleasant emotional stresses and stressful situations for a long period of time, secretion of some hormones, particularly catecholamines and corticosteroids, from the endocrine system increases. Excessive secretion of these hormones in the long term leads to cardiovascular and respiratory problems, infectious diseases, and cancer [27]. A good communication can help patients for appropriate and faster adaptation with stresses due to cancer [28-30].

## CONCLUSION

The high and increasing incidence of cancer and its difficult treatment at advanced stages have imposed a huge burden on the health system of various countries. This reveals the importance and necessity of identifying the risk factors and ways of dealing with them and timely prevention, diagnosis, and treatment of cancer. One of the constraints in this research was it did not include different types of cancer. In addition, this study was conducted on patients in Zahedan and the results cannot be generalized to other areas. Non-application of interview and clinical assessment, which would produce more accurate results, was another constraint of this study.

**Ethical Clearance**: Taken from Zabol University of Medical Science committee

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# Factors that affect the Attitude of Dental Students towards People Living with HIV/AIDS

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## ABSTRACT

**Background:** The purpose of this study was to determine the various factors that can affect the attitude of students in a dental college in India towards PLWHA. Materials and Methods: A cross sectional survey was conducted among undergraduate dental students, where they were asked to fill an anonymous questionnaire. Apart from the basic information, the questionnaire consisted of a VAS to evaluate the degree of fear of these students in treating PLWHA; questions to assess the attitude towards patients with HIV based on a five-point Likert response; and also closed-ended questions to grade the students' knowledge about HIV infection. The data were then analyzed Student t test and ANOVA. A p-value of <0.05 was considered statistically significant. Results: An increased proportion of students with positive attitude where seen in the clinical group than the pre-clinical group [p=.001]. The attitude scores were significantly higher in students with minimal fear in treating patients with HIV/AIDS [p=.000] and those with good knowledge on HIV/AIDS [p=.001]. Conclusion: Hence within the limitations of this questionnaire study it can be assumed that the two independent factors that can affect the attitude of dental students towards PLWHA and influence their willingness to treat patients who are HIV positive are the level of knowledge on various aspects of HIV/AIDS and the degree of fear they have in treating HIV infected individuals.

*Keywords: Attitude, Dental students, Fear, HIV/ AIDS, Knowledge.*

## INTRODUCTION

In India, though there has been a reduction in the number of new cases of HIV infection, the number of people living with HIV/AIDS (PLWHA) is high. Over 2.1 million people are estimated to be affected with HIV in India.[1] Of which, Karnataka, the ninth most populous state in India is one of county's six high HIV/AIDS prevalent state. Within Karnataka, the Dakshina Kannada district has a prevalence of more than 1% among antenatal care clinic attendees, making it one of the high prevalence districts.[2] Therefore, health care providers here are likely to come across HIV positive individuals more often.

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People living with HIV/AIDS, especially in developing countries are often deprived of quality oral health care due to poverty and discrimination by dental health care workers who are unwilling to treat them.[3] Even though dental health care professionals have an ethical responsibility and are lawfully supposed to provide oral health care to HIV infected patients, they often deny care to them. The hindrance for oral care to PLWHA could be a consequence of inadequate knowledge, deficiency of appropriate facilities, stigma and discrimination. The reluctance to provide dental care to patients with HIV infection is primarily due the lack of understanding of the issues concerning HIV among dental professionals. This could be attributed to the inadequate knowledge and training received at the dental schools.[4]

It is important to assess students' existing knowledge and attitudes about HIV/AIDS. Such a baseline evaluation of the students' HIV-related knowledge is needed to assess the competency of the dental curriculum with respect to the various aspects of HIV/AIDS.[5, 6] This

can aid the dental educators to include these issues in the dental syllabus to prepare our future oral health professionals to effectively deliver care for the neglected patient populations. The objectives of this study were to assess these students' knowledge of and attitudes towards patients with HIV/AIDS and to compare the knowledge and attitudes of preclinical and clinical students in a Dental College in Dakshina Kannada district. The study also intended to determine the various factors that can affect the degree of fear while treating patients with HIV/AIDS in these students.

## METHODOLOGY

*Sample Population:* A cross sectional survey was conducted among the preclinical students (first year and seconds year BDS students) and clinical students (third year and fourth year BDS students) of a Dental college in Dakshina Kannada district, Karnataka, India.

*Tool used:* A self-administered anonymous questionnaire was given to the students willing for participation in the study. The questionnaire consisted of three sections.

I. The first section comprised of basic information including gender, academic year, and the degree of fear in treating patients with HIV/AIDS (scored using a scale of 1-10). Score 1-4 is considered as no/ minimal fear, 5-7 as moderate fear and 8-10 as extreme fear.

II. The second section was to assess the attitude of the students towards patients with HIV and their willingness to treat them. The participants were asked to give their opinion based on a five-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) for seventeen questions (Table 1). The scores were computed from 5 to 1 for a positive attitude and inversely for the negative attitude. Score of >75% is considered positive, score between 50-75% as passive and score <50% as negative attitude.

III. The third section consisted of seventeen closed ended questions to evaluate the basic knowledge of the students about HIV infection. The participants were asked to mark the statement as true, false or not sure (Table 2). For every correct answer a score of 1 and for the wrong answer as well as uncertain answers a score of zero was given. The total score was then calculated for each participant. The total score of a student can therefore range from 0 to 17. A score percentage of >75%, between

50-75%, 25-50%, and <25% was considered as very good, good, moderate and weak knowledge of the participants about HIV/AIDS respectively.

The section (II) and (III) in the questionnaire is the modified version of the survey tool used by Sadeghi *et al.*[7]

*Statistical analysis:* The statistical analysis was carried out using SPSS Version16.0 (SPSS Inc., Chicago IL). The descriptive statistics was calculated. A one way ANOVA (Analysis of Variance) was used to compare students' means for knowledge levels and attitudes towards HIV/AIDS between years of study. A post hoc analysis was done in case of multiple intergroup comparisons. A p-value of <0.05 was considered statistically significant.

## FINDINGS

Out of the 412 dental students from first year to fourth year that were included in the sample population, only 323 completed questionnaires were included in the study. Out of these 75.5% (n=244) were females and the rest 24.5% (n=79) males (Figure 1). The attitude score of students were significantly better in clinical students as compared to preclinical students (P <0.05). It was also observed that the attitude score was significantly higher in individuals with lesser fear of contracting HIV infection from patient than those with heightened fear (P<0.01). The attitude score was significantly lower in students with poor knowledge about HIV/AIDS as compared to those with better understanding (P <0.05). However, it was observed that there was no difference in attitude among students based on gender (Table 3).

It was observed that the knowledge score was significantly higher in the clinical students than in the preclinical students (P<0.01). Even a significantly higher knowledge scores were observed in students with positive attitude towards PLWHA (P<0.05) (Table 4). There was no significant correlation between attitude score and degree of fear (P>0.05). Degree of fear was seen to be significantly less among male than female students. It was significantly lower in preclinical students as compared to clinical students. It was also seen to be lower in individuals with positive attitude (Table 5).
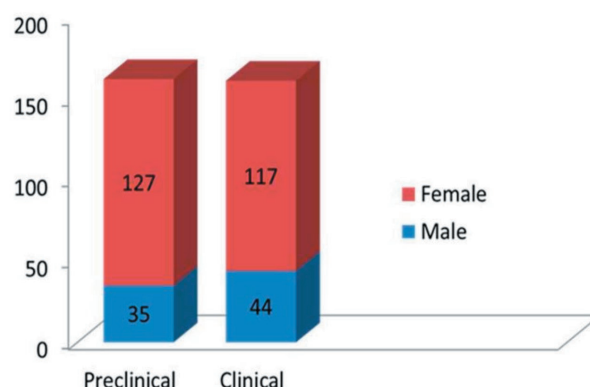
**Figure 1: Distribution of the participants included in the study based on their course and gender**

**Table 1: Questionnaire Part-II: Attitude towards and willingness to treat HIV/AIDS patients**

| No. | Attitude | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|-----|----------|---------------|-------|---------|----------|-------------------|
| 1 | Professional oral care to HIV/AIDS patients is waste of time and resources | 0.6 | 1.2 | 6.8 | 39.3 | 52 |
| 2* | Supporting HIV/AIDS patients improves community health | 31.9 | 50.2 | 12.7 | 4.6 | 0.6 |
| 3* | I will deliver emergency care to HIV/AIDS patients if needed | 32.8 | 48.9 | 12.4 | 4.6 | 1.2 |
| 4 | If my colleague/ assistant is HIV- infected, I will stop working with him/her | 1.9 | 7.4 | 13.6 | 36.8 | 40.2 |
| 5* | I am morally responsible to treat HIV/AIDS patients | 29.4 | 49.2 | 17.6 | 2.5 | 1.2 |
| 6* | All dental patients should be considered potentially infectious | 37.8 | 36.5 | 12.1 | 9.0 | 4.6 |
| 7* | I will treat HIV/AIDS patients for dental procedures that DO NOT involve bleeding | 21.7 | 52.3 | 16.1 | 7.1 | 2.8 |
| 8 | I am convinced that HIV/AIDS patients contracted the disease through their immoral activities | 3.1 | 9.3 | 23.8 | 39.9 | 23.8 |
| 9* | I will treat HIV/AIDS patients for dental procedures that involve bleeding | 10.8 | 37.5 | 34.7 | 13 | 4.0 |
| 10 | Dentists with HIV/AIDS should NOT be allowed to treat patients | 7.1 | 18.6 | 22.3 | 38.1 | 13.9 |
| 11 | I believe I have the right to refuse to treat an HIV/AIDS patient | 6.5 | 21.7 | 26.3 | 28.8 | 16.7 |
| 12 | Patients with HIV/AIDS should NOT be treated along with other patients | 9.6 | 22.0 | 22.3 | 29.7 | 16.4 |
| 13* | My knowledge about infection control is enough to treat HIV/AIDS patients. | 6.8 | 29.7 | 41.8 | 19.2 | 2.5 |
| 14 | All dental patients should be HIV-tested | 18.6 | 35.9 | 27.6 | 16.1 | 1.9 |
| 15 | I worry about being infected with HIV by my patients | 18.9 | 46.7 | 22.6 | 9.9 | 1.9 |
| 16 | It is my right to know if my patients are infected by HIV | 65 | 30.7 | 3.1 | 0.6 | 0.6 |
| 17 | Extra precaution need to be taken when treating HIV patients | 59.8 | 30.0 | 7.4 | 1.5 | 1.2 |

[*statement with positive connotation]

(Given are the overall responses of the students in the descending order of attitude score)

**Table 2: Questionnaire Part-III: Knowledge and awareness on HIV/AIDS**

| No. | Awareness | True | False | Not sure |
|---|---|---|---|---|
| 1 | HIV infection can spread by touching, kissing, sharing food and drinks | 12.4 | 84.2 | 3.4 |
| 2 | Patients with HIV cannot donate blood | 94.4 | 2.8 | 2.8 |
| 3 | HIV is always transmitted from mother to child during birth | 48.0 | 36.2 | 15.8 |
| 4 | Treatment of HIV/AIDS require special dental clinics | 20.4 | 55.7 | 23.8 |
| 5 | HIV/AIDS patients can be identified by physical appearance | 8.0 | 83.9 | 8.0 |
| 6 | Needle stick injury can transmit HIV virus | 91.3 | 2.2 | 6.5 |
| 7 | ELISA test is a screening test for HIV infection | 91.6 | 2.5 | 5.9 |
| 8 | Western blot test is a confirmative test for HIV infection | 80.2 | 7.4 | 12.4 |
| 9 | Medical and paramedical staffs are more prone for HIV infection | 73.7 | 13.0 | 13.3 |
| 10 | Pure saliva can be a vehicle for transmission of HIV infection | 48.6 | 34.4 | 17.0 |
| 11 | HIV/AIDS can be suspected from oral manifestations | 57.9 | 13.6 | 28.5 |
| 12 | A negative ELISA test rules out HIV infection | 13.9 | 50.8 | 35.3 |
| 13 | HIV can be completely cured with highly active antiretroviral therapy (HAART) | 10.5 | 52.6 | 36.8 |
| 14 | It is difficult to kill the HIV virus with all sterilization methods | 41.2 | 29.4 | 29.4 |
| 15 | AIDS and HIV are synonyms | 23.8 | 67.5 | 8.7 |
| 16 | Hepatitis B is more communicable than HIV/AIDS | 64.4 | 5.9 | 29.7 |
| 17 | Dental workers can act as an intermediary for transmission of HIV | 67.8 | 14.2 | 18.0 |

(correct options have been underlined)

**Table 3: Attitude score of dental students**

| Variables | | Attitude score (Mean±SD) | P value |
|---|---|---|---|
| Course | Preclinical | 55.44±6.90 | .034 |
| | Clinical | 57.07±6.64 | |
| Gender | Male | 55.62±7.41 | .353 |
| | Female | 56.46±6.81 | |
| Degree of fear | No/ minimal | 59.51±7.38[a] | .000 |
| | Moderate | 56.16±6.17[b] | |
| | Extreme | 52.97±6.47[c] | |
| Knowledge | Good | 57.59±7.65[a] | .001 |
| | Moderate | 56.43±6.42[a] | |
| | Poor | 52.92±6.52[b] | |

Groups with different superscript are statistically significant (P<0.05)

**Table 4: Knowledge score of dental students**

| Variables | | Knowledge score (Mean±SD) | P value |
|---|---|---|---|
| Course | Preclinical | 10.07 ± 2.15 | .000 |
| | Clinical | 12.261 ± 2.14 | |
| Gender | Male | 11.08 ± 2.24 | .719 |
| | Female | 11.19 ± 2.47 | |
| Degree of fear | No/ minimal | 11.07 ± 2.28 | .459 |
| | Moderate | 11.06 ± 2.54 | |
| | Extreme | 11.46 ± 2.29 | |
| Attitude | Positive | 12.07±2.04[a] | .017 |
| | Neutral | 11.04 ± 2.43[b] | |
| | Negative | 10.00 ± 3.08[c] | |

Groups with different superscript are statistically significant (P<0.05)

**Table 5: Fear score among dental students**

| Variables | | Fear score (Mean±SD) | P value |
|---|---|---|---|
| Course | Preclinical | 5.40 ± 2.23 | .001 |
| | Clinical | 6.27 ± 2.26 | |
| Gender | Male | 5.35 ± 2.43 | .033 |
| | Female | 5.98 ± 2.22 | |
| Attitude | Positive | 4.39 ± 2.32[a] | .000 |
| | Neutral | 6.03 ± 2.16[b] | |
| | Negative | 7.60 ± 3.78[b] | |
| Knowledge | Good | 6.08±2.37 | .329 |
| | Moderate | 5.66 ± 2.28 | |
| | Poor | 5.94 ± 2.11 | |

Groups with different superscript are statistically significant (P<0.05)

## DISCUSSION

The present study showed that the overall attitude of the dental students towards PLWHA was passive. This is in contrast to the previous studies which either showed positive attitude [3, 8] or negative attitude [5, 7] of dental students towards patients with HIV infections. This dissimilarity in finding can be attributed to the modifications made in the questionnaire, which was made to better suit the dental health care scenario. The fewer number of students (13.6%) showing favorable attitude towards patients with HIV infection in this survey could be because of the inadequate stress given on ethics and patient care during theory classes and clinical demonstrations.

There was no difference in the attitude score of male and female dental students. Whereas, the overall attitude score was significantly higher for students in clinical group (third year and fourth year students) as compared to the pre-clinical group (first year and second year). This could be because of the more exposure and more information of the clinical students on HIV/AIDS.[5] The statement that "All dental patients should be considered potentially infectious" received the most varied response among the clinical and preclinical group. As per the infection control guidelines, all patients should be considered potentially infectious, and this is referred to as standard precaution.[9] This statement received the highest score among the clinical group, whereas the preclinical group showed an overall negative response for the above mentioned statement. This could be attributed to the inadequate knowledge of the preclinical students on infection control protocol to be followed while treating a patient.

The statements in the attitude survey that were used to measure the willingness of the students to treat patients with HIV were as follows;

- "I will deliver emergency care to HIV/AIDS patients if needed"

- "I will treat HIV/AIDS patients for dental procedures that involve bleeding"

- "I will treat HIV/AIDS patients for dental procedures that DO NOT involve bleeding"

The students in the clinical group gave an overall better score for all the above mentioned statements than the preclinical group. In the situations where the students have to perform a dental procedure that involve bleeding in patients with HIV infection received a lower score than the other two situations. This could be because of the fear of HIV contagion.

The statement that "All dental patients should be HIV-tested" and "It is my right to know if my patients are infected by HIV" received a negative score. Hence the importance of the confidentiality to avoid stigmatization needs to be stressed among dental students. Most of the students, especially the preclinical students were not very confident about their knowledge on infection control. This should prompt the faculties in training the students in various aspects of infection control to make them more competent to treat all patients without any fear of cross contamination. Statements on certain ethical issues like "I believe I have the right to refuse to treat an HIV/AIDS patient", "Patients with HIV/AIDS should NOT be treated along with other patients" also did not receive a positive

score. Hence the various aspects of ethics in dentistry should also be dealt with in the curriculum especially before the students enter the dental clinics.[10]

It was also observed in the present study that the attitude score was significant better in students with lesser fear in treating patients with HIV/AIDS. Therefore fear could be a factor that could determine the attitude of the dental students.[11] Hence students who are phobic may benefit from counseling in developing better attitude towards PLWHA. An interesting finding was that fear of HIV cross contamination was seen more among clinical students and was also significantly more in female than in male students. The reasons for this are difficult to fathom.

In the current study, the overall knowledge score of among the dental students was less compared to the previous studies. The reason for this is the extra option of "not sure" in addition to true or false. This was to give a more accurate knowledge score as it would prevent any guess work from students. Only half of the students in the clinical group showed good knowledge level. Hence the designed dental curriculum needs to be revamped to provide the students with adequate knowledge at the end of the course.[8] As expected the senior students showed statistically significantly better knowledge levels than the preclinical students.[12] There was however no significant difference between the two genders as well as between the degree of fear of students on treating patients with HIV/AIDS on the knowledge level. A positive correlation was seen between the knowledge score and the attitude score. Hence it could be concluded that a better knowledge on various aspect of HIV/AIDS could improve the attitude of the dental students towards PLWHA.[13]

Saliva as a vehicle for HIV transmission has always been a doubt among many. More than forty percent of the students was of the opinion saliva exposure could transmit HIV. But studies have shown that the HIV transmission via saliva is non-existent due to the inhibitory factors in saliva.[14] Since dentist most of the time come in contact with saliva, this wrong notion could have led to the more fear of treating HIV infected individuals among clinical students. The statement with the least number of right answers was "It is difficult to kill the HIV virus with all sterilization methods". HIV begin a lipophilic virus is easy to kill and therefore most sterilization methods are effective against it.[15] This incorrect view also could have contributed to the fear. Hence it is important to discuss the various possible means of transmission of HIV, and discuss in detail the infection control protocols that need to be followed.[16] This is needed to eliminate any false information regarding HIV and to instill a positive attitude among dental students towards individuals who are HIV positive.

**Conflict of Interest:** None

**Ethical Clearance:** Obtained

**Source of Funding:** Self

## CONCLUSION

As per the observations made in this study, high level of knowledge on various aspects of HIV can improve the willingness of dental students in treating patients with HIV infection. Additionally, from the present study it could be comprehended that the level of knowledge had no influence on the fear of dental students treating these individuals. However the degree of fear among the dental students in treating patients who are HIV positive were inversely related to the positive attitude towards these individuals. Hence within the limitations of this questionnaire study it can be assumed that the two independent factors that can affect the attitude of dental students towards PLWHA and influence their willingness to treat patients who are HIV positive are (i) the level of knowledge on various aspects of HIV/AIDS and (ii) the degree of fear they have in treating HIV infected individuals. Therefore it is the responsibility of the dental educators in providing the dental students with adequate knowledge on the different aspect of HIV/AIDS as well as on other related topics like infection control and ethics in patient care. These topics should be taught as soon as the dental students enter the dental college.

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# Efficiency of High Blood Flow in Increasing Dialysis Efficacy versus Dialysis Complications

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## ABSTRACT

**Background:** Although new hemodialysis methods are not efficient enough, statistics indicate inadequacy of dialysis. Inadequacy of dialysis is a cause of reduced quality of life, frequent hospitalization and increased mortality rates in these patients. High dialysis blood flow can be effective in improving dialysis adequacy. On the other hand, this method has many benefits alongside few complications. The present study aimed to examine the effect of increased dialysis blood flow on adequacy and complication in dialysis simultaneously.

**Method:** this was a single-group semi-experimental before- and after-intervention trial. All 22 patients who underwent hemodialysis in the past six months 3 times a week. Preliminary examinations were performed using a checklist in each session. The complications were evaluated during every hemodialysis session using a checklist. Adequacy of dialysis was measured for each patient in the fourth intervention sessions.

**Results**: a significant difference was found between the two methods in terms of mean systolic blood pressure before and at the beginning of dialysis. No significant difference was found between the two methods in terms of incidence of hypotension, nausea, vomiting and muscular cramps. Mean score of dialysis adequacy was as $0.83 \pm 0.22$ in the routine sessions as $1.19 \pm 0.45$ in the intervention sessions (increased dialysis blood flow). Paired-sample t-test results showed a significant difference between these two figures (p = 0.000).

**Conclusion:** findings of this study suggested that although higher blood flow was used in this study compared to previous studies conducted in Iran, a considerable increase was observed in adequacy of dialysis.

***Keywords:*** *increased blood flow, adequacy of dialysis, hemodialysis, KT / V*

## INTRODUCTION

The number of ESRD patients was estimated as 3346000 in the world at the end of 2014. This figure increases by 6% at annual rate. Thereby, ESRD poses a considerable therapeutic dilemma in all global countries[1]. The prevalence of ESRD was estimated as 680 in every one million people in Iran, which is higher than mean global statistics [2].

Hemodialysis is the most common therapeutic method used in end-stage renal patients among alternative treatments[3]. Mortality rate is high in patients with ESRD undergoing hemodialysis despite continuous improvement in medical technology and health care[4]. High rate of mortality in hemodialysis patients still remains a main challenge to health care system. Inadequacy of dialysis is an important cause of mortality in hemodialysis patients. Dialysis inadequacy can cause such complications as malnutrition, nausea, vomiting, anorexia, hypoalbuminemia, restless leg syndrome [5]. Adequacy of dialysis can relieve these complications[6]. Various factors like type of vascular access, dialysis period[6], increased dialysis fluid flow, using a filter

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with ultra-high filtration rate and increased blood flow affect dialysis adequacy [7, 8]. The patients cannot tolerate more than 4 hours of dialysis treatment regardless of its high costs. Increased dialysis fluid flow does not have a great impact on adequacy of dialysis. On the other hand, hemodialysis patients may not tolerate high-flux dialyzer [7].

There are confounding evidence on increased blood flow as an effective factor in adequacy of dialysis. Accordingly, several studies suggested that increased dialysis blood flow delivered to hemodialysis machine is a time-saving and economical technique that increases dialysis adequacy [7]. Hariprasad et al. (2007) showed that high blood flow is a means of improving dialysis adequacy and survival in ESRD patients [9]. Shahdadi et al. and (2009) and Kim et al. (2010) showed that increasing blood flow from 15% to 25% increases dialysis adequacy compared to common dialysis treatment [7, 10, 11]. However, increased blood flow can fail to increase dialysis adequacy due to some reasons such as type of vascular access, hypotension, muscular cramps and intolerance in dialysis patients [8]. Various studies have indicated dialysis inadequacy in more than half of dialysis patients, especially the studies conducted in Iran [3, 12, 13]. Thereby, the present study aimed to examine efficiency of this method in increasing dialysis adequacy simultaneously in comparison with dialysis complications. It is necessary to mention that higher dialysis blood flow was used in this study compared to previous studies [7, 10] in order to evaluate dialysis adequacy and complications.

## METHOD

This was a semi-experimental single-group before-and-after-intervention trial, which aimed to determine the effect of increasing dialysis blood flow on dialysis adequacy and complication in 22 hemodialysis patients in Specific Disease Center in Zabol in 2016-2017. Sample size was determined using the following statistical formula in a pilot study [8].

$$N = 2(Z_{1-\alpha/2} + Z_{1-\beta})^2 \, \delta^2 / d^2 = 22 \qquad \begin{matrix} z_{1-\frac{\alpha}{2}} = 1.96 \\ z_{1-\beta} = 1.28 \end{matrix}$$

The study was conducted in three phases. At the first phase, eligible patients for the study were selected after performing necessary pre-arrangements. Inclusion criteria were end-stage renal disease, three times dialysis per week in four-hour sessions, at least six months after beginning hemodialysis treatment, an arteriovenous

fistula or graft, tolerating dialysis sessions, capability to participate in the project, no history of cardiogenic pulmonary disease and acute diseases, less than 3 liters ultrafiltration, aged from 15 to 65 years, more than 10 mg per dL hemoglobin. Objectives and method of the study were explained to the participant who consented to participate in the study. In the second phase, all patients underwent four routine dialysis sessions (250 ml / min dialysis blood flow). In the third phase, the patients underwent four intervention sessions with higher dialysis blood flow than routine blood flow. Accordingly, dialysis blood flow was increased by 15% and 20% compared to initial dialysis blood flow (250 ml / min) respectively in patients whose weights were less than and more than 65 kg. Temporary exclusion criteria were anti-cramps, nausea, vomiting, and hypertension four hours prior to the study, 140.90 mm Hg <blood pressure< 100.60 mm Hg at the beginning of hemodialysis treatment, smoking in one hour prior to hemodialysis, nausea, vomiting and muscular cramps prior to each session, changes in diet during the study. Any of the afore-mentioned cases was not treated at that session and was referred to other sessions. All patients were closely monitored in case of any complication before and after dialysis sessions. It should be noted that B. Braun hemodialysis machine, 37°C dialysis solution, bicarbonate dialysis solution, a fixed concentration of dialysis solution, 140 mEq per liter sodium concentration and an identical filter type was used for all patients in each session. In addition, such variables as hemodialysis shift, ultra-filtration rate, drinking or not drinking caffeinated beverages before and during hemodialysis, diet and use of antihypertensive medications before dialysis were closely monitored for each patient. Moreover, two blood samples were taken from each patient at the beginning and at the end of the sessions to determine dialysis adequacy. The first blood sample was taken from arterial line after placement of dialysis needles before dialysis. The second blood sample was taken after dialysis and before disconnecting the patient from dialysis device. First, dialysis blood flow was reduced to 50 ml per minute. Blood sample was taken from sampling sites of dialysis lines after 15 to 30 seconds. The samples were immediately transferred to a lab. Dialysis adequacy was determined using standard KT / V criterion and Daugirdas 2 formula based on BUN test results before and after the fourth dialysis session at the second and third phases given the weights of the patients before and after dialysis (at the fourth session).

## RESULTS

The results showed that 59.1% were females and 41.9% were males. Mean age of participants in this study was 43 ± 3.212. Majority of the patients were married (59.1%). The most common cause of ESRD was diabetes and hypertension (40.9%) in this study. Furthermore, majority of the participants were illiterate (45.5%)

Mean score of dialysis adequacy was 0.83 ± 0.22 in routine dialysis sessions and 1.19 ± 0.45 in intervention sessions (increased blood flow). Paired-sample t-test results showed a significant difference in mean score of dialysis adequacy between routine and intervention sessions (p = 0.000) (Table 1).

The findings showed that systolic blood pressure of patients in routine sessions were 129.86 ± 13.39, 133.36 ± 15.98, 135.63 ± 22.4, 134.13 ± 19.4, 37.18 ± 22.51, 138.68 ± 25.89 138.50 ± 25.12 and 138.86 ± 25.5 respectively before and after dialysis, 60 minutes, 120 minutes, 150 minutes, 180 minutes, 210 minutes and 240 minutes after beginning of dialysis. In addition, systolic blood pressure of patients in intervention sessions were 125.95 ± 13.31, 128.13 ± 14, 126.54 ± 20.97, 127.54 ± 25.42, 126.27 ± 26.42, 125.59 ± 28.32, 126.04 ± 28.32 and 126.04 ± 29.70 respectively before and after dialysis, 60 minutes, 120 minutes, 150 minutes, 180 minutes, 210 minutes and 240 minutes after beginning of dialysis (table 2). An increasing trend was observed in mean systolic blood pressure during routing dialysis session (low dialysis blood flow). Paired-sample t-test results showed significant changes in mean blood pressure before dialysis and at the beginning of dialysis (p < 0.05). However, no significant changes were observed in mean systolic blood pressure during dialysis and at the end of dialysis (p > 0.05). In intervention sessions (high dialysis blood flow), mean systolic blood pressure

increased at the beginning of dialysis, decreased 180 minutes after dialysis and was constant until the end of dialysis. Significant changes were observed in mean systolic blood pressure in the first and third intervention sessions only at the beginning and before dialysis. Nevertheless, no significant changes were observed in mean systolic blood pressure in other intervention sessions from beginning to the end of the sessions (p > 0.05). No incidence of hypotension was observed at all routine sessions (250 ml per min dialysis blood flow). However, one incidence of hypotension was observed in all intervention sessions and one case of hypotension was detected in the second and fourth intervention sessions. McNamara's test results showed no significant difference between routine and intervention sessions in terms of incidence of hypotension (p = 0.2).

Moreover, McNamara's test results showed no significant difference between routine and intervention sessions in terms of nausea, vomiting and headache (p > 0.05). The incidence of cramps from the first to fourth routine sessions was respectively as 1, 2, 2 and 1 cases. Furthermore, the incidence of cramps from the first to fourth intervention sessions was respectively as 6, 7, 7 and 4 cases. McNamara's test results showed no significant difference between routine and intervention sessions in terms of incidence of muscular cramps (p = 0.06).

**Table 1 - mean KT / V before and after intervention**

| KT / V | Mean ± SD | Cases |
|---|---|---|
| Routine session (250ml/min dialysis blood flow) | 0.83 ± 0.22 | 21 |
| Intervention sessions (high dialysis blood flow) | 1.19 ± 0.45 | 21 |
| Paired-sample t-test | t = -4.4 | P = 0.000 |

**Table 2 - Mean systolic blood pressure before starting dialysis in both routine and intervention sessions**

| Systolic blood pressure | Mean ± SD in routine sessions | Mean ± SD in intervention sessions | Paired-sample t-test results | | |
|---|---|---|---|---|---|
| | | | t | df | p |
| Before | 129.86 ± 13.39 | 125.95 ± 13.31 | 2.1 | 21 | 0.047 |
| Beginning | 128.13 ± 14 | 133.36 ± 15.98 | 2.5 | 21 | 0.02 |

## DISCUSSION

The findings showed that mean age of hemodialysis patients was $43 \pm 3.212$ in Zabol City. However, mean age of the patients was respectively 58 and 50 in the studies conducted by Kim et al. (2016) (14) and Ward (2011) [15]. This can be attributed to better control of effective factors in incidence of ESRD in Korea and America than Iran. Age range of the patients was from 20 to 85 years old in the afore-mentioned two studies while age range of the patients was from 15 to 65 years old in the present study. Mean age of hemodialysis patients was respectively as 39 and 38.3 in the studies conducted by Beladi in Ahwaz (2012) [13] and Shahdadi et al. in Zabol (2010) [7]. This difference could be attributed to better control of the patients with hypertension and diabetes in Zabul compared to Ahwaz and better control of the disease in the five recent years prior to 2010.

Mean KT / V was $0.83 \pm 0.22$ in the routine sessions and as $1.19 \pm 0.45$ in intervention sessions. This shows a significant increase in dialysis adequacy due to high dialysis blood flow in the intervention sessions ($p = 0.000$). This finding is consistent ith findings of the studies conducted by Claudia [16], Gotzvelir [18], Alice [17], Borzue [10], Shahdadi [7], Kim [11], Hwassell [19]. No acceptable KT/V criterion was found before intervention in the study while 50% of the patients had KT/V > 1.2 after the intervention.

An increasing trend was observed in mean systolic blood pressure during routine dialysis sessions (low dialysis blood flow). Paired-sample t-test results showed significant changes in mean systolic blood pressure only at the beginning of dialysis compared to before dialysis ($p < 0.05$). However, no significant changes were observed in systolic blood pressure from the beginning to the end of dialysis ($p > 0.05$). This increase may be due to the issue that filters with a clearance of materials and medications can affect clearance of antihypertensive drugs [1]. On the other hand, a considerable amount of blood flow out of body at the beginning of dialysis, which consequently reduce delivery of blood to the kidneys, activates the renin - angiotensin system and increases blood pressure [20]. In intervention sessions, mean systolic blood pressure increased at the beginning of dialysis, decreased 180 minutes after beginning of dialysis and remained constant until the end of dialysis. Systolic blood pressure dropped after dialysis since blood flow out of body at higher dialysis blood flow

in the intervention sessions. Previous studies have also shown that mean blood pressure significantly drops during dialysis [21] However, McNamara's test results showed that the incidence of hypotension was not significantly different between routine and intervention sessions in this study ($p = 0.2$). These results are consistent with the results of the studies conducted by Shahdadi et al. [7] and Alice et al. [17]. It should be noted that higher dialysis blood flow was used in this study compared to the study conducted by Shahdadi et al. However, no significant difference was found between routine and intervention sessions in terms of incidence of hypotension ($p > 0.05$). McNamara's test results also showed no significant difference between routine and intervention sessions in terms of nausea, vomiting and headache ($p > 0.05$). The incidence of cramps from the first to fourth routine sessions was respectively as 4.5%, 9%, 9% and 4.5%. The incidence of cramps was respectively as 27.2%, 31.8%, 31.8% and 18.18% from the first and fourth intervention sessions. McNamara's test results showed no significant difference between routine and intervention sessions in terms of incidence of muscular cramps ($p = 0.06$). These results are consistent with the results of the studies conducted by Shahdadi and Alice [7, 17].

The findings suggest that 15% to 20% increase in dialysis blood flow (initial dialysis blood flow = 250 ml per min) considerably increased dialysis adequacy without any complications. Every 0.1 increase in KT / V criterion simultaneously reduced intrinsic mortality rates of cerebrovascular, cardiovascular and infectious diseases [10]. It seems that increase in dialysis blood flow increased adequacy of dialysis in an effective manner.

## CONCLUSION

Findings of this study suggested that although higher blood flow was used in this study compared to previous studies conducted in Iran, a considerable increase was observed in adequacy of dialysis.

**Conflict of Interest:** None declared

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# Use of Alternative System of Medicine other than MDT by Leprosy Patients

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## ABSTRACT

To identify the use of alternative system of medicine other than MDT by leprosy patients. **Material and Method :** 251 study subjects were selected randomly attending the Skin & VD OPD of S. S. Hospital of IMS, BHU, Varanasi. Questions related to alternative system of medicine were administered to leprosy patients aged 15 years or above by the interviewer himself. **Result :** MDT was initial treatment of 41.8% of the patients. Homeopathy (36.3%) was the most popular treatment among the alternative system of medicine. About three fourth of patients went for more than one treatment. **Conclusion :** Homeopaths are hurdle in the success of NLEP. There is need to improve the compliance to MDT.

***Keywords:*** *Leprosy, MDT, Alternative medicine, Homeopathy*

## INTRODUCTION

Leprosy is not a disease of modern civilization and industrialization, but its origin is as old as 4600 BC[1]. In India, leprosy was referred to as "Kushtha" in ancient Vedic writings scriptured as back as 1400 BC. Probably the name Kushtha was derived from "Kushanti", which means eating away[2].

Although the cure of leprosy is possible by MDT, there are certain misbelieves in the mind of leprosy patients. Lack of belief or confidence in conventional medicine which often conflicts with the fact, usually leads to patient seeking primary treatment from local healers. It is known fact that the delayed response in getting medical treatment for leprosy causes permanent physical deformities in the patient and gives an unhygienic picture that forces fellow people to look at the leprosy patient hatred[3].

Patients take treatment from various types of medical/non-medical agencies such as home remedies, medico-religious treatment, indigenous drugs, unqualified doctors (quacks), qualified doctors, government hospitals, dispensaries and leprosy clinics. To implement the NLEP more sincerely, it is pertinent to identify the alternative system of medicine other than MDT used by leprosy patients.

## MATERIAL AND METHOD

Patients mainly from eastern UP and adjacent western part of Bihar find their most common destination as S. S. Hospital, BHU, Varanasi. Varanasi is also one of the most favoured religious destinations. Leprosy is firmly associated with religion. So, patients were selected from Dept. of Skin & VD of S.S. Hospital, BHU, Varanasi. A pilot study was conducted on 50 leprosy patients attending the OPD of Department of Skin & VD and required sample size was calculated to be 225. Assuming the attrition rate of 10%, the sample size of present study was fixed at 250. Cases who noticed their symptoms within preceding two years were included in the study. As the objectives of the study were to know the use of alternate system of medicine, this period was neither too short to use the alternate system of medicine nor too long to allow the recall factor to crop in. Children below 15 years were not taken as it may not be possible to get complete information on use of alternative medicine

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for leprosy. Primary tool used was a predesigned and pretested interview schedule, prepared in Hindi, keeping the language of the respondents in mind. The questionnaire contained either semi structured or open ended (wherever structuring was not possible) questions. The questions were explained to the patient and his/her response was recorded by the interviewer himself, so that least inter-observer variation crop in. SPSS statistical software was used.

## RESULT

**Table 1 : First treatment taken by the patient**

| Characteristics | No. | Treatment in percent | | | | |
|---|---|---|---|---|---|---|
| | | MDT | Allopathy other than MDT | Homeopathy | Ayurvedic | Other |
| Total | 251 | 41.83 | 27.49 | 18.32 | 4.38 | 7.97 |
| Residence | | | | | | |
| Rural | 216 | 39.81 | 27.78 | 18.98 | 5.09 | 8.33 |
| Urban | 35 | 54.29 | 25.71 | 14.28 | 0.00 | 5.71 |
| **Education** | | | | | | |
| Illiterate | 62 | 37.09 | 41.94 | 8.36 | 3.23 | 9.68 |
| Primary | 36 | 47.22 | 19.44 | 19.44 | 2.78 | 11.11 |
| Middle | 28 | 32.14 | 25.00 | 28.57 | 3.57 | 10.71 |
| Secondary | 64 | 40.62 | 23.44 | 25.00 | 7.81 | 3.12 |
| College | 61 | 49.18 | 22.95 | 16.39 | 3.28 | 8.19 |

MDT was the initial treatment in maximum number of cases (41.8%) followed by other allopathic treatment and homeopathic drug. Majority of patients (54.3%) from urban background went for MDT while more number of rural patients went for alternative medicines (homeopathic, other and ayurvedic). Higher percentage of literate patients (43.4%) went for MDT first, as compared to illiterate patients (37.1%).

**Table 2 : Ever use of treatment other than MDT**

| characteristics | No. | Treatment in percent | | | |
|---|---|---|---|---|---|
| | | Allopathic other than MDT | Homeopathic | Ayurvedic | Other |
| Total | 251 | 41.43 | 36.25 | 13.94 | 8.37 |
| Residence | | | | | |
| Rural | 216 | 41.21 | 34.83 | 15.09 | 8.87 |
| Urban | 35 | 41.80 | 46.83 | 3.79 | 7.60 |
| **Type of disease** | | | | | |
| PB | 75 | 33.16 | 41.45 | 13.99 | 11.40 |
| MB | 176 | 63.14 | 34.21 | 13.80 | 7.75 |

41.4% cases went for allopathy other than MDT either initially or in the later part of their course of treatment. Close to above observation 36.3% approached for homeopathic treatment. 13.9% ever used ayurvedic therapy and 8.4% other therapy like, treatment from traditional healers and medico-religious practices. There was significantly

higher proportion of cases from rural background than from urban background, who took Ayurvedic treatment. About double the percentage of PB cases, MB cases went for modern treatment other than Multi Drug Treatment.

**Table 3 : Types of treatment taken by the patient**

|  |  | Types of treatment in percent | | | |
|---|---|---|---|---|---|
|  | No. | 1 | 2 | 3 | 4 |
| Total | 251 | 24.70 | 36.65 | 23.51 | 15.14 |
| Residence |  |  |  |  |  |
| Rural | 216 | 23.96 | 34.96 | 24.79 | 16.29 |
| Urban | 35 | 29.81 | 48.08 | 15.38 | 6.73 |
| **Type of disease** |  |  |  |  |  |
| PB | 75 | 37.18 | 44.04 | 14.08 | 4.69 |
| MB | 176 | 18.35 | 32.84 | 28.44 | 20.37 |

Three fourth patients went for more than one treatment. 15.7% of the patients took four or more than four treatment regimens. Significantly higher percentage of rural cases got four or more than four type of treatment as compared to urban cases. PB cases getting more than two types of treatment were significantly less than the MB cases.

## DISCUSSION

In our study, majority of patients (69%) initially went for allopathic medication. Similar observation (74.6%) was made by Umadevi (1992)[4]. Kumar and Anbalagan (1982)[5] observed that 53.3% of leprosy patients directly went for MDT, which is close to our observation (42%). In agreement with these findings, Kumar and Anbalgan[5] and Umadevi (1992)[4] also found that allopathic system of medicine was most popular among leprosy patients.

Tare (1982)[6] found that most of the patients had faith in traditional system of medicine. While Kumar et al (1982)[5] and Umadevi (1992)[4] observed 98% and 74.6% of the patients opting for allopathic system of medicine, respectively. Gershon, Mani and Kumar (1981)[7], Kumar and Anbalagan (1982)[5] and Kumar, Sivaprasad, Anbalagan et al (1983)[8] also found that 87%, 53.3% and 83% of leprosy patient directly opted for MDT, repectively. Umadevi (1992)[4] observed that majority of the patients from rural (68.3%) as well as urban area (65.1%) straight away consulted for MDT.

In the initial stages of disease 9.4% patients from urban area and 5.6% from rural area began to treat the patch by homeopathy. Kumar and Anbalagan (1982)[5]

and Kumar, Sivaprasad, Anbalagan et al (1983)[8] reported 10% and 1.27% patients consulted quacks, respectively. While, Umadevi observed that 2.1% urban and 2.0% rural patients approached the quack[4]. Only 8% went for other treatment which is close to observation of Kumar and Anbalagan, 1982 (10%)[5]. In contrast to our observation, in Pakistan, 52% of patients initially sought help from folk healers (Mull, 1989)[9]. Robertson, Nicholls and Butlin (2000)[10] discussed that among the patients who went to professional health services; 40% did not receive a definite leprosy diagnosis.

Possible explanation of significantly higher proportion of MB patients initially taking allopathic treatment other than MDT as compared to PB patient is that NLEP workers and even General Practitioners misdiagnose the leprosy cases when they do not present with clinical features of leprosy like, hypopigmented skin patch, partial or total loss of skin sensation. They give symptomatic treatment to leprosy cases presenting with fever, cold, testicular pain, eye discharge and skin nodule. These cases reach to specialists after getting non-specialized treatments.

It is observed from the table - 1 that 18.32% of patients first approached for homeopathic treatment which is higher than the observation of Umadevi (1992)[4]. Singh (2000)[11] observed in his study on 212 leprosy patients attending the dermatological clinic for the first time that 43% of patients opted for homeopathic treatment, which is close to the findings of this study (36.3%). Homeopathic treatment is a very popular alternative system medicine in this country especially for skin and chronic diseases. He

mentioned that Homeopaths give a negative education of leprosy by counseling the patients that allopathic system of medicine will suppress the disease, but not root it out from the body system. Homeopathy is a hurdle in NLEP. This message should be incorporated in all the health education material. The opinion should be incorporated in the NLEP in India and leprosy programmes in other parts of the world where Homeopathy is practiced.

In India, Ayurvedic treatment is being practiced since ancient time. Rural patients being rooted in culture and tradition have more faith in Ayurvedic treatment. It could the reason for more number of patients opting for Ayurvedic treatment.

In the present study three fourth patients went for more than one treatment while Kumar and Anbalagan (1983)[5] observed that only 35% of patients changing one or more treatment agency. Umadevi (1992)[4] also found lower number of patients changing the treatment agency. Multiple number (more thant 2) of treatment is significantly high in MB cases. Possible reason of this finding is that MDT kills the mycobacterium. But the deformity does not disappear. Patients think that the disease is still persisting and they wander from one healer to another in search of permanent cure to the deformity.

Heynder (2000)[12] reported on the basis of information about visits of the patients to the clinic that the time available to give any message targeted at reducing defaulting was very short, including time left for health education. The non-compliant patients should be the targets of measures such as intensified health messages and home visits in order to reduce the risk of defaulting.

## CONCLUSION

Homeopaths are a hurdle in the success of NLEP. Awareness should be increased in public further that MDT is the only effective treatment of leprosy. This message is though incorporated in the present programme have been ineffective in achieving the desired result and they are opting for alternative system of treatment other than MDT.

**Conflict of Interest:** None

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# Imaging Spectrum of Extranodal Lymphoma Manifestations

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## ABSTRACT

Lymphomas are a heterogenous group of malignancies, all of which arise from a given stage in lymphocyte ontogeny but which have highly variable clinical and imaging manifestations. Immunosuppression from any cause is a well-known risk factor for certain subtypes. Lymphoma may be unifocal, multifocal, or diffuse, affect isolated lymph nodes or any organ system, and demonstrate a range of imaging appearances at almost every site. Primary extranodal lymphoma refers to disease restricted to a single organ, although it can be multifocal. Here we present an imaging spectrum of extranodal lymphoma manifestations involving the CNS, nasopharynx, mediastinal, retroperitoneal, renal and spine.

*Keywords:* extranodal / lymphoma / malignancy / imaging

## INTRODUCTION

World Health Organization International Classification of Disease (2008) recognizes more than 50 types of lymphoma based on histopathologic, immunohistochemical, cytogenetic, and molecular analyses.[1] Lymphoma is a relatively common malignancy affecting all ages, but it predominantly affects those in later life. Extranodal lymphoma occurs in about 40% of the patients with lymphoma and has been described in virtually every organ and tissue.[2] Diagnostic imaging provides important information for staging and response assessment in patients with lymphoma. When CNS lymphoma is suspected, contrast enhanced MR is the imaging modality of choice. MDCT is the principal imaging technique used for the evaluation of patients with extracranial lymphoma. However, evidence indicates that PET/CT is superior to CT in detecting extranodal disease in the abdomen, especially in the spleen and liver.[3,4]

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Case 1: 41 year old lady with complaints of headache since 2 months. Imaging features were suggestive of CNS lymphoma.
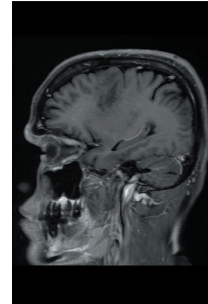


**Figure 1: Sagittal contrast MRI image of brain showing a non-enhancing lesion in the right frontal lobe in a biopsy proven case of primary CNS lymphoma.**

Case 2: 56 year old gentleman who is a known case of Burkitt's lymphoma with complaints of epistaxis, right facial pain and tinnitus. Imaging features were suggestive of a nasopharyngeal lymphoma.



**Figure 2: Axial contrast CT image showing enhancing mass lesion in the nasopharynx at the region of adenoids – Biopsy proven case of nasopharyngeal lymphoma.**

Case 3: 48 year old lady with complaints of left sided chest pain since 1 month. Imaging features were suggestive of mediastinal lymphoma with the lesion in close proximity to the left main pulmonary artery and left branch pulmonary artery.
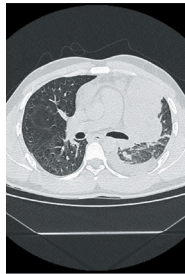


**Figure 3: Axial CECT chest image showing heterogenously enhancing large mass lesion in close relation to the main pulmonary artery and left branch pulmonary artery – Biopsy proven case of mediastinal lymphoma.**

Case 4: 45 year old gentleman with complaints of left flank pain since 2 months. Imaging features were suggestive of left renal lymphoma with hydroureteronephrosis secondary to encasement of the ureter.
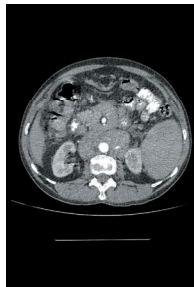


**Figure 4: Coronal T2W MRI image showing multiple subcapsular lesions in the left kidney and multiple lobulated mass lesions in the left perinephric region causing compression of left ureter resulting in proximal hydroureteronephrosis – suggestive of renal lymphoma.**

Case 5: 51 year old lady with complaints of fever, vomiting, lower abdominal pain and loose stools since 1 month was screened for bowel malignancy. Imaging features were suggestive of lymphoma with confluent lymph node involvement of the mesentery and retroperitoneum with vascular encasement.
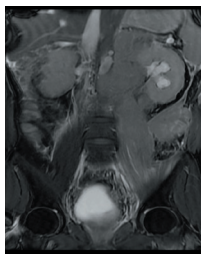


**Figure 5: Axial CECT abdomen image showing homogenously enhancing cconfluent nodal mass involving the mesentery and retroperitoneum showing vascular encasement – Biopsy proven case of retroperitoneal lymphoma.**

Case 6: 38 year old gentleman with 6 months history of mid-dorsal back ache and tingling sensation along the right upper extremity. Imaging features were suggestive of lymphoma of D5 vertebra with an epidural soft tissue enhancing mass causing cord compression.



**Figure 6: Sagittal contrast enhanced MRI image of the dorsal spine showing collapse of D5 vertebra with enhancement of pre/para vertebral and epidural soft tissue with cord indentation –Biopsy proven case of vertebral lymphoma.**

## DISCUSSION

CNS lymphoma consists of 2 major subtypes: secondary CNS involvement by systemic lymphoma (the most common) and PCNSL, in which the lymphoma is restricted to the brain, leptomeninges, spinal cord, or eyes without evidence of it outside the CNS at primary diagnosis.[5,6] Patients with extranodal involvement and those with primary or acquired immunodeficiency disorders carry an increased risk of CNS relapse.[7] Approximately 50% of the patients with CNS metastases from NHL have progressive systemic lymphoma at the time of diagnosis of their CNS manifestation. PCNSL often has a characteristic appearance on both CT and MR imaging. This is due to its hypercellularity, high nuclear/cytoplasmic ratio, disruption of the blood-brain barrier, and its predilection for the periventricular and superficial regions, often in contact with ventricular or meningeal surfaces.[8,9,10,11] CNS lymphomas may have a characteristic appearance on traditional CT and MR imaging; however, none of these imaging characteristics will unequivocally differentiate CNS lymphomas from other neoplasms (eg, metastases from other malignancies, malignant gliomas, meningiomas) or non-neoplastic diseases (eg, multiple sclerosis, stroke, cerebral toxoplasmosis, pyogenic abscess).[12,13,14] Furthermore, the typical imaging characteristics may not be present.DWI, perfusion MR imaging, and MR spectroscopy are increasingly used in clinical radiologic practice and may help to differentiate CNS lymphomas from other lesions of the brain. Because CNS lymphomas are highly cellular tumors, water diffusion is often restricted, making them

appear hyperintense on DWI and hypointense on ADC maps. A visible tumor on imaging is essential to raise a suspicion of CNS lymphoma, which then can lead to an early histologic diagnosis based on cytology of the CSF or brain biopsy.

Nasopharyngeal non-Hodgkin lymphomas are rare and lymphomas arising from the nasopharynx appear to be a particular biological entity. Lymphomas represent the second malignant head and neck tumours region after squamous cell carcinoma.[15] It represents 2.5% of head and neck tumours. Oral and paraoral regions constitute the second most affected localisations by extra nodal lymphomas after that of the gastrointestinal tract.[16] The NHL lymphomas represent the majority of head and neck lymphomas (65-70%). The Waldeyer ring was the site most frequently affected by NHL (ie, the tonsils, nasopharynx and the base of the tongue).

Nodal involvement in the chest is common in both Hodgkin disease and non-Hodgkin lymphoma (NHL). The site of nodal enlargement may be suggestive of the diagnosis with Hodgkin disease involving the anterior mediastinal nodes and NHL involving the subcarinal, paraesophageal, and internal mammary nodes but is by no means specific in distinguishing between the two entities [17] Lung parenchymal involvement is more common as part of disseminated Hodgkin disease than NHL, but primary pulmonary lymphoma (i.e., without evidence of significant nodal disease) is more commonly NHL. The patterns of pulmonary involvement in either disease are many and varied. Extension of hilar nodal masses into lung parenchyma, cavitating lung nodules, persistent consolidation, widespread pulmonary nodularity, and reticular patterns with interlobular septal thickening have been reported.[18]

Renal involvement occurs in 3–8% of patients with lymphoma; the kidney is the most commonly involved part of the genitourinary tract.[19] The patterns of renal involvement, in descending order of frequency, include multiple circumscribed masses direct infiltration from adjacent nodes, a solitary mass, an isolated perinephric mass and diffuse infiltration[19] Renal metastases can mimic renal lymphoma. Renal cell carcinomas can often be differentiated from renal lymphoma by their hypervascular enhancement pattern.

Lymphomatous involvement of retroperitoneal lymph nodes, individually or in groups can be seen. Nodal involvement and extranodal extension may produce loss of definition of individual nodes within a confluent mass. A single central mass may be found along the abdominal great vessels, retroperitoneum, and mesentery. Alternatively, relatively symmetrical bilateral masses may be observed in the prevertebral area.

Lymphoma affecting the bones is rare, particularly primary bony lymphoma in the absence of systemic disease. Bony involvement is seen in approximately 5% of cases of disseminated lymphoma.[20] On T1-weighted images, lymphoma within bone marrow displays low signal intensity (similar to adjacent muscle) but high signal intensity on T2-weighted and STIR image sequences.[21]

## CONCLUSION

Lymphoma comprises a heterogenous group of diseases also known as a "great imitator" and should be considered when mass lesions are seen anywhere in the body. The wide spectrum of imaging appearances of extranodal lymphoma presented here should serve to alert the radiologist to consider its diagnosis in patients with or without a history of lymphoma in the presence of supportive collective imaging findings and suggestive clinical features. Making the diagnosis of lymphoma often requires multiple imaging modalities. As we have discussed, PET is playing a progressive role in the staging and follow-up of lymphoma. With longer survival times from modern treatment, the interpretation of imaging must take into account any prior therapy the patient has received.

**Conflict of Interest :** None

**Source of Funding :** None

**Ethical Clearance:** Institutional Ethical Review Board (IERB), St. John's Medical College, Bangalore -560 034.

**Informed Consent :** Obtained

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# The Effect of a Self-care Training Program based on Orem Model on Anxiety in Patients with Multiple Sclerosis (MS)

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## ABSTRACT

**Background and objective:** Multiple sclerosis (MS), as one of the major causes of disability in the world, is a chronic and progressive disease of the central nervous system which can cause anxiety in patients. Hence, self-care methods are of special importance for MS patients. The present study aimed to determine the effect of a -self-care training program based on Orem model on anxiety in patients with MS.

**Materials and method**: In the present clinical trial, 88 patients with multiple sclerosis who were a member of the MS Association of Zahedan were selected as the convenience sampling method and randomly divided into two intervention and control groups of 44. Collection data tool was DASS21 questionnaire.

**Findings:** The mean score of anxiety in the intervention and control groups was not significantly different before the intervention (P>0.05). In addition, the mean anxiety scores change before and after the intervention was higher in the intervention compared to the control group (P<0.05).

**Conclusion**: According to the study findings, it can be stated that implementation of self-care training programs based on Orem model can reduce anxiety in patients with multiple sclerosis. Considering the limitations of the present study, further studies are recommended to be conducted in this regard.

*Keywords: Self-care; Orem model; Anxiety; Multiple sclerosis.*

## INTRODUCTION

Multiple sclerosis (MS) is a chronic, progressive disease of the central nervous system which is associated with complications and debilitating symptoms [1-5]. In Sistan and Baluchestan Province, the prevalence and incident of MS have been reported to be 13.96 and 2.67 people per every hundred thousand of the population [5], with a higher prevalence in women than men by 2 times [6]. Early onset of this disease, high levels of disability, and the patient's natural life span impose effects and costs on patients, family members, healthcare systems, and society [7-9]. Although the exact cause of the high prevalence of anxiety and depression in MS patients is unknown, a combination of psychological, social, and neurological factors related to the disease has been reported to be involved in this regard [10,11]. These symptoms may be either due to direct effects of inflammation and demyelination of nerves or psychological effects of the chronic illness and unpredictability of MS [13]. Jones *et al*. (2014) concluded that physical disabilities caused by MS are the main reason for the high prevalence of anxiety and depression among these patients [14]. Recent findings of the American Academy of Neurology indicate that stress is one of the most important factors in the exacerbation and relapse of MS symptoms. Additionally, stress itself is considered one of the complications of this disease [15].

Disabilities associated with multiple sclerosis affect the well-being and life satisfaction and create a sense of

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despair in patients. This feeling mutually affects one's ability to perform self-care [16-19]. It is necessary to tell MS patients that they have the ability to change their horizons and enjoy their other abilities. These patients should keep it in mind that MS cannot destroy their vitality. They should accept that some the realities of life are under their authority. Therefore, they should learn how to adapt to the new way of life [10].

Orem's Self-Care Model is an appropriate clinical guide for development and implementation of self-care programs. It is also applied as a conceptual framework to guide self-care programs [21]. This model has been used in various studied on MS patients and its effect on improvement of the quality of physical and mental life and reduction of fatigue [9, 22, 23]. Masoudi *et al.* (2010) and Madani *et al.* (2007) have reported the effect of self-care programs on the self-esteem of MS patients [24-27]. Given the necessity of choosing an appropriate self-care program for MS patients, the present study aims to determine the effect of a self-care training program based on Orem model on anxiety in patients with MS.

## MATERIALS AND METHOD

The present study was a randomized controlled clinical trial. The statistical population included all patients with multiple sclerosis who were a member of the MS Association of Zahedan in 2014-2015. According to the study conducted by Alimohamadi *et al.* [28] ($S_1$= 2.2, $S_2$= 2.91, $\alpha$=3.02, and $\beta$= 0.05), the sample size for each group was determined to be 44. A total of 88 people entered the study based on the convenience sampling method and then assigned to two groups of intervention and control using the table of random numbers. Five subjects in the intervention group did not participate in training sessions and five people in the control group did not complete the follow-up questionnaire. As a result, the final analysis was performed for 78 patients (39 patients in each group).The inclusion criteria were being aged 20-50, literacy of reading and writing, non-dependence on the wheelchair, not being in the acute phase of the disease, and not being afflicted with other acute or chronic physical, mental or psychological disorders such as severe depression and impaired speech or hearing. In addition, the only exclusion criterion was the occurrence of serious physical or mental disorders during the intervention.

The data collection tools included a personal information questionnaire, a needs assessment form, a self-reporting checklist, and the DASS-21. The information related to this checklist was collected and evaluated after 3 months. To measure stress, anxiety, and depression among the participants, the DASS-21 (Depression Anxiety Stress Scales-21) was used. This scale consists of 21 items (7 items for measuring each of the anxiety, stress, and depression symptoms) based on a 4-point Likert scale (from 0= never to 3= much). In other words, the minimum and maximum score on each item are 0 and 3, respectively. Lovibond *et al.* (1995), using the test-retest reliability, reported that the reliability coefficient for stress, anxiety, and depression scales was equal to 0.81, 0.79, and 0.71, respectively [29]. In Iran, Ghaffari (2008) used the test-retest reliability to determine the reliability of a questionnaire. Accordingly, the DASS-21 was filled out by 15 eligible patients with multiple sclerosis in two times within 7 days. The results showed that the reliability coefficient for anxiety scales was equal to 0.71. In addition, the reliability coefficient for the whole tool was 0.91 [10]. In the present study, the reliability of the DASS-21 was confirmed using Cronbach's alpha. The reliability coefficient for anxiety was obtained 0.89.After explaining the purpose of the study to patients visiting the MS Association of Zahedan, they were asked to enter the study after filling out an informed consent form.

Before the intervention, the personal information questionnaire was filled out and the sleep quality score in the intervention and control patients was measured. Then, the needs assessment form was completed for the intervention group, based on which a training program was designed for them. Contently approved by two neurologists, a training program based on Orem model and patients' needs was developed. This training program was conducted for patients in the intervention group in nine 45-minute sessions over two weeks in the MS Association of Zahedan under the supervision of a neurologist. After the intervention finished, patients were followed up for 3 months. In this step, patients executed the training program at home and filled out the self-reporting form every day. The author was present in the MS Association of Zahedan every Sunday from morning to noon to answer the questions and address the problems of patients in person or via telephone. After three months, patients of both groups (intervention and control) were invited to fill out the DASS-21 questionnaire.

All obtained data and information were statistically

analyzed using by SPSS-16.

## FINDINGS

The mean age of patients in the intervention and control groups was 34.1±8.2 and 35.6±8.4, respectively. Information related to demographics of patients has been presented in Table 1. According to findings, no significant difference was found between the intervention and control groups in terms of gender, age, educational attainment, marital status, and duration of affliction with the disease. In the intervention group,

the mean score of anxiety showed a significant decrease after the intervention (P<0.001). The paired t-test also showed a significant reduction in the mean score of anxiety in the intervention group three months after the training program finished (P<0.001). In the control group, a significant decrease was observed in the mean score of anxiety three months after the training program. According to the results of the independent t-test, there is a significant difference between the two groups in the mean changes of anxiety score (P=0.002) (Table 2).

**Table 1: Demographic information of participants**

| Variable | Groups | Intervention | Control | P-value |
|---|---|---|---|---|
| | | Number (percentage) | Number (percentage) | |
| Gender | Male | 8 (20.5) | 13 (33.3) | 0.2* |
| | Woman | 31 (79.5) | 26 (66.7) | |
| Educational attainment | Elementary or middle school | 5 (12.9) | 7 (17.9) | 0.56* |
| | High school | 13 (33.3) | 9 (23.1) | |
| | University | 21 (53.8) | 23 (59.0) | |
| Marital status | Single | 9 (23.1) | 8 (20.5) | 0.78* |
| | Married | 30 (76.9) | 31 (79.5) | |
| Age | 20-30 | 14 (35.9) | 13 (33.3) | 0.89* |
| | 31-40 | 14 (35.9) | 13 (33.3) | |
| | 41-50 | 11 (28.2) | 13 (33.3) | |
| Mean age (year) | | 34.1±8.2 | 35.6±8.4 | 0.43** |
| Duration of affliction with the disease (year) | | 5.72±4.92 | 4.81±3.58 | 0.35** |

* chi-square test

** independent t-test

**Table 2: Comparison of the mean score of anxiety before and after the intervention in both groups**

| Variable Score | Group | Before the intervention | After the intervention | P** |
|---|---|---|---|---|
| | | Mean ± SD | Mean ± SD | |
| Anxiety | Intervention | 6.24 ± 9.51 | 4.65 ± 6.77 | P=0.001 |
| | Control | 5.21 ± 7.28 | 4.93 ± 7.10 | 0.05=P |
| | P* | 0.09 | 0.78 | |

* paired t-test
** independent t-test

**Table 3: Comparison of the mean changes of anxiety score in the intervention and control groups**

| Variable | Group | Intervention | Control | P* |
|---|---|---|---|---|
| Score | | Mean ± SD | Mean ± SD | |
| Anxiety | | 3.70 ± 2.74- | 2.09 ± 0.21- | P=0.001 |
| * independent t-test | | | | |

## DISCUSSION

The present study aimed to determine the effect of a self-care training program based on Orem model on anxiety in patients with MS.The objective of Orem self-care model is to encourage patients to look after themselves, and the role of nurses is to evaluate the needs of self-care and determine the self-care force in patients with chronic diseases [15]. People who are vulnerable or afflicted with self-care failure need nursing interventions in order to control the disease process [16]. Self-care training emphasizes one's ability to look after himself/herself [17]. In addition to several physical problems, MS patients suffer from psychological problems such as anxiety, stress, depression, and despair [18].In the present study, there was no significant difference between the intervention and control groups in terms of the mean score of anxiety before the intervention (P=0.09). However, 3 months after the intervention finished, the mean score of anxiety in the intervention group showed a significant decrease compared to the control (P<0.001).According to the classification of DASS-21, gaining a score of 0-7, 8-9, 10-14, and 15-19 on this scale represents normal anxiety, low anxiety, moderate anxiety, and severe anxiety, respectively [28]. Studies have shown that MS patients experience higher levels of anxiety compared to healthy individuals. A study conducted by Byck *et al*. on 140 Norwegian MS patients showed that 19% of MS patients were complaining of anxiety, as the prevalence of in these patients was significantly higher than the general population [29]. Hence, anxiety should be seriously taken into account as one of the measures of mental health in order to design intervention for reducing the level of anxiety in MS patients. Aghakhani *et al*. (2011) performed a training program on 62 patients with myocardial infarction and followed them up for 2 months. They concluded that the training program caused a significant decrease in anxiety level among the subjects compared to the control [30].

In another study, Bakhtiari *et al*. (2011) executed a self-care model on breast cancer patients undergoing chemotherapy. Their results are consistent with findings of the present study [31].

## CONCLUSION

According to the study findings, it can be stated that the execution of the training program based on Orem model, developed in accordance with problems of MS patients, can have a positive impact on the reduction of anxiety level. Since this training program is a non-invasive and low-cost intervention, it can help nurses in performing their training role. On the other hand, the findings of this study can be a starting point in line with broadening knowledge in this regard. Considering the limitations of the present study such as reluctance of some MS patients to participate in this intervention, it is recommended that further studies be carried out on this subject.

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# Chest Ultrasound in the Diagnosis of Pneumothorax- A Prospective Study

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## ABSTRACT

**Objectives:** Few studies have systematically evaluated the role of chest ultrasound(US) in the diagnosis of pneumothorax in a variety of clinical settings. In the present study, we assessed the role of chest US, in the diagnosis of pnemothorax in haemodynamically stable patients and assessed the average time for the diagnosis of pnemothorax by chest US.

**Methodology:** A total of 136 hemodynamically stable patients who either had clinically suspected pneumothorax or were with chest tube in-situ for evaluation of residual pneumothorax, were included in the study. A sonographic diagnosis of "Pneumothorax" or "No Pneumothorax" was made. The time taken to make the diagnosis was also recorded.

Chest radiograph was then obtained in all patients and non contrast CT thorax was done only in whom the diagnosis of pneumothorax could not be confirmed on chest radiograph.

The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and overall accuracy of chest US were calculated considering chest radiograph (n=73) and computed tomography (n=63) as 'gold standard'. The performance of chest US in the detection of pneumothorax was compared to the "gold standard" using a Kappa agreement test.

**Results:** Ultrasound had a strong agreement with the 'gold standard' (kappa=0.70, p<0.05). The sensitivity of chest US to diagnose pneumothorax in our study was 89% and specificity was 87%. The average time taken for ultrasonographic examination of both lungs and evaluation of all sonographic signs was 5 minutes.

**Conclusion:** Chest ultrasound can be used as a primary imaging modality for the diagnosis of pneumothorax as it has high sensitivity and specificity.

***Key-words**: Chest ultrasound, pneumothorax*

## INTRODUCTION

Pneumothorax is a potentially life-threatening condition. Thus early detection of pneumothorax is critically important.

Several early trials by Litchenstein et al[1-2] established the diagnostic signs of pneumothorax on ultrasound (US) and showed a strong superiority in favour of US over chest radiography (CXR). Despite those and other cumulating original research evidence favouring ultrasonography, US remained underused.

So far several studies have evaluated the role of chest US in specific clinical settings, e.g., posttraumatic pneumothorax[3-6]; pneumothorax in intensive care unit patients[1]; post-intervention pneumothorax[7,8] as well as a few scattered reports or studies regarding the role of US in pneumothorax due to lung diseases[9]; pneumothorax in children[10]; residual pneumothorax after intercostal chest tube drainage[11] and spontaneous pneumothorax.[12]

However, few studies have systematically evaluated the role of chest US in the diagnosis of pneumothorax, combining all above described clinical settings.

In the present study, we assessed the role of chest US, in the diagnosis of pnemothorax in haemodynamically stable patients and assessed the average time for the diagnosis of pnemothorax by chest US.

## METHODOLOGY

We conducted a prospective study during the period January 2015 to January 2016, in which 136 hemodynamically stable patients were included. The included patients either had clinically suspected pneumothorax or were with chest tube in-situ for evaluation of residual pneumothorax. The patients with clinically known subcutaneous emphysema and pleural calcification, if known from previous radiographs, were excluded from the study. Prior approval from the Ethical Committee of the institute was taken and informed consent was taken from every patient included.

Transthoracic chest US was performed using either Logiq 5 Pro or Logiq P3 ultrasound units. A 2–5 MHz convex transducer and a high frequency 7–12 MHz linear array transducer were used. Finally, M–Mode scanning was carried out.

**Normal appearance**: The visceral and parietal portions of the pleura can be seen as two echogenic lines deep to the ribs. At real-time imaging, the visceral and parietal portions of the pleura are seen to slide over each other with respiration, which has been described as the "**lung sliding**" sign[1].

Beyond the pleura-lung interface, the lung is air-filled and does not allow further visualization of normal lung parenchyma. However, the large change in acoustic impedance at the pleura-lung interface results in horizontal artefacts that are seen as a series of echogenic parallel lines equidistant from one another below the pleural line called **"B lines"**. In addition, vertically oriented "**comet-tail**" artefacts can also be normally seen [Figure 1], originating at the pleura-lung interface moving synchronously with lung sliding and respiratory movements.

The use of M-mode, which detects motion over time, provides more evidence that the pleural line is sliding. It is beneficial in patients where sliding may be subtle, such as, in the elderly or in patients with poor pulmonary reserve, who are not taking large breaths. The M-mode cursor is placed over the pleural line and two different patterns are displayed on the screen: The motionless portion of the chest above the pleural line creates horizontal 'waves,' and the sliding below the pleural line creates a granular pattern, the 'sand' [Figure 2]. The resultant picture is one that resembles waves crashing in onto the sand and is therefore called the 'seashore sign' and is present in normal lung.[3,13,14]

**Pneumothorax:** The key sonographic signs used to diagnose pneumothorax include: absent lung sliding, loss of comet-tail artefacts, exaggerated horizontal reverberation artefacts (A lines) [Figure 3] and the Stratosphere sign (parallel horizontal lines above and below the pleural line).

In this way, a sonographic diagnosis of "Pneumothorax" or "No Pneumothorax" was made. The time taken to make the diagnosis was also recorded in each patient. In the entire study group of 136 patients, Chest radiograph was obtained in supine or erect position within 30 minutes of performing chest US. The chest radiograph was not seen by the radiologists performing the chest US. In 73 of the 136 patients in whom the diagnosis of pneumothorax made on chest US was confirmed on the chest radiograph, computed tomography (CT) of the chest was not performed to avoid exposure to radiation. In the remaining 63 cases out of 136, a non-contrast CT of the chest was done within 3 hours of conduction of chest US, using GE single slice CT scanner. Axial scans with a slice thickness of 3 mm or less were acquired at appropriate KVp and mAs. Scanning was done from the thoracic inlet to the domes of diaphragm and images were viewed in both lung and mediastinal windows. The maximum thickness of pneumothorax was recorded.

## ANALYSIS AND RESULTS

The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and overall accuracy of chest US were calculated considering chest radiograph (n=73) and computed tomography (n=63) as 'gold standard'. The performance of chest US in the detection of pneumothorax was compared to the "gold standard" using a Kappa agreement test (A Kappa value greater than 0.60 indicates good agreement with the gold standard).

The age range was 5 months to 72 years; 136 cases studied included 102 males. Chest pain (n=129; 95%) and dyspnoea (n=92; 68%) were the most common complaints. The duration of complaints ranged from 1 hour to 1 month. Chest radiograph was done in the

erect position in 100 cases and in the supine position in 36 cases. According to our "gold standard" (i.e., chest radiograph in 73 cases and CT of the thorax in 63 cases), pneumothorax was present in 107/136 (79.4%) cases; 66 had pneumothorax on the right side, 40 had pneumothorax on the left side and 1 had bilateral pneumothorax.

The causes of pneumothorax were: trauma (40%), post–intercostal drain (ICD) residual pneumothorax (32%), chronic obstructive airways disease (13%), spontaneous pneumothorax (7%), tuberculosis (6%) and post–intervention e.g., lung fine needle aspiration cytology (FNAC) or aspiration of pleural fluid (2%) (*see* Table).

Pneumothorax was diagnosed by chest US in 95/ 107 confirmed cases of pneumothorax (true-positive). Chest US was able to diagnose all the 37 cases in whom therapeutic intervention was needed for the management of pneumothorax.

There were 29 true-negative, 4 false-positive and 12 false-negative cases on chest US. A false positive diagnosis of pneumothorax was made on chest US in 3 cases with bullous emphysema and in 1 case with pleural thickening. All 12 false-negative cases diagnosed on chest US had a pneumothorax of width <1 cm on axial CT section. Kappa agreement test indicated that US had a strong agreement with the 'gold standard' (kappa=0.70, p<0.05). Thus, the sensitivity of chest US to diagnose pneumothorax in our study was 89% and specificity was 87%.

Twenty two of the 32 (68.8%) cases of pneumothorax missed on the chest radiograph but diagnosed on chest CT, were correctly diagnosed on US. Pneumothorax >1.0 cm in thickness on CT scan, was diagnosed on sonography in all cases.

"Lung sliding", i.e., to-and-fro movement of pleural line with respiration, was the most useful sign in the detection or exclusion of pneumothorax. It was absent in all cases diagnosed to have pneumothorax.

The average time taken for ultrasonographic examination of both lungs and evaluation of all sonographic signs was 5 minutes, in the present study. The time taken for diagnosing the presence or absence of pneumothorax by sonography (usually possible by one or more sonographic signs) ranged from less than 1 minute to 15 minutes.

**Table : Clinical spectrum of pneumothoraces in our study**

| | Number (%) |
|---|---|
| Trauma | 42(40) |
| Post–intercostal drain (ICD) residual pneumothorax | 34 (32) |
| Chronic obstructive airways disease | 14 (13) |
| Spontaneous pneumothorax | 7 (7) |
| Tuberculosis | 6 (6) |
| Post–intervention e.g., lung FNAC or aspiration of pleural fluid | 2 (2) |
| **Total** | **107** |

## DISCUSSION

Thoracic sonography for the detection of pneumothorax has become a well-established modality in the acute care setting. The ease of use and portability of newer machines, combined with the improved training has allowed thoracic ultrasound to become a useful bedside tool in patients with respiratory complaints. Although CT scan remains the gold standard and may still catch smaller occult pneumothoraces that ultrasound misses, its disadvantages are becoming more apparent. Bedside ultrasound obviates the need for patient transport in unstable situations, it eliminates radiation exposure, it is quicker to perform and is immediately interpreted at the bedside without unnecessary delays. In addition, it is more cost-effective and can be repeated multiple times.

In our study the sensitivity of chest US to diagnose pneumothorax was 88.8% and its specificity was 87.8%. This is comparable to those observed in other studies such as that done by Zhang et al and Balesa et al.[3,15] However, the sensitivity of chest US in our study was less than 100 as reported in some other studies.[4] Most of the earlier studies had included only adult patients who had undergone transthoracic sonography-guided lung biopsy[8]; only adult patients who had undergone transbronchial biopsy or ultrasound-guided chest tube placement,[7] and adult blunt thoracic trauma victims.[4] On the other hand, our study included a wide spectrum of cases including those with trauma; history of intervention; various lung diseases (e.g., tuberculosis, chronic obstructive airway disease, bullous lung disease, etc); patients with intercostal chest tube *in-situ*; cases with primary spontaneous pneumothorax and even children. This vast spectrum studied may be a contributory factor, for the sensitivity of US in our study being less than 100%

Chest US yielded false-positive results in 4 of our patients: due to bullous emphysema in 3 and pleural thickening in 1. It was evident other studies done in the past also cited conditions like pleural adhesions, bullous emphysema, acute respiratory distress syndrome and main-stem intubation on the contralateral side, as causes of false positives.[3-6]

Since sonography detected 22/32 patients with pneumothorax that was not evident on the chest radiograph, and was also able to identify all cases having a pneumothorax of >1.0 cm thickness on CT, it has the potential to replace serial chest radiographs in monitoring of the patients with pneumothorax; and thereby, avoid exposure to ionising radiation.

In our study, as in another study,[2] chest radiography was used as the "gold standard", when it showed obvious pneumothorax, and CT whenever it proved necessary. A single gold standard (traditionally considered to be CT) was not used, to avoid unnecessary irradiation of young patients.

Chest ultrasonography was used for the first time in the evaluation of pneumothorax at our institution; and prior to this study we did not have any practical experience with ultrasonographic signs for the diagnosis of pneumothorax. Zhang et al[3] mentioned that they had received formal training of 28 hours on emergency bedside ultrasound before conducting their study. The average time taken by sonography for diagnosing presence or absence of pneumothorax in our study was 5 minutes. This was comparable to the average time taken of 2.3±2.9 min.

Though we did not calculate the sensitivity and specificity of each Chest US sign in our study, use of a combination of absent lung sliding and the loss of comet-tail artefact has a reported sensitivity of 100%, specificity of 96.5% in the study done by Wu et al[16]. Although US is useful in the diagnosis of pneumothorax, the technique is unable to quantify the size of the pneumothorax. US may also be of limited use in patients with subcutaneous emphysema or pleural calcifications (which we excluded from our study), because acoustic artefacts due to these conditions may limit visualization of the pleural interface. Absent lung sliding should not be used as the sole criterion in the diagnosis of pneumothorax. Lung sliding may be absent in patients with previous pleurodesis, abestos-related diffuse pleural thickening, or adult respiratory distress syndrome in the absence of a pneumothorax [2]
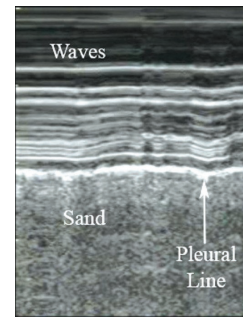


Figure 1.' B lines' and 'comet tail artifacts' in a normal patient
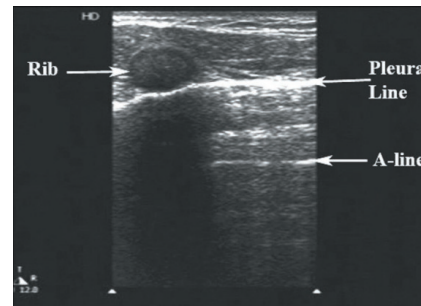


Figure 2. M-mode illustrating the 'Seashore sign' (normal)
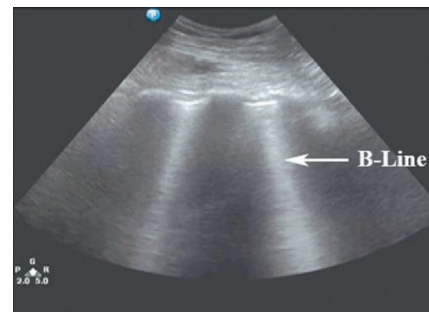


Figure 3. 'A lines' , a type of reverberation artifact in pneumothorax

## CONCLUSION

Chest ultrasound is a readily available bedside procedure and avoids patient exposure to ionizing radiation. It can be used as a primary imaging modality for the diagnosis of pneumothorax in a vast array of clinical settings, as it has high sensitivity and specificity.

It can make a rapid and confident diagnosis of presence of absence of all significant pneumothoraces requiring intervention in average 5 minutes time, so it should be combined with Focussed Assessment with Sonography for Trauma(FAST).

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# The Effect of a Self-Care Instructional Program based on Orem's Model on the Stress of Multiple Sclerosis Patients

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## ABSTRACT

**Background and Purpose:** Multiple sclerosis (MS) is a chronic and progressive disease of the central nervous system. As a major cause of disability in the world, it can cause stress in patients. Therefore, it is important to use self-care methods for MS patients. The present study examines the effect of a self-care instructional program based on Orem's model on the stress of MS patients.

**Materials and Method:** In the present clinical trial study, 88 MS patients who were members of the MS Society of Zahedan city in Iran during 2014-15 were selected as a convenience sample and randomly assigned to an intervention group and a control group of 44 members each. A nine-session instructional program suiting the patients' needs was designed and implemented based on Orem's model. The patients' adherence to the program was assessed using a self-report checklist.

**Findings:** Before the intervention, the intervention group had a significantly higher mean stress score than the control group (p = 0.04). After the intervention, the intervention group had a significantly greater mean change in stress scores than the control group (p < 0.05).

**Conclusion:** The findings show that the implementation of Orem's self-care instructional program can reduce the stress of MS patients. Given the limitations of the present study, further research in this field is recommended.

***Keywords:*** *Self-care, Orem's model, stress, multiple sclerosis.*

## INTRODUCTION

Multiple sclerosis (MS) is a chronic and progressive disease of the central nervous system with disabling complications and symptoms.[1] There are 2.5 million people worldwide suffering from this disease[2-4]. In the Sistan-and-Baluchestan province, the reported prevalence and incidence of MS are 13.96 and 2.67 per 100,000 respectively.[5-7]

People suffering from chronic diseases suffer not

only from their physical disabilities but also from psychological complications resulting from their limiting circumstances.[8-11] What exactly causes the high prevalence of anxiety and depression among these patients is unknown, but a combination of psychological, sociological, neurological, and disease-related factors are thought to play a role.[11,12] Jones et al. (2014) concluded in a study that the main cause of anxiety and depression in MS patients is the disabilities resulting from this disease.[13,14] The results of recent studies conducted by the American Academy of Neurology indicate that stress is a major contributing factor to the aggravation and recurrence of MS symptoms. Stress is also a complication of this disease.[15] One of the most stressful aspects of this disease is its uncertain prognosis. In fact, it is not known how the patient will

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feel even in the following week. As soon as the patient begins to adapt to the debility caused by the previous attacks of the disease, there comes another attack, bringing more limitations and subjecting the patient to a new round of adaptation and life changes.[16-18].The disabilities accompanying MS affect the patient's feeling of well-being and life satisfaction, causing the patient to feel hopeless. Reciprocally, this feeling affects the patient's self-care capability.[19,20] Self-care instruction emphasizes the person's ability to perform self-care.[6] Lack of awareness and self-care deficit are among the factors leading to the repeated hospitalization of MS patients.Orem's self-care model is a good clinical guideline for designing and implementing a self-care program; it can provide a conceptual framework for such programs.[21] This model has been used in many studies on MS patients, and its effectiveness in improving the quality of physical and mental life and reducing fatigue has been confirmed.[9, 22, 23] Masoudi et al. (2010) and Madani et al. (2007) demonstrated the effectiveness of self-care programs in increasing self-esteem in MS patients.[24, 25]. Given the necessity of selecting a good self-care program for MS patients, the present study was conducted in 2014-15 to examine the effect of a self-care program based on Orem's model on the stress of MS patients.

## MATERIALS AND METHOD

The present study was conducted as a randomized controlled clinical trial. The population of the study consisted of all the MS patients who were members of the MS Society of Zahedan city in Iran in 2014-15. In accordance with the study by Alimohamadi et al.[28] ($S_1 = 2.2$, $S_2 = 2.91$, $\alpha = 3.02$, $\beta = 0.05$), the sample size was determined to be 44 members for each group.A total of 88 patients entered the study as a convenience sample and were assigned to the intervention and control groups using a random number table. Five members of the intervention group did not attend the instructional sessions, and five members of the control group did not come to complete the follow-up questionnaire. Therefore, the final analysis was done for 78 patients (39 in each group).

The inclusion criteria for the study were an age of between 20 and 50 years and literacy. Exclusion criteria were wheelchair dependence, being in the acute phase of the disease, and suffering from any other acute or chronic physical, mental, or psychological problems such as severe depression, speech or hearing problems. The dropout criterion was the occurrence of serious physical or psychological disorders during the intervention. The instruments used for data collection were the personal details questionnaire, the needs assessment form, the self-report checklist, and the DASS-21 questionnaire.

The personal details questionnaire contained questions about age, gender, education level, marital status, and duration of illness; it was completed by both groups prior to the intervention.

The patients were asked to specify, on a four-point Likert scale (always, often, rarely, never), what problems they currently suffered from and how often. This form was completed prior to the intervention to obtain the instructional needs of the intervention group. The self-report checklists had been developed to track patient adherence to the program on a daily basis over a period of three months, and the patients were asked to complete it after each day of following the instructed program. Its data was collected and assessed after the three month period.The respondents answer the questions in the questionnaire on a four-point Likert scale (from 0 = "not at all" to 3 = "very much"). In other words, the lowest score for each question is 0 and the highest score is 3. Lovibond et al. (1995) reported a reliability coefficient of 0.81 for the stress scale of this questionnaire by using a test-retest method.[29] In Iran, Ghaffari (2008) used the test-retest method in a study to determine the reliability of this questionnaire. In the study, this questionnaire was completed by 15 eligible MS patients on two occasions, seven days apart, and a reliability coefficient of 0.91 was reported for the stress scale. Moreover, the overall reliability coefficient for the whole instrument was reported to be 0.91.[10] The goals of the study were explained to the patients visiting the MS Society of Zahedan, and they were asked to participate in the study if they want. They completed the informed consent form and then were assigned to the intervention and control groups.

The content of the program had been approved by two neurologists. This instructional program was administered to the intervention group in nine 45-minute sessions over a period of two weeks at the building of the MS Society and under the supervision of a neurologist. The data was analyzed in SPSS 16 using the following tests: independent t-test (to compare the two groups in terms of age, mean stress score, and mean

change in stress score), chi-square (to compare the two groups in terms of the frequency distribution of some demographic variables), and paired t-test (to compare the pre-intervention and post-intervention mean stress scores within each group).

## FINDINGS

The mean age of the participants was 34.1 ± 8.2 in the intervention group and 35.6 ± 8.4 in the control group. Table 1 shows the participants' demographic details. According to the findings, before the intervention, no statistically significant difference was observed between the intervention group and the control group in terms of gender, age, education level, marital status, and duration of illness.

In the intervention group, the mean stress score decreased significantly after the intervention ($p < 0.001$).

According to the paired t-test, there was a significant reduction in the mean stress score of the intervention group three months after the completion of the instructional intervention. In the control group, too, a significant reduction in mean stress score was observed three months after the completion of the instructional intervention. (Table 2)

According to the independent t-test, there was a statistically significant difference between the intervention group and the control group in terms of mean change in stress score ($p = 0.002$). (Table 3)

### Table 1: Participants' demographic details

| variable | group | intervention Number (percent) | control Number (percent) | p |
|---|---|---|---|---|
| gender | male | 8 (20.5) | 13 (33.3) | 0.2 * |
| | female | 31 (79.5) | 26 (66.7) | |
| education level | elementary school or junior high school | 5 (12.9) | 7 (17.9) | 0.56 * |
| | senior high school | 13 (33.3) | 9 (23.1) | |
| | university | 21 (53.8) | 23 (59.0) | |
| marital status | single | 9 (23.1) | 8 (20.5) | 0.78 * |
| | married | 30 (76.9) | 31 (79.5) | |
| age | 20-30 | 14 (35.9) | 13 (33.3) | 0.89 * |
| | 31-40 | 14 (35.9) | 13 (33.3) | |
| | 41-50 | 11 (28.2) | 13 (33.3) | |
| mean age (year) | | 34.1 ± 8.2 | 35.6 ± 8.4 | 0.43 ** |
| duration of illness (year) | | 4.92 ± 5.72 | 3.58 ± 4.81 | 0.35 ** |

\* chi-square test

\*\* independent t-test

### Table 2: Comparison of mean stress score within each group and between the two groups

| variable | group | before intervention mean ± standard deviation | after intervention Mean ± standard deviation | p * |
|---|---|---|---|---|
| stress scale score | intervention | 14.82 ± 6.56 | 10.84 ± 5.16 | p < 0.001 |
| | control | 12.03 ± 5.43 | 11.12 ± 5.40 | p = 0.008 |
| p ** | | 0.04 | 0.81 | |

\* paired t-test

\*\* independent t-test

**Table 3: Comparison between the intervention and control groups in terms of mean change in stress score**

| variable | group | | p * |
| --- | --- | --- | --- |
| | intervention | control | |
| | mean ± standard deviation | mean ± standard deviation | |
| change in stress scale score | – 3.97 ± 3.28 | – 0.90 ± 2.01 | p < 0.001 |

* Independent t-test

## DISCUSSION

People prone to or suffering from self-care deficit need nursing interventions to control the process of their disease.[16] Self-care instruction emphasizes the person's ability to perform self-care.[17] MS patients have many physical problems and, consequently, they begin to suffer from psychological problems such as anxiety, stress, depression, and hopelessness; in fact, their psychological condition is affected by their physical condition.[18,23]. The effect of stress was moderated in the analysis. Three months after the completion of the instructional program, mean stress score in both groups decreased significantly (p < 0.05).

According to the severity labels of DASS-21, a score of 0-14 is in the normal range, 15-18 indicates mild stress, 19-25 indicates moderate stress, and 26-33 indicates severe stress.[30] Moreover, with the implementation of the model, mean stress score in both groups decreased significantly. However, mean change was greater in the intervention group than in the control group. This finding indicates the effectiveness of the instruction for the patients in the intervention group.In a similar study, Rostami et al. (2015) investigated the effect of Orem's self-care model on the stress of patients on hemodialysis. The results showed a significant reduction in the stress score of the intervention group.[31]

In another study, Dehghani et al. (2011) examined the effect of a peer-group instructional program on the stress of MS patients. In this study, too, the stress score of the experimental group significantly decreased after the intervention.[32] Ghaffari et al. (2008) demonstrated that 63 sessions of progressive muscle relaxation techniques reduced three common and disturbing MS symptoms, namely depression, anxiety, and stress, in MS patients. In this study, before the intervention, there was no significant difference between the two groups in terms of mean depression, anxiety, and stress scores. Moreover, no significant difference was found between the two groups in terms of mean depression and anxiety scores on three occasions of measurement. However, this difference between the two groups was significant in terms of stress score on three occasions of measurement (p < 0.008).[9]

## CONCLUSION

Since Orem's self-care program is a non-invasive and inexpensive intervention, it can be used in line with the instructional role of nurses. Moreover, the results of the present study can be a starting point to increase knowledge about this topic. Given the limitations of the present study, including the unwillingness of MS patients to participate in the study because of the nature of their disease, further research in this field is recommended.

**Conflict of Interest:** None declared

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# A Study of Patterns of Breast Lesions on Fine Needle Aspiration Cytology in Hapur Region, Uttar Pradesh

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## ABSTRACT

**Objective-** To detect the frequency distribution of various breast lesions on fine needle aspiration cytology (FNAC) and incidence of duct carcinoma in different age groups.

**Material and Method-** 200 cases who presented with breast lesions for fine aspiration cytology with Papanicolaou stain, age group 15-60 years and both sexes were included in the study conducted over a period of June 2014 – May 2016.

**Results-** FNAC was done on 200 cases of breast lesions, of which 150 (75.0%) were benign, 27 (13.5%) malignant, 11 (5.5%) benign breast disease with atypia, 4 (2%) suspicious, and 8(4.0%) unsatisfactory. Fibroadenoma was the most common benign lesion and ductal carcinoma was the common malignant lesion. There was significant association between benign breast lesions and age. Majorities were pre-menopausal females and commonest age group was 31-40 years.

**Conclusion-** With experienced hands, fine needle aspiration cytology (FNAC) is a safe, cost effective and reliable technique for preoperative evaluation of palpable breast lumps. FNA features are more informative when combined with clinical and radiological findings. Fibro adenoma forms the majority of benign breast lesions, followed by duct carcinoma with increased incidence in the third decade. So, clinical breast examination and mammography screening in female subjects should be encouraged in developing countries from the third decade onward for early detection of breast carcinoma.

***Keywords-*** *Breast Lesions, Fine Needle Aspiration Cytology (FNAC), Fibro adenoma, Duct Carcinoma.*

## INTRODUCTION

Breast carcinoma is the most common malignant neoplasm and the leading cause of death from cancer in women, with more than 1 million cases occuring worldwide annually.[1] To differentiate benign from malignant lesions is one of the major goals of FNAC. In the evaluation of breast masses, the time honored triple assessment combines clinical, radiological and

pathological information. FNAC together with core needle biopsy, is the initial pathological investigative methods of choice.[2] Accuracy in FNAC can be increased by multiple sampling of appropriate sites by ultrasonography guidance and mammographic localization.[3] Much confidence has been placed on this approach for it can obviate standard excisional biopsy when all three components of the triple test are conclusively negative or positive. Nevertheless, in FNAC of breast lesions, there are instances where the differentiation of benign and malignant is not possible.[4] FNAC is known to have high specificity [99%] and more than 80% sensitivity in the diagnosis of breast lump. This problem arises when paucity of specimen sampling is encountered or there is a morphological overlap between benign and malignant lesions (e.g., atypical hyperplasia

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and low-grade carcinoma in situ, or in papillary lesions). To accommodate these problematic areas, cytological reporting categories are used to objectively describe their features in cytological terms and to incorporate the groups with uncertainties.

The most commonly used categorization is a five-tier system, with categories ranging from insufficient materials (C1), benign (C2), atypical (C3), suspicious of malignancy (C4), or frankly malignant (C5)[5]. FNAC can also be also used to diagnose lesions of male breasts such as gynaecomastia and carcinoma, accessory axillary breasts and their lesions, and status of the axillary lymph nodes, thereby reducing the number of open breast biopsies.[6]

Under this categorization, C1 is inadequate aspirate smear due to hypocellularity, aspiration, smearing or staining errors. Most often, it is the degree of cellularity of the epithelial cells that is inadequate. The exact definition of what constitutes an inadequate aspirate remains an enigma, and this subjective issue is best determined by the interpreter of the aspirate, whether or not a confident diagnosis could be made basing on the quantity of the materials aspirated. C2 category is for smears that are usually cellular, showing the characteristic patterns of different benign lesions. No atypical or malignant features are present. Usually duct configurations, myoepithelial cells, and bipolar nuclei are visible. Inflammatory background is commonly encountered. In contrast, C3 and C4 are the grey zones. C3 presents the characteristics of a benign smear and yet there are features that are not usually seen in clearly benign specimens such as cellular crowding, pleomorphism, and discohesive. C4 is reserved for aspirate where atypical features are obvious but factors such as poor preservation, hypocellularity, or components of a benign smear are present, thus precluding a firm malignant diagnosis to be made. This ambiguity shows the importance of correlation with other disciplines. It also emphasizes not to stretch the result of FNAC beyond the capabilities and experience of the interpreter to reduce both positive and negative errors. C5 category consists of cellular aspirate with evidently malignant cytological features. As much has been discussed on the atypical, suspicious, and malignant categories, this paper will be limited to the adequate (or inadequate) and benign categories together with the false negative and false positive cases.[7]

| C1 | Inadequate |
| C2 | Benign |
| C3 | Atypia probably benign |
| C4 | Suspicious of malignancy |
| C5 | Malignant |

About 10% women visiting health organization clinics present with breast lumps as the chief complaint. 80-85% of breast lumps are benign and rest are malignant.[8,9,10] It is now the most common cancer both in developed and developing regions. Early detection is the mainstay in management of breast carcinoma.[11] Most common symptoms associated with breast lesions reported by women are pain, palpable mass, lump or nipple discharge.[12] Discrete palpable lump is a problem often presented to surgeons, gynecologists and general practitioners.[6] A breast mass is generally palpable when it exceeds 2 cm in size. The likelihood of a palpable mass is being malignant increases with age. Only 10% of breast masses under the age of 40 are malignant compared to 60% of masses over the age of 50 years.

## MATERIAL AND METHOD

A retrospective hospital based study was conducted at the pathology department of a tertiary care hospital situated at Hapur, India. Data was collected from the records of FNAC of breast lesions done in last two years duration from June 2014 to May 2016. All the fine needle aspiration (FNA) was carried out with a 22 or 23 gauge needle attached to a 20 cc disposable syringe fitted in a syringe holding FNA gun which provided a better grip and a negative pressure to aspirate adequate sample. The sample was obtained by to and fro motion. Samples were smeared onto glass slides and fixed in 95% methanol along with one or two air dried smear for May Grunwald Giemsa (MGG) stain. In cystic lesions, after aspiration of fluids, the lesion was again aspirated. The fluid was centrifuged and smears are made from sediment. Wet-fixed smears were stained with, and Papanicolaou stain; while air dried smears were stained with May Grunwald Giemsa stain (MGG). FNAC results were studied in detail for findings of benign breast lesions, suspicious and malignant lesions.

## STATISTICAL ANALYSIS

Data was entered in SPSS software and analysis was done. Chi-square test was applied to find statistical significance of findings.

## RESULTS

FNAC was done on 200 cases of breast lesions, of which 150 (75.0%) were benign, 27 (13.5%) malignant, 11 (5.5%) benign breast disease with atypia, 4 (2%) suspicious, and 8(4.0%) unsatisfactory. Fibro adenoma was the most common benign lesion and ductal carcinoma was the common malignant lesion. There was significant association between benign breast lesions and age. Majorities were pre-menopausal females and commonest age group was 31-40 years. (Table- 1)

Out of 150 cases of benign breast lesions, Fibro adenoma 114(76.00%) was the most common diagnosis followed by fibroadenosis 14 (9.33%), fibrocystic change 4 (4.00%), inflammatory 5 (3.33%), granulomatous disease 4 (2.66%), fat necrosis 2 (1.33%), phyllodes 2 (1.33%); and lipoma, epidermal inclusion cyst, necrotizing lesion constituted 5(3.33%).

Of the 27 cases of malignant lesions, ductal carcinoma 19 (70.37%) was the commonest followed by mucinous (colloid) carcinoma 3 (11.11%), and 5 (18.51%) consisted of lobular carcinoma, papillary carcinoma, and secondaries. Benign breast lesions were more common in the age group of 31-40 years followed by 21 – 30 years while malignant breast lesions were common in the age group of >50 years (table 1). Benign breast lesions was a significantly associated with age, whereas, correlation could not be established between age and malignancy.

In our study right sided lesions (100 cases) were slightly more than left sided lesions (86 cases) and bilaterally sided lesions (14 cases) in a ratio of 7.1: 6.1: 1. All cases were grouped into categories viz., benign, benign disease with atypia, suspicious of malignancy, malignant and unsatisfactory as per FNAC diagnosis and Table 1 show their age wise distribution. Furthermore, 84% of cases were of premenopausal age group (<45 years) table: 2.

**Table: 1 Association between age and FNAC categories of Breast lesions**

| Age | FNAC Categories | | | | | | | | | | Total |
| | Benign | | Malignant | | Benign Breast Disease With Atypia | | Suspicious | | Unsatisfactory | | |
| | No. | % | No. | % | No. | % | No. | % | No. | % | |
| **11-20 yrs** | 43 | 89.5 | 0 | 0.0 | 3 | 6.2 | 0 | 0.0 | 2 | 4.1 | 48 |
| **21-30 yrs** | 44 | 81.4 | 2 | 3.7 | 4 | 7.4 | 1 | 1.8 | 3 | 5.5 | 54 |
| **31-40 yrs** | 48 | 77.4 | 8 | 12.9 | 3 | 4.8 | 2 | 3.2 | 1 | 1.6 | 62 |
| **41-50 yrs** | 8 | 44.4 | 7 | 38.8 | 1 | 5.5 | 0 | 0.0 | 2 | 11.1 | 18 |
| **>50 yrs** | 7 | 38.8 | 10 | 55.5 | 9 | 4.4 | 1 | 5.5 | 0 | 0.0 | 18 |
| **Total** | 150 | 75.0 | 27 | 13.5 | 11 | 5.5 | 4 | 2.0 | 8 | 4.4 | 200 |

**Table: 2 Association between pre & postmenopausal and FNAC categories of Breast lesions**

| Age | No. of Cases | Percentage | Benign | Suspicious | Malignant |
| --- | --- | --- | --- | --- | --- |
| **Premenopausal age group <45 yrs** | 168 | 84% | 146 | 0 | 22 |
| **Postmenopausal age group >45 yrs** | 32 | 16% | 7 | 1 | 24 |
| **Total** | 200 | 100% | 150 | 4 | 46 |

**Table: 3 Statistical Analyses**

| Chi-square tests | Value | df | Asymp sg. |
|---|---|---|---|
| Pearson Chi- square | 60.277 | 2 | P<0.0001 |

## DISCUSSION

FNAC is an invaluable tool for preoperative diagnosis and also postoperative follow up of breast lump. Pathologists being trained in and aware of both microscopic and macroscopic features are in ideal position to perform FNAC on palpable lesions and to give accurate diagnosis. In the current study, among 200 patients presented with breast lump, age range was found to be 11 – 72 years. We have evaluated the pattern of breast lesions as diagnosed through FNAC and observed that benign lesions constituted 75.0% of cases, and 13.5% were malignant. In current data, among 168 cases in the reproductive age group, only 13.09% (22/168) were diagnosed as malignant while among the postmenopausal group, 78.12% cases (25/32) were malignant. This correlates well with other studies done by Harirchi I, Braithwaite A, Medina Franco H, and Place R, where more number of breast carcinoma were found in postmenopausal age group.[13, 14, 15]

On FNAC of breast, the main features of benign aspirate include cohesive clusters of ductal epithelial cells, presence of myoepithelial cells and minimal anisonucleosis. On the other hand atypia is suggested when the epithelial clusters are more discohesive, there are less number of myoepthelial cells and cells show presence of anisonucleosis with occasional prominent nucleoli.

Fibro adenoma was the most common diagnosis in benign lesions. Among the malignant lesions, ductal carcinoma was the commonest diagnosis. Similar observations were made by other researchers.[16, 17, 18] Fibroadenosis was the second common diagnosis among the lesions followed by fibrocystic changes. However, few studies have reported fibrocystic disease as the common diagnosis followed by fibroadenoma.[19, 20] we have observed that malignant lesions formed 14% of the total FNAC case investigations. Similar incidence of carcinoma was found in different authors.[16,18] But a study done by Mohammed Bdour et al., had reported much higher incidence of 10 carcinomas (41%).

High diagnostic accuracy of FNAC in differentiating different breast lesions were also being highlighted in the studies.[16, 18, 21] We have searched the relationship between age and type of breast lesions and found that benign breast lesions were more common in the age group of 31-40 years followed by 21 – 30 years, while malignant breast lesions were more common in the age group of >50 years.

In all cases diagnosed as fibro adenoma, smears were cellular and showed characteristic mono-layered clusters of cells with minimal atypia, bare nuclei and fragments of fibromyxoid stroma. However, it is possible that, some of the cases reported as "proliferative breast disease without atypia" were actually fibro adenoma with low cellular yield lacking the characteristic cytological picture of fibro adenoma.

All inflammatory cases were of acute inflammatory etiology with necrotic and proteinaceous background. In 2 inflammatory cases, associated lactational changes were also noted. Benign lesions including fibro adenoma, fibrocystic diseases and inflammatory conditions comprised more than 90% of cases in studies done by Dutta S K, and Otu AA.[22,23]

We had 15 cases which were initially reported as "suspicious" or "with atypia" on FNAC. On FNAC they showed discohesive cell clusters with occasional nuclear atypia (Figure 1). Ductal carcinoma is the commonest type of breast carcinoma seen worldwide. In our study, as well, 19/27 (70.37%) of malignant cases are of ductal subtype which corroborates with other data.[24,25,13] All these cases on FNAC showed malignant cells with obvious nuclear atypia (Figure 3 & Figure 4) We also had of 1 of lobular and 3 mucinous carcinoma cases which are cytologically different from ductal carcinoma. Benign lesions were much more common comprising 78% cases in contrast to 22% cases diagnosed as malignancy or suspicious of malignancy. Similarly, as in our study, Dennsion G et al also found that out of 143 cases, 73.4% were benign compared to 26.6% malignant cases.[26]

## CONCLUSION

The benign breast lesions were far more common than the malignant breast lesions. 'Triple test' Which analyses clinical and radiological findings in conjunction with pathologic features is most useful method to accurately diagnose the lesion. FNAC is a reliable tool

for conclusive diagnosis of a breast lesion. FNAC is well recognized for its high accuracy and efficacy rate in investigation of breast lump. False results especially false positive results are very rare which can be further minimized with proper clinical correlation.

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# Pilomatricoma Called "Tumor Perplex"- Perplexity Continues with this Large Pilomatricoma – Still a Diagnostic Pitfall

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## ABSTRACT

Pilomatricoma/calcifying epithelioma of Malherbe/Tumor perplex represents a rare benign skin tumor. Accuracy of pre operative diagnosis ranges from 0-30% [9] and these cases are frequently misdiagnosed on fine needle aspiration cytology (FNAC). In this paper we present a case of unusually large pilomatricoma at a rare site in an adult male which was misdiagnosed as round cell neoplasm on cytology smears. Even though it has a unique morphological appearance in tissue sections it is often misdiagnosed on cytology smears.

This report is to emphasize the major pitfalls,differential diagnosis and cytomorphological and histopathological features of pilomatricoma and to highlight the importance of keeping this clinical diagnosis in mind for nodular lesions of the head and neck (>50 %), upper extremity, trunk and lower extremity in decreasing order of frequency and shows female predominance.[10]

Most studies have reported cases of lesions measuring 0.5 to 3 cm diameter.[8,10,11] This case presented with unusually large size of 5x4x1.5 cm which has not been reported to the best of my knowledge.

*Keywords* – *Pilomatricoma, appendage tumor, cytology, histopathology,basaloid cells,ghost cells.*

## INTRODUCTION

Pilomatricoma is a benign appendage tumor with differentiation towards the matrix and inner sheath of normal hair follicle and cortex.[15] It was described by Malherbe as benign calcifying epithelioma. Subsequently numerous ultrastructural and electron microscopic studies were conducted by Hashimoto et al [5] who said that the tumor is derived from the primitive basal cells of the epidermis that differentiate into hair matrix cells.The term "pilomatrixoma" was coined by Forbis and Holwing[7] in view of its histogenesis.

## CASE REPORT

A 31 year male presented in the surgical out patient department with a nodular mas on the left side of the chest wall measuring 6 x 3.8 x1.5 cm with an exophytic nodular area measuring 3 x2 x 1 cm. patient gave history of child bite about ayear back and there was increase in size since last 6 months. There was no other significant history.

Clinical diagnosis was of a malignant lesion and was misdiagnosed on FNAC as round cell neoplasm,was advised histopathologival examination on which it was diagnosed as pilomatricoma. However,as this case had micro foci of necrosis and occasional mitotic figures,was advised close follow up for recurrence and malignant change, though adequate surgical resection as recommended was done to minimize local recurrence.



**Image 1: Pre operative** - chest wall lesion

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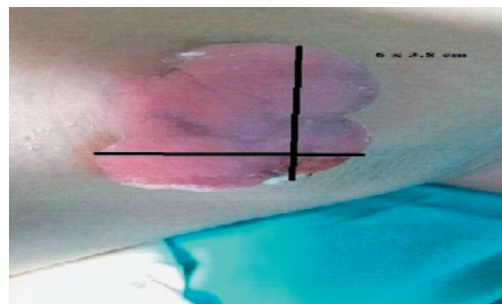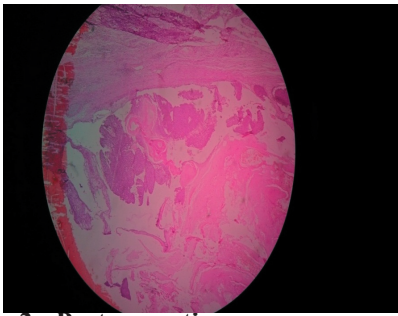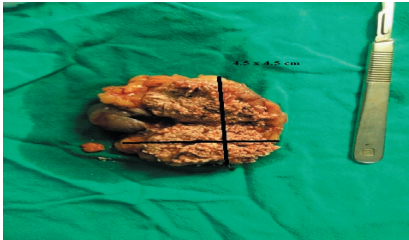Email : dr_tyagi_surabhi@yahoo.co.in

**Image 2 : Post-operative**



**Microscopy – Histopathology**
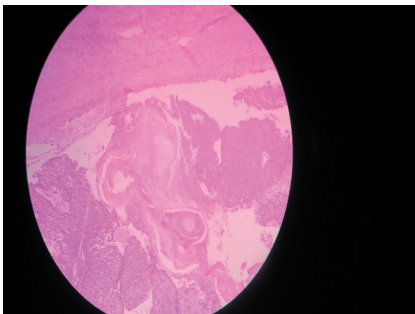**Image 3 : Magnification - Scanner**



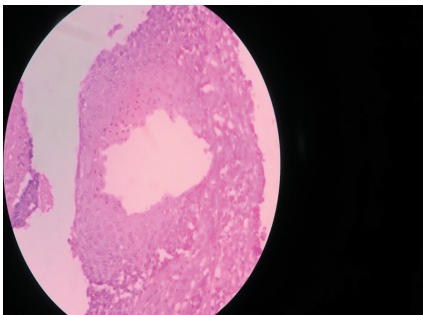**Image 4 – Magnification 10 X**



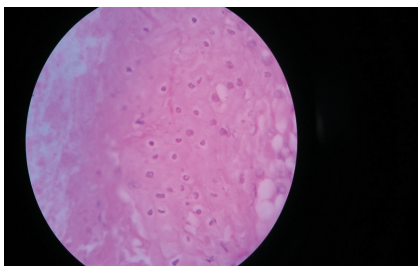**Image 5 -Magnification – 40 X**



**Image 6 –Magnification 100 X**

## DISCUSSION

Pilomatricoma is a rare benign appendegeal tumor [6] which is often misdiagnosed on cytological smears and not thought of as a differential diagnosis by the clinicians also. Accuracy of preoperative diagnosis of pilomatricoma is 0 – 30 % which may be due to lack of familiarity of the tumor. As mentioned in the literature,on aspiration cytology it can be misdiagnosed as –

1. Squamous cell carcinoma [1,2,3]
2. Basal cell carcinoma [1]
3. Appendegeal tumor [1,3,4]
4. Pleomorphic adenoma [4,8]
5. Epidermal inclusion cyst [1,3,4,7]
6. Dermoid cyst
7. Branchial cyst
8. Lipomas
9. Preauricular sinuses
10. Adenopathies
11. Hemangiomas
12. Foreign body reaction [7,8]
13. Giant cell lesions,[3] depending on the site of occurance and aspirate.

Common sites of occurance are head and neck (>50 %), upper extremities, trunk and lower extremities in decreasing order of frequency.[8]

On histopathological examination there is a well circumscribed nodulocystic lesion in the lower dermis. There are islands of epithelial cellswith characteristic arrangement of basophilic cells at the periphery and shadow cells in the centre.As the tumor matures,these basaloid cells degrade centrally forming the anucleated ghost cells or shadow cells due to unstained region due to loss of nuclei. The shadow area represents differentiation towards the hair cortex. Calcification was also present.

Basaloid cells are small to medium sized cells with distinct cell margins ,scanty cytoplasm,deeply basophilic round to oval mildly pleomorphic nuclei with regular fine to coarse chromatin and distinct small nucleoli and are therefore easily misinterpreted as malignant.

Ghost cells are cells which have lost their nuclei gradually and there is an unstained shadow of the lost nucleus. Many foreign body giant cells are also seen.

The cytological diagnosis is based on the presence of combination of basaloid cells, ghost cells and foreign body giant cells in an inflammatory background.All these may not be necessarily present in the cytological smears leading to misdiagnosis in many cases.[14]

When aspirate happens to be from the periphery or from an early lesion ,the smears show predominance of basaloid cells which are easily misinterpreted as malignant [1]due to their high N:C ratio, slight nuclear hyperchromasia and mild nuclear pleomorphismwith distinct nucleoli.

Ghost cells, though are quite obvious on histopathology, can be easily overlooked or may be even absent on cytological smears.

Thus, pilomatricoma has its diagnostic pitfalls and should be kept in mind while diagnosing the solitary skin nodules on its sites of occurance.

Recurrence is rare after adequate surgery ( 2-6 %)[11,15] and recurrence is suspicious of malignancy- pilomatrix carcinoma [11,12,16]. Warning signs are [6,13,15]–

1. older age
2. male gender
3. rapid increase in size of the lesion
4. adherence to adjacent structures
5. skin infiltration
6. ill defined margins
7. capsular infiltration
8. high mitosis
9. atypia
10. central necrosis
11. lymphovascular invasion.

Recommended treatment is complete surgical resection of the lesion with 1 cm lateral margins to minimize local recurrence. Most common sites for metastasis include [16] –

1. lungs
2. bones
3. brain
4. abdominal organs
5. skin
6. lymph nodes

## CONCLUSION

Inspite of literature describing the tumor and its differential diagnosis with the diagnostic pitfalls ,the lesion is still a difficulty for clinical diagnosis and FNAC.

While reporting the cytological aspirates with predominance of basaloid cells one should consider the probability of pilomatricoma and search for additional features like ghost cells which may be overlooked and foreign body giant cells. A repeat FNAC may reveal the diagnosis [2]. Clinical data of long history may provide a clue to misdiagnosis of malignancy along with the young age of the patient.

While considering the diagnosis of solitary firm skin nodules/nodular masses of head and neck, upper limbs, trunk and lower limbs, this clinical diagnosis should be considered to avoid misdiagnosis and mental confusion and agony to the patient being diagnosed with malignancy.

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# Lived Experience of Intubated Patients:
# A Phenomenological Study

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## ABSTRACT

**Introduction:** The intubated patients have valuable lived experiences on hospitalization in the Intensive Care Unit (ICU). Understanding the lived experiences of ICU's patients help the caregivers for better care planning and implementing. Thus, this study aimed to phenomenologically explore the intubated patients' lived experiences of ICU care.

**Methodology:** This descriptive phenomenological study conducted through a semi-structured interview with 12 intubated patients in ICU. The participants were selected using purposive sampling method from November 2015 to July 2016. Colaizzi's method was used for data analysis.

**Results:** A total of 4 themes and 13 sub-themes were obtained. The main extracted themes included mental health problems associated with the lack of communication, family as a for the patients, intubation as an evocation of imprisonment, torture and death, and starting a new life with extubation.

**Conclusion:** The intubated patients experience many challenges during the hospitalization in ICU. As intubated patients are unable to communicate verbally neglect of their needs are not impossible. The medical staff's should thus pay more attention to the patients. The presence of family members and allowing them to visit and participate regularly in their patient care should be a must.

***Keywords:*** *Intensive care unit (ICU), intubated patient, descriptive phenomenology, lived experiences*

## INTRODUCTION

Intensive Care Unit (ICU) is a specialized department with expert career in hospitals, which provides comprehensive care for patients with serious life-threatening conditions [1, 2]. During the last two decades, the number of ICU beds has been doubled [3], and approximately five million patients are annually admitted to ICU mainly requiring mechanical ventilation [4,5]. These patients are facing many physical and psychosocial problems during hospitalization such as sensory overload or sensory depravation, physical discomfort[8], numbness in the body, dizziness [12], physical limitations[10], restlessness, unanticipated removal of tracheal tube [9], fear, anxiety, anger, guilt [12,13], sleep disturbances, feelings of loneliness [13] and imprisonment in an unfamiliar environment [14].

A low sedative protocol for mechanically ventilated patients leads to a higher level of consciousness and increased understanding of the issues that they are experienced in ICUs [15, 16]. Due to the critical conditions of the intubated patients, especially for those who do not receive sedatives during intubation period, itis necessary to conduct some studies to shed light on their experiences during hospitalization in ICU. Mechanically ventilated patients who are conscious during intubation may have some experiences identifyingwhich could open a window for a mutual understanding between patient and nurse. Besides, the patients' experiences may lead the nurses as well as other healthcare teams to improve the level of care and ultimately accelerates the patients' recovery. Since few qualitative studies have

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been conducted on ICU's patients, this study aimed to explore the patients' experiences of tracheal intubation period using a qualitative phenomenological approach.

## METHODOLOGY

This qualitative descriptive phenomenological study explored the mechanically ventilated patients' experiences of care in the ICU. Qualitative research focuses on how social experiences are created and what are their meaning in life. Phenomenology is one of the best research methodologies to describe phenomena and understand human experiences deeply [17].

The study population were the patients admitted to the ICU of Imam Ali hospital in Zabol, Iran. The inclusion criteria included previous experience of intubation, favorable current conditions such as no sharp pain and acute problem for interviews, having at least 15 years of age, having hearing and vision ability, being able to speak and not having an obvious mental illness. Exclusion criteria also included an unwillingness to cooperate and not remembering the experiences during hospitalization or tracheal intubation.

Purposive sampling method using in-depth semi-structured interviews were applied to data collection. The data were collected between November 2015 and July 2016. The interviews were conducted in the bed when ICU was uncrowded or in a private room in the ICU or at the participants' home. The written questions were presented to the participants 48 hours before the interview to have more time to think about their experiences. The questions were about life experiences during the tracheal intubation, such as 'what experience…do you have?' Each interview took 45 minutes to 1 hour and performed in one or two sessions depending on the patients' status. Meanwhile, the researcher took notes to record the observed points, interactions, communications, environmental conditions and non-verbal gestures. The interviews were recorded with permission of the participants and were typed word for word. Afterthe analysis of each interview, the next interviews were held  until data saturation.

Colaizzi's method [18] was used to analyze the data. That is, each participant's experiences was read to feel empathy with him/her. Then, the meanings or concepts were extracted from important paragraphs and phrases. The arranged concepts were organized and combined into the thematic categories. Then, an explicit statement was arranged to describe the studied phenomenon and was finally presented to the participants to approve. Data analysis was performed separately by two researchers who had a Ph.D. in nursing (M. F. and M. R.) and another researcher who had a PhD in Nursing/Medical Education (A.A.) confirmed the results.

The rigor and trust worthiness of the study were based on credibility, transferability, dependability, and conformability [19]. To increase the credibility of the study, the researcher listened the audios and read the transcripts several times and two of the co-researchers randomly examined the data and their analysis. For increasing the transferability, participants with various demographic data were selected.  The dependability was achieved through a third co-researcher who confirmed the results. To achieve the conformability of the study, three of researcher analyzed the information independently.

The ethical approval was obtained from the research and technology deputy of Zabol University of medical sciences, Iran. The participants had right to reject freely the interviews at any time.

## RESULTS

A total of 12 interviews was held with patients who had previously undergone mechanical ventilation. The age range of participants was between 19 and 48 years and their average age was 33 years. Seven of the participants were female and five were male and 10 of them were married.  The range of tracheal intubation was between 2 to 50 days.  Most patients were admitted due to an accident trauma. Data analysis revealed 4 themes and 13 sub-themes. The themes were included lack of communication resulting in psychological health problems, family as a need for patients, intubation as an evocation of imprisonment, torture and death and extubation as a new life.

### Lack of communication results in psychological health problems

Stress, frustration and depression due to the inability to communicate are the components of this theme. Patients attempted to express their needs when having tracheal tube, but they have been unsuccessful. Nurses did not understand the patients' needs properly because of lack communication, which resulting in stress, frustration and depression in patients.

An intubated 19-year-old female expressed her biggest problem as follows:

"When I was conscious, I felt the tube in my throat which was very annoying. The inability to talk was the worst problem I had. It was frustrating. I had a very bad feeling and I was under too much pressure."

A 32-year-old female patient with Master degree, who had a neck injury after a car accident and had been intubated for 45 days, expressed her as follows:

"I was in a very bad mental condition during these 45 days. I was fully conscious and I noticed all the events. Since I couldn't speak at all, I was not able to inform the others of my needs and pains, so that even heat and cold had become an irritating problem. These events had depressed me".

**Family as a need for the patients**

The components of this theme are self-worthiness after relatives' visits, anxiety, missing family. The patients' reaction to the presence of family members was different. They were pleased with the presence of their family members and relatives and showed reflexive reactions to their behaviors so that the visitors' patience, crying, sadness and prayer created similar feelings in the patients. One of the important concerns of patients during the intubation was their family members, especially children. The family members' visit and presence revived the patients. At presence of family, the patient's psychosomatic problems disappeared for a while and the tracheal tube issues were tolerable.

A 36-year-old mother patient expresses her concerns as follows:

"I was so concerned about my child, but I could not tell anyone anything. I think at such time, anyone would have some concerns about their close ones. However, after a few days, they brought my child to me. He didn't talk, but he laid his head on my chest and I had a very good feeling. From that day on, my general condition improved too much."

A 30-year-old man expressed his feelings about his family as follows:

"…with tied hands and feet, with people coming and going repeatedly, with secretions accumulated in the throat, the tube in the throat felt terrible. When my family came by my side and gave me a spirit, I felt very happy and forgot all my problems. I tried to communicate, but I couldn't. "

**Intubation as an evocation of imprisonment, torture and death**

The patient's macabre experience, a sense of imprisonment, torture and death, which relates to the caring procedures such as suctioning of the tracheal tube are the components of this theme. Tracheal tube reminds the patients of the pain in all parts of their body, torture in every moment, drowning in loneliness and willing to die to get rid of that condition. Patients felt that they had reached the end of their life, because the provided services were like being in prison and being tortured. They thought that no one understood them and the difficulties of the ICU's issues. They believed that only people who experienced the ICU can understand those difficulties.

A 19-year-old female patient describes intubation as follows:

"Those moments were very hard for me and I think only someone who had experienced those moments could figure out what I'm saying… like a prisoner with tied hands and feet and closed mouth who is continually punctured with needles and cannot say anything. "

A 48-year-old male patient expressed the torture in the intensive care unit as follows:

"In general, everything in the ICU was a torture. Tracheal tube was a quite torture, a permanent torture. However, the hardest torture in ICU was nasal tube [Nasogasterial] replacement. Since you are intubated, they passed it through the nose and the nose got sore. When the sore was recovering, they pulled it out and inserted it again into the nose. Doing this, they pressed the injured sore which made more pain".

Patients described suction as a hard experience associated with the feeling of drowning and death. However, they were aware of its importance.

A 36-year-old female intubated patient described suction as follows:

"I well remember suction. It was hard. It felt choking, but I felt better after removing the tube.However,it was suffocating when it took too long. It was like drowning

in the water; especially when theyinsert the liquid into the tube before suction. Suction is good. But, it should be short and not too long".

**Extubation as a new life**

The components of this theme include extubation the feeling of new life, extubation feeling comfortable and light, and removal of tracheal tube the best moment of a person's life. The patients expressed their good feelings about the tracheal tube removal including rebirth, release from ventilator and suction. Sometimes, they were not willing to re-intubate despite their bad respiratory condition. Meanwhile, tracheal tube removalcreated an incentive in patients for improvement.

In this regard, the participant number 9 described extubation as follows:

"When they removed the tube, I was reborn. I felt free. I thought I had returned to the world wholeheartedly. I decided that I should try not to allow them to insert that again. Although I felt bad, I hardly breathe and I could succeed. "

The participant number 6, a 30-year-old woman, described extubation as follows:

"When I was intubated, I thought that I couldn't survive and I couldn't breathe without the device, until I realized that I didn't have the tube and it was removed. Then, I re-opened my eyes to the world.

It was like a rebirth, I felt comfort and light, I could not describe my condition".

The participant no. 5 describes the extubation moment as the best moment of his/her life:

"When the tube was removed, it was the best moment of my life. I relieved. But, before that, I thought I wouldn't tolerate it and I couldn't breathe, but I put so much effort to take a deep breath. Suddenly, I realized that I breathe easily. When they put my oxygen mask, the doctors realized that I was fine".

## DISCUSSION

This study shows the ICU patients' experiences of the tracheal intubation. During hospitalization and tracheal intubation and treatment by the ventilator, patients face with various problems affecting their recovery.

One of the themes of the study is the lack of communication results in neglect and physical, psychological health problems in the intubated patients. During the tracheal intubation, the patients' needs were neglected by the nurses due to misunderstanding and inability to communicate properly. Despite of the patients' attempts to make non-verbal communication in the absence of verbal ones, the efforts have been mostly unsuccessful. In this regard, Tajia et al. (2009) state that about 60% of medical and nursing errors relate to the lack of communication between patient and nurse [20]. Nurses often are unable to understand the patients' non-verbal behavior and even sometimes refuse to provide other methods of communication such as offering pen and paper to the patients. The lack of communication results to nurses' neglect to offer appropriate care and increasing incidence of physical and psychological problems in patients. In this regard, Wang et al (2015) claimed that hospitalization in the ICU and treatment of ventilator is a vital and valuable treatment period, yet an uncomfortable and painful experience for the patients. The patient's main problem is inability to express their needs to the healthcare personnel [21]. This inability is a common event, though, it causes psychological problems such as stress, restlessness, agitation and depression in the intubated patients [22, 23].

Another theme of the study is the family as a need for the patients. The needs of the patients and family members are inseparable. When a family member faces a serious problem, the whole family will face an imbalance. Under such situation, the medical staff should provide a peaceful environment for the patients and their family. They should allow the family members participate in patient care because it is not only a requirement but also a valuable patient-family-nurse interaction [24]. In the situations where patient needs are not well understood or ignored by the medical staff, family is the most important supportive source to meet their needs. The moments when the patients are involved with tracheal tube and pain, the presence of family is the comforting and life-giving force. In this regard, Berney et al. (2015) and Chahraoui et al.(2015)claim that the participation of family members in the patient care is enjoyable and accelerates their physical and mental recovery [23,25].

The other theme of this study is intubation as an evocation of imprisonment, torture and death. The intubated patients admitted to the ICU imagined

themselves as prisoners being constantly tortured by physical and social limitations, nursing procedures, and incommunicado. Nursing procedures that the patients complained including getting tied to the bed to control their restlessness without understanding or eliminating the main cause, tightly closure of tracheal tube to the jaw to prevent its removal, long-term suction, frequent NG-tube replacement, frequent blood sampling and personal hygiene without informing the patient. In this regard, Wang et al. (2009), Poulsen and Baumgarten (2015) and Engstrom et al.(2013) suggest that intubation and connection to the ventilator is a painful, unpleasant, torturing and unbearable experience for the patients, so that sometimes the patients do not receive enough oxygen [26-28].

Starting a new life with extubation is the last theme of this study. This experience shows that the hardness of hospitalization in ICU may have a joyous end.Extubation was reported as a revival, a pleasant experience and release from so many problems. Therefore, the patients encouraged themselves to keep this status through thinking about family and future. In this regard, Samuelson (2011) and Engstrom et al. (2013) state that extubation and the ability to communicate verbally are enjoyable experience and motivator to return to health and life [14,28].

## CONCLUSION

The study shows some common problems of intubated patients, which are due to the lack of verbal communication and misunderstanding of non-verbal behavior of patients by healthcare providers. Deliberate supervision and continuing education may improve nurses' skills to solve the patients' problem properly. Family members should be considered as an integral part and an undeniable social need for patients and should be involved in their patient care.

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# Prevalence of ABO and Rhesus Blood Groups in District Hapur, Uttar Pradesh - An Institutional Study

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## ABSTRACT

**Background:** ABO and Rhesus blood group are the most important blood groups in human beings. People inherit different blood groups and this plays a very important role in tranfusion safety.

**Objectives:** The objective was to study the distribution pattern of ABO and Rh blood groups among blood donors in Hapur region of Uttar pradesh and compare it with other data from similar state within india and all over the world.

**Material and Method:** A retrospective study was conducted at blood bank of Saraswati Institute of Medical Sciences, Hapur from January 2011 to December 2015.

**Results:** The most common blood group was B (36.35%) followed by O (29.85%), A (24.6) and AB (9.2%). Rh positive were (94.52%) much more than Rh negative (5.48%). Male donors were more than female donors. Replacement donors (95.71%) were much more than voluntary donors (4.29%).Predominant donors belonged to age group 18-35 years.

**Conclusion:** The most common blood group tested in our blood bank was 'B' blood group with Rh positivity. Every transfusion centre should have a record of frequency of blood groups in their population. It helps in inventory management.

*Keywords: ABO, Rhesus , blood groups , prevalence , Hapur.*

## INTRODUCTION

Blood group antigens which can be polysaccharides and proteins are present on the surface of red blood cells. International society of blood transfusion has defined 33 blood group systems which include around 700 erythrocyte antigens. Out of them ABO and Rh grouping is most important. [1,2]

Karl Landsteiner in 1901 discovered the first human blood group, which was the ABO group.[3] Later Rh blood group was defined by Landsteiner and Weiner in 1941 [4]. Together these two systems have proved to be the most important for blood transfusion purposes. The ABO blood group system is the only system with naturally occuring antibodies and is consistent and predictable. Rh-D phenotype is categorized as Rh-D positive or Rh-D negative based on the presence or absence of Rh-D antigen. In transfusion practice, after A and B antigen, the D antigen is most immunogenic [5].

People inherit different blood groups and this plays a very important role in transfusion safety . The prevalence of ABO blood groups is different among various populations. The study of blood groups is necessary, due to its role in various genetic studies, clinical studies for reliable geographical information and in blood transfusion practices which will help in reducing morbidity and mortality rate [6].Hence, in this study, distribution of blood groups is studied in Kumaon region of Uttrakhand, India.

## MATERIAL AND METHOD

A retrospective study was conducted at blood bank of Saraswathi Institute of Medcial Sciences, Anwarpur,

Hapur, UP, India including 4760 donors from January 2011 to December 2015. The blood donors were selected after taking a detailed history and a complete examination regarding their eligibility criteria for blood donation. Donors were deferred or accepted according to their medical history regarding chronic or acute diseases. Blood was taken from a donor only after fulfilling all the eligibility criteria of a healthy donor. The donors were then asked to sign the donor questionnaire and informed consent form. The blood samples were obtained by standard procedures of venepuncture and subjected to determination of ABO and Rhesus blood group using anti sera (TULIP DIAGNOSTICS LTD.) by combined slide and test tube method. Each sample of donors was tested for ABO and Rhesus status.

## ETHICAL ISSUES

The donors signed an informed consent after being informed that the details of their blood groups will remain with blood bank and may be used either for research and transfusion purposes. This study was carried out within the acceptable ethical norms.

## RESULTS

Blood grouping of 4760 donors was done. The most common blood group was B (36.35%), followed by O(29.85%), A(24.6%) and AB(9.2%). In the Rh blood group, Rh positive donors (94.52%) were much more than Rh negative donors (5.48%) [TABLE1].Blood group frequency with respect to ABO and Rhesus positive was found to be shown by formula B>O>A>AB [Table - 2] which is in accordance with other studies [20,21]. The frequency for ABO and rhesus negative was given by formula B>O>A>AB [ Table-2] which is in contrast to study done by Kaur et al [20] Parul Garg et al [21], in which it is given by the formula O>B>A>AB and B>A>O>AB respectively. Male donors were more than female donors. [Table-3]. Replacement donors (95.71%) were much more than voluntary donors (4.29%) [TABLE-4]. Predominant donors belonged to age group 18-35 years (82.04%) and least were of age group 35 and above (17.96%) [Table-5].

**Table 1: Prevalence of blood groups in the present study**

| ABO type | Percentage(%) |
|---|---|
| A | 24.6% |
| B | 36.35% |
| AB | 9.2% |
| O | 29.85% |

**Table 2: Distribution of abo and rhesus blood group among study population (N=4760)**

| BLOOD GROUP | A(%) | B(%) | AB(%) | O(%) | Total (%) |
|---|---|---|---|---|---|
| Rh positive | 1118(23.49%) | 1634(34.33%) | 404(8.49%) | 1343(28.21%) | 4499(94.52%) |
| Rh negative | 53(1.11%) | 96(2.02%) | 34(0.71%) | 78(1.64%) | 261(5.48%) |
| **Total** | **1171(24.6%)** | **1730(36.35%)** | **438(9.2%)** | **1421(29.85%)** | **4760(100%)** |

**Table 3 : Distribution of donors according to gender**

| Gender | No. of donors | Percentage(%) |
|---|---|---|
| Male | 4636 | 97.39% |
| Female | 124 | 2.61% |

**Table 4: Distribution of Volunatary and Replacement Donors**

| Type of Donation | No. of donors | Percentage(%) |
|---|---|---|
| Voluntary | 204 | 4.29% |
| Replacement | 4556 | 95.71% |

**Table 5 : Distribution of age groups among study population**

| AGE GROUPS (in Years) | No. of Donors |
|---|---|
| 18-35 | 3905(82.04%) |
| >35 | 855(17.96%) |

**Table 6: Comparision of frequency percentage of abo and rhesus blood group in different countries of the world and in different areas in india**

| POPULATION | A | B | O | AB | Rh+ve | Rh-ve |
|---|---|---|---|---|---|---|
| BRITAIN[7] | 42 | 8 | 47 | 3 | 83 | 17 |
| AUSTRALIA[8] | 38 | 10 | 49 | 3 | - | - |
| USA[9] | 41 | 9 | 46 | 4 | 85 | 15 |
| NIGERIA[10] | 21.6 | 21.4 | 54.2 | 2.8 | 95.2 | 4.8 |
| PAKISTAN[11] | 22.4 | 32.4 | 30.5 | 8.4 | 93 | 7 |
| NEPAL[12] | 34 | 29 | 32.5 | 4 | 96.7 | 3.3 |
| SAUDI ARABIA[13] | 24 | 17 | 52 | 4 | 93 | 7 |
| SOUTHERN INDIA | | | | | | |
| SHIMOGA-MALNADI[14] | 24.27 | 29.43 | 39.17 | 7.13 | 94.93 | 5.07 |
| BANGLORE[15] | 23.85 | 29.95 | 39.82 | 6.37 | 94.2 | 5.8 |
| EASTERN INDIA | | | | | | |
| DURGAPUR[16] | 23.9 | 33.6 | 34.8 | 7.7 | 94.7 | 5.3 |
| CENTRAL INDIA | | | | | | |
| MAHARASHTRA[17] | 28.38 | 31.89 | 30.99 | 8.72 | 95.36 | 4.64 |
| WESTERN INDIA | | | | | | |
| AHEMDABAD[18] | 21.94 | 39.4 | 30.79 | 7.86 | 95.05 | 4.95 |
| NORTHERN INDIA | | | | | | |
| AMRITSAR(19) | 18.01 | 38.06 | 34.31 | 9.62 | 91.28 | 8.72 |
| UTTRAKHAND[20] | 28.7 | 32.07 | 28.7 | 10.53 | 94.49 | 5.51 |
| PRESENT STUDY | 24.6 | 36.35 | 29.85 | 9.2 | 94.52 | 5.48 |

## DISCUSSION

Blood group and Rh antigen are hereditary gene for ABO antigens is on the 9 chromosome and Rh antigen gene is on the 1st chromosome [21] Diversity has been observed in the distribution of blood groups in population within the country. In the present study, frequency and distribution of ABO and Rh blood group in the blood donors in Hapur region are compared with the similar studies carried out within and outside India [Tabel-6].

Frequency of blood groups of present study was compared to the studies done at Maharashtra [17], Ahmadabad[18], Amritsar[19], Uttrakhand[20]. Most common blood groups was 'B' and least common was 'AB'. In our study the distribution of A and O blood group was in accordance with all above mentioned studies [17,18,19] in which O blood group donors were more than A blood group donors. However, this distribution was different from the study done by Parul et al [20], in which the distribution of A and O blood group showed equal frequency.

Studies done at Durgapur [16], Bangalore [15] and Shimoga-Malnad [14] found that the commonest blood group was 'O' which is in contrast to present study where B is the most common blood group. Thus, the geographical distribution of blood groups in India shows that B is the commonest blood group in central , western and northern part of India wherease 'O' is most frequent blood group in eastern and southern part of India. Countries like Britain [7], Autralia [8], USA [9], Nigeria [10] and Saudi arabia [13] showed 'O' blood group was commonest. Their results were different from our study. In Pakistan [11], the common blood group is 'B' which is in accordance with our study. However, study in Nepal[12] showed the common blood group was A which is in contrast to present study.

Rh negativity status was 5.48% in our study which is in accordance with all the studies conducted at other parts of India and is in contrast with western studies [7,9] where it was 15-17%. This suggests that the expected frequency of Rh-iso immunization would be lower in our population than that encountered in Britain and USA population.

Similar to other studies within India, our study showed higher number of male donors than that of female donors. This can be due to anemic status and low body weight due to poor nutrition and health of females in developing countries like India. Also cultural habits, Male dominant society and lack of motivation are other reasons leading to smaller number of female donors for blood donation. Hence females need to be encouraged for blood donation by improving health status and awareness about blood donation.

Voluntary blood donors were very less (4.29%) in our study. So the voluntary blood donation needs to be increased and adult population need to be motivated and aware of advantages of blood donations , removing fears and misconceptions from their minds. So that blood can be provided to all patients in emergency without waiting for the replacement donors. Also, the risk of transmission of transfusion transmitted infections is much lower in voluntary blood donors as compared to replacement donors.

Association between blood groups and diseases like peptic ulcers, gastric carcinoma, pancreatic carcinoma, venous thromboembolism, stress, mental disorders, artherosclerosis, ovarian cancer etc. Are commonly seen.[22,23,24,25,26,27]. Knowledge of blood group distribution is essential for reliable geographical information, medical diagnosis, genetic information, genetic counselling, clinical/ forensic studies in the population and also for the general well being of individuals.

Blood group should be indicated on national identity cards, driving license, school/ office identity cards as it will be very useful during urgent transfusion.

## CONCLUSION

The most common blood group tested in our blood bank was 'B' blood group with Rh positivity. Every transfusion centre should have a record of frequency of blood groups in their population. So, similar well designed regional blood grouping studies are needed to frame better national transfusion policy and efficient delivery of services especially during emergency situations, natural disastrous condition and to know the future burden of disease.

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**Ethical Clearance-** Taken from ethics committee

**Conflict of Interest** –Nil

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# Evaluation of the Relation between Occupational Burnout and General Health of Operating Room Employees in the Hospitals of Zahedan in 2014

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## ABSTRACT

**Introduction:** Occupational burnout is common and harmful phenomenon among hospital employees, keeping them healthy and recognizing their problems is significant either .The purpose of recent study is evaluation of the relation between occupational burnout and general health of operating room employees in the hospitals of Zahedan.

**Method and Materials**: This is a descriptive-analytic study that gathered 120 of operating room employees of Zahedan hospitals together by census method. The data of this survey are collected by Meshach 22-clause occupational burnout questionnaire and Goldenberg 28-question general health questionnaire.

**Results**: Results have shown that operating room employees suffer from depersonalization and then excitement exhaustion from the occupational burnout viewpoint and agitation with physical problems from the general health perspective. There is a positive meaningful relation between occupational burnout, general health and other subscales (P-V, ./05./000).In monitoring of physical health standards, agitation health standards and personal unsuccessfulness in comparison with excitement exhaustion and depersonalization, it was cleared that women and men have more problems respectively. Besides, with growing up and depersonalization and personal unsuccessfulness feelings decreased meaningfully.

**Conclusion:** The high rate of agitation, physical problems, declining general health level of operating room employees and significant impact of occupational burnout in this issue reveals the necessity of attention and scheduling of hospital managers in order to decrease occupational problems of this group.

*Keywords:* operating room employees, occupational burnout, general health.

## INTRODUCTION

Occupational burnout is a syndrome that causes a dramatic decline in therapeutic and hygienic service quality which is followed by a negative self-image, negative attitude about the career and sense of not having communication with social worker. Hygiene and therapy parts are one of the most significant extents of sustainable development in human societies that require healthy, high motivated and fresh therapists [1]According to Jackson and Maslach ,the most common definition of occupational burnout is said to be a psychological syndrome which includes three aspects: 1.excitement or emotional exhaustion 2.depersonalization 3. Personal unsuccessfulness [2].

A:emotional fatigue or exhaustion: as the physical resources decrease because of continuous stressful working conditions, emotional powers of the person may be declined in parallel Disappointment and distresses of the person will be appeared, the happiness that he/she already had in leisure times among family members or friends is decreased and total life satisfaction of he/she is decreased either: depersonalization: In this disorder

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a person's desire is that he/she considered as a human, takes him/herself out of individuality and is understood as a nonhuman object. Depersonalization can be observed in service occupations that employees have more contact with people and are often considered as an object. They are also known by their labels that they use. For instance, those physicians who are depersonalized see their patients as an object without feeling their pain and recognize their patients by their numbers, sort of illness, number of bed, room or etc. C: Personal unsuccessfulness: The third occupational burnout feature is feeling of personal unsuccessfulness. The person attracts less attentions and his/her feeling of personal improvement declines, it means that his/her function is not accompanied with success [3-5]. Occupational burnout is not a mental disorder but as time passes, it may turn into a real mental disability So that some scientists put occupational burnout into adaptive disorder categories ,according to DSM[6,7]. The impacts of occupational burnout are said to be: Absence of nurses from work place, decreasing quality of patient care, interpersonal conflicts with colleagues, psychosomatic physical problems, not having desire for taking care of patients, job change and leaving the career [8]. In Hamidnejad and colleagues study, the most important reasons of occupational burnout among nurses were salaries, social insecurity, not supporting nurses in different levels by their managers, job insecurity and long-lasting work times. Since unpleasant environmental conditions and factors such as noises, radiations, high work load, low number of employees, and high responsibilities are important in incidence of occupational stress, we can express that the atmosphere of operating room is also one of the stressful environments that can cause decrease of job satisfaction, absence from work, and decrease of the clinical care quality [10]. In this survey we decided to evaluate the relation between occupational burnout and general health of employees of operating room.

## METHOD AND MATERIALS

This study is a descriptive-analytic research. The study population is comprised of all operating room staff of Zahedan hospitals who were 120 individuals were selected through census. Data collection tools include demographic information form (age, gender, work experience, educational degree, etc.), General Health Questionnaire of Goldberg and Meshach Burnout Inventory. General Health Questionnaire of Goldberg: The twenty-eight-item GHQ test of Goldberg

(1987) deals with investigating the general health of the individual in subscales of physical health, anxiety, social dysfunction and depression, which are graded on a scale from 0 to 3 [11]. Items 1 to 7 of the questionnaire are related to the scale of physical symptoms. Items 8 to 14 investigate anxiety symptoms and sleep disturbances and items 15 to 21 are related to evaluating symptoms of social functioning and finally, items 22 to 28 evaluate symptoms of depression [12]. In the overall scale, score above 23 is considered as phenomena of disease and in subscales, scores of 0 and 7 are assigned into the mild category, 8 to 14 into the average category and 15 to 21 into severe category in terms of having problems in the areas of health, anxiety, social dysfunction and depression.

Maslach Burnout Inventory: This test was made by Maslach (1981) which is a new estimation of the phenomenon of stress, burnout. This questionnaire includes 22 items with a scale of 0 to 6 which deals with measuring emotional exhaustion, depersonalization phenomena and lack of personal success in the context of professional activity and is especially used for the assessment and prevention of burnout in professional groups such as nurses and teachers, etc. [13]. Burnout subscales include: 9 items of emotional exhaustion, 5 items of depersonalization and 8 items of lack of personal success [14]. In the overall scale, the score above 53 is considered as containing exhaustion. In the emotional exhaustion subscale, scores 0 to 22 are assigned into the low group, scores 23 to 37 are assigned into average group and scores above 38 are assigned into the high group in case of problems. In the subscale of emotional depersonalization phenomenon, scores 0 to 5 are assigned into the low group, scores 6 to 13 are assigned into the average group and scores above 14 are assigned into the high group in case of categorized problems. In the subscale of lack of personal success, the scores 0 to 33 are assigned into the low category, scores 34 to 39 are assigned into the average group and scores above 40 are assigned into the high group in case of categorized problems. The scientific validity and reliability of this tool has been confirmed by various researchers. Reliability and validity was first approved by Filian (1992) and the reliability coefficient was estimated as 0.78 using Cronbach's alpha. Behnia (2000) has estimated the reliability of the test through Cronbach's alpha as 0.55 to 0.87 and Badri Gregory (1995) has estimated it as 0.75 to 0.84 [15].

## RESULTS

The study population consisted of 65.5% females and 34.5% males where 27% have been employed with an associate's degree and 73% have been employed with a bachelor's degree. In terms of experience, 31.3% had less than 5 years, 28.8% had 5 to 10 years, 24.7% had 10 to 15 years and 16.2% had more than 15 years of experience. After conducting the statistical tests, it was found that there is a significant relationship between gender and the general health score, physical health, anxiety, depersonalization and lack of personal success and women are confronted with more problems in other cases except in depersonalization where men experience more problems; The individuals' experience has a significant negative relationship with the depersonalization score and a significant positive relationship with public health and social dysfunction and depression; that is the higher the experience of the individuals, the more their problems are in these areas, except in the phenomena of depersonalization. Regarding the educational degree, the group with associate degree are suffering more in cases of physical health and emotional exhaustion but no difference was observed in other cases. The classification of the individuals according to their scores obtained on two tests of public health and burnout are indicated in the following table:

| General health | Healthy | | With pathogenic symptoms | |
|---|---|---|---|---|
| | 28.9 | | 71.1 | |
| | Mild | Moderate | | Severe |
| Health | 47 | 36.8 | | 16.2 |
| Anxiety | 45.8 | 30.8 | | 23.4 |
| Social dysfunction | 28.4 | 66.4 | | 5.2 |
| Depression | 84.4 | 13.9 | | 1.7 |
| Burnout | Unexhausted | | Exhausted | |
| | 52.2 | | 47.8 | |
| | Low | Average | | High |
| Emotional exhaustion | 58.7 | 34.3 | | 7 |
| Depersonalization | 48.3 | 39.5 | | 12.2 |
| Lack of personal success | 94 | 4.7 | | 1.3 |

As can be seen, more than 71% of the staff in the operating room feel problems regarding having symptoms, which is more frequent in case of two subscales of anxiety and physical health. They were somehow better in burnout than public health. The depersonalization phenomenon has bothered them more than the other subscales of this test. But a significant relationship is observed regarding the relationship between burnout and all the subscales with general health and all the subscales. This means that, the same way that an individual confronts more problems due to burnout, he also experiences more turmoil in terms of public health.

## DISCUSSION

Operating room is one of the most complex work environments in health care systems. This complexity is appeared in patient related issues and also in using high-tech facilities in operating rooms [16]. The environment of operating room is somehow different and unique in comparison with other therapeutic wards.

Different people who work at the operating room, such as physicians, assistants, and even untechnical crews feel themselves as they are in a serious and stressful environment [17]. The results of Esfandiari's study that had evaluated occupational burnout in Sanandaj governmental hospitals revealed that most of the nurses suffered from occupational burnout [18]. Similar with the results of study of Rahmani and colleagues called the relation between general health, stress and occupational burnout among those nurses who work in the specific wards of training hospitals of Tabriz University of medical science, it was cleared that from the general health perspective, 62.7% of nurses were evaluated in high levels of agitation [19]. But, in contrast with their results that showed nurses were in high levels of excitement fatigue and individual adequacy; our results revealed high depersonalization. Also, in the survey of Khaghanizade and colleagues with the purpose of evaluating occupational burnout of nurses that was achieved on 200 people of nursing personnel in Tehran university of medical science dependent hospitals,

both emotional exhaustion and depersonalization were reported low (from times of occurrences and intensity point of view) and occupational personal unsuccessfulness was reported high [20] which is not in parallel with our results on employees. In the study of Moradbeigi and colleagues named evaluation of occupational exhaustion and its relation with general health of nurses who worked at hospitals of Abadan and Khorramshahr in 2011, it was cleared that most of the participants from the general health, depersonalization, and emotional and occupational burnout viewpoint were in average, low and high levels respectively. Meaningful relations were observed between factors like gender, occupational burnout, depersonalization, work place, and emotional burnout, number of shifts, general hygiene level and occupational records with general health [21]. Maasume Shahnazdust in a survey called occupational burnout of nurses and related factors in medical training centers of Rasht found out that an excessive year of work causes 1.09% increase in emotional exhaustion rate. In this study no meaningful relation between aspects of occupational burnout and gender, marital status, recruitment status, salary, work shifts, occupational level and considering the request for choosing participant was found. They also expressed that with rising occupational records, tolerance of emotional excitements will decrease in nurses [22]. Mahnush amini and colleagues in an article named the impact of teaching communicating skills on general health of nurses revealed that agitation, disturbance of social functions, depression and disorders in physical health of nurses have more spread respectively. Farnaz Rahmani and colleagues showed that in studying of the relation between general health, stress and occupational burnout among nurses who work in intensive units of Tabriz hospitals, the most common substandard of general health[24]. In a study from Australia with the purpose of clarifying the impacts of job security and stress on occupational burnout of those nurses who work in governmental hospitals, the rate of occupational personal unsuccessfulness was reported more than emotional exhaustion and depersonalization [25-29].

## CONCLUSION

To put it in a nutshell, employees of operating room experience low feelings of personal unsuccessfulness, depression and disturbances in social functions but, are severely involved with agitation, physical problems and depersonalization phenomenon.

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# Barriers to Patient Education from the Viewpoint of Nurses in Emergency Department in the Hospitals Affiliated with University of Medical Sciences in 2015

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## ABSTRACT

**Background and Objective:** Patient education is among the basic rights of patients. There are so many barriers to the implementation of patient education such as anxiety, pain, and unawareness of its benefits, the patient's lack of cooperation, lack of manpower and time, lack of knowledge, nurses' lack of skill and lack of interest in patient education as well as managerial factors. Due to the specific conditions and status of patients who are often in critical situations and given that saving lives is a priority, patient education in the emergency department is unique and very important. Thus, this study was conducted to determine the barriers to patient education from the viewpoint of nurses in the emergency department.

**Materials and Method:** This descriptive study was conducted on 62 nurses working in the emergency department in the hospitals affiliated with Zahedan Medical Sciences University in 2015 and through census method. Nurses completed demographic information form and the questionnaire of barriers to patient education. Then, data were analyzed by SPSS V16 using independent t-test and multivariate analysis of variance (MANOVA).

**Results:** Most participants (35.5%) in the age range 25-30 years were women (79%), married (80.6%) and contract employees (41.9%). Most of them (37.1%) had a work experience between 1 and 5 years and held a BA degree (96.1%). Among the four aspects under investigation, the aspect of managerial barriers to education had the highest average score (14.5±3.7) and skill-related barriers had the lowest score (10.5±2.7), respectively.

**Conclusion:** According to the study results, the barriers to patient education in the emergency department included managerial barriers including lack of motivation for patient education, lack of control and supervision on the patient education process, lack of evaluation of patient education process and lack of declaration of patient education as one of the nurses' duties.

*Keywords: Managerial barriers, working conditions, nurses' viewpoint, training skills, emergency*

## INTRODUCTION

Nurses, as important members of medical team, take different roles considering the physical, mental and social needs of patients[1]. They may play educational, advisory, directive, informative and supportive role and act as an expert. On the other hand, to play such roles, they need to establish a good relationship with their patients[2]. As noted, nurses have so many duties one of the most prominent of which is patient education. Since nurses consist of more than 70 percent of health care team, and due to their close relationship with patients and the greater time they are in contact with patients[3], they

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play a key role in this regard [4]. Patient education aims to increase the patient's ability for personal management and increase patient satisfaction, improve quality of life, reduce patient anxiety and the disease complications[5], increase participation in health care programs as well as patient independence in daily activities. Meanwhile, compliance with taking prescribed medications will be improved by 50% and re-admission will decrease by 42% [6]. On the other hand, several factors including health promotion, priority of prevention to treatment, shorter residence in the hospital, earlier clearance, spending convalescence at home, increasing cases of disability, and increasing elderly population and chronic diseases reveals the necessity of patient education[7].

Loker and Kares in their study showed that patient education includes presenting the most important information, knowledge and skills by nurses to the patients in order to change their behavior and attitude[8]. Patient education is different in each department according to the department conditions and the type of patients in that department. Emergency department (ED) is among the important departments in any hospital and is unique in patient education. Many patients in this department have poor access to patient education[9]. The patients referring to this department are usually in critical mode[10], and may experience anxiety, confusion, or even hostility[11]. The patients' physical or mental condition has been suddenly damaged and they need quick, essential and appropriate measures to be taken. The main objectives in this department include saving patients' lives, preventing from severe disorders before starting the main treatment, taking care of patients and supporting their family so that they could cope with acute situations properly[9].

Disorder, unpredictable situations, stressful conditions, lack of control and limited time frame to assess the impact of treatment interventions are among the stressful issues for nurses in the emergency department[12]. Despite the great importance of patient education, the current available evidence indicates that nurses do not show a significant and positive attitude toward patient education[13]. Despite so many benefits of patient education, there are many barriers to patient education implementation process such as anxiety, poor physical condition, unawareness of its benefits or the fact that nurses lack the necessary skills and knowledge about the methods and principles of patient education[14]. Some other factors such as environmental and

managerial factors can also be regarded as educational barriers[15]. Since patient education, as a very skillful professional activity, requires high motivation, Daly (2003) claimed that while 92% of nurses had given priority to patient education in their work[16], there are some barriers to patient education including lack of time, lack of manpower, lack of patient cooperation, nurse's lack of interest in patient education, rejection of patient education as a duty by nurses and environmental factors as main barriers to patient education [17]. In the study of Azimi et al. (2012), nurses' lack of knowledge and scientific information, lack of nursing staff, busy nurses, lack of a supervisory system, and lack of educational nature of hospitals as well as imposition of additional tasks on nurses are regarded as barriers to patient education. In his study examining the barriers to patient education[18], Haddad also showed that working conditions is one of the main barriers to patient education in the viewpoint of nurses[19, 20]. Given the importance of patient education in the emergency department, uniqueness and special nature of this department and its patients, and considering more critical conditions of its patients and the numerous articles investigating the impact of education and its barriers on the patients in the other departments, and lack of study on the emergency department, the barriers to patient education in this department is reviewed in this study in order to improve the services provided to the patients.

## MATERIALS AND METHOD

This research is a cross-sectional study conducted in the emergency department of the hospitals affiliated with Zahedan Medical Sciences University in 2015. In this study, after explaining the necessity of research to all the nurses working in the emergency department of hospitals in Zahedan and obtaining their consent, a total of 62 nurses were included in the study. In the emergency department of these hospitals, nursing aides, nursing assistants and workforce were also working under student employment contract and so on none of which were included in the study. Only the nurses working in this department were examined and no sample was extracted. Inclusion criteria included holding a bachelor's degree in nursing; nurses should have had at least 6 months of work experience in the emergency department. Otherwise, they would have been excluded.

Data collection tools included demographic

questionnaire including age, gender, marital status, employment status, work experience, educational level and shift work as well as the questionnaire of barriers to patient education which was used in the previous studies by Haddad et al. and its validity and reliability was confirmed.

**Questionnaire of barriers to patient education**, this researcher-made questionnaire was used to measure the barriers to patient education and consisted of two parts. First part contained 11 questions based on individual characteristics (age, gender, marital status, education, work experience, shifts, and the hospital in which they worked; employment status and whether they trained their patients during their shift work). The second part contained 15 questions about patient education barriers which measured nurses' views on four aspects of management, working conditions, nurses' attitude (four questions per aspect) and educational skills (3 questions). The questions were arranged based on three-point Likert scale from low to high impact to which the scores from 1 to 3 were devoted respectively, and the average score of each factor was determined as the impact degree of that factor. Content validity was used to determine the scientific validity of the questionnaire. To confirm the scientific reliability of tools, test-retest reliability was used in two weeks interval and its correlation coefficient was obtained to be 0.94[19]

Independent t-test was used to review the mean of components of patient education barriers. Multivariate analysis of variance was used to compare each component of patient education barriers and statistical software SPSS V.16 in terms of demographic characteristics.

## RESULTS

Most participants (35.5%) in the age range 25-30 years were women (79%), married (80.6%) and official employees (41.9%). Most of them (37.1%) had a work experience between 1 and 5 years and held a bachelor's degree (96.1%). Among the four studied aspects of barriers to patient education in the emergency department, the aspect of managerial barriers to education (lack of declaration of patient education as one of the nurses' duties, lack of evaluation of patient education process, lack of control and supervision on the patient education process and lack of motivation for patient education) had the highest average score (14.5±3.7). After that, working barriers to patient education with an average score of

12.5±3.7 and in the next order, attitudinal barriers to patient education with a mean score of 12.2±3.4 had the highest average score, respectively. Finally, the lowest average score was related to skill-related barrier with an average score (10.5±2.7).

**Table 1: Frequency distribution of demographic characteristics of the nurses working in hospitals in Zahedan**

| Variables | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 13 | 21 |
| | Female | 49 | 79 |
| Age | 25-20 | 15 | 2/24 |
| | 30-25 | 22 | 5/35 |
| | 35-30 | 11 | 7/17 |
| | 40-35 | 14 | 6/22 |
| Marital | Single | 12 | 4/19 |
| | Married | 50 | 6/80 |
| contract employees | official | 26 | 9/41 |
| | Formal | 8 | 9/12 |
| | Projective | 15 | 2/24 |
| | Contract | 13 | 21 |
| Work experience | 5-1 | 23 | 1/37 |
| | 10-5 | 20 | 3/32 |
| | 15-10 | 8 | 9/12 |
| | 20-15 | 11 | 7/17 |
| hospital | Imam ali | 25 | 3/40 |
| | khatamolanbia | 27 | 5/43 |
| | boali | 10 | 1/16 |
| Education | bachelor | 60 | 8/96 |
| | Master | 2 | 2/3 |

**Table 2: Mean of components of patient education barriers from the viewpoint of the nurses working in the emergency department**

| Barriers of patients education | Mean±SD |
|---|---|
| management barriers | 7/3 ± 5/14 |
| Working barriers | 7/3 ± 5/12 |
| Attitude barriers | 4/3 ± 2/12 |
| Skills barriers | 7/2 ± 5/10 |

## DISCUSSION

According to the study results, from the viewpoint of nurses, among the four studied aspects of patient education barriers in the emergency department, the aspect of managerial barriers to education (lack of declaration of patient education as one of the nurses' duties, lack of evaluation of patient education process, lack of control and supervision on the patient education process and lack of motivation for patient education) had the highest average score (14.5±3.7). The lowest average score was related to skill-related barrier with an average score (10.5±2.7).

In the conducted studies which were inconsistent with the present study, the highest average was related to working conditions. It may be due to low incentives of the nurses in the emergency department in Zahedan. In his study, Toloei (2006) examined the motivational factors associated with patient education and showed that work ethic (90%), awareness (85.5%), and interest in work (81.5%) can create motivation for patient education [21].

The questions about managerial barriers were related to lack of motivation, lack of evaluation of patient education process, and lack of control and supervision on the patient education process.

In a study by Haddad (2011) working conditions were introduced as barriers to patient education. This result was inconsistent with the results of the present study[19].

Only in the study of Soltani et al. (2012), lack of declaration of patient education as one of the nurses' duties, patients' unawareness of education and lack of educational packages were regarded as patient education barriers all of which were managerial barriers to patient education[22]. His study results were consistent with the results of the present study.

The average score in the aspect of working conditions (lack of nurses working in the department, large volume of work tasks for the nurses, consecutive shift works, and short duration of hospitalization and lack of overall health) was 12.5±3.7 which had the highest average score among the patient education barriers after managerial barriers. In the study of Haddad et al. (2011), 80% of the studied nurses regarded the large volume of work tasks as a barrier to education[19, 23]; that fact that was consistent with the results of the present study.

However, in this study, the aspect of working conditions was after the aspect of managerial aspect. It may be due to the importance of emergency department, availability of more doctors and the fact that patients paid less attention to the information provided by nurses compared to the information provided by doctors[24].

Finally, it can be said that given the importance of emergency department in any hospital, and considering the employment of nurses with high awareness in these departments and the nurses who were working hard to provide patient welfare under all circumstances, it is effective to consider their motivation and encourage them by managers. Hopefully, nurses could be more successful in education; the task which is among their basic tasks.

## CONCLUSION

According to the study results, it is recommended that nurses be encouraged to do this task after explaining organizational tasks to them, emphasizing patient education and controlling patient educational process and motivating nurses by head nurses and nurse managers. Meanwhile, given the limitations of the present study, it is recommended that further studies be conducted in this area.

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# Analysis of Job Engagement and its Impact on Turnover Intention with Reference to IT Sector, Chennai, Tamil Nadu

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## ABSTRACT

In an organization under one roof, the engagement practices differ from generation to generation due to the psychological nature of the employee and bought up nature of their organization. This article looks at how the engagement practices differs from generation to generation and has been changed over time, as indicated by three months of survey data and interviews with a subset of IT employee. The main purpose of the study is to determine the difference in the engagement practices of multi-generation workforce who are all working under a same organizational climate with held up of different roles and responsibilities. Descriptive research design was adopted in this study. Convenience method from non probability sampling technique used to choose samples. Totally 236 Teir-3 IT employees respondents participated by questionnaire in this study. Using SEM model. Findings of this study are only related to the IT employees from Chennai, study period, and maybe it is not generalized to other Districts and Countries.

***keywords:*** *Turnover Intention, job Engagement, Intention to stay*

## INTRODUCTION

Job engagement is a psychological state of mind involves the facing of the one own self to their job and other employee-role activities. Khan (1990)[12] was the first scholar to define personnel engagement. Based on this definition dimension of engagement was measured. There are two thoughts given by Maslach and Leiter[13] to the term of work engagement. According to their approach the definition of work engagement is a positive accomplishing work oriented mind set determined by the three character vigor, absorption, and dedication. These characters are activated instantaneously to create an engaged state of mind and assessed by Utrecht Work Engagement Scale.

In the competitive world the survival of the organization begins to realize one thing that competitive organization cannot duplicate their uniqness of workforce (Endres & Mancheno-Smoak, 2008; Fisher et al.)[14] is highly depend upon how effectively engaging the workforce at all level of management though HR practices and to develop a human resource strategies in such a way to retain employees thereby reducing the impact and intention of losing valued employee from the organization, and minimize the hidden cost that would affect the bottom line. (CEL & Associates, 2008). Generally in this knowledge based economy skilled employee are accepted as key assets and their losses mostly would not be accept in the organization such attraction and retention of these skilled one is very challenging because these workers have several other job options (Thomas, 2000; Joo & McLean, 2006; Butler & Waldroop, 1999)[15].

In the diversified workforce the problems and pressure within this coherent groups has to be addressed by the employer along with their opportunities. The reason for the problem within this different generation is their age gap they don't want to understand each other's (Vesterinen & Suutarinen 2011)[16]. Therefore, organizational survival depends on the ability to manage and engage this multi-generational workforce so that their intention to turnover can be reduced when they substantially involved in their tasks, cognitively attentive, and emotionally connected to others through the motivation of intrinsic and extrinsic resource which intent to engage while performing their jobs to satisfy customer preferences, by achieving quality, innovation and organizational goals, by their work engagement and commitment (Fay & Luhrmann 2004; Newell, 2002).

Job engagement is a psychological state of mind involves the facing of the one own self to their job and other employee-role activities. It's being characterized by vigour, dedication and absorption this three dimension factor was put forth by (Schaufeli, Bakker and Salanova 2006). And it's measured using the instrument Utrecht Work Engagement Scale (UWES). Meere (2005) stated that to promote the organizations success, it has to think to see beyond commitment of the employees and put forth an effort in improving engagement so that the employees working in the organization willing to go beyond the designated job responsibilities.

The virtual qualities of engaged employee include innovation, creativity, taking responsibility personally to happen thing and giving effort to attain desire of the company and posses the emotional connectivity with the organizations vision and mission (Wagner and Harter, 2006). Engagement is sometime refereed as job engagement (Kong, 2009), employee engagement (Crawford, LePine & Rich, 2010), organizational engagement (Saks, 2006), and personal engagement (Kahn, 1990). The difference in name create a confusion and interpretation variation among the different practioners and researcher so decide a one term for this new construct and develop a research further on engagement refers to commitment, passion, enthusiasm, absorption, focused effort and energy. Based on business and academics no particularization occurs in the conceptualization of framework.

Job engagement has received more attention from individuals such as practitioners and academicians and one of the industries giving more importance is service industry. Engagement is been familiar terms in academics recently, and its first origin happen in business and consultancy (Thanawatdech Thirapatsakun*, Chanongkorn Kuntonbutr, Panisa Mechinda; 2014). An more number of studies shows that work engagement is a evidently unique construct in need of further study (Maslach, Schaufeli and Leiter 2001; Hallberg and Schaufeli 2006; Saks 2006; Bakker and Schaufeli 2008; Macey and Schneider 2008; Meyer and Gagné 2008; Kühnel, Sonnentag and Westman 2009).

Another researcher Schmidt (2004) defining the engagement by bringing two concepts commitment and satisfaction together, commitment involves physical and motivational elements. Sharpley (as cited in Harrad 2006 ) point out the difference between motivation and engagement , stating that it is possible to motivate employee in job without necessary attachment feeling to the organization and also emphasis the importance of mutual feeling of support between the organization and employees. There is no guarantee for engagement among the employee since satisfaction and commitment are two separate key elements.

Generations varies on aspects such as professional and personal life (Rousseau & Greller, 1994; Morgan & Ribbens, 2006 and Macky, Gardner & Forsyth, 2008), and basis on work ethics (Smola & Sutton, 2002; Sessa et al., 2007 and Crawford & Hubbard, 2008). Generational differences may result in conflict and frustration. The survey by Lee Hecht Harrison, states 60% employers experiencing intergenerational conflicts. However those reduction leads to business success along with production and creativeness in work (Susan A. Murphy, 2007).

SHRM Quarterly Research, 2009, states that organization start recognizing the complementary skills and experience that a diversified work group bring in the work station proved as significant competitive advantage in the market. In addition conflicting and work attitude among these groups varies one fit size approach may not work (Houlihan, 2007). So the organization truly understands the needs and aspiration of generation thereby determine the strategies to meet their aspiration and to engage them in a better way.

Haeberle, Herzberg, and Hobbs (2009) impact the difference in generation will have a profound effect in the work environment such effects showed the need of equipments, professional growth preferences, desired leadership, effective reward, remunerations, benefits, and recognition system among the employees.

## INDIAN EMPLOYEES MOST ENGAGED GLOBALLY: THE ECONOMIC TIMES, REPORT NOV 30, 2014

A majority of Indian employees are performing intensely and their work engagement level is highest in the world, a new study says. At the same time, six out of ten Indian employees are not working to their full potential while the younger employees are constantly on the lookout for a new job. According to BI Worldwide, an employee engagement solution providers, 51 per cent of Indian employees are performing intensely, making them globally the most engaged in their work. The report

further said the older generation in India would prefer to stay at their current employer for almost seven years while the younger lot is planning to leave much sooner. According to BI Worldwide research in India, Gen X (born between 1960s to 1980s) employees would like to leave in 4.7 years, while Gen Y (born between 1980s to 1990s) plans on staying for a mere 2.9 years. Moreover, nearly a quarter of Gen Y employees who work full time in an organization larger than 500 employees have plan to leave their company within the next year. "With entire career ahead of them, Gen Y employees are jockeying for position. They are experimenting. And they've realized that their income can grow more rapidly if they job-hop," the report said. According to the report, the top five reasons why the Gen Y employees in India plan to leave are fear, job stress, a sense of unfair pay, a bleak or unknown future and for an innovative workplace where they can contribute ideas and make decisions.

Intention to leave or stay is affected by employees' job satisfaction and commitment to the organization. There is extensive accumulated research showing that when workers are satisfied with their jobs and committed to their organization, they have a lower tendency to leave their organizations (Arthur, 2001; Mitchell et al., 2001; Mobley, 1977; Mobley et al. 1979). JD-R suggest that employees experiencing likeability toward work are less likely to leave the organization (Saks, 2006). Also pointed out that engagement is similar to other concepts such as Turnover intention, OCB, organizational commitment.

## PROPOSED RESEARCH MODEL
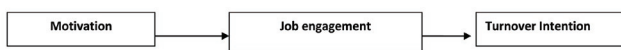


## OBJECTIVES OF THE STUDY

1. To study the relationship between Motivation and Job engagement.

2. To measure the influence of Job engagement on Turnover Intention.

HYPOTHESIS:

1. H1: There is a positive relationship between motivation and Job engagement.

2. H2: There is a positive relationship between Job engagement and Intention to stay.

## RESEARCH METHODOLOGY

This study was conducted using both analytical and descriptive type of methodology. The study depends on primary and secondary data.

## STUDY AREA

Since Job engagement is applicable to almost all industries and the respective organizations, a global trend demands its implementation at all levels. Therefore, the researcher contacted different Teir 3 IT companies to obtain the exact characteristic features of Job engagement. The study covered different IT companies in chennai.

## SAMPLING SIZE AND DESIGN

The primary data were collected through survey method. Survey was conducted through electronic mail using well formulated Questionnaire. Convenience Sampling has been done for generating data. Totally 400 Questionnaires were distributed and 277 collected out of which 236 completed questionnaires were found usable.

## QUESTIONNAIRE DESIGN

The primary data were collected through questionnaire survey. The respondents were asked to give their opinion relating to motivation and its relation with job engagement measures and its impact on turnover intention. The first part of the Questionnaire comprises motivational factors with optional questions. The second part includes statements relating to Job engagement measures, with Likert's 5 point scale. The third part includes the statement relating to Intention to stay.

## SCALING TECHNIQUE IN THE QUESTIONNAIRE

The questionnaire used comprises both optional type and Statements in Likert's 5 point scale. The responses of these sections were obtained from the companies in the 5 point scale, which ranges as follows:

5 – Strongly agree 4 – Agree 3 – Neutral 2 – Disagree 1 – Strongly Disagree

### SECONDARY DATA

The Secondary data were collected from Journals, Magazines, Publications, Reports, Books, Dailies, Periodicals, Articles, Research Papers, Websites, Company Publications, Manuals and Booklets.

### DATA ANALYSIS

To validate the questionnaire and to confirm the feasibility of the study. The filled up Questionnaires were collected from 236 respondents and Cronbach's Alpha Criterion was applied to test the reliability. The value determined was 0.992 proving the reliability of the instrument. The quality of the questionnaire was ascertained and the test showed high reliability. The variables considered for the analysis were satisfying the normal probability distribution. Based on the study, the questionnaire was suitably to elicit response from the sample group. And structural equation model (SEM) used to validate the questionnaire and to validate the model fit as per the proposed research.

### DATA COLLECTION

Questionnaires were circulated through e-mail with follow up requests being made in February 1st to April 30th 2010. The correct contact person was identified and invited to participate. To motivate respondents each was offered a view of the aggregated responses after data collection. 400 questionnaires were sent to employees working in IT sector from different companies were participated.

### STRUCTURAL EQUATION MODEL (SEM)



**Model Fit Summary**

**Table 1: CMIN**

| Model | NPAR | CMIN | DF | P | CMIN/DF |
|---|---|---|---|---|---|
| Default model | 5 | 277.507 | 1 | .000 | 277.507 |
| Saturated model | 6 | .000 | 0 | | |
| Independence model | 3 | 1166.537 | 3 | .000 | 388.846 |

**Table 2:RMR, GFI**

| Model | RMR | GFI | AGFI | PGFI |
|---|---|---|---|---|
| Default model | .050 | .684 | -.896 | .114 |
| Saturated model | .000 | 1.000 | | |
| Independence model | .607 | .362 | -.277 | .181 |

**Table 3: Baseline Comparisons**

| Model | NFI Delta1 | RFI rho1 | IFI Delta2 | TLI rho2 | CFI |
|---|---|---|---|---|---|
| Default model | .762 | .286 | .763 | .287 | .762 |
| Saturated model | 1.000 | | 1.000 | | 1.000 |
| Independence model | .000 | .000 | .000 | .000 | .000 |

**Table 4: Parsimony-Adjusted Measures**

| Model | PRATIO | PNFI | PCFI |
|---|---|---|---|
| Default model | .333 | .254 | .254 |
| Saturated model | .000 | .000 | .000 |
| Independence model | 1.000 | .000 | .000 |

**Table 6:FMIN**

| Model | FMIN | F0 | LO 90 | HI 90 |
|---|---|---|---|---|
| Default model | 1.181 | 1.177 | .959 | 1.426 |
| Saturated model | .000 | .000 | .000 | .000 |
| Independence model | 4.964 | 4.951 | 4.489 | 5.445 |

**Table 5: NCP**

| Model | NCP | LO 90 | HI 90 |
|---|---|---|---|
| Default model | 276.507 | 225.405 | 335.014 |
| Saturated model | .000 | .000 | .000 |
| Independence model | 1163.537 | 1054.899 | 1279.551 |

**Table 7:RMSEA**

| Model | RMSEA | LO 90 | HI 90 | PCLOSE |
|---|---|---|---|---|
| Default model | 1.085 | .979 | 1.194 | .000 |
| Independence model | 1.285 | 1.223 | 1.347 | .000 |

**Table 8:AIC**

| Model | AIC | BCC | BIC | CAIC |
|---|---|---|---|---|
| Default model | 287.507 | 287.680 | 304.826 | 309.826 |
| Saturated model | 12.000 | 12.208 | 32.783 | 38.783 |
| Independence model | 1172.537 | 1172.641 | 1182.928 | 1185.928 |

**Table 9: ECVI**

| Model | ECVI | LO 90 | HI 90 | MECVI |
|---|---|---|---|---|
| Default model | 1.223 | 1.006 | 1.472 | 1.224 |
| Saturated model | .051 | .051 | .051 | .052 |
| Independence model | 4.990 | 4.527 | 5.483 | 4.990 |

**Table 10: HOELTER**

| Model | HOELTER .05 | HOELTER .01 |
|---|---|---|
| Default model | 4 | 6 |
| Independence model | 2 | 3 |

**Interpretation:** From the above value it is interpreted that there exist a strong relationship between construct hence the model is a fit model.

## RELIABILITY ANALYSIS

**Table 11:**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .992 | .992 | 31 |

## ANALYSIS & DISCUSSION

Leiter and Bakker 2010, on theoretical discussion in academic literature have been stated that employees who are engaged pursued to achieve challenging goals and also feel as a compulsion. And plays a key role in push employees to give their extra effort, energy and focus. Halbesleben and Wheeler 2008; Halbesleben 2010, study proved a negative relationship between work engagement and intention to quit. Schaufeli and Bakker (2004) study also find some negative relationship with turnover and this study also measure the work engagement as a mediating factor. Hallberg and Schaufeli (2006) this study highlight the negative moderate relationship to measure the work engagement and turnover intention, Shuck et al. (2011) identifies a similarity in relationship for engagement measure. Finally job and organizational engagement are negatively linked to intention to quit Saks (2006).

**Ethical Clearance**- Nil

**Source of Funding**- Self

**Conflict of Interest** - Nil

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# Prevalence of Hypertension and their Risk Factors in Bank Employees in Kanchipuram District

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## ABSTRACT

**Background:** Prevalence of Hypertension is on the rise and bank employees have sedentary life style and stressful work, which directly bears on the health of the individuals. This Study was conducted to know the prevalence of hypertension among bank employees and their risk factors. **Materials and Method:** A cross sectional study was done on 507 bank employees in Kanchipuram district. The employees were subjected to a detailed interview, examination; Data was analyzed by Chi-square test and multiple logistic regression analysis. **Results:** Out of 507 persons 345 were men and 162 were women. The mean±SD age of the participants was 43.9±8.4 years. Almost one-third of them aged between 35 and 45 years. Prevalence of Hypertension was about 38%, HTN was significantly ($p<0.001$) more prevalent among men (148/193, 77%) than women 45/193( 23%). **Conclusion**: The prevalence of Hypertension was very high among bank employees and hence appropriate counseling and other interventional measures need to be placed in this vulnerable population, we recommend the need for physical activity, periodic screening.

*Keywords: Hypertension, Body Mass Index, Cardiovascular diseases.*

## INTRODUCTION

Hypertension is a modern days epidemic and it is an increasingly important medical and public health issue.[1,2] The prevalence of cardiovascular diseases (CVDs) is on the rise. It is expected that by 2020, this group of diseases will be the largest cause of death in India.[3] Cardiovascular diseases (CVDs) account for 29% of the cause of death, globally.[4] Hypertension is directly responsible for 42% of coronary heart disease deaths and 57% of all stroke deaths in India.[5] The working force of the population belong to 30-59 years age group. This age period is also witness to high incidence of coronary heart disease (CHD) in the population at large.[6] The work environment can enhance the CHD risk. There is a definite and direct link between work situation and

health status.[7] Bank employees undergo varying levels of mental stress and are thus more prone for chronic diseases like HTN. The job of bank employees is both sedentary and involves a high level of stress and thus making banking a potential occupational risk group for hypertension.[8] Thus we consider the work stress in bank employees will allude to their health and much has been documented on the prevalence of HTN among bank employees. Hence we conducted a study to determine the prevalence of HTN

## DATA COLLECTION

Due Permission was obtained from the respective banks prior to data collection, informed consent from the subjects was obtained by a self-administered questionnaire to collect data on socio-demographic profile and risk factors of hypertension. BMI was calculated using: weight was recorded using an electronic weighing machine and was rounded off to the nearest 0.5 kg. Height was measured by asking the subjects to stand bare foot, in erect position with forward looking posture and sole properly rested, the height was measured by rounding off to the nearest 0.5cm. Blood pressure

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was measured using a mercury sphygmomanometer of appropriate cuff size, after 5 min of rest with the participant in sitting position, feet relaxed on the floor and arm supported at chest level. Care is taken that the subject avoided caffeine, smoking or exercise for at least 30 min prior to measurement. The measured blood pressure values were classified as "normal," "pre-HTN" or "HTN" according to Joint National Committee (JNC) VIII criteria. Stress level was assessed by Cohen's Perceived Stress scale which was tested and validated. The scale was administered in English. A pilot study was conducted on 10 participants to evaluate the reliability and validity of the questionnaire. The questionnaire consists of 10 questions and the responses were entered in a 5-point Likert scale. Stress level was classified into "low" (score: 0–11), "average" (score: 12–15), "high" (score: "16–20"), and "very high" (score $\geq$21).

## METHOD

A cross-sectional study was conducted on 507 (345 male and 262 female) bank employees from 43 nationalized banks(from October 2014 to September 2015) in Kanchipuram district , Tamilnadu ,India. Blood pressure was measured and classified according to the Joint National Committee (JNC) VIII criteria. Data on risk factors of hypertension, smoking, alcohol use, physical activity, and body mass index, were obtained for each participant using a standard questionnaire. Stress level was assessed by Cohen's Perceived Stress scale. Data was analyzed by Chi-square test and multiple logistic regression analysis.

Based on the prevalence of HTN for employees was 44.3% (refer    Prevalence and Risk Factors of Hypertension among Bank Employees in Urban Puducherry, India S Ganesh Kumar, N Deivanai Sundaram)[9]

Using the formula $\frac{Z\alpha^2\ PQ}{D^2}\ \frac{1.96^2\ x\ 44\ x\ 56}{5^2}$ D= 10 % allowable error sample size is 483 and with 5% attrition rate total sample size was 507. To cover  the sample size 507 , the   Kanchipuram district consist of11 taluks , in that   we selected Cheyyur taluk and chithmur block is our sample area. There we selected 43 banks by simple random sampling

## STATISTICAL ANALYSIS

The collected data was analyzed by IBM SPSS 20 version 16. $\chi2$ test and multiple logistic regression analysis were used for data analyses. A p value <0.05 was considered statistically significant.

## RESULTS

All the 507 selected respondents participated in the study. There were 345 (68.05 % ) male and 162(31.985%) female in the study population. The mean±SD age of the participants was 43.9±8.4 years. Almost one-third of them aged between 35 and 45 years.

Overall, the mean±SD systolic/diastolic blood pressure was  136.7±18.5/86.4±12.3  mm  Hg.  The prevalence of HTN was 38.1% (95% CI: 29.3%–41.3%) among the bank employees. Of the 193 participants with HTN, 89 (46%) was known case and 104 (54%) were newly diagnosed in the study. Of 89 employees who were known cases of HTN, 73 (82%) were taking medications regularly. The prevalence of pre-HTN was found to be 34.7% (95% CI: 29.3%– 44.6%).

HTN was significantly (p<0.001) more prevalent among men (148/193, 76.6%) than women 45/193( 23.3%). Age and occupation of participants also significantly affect the prevalence of HTN in univariate analysis (Table 1).

**Table 1: Prevalence of HTN according to sex ,age and occupation (n=507)**

|  |  | normal | % | HTN | % | total | Chi square |
|---|---|---|---|---|---|---|---|
| Sex | Male | 197 | 63% | 148 | 77% | 345 | 10.061* |
|  | Female | 117 | 37% | 45 | 23% | 162 |  |
| Age (yrs) | 25-35 | 140 | 44% | 27 | 14% | 167 | 38.873* |
|  | 36-45 | 110 | 35% | 93 | 48% | 203 |  |
|  | 46-55 | 65 | 21% | 72 | 38% | 137 |  |
| Occupation-Post | Managerial | 38 | 12% | 17 | 9% | 55 | 3.767 P=0.152 |
|  | Official | 80 | 25% | 65 | 34% | 145 |  |
|  | Clerical | 196 | 62% | 115 | 60% | 311 |  |

*p<0.001 Sex and age was associated with HTN

**Table 2: Prevalence of HTN according to risk factors**

| | | normal | % | HTN | % | total | Chi square |
|---|---|---|---|---|---|---|---|
| BMI (kg/m2) | <25 | 42 | 13% | 20 | 10% | 62 | 1.060 P=0.589 |
| | 25–30 | 96 | 31% | 55 | 28% | 151 | |
| | >30 | 176 | 56% | 118 | 61% | 294 | |
| Smoking | Yes | 67 | 21% | 38 | 20% | 105 | 0.198 P=0.656 |
| | No | 247 | 79% | 155 | 80% | 402 | |
| Alcohol | Yes | 42 | 13% | 42 | 22% | 84 | 6.081* |
| | No | 272 | 87% | 151 | 78% | 423 | P=0.014 |
| Physical activities | Nil | 28 | 9% | 86 | 45% | 114 | 68.431* |
| | <2 hrs | 103 | 33% | 54 | 28% | 157 | 0.000 |
| | 2-4 hrs | 86 | 27% | 36 | 19% | 122 | |
| | >4 hrs | 97 | 31% | 17 | 9% | 114 | |
| Perceived stress | Low | 14 | 4% | 22 | 11% | 36 | 8.735* |
| | Average | 116 | 37% | 63 | 33% | 179 | 0.033 |
| | High | 83 | 26% | 74 | 38% | 157 | |
| | Very high | 101 | 32% | 34 | 18% | 135 | |
| Diabetes | Yes | 43 | 14% | 56 | 29% | 99 | 17.856* |
| | No | 271 | 86% | 137 | 71% | 408 | 0.000 |

Alcohol use, lesser physical activity, stress Diabetes ,were significantly associated with the prevalence of HTN in univariate analysis (Table 2).

## DISCUSSION

This study shows that the prevalence of hypertension among bank employees in Sullia was 38%. This is high when compared with the World Health Organization (WHO) estimates for prevalence of hypertension in the general population of India, which is 23%.[10] There are few studies conducted among bank employees in Indian and at international level. We assessed the prevalence of HTN and its risk factors among bank employees and found that prevalence of HTN and pre-HTN was significantly high. This is an important finding as the prevalence was even higher than the previously reported values.[11,12,13] A study conducted in Surat city, India, reported a prevalence of 30.5% among bank employees; in the study, the prevalence was significantly associated with age and position at the bank.[12] Another study conducted in Meerut, India found a prevalence of 69.5% in bank employees which is very high; it was even higher than what we found in the present study. In that study, there was significant association between alcohol consumption, BMI and prevalence of HTN.[14]

The prevalence of HTN has been found to be higher among bank employees than in the general urban population. The prevalence of HTN in a study in Indian urban population was found to be 20%, which was lower than that found in the current study. 12 Similar to other studies, we also found a higher prevalence among those with higher age.[12,14] The prevalence was more among men than women in univariate analysis; this may be attributed to the fact that most of the studied women were young. Obesity, smoking and alcohol consumption were shown to be significantly associated with the prevalence of HTN.[14] However, in our study, BMI did have significant effect on the prevalence with the increasing age.

The prevalence of current smokers was found to be around 10%. Similar prevalence of smokers was observed in a bank study done by Lokare et al.[15] in Hubli-Dharwad (10%). This prevalence is less when compared

with the general population.[7,16] The reason for this is that bank employees work continuously for long duration (8 hrs/day) and rarely get an opportunity to smoke in between and most are aware of the harmful effects of smoking. The prevalence of alcohol consumption was around 7%. The prevalence of diabetes mellitus was around 9%, which are similar to finding in other bank studies as well as studies done in the general population. The type of diet (vegetarian/ non-vegetarian) was not a significant risk factor for hypertension in the study, probably because most of the non-vegetarians ate a lot of fish in their diet. There is also evidence that long-term mental stress associated with white collar job is associated with the prevalence of HTN.[17]we could find significant association between the level of perceived stress and the prevalence of HTN.

The study has got the inherent limitations of a cross-sectional study. Detailed dietary history and quantification of certain risk factors were not assessed due to feasibility constraints. Despite these limitations the study gave valuable information regarding the prevalence of HTN and its risk factors among this vulnerable group. The information can be used for introduction and implementation of appropriate interventional measures in lifestyle by the concerned authorities

## CONCLUSION

The prevalence of hypertension was very high in bank employees and this study helps in identifying the risk factors of hypertension which may further help in identifying the risk groups  by screening the individuals above 40 years and above, Interventional measures need to be implemented depending on the state of individuals like health education on life style modifications.

**Ethical Clearance:** Taken from MAPIMS Ethical committee

**Source of Funding** – Self

**Conflict of Interest -** Nil

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# Levander a Plant for Medical Uses: A Literature Review

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## ABSTRACT

Levander is a natural product that is now a day frequently used in the field of dermatology. Though there are various indications for its use, controlled trials are needed to determine its real efficacy. The Levander plant, its properties, mechanism of action and clinical uses are briefly reviewed in this article.

***Keywords:*** *Levander, Medical Uses, Review*

## INTRODUCTION

Lavandula (common name lavender) is a genus of 39 known species of flowering plants in the mint family, Lamiaceae. It is native to the Old World and is found from Cape Verde and the Canary Islands, Europe across to northern and eastern Africa, the Mediterranean, southwest Asia to southeast India. Many members of the genus are cultivated extensively in temperate climates as ornamental plants for garden and landscape use, for use as culinary herbs, and also commercially for the extraction of essential oils[1]. The most widely cultivated species, Lavandula angustifolia, is often referred to as lavender, and there is a color named for the shade of the flowers of this species[2].

### SCIENTIFIC CLASSIFICATION

|  |  |
|---|---|
| Kingdom: | Plantae |
| Order: | Lamiales |
| Family: | Lamiaceae |
| Subfamily: | Nepetoideae |
| Tribe: | Lavanduleae |
| Genus: | Lavandula |

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## DESCRIPTION

The genus includes annual or short-lived herbaceous perennial plants, and shrub-like perennials, subshrubs or small shrubs.Leaf shape is diverse across the genus. They are simple in some commonly cultivated species; in others they are pinnately toothed, or pinnate, sometimes multiple pinnate and dissected. In most species the leaves are covered in fine hairs or indumentum, which normally contain the essential oils[3].

### Nomenclature and taxonomy

L. stoechas, L. pedunculata and L. dentata were known in Roman times.[4] From the Middle Ages onwards, the European species were considered two separate groups or genera, Stoechas (L. stoechas, L. pedunculata, L. dentata) and Lavandula (L. spica and L. latifolia), until Linnaeus combined them. He only recognised five species in Species Plantarum (1753), L. multifida and L. dentata (Spain) and L. stoechas and L. spica from Southern Europe. L. pedunculata was included within L. stoechas[4]. By 1790, L. pinnata and L. carnosa were recognised. The latter was subsequently transferred to Anisochilus. By 1826 Frédéric Charles Jean Gingins de la Sarraz listed 12 species in three sections, and by 1848 eighteen species were known[5].One of the first modern major classifications was that of Dorothy Chaytor in 1937 at Kew. The six sections she proposed for 28 species still left many intermediates that could not easily be assigned. Her sections included Stoechas, Spica, Subnudae, Pterostoechas, Chaetostachys and Dentatae.

However all the major cultivated and commercial forms resided in the Stoechas and Spica sections. There were four species within Stoechas (Lavandula stoechas, L. dentata, L. viridis and L. pedunculata) while Spica had three (L. officinalis (now L. angustifolia), L. latifolia and L. lanata). She believed that the garden varieties were hybrids between true lavender L. angustifolia and spike lavender (L. latifolia) [6]More recently, work has been done by Upson and Andrews, and currently Lavandula is considered to have three subgenera.Subgenus Lavandula is mainly of woody shrubs with entire leaves. It contains the principal species grown as ornamental plants and for oils. They are found across the Mediterranean region to northeast Africa and western Arabia[7].

## CULTIVATION

The most common form in cultivation is the common or English lavender Lavandula angustifolia (formerly named L. officinalis). A wide range of cultivars can be found. Other commonly grown ornamental species are L. stoechas, L. dentata, and L. multifida (Egyptian lavender).Because the cultivated forms are planted in gardens worldwide, they are occasionally found growing wild as garden escapes, well beyond their natural range. Commonly such adventitious establishment is apparently harmless at best, but in some cases Lavandula species have become invasive. For example, in Australia, Lavandula stoechas has become a cause for concern; it occurs widely throughout the continent, and has been declared a noxious weed in Victoria since 1920. It also is regarded as a weed in parts of Spain[8].Lavenders flourish best in dry, well-drained, sandy or gravelly soils in full sun.[9]All types need little or no fertilizer and good air circulation. In areas of high humidity, root rot due to fungus infection can be a problem. Organic mulches can trap moisture around the plants' bases, encouraging root rot. Gravelly materials such as crushed rocks give better results [10].

### Culinary use

It is grown as a condiment and used in salads and dressings. Flowers yield abundant nectar from which bees make a high-quality honey. Monofloral honey is produced primarily around the Mediterranean, and is marketed worldwide as a premium product. Flowers can be candied and are sometimes used as cake decorations. Lavender flavours baked goods and desserts (it pairs especially well with chocolate), and is also used to make "lavender sugar". Lavender flowers are occasionally blended with black, green, or herbal teas[11].

## MEDICAL USES OF LAVENDER

### Fungal infections

A study published in the Journal of Medical Microbiology found that lavender oil could be very effective in combating the incidence of antifungal-resistant infections. Lavender oil was tested by scientists from the University of Coimbra in Portugal against a range of pathogenic fungi.The researchers found that the oil was lethal to a whole range of skin-pathogenic strains.Coresearcher, Professor Lígia Salgueiro explained that the essential oils distilled from the Lavandula genus of the lavender plant work by destroying the fungal cell's membrane.Salgueiro said "Lavandula oil shows wide-spectrum antifungal activity and is highly potent. This is a good starting point for developing this oil for clinical use to manage fungal infections. What is now required is clinical trials to evaluate how our in vitro work translates in vivo."[12, 13]

### Wound healing

A study carried out at Celal Bayar University, Turkey, and published in the journal Evidence-Based Complementary and Alternative Medicine compared the effects of several treatments for wound healing on laboratory rats.The researchers compared the effects of TENS (transcutaneous electrical nerve stimulation), saline solution, povidine-iodine, and lavender oil (Lavandula angustifolia).The study authors wrote "Wound closure progressed more rapidly in the TENS and lavender oil groups than in the control and other study groups."[14, 15]

Hair loss in a condition called alopecia areata. There is some evidence that applying lavender oil in combination with oils from thyme, rosemary, and cedarwood might improve hair growth by as much as 44% after 7 months of treatment [16].

**Anxiety.** Some research shows that taking lavender oil by mouth for 6-10 weeks improves anxiety and sleep and prevents anxiety recurrence in people with mild-to-severe anxiety. However, lavender does not seem to be more effective than the anti-anxiety medication lorazepam (Ativan). So far, early studies disagree about the effectiveness of using lavender oil as aromatherapy for treating anxiety[17].

## Cancer

Cancer-related pain. Some research shows that using lavender oil for aromatherapy massage does not reduce pain in people with cancer-related pain. Dementia. Applying lavender oil to the collar of clothing or using lavender oil for aromatherapy massage does not seems to improve mental function in people with Alzheimer's disease or dementia[18]. Complications after childbirth. Most research shows that adding lavender oil to baths does not improve pain in the area between the vagina and anus after childbirth. However, some evidence suggests that lavender oil baths might reduce this pain immediately (within 12 hours) after childbirth[18].

## Antimicrobial

Interestingly, the volatile components of Lavandula essential oils have also been found to display potent antifungal activity; however, no significant differences in activity have been reported between different Lauandula oil volatiles l2I5. Vapour treatment would appear to have an advantage over solution treatment in that the microbial growth could be inhibited by a smaller amount of essential oil, while potentially also acting as a potent inhibitor of sporulation, assuming that suitable vapour concentration and treatment times can be determined. Initial studies suggest that the gaseous contact activity of the essential oils was determined mainly by the maximum vapour concentration at an early stage of incubation and that maintaining high vapour concentration for long periods of time was not necessary 15. It should be noted,however, that the effective vapour concentrations in a clinical setting have not yet been directly related to the concentrations used routinely in aromatherapy. The use of essential oil volatiles for therapeutic benefit is not new[19].

## Sleep

Aromatherapy is thought to be therapeutically effective due to both the psychological effect of the odour and the physiological effects of the inhaled volatile compounds, where the latter effects are believed to act via the limbic system, particularly the amygdala and hippocampus. However, although inhalation of lavender oil volatiles has been reported to be capable of altering patient mood and improving sleep patterns, the true therapeutic benefit of inhalation of lavender oil remains controversial',This may be related to the fact that many studies combine both massage and lavender oil and are unable to determine whether the benefits seen are as a result of massage or of lavender oil inhalation/absorption[20]. For example, a recent study investigating the use of lavender oil aromatherapy in dementia patients found no evidence that a purely olfactory form of aromatherapy led to decreased agitation in severely demented patients and suggested that cutaneous application of the essential oil may be necessary to achieve the optimum effect 18. Similarly, although percutaneous administration of one of the main ingredients of lavender oil, (-)- linalool, led to a decrease in systolic blood pressure and skin temperature, compared to a corresponding control group receiving a placebo, no effect on subjective evaluation of wellbeing was noted In another study, although massages with lavender essential oil and an inert carrier oil were unable to demonstrate any significant long-term benefits in improving pain control, but anxiety or quality of life (compared to those patients who received the inert carrier oil only or no massage) and sleep scores improved significantly in both the massage and the combined massage (aromatherapy and massage) groups. These findings were accompanied by a statistically significant reduction in depression scores in the massage group, whether lavender oil was used or not. Inhalation of lavender aromatherapy during radiotherapy was also found to reduce anxiety[21, 22]

## Emotional status

Conversely, several authors have noted an association between lavender odour, positive emotional states and therapeutic benefit 22~25. For example, Diego et al. 26 found that individuals receiving lavender oil (10%) odour for 3 minutes were significantly more relaxed, had decreased anxiety scores, better moods and showed increased alpha power in their EEGs (an indication of increased drowsiness). Similarly, in a pilot study by Walsh & Wilson  , long-stay neurology in-patients also showed increased mood scores and reduced psychological distress following aromatherapy (tea tree, rosemary and L. angustifolia oils), suggesting that lavender aromatherapy can improve patients' experiences in intensive care with no detrimenta physical or behavioural outcomes[23].

## Pain

Inhalation of lavender oil is also reported to be of benefit in pain relief. Lavender oil has been shown to be an effective short-term treatment for lower back pain

when acupoint stimulation was followed by acupressure with aromatic lavender oilZRI.n an other recent (animal) study, it was shown that inhalation of lavender oil (L. x intermedia 'Grosso') for 1 hour resulted in significant analgesic activity at doses that did not produce a sedative sideeffect, with the oil appearing to significantly reduce the acetic acid-writhing response in a naloxone-sensitive manner. A similar effect was found with oral (100mg/kg) administration2'. It has been suggested, however, that, rather than having a direct analgesic effect, inhalation of lavender oil may simply elicit a more positive appraisal and subsequent positive retrospective evaluation of treatment-related pain from the patient when they report on lavender aromatherapy associated pain relief "[24, 25].

**Gastric ulcers.** Extensive research is now being carried out worldwide to identify and isolate the chemical components of lavender oil,which will allow the identification of biologically active constituents of the oil and determination of any synergistic effects of the 'mixed' components. While it is known that the main constituents play a major role in the biological activity of lavender oil, it has also been reported that the antimicrobial activity of different types of lavender oil are not all related to these major constituents[26]. Studies investigating the relationship between biological activity and chemical composition of lavender have found no correlation between linalool or linalyl acetate content and antibacterial or antifungal activity 7. In addition, very little is known of any synergistic relationships which occur between the oil constituents. In conclusion, many more claims are made for therapeutic benefit derived from lavender oil than are reviewed in this paper; however, controversy surrounds many aspects[27].

## CONCLUSION

Further research is required to determine the true bioactivity of lavender oil and its constituents. Despite this lack of evidence for many claims, lavender continues to be used by the general public and clinical staff, perhaps because any potential therapeutic benefit is seen as a possible 'bonus' to the simple love of lavender.

**Conflict of Interest:** None declared

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# Examining the Quality of Prenatal Care Received by Women Attending Health Centers of Jiroft During 2015

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## ABSTRACT

**Introduction and Aim:** Prenatal care is an important tool for identifying and reducing risks such as; low weight infants, stillborn or death of infant during the first year of life. Providing prenatal care leads to the birth of healthy baby without compromising the health of mother. Aim of the study was to determine the quality of prenatal care provided by health centers is the city of Jiroft in 2015.

**Method:** This was a descriptive cross-sectional study in which 385 mothers attending health centers in the city of Jiroft were selected through quota sampling. To determine the quality of received prenatal care Kotel Chuck tool was used.

**Results:** According to Kotel Chuck measurement, 51.6% of the women had received moderate quality of care. In regard to prenatal care, majority of the women (62.3%) had received prenatal care in the first trimester of their pregnancy.

**Conclusion:** The majority of women were attending health centers for prenatal care but only a few of them received appropriate and adequate care. Furthermore, since prenatal care prevents problems during pregnancy and childbirth, more attention must be paid to it and measures must be taken to eliminate/reduce its barriers.

***Keywords:*** *quality of prenatal care, pregnancy, Jiroft.*

## INTRODUCTION

Currently, prenatal care is considered as one of the important measures of preventive medicine. Prenatal care is a systematic care which includes examination, counselling about important issues related to pregnancy, reassuring, teaching and supporting pregnant mothers and their families, eliminating dissatisfaction, and developing a continuous clinical and laboratory screening program to confirm the safety of pregnancy [1]. Prenatal care is considered more in recent years as a measure to prevent undesired birth outcomes [2].

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Reducing mortality rates of mothers and children has always been the main goal of the World Health Organization's activities. The World Health Organization also refers to prenatal care as one of the essential ways to achieve this goal [3]. Prenatal care includes; careful assessment of women before pregnancy and the first visit after pregnancy and during future visits. On the other hand, prenatal care, by providing appropriate contraception methods, helps women who do not want to get pregnant [4].

Research shows that, prenatal care has reduced mothers and infants' mortality rates and increased their health. It has also removed extra costs of healthcare systems, and is generally one of the most valuable and economical primary health care programs [5]. Improving maternal health is the fifth goal of Millennium development Goals, which according to estimates

of the international agency for the United Nations in all parts of the world, shows progress in reducing maternal and infant mortality. However, it seems that the speed of progress towards achieving the Millennium development goals to reduce 75% of deaths of mothers by 2015 compared to 1990, has been insufficient and slow. [6] According to the Center for Disease Control and Prevention, 30% of mothers in the United States at least have a risk factor before pregnancy, and undesirable result of pregnancy has turned to a major concern in the world [7]. Many studies in different part of the world have shown that, provision of prenatal care is inadequate. Inadequate provision of prenatal care leads to an increase in cases of preterm delivery, low birth weight and mortality of mothers and infants [8]. The quality of service depends on conditions of the service received by the customer (service user) and often represents the method of provision and environment in which the service is provided [9]. Pregnant women pointed to problems of transportation and location of the health centers as one of the causes of dissatisfaction and not attending the centers to receive prenatal care [10,11].

Many studies have shown that, implementation of correct process will lead to satisfactory results. Providing high-quality services require factors, such as high skill of staffs and allocation of adequate time and accuracy in the delivery of service. Poor performance of health care providers also leads to the inadequacy of services and clients' dissatisfaction [12]. Appropriate counseling before pregnancy prevents obesity and helps to achieve optimal weight and maternal health by interventions such as prescribing Folic Acid [13]. Prenatal care is adequate when is started at the first trimester of the pregnancy and continues throughout the pregnancy based on a scheduled timetable in order to reduce the maternal and infant's mortality, low weight and premature birth [14-16]. Measuring the effectiveness of prenatal care is a great challenge because it includes various services (such as; pre and post birth care) provided by different professions such as; gynecology, midwifery delivery Nurses [17, 18]. Risks that threaten pregnant women are reminiscent of the duties of health, policy and legal organizations. Midwives have a heavy responsibility in maternal health. Therefore, this study was conducted to assess the quality of prenatal care received by women attending health centers in the city of Jiroft during2015.

## METHOD

This descriptive cross-sectional study was conducted to assess the quality of prenatal care received by women attending health centers of Jiroft. Samples included all women who attended health centers to receive health care for their under one year old children. Study population consisted of 385 women who were selected through quota sampling. Data were collected by a questionnaire which included two parts. First part was related to demography information and the second part consisted of two questions; the start time of the care and number of visits from the health centers. Information was derived from the participants' medical records by the researcher. To determine the adequacy of prenatal care Kotel Chuck's tool was used.

Based on standard tool of Kotel Chuck, first, the number of received care (visits) was divided by 10 (as the standard number of visits by the College of America) and the result was multiply by 100, thus, the percentage of received care was obtained. Then, based on the same tool, any percentage less than 50% and start of the care at the second three months of pregnancy were classified as inadequate care. Any percentage between 50% and 80%, and start of care at the first three months of the pregnancy were classified as moderate care and percentage > 80% was classified as adequate and

The number of visits was recorded using the medical recorders [19]. Collected data were analyzed using SPSS software.

## RESULTS

In regard to received prenatal care, majority of the participants (62.3%) were receiving prenatal care in the first trimester of the pregnancy. Based on Kotel Chuck's measuring tool, majority of women (51.6%) had received moderate quality of prenatal care (Table 1 and 2).

**Table 1: Frequency distribution of samples based on the time of first care they received**

| Frequency/time of the first care received | Number | Percentage (%) |
|---|---|---|
| First trimester | 240 | 62.3% |
| Second trimester | 110 | 28.6% |
| Third trimester | 35 | 9.1% |
| **Total** | **385** | **100%** |

**Table 2: Distribution of samples based on Kotel Chuck's tool**

| Frequency/quality of received care | Number | Percentage |
|---|---|---|
| More than adequate >100% | 39 | 10.1% |
| Adequate 80%-110% | 190 | 49.4% |
| Moderate 505%-79% | 80 | 20.8% |
| Inadequate | 76 | 19.7% |
| **Total** | **385** | **100%** |

## DISCUSSION

One of the major problems of maternal health in many countries is that, most mothers do not receive necessary care during pregnancy, while health centers provide a variety of cares for them. On time and continuous prenatal care during pregnancy leads to improved pregnancy outcomes. Therefore, examining the patterns by which women use prenatal cares and factors influencing them will be an important step towards improving pregnancy outcomes. Findings of this study, based on Kotel Chuck's measurement, showed that, 69% of women received moderate quality of prenatal care. The study by Omar et al, which has also used Kotel Chuck's measurement, showed that, 47% of women had used inadequate prenatal care [20]. Khanjari et al reported that, 83% of women had received moderate or inadequate prenatal care during their pregnancy [21]. Mikhail (2000) indicated that, 49% of women had used less than adequate prenatal care. Any attempt to improve physical space of health centers, equipment and attractiveness of the environments is to encourage patients to attend these reliable and safe health centers to receive care during the pregnancies [22]. In today's world, since communication with patients is one of the main components of health education, providing re-learning programs on communication skills is essential for health care personnel [23]. Providing appropriate number of staffing, and not using impatient or inexperience staffs to deliver prenatal care may also play an important role in increasing the satisfaction of clients from health care services provided by these centers. In addition, the use of trained, affable and knowledgeable personnel in health centers' admission unit which is the first place that patients have contact with personnel, can changed the view of pregnant women about public health centers.

## CONCLUSION

The majority of women were attending health centers for prenatal care but only a few of them received appropriate and adequate care. Furthermore, since prenatal care prevents problems during pregnancy and childbirth, more attention must be paid to it and measures must be taken to eliminate/reduce its barriers.

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# Effect of Self-Care Program based on Orem's Model on Complications of Disease in Patients with Multiple Sclerosis

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## ABSTRACT

**Background and Objectives**: Multiple sclerosis (MS) is a major cause of disability worldwide that causes many complications and problems for patients and leads to disability. Therefore, the use of self-care strategies for these patients is important. This study aimed to determine the effect of Orem model-based self-care training program on complications of the disease in patients with MS.

**Materials and Method**: In this quasi-experimental before and after study, 88 patients with multiple sclerosis who were a member of Zahedan MS association in 2014 were selected through the convenience sampling method and were randomly divided into two groups of intervention and control, each with 44 subjects. Nine training program sessions were designed and conducted based on the patients' needs. The effectiveness of the program was evaluated by patients using a check list. Before and 3 months after the intervention, patients' needs assessment forms were evaluated. Data was analyzed using independent t-test, paired t-test, and chi-square using SPSS 16.

**Results**: The mean age of the intervention group was 34.1±8.2, while the mean age of the control group was 35.6±8.4 years. Self-care program resulted in a significant reduction in complications such as muscle cramps, fatigue, constipation and self-esteem (P=0.001).

**Conclusion**: According to the results, implementation of Orem self-care program can improve the complications in MS patients. Given the limitations of this study, more research in this regard is recommended.

*Keywords: Self-care, Orem, multiple sclerosis complications, multiple sclerosis.*

## INTRODUCTION

Multiple sclerosis is a chronic, progressive disease of the central nervous system and is associated with complications and debilitating symptoms[1]. In total, 2.5 million people worldwide are living with the disease[2]. It has unpredictable prognosis[3]. According to data from 12 provinces in 2011, the overall prevalence of MS in Iran is 41.81 per 100,000, where Isfahan and Mazandaran provinces had the highest and lowest incidence rate by 83.3 and 33.32 patients per 100,000, respectively[5]. In Sistan and Baluchestan province, prevalence and incidence of multiple sclerosis were reported as 13.96 and 2.67 per 100,000, respectively [6]. The disease is the third leading cause of disability in the U.S. and often occurs at ages 20-40 [7], and its prevalence in women is twice that of men [8]. Early onset of the disease and high levels of disability imposes high costs on patient, family members, health care systems and society and affects them greatly [3]. Common early signs of the disease include visual disturbances, pain, urinary incontinence, and weakness [9] that threatens the patient's

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independence and ability to participate effectively in the family and the community and affect all aspects of their daily life [10]. Therefore, it is not surprising that MS patients experience higher rates of psychological distress as compared to healthy individuals [2]. Self-care training focuses on the patient's ability to care for himself and can also reduce hopelessness. Lack of awareness and self-care deficit are among the reasons that lead to multiple hospitalization of MS patients; therefore, self-care training plays an important role in the prevention of repeated hospitalization, hopelessness, and increased self-esteem in the patients [10]. Orem self-care model is a clinical guideline to guide and implement self-care programs and can be used as a conceptual framework to guide self-care programs [15]. The model has been used in multiple studies on MS patients, and its effect on physical and mental quality of life and fatigue reduction has been confirmed [7,10,16]. Masoudi et al. [2010] and Madani et al. [2007] showed the effect of self-care program on increasing self-esteem of these patients [15, 17]. Studied report a negative correlation between fatigue and hope and a positive correlation between self-esteem and hope [18, 19]. Therefore, since the effect of self-care program on increased self-esteem and reduced fatigue is confirmed, and these two factors are correlated with hope, and considering the need for choosing a self-care program for these patients, the present study aimed at determining the effect of self-care program based on Orem's model on hope in MS patients during 2014-2015.

## MATERIALS AND METHOD

This quasi-experimental study was conducted using a before and after design. The study population included all MS patients who were a member of MS association in Zahedan. The sample size was determined as 44 for each group. A total of 88 patients were enrolled using the convenience sampling method and were assigned to two groups of intervention and control by using a table of random numbers. Five patients in the intervention group did not participate in the training sessions, and 5 in the control group did revisited to complete the follow-up questionnaire. As a result, the final analysis was performed for 78 patients (39 patients in each group).Inclusion criteria included age of 20-50 years, literacy, wheelchair independence, not being in the acute phase of the disease, lack of other severe acute or chronic physical, mental or psychological disorders, such as depression, speech disorders. Exclusion criteria

included auditory and physical disorders and serious psychological complications during the intervention.

Data collection tools included demographic questionnaire, needs assessment form and self-report check list.Demographic questionnaire includes items on age, sex, education, marital status and duration of illness and was completed by both groups before the intervention.Patients' needs assessment form: This researcher-made form was designed to evaluate patients' problems and included a list of patient' common problems such as double vision, blurred vision, loss of balance when walking, cramps, fatigue, constipation, urinary and fecal incontinence, memory loss, and muscle weakness. There was an option for patients to write down their other problems. Patients were asked to determine their problems and how much they were suffering based on a scale of 1-4 (always, often, very little, not applicable). This form was completed by patients before and 3 months after the intervention to assess their MS-related problems and complications.Self-reported check-list: Self-reported check-list was designed to keep track of the implementation of the program over three months on a daily basis. It was completed by the intervention group after the daily training programs. The corresponding information was collected and evaluated after 3 months. After explaining the objective of the research for patients visiting Zahedan MS association, they were asked to enroll in the study voluntarily. They were then assigned to the intervention and control groups.Before the intervention, the demographic questionnaire was completed, and the needs assessment form was designed to determine the problems and complications of the disease in the intervention group, and educational programs was designed accordingly based on the Orem's model and patients' needs [7]. The content was approved by two neurologists. The educational program was provided in nine 45-minute sessions over two weeks supervised by a neurologist for the intervention group.In the sessions, after providing additional details about the research and its objectives, self-report forms were given to the patients. They were also instructed how to record the self-care program. The content of the training program was then presented based on the definition of the disease, its causes and symptoms, methods of diagnosis and treatment and self-care skills related to physical problems and muscle weakness, fatigue and how to treat muscle spasms, gait disorders, urination and defecation disorders, physical and cognitive function disorders,

and mental disorders. The program was provided through presentations.Researcher was available in the Association on a certain day, and patients were able to ask their questions and problems in person or by phone. After three months, the intervention and control groups were invited.

The problem determination form was then recompleted by the patients in both groups.

To adhere to ethical standards, upon completion of the training program, it was provided to the control group in the form of educational pamphlets. Data

analysis was conducted using independent t-test, chi-square (to compare the frequency of some demographic variables between the two groups), and paired t-test using SPSS 14.

## RESULTS

The mean ages of the intervention and control groups were 34.1±8.2 and 35.6±8.4 years, respectively. Patients' demographic characteristics are shown in Table 1. Findings showed no significant difference between the two groups in terms of gender, age, education marital status and duration of disease before the intervention.

**Table 1: Demographic characteristics of patients**

| Variable | Group | Intervention<br>Number (percentage) | Control<br>Number (percentage) | P |
|---|---|---|---|---|
| Sex | Male | 8 (20.5) | 13 (33.3) | 0.2× |
| | Female | 31 (79.5) | 26 (66.7) | |
| Education | Primary and secondary | 5  (12.9) | 7 (17.9) | 0.56× |
| | Secondary | 13 (33.3) | 9 (23.1) 9 | |
| | University | 21 (53.8) | 23 (59.0) | |
| marital status | Single | 9 (23.1) | 8 (20.5) | 0.78× |
| | Married | 30  (76.9) | 31 (79.5) | |
| Age | 20-30 years | 14 (35.9) | 13 (33.3) | 0.89× |
| | 31-40 years | 14 (35.9) | 13 (33.3) | |
| | 41-50 years | 11 (28.2) | 13 (33.3) | |
| Mean age (years) | | 34.1 ± 8.2 | 35.6±8.4 | 0.43×× |
| Disease duration (years) | | 5.72±4.92 | 4.81±3.58 | 0.35×× |

× Chi-square test

××Independent t-test

| MS Complications | Before intervention<br>Relative Frequency (%) | After intervention<br>Relative Frequency (%) | P |
|---|---|---|---|
| Cramp | 34.5 | 23 | 0.001 |
| Fatigue | 71 | 34 | 0.01 |
| Constipation | 38 | 12 | 0.0001 |
| Self-esteem | 13 | 42 | 0.001 |

Findings showed that implementation of the program significantly reduced the complications of MS (cramps, fatigue, constipation and self-esteem).

## DISCUSSION

The present study revealed that self-care training program resulted in a significant increase in self-esteem and a significant decrease in muscle cramps, fatigue and constipation in MS patients after the intervention compared to before the intervention, indicating the positive effects of training intervention based on Orem's model.

In the present study, it was found before the intervention, only 13% of the patients had high self-esteem. This indicates that they are facing numerous problems related to their illness. According to Schwartz (1999), all multiple sclerosis patients experience some degrees of depression and anxiety, which changes their self-esteem significantly. Therefore, healthcare workers should provide training and support in order to improve their self-esteem. In Schwartz's view, what is not observed in the treatment interventions is the support and training that leads to improved self-esteem(20). Ali-Mohammadi et al. (2001) showed that self-care improves psychological performance. It seems that patients' participation in self-care behaviors raises their awareness about the disease and its symptoms. On the other hand, through improving the patient's ability to perform self-care tasks, their feeling about their future can be improved, which leads to increased self-esteem, improved mental and mood conditions, reduced anxiety and fear and ultimately improved quality of life [21]. Findings of Masoudi et al. (2010) showed that the use of Orem model-based self-care program effectively improves self-esteem in MS patients (Masoudi 2010). Madani et al. (2002) reported that the self-care program increased self-esteem in MS patients (Madani, 2002), which is consistent with the results of this study [15,17].

Findings of the present study indicated that patients' fatigue decreased from 71% before the intervention to 34% after the intervention. Diagnosis and control of fatigue in MS patients are of utmost importance. In a study entitled "Quality of life in patients with multiple sclerosis; effects of fatigue and depression," Janardhan and Bakshi (2002) showed that effective diagnosis and treatment of fatigue and depression, regardless of the level of neurological disability, can improve daily activities and overall quality of life of these patients [22]. Hartelius (2004), in a study entitled "How fatigue can impact relationship?" showed that MS patients experience significantly more problems due to fatigue in all sub-categories (cognitive, physical, psychological, social and communicational) [23]. In a study in 2009 entitled "The effect of Orem self-care program on fatigue and daily activities in patients with multiple sclerosis," Masoudi et al. (2009) showed that the use of Orem-based self-management program tailored with patients' educational needs affects patients' fatigue and daily activities (Masoudi et al. 2009), which is in agreement with the present study[16]. Self-care program resulted in a significant reduction in cramps in patients. A study, reported that exercise significantly reduces physical complications in patients with MS. Stufibergen[16] reported that physical function in patients with MS who regularly participate in exercise activities is significantly improved[14]. Findings showed that constipation in patients decreased from 38% before the intervention to 12% after the intervention. This is in agreement with the result of the studies by Masoudi et al. (2010) and Madani et al. (2002)[7, 8]. A limitation of this study was the individual differences in the intervention group in performing the received trainings and applying the skills and techniques in spite of follow-ups.

## CONCLUSION

According to the results, it seems that an Orem model-based self-care program that was designed based on complications in MS patients positively improves patients' hope. Therefore, considering that Orem model-based self-care program is a non-invasive and low-cost intervention, it can be in line with educational role of nurses. Our findings can be a starting point to improve knowledge in this field. Given the limitations of the present study, further research is recommended.

**Conflict of Interest:** None declared

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# Examining the Health-Promoting Lifestyle and its Related Factors among the Nursing Students of Jiroft University of Medical Sciences

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## ABSTRACT

**Background:** Health-promoting behavior is one of the main indicators of human health, and is also a way to have better quality of life. This study aimed to examine the health-promoting behaviors and its related factors among nursing students of Jiroft University of Medical Sciences.

**Method and materials:** This study was a descriptive-analytical study conducted on all nursing students of Jiroft University of Medical Sciences (n =151). To collect the data, two questionnaires; demographic characteristics, and a standard questionnaire consisted of 52 questions (health promoting lifestyle 2) were used to measure health-promoting behaviors among the students. After the data collection, descriptive statistics (frequency distribution and percentage table) and t-test in the SPSS statistical software version 21 were used. The level of $P \leq 0.05$ was considered significant.

**Results:** The mean age of the students was 23.49±4.3, and 13.9% of them were married. Also, 55.63% of them were female and 44.37% were male. The results showed that, the total mean score of HPLP2 was 162.1±18.42, and the highest score was related to the sub-group of spiritual growth (31.91±4.7), and the lowest score belong to the sub-group of physical activity (20.39±5.6). In this study, no relationship was found between health-promoting behaviors and age, sex, marital status and place of residence. The t-test showed a significant relationships between marital status and spiritual growth (p = 0.02), and between total quality of life and spiritual growth (p = 0.01) and stress management (p = 0.044).

**Conclusions:** According to the results, improving the life style of students, particularly in terms of physical activity needs further attention. Special facilities must be provided for the students to help them choose health-promoting behaviors.

**Keywords:** *Nursing Students, Health-Promoting lifestyle, Jiroft.*

## INTRODUCTION

In 1979 the Department of Health, Education and Welfare of the United States showed that, the main cause of death and mortality is related to incorrect lifestyle [1]. Health-promoting behaviors are among the best ways to maintain and control the health [2]. In this regard,

the World Health Organization stressed the importance of health promotion, including encouraging healthy lifestyles, creating supportive environments for health, strengthening community interventions, re-directing health services, and introducing public health policies [3]. Lifestyle has been defined as all behaviors that are under the control of individuals or influence the individuals' health risks. A holistic approach suggests that, health-protecting behaviors (risk reduction and prevention), and health-promoting behaviors may be considered as the integral part of a healthy lifestyle [4]. Health promotion is an essential strategy for reducing health discriminations

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and providing primary care services. Health promotion includes all interventions that encourage physical, spiritual and mental activities[5]. Pender believes that, health-promoting lifestyle is a multi-dimensional model of voluntary and conceptual actions that maintain and improve health, self-fulfillment and success [6]. Almost half of the country's population is adolescents and young adults [2]. They play an important role in the promotion of society's health, and as they are at the relatively healthy state of life, they are considered as the priority in the health promotion programs all over the world [7]. This is while, they rarely think about life skills to manage their health and emotions, and may become upset if given self-care responsibility, or become depressed when faced with problems and difficulties [8]. One of the critical periods in adolescence, is college life which is a dynamic and transitional period [7]. Entering the university is associated with certain emotions that can affect the students' mental and physical health [9]. In this period, which is concurrent with the physical, psychological, social and sexual development in young adults, they gradually accept responsibility for their health. This transitional period is the best time to establish healthy behaviors. Since, the students account for a large number of the country's young population and as their social position as educated members of the society, can make them a role model for other people, choosing any lifestyle in terms of diet, physical activity and smoking not only affects their own lives, but also affects the behavior and lifestyle of other classes in the society [7]. Thus, this study was conducted to examine the health-promoting behaviors and its related factors among nursing students of Jiroft University of Medical Sciences, in order to be used in future planning regarding the healthy lifestyle of students.

## METHOD AND MATERIALS

This study was a descriptive-analytical study conducted on nursing students of Jiroft University of Medical Sciences to examine the health-promoting behaviors and its related factors among them. The study population consisted of all nursing students of Jiroft University of Medical Sciences, who were selected through census method.  In order to achieve the study's objectives, a two-part questionnaire was used. The first part of questionnaire consisted of demographic characteristics of the subjects such as (age, sex, marital status, place of residence) and the second part contained a standard Health promotion lifestyle 2

questionnaire to assess the health-promoting behaviors in six dimensions; health responsibility, physical activity, spiritual growth, nutrition, stress management and interpersonal relationships. There were four answers for each question based on the Likert scale as never (1), sometimes (2), usually (3) and always (4). The score of health-promoting behaviors ranged from 52 to 208, and was also calculated for each dimension separately. The scores of 52-102 indicated a weak behavior, 103-153 indicated a moderate behavior, and 154 and above indicated the desired level of behavior. Walker and Hill Polerski reported Cronbach's alpha of 94% for the present questionnaire, and the range of 79% to 94% for its 6 sub-groups [10]. In Iran, in the Persian version of the HPLP2 standard questionnaire, the Cronbach's alpha of 87% was reported by Morrovati et al [2].

For data analysis, descriptive statistics (frequency distribution and percentage table), and to determine the relationship between variables, statistical t-test were used in SPSS software version 21, and a significant level of $P \leq 0.05$ was considered.

## RESULTS

In this study, 151 students responded to the questionnaire. Students' demographic characteristics such as age, sex, marital status and place of residence are shown separately in Table 1.

The average age of nursing students was $23.49 \pm 4.3$. More than half of the participants (55.63%) were female, and 13.9% of them were married and 59.6% of them were living in dormitory.

**Table 1: Frequency distribution and percentages of some personal characteristics of students of Jiroft University of Medical Sciences**

| Variables | Number (percen-tage) | Range | Mean and standard deviation |
|---|---|---|---|
| Age | | 18-45 | $23.49 \pm 4.3$ |
| Gender | | | |
| Female | 84(55.63) | | |
| Male | 67(44.37) | | |
| Marital status | | | |
| Single | 130(86.1) | | |
| Married | 21(13.9) | | |
| Place of residence | | | |
| Dormitory | 90(59.6) | | |
| With family | 61(40.4) | | |

The results of means and standard deviation of the health-promoting behavior and its dimensions among the studied students are presented in Table 2.

**Table 2: The means and standard deviation of the overall health-promote behaviors of its sub-scales**

| Variables | Mean and standard deviation |
| --- | --- |
| Interpersonal relationship | 30.1± 4.3 |
| Nutrition status | 25±6.2 |
| Health-caring responsibility | 24.37±503 |
| Physical activity | 21.1±6 |
| Stress management | 25.2±3.6 |
| Spiritual growth | 32± 4.53 |
| Total score of questionnaire | 163.3±18.35 |

According to the findings in table 2:

The mean and standard deviation of health-promoting behavior in nursing students was 163.3±18.35, and the highest score was related to the sub-group of spiritual growth (32±4.53) and the lowest score belonged to the sub-group of physical activity (21.1±6).

In general, the students under study had a good health-promoting lifestyle. In this study, no significant relationship was found between health-promoting behaviors and age, sex and place of residence among the samples. The t-test showed a significant relationship between marital status and spiritual growth (p = 0.02), and between quality of life and spiritual growth (p = 0.01) as well as stress management (p = 0.044).

## DISCUSSION

The results of present study showed that, the mean score of health-promoting behaviors in students was higher than 154, which indicated appropriate health-promoting behaviors. In a study of Jalili et al [11], the mean of health-promoting behaviors was 134.6, and it was 130 in the study of Motlagh et al [12]. The results of Shaban et al [13] study also showed that, 57% of medical students and 54.9% non-medical students had a desirable behavior.

Babanejad et al [14], and Packer et al [15] reported that, the total score of lifestyle for most students was at the average level, which is inconsistent with the results of the present study.

In the present study, the lowest score obtained by the students belonged to the sub-group of physical activity, which indicated that, the sport has not been a part of students' daily activity which may be due to their lack of time, as the study takes most of their time. This result is consistent with the results of Motlagh et al study [12].

The study of Ederle Kelley et al [16] showed that, although 60% of the students earned good scores in nutritional habit and stress management, 51% of them earned a low score in physical activity.

Hosseini [9] states that, exercise has a positive effect on mental health, and the mental health of students who do exercise is higher than students who do not do exercise. Physical inactivity is a challenge in all countries and is a risk factor for many diseases because it has been proven that, physical activity has positive effects on health. Thus, the reasons for inactivity must be studied and educational interventions as well as appropriate methods to improve physical activity must be planned.

The results of this study showed that, the highest score achieved by students was related to the sub-group of spiritual growth, which is consistent with the results of studies by Motlagh [12], Ghorbani [17], Lee [8] Anjzab [18], Mirghafoorvand [19], and Rahmadi [20] and their colleagues.

Karami et al [21] showed a significant relationship between the religious beliefs, social health and depression.

Abedi [22] states that, spiritual health is an important aspect of human health that gives meaning and direction to life, and coordinates the relationships between human and himself, God, society and environment. Therefore, high score of spiritual growth emphasizes on the effects of religion and culture on health-promoting behaviors.

In this study, no significant relationship was found between age, gender, location, and health-promoting behaviors, which is consistent with the results of studies by Babanejad [14] Packer [15] and their colleagues, but, inconsistent with the results of Salis et al [23] study, in which this non-compliance is thought to be due to the similarity in the age of students.

In this study, no significant relationship was found between marital status and spiritual growth of the samples (α = 0.000) in a way that, married people had better spiritual growth. This is probably due to the higher level of activity and social interaction that married people maintain, which could be quite opposite in single people.

Soltaninejad [24] states that, marriage and making a family creates a feeling of support, happiness, and physical wellbeing in people.

## CONCLUSION

In general, it can be said that, the findings of this study indicated that, studied students had an acceptable level of the health-promoting behaviors. Furthermore, to improve the health of students and create excellent health-promoting behaviors in them, it is necessary to provide lifestyle, and healthy life education programs for them. In addition, considering the low score of physical activity, it is essential to provide health-promoting educational program for them with an emphasis on physical activity.

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# The Comparative Study of Clinical Nurses and Nursing Students' Opinions about Effective Factors on Patients Training in Instructional Hospitals of Zahedan

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## ABSTRACT

**Introduction:** One of the critical roles of nurses and it is not less important than the role especially caring role. Nurses and nursing students' comments on patients training were examined and compared in this study.

**Method:** This is a descriptive analytical study (cross-sectional). Statistical population included all nurses and nursing students. Sampling was done using those nursing students who entered the hospital and experienced the patients training therefore students 4th semester and higher were included in the study. 150 nursing students were determined by census to be studied on also 150 clinical nurses were selected due to study conditions and unification.

**Results:** Results of the first, second and the third aim of the study ( the effective factors of nurses on patients training from the viewpoints of nurses and nursing students) showed that trainers enough information and knowledge have been the most important effective factors respectively from the nurses and nursing students viewpoints (96.7% and 99.3%).

**Conclusion:** It is recommended according to results of the study that: Patients training should be more emphasized in curriculum of medical and nursing students in order to understand its techniques, methods and importance.

*Keywords: Clinical nurses; nursing students; patients.*

## INTRODUCTION

Humans need training to meet their basic needs and to survive. They are in different situations during life in which they need to obtain especial skills and awareness. One of these situations is when an individual is hospitalized due to disease then he wants his health back so he does his best to obtain his health again. Sources mention that many people who get sick need to learn something about their new situation. They like to know about experiments, clinical trials, disease stages and the new environment if they are hospitalized [1, 2, 3, and 4]. Moreover because they learn about their diseases they

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feel more secure and relaxed due to meeting one of their human needs [4]. Patient training is one of the important nurses duty in clinical trials and an accepted standard and a nursing cares quality condition based on which all the patients have the right to be trained for maintaining their health, prevention of diseases and health level promotion. Undoubtedly patient training is one the important aspect of nursing cares which should be performed and evaluated like other nursing interventions [5]. The aim of patients training is to promote quality of life, to reach the optimal physical or mental growth and to boost self-confidence [3] nurses' role has developed from simple cares to patients training needs in the recent decade [6]. Nurses should consider every situation an opportunity for training whether their audience are patients or not, although the patients have the right to accept this responsible nurses have the duty to provide proper information for patients to boost their need for

learning and obtaining information therefore nurses should consider training opportunity as an asset whether in medical environment or society [2]. Training the patients and their families is a great way to promote and achieve the needed skills, to decrease the hospital costs and to make patients accept the recommended treatments [7]. Treatment policies emphasize that the patients should be treated in the least hospitalized time thus patients and their families will need extensive trainings for the upcoming cares [3,8]. Many of the authors believe that because nurses spend much time with patients and have intimidate relationship with them so it is better that they train the patients themselves. It was recognized in the previous study that nurses skills or knowledge, their acceptance by patients and effective equipment are the effective factors on training [9, 10,11]. Having considered that patients training in hospitals is a difficult task and it has not been an extensive organized activity in Iran or no group accepts its responsibility moreover no nursing activity related to patients training is recorded in patients files while it is one of the critical roles of nurses and it is not less important than the role especially caring role. Nurses and nursing students' comments on patients training were examined and compared in this study.

## MATERIALS AND METHOD

This is a descriptive analytical study (cross-sectional). Statistical population included all nurses and nursing students. Sampling was done using those nursing students who entered the hospital and experienced the patients training therefore students 4th semester and higher were included in the study. 150 nursing students were determined by census to be studied on also 150

clinical nurses were selected due to study conditions and unification. Data gathering tool was a self-constructed questionnaire form that was adjusted in four parts for nurses and nursing students. The first part included four demographic information questions. The second part had nine questions related to effective factors on patients training instruction. The third part had six questions related to training receiver and the fourth part included five questions of equipment and facilities. High importance was given 3 score, medium importance 2 scores and low importance 1 score regarding the scoring part. Obtained scores of answering the questions of related factors on trainer were from 9 to 27, they were from 6 to 18 in patient's related dimension and between 5 to 15 in equipment and facilities dimension. The nursing students and nurses were asked to state their answers as high, medium and low in the second, third and the fourth part of the questionnaire. Descriptive statistics were used to describe the data and analytical statistics like x2 to compare the comments of nurses and nursing students. Results were analyzed by SPSS version 16 software and statistical tests like T an X2.

## RESULTS

Results of the first, second and the third aim of the study ( the effective factors of nurses on patients training from the viewpoints of nurses and nursing students) showed that trainers enough information and knowledge have been the most important effective factors respectively from the nurses and nursing students viewpoints (96.7% and 99.3%).(Table 1,2,3).

**Table 1: The effect of nurse related factors on patients training from nurses and nursing student's point of view**

| group | | Nursing student | | | | | | Nurse | | | | | |
| Understudied Factor | | Non-significant | | Mid- significant | | Non-significant | | Mid- significant | | Non-significant | | Mid- significant | |
| | p | Percent | number | Percent | number | Percent | number | Percent | number | Percent | number | Percent | number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adequate information | 0.09 | 96.7 | 145 | 0 | 0 | 33 | 5 | 99.3 | 149 | 0 | 0 | 0.7 | 1 |
| Adequate skill | 0.034 | 86 | 129 | 13.3 | 20 | 0.7 | 1 | 94.7 | 142 | 5.3 | 8 | 0 | 0 |
| Believe in education | 0.001 | 76.5 | 114 | 21.5 | 32 | 2 | 3 | 92.6 | 138 | 6.7 | 10 | 0.7 | 1 |
| Time shortage | 0.037 | 73.3 | 110 | 25.3 | 38 | 1.3 | 2 | 84.7 | 127 | 14.7 | 22 | 0.7 | 1 |
| Managers attendance | 0.000 | 77.2 | 115 | 22.1 | 33 | 0.7 | 1 | 89.9 | 133 | 6.1 | 9 | 4.1 | 6 |
| utilizing results | 0.064 | 74 | 111 | 24.7 | 37 | 1.3 | 2 | 84.7 | 127 | 14 | 21 | 1.3 | 2 |

**Table 2: Determining the effect of patients related factors on patients training from clinical nurses and nursing student's point of view**

| Group | Nursing student | | | | | | Nurse | | | | | | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Understudied factor** | Non-significant | | Mid-significant | | significant | | Non-significant | | Mid-significant | | significant | | |
| | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | |
| The capability of communication | 80 | 120 | **0.009** | 9.35 | 0.9 | 1 | 92 | 138 | 7.3 | 11 | 0.7 | 1 | **0.009** |
| Accepting teacher | 78.7 | 118 | **0.247** | 1.341 | 0 | 0 | 83.9 | 125 | 16.1 | 24 | 0 | 0 | **0.247** |
| The Short term confinement time | 55.4 | 82 | **0.41** | 1.78 | 6.8 | 10 | 49 | 72 | 40.8 | 60 | 10.2 | 15 | **0.41** |
| Incapability of giving information to the teacher | 73.3 | 110 | **0.27** | 3.92 | 2.7 | 4 | 80.7 | 121 | 16 | 24 | 2.7 | 5 | **0.27** |
| Collaboration of patient and their family to give information | 72.7 | 109 | **0.295** | 2.44 | 2.7 | 4 | 80 | 120 | 18.7 | 28 | 1.3 | 2 | **0.295** |
| A patient belief in education | 79.3 | 119 | **0.608** | 0.996 | 2.7 | 4 | 79.2 | 118 | 16.1 | 24 | 4.7 | 7 | 0.608 |

**Table 3: The effect of equipment related factors on patients training from the nurses and nursing student's point of view**

| group | nurse | | | | | | Nursing student | | | | | | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Understudied factors | Non-significant | | Mid-significant | | significant | | Non-significant | | Mid-significant | | significant | | |
| | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | |
| Access to specific forms | 41.3 | 62 | 41.3 | 62 | 17.3 | 26 | 57.1 | 84 | 29.3 | 43 | 13.6 | 20 | 0.023 |
| Access to educational assistance tools | 38 | 57 | 51.3 | 77 | 10.7 | 16 | 53.3 | 80 | 36.7 | 55 | 10 | 15 | 0.03 |
| The existence of an appropriate place | 47 | 70 | 39.6 | 59 | 13.4 | 20 | 57.3 | 86 | 30.7 | 46 | 12 | 18 | 0.18 |
| Access to specific forms of evaluation | 42 | 63 | 44.7 | 67 | 13.3 | 20 | 52.1 | 76 | 40.4 | 59 | 7.5 | 11 | 0.11 |
| Utilizing evaluation results | 47.7 | 71 | 40.3 | 60 | 12.1 | 18 | 68 | 102 | 25.3 | 38 | 6.7 | 10 | 0.002 |

## DISCUSSION

Results of the first, second and the third aim of the study ( the effective factors of nurses on patients training from the viewpoints of nurses and nursing students) showed that trainers enough information and knowledge have been the most important effective factors respectively from the nurses and nursing students viewpoints (96.7% and 99.3%). Trainers enough skills and their belief in examining and knowing patients learning needs were the second and the third effective factors from both groups viewpoints. There were differences between nurses and nursing students 'ideas like belief in training, medical team cooperation and applying training results. Results of this study showed that there was a difference between nurses and nursing students 'ideas about the effective factors on training so there was a significant statistical difference in this part. Results of the study of Marcum et al showed that 92% of nurses stated that nurses enough knowledge is one of the nursing cares necessity priorities [12] thus considering nurses training and increasing their knowledge via courses, books, booklets, CDs, movies, instructional sites for patients training, prevention, treatments and cares are its most important strategies and this issue has been confirmed in studies of Lamiani, Huezo , whei and Tolooee and et al [13,14,15,16]. Trainers' belief in examining and knowing patients learning needs is the next important issue which was the same in both groups. The study of Goodarzi also stated that positive attitude toward patients training is one the important nursing priorities. Since patients instruction is one of the important interventions in nursing cares and also one of nurses important roles, its requirement is enough mentality therefore nursing authorities should try to improve it. Most nurses need to receive feedback from authorities and using proper method of freedom, action independence and participation in decision making have positive effect on their performance [17]. Decision

making is having independence and free will in working environment so it is necessary that authorities revise their managing ways [18] . Mossavi[19], Lamiani [13,] Zokaei et al [20], haddad et al [21] have shown the same results in different studies. Thanksgiving and appreciation is the most powerful,simplest and the cheapest way to encourage and satisfy people which causes positive self-concept growth, satisfaction, self-actualization and employees progress.Others studies have also shown that nurses motivation for patients training is under the influence of occupational conscience, awareness, work interest, knowing, appreciation, job progress, job promotion, security, supervision, facilities, salary, contract and motivation. They cause it to be done consistently and desirably[16, 17 ,13]. One of the very important items especially for nurses was the necessity of nursing cares authorities attention to patients training which had 89.9% of scores and was one of the most important items from nurses' point of views.The study of Golchin and FalahatPishe that was carried out in medical sciences university of Ghazvin (position of patients training from the nurses point of view and its revision necessity) in which nurses had accepted their instruction role but they stated the patients training obstacles as the followings:Non-motivated patients, lack of equipment, enough time, few manpower, negative physician reactions and lack of authorities plans [22]. Results of the study of Borhani et al (patients training obstacles from nurses and nursing authorities point of view) showed that both nurses and nursing authorities determined nurses related factors as the most important obstacles of training and diseases related factors were less important [23]. Results of the present study are the same as those of Esmaeeli study. He concluded that nurses assessed enough manpower as the important factors[24,25]. Another important item seems to be trainers' familiarity with methods of learning evaluation and their ability to choose and apply proper instructional methods. Although all the above mentioned studies emphasize the necessity of patients training and have mentioned enough nurses as the necessary condition, researchers believe that even with the least equipment patients training can be performed face to face which should be taken into account by the staff [24,23]. Results of this study about the effective factors on patients training showed that 80% of nursing students and 92% of nurses chose the phrase (patient's ability to communicate with trainer during training time) as the most important item of training. The phrase of short-term hospitalization in hospital had the least importance from both groups point of view. Results of the study of Mobaraki (importance of patients training from the nursing students' point of view in nursing and Midwifery College in Yasooj) showed that the majority of nursing students stated patients effective communication with nurses as the most important item from the patients point of view which is similar to the present study [26]. Communication means having the ability to transfer the training message and receiving reactions [27]. Other studies also mention that nurses do not have enough awareness and skills of principles and methods of patients training. Having communicational skills is one of the main principles of training that its lack hinders proper patients training [28]. The study of Goodarzi (effective factors on patients training from nurses' point of view) mentions that effective communication is one of the main and paving parts of patients training [17,29].

## CONCLUSION

It is recommended according to results of the study that: Patients training should be more emphasized in curriculum of medical and nursing students in order to understand its techniques, methods and importance.

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# Examining Muscular Relaxation Technique Effect on Fatigue of Parents Having Children with Leukemia Under Chemotherapy Treatment In Instructional Hospitals of Zahedan

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## ABSTRACT

**Introduction:** Fatigue is the overall and consistent decrease of usual physical and mental abilities. Although its common treatment is pharmacotherapy, its temporary effect and side effects have led to studies related to non-pharmacologic actions, alternative and complementary medicine in recent years. The aim of this study is to determine the effect of muscular relaxation method on fatigue of parents of children with leukemia undergoing chemotherapy.

**Method:** It is an interventional study. Statistical population included parents of children with leukemia that 120 of them were put in two groups of case control and control and treated by Benson's relaxation method. Data gathering tools included demographic information questionnaire and fatigue intensity assessing questionnaire. The data were analyzed by SPSS version 18 software and statistical tests of paired sample T test, Wilcoxon, T test, Pearson correlation and one-way ANOVA.

**Results:** The mean of fatigue score in case control group was 73+_14.63 and 43.71 +_11.06 respectively before and after the intervention, there was also a significant statistical difference of fatigue between case control and control group after the intervention. A significant negative statistical relationship was observed between fatigue and age variable but there was no significant statistical relationship among fatigue with variable like weight, son and daughter numbers, education, occupation, gender, residence and income (P>0.05)

**Conclusion:** Planning consistently for parents of children with leukemia to make them participate in classes and training sessions of muscular relaxation techniques with the other parents and understanding other parent's conditions will promote family performance, fatigue and totally the mental health of society and family which finally promotes the quality of life of all family members and the sick child.

***Keywords:*** *Muscular Relaxation, Fatigue, Leukemia, Chemotherapy*

## INTRODUCTION

Parents of children with leukemia are exposed to decrease of physical or mental health related to understanding satisfaction of economic status and lack of identity[1]. Some of the factors that decline the quality of life of parents of children with leukemia are

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lack of coping with conditions, their children status and consequently fatigue [2, 3]. Fatigue emanating from long treatments is one of the main problems for parents of children with leukemia [4] which causes their highest fatigue level[5]. Fatigue is the inability to maintain the required or expected force as a temporary decline in working capacity[6] and an important natural response to high physical activity and long term stress [7]. It is also defined as a nursing diagnosis like feeling week and reducing the ability to do physical and mental activities [8]. Examining fatigue and ensuring the enough rest and sleep are the nurses responsibilities which needs planning and proper interventional techniques to be

improved [9].Relaxation has various methods but the one introduced by Herbert and Benson is more preferred due to simple learning and teaching. Relaxation technique is done by loosening, releasing and expanding each body muscles without constricting them because it increases the pulse, respiration, blood pressure and heart workload [10].Effectiveness of Benson relaxation has been proved in various studies like patients under coronary artery angiography [11], fatigue decrease for hemodialysis patients [12] and increasing the quality of life of hemodialysis patients [13]. Having considered the inappropriate quality of life of parents of children with leukemia [1] it seems necessary to examine the effect of muscular relaxation on fatigue of patients with cancer and especially their families. This study was done to determine the effect of muscular relaxation technique on fatigue of parents of children with leukemia receiving chemotherapy in instructional hospitals of Zahedan.

## METHOD

This is a semi experimental interventional method. Its samples were divided to four columns (group A is case control and group B is control) and 60 persons were in case control and also 60 in control group. Intervention was Muscular relaxation in this study which was a kind of respiratory relaxation and using it is very easy for most parents, it reduces sympathetic nervous system activity. Instructional contents of sessions included questions about the advantages of relaxation and practical show of relaxation technique which was done 2 times a week in the presence of the researcher. Having explained how to do the relaxation technique, the samples were asked to do them in front of the researcher in order to ensure their correctness. They were also asked to do the trainings 2 times for 20 minutes each time moreover Calls were made to follow up the doing of relaxation techniques. Instructional pamphlets and CDs were also given to them. The samples also fill up the fatigue questionnaire before the intervention and four weeks after doing relaxation trainings by the case control group. BFI includes 10 questions. The first question shows the existence of abnormal fatigue by yes or no answers in the last week. The following questions examine the present fatigue, normal fatigue in the last 24 hours, the most level of fatigue during the last 24 hours, the effect of the last 24 hours fatigue on total activity, behavior, walking ability, communication with others and enjoying the life in addition it evaluate each with a scale of 0 to 10 . Zero score is the lack of fatigue and 10 score is the most

level of fatigue. Finally the total intensity of fatigue is obtained by pulsing the scores of 2 to 10 (9 questions) and dividing them by 9. This is a standard scale which has been used in many studies. Various studies in Iran and other countries have verified the reliability of this questionnaire. [14, 15, 16]. Having gathered the data, they were entered to the SPSS software. Data description was done using frequency, central, and distribution and percent indexes. T and X2 test were used to homogenize quantitative demographic variables in fatigue dimension and qualitative demographic variables. Wilcoxon test was used to compare fatigue dimension in both groups before and after the intervention and Mann Whitney u test to determine the effect of muscular relaxation technique on fatigue between two groups of case control and control group. It should be mentioned that was considered 0.05.

## RESULTS

The age mean of parents of children with leukemia was 36.9 in case control group with SD of 10.9 and 38.06 in control group with SD of 12.62. 53.4% of the parents had one or two daughters and 33.3% of them had three sons. Most of them were illiterate (40%). 30% of them had high school level literacy and the other 30% had diploma. 43.3% of the parents resided in cities and 7.56% of them in villages. Most of them had an income of less than 1 million Toman. 43.3% of the parents were housewives, 13.3% employees and 38.3% self-employed. Statistical tests showed a significant difference in fatigue dimension between two groups of case control and control after the intervention among the parents of children with leukemia receiving chemotherapy.

**Table1: The relationship between fatigue and demographic variable (qualitative) among the parents of children with leukemia in instructional hospitals of Zahedan in 2014**

| Variables | Fatigue |
|---|---|
| Age | r = -0/182 <br> P=0/046 |
| Weight | r = 0/096 <br> P=0/297 |
| Numbers of girls | r = - 0/060 <br> P=0/514 |
| Numbers of boys | r =- 0/157 <br> P= 0/087 |

## DISCUSSION

Fatigue emanating from long term treatment is stated as another common problem for parents of children with cancer in the study of Wills [17]. The highest level of fatigue for parents and children with blood cancer is also mentioned in another study [5]. Results of the study of Yurtkuran et al (2007) ( examining exercise program for hemodialysis patients) showed that applying supplementary treatment methods lead to a significant difference in the mean of fatigue score between case and control group and these exercises could decrease the fatigue level of the patients as supplementary treatment[18] which was similar to our study however The difference is that doing instructional program increases the sympathetic system activity, pulse and heart workload. Muscular relaxation decreases sympathetic system activity by loosening the muscles and carrying out a comparative research about the precise effect requires more information.

Results of the study of Gaffari et al (2008) ( the effect of progressive relaxation technique on fatigue of patients with MS) showed that there was a significant statistical difference in two groups of case control and control in three different times ( before the intervention, one month after the intervention and 2 months after the intervention) and progressive muscular relaxation led to fatigue level decrease in case control group than the control group [19] while our study was carried out in two times (before the intervention and 1 month after the intervention) probably the intervention time increase for relaxation technique made this effect more observable. Chin et al (2014) carried out a study to examine the effect of Yoga on hemodialysis patients anxiety. Its final results showed that doing Yoga decreases fatigue level[20]. Samples of our study were not patients and the fatigue decrease was obviously seen in case control group parents after doing muscular relaxation technique. Results of the present study showed that muscular relaxation technique decreases fatigue level in case control group than the control group which can indicate the effectiveness of relaxation on fatigue level decrease. Having considered the study results and good execution of muscular relaxation technique as a supplementary treatment method it could be said that executing muscular relaxation technique can decrease the fatigue which is one of the debilitating signs among parents with leukemia. Examining the statistical tests showed that there was no significant statistical relationship between age and fatigue, it was not also significant for weight, daughter's number, and son's number. There was not a significant statistical relationship among fatigue, education factors, occupation, blood type, sex and income but the relationship between fatigue and residence place was significant. The study of Kooshan et al (2014) showed that there was not any significant statistical relationship among hemodialysis patients fatigue with sex, marital status, education and income [12] which is similar to our study. The study of Sajjadi et al (2010) (examining the effective factors on fatigue of patients with acute kidney failure receiving hemodialysis) showed that there had been a relationship among demographic variables of sex and income with fatigue level so that women reported significant more fatigue compared to men and fatigue level was more for those who had not enough income [7]. The study of Lee et al (2007) showed that increase of education level decreases fatigue level and aging increases fatigue level [21] which was different from our study. It can probably be said that having a child with cancer in low age causes more stress and fatigue. Totally the existence of a significant relationship between demographic information and fatigue does not mean the lack of a true relationship. Examining such relationships needs more specific studies with proper sample and concentration on these variables.

## CONCLUSION

Teaching relaxation techniques by nurses, being aware of using it for families and patients clinical management, improves families' health quality effectively. Since the advantages of applying relaxation methods are simplicity and ease of teaching they do not include high cost, Compared to other treatment methods like drug-therapy they don't have any complications therefore it is recommended to combine drug-therapy methods like muscular relaxation in the training programs for nurses and nursing students.

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