National Journal of Research in Community Medicine

of India

ISSN: 2277-1522 (Print) ; 2277-3517 (Online)

An Official Publication of Community Medicine Faculties Association

Volume 6. Sup. Issue 1. 2017 (001-082)

Special Issue on Lifestyle Diseases

Indexed in Index Copernicus& Other database

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31-07-2017

National Journal of Research in Community Medicine (NJRCM)

Volume 6. Sup. Issue 1. 2017 (001-082)

Community Medicine Faculties Association
Chennai
India

NJRCM- Volume 6. Sup. Issue 1. 2017 (001-082)

National Journal of Research in Community Medicine
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Web Site: www.commedjournal.in
Association Site: https://sites.google.com/site/comfaoffice/who-we-are
E-Mail: dopnjrcm@gmail.com

Address:
Community Medicine Faculties Association
(Registered Under The Tamil Nadu Societies Registration Act, 1975)
No: 29/2 (New no.60) Rettaikuzhi Street, Tondiarpet, Chennai – 600 081.

Manuscript Submission:
http://www.commedjournal.in/man.html
Indexed in Index Copernicus (http://journals.indexcopernicus.com/masterlist.php): ICF value:**64.29 and other data base.**

NJRCM- Volume 6. Sup. Issue 1. 2017 (001-082)

Table of Content

National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(001-006)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

PREVALENCE OF ANXIETY AND DEPRESSION IN PATIENTS SUFFERING FROM HYPERTENSION AND DIABETES MELLITUS

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Introduction: In recent years, there has been a surge in lifestyle diseases. It is heartening to note that people have become aware of their underlying problems, and are working towards management of these diseases. However, patients suffering from lifestyle diseases may have increased anxiety and depression levels in relation with long-term management of these diseases. Subsequently, mental health abnormalities will hamper management and prognosis of lifestyle diseases. This gives rise to the imperative need to identify prevalence of anxiety and depression levels among patients suffering from life-style diseases. **Objectives:** To screen for anxiety and depression levels in persons suffering from diabetes mellitus and hypertension **Materials and methods:** Convenience sampling method was used on out-patients and In-patients of a private medical college hospital. Strict inclusion and exclusion criteria were followed. Tool used –HADS (Hospital Anxiety and Depression Scale) **Results:** A total of 100 patients participated in the study. Among the 100 subjects, it was found that 45% of patients were diabetic, 30% of patients had hypertension and 25% patients had both diabetes and hypertension.Among patients with diabetes, 32.9% had mild to severe anxiety, while 29% of patients had mild to severe depression .38% of patients were had normal levels of anxiety and depression. Among patients with hypertension, 43.33% had mild to severe anxiety, while 46.66% had mild to severe depression. 10% of patients were found to have normal levels of anxiety and depression. Among patients with both diabetes and hypertension (co-morbid conditions) , 36% had mild to severe anxiety , while 56% had depression . 8% of patients were found to be normal. **Conclusion:** There is high prevalence of anxiety and depression among patients with both co-morbidities. This study indicates the need for further research in screening, diagnoses and treatment of anxiety and depression that has been grossly neglected till now.

Keywords: Depression, Anxiety, Diabetes, Hypertension, Lifestyle diseases

INTRODUCTION:

There has been a surge in lifestyle diseases in the past few years, especially diabetes mellitus and hypertension. This is due to increased urbanization, intake of more processed, packaged foods, increasingly stressful lifestyles and absence of physical activity, among others reasons.[1] Genetic causes also play a very important role.

In the Indian setting, while people have become proactive in dealing with this problem , it is disheartening to note that no thought has been given to the mental status of a person suffering from a lifestyle disease . The world mental health surveyshave shown that prevalence of anxiety and other mood disorders are somewhat higher in diabetic patients.[2]A survey of 245 404 participants from 60 countries, found respondents with depression along with one or more chronic diseases had the worst health scores of all the disease states.[3]The World mental health surveyshave also proved the co-occurrence of physical and mental health disorders.[4]

Studies have shown that Anxiety and depression are associated with unhealthy lifestyle in patients.[5] Another study has shown that anxiety and fear are the most frequent emotional disorders among patients suffering from diabetes. Depression occurs in approximately 30% of patients with diabetes.[6]Also, interview-defined depression affects approximately one

third of hypertensive patients. Effectivepatient-centered interventions for depression are needed.[7]

When it comes to mental health, stigma is still widely prevalent. A patient diagnosed with a disease is given medicines and advice on how to manage the disease. However , there is also a possibility of occurrence of mental disorders , associated with the stress of managing that particular disease .By doing this study, it is possible to prove that lifestyle diseases and psychiatric abnormalities indeed do go hand in hand.

MATERIALS AND METHODS

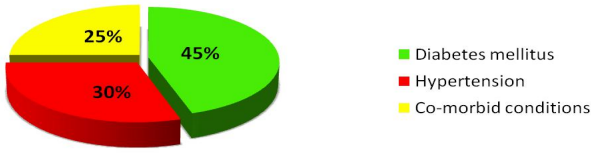
A cross-sectional research design was adopted for the study. The study was conducted in a tertiary care hospital in Chennai. Both in-patients and out-patients were included in the study. Patients who were above 18 years of age, who had either diabetes mellitus, or hypertension, or both, were selected for the study. Patients in the casualty ward**,** post-operative patients, pediatric patients, patients with type 1 diabetes and patients with known psychiatric disorders were excluded from the study. The instruments used for data collection consisted of a proforma, for the purpose of gathering demographic data, and the Hospital Anxiety and Depression Scale (HADS), a standardized, valid scale that is used for screening anxiety and depression levels in a population.[8] HADS questionnaire consists of a set of 14 questions- 7 for assessing anxiety and 7 for assessing depression. HADS has an in –built reference scale for both anxiety and depression. Patients with a score of 0-7 were considered to have normal levels of anxiety and depression. A score of 8-10 indicated slightly abnormal levels of anxiety and depression, while a score of 11-21 indicated severe levels of anxiety and depression. HADS scale is screening tool. it does not diagnose whether patient has an underlying anxiety disorder or depressive episode.

Permission for conducting the study was obtained from the Medical Superintendent of the college hospital. Oral consent was obtained from the subjects. Confidentiality of subjects was assured.A method of convenience sampling was adopted.The patients were interviewed separately. The questions were explained to them, and the patient's response was marked by the researcher. Patients were comfortable and encouraged to speak freely. Data analysis was done with the help of Microsoft excel.

RESULTS:

A total of 100 patients participated in the study. 85% of patients were in the age group of 35-65 years. Percentage of patients with income generating jobs was found to be 38%. Among the 100 subjects, it was found that 45% of patients were suffering from diabetes , 30% of patients were suffering from hypertension and 25% patients were suffering from both diabetes and hypertension.[see Fig -1]

Fig 1: Graph showing percentage of patients suffering from diabetes . hypertension , and co morbid conditions in a population of 100 patients.



Among patients with diabetes, it was found that 32.9% exceeded the HADS cut-off score for mild to severe anxiety, while 29% of patients had mild to severe depression .38% of patients were found to have normal levels of anxiety and depression.[see Fig -2]

Fig 2: Pie chart showing the prevalence of anxiety and depression among patients with diabetes according to HADS cut-off.

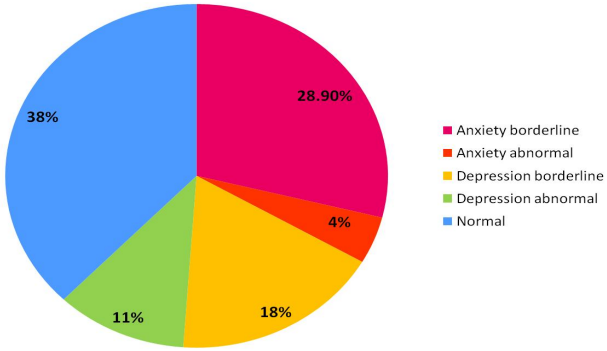


Fig 3: Bar graph showing anxiety and depression prevalence among hypertensive patients (according to HADS cut-off)

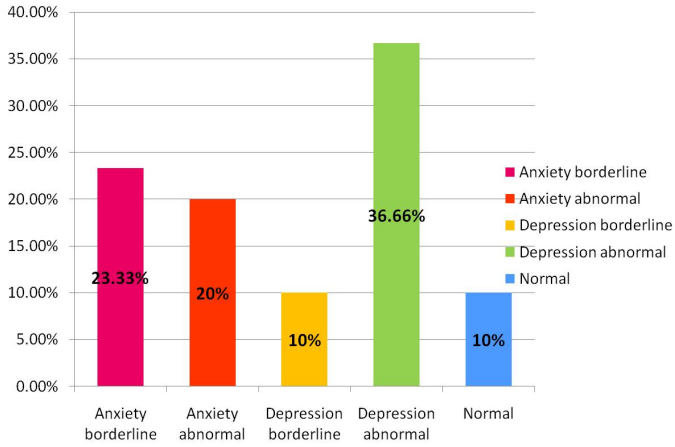
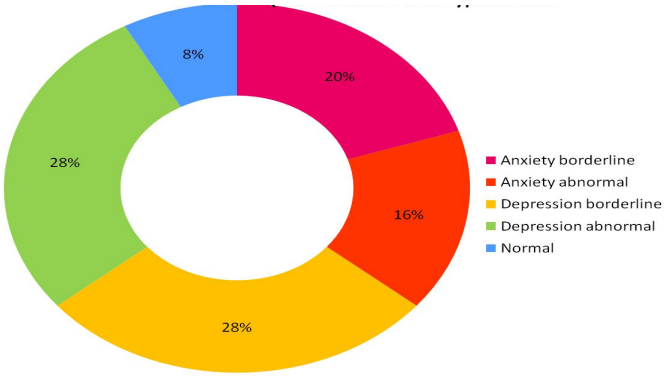


Fig 4: Anxiety and depression prevalence among patients with co-morbid conditions (both diabetes and hypertension)



Among patients with hypertension, it was found that 43.33% were above the cut-off score for mild to severe anxiety, while 46.66% exceeded the HADS score for mild to severe depression. 10% of patients were found to have normal levels of anxiety and depression.[see fig-3]

Among patients with both diabetes and hypertension (co-morbid conditions), 36% were experiencing mild to severe anxiety, while 56% exceeded the HADS cut-off score for depression and 8% of patients were found to be normal.[see Fig – 4]

DISCUSSION:

The aim of this study was to assess anxiety and depression levels in patients suffering from diabetes or hypertension, or both.In a meta-analysis, on comparing the Indian epidemiological studies to any international epidemiological studies, it is found that prevalence ratesof psychiatric disorders reported in India are very low, possibly due to genetic reasons, good family support, and spiritual beliefs.[9] Although this a good sign, yet another study has shown that most of the epidemiological studies done in India have neglected anxiety disorders. The use of poor sensitive screening instruments, single informant and systematic under- reporting has added to the discrepancy in the prevalence rate[10].

Unrecognized mental illnesses have far reaching consequences. For example, Scientists in Columbus, Ohio have found a tangible biological link between mental health status and physical health. Psychological stress causes poor wound healing in patients. Psychological stress results in increased cortisol level in the blood. This increase in cortisol slows the movement of cytokines to the wound, leading to decreased wound healing and poor recovery from illness.[11]Thus, it is safe to assume that the mental status of a patient plays a very important role in the management of a lifestyle disease.

A Medline search study has found that mental illnesses are associated with increased prevalence of chronic diseases.[12]In an Ireland study, 32% of diabetic patients exceeded the HADS cut-off score for “mild to severe” anxiety, while 22.4% exceeded the HADS cut-off for “mild to severe” depression. [13] In comparison, our study shows that 32.9% of diabetic patients have mild to severe anxiety, while 29% had mild to severe depression. In Ethiopia,a study showed that 28% of participants suffering from hypertension had anxiety. In our study, 43.33% of patients suffering from hypertension had high anxiety levels.In Lithuania, anxiety was seen in 22.4% of hypertensive patients, while depression was seen in 7.4% of hypertensive patients.[14]In our study, we found that 43.33% had anxiety, while 46.66% had depression.

Unsurprisingly, in patients with co-morbid conditions (both diabetes and hypertension),anxiety and depression levels were quite high, 36% and 56% respectively.Based on the observation from our study, it is quite clear that anxiety and depression levels (37% and 41%) among patients suffering from these lifestyle diseases are fairly high.

CONCLUSION:

Anxiety and depression levels are quite high in patients suffering from lifestyle diseases. The study reveals that anxiety and depression levels among patients suffering from these lifestyle diseases are fairly high with 37% and 41% respectively. To alleviate their suffering and provide better healthcare, medical professionals need to implement new strategies to address mental health issues among patients with life style diseases. Detailed psychiatric assessments, pharmacotherapy and psychotherapy from a psychiatrist could go a long way in improving the patient’s mental and physical status, thereby greatly improving quality of life. Further research in this regard is also necessary to identify and acknowledge the widespread neglect of anxiety and depression.

Acknowledgement:

We would like to express our sincere gratitude to patients who participated in this study. We would like to thank the management of our college, Tagore Medical College and Hospital, for their support. We would also like to thank the Departments of Community Medicine and Psychiatry, for their unwavering support and guidance.

Conflict of Interest: Nil

Source of funding: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(005-008)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Assessment of the compliance with the Cigarettes and other Tobacco Products Act(COTPA) in Guntur District

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Abstract: The WHO Framework Convention on Tobacco Control (FCTC) was a response to the global tobacco epidemic. It is an all-powerful global instrument that contains binding provisions on member countries. The FCTC provided a comprehensive direction for tobacco control at all levels and has become one of the most widely ratified treaties, covering more than 87.8% of the world's population with 175 countries as signatories. Globally, a one third of adults are regularly exposed to secondhand smoke, which is responsible for nearly 0.6 million premature deaths of non-smokers per year. Therefore the present study was planned to ascertain the level of compliance with section 4 of smoke-free law in public places of Guntur district of the Andhra Pradesh state of India. **Methodology :**A cross sectional observational study was conducted in the months of May, June and July 2016 in new capital of Andhra Pradesh Guntur district. The public places including hotels /restaurants government offices, educational institutions, healthcare facilities and transit stations and parks were surveyed. A total of 296 public places were observed from overall Guntur district. Out of which 160 places from Guntur urban area and 136 places are from 4 semi urban areas were observed after approval from Institutional ethics Committee. The study variables included were absence of smoking, absence of odour of tobacco smoke, signage display, absence of cigarette/beedi stubs and absence of smoking aids at public places. **Conclusions**: The present study it was found that the overall Compliance rate in Guntur District was 49.73% for section 4 of COTPA. Among these sites highest compliance was observed at educational institutions, hospital and govt buildings. And also identifies that smoking ban was less effective at the transit points as compared with other public places. The Compliance rate was comparatively high in urban when compared with the semi urban areas.

Key words: COTPA, Compliance, Public Places

Introduction

The WHO Framework Convention on Tobacco Control (FCTC) was a response to the global tobacco epidemic. It is an all-powerful global instrument that contains binding provisions on member countries. The FCTC provided a comprehensive direction for tobacco control at all levels and has become one of the most widely ratified treaties, covering more than 87.8% of the world's population with 175 countries as signatories. It focuses on both demand reduction strategies and supply side issues, including regulation of trade and commerce (WHO FCTC, 2003). Globally, a one third of adults are regularly exposed to secondhand smoke, which is responsible for nearly 0.6 million premature deaths of non-smokers per year.[1,2]

Tobacco control law which states that "no person shall smoke in any public place" came into force on May 1, 2004. Chandigarh, on 15 July, 2007, became not only India's first city to go smoke free but third city in the world.Till now only places in the developed countries like California, Washington, New York, Sydney, etc. were smoke free.[3]

To counter the pandemic of tobacco, even before and parallel to the FCTC, the government of India notified a comprehensive tobacco control legislation titled "The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce,

Production, Supply and Distribution) Act in 2003. Though the national law came into force on May 1, 2004 and the Treaty obligations became effective from February 27, 2005. COTPA like FCTC gives priority to protection of public health and requires effective steps for its implementation to meet different objectives (GOI, 2003).

COTPA banned smoking at public places (Section 4: came into effect in May 2004, revised rules in October 2008), sponsorship of any sport/cultural events by cigarette and other tobacco product companies (Section 5: implemented in May 2004), sale of tobacco products to and by minors (Section 6: implemented in December 2004), sale of tobacco products within 100 yards of educational institutions (Section 6b: implemented in December 2004), and provision of specified and mandatory pictorial warnings, including in imported products (Section 7: implemented on 31 May 2009). Pictorial warnings on all tobacco products were made mandatory following the Supreme Court directives (GOI, 2003).[3]

Guntur has been successful in banning smoking in public places and sale of tobacco products, especially near educational institutions during the years 2011-2013. “A fine of Rs 100 to Rs 200 is imposed for smoking in public places while selling tobacco products to minors, and advertisements invite a fine of Rs 4,000 to Rs 5,000” .In two years (2011-2013), the Guntur anti-tobacco cell’s team collected Rs 42 lakh towards fines. “The overall fine collected in the drive across the state is Rs 50 lakh with Guntur alone accounting for Rs 42 lakh,” PHFWD. The anti-tobacco drive by the Guntur police was intensive and won superintendent of police, Guntur rural, J. Satyanarayana the Special Tobacco Control Champion State Award for the year 2012. The Guntur rural police has booked more than 31,000 cases against violators and collected an amount of Rs 17 lakh.[4]

Therefore the present study was planned to ascertain the level of compliance with section 4 of smoke-free law in public places of Guntur district of the Andhra Pradesh state of India.

Methodology

A cross sectional observational study was conducted in the months of May, June and July 2016 in new capital of Andhra Pradesh Guntur district. The study areas were obtained by district authorities. From that list urban and semi urban areas of Guntur district like Guntur, Tenali, Sattenapalli, Chilakaluripeta and Narasaraopeta were selected by simple random sampling method. The public places including hotels /restaurants government offices, educational institutions, healthcare facilities and transit stations and parks were surveyed. A total of 296 public places were observed from overall Guntur district. Out of which 160 places from Guntur urban area and 136 places are from 4 semi urban areas like Tenali, Sattenapalli, Chilakaluripeta and Narasaraopet (34 from each site). The category-wise list of public places was prepared by exploring the information available from District collector, Commissioners and Municipal Health officers of the district and information available on the Guntur District website. The final list of selected sites was confirmed from the above sources of information, which formed the sample frame of the study. The number of public places from each of these urban and semi urban areas selected in such a way to ensure they represent all public places to ascertain the compliance level of COTPA.

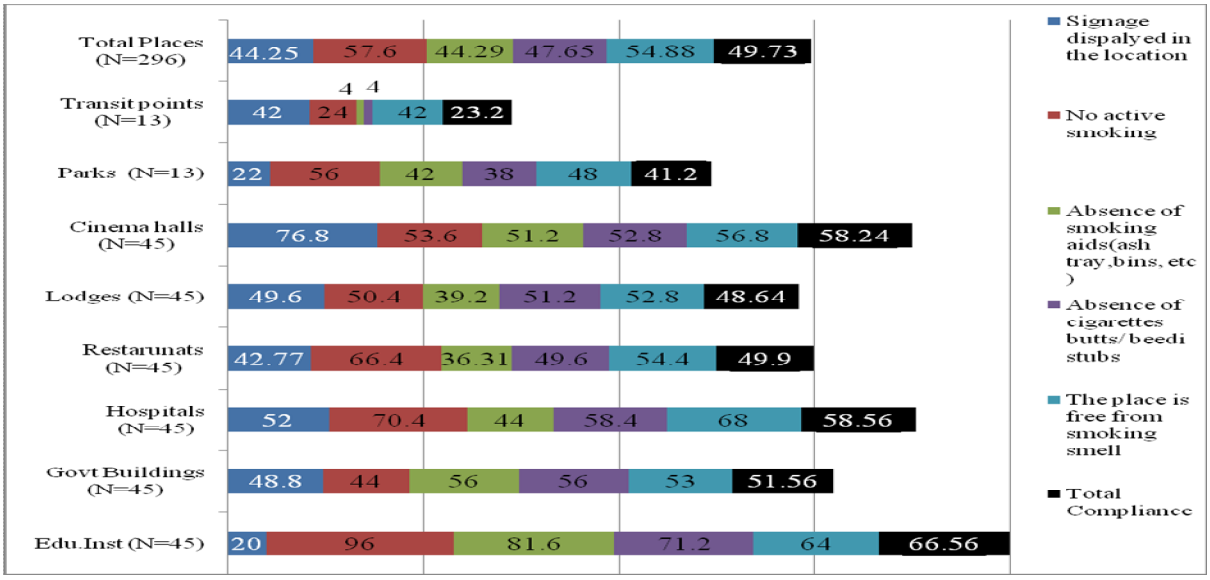
The study tool was adapted from the guide on ‘Assessing compliance with smoke-free law’ developed as a part of collaborative effort among the Campaign for Tobacco Free Kids,

Johns Hopkins Bloomberg School of Public Health and International Union against Tuberculosis and Lung Disease. This guide presents step-by-step information, beginning with the need to clarify why a compliance study might be conducted and how an assessment of public places can be done as per requirements of the law.[5] In the current study, ‘public places’ were adopted as per Indian smoke-free law (COTPA-2003 and its subsequent amendment in year 2008) which define it as any place to which the public have access, whether as of right or not, and includes auditorium, hospital buildings, railway waiting room, amusement centres, restaurants, public offices, court buildings, work places, shopping malls, cinema halls, educational institutions, libraries and public conveyances which are visited by the general public[6]. A team of trained researchers visited the public places on weekdays. The compliance observation (once per public place) was done at an unannounced timing in order to capture typical behaviour. In the government buildings, educational institutions and healthcare institutions, visits were made during the office timings (09:00–17:00), school hours (08:00–14:00) and hospital visiting hours (10:00–11:00 and 17:00–18:00), respectively.The observations at the transit sites were made during the busiest hours (17:00–20:00). The average time spent at each location varied from 20 min to half-an-hour depending on the area covered. While visiting the public place, the research investigators informed the incharge of the public place and requested their informed consent. None of the public place incharge refused to accord consent for the survey. Thereafter, the information regarding the location was recorded in the observation sheet.

The study variables included were absence of smoking, absence of odour of tobacco smoke, signage display, absence of cigarette/beedi stubs and absence of smoking aids at public

places. Total compliance for each category of public places was calculated by averaging the percentages of

Figure No.1: The Public place wise compliance in Guntur Dist

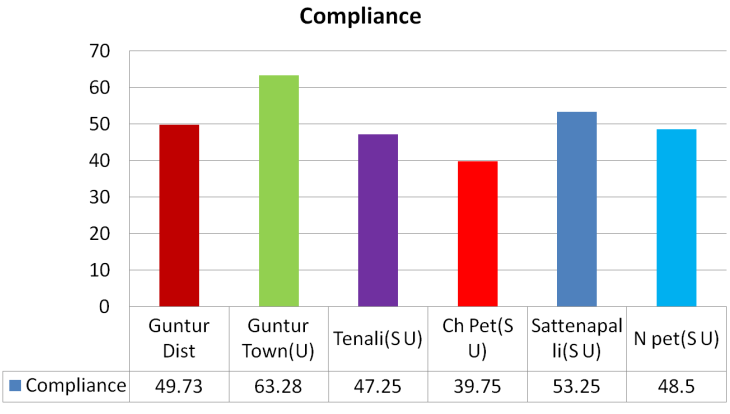


various compliance indicators. The data was collected were entered in MS-Excel and analysed using SPSS-18 statistical package. Before conducting the study, the research proposal was submitted to Institutional ethics Committee, Guntur Medical College, Guntur for approval.

Results

The present study it was found that the overall Compliance rate in Guntur District was 49.73% for section 4 of COTPA. Among these sites highest compliance was observed at educational institutions, hospital and Govt buildings (Fig No.1).

Figure No.2: Compliance in urban and semi urban areas of Guntur Dist



The Compliance rate was comparatively high in urban when compared with the semi urban areas(Fig. No.2).

Discussion

The current study identifies that smoking ban was less effective at the transit points as compared with other public places. The probable reason could be the movement of travelers from neighboring rural areas or semi urban areas where implementation of COTPA might have been poor or they may not be aware about prohibition of smoking at public places. It was also observed more smoking activity in hotel/bars/restaurants as compared with other public places such as health institutions, educational institutions and government offices. Our study findings are in similar with a study done by Barnoya et al[7] in Latin America where they reported higher levels of airborne nicotine level in bars/restaurants in comparison with educational institutions. Further, a survey conducted in New Zealand also documented low smoking activity at educational institutions.[8]The Compliance rate was comparatively high in urban when compared with the semi urban areas. Some of these studies have shown good compliance,[9–14] while others indicate poor compliance of smoke-free legislation.[15,16]The variability in the results of compliance monitoring studies could be due to differences across study jurisdictions in terms of study population, socio-religious factors and enforcement of smoke-free legislation.

Limitations

Majority of the public places like educational institutions, hospitals, cinema Halls, Govt Offices, restaurants (eateries), lodges (accommodation site), transit points and Public parks observed from only urban and few semi urban areas. The findings however may not be applicable to the whole Guntur district.

Recommendations

Smoking in educational institutions should be strictly prohibited with law because they affect social norms by limiting smoking among persons such as teachers who have influence on young students. Smoke free law requires ongoing support to sustain its compliance. There should be support from local police personnel, health care institutions, involving staff and parents in implementing the law. And also ensure the clarity about who is responsible for enforcing the law and how it will be enforced. Information education communication and behavior change communication strategies need to be

implemented to bring out the changes in the attitude of the people to achieve the objective of smoke free law. The in charge officers at transit sites and public parks need to be empowered to strictly enforce the smoke-free law. They need to be trained regarding their roles and responsibilities of implementation of the Act. The weak enforcement of provisions of COTPA demand an urgent action by the state government for informing the bureaucrats, policy makers and opinion leaders about the provisions of COTPA and ensuring its effective implementation. Intensification of ongoing tobacco control efforts in India, with special focus on the effective implementation of, and compliance with, Section 4 of COTPA through development and demonstration of effective and sustainable state- district- and local-level enforcement mechanisms is the immediate need, as has been reflected out of the results of the this study.

Acknowledgements

We thank Dept of Health & Family Welfare, AP, Hyderabad. The implementation would not have been possible if we did not have a support of Principal Secretary Health Medical & Family Welfare, AP, Hyderabad. We thank Nodal Officer, AP State Tobacco Cell, PHFWD,AP, Hyd. and AP State Tobacco Cell who provided insight and expertise that greatly assisted the study. Our sincere thanks also goes to DM&HO, Guntur and all the Municipal Commissioners, without their precious support this project is not possible. Last but not the least, we would like to thank Principal, Guntur Medical College, Guntur and Medical Superintendent, GGH, Guntur for supporting this study. Finally we thank our department staff and interns who collected the data to conduct this project.

Conflict of interest: Nil Source of funding: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(009-014)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

ASSESSMENT OF WORK-RELATED STRESS AND ITS ASSOCIATED FACTORS AMONG MANAGERIAL STAFF IN AN INDUSTRY LOCATED IN BANGALORE CITY

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Introduction: Stress acts in a synergistic manner with other Non-Communicable disease risk factors. Effects of stress on individual workers would lead to various health problems and will also impact the organization with decreased performance and productivity. Managers and supervisory staff are expected to be stressed due to target demands and attribution of responsibility of people in their span of control. Hence this study looked at the same, contributing to risk reduction in workplaces for NCDs. **Objectives**: 1. To estimate prevalence of stress among managers and supervisory staff in a selected industry. 2. To assess the level of stress and its associated factors among those identified to have stress. **Material & methods:** A cross-sectional study was conducted among 176 managers & supervisors currently employed and working, in a conveniently selected industrial unit, located in the periphery of Bangalore city. The above industry involved processes viz. production, maintenance etc. in manufacturing automobile parts. Each manager was contacted in person and information was collected using a self-administered questionnaire during their leisure time at work. Stress was assessed by using 'Tool to assess and classify work stress and associated symptoms', developed by Centre for public health, NIMHANS. **Results:** Prevalence of work-related stress was 22.2% with 95% CI (18.04 - 26.36). The prevalence of stress was high among managers (33.3%) when compared to supervisors (20.9%) & the difference in prevalence of stress between two categories was statistically significantly ($p<0.05$). Alcohol and tobacco consumption were found to be significantly associated with Work-related stress ($p<0.05$). **Conclusions:** In order to alleviate the occupational stress of staff, strategies to reduce stress, both at macro level and at micro level are to be designed & testified.

Keywords: stress, work-related stress, manager, supervisor, employee, Industry

INTRODUCTION

Stress is an evidence based risk factor for various Non-communicable and psychosomatic diseases. It acts in a synergistic manner with other NCD risk factors.[1] Work-related stress is a pattern of physiological, emotional, cognitive and behavioural reactions to some extremely taxing aspects of work content, work organization and work environment. Work-stress is believed to be increasing due to change in occupational environments. Thus effects of stress on individual workers would lead to various health problems & may also interfere with an Employee's ability to work safely, contributing to work injuries and illnesses and will also impact the organization with decreased performance and productivity.[2 3] A combination of high demands in a job and a low amount of control over the situation can lead to stress. Some of the factors related to work related stress are poor match between job demands & the capabilities, bad work organization, pressures of deadlines and so on.[4] Further, Role over load, Role authority, Role conflict, & lack of senior level support also contribute more to occupational stress.[5 6]There is a need to understand its magnitude, associated factors from the context of Indian industries because significant proportion of contribution of our population is from workforce. Hence this study was undertaken to estimate prevalence of stress and level of stress among managers and supervisory staff and to assess associated factors among those identified to have stress.

MATERIAL & METHODS:

A cross-sectional study was undertaken for 3 months, from Sep to Nov 2015, in a large-scale industry situated in the periphery of Bangalore city. From the 4 large manufacturing units situated in a common industrial complex, one of the consenting unit was selected conveniently based on logistical and practical issues. All the employees working in the above selected unit were recruited for study, of which 9 of them were excluded, since their work experience was less than 6 months in current employment. Thus study was undertaken among 176 eligible subjects. Studied unit involved manufacturing of automobile parts, which included processes viz. processing raw materials, manufacture of parts from scrap or directly melting reduced iron in furnaces, melting scrap pile, moulding, transportation, assembly, maintenance etc.

After obtaining approval from Intuitional Ethics Committee, requisite permission was obtained from factory manager. Before administering questionnaire, participants were briefed about the contents of tool & the purpose of study. Those who were on sick leave, maternity leave or on vacation were not invited to join the study. Strict confidentiality was ensured throughout the process of data collection. Each manager was contacted in person and information was collected using a self-administered questionnaire during their leisure time at work (before and after breaks). The approximate time taken for completing interview for each person was 20 minutes. Employee participation was voluntary upon signature of a formal consent.

Research Instrument: Stress was assessed by using **'Tool to assess and classify work stress and associated symptoms',** developed by Centre for public health, NIMHANS. Responses to the questions were based on workplace experiences within in past six months. Scoring ranged from a Minimum affirmative score of 0 to a maximum score of 98 and employees who scored 48 or more were considered to be stressed.

The first part composed of items pertaining to socio-demographic and work related characteristic: age, sex, marital status, education, travel time to industry, total monthly income, Job designation and work section. The second part of the instrument contained 16 questions to assess stress, covering domains viz., role in organization (Role overload, Role ambiguity), career development (Effort-reward imbalance, job security), organizational environment & support (Working conditions, relationships with peers and superiors, responsibilities, Job control, Job demand) and work life balance (finding difficult to balance work and home life). Third part included the questions on self-reported physical and mental symptoms attributed to work stress.[6 7]Whereas in fourth part, questions were adopted from WHO STEPS instrument to collect information pertaining to Behavioural and Lifestyle factors. This part contained a comprehensive questions pertaining to intensity of physical activity viz., walking, running, sports etc. and practice of relaxation techniques viz., yoga, meditation, listening to music, etc., of various grades: regularly (>4 times in a week), frequently (less than 4 days a week), occasionally (around 4-6 times in month).[8]

Statistical analyses : A descriptive analysis was performed by using means, standard deviations, minimum and maximum values of the scores attributed to continuous variables and ratios referring to categorical variables. Associations between participant characteristics and work-related stress was assessed using both unadjusted and multivariable logistic regression models. Unadjusted analysis was undertaken by using chi-square test to test the association between stress at work and other categorical variables. Spearman's correlation coefficients (non-parametric variables) was employed to elicit correlation between domains of work-stress and Stress score. Finally, a multiple logistic regression analysis was conducted, adjusting for confounding variables. A 5% level of significance was used for all performed analyses.

RESULTS:

***Descriptive statistics*: Characteristics of the studied population**

Table 1: Distribution of study subjects based on Socio-demographic factors

Particulars	No(%)	Age Group (In Yrs.)	No(%)
Job Designation		≤39	88(50)
Managers	6(15.3)	≥40	88(50)
Supervisors	33(84.6)	**Gender**	
Name of section		Male	169(96)
Electrical department	20(11.4)	Female	7(3.97)
Axile production	52(29.5)	**Income group (Rs)**	
Drawing Lab	12(6.8)	≤39000	60(34.0)
Wheel production	12(6.8)	≥40000	116(65.9)
Electrical machine maintenance system	12(6.8)	**Travel time (in min)**	
Parts assembly	11(6.3)	≤15	50(28.4)
Utility	14(8)	16-30	25(14.2)
Machine Shop	29(16.5)	31-45	79(44.8)
Others	14(8)	≥46	7(3.97)

The categorical variables of socio-demographic, occupational and lifestyles features are shown in Table 1. Most participants were male (96%), married or living with a partner (92%), and the majority had intermediate degree (74.4%) or graduation (17%). Mean age was 41 (IQR; 35 – 44) yr. The majority worked in axile

production (29.5%); supervisors (84.6%) were in higher proportion when compared to managers (15.4%). The workers performed activities mainly during day shifts. Subjects performed managerial & supervision activities which involved some physical and mainly mental tasks. Total monthly income of studied population ranged from 12000 to 1 lakh. Majority of the participants (44.8%) required travel time of 31 to 45 min to reach work-place from the place of their residence and most of the participants used their private vehicle as the mode of transport (68.1%).

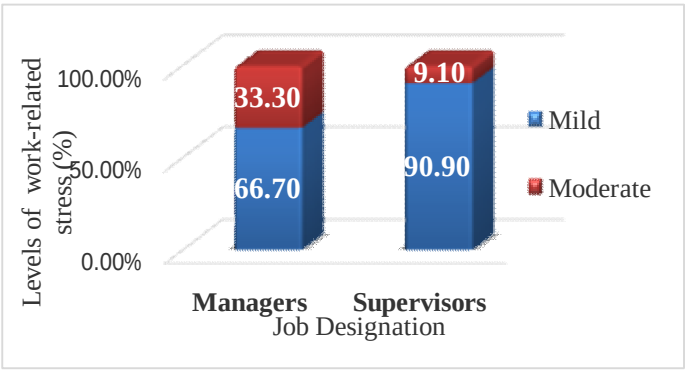
Stress at work

Prevalence of work-related stress was 22.2% (95% CI; 18.04 - 26.36) as given in Table 2, of which managers had higher prevalence of stress (33.3%) when compared to supervisors (20.9%). However, the difference between two categories was not found to be statistically significant (p=0.238). In addition, managers had higher prevalence of moderate stress (33.3%) when compared to supervisors (9.1%) as shown in Fig 1. Majority of supervisors were found to have mild stress (90.9%). None of participants were found to have severe stress. The difference in level of stress between two categories was statistically significantly (p<0.05).

Table 2: Prevalence of work-related stress according to Job-designation

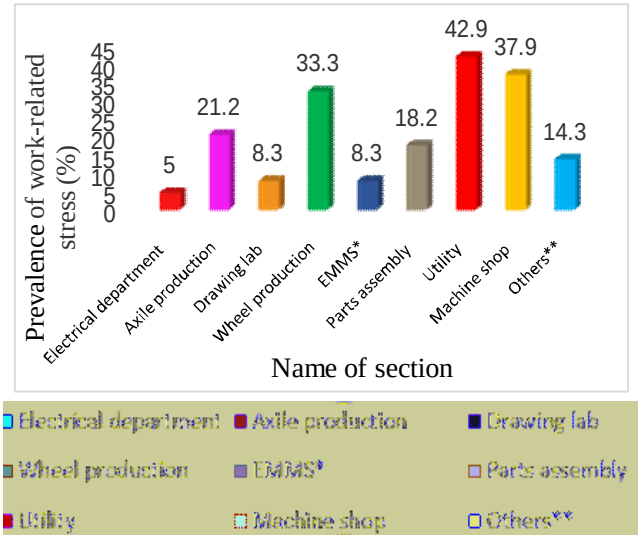
Stress	Job designation		Total
	Manager n (%)	Supervisor n (%)	n (%)
Present	6 (33.3)	33 (20.9)	39(22.2)
Absent	12 (66.7)	125 (79.1)	137 (77.8)
Total n (%)	18(100)	158(100)	176(100)

Fig 1: Levels of work-related stress according to Job-designation



Subjects working in utility and machine shop sections were observed to have higher stress prevalence i.e. 42.9% and 37.9% respectively, followed by wheel and axile production i.e. 33.3% and 21.2% respectively. Whereas rest all other sections were found to have comparatively lesser prevalence of work-stress as represented in Fig2.

Fig 2: Section wise distribution of work-related stress



*EMMS-Electrical & mechanical machine maintenance shop, **others - Road transport, machine maintenance forge, office and store.

Excessive tiredness (41%) was the most common symptom reported by study subjects followed by lack of energy (20.5%) and headache (15.4%), whereas other symptoms were reported less frequently (Table 4).

Table 4: Distribution of symptoms associated with work-related stress

SL N	Symptoms associated with stress	n (%)
1.	Excessive tiredness*	16(41)
2.	Headache	8(15.4)
3.	Lack of energy	3(20.5)
4.	Backache	3(7.7)
5.	Lack of motivation	4(7.7)
6.	Skin problems	3(10.3)
7.	Tendency to make errors at work	2(7.7)
8.	Gastric/Digestion problem	4(10.3)
9.	Increased irritability	2(5.1)
10	Increase in heart beat	1(2.6)
11	Frequent fight with colleagues	3(7.7)
12	Increased appetite	2(5.1)
13	Increased absence from work	2(5.1)
14	Disturbed sleep	4(10.3)

*The association between work-related stress and excessive tiredness was statistically significant (p<0.05).

On Univariate analysis, it was observed that subjects requiring a travel time of less than 15 min to work place, were found to be less stressed when compared to those who required travel time exceeding 46 min, and the difference between the two categories was statistically significant (p=0.008).

Table 5: Univariate and Multiple logistic regression analysis of work-related stress and associated factors

Variable name	Level	Work-stress		Univariate		Multiple logistic regression	
		Present n (%)	Absent n (%)	OR (95% CI)	P value	OR (95% CI)	P value
	<15	13(20.6)	50(79.4)	0.13(0.02-0.59)	0.008	0.40(0.06-2.3)	0.01
	16-30	7(28)	18(72)	1.32(0.56-3.09)	0.66	1.09(0.25-4.7)	0.89
	31-45	13(16.5)	66(83.5)	0.66(0.23-1.94)	0.45	0.03(0.002-0.47)	0.31
Travel time (in min)	46-60	6(66.7)	3(33.3)	1	-	1	-
Vigorous intensity physical activity	No	31(32)	66(68)	4.16(1.78-9.71)		-	
	Yes	8(10.1)	71(89.9)	1	0.07	-	
Moderate intensity physical activity	No	32(61.5)	20(38.5)	26.74(10.3-68.8)		67.87(15.6-295.1)	
	Yes	7(5.69)	117(94.4)	1	<0.001	1	<0.001
Relaxation techniques practiced	No	31(27.7)	81(72.3)	2.67 (1.14-6.25)		-	
	Yes	8(12.5)	56(87.5)	1	0.2	-	
Alcohol consumption within past 1 month	Yes	27 (30.3)	62(69.7)	2.70 (1.27-5.81)		7.12 (1.81-28.03)	
	No	12(13.8)	75(86.2)	1	0.007	1	0.005
Tobacco consumption within past 1 month	Yes	28(31.8)	60(68.2)	3.26 (1.51-7.29)		7.23(1.78-29.38)	
	No	11(12.5)	77(87.5)	1	0.002	1	0.006

Subjects, who did not perform any grade of moderate intensity physical activity were 27.7 times more likely to develop stress when compared to those who performed. Further, on multiple logistic regression analysis, after adjusting for other confounders, risk increased to 67.8 and the association was found to be statistically significant ($p< 0.001$). Similarly subjects who did not perform any grade of vigorous intensity physical activity were 4.1 times more likely to develop stress when compared to those who performed. The difference in prevalence of stress between two categories was found to be statistically significant ($p<0.01$). Further, on multiple logistic regression analysis, after adjusting for other confounders, the association between practise of vigorous intensity physical activity & work-stress was not found to be significant (shown in Table 5).

Subjects who did not practise any of the relaxation techniques were 2.6 times more likely to develop stress when compared to those who practised, although the association was significant on univariate analysis, but was found to be non-significant after adjusting for various confounders. Respective consumption of alcohol and tobacco was associated with 2.70 and 3.26 times more likelihood of developing stress at work among participants, when compared to those did not consume. The difference in prevalence of stress between two categories, among both the groups was statistically significant ($p<0.01$). For the final multivariable model, we found that travel time to work-place, moderate intensity physical activity, smoking status and alcohol consumption were significantly associated with work-related stress

DISCUSSION:

Prevalence of work-related stress in the current study was 22.2% & managers had higher stress levels (i.e. 33.30%) when compared to supervisors (i.e. 20.90%). In a similar study, carried out by Sein MM et al., using Job Content Questionnaire, in April 2009, on 200 rubber glove factory employees in central Thailand revealed; prevalence of job stress was 27.5% and Low supervisor social support & high job insecurity were found to be associated factors.[9]

A cross sectional study by Sumit prakash et al at Central Hospital, South East Central Railway (SECR), Bilaspur found a similar findings of higher prevalence of moderate stress i.e. 57%, followed by mild stress 42%, where as severe stress was experienced by only 1%, when compared to control group. Among associated factors top 5 stressors were identified to be postural discomfort (96%), noisy work place (95%), long duties with

improper rest (88%), fear of susceptibility to accidents due to drowsiness caused by fatigue & exhaustion (83%), absence of toilet in job requiring long hours of working & responsibilities of thousands of life.[10]

In 2003 a study by siong choy et al., among 34 multinational companies operating in Malaysia revealed, managers had higher prevalence of stress due to heavy workloads, higher stress levels among managers may be attributed to high job demands in the form of set forth targets & responsibility of large number of employees under their span of control, when compared to other group of employees.[11]

In a similar study conducted by Maria Carmen Martinez et al (2005) on Electric Utility workers, it was also observed that regular physical activity and income were inversely related to stress. Budden JS., used correlation analysis to investigate the relationship between occupational stress and perceived behavioral control to exercise. Results indicated that; occupational stress and perceived behavioral control to exercise were negatively related ($r=-0.16$, $p<0.01$). In addition, correlations indicated that both occupational stress and perceived behavioral control to exercise were related to exercise intention.[12]

In 2011, a study by Sunday Azagba, revealed, effects of job stress on smoking and alcohol consumption differed substantially for at least 'two types' of individuals, light and heavy users. Job stress had a positive and statistically significant impact on smoking intensity, but only for light smokers, while it had a positive and significant impact on alcohol consumption mainly for heavy drinkers. But, in the current study it was observed that, smoking and alcohol consumption had significant association with stress at work-place.[13] In 2009, kouvonen A, results highlighted smoking cessation may be less likely in workplaces with high strain and low control and also concluded, elevated odds ratios (ORs) for smoking cessation were found for the lowest vs the highest quartile of work unit level job strain (OR 1.43, 95% CI 1.17 to 1.75) and for the highest vs the lowest quartile of work unit level job control (OR 1.61, 95% CI 1.31 to 1.96). The association between job strain and smoking cessation was slightly stronger in light than in moderate/heavy smokers.[14]

Organisational domains and work-related stress: In the present study, results confirm strong influence of 5 domains; work-life balance, role in organisation, career development, organizational environment and support in experiencing occupational stress. Among all domains, work-life balance ($r=0.479$, $p<0.001$) contributed highest to work-related stress. Lack of orientation to the employees will create problem in implementing company's policies and assigned responsibility. Poor quality of work life affects efficiency and satisfaction level of the workers. This may lead to increase stress level.[13]In many researches, it has been found that if talented and professionally qualified employees are not involved in the problem solving and decision making process, then they experience stress.[15]

The experience of occupational stress due to pressure from overload, personal responsibilities and managerial role, may be due to their position in the industry and have to work up to the expectation of their seniors. It was well expected by managers and supervisors as they are to show their ability to reach higher position in the organization and consequently experience more work stress.[16]In current study, the levels of pressure from being overloaded, personal responsibilities, managerial role, mental health and pressure from life/work balance were present. The supervisory level employees were found to be experiencing more pressure which is an intrinsic to the job as the primary predictor of mental health.

The stress diathesis model essentially says that the effect of stressors on illness and wellness is not absolute, but a function of moderating factors like inner strength and coping techniques. Lack of career advancement related to the problem of high rate of employee turnover, Work overload resulting in spill over of workload at home and guilt and dissatisfaction for being less attentive to family, Risk taking and decision making consisting of fear of making mistakes and Employee morale and organizational culture related to a lack of participation in decisions affecting their work, undue blame for machine failure and difficulty in team work considering the fluid and non-involved nature of work.[17]

Work-related Stress and associated symptoms: In our study Excessive tiredness (41%) was the most common stress associated symptom, similar finding were found in study by K. Chandraiah, among IT professionals, it was observed that, employees reported the commonly experienced feelings such as frustration, pride in accomplishments, being overwhelmed, anxiety and common stress symptoms decrease in energy, anxiety, muscle tension, headache, stomach upset, negative thinking and insomnia thus both positive and negative effects were reported. Symptoms of stress must be reviewed and employer and employee options to reduce stress should be examined.[17 18]

conclusion: Prevalence of work-related stress was 22.2% (95% CI; 18.04 - 26.36). The prevalence of stress was high among managers (33.3%) when compared to supervisors (20.9%). Majority of subjects had mild stress (19.3%) while a minority of them had a moderate stress (2.8%) and further, the prevalence of moderate stress was high among managers (11.1%) when compared to supervisors (1.9%). Organisational domains viz., Role in organisation, Career development, Organisational environment, & Organisational support, emerged as significant predictors of work-stress. Among all the domains work-life balance had a strong and positive correlation with work-related stress. Thus the attitudes, feelings and emotions of employees towards organization

play a vital role in determining their performance and behaviour. Therefore the organizations need to pay increasing attention on understanding Organizational Climate, enhancing the Job Satisfaction of their employees and thus reducing the Stress at work-place.

On multiple logistic regression after adjusting other variables, it was found that; work-related stress was significantly associated with physical activity, alcohol intake and tobacco consumption. Thus smoking cessation programmes may benefit from taking into account, the modification of stressful features of work environment. In addition Yoga & relaxation intervention can reduce perceived stress and improve psychological well-being of employees.

Limitations: 1) Convenient sampling design**.** 2) Self-reported psychosocial work factors and stress symptoms were measured at only one point of time

Recommendations: Stress management programmes, both individual focused and organizational focused may be conducted. The individual focused strategies like relaxation techniques, biofeedback, meditation, exercise can be undertaken. The organizational focused strategies like adapting organization structure, selection and placement, training, altering physical and environmental job characteristics, job rotation and emphasizing health concerns can done to minimize stress.

Acknowledgement

It is a privilege and a great pleasure to express our gratitude to our esteemed Dr. S. Pruthvish (MD, DNB, PGDHHM, FISHWM, FAMS) Professor and Head, Department of Community Medicine, who provided us with all the impetus needed for the study and for their guidance, support and inspiration from initiation to the completion of the study. I thank Dr. Medha Y. Rao**,** Principal and Dean, M.S.Ramaiah Medical College and Hospitals, Bangalore for providing the opportunity and support. The research team is really thankful to Dr. N S Murthy (M.Sc., PhD, FAMS, FSMS, Research Coordinator, Division of Research and Patents, GEF), Mr. Shivaraj (M.Sc., Assistant professor and Statistician), taking their precious time out for the cause. I specially thank all faculty and Post Graduates, Dept. of community medicine, M S Ramaiah medical college, Bangalore, for their support & assistance in the study. Last but never the least thank all Chief Executives, section Engineers, Factory managers and Supervisory level employees, consenting to and participating in the study without whom the study would not have been possible.

Conflict of interest: None declared.

Participant consent: Obtained.

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(015-022)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

A Study of Sleep Pattern and Associated Factors among MBBS Students of Dr. B. R. Ambedkar Medical College, Bangalore.

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Abstract

Background: Most students staying away from home, in new environment can experience many issues. And due to demands of academic performance the lifestyle and habits tend to change. Sleep is one of the factor if not stabilized can affect the quality of work, performance and education. Medical students are a population who are at great risk. Several factors like attitude and knowledge, habits, environmental factors, etc. have been identified as factors for disturbed sleep. **Objectives:** To study the sleep pattern among MBBS Students and to assess factors influencing sleep among MBBS students. **Methodology:** An institutional based, descriptive cross sectional study conducted for period of 3 months. Study was conducted in class room at the end of teaching session, by using preformed semi-structured questionnaire after explaining aim of the study and instructions for filling the questionnaire. Information regarding habits, social history and sleep habits during past one month only was collected in order to obtain most accurate reply. The responses were entered in EpiInfo7 software and further analysis will be conducted. **Results:** Number of students included in study were 301 out of which majority were female students. Students believed minimum 6 to 8 hours of sleep is required to continue normal daily activities. Most of them sleep 7 hours per day yet some (20.5%) would not feel refreshed after sleep. the most common factors influencing sleep were observed to be disturbances due to noises (66.7%), light (54.6%) and many thoughts racing in mind before falling asleep (51%). This study also describes symptoms differentiating disturbed sleep and insomnia.

Keywords: Sleep pattern**,** quality assessment, insomnia, symptoms

INTRODUCTION:

Sleep is an important aspect of healthy living, yet ignored often. Sleep is defined as state of unconsciousness from which a person can be aroused. Sleep is essential for the normal functioning of all the systems of our body as it affects mental as well as physical health. The stages and state of human sleep are defined on the basis of Electroencephalograms.

Normal healthy adult requires sleep for 7 to 8 hours. A sleep deprived person lack concentration, behaves unpleasant and irritable and often makes mistakes in his activities. It also has a long term effect on body systems.

With the growing technologies there is increased burden among students to know about it, which requires more efforts. All these advancements and expectations has directly or indirectly influenced the pattern of sleep.

Students have developed the habit of sleeping late and less in order to satisfy the needs of academics[1]. Sleep deprivation and symptoms related to sleep disorders have not only been ignored but also inadequately understood. Almost one-third of adults report difficulty in sleep.[2]

Sleep disorders and insufficient sleep duration seem to be endemic in our contemporary society, and currently constitute a health, welfare and social problem that requires close monitoring and preventive measures[3].

Factors influencing quality of sleep is an unidentified public health issue, especially among university students.[4]

Even a small reduction in the amount of sleep, especially when accompanied with a varying sleep schedule, may cause fatigue.[5]

When College life starts, the students face lot of challenges like new schedules and environment, social obligations as well as academic stress.[8] The stress of adjusting to the changes in city, environment, food etc., may be reason for this in addition to missing of their homely atmosphere especially for hostellers according to a pilot study assessing quality of life, sleepiness and mood disorder among first year undergraduates.[9] Studies regarding factors to poor sleep experiences are rare for university students. The contributing factors should be identified and comprehensive measures should be taken to improve the quality of sleep.

The objectives of this study are to study the sleep pattern among MBBS Students and to assess factors influencing sleep among them.

MATERIALS AND METHODOLOGY:

This is an Institutional based, descriptive cross sectional study, done among MBBS students from 1st to final year. Total number of 400 students were expected to be involved, but at the time of study 301 students were involved. A semi structured questionnaire was framed by combining questions from sleep assessment questionnaire and sleep quality assessment (PSQI) in such a way that it was simple to understand and easy to answer, and questions pertaining to their general information, social history and leading questions for assessment of symptoms of sleep patterns like that of disturbed sleep and insomnia were included.

Study was conducted in the class room at the end of teaching session. The questionnaire was given to students after explaining aim of the study and instructions for filling the questionnaire. And completed forms were collected after 15 minutes. The responses were analyzed using EpiInfo7 and Microsoft Excel. Students absent for 3 consecutive visits to class could not be included and also incomplete information was not analyzed.

RESULTS:

Total of 301 students from various academic levels were included in the study, out of which 174 (57.8%) were female and 127 (42.2%) were male students. The other student details are as follows in Table 1.

It was observed that 89% of the students had habit of sleeping, either alone in separate bed or separate bedrooms (Figure 1- Distribution based on Social History).

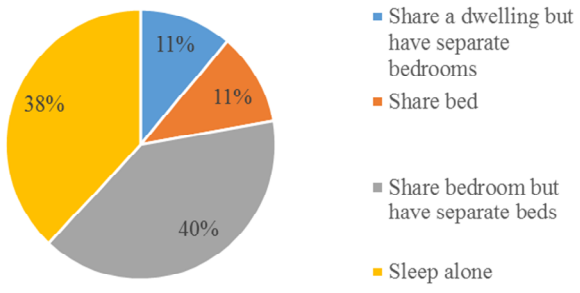
Majority of students (98%) had no health hazardous habits. Just 4 (1.3%) of the students had habit of consuming alcohol occasionally, and 2 (0.7%) students occasionally smoked tobacco. Other habits included consumption of tea or coffee during exams.

Though most of the students preferred familiar bed set up but there were some students (6%) who preferred unfamiliar bed set up.

Table 1- General Description of Subjects.

	Total	Male	Female
	(% sum of all categories)	(% out of total)	(% out of total)
Age range (in years) (301)			
<20	156	65	91
	-51.80%	-41.70%	-58.30%
21-24	135	57	78
	-45%	-42.20%	-57.80%
>25	10	5	5
	-3.30%	-50%	-50%
Academic Year (297)			
I	61	21	40
	-20.50%	-34.40%	-65.60%
II	83	42	41
	-28%	-50.60%	-49.40%
III	87	36	51
	-29.30%	-41.40%	-58.70%
IV	66	27	39
	-22.20%	-41%	-59.10%
BMI (284)			
<18.5	40	13	27
	-14.10%	-32.50%	-67.50%
18.5-24	161	65	96
	-56.70%	-40.40%	-59.60%
25-29	70	36	34
	-24.60%	-51.40%	-48.60%
>30	13	8	5
	-4.60%	-61.50%	-38.50%
Address (297)			
Local	148	73	75
	-49.80%	-49.30%	-50.70%
Hostel	149	53	96
	-50.20%	-35.60%	-64.40%

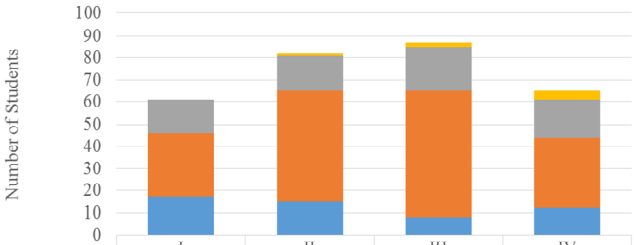
Figure 1: Distribution based on Social History



On further analysis it was observed that students had habit of sleeping on an average of 6-8 hours per day. And according to them, the minimum duration of sleep required to continue daily activities normally ranged from 1 to 10 hours, but most (55.8%) of them were aware that minimum of 6 to 8 hours of sleep is necessary to continue daily activities.

Their sleep pattern varied as shown in Figure 2.

Figure 2: Academic wise Duration of sleep



	I	II	III	IV
10-12 hours	0	1	2	4
8-10 hours	15	16	20	17
6-8 hours	29	50	57	32
<6 hours	17	15	8	12

It was observed that a total of around 40.2% (121) complained of being disturbed by noises, 51.2% (154)-light, Heat-36% (108), cold-9.3% (28); 15.6% (74) students would wake up often to use bathroom, 8.3% (25) would sweat a lot during sleep, 16% (48) would have unpleasant feeling during sleep, 6.3% (19) get choking sensation when asleep, 46% (138) had many thoughts going on in mind whilefalling asleep, 5%(14) who slept with others would disturb them, 33.5%(101) noticed very messy bed covers after sleep, 9.3% (28) were said that they snore loudwhile asleep, 25.6% (65) had trouble in falling asleep, 9.3% (18) preferred unfamiliar bed set up; 5% (15) had creeping or crawling sensation when falling asleep; 2.6% (8) felt pain; 32.2% (97) could not fall asleep without trouble; 8.3% (25) would not fall asleep no matter how hard they try; 27.2% (82) students had trouble going back to sleep once awaken in night; and about 11.6% (35) students would wake up in midnight feeling hungry.

Some of the symptoms of disturbed sleep and insomnia evaluated in this study and its proportion among students are represented in Figure 4 and Figure 5 respectively.

Considering the proportions of factors influencing sleep some major factors affecting sleep are sorted in Figure 3. (Complete discription of Factors influencing sleep and the symptoms among sudents are as shown in Table 2).

Figure 3: Major factors influencing sleep

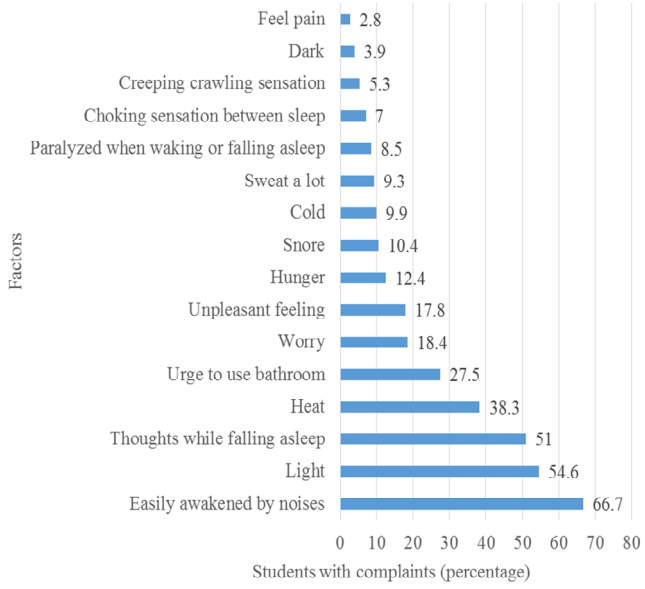
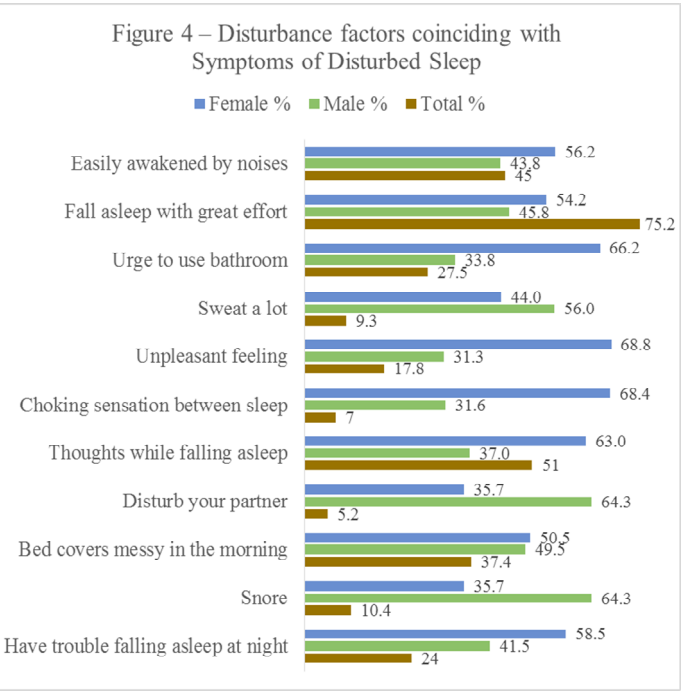


Figure 4 – Disturbance factors coinciding with Symptoms of Disturbed Sleep



In this study it was also observed that students in early academic year (Ist year) and under 20 years of age group had more sleep problems compared to other students. The details are as shown in 100% stacked bar graph in Figure 6- age-wise distribution of factors affecting sleep, Figure 7- Distribution of factors influencing sleep according to BMI of students and Figure 8- Academic year wise distribution of factors influencimg sleep pattern. (A-Factors coinciding symptoms of disturbed sleep. B-Factors coinciding symptoms of insomnia).

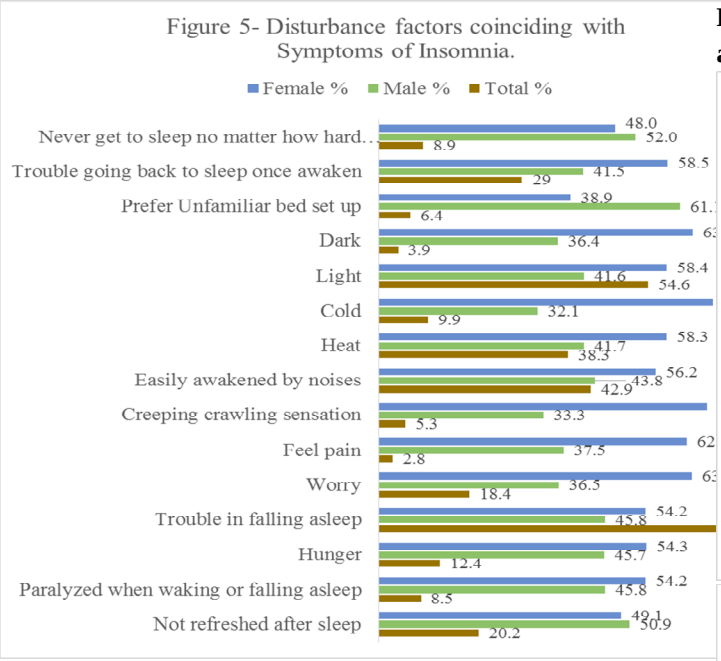
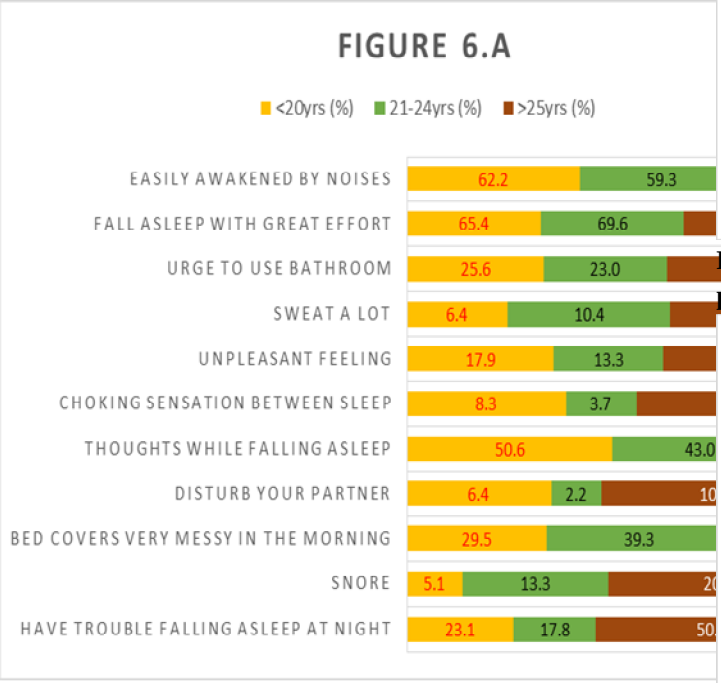


Figure 6- Age-wise distribution of Factors influencing sleep



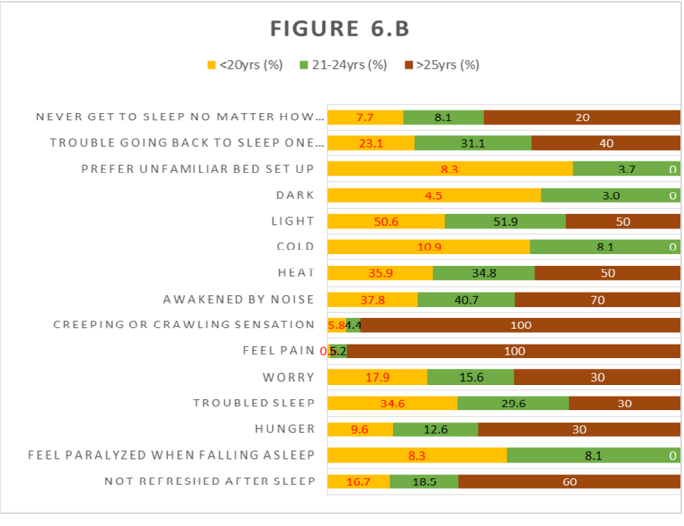
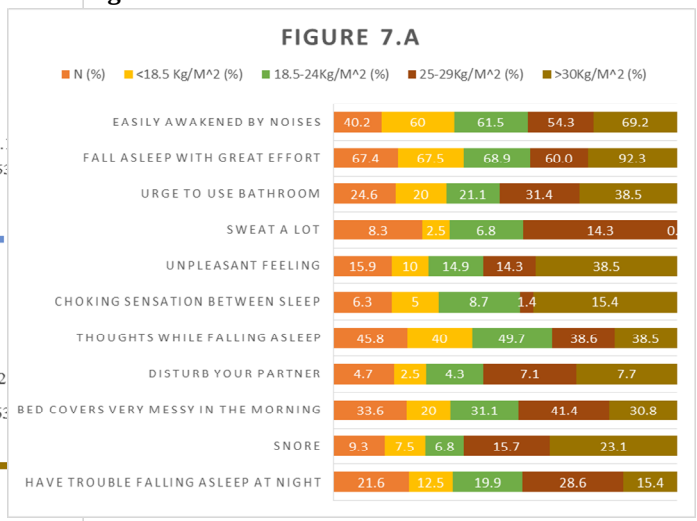


Figure 7- Distribution of factors influencing sleep according to the BMI of students.



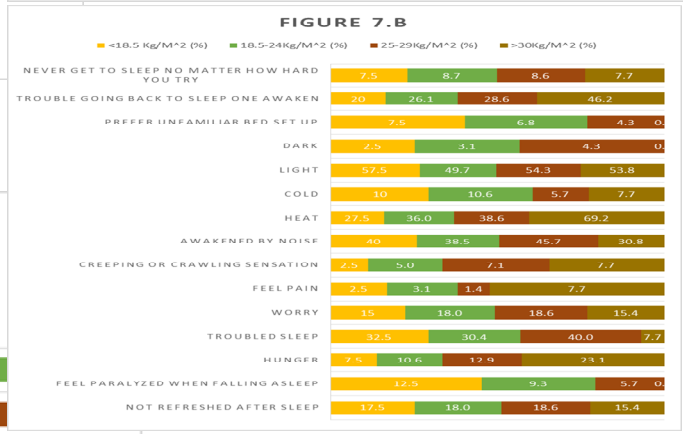
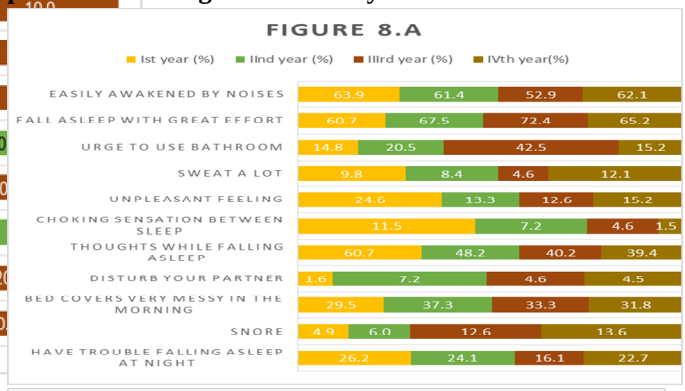


Figure 8- distribution of factors influenzing sleep pattern according to Academic year



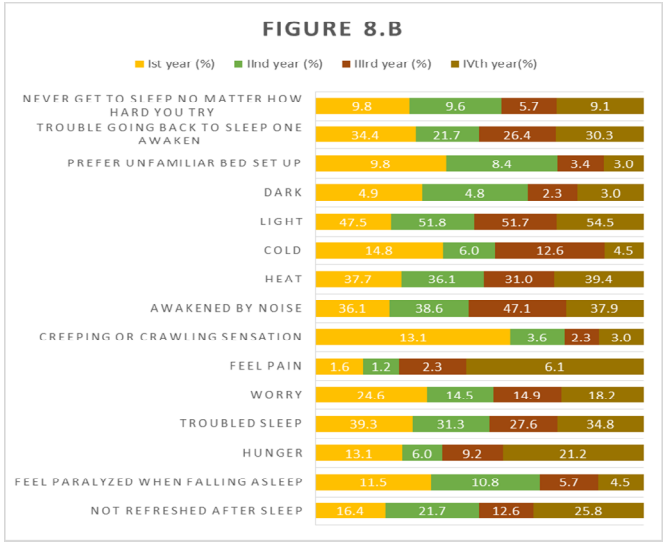


Table 2: Factors influencing sleep, signs and symptooms of disturbed sleep and insomnia.

Sl. no	Factors	Total	Age			Academic year				BMI				Address	
		N	<20	21-24	>25	I	II	III	IV	<18.5	18.5-24	25-29	>30	Hostel	Local
	Total %	**301 %**	**156 %**	**135 %**	**10 %**	**61 %**	**83 %**	**87 %**	**66 %**	**40 %**	**161 %**	**70 %**	**13 %**	**149 %**	**148 %**
1.	Have trouble falling asleep at night	65 21.6	36 23	24 18	5 50	16 26.2	20 24	14 16	15 22.7	5 12.5	32 20	20 28.6	2 15.4	35 23.5	27 18.3
2.	Snore	28 9.3	8 5	18 13.3	2 20	3 5	5 6	11 12.6	9 13.6	3 6.8	11 6.8	11 15.7	3 23	17 11.4	11 7.4
3.	Bed covers very messy in the morning	101 33.6	46 30	53 39.3	2 20	18 29.5	31 37.3	29 33.3	21 32	8 31	50 31	29 41.4	4 30.8	52 35	47 31.8
4.	Disturb your partner	14 4.7	10 6.4	3 2.2	1 10	1 1.6	6 7.2	4 4.6	3 4.5	1 2.5	7 4.4	5 7.2	1 7.7	8 5.4	6 4.1
5.	Thoughts while falling asleep	138 45.8	79 50	58 43	1 10	37 60.7	40 48.2	35 40.2	26 39.4	16 40	80 49.7	27 38.6	5 38.5	68 45.6	68 46
6.	Choking sensation between sleep	19 6.3	13 8.3	5 3.7	1 10	7 11.5	6 7.2	4 4.6	1 1.5	2 5	14 8.7	1 1.5	2 15.4	12 8	7 4.7
7.	Unpleasant feeling	48 15.9	28 18	18 13.3	2 20	15 24.6	11 13.3	11 12.7	10 15.2	4 10	24 15	10 14.3	5 38.5	26 17.5	20 13.5
8.	Sweat a lot	25 8.3	10 6.4	14 10.4	1 10	6 10	7 8.4	4 4.6	8 12	1 2.5	11 7	10 14.3	0	13 8.7	12 8
9.	Urge to use bathroom	74 24.6	40 25.6	31 23	3 30	9 14.8	17 20.5	37 42.5	10 15.2	8 20	34 21.1	22 31.4	5 38.5	40 27	33 22.3
10.	Fall asleep with great effort	203 67.4	102 65.4	94 70	7 70	37 60.7	56 67.5	63 72.4	43 65.2	27 67.5	111 69	42 60	12 92.3	98 65.8	103 70
11.	Easily awakened by noises	121 40.2	97 62.2	80 59.3	3 30	39 64	51 61.4	46 53	41 62	24 60	99 61.5	38 54.3	9 69.2	83 55.7	95 64.2
12.	Not refreshed after sleep	57 18.9	26 16.7	25 18.5	6 60	10 16.4	18 21.7	11 12.6	17 25.8	7 17.5	29 18	13 18.6	2 15.4	28 18.8	27 18.2
13.	Feel paralyzed when falling asleep	24 8	13 8.3	11 8.1	0	7 11.5	9 10.8	5 5.7	3 4.5	5 12.5	15 9.3	4 5.7	0	13 8.7	11 7.4

14.	Hunger	35 11.6	15 9.6	17 12.6	3 30	8 13.1	5 6	8 9.2	14 21.2	3 7.5	17 10.6	9 12.9	3 23.1	18 12.1	17 11.5
15.	Troubled sleep	97 32.2	54 34.6	40 29.6	3 30	24 39.3	26 31.3	24 27.6	23 34.8	13 32.5	49 30.4	28 40	1 7.7	103 69.1	42 28.4
16.	Worry	52 17.3	28 17.9	21 15.6	3 30	15 24.6	12 14.5	13 14.9	12 18.2	6 15	29 18	13 18.6	2 15.4	32 21.5	20 13.5
17.	Feel pain	8 2.7	1 0.6	7 5.2	10 100	1 1.6	1 1.2	2 2.3	4 6.1	1 2.5	5 3.1	1 1.4	1 7.7	4 2.7	4 2.7
18.	Creeping or crawling sensation	15 5	9 5.8	6 4.4	10 100	8 13.1	3 3.6	2 2.3	2 3	1 2.5	8 5	5 7.1	1 7.7	10 6.7	5 3.4
19.	Awakened by noise	121 40.2	59 37.8	55 40.7	7 70	22 36.1	32 38.6	41 47.1	25 37.9	16 40	62 38.5	32 45.7	4 30.8	66 44.3	51 34.5
20.	Heat	108 35.9	56 35.9	47 34.8	5 50	23 37.7	30 36.1	27 31	26 39.4	11 27.5	58 36	27 38.6	9 69.2	56 37.6	51 34.5
21.	Cold	28 9.3	17 10.9	11 8.1	0	9 14.8	5 6	11 12.6	3 4.5	4 10	17 10.6	4 5.7	1 7.7	14 9.4	14 9.5
22.	Light	154 51.2	79 50.6	70 51.9	5 50	29 47.5	43 51.8	45 51.7	36 54.5	23 57.5	80 49.7	38 54.3	7 53.8	68 45.6	83 56.1
23.	Dark	11 3.7	7 4.5	4 3	0	3 4.9	4 4.8	2 2.3	2 3	1 2.5	5 3.1	3 4.3	0	6 4	5 3.4
24.	Prefer Unfamiliar bed set up	18 6	13 8.3	5 3.7	0	6 9.8	7 8.4	3 3.4	2 3	3 7.5	11 6.8	3 4.3	0	7 4.7	11 7.4
25.	Trouble going back to sleep one awaken	82 27.2	36 23.1	42 31.1	4 40	21 34.4	18 21.7	23 26.4	20 30.3	8 20	42 26.1	20 28.6	6 46.2	46 30.9	35 23.6
26.	Never get to sleep no matter how hard you try	25 8.3	12 7.7	11 8.1	2 20	6 9.8	8 9.6	5 5.7	6 9.1	3 7.5	14 8.7	6 8.6	1 7.7	15 10.1	8 5.4

(Factors of SL NO: 1 to 11 are coinciding with signs and symptoms of disturbed sleep whereas factors 10 to 24 coincide with signs and symptoms of insomnia.)

DISCUSSION:

The two main stages of sleep alternate at about 90-minute interval. And any form of disturbance in this duration of 90 minutes can have consequences on activities of whole day.

Social history is one of the factor in building the pattern of sleep and most of the students have change in environment of sleep due to change in their habitat. Thus they are more prone for disturbed sleep. In this study it was observed that students staying away from home had more sleep concerns compared to those who stayed at home.

Recent surveys show that nearly 75% of university students reported occasional sleep problems such as difficulty falling asleep, sleep disturbances.[4]

A study by Gwiria, et al on the prevalence of sleep problems and its impact on sleep quality and academic performance mentions that prevalence of sleep problems is more among the female medical students.[6]

Study by Veldi M, et al. demonstrates that complaints about sleep problems are common in young medical students[7]. In this study also it was observed that more number of females and students of 1st and 2nd academic year complaint of disturbances in sleep than others.

Experimental studies have demonstrated that a shift in bedtime by two hours while maintaining the same sleep duration resulted in increased feelings of depression, difficulty in concentration and mood changes.[8]

Some experts have claimed that basic amount of sleep is around 6 hours per night[10]. In this study also students slept on an average of 6 to 8 hours, and considered that minimum of 7 hours of sleep is required to continue normal daily activities. Medical students are a unique group of young adults whose academic commitments and lifestyle can impact their sleep habits and result in sleep deprivation[8].

It is a known fact that there is activation of sensory systems during REM sleep, this is the reason individual feels unpleasant while asleep and have various signs like choking sensation, feel pain, creeping and crawling sensation, etc. Stressful events such as examinations, relationship problems and worry can also be precipitating factors for the sleep problems.

Pre-sleep cognitions, i.e., active thinking, worrying, planning, and analyzing at bedtime are significantly correlated with insomnia. Prevalence of Sleep disturbances are more common among medical students than among non-medical students and the general population[11].

Thus, among medical students, sleep disturbance is a distressing and disabling condition that can effect on quality of work and education[12]. And medical students are said to be at great risk of having bad sleep practice and hygiene due to demanding clinical and academic activities.[13]

Survey among university students using the Sleep Hygiene Awareness and Practice Scale and the Pittsburg Sleep Quality Index and showed that the practice of proper sleep habits was related positively to good sleep quality[14].

These are just some of the factors disturbing sleep pattern. If not corrected can have hazardous outcomes like insomnia, depression, parasomnia, etc.

CONCLUSION:

Despite of sleeping for an average of 7 hours per day, students would not feel refreshed and desired to sleep for longer duration. And this need could not be met sometimes even on holidays, especially among medical students.

Some students would feel hungry after a short duration of sleep, this could be due to insufficient intake of dinner. Thoughts or unpleasant feelings before or during falling asleep could be due to the stress during the day. Some students also complained of snoring aloud or choking sensation this could be due to involvement of other system of body like respiratory system or neurological condition.

In the study the most common disturbing factor were noise and light and plenty of thoughts racing in mind before falling asleep. Messy bed covers in the morning indicate rapid movements during sleep this is the indication for disturbed sleep and subconscious attempt to be comfortable while asleep.

And majority of the students sleep alone more comfortably than sharing bed with anyone else.

This study shows that students of academic year II and III had comparatively more complaints of sleep disturbance than other year students. And also students below 20 years of age had more complaints of disturbed sleep than others.

This study also shows that staying away from home is associated with more incidence of disturbed sleep.

RECOMMENDATIONS:

Academic requirements cannot be modified easily but lifestyle changes can improve quality of sleep and prevent its hazardous consequences. For students it is important to maintain sleep hygiene. Some tips to improve quality of sleep among students of MBBS group are:

1. Get a full night's sleep on a regular basis.
2. Get up at the same time every morning.
3. Avoid taking naps during daytime.
4. Keep a regular schedule. (Regular times for meals, medications, chores, and other activities).
5. Avoid using mobile or other gadgets before going to sleep.
6. Do not go to bed hungry, but don't eat a big meal near bedtime either.
7. Do not drink plenty of water after 6 P.M, especially near bedtime.
8. Try to get rid of worries by discussing with close people (friends, relatives)
9. Try to get rid of disturbances by discussing with family members.
10. Make the surroundings comfortable before going to sleep. (Level of luminosity, speed of fan or air cooler).

LIMITATIONS: Not all the questions were answered by all the students so the incomplete data is not utilized.

Conflict of interest: None
Source of funding; Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(023-027)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

IMPACT OF DEPRESSION ON QUALITY OF LIFE IN PATIENTS WITH TYPE II DIABETES MELLITUS

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Background: Diabetes Mellitus is a frequently encountered chronic metabolic disease with various complications throughout its course, which causes severe disability in an indivigual life. It has been well documented that depression is higher in diabetic and co-morbid depression causes further deterioation in Quality of Life (QOL) in diabetic patients. **Aims:** 1) To assess the prevalence of depression among diagnosed patient with type- II Diabetes Mellitus. 2) To study the impact of depression on quality of life in Type II Diabetes Mellitus patients. **Settings and Design:** Cross sectional study with one to one interview. The study was conducted in Urban Health Training Center, Maduranthagam which is the field practice area of Department of Community Medicine, Melmaruvathur Adhiparasakthi Institute of Medical Sciences. **Materials and Methods:** A total of 200 Type II Diabetes Mellitus patients was included in the study. A pre-tested structured questionnaire was used to collect information on identification data and socio-demographic characteristics. Depression was assessed by using standard Geriatric depression scale and further the quality of life was measured using Quality of Life Enjoyment and Satisfaction Questionnaire Short form (QLES–Q-SF). **Statistical analysis:** Data was analysed using SPSS version - 22. **Results:** Among the 200 diabetic patients 65% (N = 130) met the diagnostic criteria for depression. Among the depressed group majority (77.7%) suffered severe depression. QLESQ- SF total and each item scores was significantly lower in depressed group than in the non-depressed group. There was significant (negative) correlation of Geriatric depression scale scores and age with QLESQ- SF total scores and percentage maximum score. **Conclusion:** Our study demonstated that the presence of depression in Type II Diabetes Mellitus further deteriotes the Quality of life of those patients. Therefore identifying and treating depression among diabetic patients at an early stage would have a beneficial effect on their Quality of Life.

Key words: Type- II Diabetes Mellitus, depression, Quality of life, periurban, prevalence

INTRODUCTION

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia.[1] It is a chronic disease that causes short and long term complications. According to World Health Organization (WHO)[2] globally, an estimated 422 million adults are living with Diabetes Mellitus. This is projected to almost double by 2030.[3] Type 2 Diabetes makes up about 85-90% of all cases.[4,5] It is well documented that the prevalence of depression among patient with diabetes is higher than among the general population.[6] A recent meta-analysis of 42 studies concluded that the presence of diabetes doubled the odds of co-morbid depressive disorder.[6] It has been well documented that co-morbid depression causes further deterioration in Quality of Life (QoL) in diabetic patients. Several studies have shown that QoL in diabetes is decreased as compared to individuals without diabetes.[7-9] Furthermore, the presence of diabetic complications has an additional negative impact on QoL.[7-10] Therefore, screening for depression among diabetic patients is important in different races and ethnicities. Depression is often reversible with prompt recognition and appropriate treatment. However, if left untreated, depression may result in physical, cognitive, functional, and social impairment, as well as decreased quality of life, delayed recovery from medical illness and surgery, increased health care utilization and suicide. This study was undertaken to overcome the scarcity of research about depression among diabetic patients in our

settings. The knowledge gained from this study will assist healthcare practitioners to better understand depression in diabetes mellitus and design treatments that address the metabolic and psychological needs of affected individuals to improve overall health outcomes. The objective of this study is to assess the prevalence of Depression among diagnosed patient with Type II Diabetes Mellitus and to study the impact of depression on Quality of life in Type II Diabetes Mellitus patients.

MATERIALS AND METHODS

Study Design: Cross-sectional study.
Study Duration: The study was conducted from January 2014- December 2014.
Study Area: The study was conducted in Urban Health Training Center, Maduranthagam which is the field practice area of Department of Community Medicine, Melmaruvathur Adhiparasakthi Institute of medical Sciences (MAPIMS)
Study Population: Special Non communicable Disease clinics are being run at the Urban Health Training Center, Maduranthagam of MAPIMS. All diagnosed patient with Type II diabetes mellitus aged ≥ 40 visiting was included.
Inclusion Criteria:

i) Participants agreeing to participate and providing consent
ii) Participants whose age is more than 40 years
iii) Patients with Type II Diabetes Mellitus.

Exclusion criteria:

Persons suffering from,

i) Type I diabetes patients
ii) Gestational diabetes
iii) Prior diagnosis of anxiety and/or depression or any other psychotic disorders
iv) Prior history of intake of drugs (except for the drugs used for the management of diabetes) which is known to cause depression.

Sample Size and Sampling Method: A sample size of 204 was calculated assuming a prevalence of 15%[11] from previous study for the coexisting depression in Diabetes patients at 95% confidence interval and a sample error of 5%. The formula used for calculation was $4PQ/l^2$. A total sample size of 200 patients with Type II Diabetes mellitus patients was covered. Convenience sampling was used to draw the sample for the study within the study period.

Technique and Tools: A pre-tested structured questionnaire was administered to collect information on identification data and socio-demographic characteristics. Depression will be assessed by using standard Geriatric depression scale[12] and further the Quality of life will be measured by using Quality of Life Enjoyment and Satisfaction Questionnaire (Q‑LES–Q).[13]

Procedure: The Dean of the college was contacted and the purpose of the study was explained to them in detail. Totally, 200 Type II Diabetes mellitus patients was studied. Initially, the questionnaire was pretested among 10 patients with Type II diabetes Mellitus in another center. Pretesting was done among patients in the same age brackets, in a similar setting in another center to screen for potential problems in the questionnaire after which the questionnaire will be finalized.

The purpose of the study and the contents of the form was explained to participants in detail. The pre-tested questionnaire and detailed consent form will be given individually to all the participants in the study. One to one interview was conducted among all the 200 patients with Type II Diabetes mellitus.

Statistical Analysis: Data was analysed using SPSS version - 22. Descriptive statistics, frequency, means (SD) etc was estimated as appropriate. Chi -square test and t-test was used to find the association between the attributes. Pearson's correlation analysis was used to assess the relationship between Quality of life and depression among Type II diabetes mellitus patients.

RESULTS

Table 1: The socio demographic data of the depressed and non-depressed group

Characteristics	Depressed (n = 130)	Non-Depressed (n = 70)	p-value
Age	67.34 ±	64.27 ± 4.851	t = 3.9051, p = 0.0001
Gender	**N (%)**	**N (%)**	
Male	58 44.6)	41 (58.6)	χ^2 = 3.545, p = 0.0597
Female	72 (55.4)	29 (41.4)	
Religion			
Hindu	127 (97.7)	65 (92.9)	χ^2 = 2.770 p = 0.1310
Muslim	3 (2.3)	5 (7.1)	
Literacy Status			
Illiterate	81 (62.3)	39 (55.7)	χ^2 = 0.824 p = 0.369
Literate	49 (37.7)	31 (44.3)	
Occupation			
Not working	107 (82.3)	56 (80.0)	χ^2 = 0.161 p = 0.706
Working	23 (17.7)	14 (20.0)	$d_{f=1}$
Family Type			
Joint	65 (50)	32 (45.7)	χ^2 = 0.335 p = 0.657
Nuclear	65 (50)	38 (54.3)	
Comorbidity			
Absent	14 (10.8)	5 (7.1)	χ^2 = 0.696 p = 0.460
Present	116 (89.2)	65 (92.9)	

Table 1 shows the socio-demographic characteristics of depressed and non-depressed group. Mean age of the depressed group was 67.34±5.53 years and that of the non-depressed group was 64.27±4.85 years. The difference in the age of both groups was statistically

Table 3: QLESQ-SF item scores of the depressed and non-depressed groups QLESQ-SF

Questionnaire	Depressed (N=130)	Non-depressed (N=70)	t - statistics	p – value
Physical Health	2.61 ± 0.55	3.17 ± 0 .72	6.1379	0.0001*
Mood	2.55 ± 0.58	3.56 ± 0 .69	10.8873	0.0001*
Work	2.45 ± 0.67	3.07 ± 0.76	5.919	0.0001*
Household	2.46 ± 0.78	3.27 ± 0.85	6.7389	0.0001*
Social Relation	2.60 ± 0.77	3.71 ± 0.66	10.1562	0.0001*
Family Relation	2.62 ± 0.78	3.79 ± 0.65	10.6628	0.0001*
Leisure Time	2.51 ± 0.67	3.27 ± 0.77	7.2028	0.0001*
Daily Life	2.62 ± 0.80	3.57 ± 0.79	8.0415	0.0001*
Sexual Drive	1.71 ± 0.69	2.06 ± 0.899	3.0642	0.0025*
Economic Status	2.39 ± 0.66	3.07 ± 0.666	6.8939	0.0001*
Housing	2.52 ± 0.62	3.21 ± 0.849	6.5451	0.0001*
Get Around	2.62 ± 0.76	3.41 ± 0.860	6.687	0.0001*
Vision	2.42 ± 0.78	3.36 ± 0.817	7.9562	0.0001*
Well Being	2.51 ± 0.60	3.53 ± 0.583	11.5804	0.0001*
QLESQ-PER (% Maximum Scores)	36.74 ± 8.59	57.24 ± 11.26	14.3965	0.0001*

**p- value < 0.05 was considered as significant*

Table 4: Correlation matrix between variables

	Depression total Score	Age	Raw score	Maximum score
Raw score				
Pearson Correlation	-0.451	-0.141	1	1
Sig. (2-tailed)	0.000**	0.11	-	0.000**
N	130	130	130	130
Maximum score				
Pearson Correlation	-0.451	-0.141	1	1
Sig. (2-tailed)	0.000**	0.11	0.000**	-
N	130	130	130	130
Depression total score				
Pearson Correlation	1	0.134	-0.451	-0.451
Sig. (2-tailed)	-	0.128	0.000**	0.000**
N	130	130	130	130
Age				
Pearson Correlation	0.134	1	-0.141	-0.141
Sig. (2-tailed)	0.128	-	0.11	0.11
N	130	130	130	130

**** Correlation is significant at 0.01 level (2-tailed)**

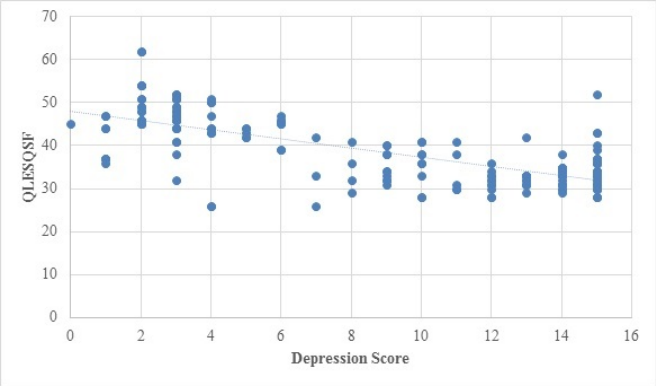
significant (t=3.90, *P*<0.05). Among the depressed group, 72(55.4%) were females and 58(44.6%) were males. Among the depressed group 127 patients were hindu and 3 were muslim and, among the non-depressed group, 65 patients were Hindu and 5 were Muslim by religion(χ =2.77, *P*=0.13). 62.3% were illiterates among the depressed group and 55.7 % among the non-depressed group. The difference was not statistically significant (χ = 0.82, *P*=0.36). Among the depressed group, 107(82.3) patients were not working and 23(17.7) were working among the non-depressed group, 56(80%) patients were not working and 14(20%) belonged to working group (χ =0.16, *P*=0.70). Among the depressed group, 65 patients belonged to a nuclear family and 65 belonged to a joint family and, among the non-depressed group, 32 patients were from nuclear family and 38 belonged to a joint family (χ =0.335, *P*=0.65). There were no statistically significant differences between the family type and religion among depressive and non-depressive groups.

Table 2, shows the severity of depression of study population. Among the total 200 participants, 130 patients (males:58, females:72) met the standard Geriatric depression scale diagnostic criteria for depressive episodes. Among the depressed group, 22.3% (*N*=29) suffered from mild depression and another 77.7% (N=101) had severe depression.

Table 2: Grading of Depression

Severity	Count (N)	Percentage (%)
Mild depression	29	22.3
Severe depression	101	77.7
Total	130	65

Figure 1: Relationship between Depression score and QLESQSF



To study the Quality of life (QoL), raw scores on QLESQ-SF were converted to percentage maximum scores (QLESPER). The evaluation of QLESQ-SF life quality scale showed that all items and total score of the scale were significantly lower in the depressed group compared to non-depressed group

The relationships between QLESQ-SF total scores and percentage maximum scores, depression scores, age group was investigated. (Table 4) There was a significant negative moderate correlation between depression score and QLESQ-SF percentage maximum scores

(r = - 0.451, *P*<0.01). Age group was also negatively correlated with QLESQ-SF percentage maximum scores (r = - 0.141, *P = 0.110*).

Figure 1 is the graphic presentation of the relationship between depression scores and QLESQ-SF scores. There is a negative correlation between depression scores and QLESQ-SF.

DISCUSSION

The present study aimed to assess the prevalence of major depressive disorder and to evaluate its impact on QOL. The result from the present study shows the rate of depression to be 65% in Type II Diabetes patient. Among the depressed group, majority (77.7%) was moderately depressed. Age, gender, religion, and family type are not the contributing factors for the development of depression in diabetic patient.

However, worldwide estimates of depression prevalence among individuals with diabetes appear to vary by

diabetes type and among developed and developing nations. Li *et al.*,[14] found that among the U.S. adults aged ±18 years, the age adjusted rate of depression was 8.3% (95% CI 7.3-9.3), ranging from 2.0% to 28.8% among the 50 states. Asghar *et al*., found evidence of depressive symptoms in 29% of males and 30.5% of females with newly diagnosed diabetes in rural Bangladesh.[15] Similarly, Sotiropoulos *et al*., found 33.4% of a cohort of Greek adults with Type 2 diabetes.[16] Zahid *et al.*,[11] found a more modest depression prevalence (14.7%) among patients with diabetes. However, Khamseh *et al.*, found major depression in 71.8% of a sample of 206 Iranian patients with type 1 and type II diabetes, rural area in Pakistan.[17] which is higher than in this study. Mier *et al*., found that the rate of depression among panic patients was 40.5% in north eastern Mexico.[18]

According to Tattersall *et al*., diabetes can have considerable consequences on the quality of everyday life, with possible limitations in physical activity, social life, family relations, and leisure activities.[19] It is being increasingly recognized that the impact of chronic illnesses must be assessed in terms of their influence on QoL in addition to more traditional measures of medical outcome. QoL in people with diabetes is generally accepted as an important aspect of the outcome of treatment. In this study, taking into account overall QoL, depressive patients had significantly lower QLESQ-SF, total and each item score. These findings are consistent with that in other studies that indicate that depression may affect the QoL in patients with chronic diseases. According to Wells et al, patients with depression and DM rate themselves lower on all domains than those with DM alone.[20]

Depression affects the highest order capacities of the human organism, including motivation, energy, concentration, and self-confidence. Depressed patients have a worse QoL than general medical patients within the same clinics with common diseases such as hypertension, arthritis, diabetes, and heart disease according to Egede *et al.*,[21] Taken together, these studies and our findings provide strong evidence that presence of co-morbid depression decreased their Quality of life. In addition Unützer *et al*., showed that patients with co-morbid depression with chronic medical illnesses had additive decrements in quality adjusted life years.[22]

According to Iliffe *et al*.,[23] Jaffe *et al*.,[24] and Laukkanen *et al*.,[25] the degree of deterioration in QoL is proportional to the severity of depressive symptoms. This study also shows that there were negative correlations between Depressive scores and QLESQ-SF scores in Diabetic patients which supports another study.[26] This supports the view that patients with poor control of blood glucose level have worse QoL.

CONCLUSION

Diabetes is one of the most complex chronic medical conditions that places serious constraints on patients' activities. Our study demonstated that the presence of depression in Type II Diabetes Mellitus further deteriotes the Quality of life of those patients. This finding and the increased prevalence of depression in diabetes suggest that it may be useful to examine the relative effects of disease severity and co-morbid depression on QoL in patients with diabetes. The foremost goals of therapy are to normalize metabolic parameters and the QoL. Diagnosing and treating depression may be essential to improve the QoL in type II DM population. Therefore identifying and treating depression among diabetic patients at an early stage would have a beneficial effect on their Quality of Life.

Interest of conflict and source of funding: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(028-032)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Breast Cancer Risk and Screening practices among Health care workers in a tertiary care centre, Trivandrum, South India.

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Background: Breast cancer is the leading cause of cancer death among women all over the world. Incidence rates are high in Kerala; southernmost state of India. Even though we have facilities for screening and proper treatment; large population, including health care workers, present with advanced disease."A-J(Augustine-Jose)model" is a mathematical tool developed similar to Gail Model in predicting women's lifetime risk for developing breast cancer.**Objectives:** To identify women at high risk for developing breast cancer using A-J model breast cancer risk assessment tool and to assess the knowledge regarding breast cancer and perceptions and practice of screening among health workers of a tertiary level Medical College, in South Kerala. **Methods:** A cross sectional study was conducted among 210 health care workers aged 30 years and above using a semi structured questionnaire. Data was collected from Doctors, Nurses and class IV workers. **Results:** There were 70 study participants in each group and the mean age was 38 years.Even though disparities in knowledge is observed as expected, screening practice was noticeably low among all groups.Risk factors for breast cancers were more among doctors than other health care workers. According to this tool 10% participants are at higher risk for developing breast cancer and 8% are at very high risk compared to the women in their respective age groups. Lack of time and laziness are the commonly reported reasons for the poor practice. **Conclusion:** This risk score would enhance screening practices and thus help in early detection of breast cancer and save theirlives.

Keywords: breast cancer, A-J model breast cancer risk assessment tool , health care workers, risk factors

Introduction

Breast cancer is the leading cause of cancer among women all over the world with an average annual incidence of 43.3 per 100000 women according to the world cancer report 2014(1).Breast Cancer (BC) rates (age standardised incidence) are increasing in India and it is found to be 25.8 per 100,000 females. The figures for kerala state of India is 30.5 in urban area and 19.8 in rural areas with Trivandrum having the highest Incidence rates. According to the study conducted at regional cancer center , Trivandrum BC accounts for 31% of all female cancers in Trivandrum and 35% patients are less than 50 years old. Crude Rate (CR) of breast cancer increased from 39 to 55.4 per lakh women in 2016. Age specific rates (ASR) increased from 35.2 to 43.4 CR will be 80 by 2019- 2020 in Trivandrum(2).

The role of reproductive factors in the etiology of breast cancer has been recognized for more than 100 years, beginning with the observation by Ramazzini of a high incidence of the disease in nuns. It is now well established that nulliparous women have approximately twice the risk of parous women. Women with early age at first childbirth are at lowest risk. The reduced risk associated with parity may be further enhanced if a woman decides to breastfeed. However, protection is likely dependent on longer periods of breastfeeding. Menstrual factors are also predictive of risk; early age at menarche and later age at natural menopause are associated with the highest risks,

presumably reflecting in part an influence of ovulatory activity(1). Menstrual and reproductive factors are major risk factors and can be used to estimate individual risks via the Gail Model Breast Cancer Risk Assessment Tool (http://www.cancer.gov/bcrisktool/) and other risk prediction models(3).

Many studies have examined the role of health workers such as doctors, nurses and staffs in promoting breast cancer screening. Even when female health workers are not directly involved in referring patients for breast cancer screening, they play an important role in creating an environment supportive of screening behaviors by offering positive role models. Studies from developed countries show that attitude and orientation of healthcare providers are important determinants of use of breast screening program(4). It has also been observed that for health workers to be effective as educators they must posses the appropriate knowledge, attitude and beliefs concerning the health behavior being promoted . Therefore there is a need for information and enlightenment, if patients are to present early in hospital. The practice of any of these screening methods is dependent on the awareness about breast cancer. If this knowledge is poor among those who should teach others, there will be difficulty promoting this life saving methods.

For early breast cancer detection, American Cancer Society recommends that women aged 40 years and older should have a mammogram every year. Regarding clinical breast examination (CBE), it recommends that women in their 20s and 30s should have CBE a as part of a periodic (regular) health examination by a health professional, preferably every 3 years. Starting at age 40, women should have a CBE by a health professional every year. In resource-poor settings, doing breast self-examination (BSE) monthly is an option for women in their 20s(5).

Only 9% women present with Stage I disease (RCC Trivandrum) of BC including the health care workers and the Screening Practice for BC is very low(2). Reluctance, laziness and lack of time among health care providers and Lack of awareness regarding the importance of screening at regular intervals are the most common barriers for screening practice. This study was designed to evaluate the risk among the health care workers and their knowledge, perception and practice of breast cancer screening among female health workers in a tertiary care center, Trivandrum, south India.

In this study - the risk score was calculated using “A-J (Augustine- Jose)Model” a Mathematical tool developed to calculate a woman’s lifetime risk of developing breast cancer(6).It uses the following 7 parameters: 1. Current Age 2. Age at Menarche 3. Age at first live birth 4. Number of Live births 5. History of breast feeding, 6. Number of First degree relatives with breast cancer, and 7. Total number of previous breast biopsies. The “A-J (Augustine- Jose) model” calculates a Breast Cancer risk score that helps to determine the type and frequency of screening required. Higher scores indicate higher risk of developing breast cancer, and the need to undergo frequent screening for early detection. Low Scores do not guarantee absence of risk and routine screening is recommended. The tool is most accurate for women 30 years andabove.

Objectives of the present study were to study the usefulness of A-J model breast cancer risk assessment tool in identifying women at high risk for developing breast cancer and to motivate them for regular screening and to assess the knowledge regarding breast cancer, perceptions and practice of screening among health care workers of a tertiary care centre (Sree Gokulam Medical College and Research Foundation, Trivandrum, Kerala) in South India.

MATERIALS AND METHODS

Study type and setting: A Cross-sectional hospital based study was conducted at Sree Gokulam Medical College & Research Foundation, Venjaramoodu, Trivandrum, south India . Study population :By convenient sampling method 210 Female health care workers aged 30years and above including Doctors, Nurses and class IV workers are taken. Study was held for a period of 2 months, from December 2016 to January 2017 . Data Collection: The data were obtained through the face-to-face interview using a Semi Structured questionnaire to obtain the demographic and risk factors including, Age, Age at menarche ,marital status , No of live births, Age at first live birth, Total duration of breast feeding, Number of previous breast biopsies, Number of first degree relatives with breast cancer. Informed verbal consent was taken from each participant. Participants asked whether they did any type of screening practice ,if not ask about the barriers. A-J Model Breast Cancer Risk Assessment Tool (Snehita Calculator): A-J Model is a logistic regression model based on seven known risk factors of breast cancer (mentioned above) in predicting women’s lifetime risk for developing breast cancer. This model is used to do breast cancer risk assessment in the calculator made by Snehita Women’s health foundation. It helps to increase ones perception of their own risk which could be a motivation for screening. Data analysis: After collecting all Data, data entry was performed in Microsoft-Excel and analysis was done using IBM SPSS statistics for windows, version 20. Ethical considerations: Approval was taken from the institutional ethics committee of SGMC&RF, Trivandrum before conducting the study. Informed consent was obtained from the participants before interviewing them.

Results and Discussion :

Out of 210 female health care workers (age group>30 years),Doctors,Nurses and Class IV workers (number 70 each)are included in this study. Table:1 shows socio

demographic characteristics of the study participants, religion ,marital status, financial background

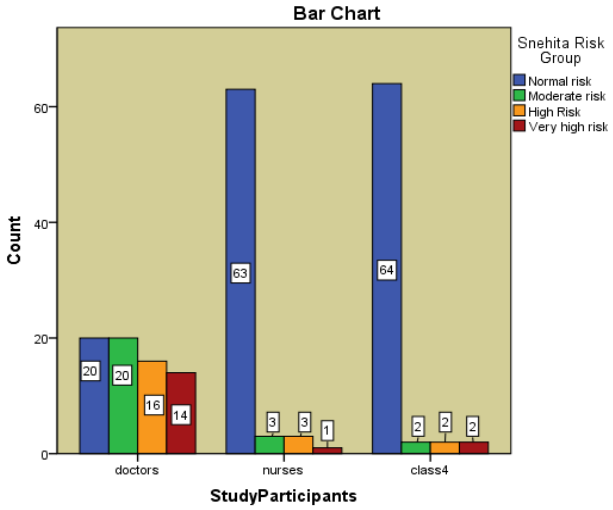
Table 1: Known risk factors of breast cancer among respondents.

Known risk factors	Mean	Frequency(percentage)
1. Age (N=210)	38years	-
2. Age atmenarche(N=210)	13.38years	
3. Number of livebirths(N=210)		0 - 33(15.7%) 1 - 69(38.9%) 2 - 98(55.3%) 3 - 10(5.6%)
4. Age at 1st childbirth(N=177)	23.94years	0
5. Duration ofbreast feeding(N=177)	2.05years	-
6. Family history ofbreast cancer(N=210)	-	No history -186(88.6%) Positive family history-
7. History of previousbreast biopsy(N=210)		Yes- 4(1.96%),No-206(98.1%)

The distributions of the common risk factors of breast cancer are given in Table 1. The known risk factors of the breast cancers are(7)(8) . 1.Increasing Age 2. Early age at Menarche 3. Increasing age at first live birth 4. Number of Live births 5. History of breast feeding, 6. Number of First degree relatives with breast cancer,(9) and 7. Total number of previous breast biopsies (10).Marriage at an early age, early and multiple childbirths, and breastfeeding of all children for a long period of time is the norm in most Indian societies. However, the urban educated class is moving away from this trend, with late-age childbirth and little or no breastfeeding due to changing social values and the demands of jobs on working women. These changes may be partly responsible for the increasing trend of breast cancer incidence. In our study also shows the trend of increasing pattern of risk factors among doctors group with in the health care workers. Nulliparity and late age at first childbirth are consistently observed reproductive risk factors. A case control study in Mumbai indicated that compared to married women, single women had a 4–5-fold higher risk for developing breast cancer in the age group of 40– 54 and above (11). In another study, nulliparous women had a 2.2-fold higher risk than parous women(12).

According to AJ model 70% (n=147) of the health care workers had normal risk, 11.9% (n=25) had moderate risk and 10% (n=21) had high risk and 8% (n=17) had very high risk for breast cancer ; the Figure1 shows the risk score for breast cancer among each groups and it was obtained that doctors are at very high risk than nurses and class IV workers. Knowledge scores were calculated and grouped into poor, average and good. 61.4% (n=129) had poor knowledge score and 31.4% (n=66) had average knowledge and 7.1% (n=15) had good knowledge score about breast cancer and their risk factors.(figure2) The study conducted by paul Augustine etal "Usefulness of Gail Model Breast Cancer Risk Assessment Tool in Estimating the Risk for Development of Breast Cancer in Women of Kerala India" quoted that "Assessment of a

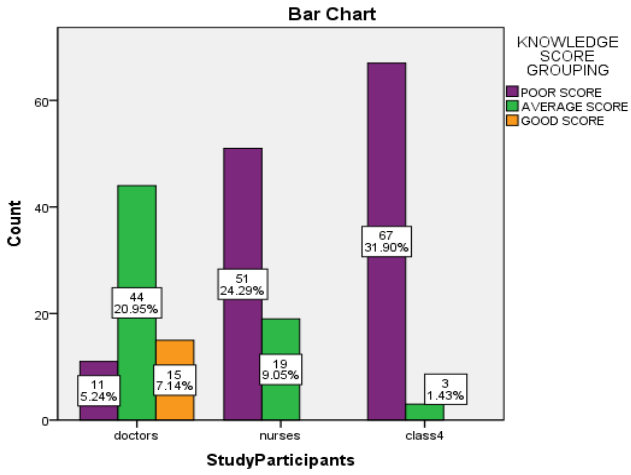
Fig1 Risk score calculated by A-J model calculator among health care workers



Chi square value-81.373 Pvalue-0.001

Score category	
Values	Risk score
<0.35	Normal risk
0.351-0.5	Moderaterisk
0.51-0.65	High risk
>0.65	Very high risk

Fig2:Knowledge score among health care workers(N=210)

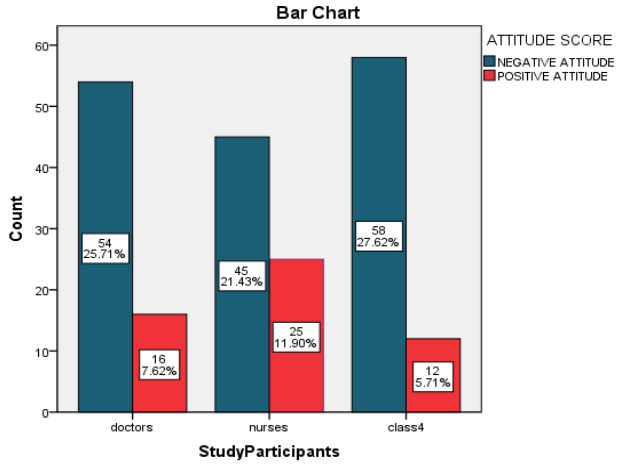


P value-0.001 Chi-square value-107.516

woman's risk of breast cancer can be used for counseling and decision making about clinical management of risk. Physicians should give patients a clear and positive message regarding risk management and should emphasize that risk calculations are estimates only of the probability of having breast cancer, not the risk of dying of the disease". The Gail's Breast Cancer Risk Assessment Tool will estimate a woman's risk of developing invasive breast cancer during the next 5-year period and up to age 90 (lifetime risk) based on the woman's age and the risk factor information provided(3). So these type of risk assessment tools are helps in

estimating the risk of breast cancers and it is a motivation for the women for doing regular screening practice.

Fig 3: Attitude score towards breast cancer screening



P value-0.035Chi-squarevalue-6.713

Table 2: Type of screening done by the health care workers

	Self breast examination	Clinical breast examination	Radiological examination
Doctors	44(57%)	9(12.9%)	6(8.6%)
Nurses	21(30%)	4(5.7%)	6(8.6%)
Class iv workers	5(7.1%)	4(5.7%)	2(2.9%)

Table 3: Barriers of breast cancer screening

Barriers for screening	Frequency(percentages)
Lackof time	23.3%(n=49)
Lazzyness	14.3%(n=30)
Relectant to examination	13.8%(n=29)
Due to lackof confidence	9%(n=19)
Financialreasons	6.9%(n=15)
Not having any growth or disease	6.2%(n=13)
Due to fear	5.7%(n=12)
Don't knowaboutscreening	1.4%(n=3)
Due to unavailibility of lady doctors	1%(n=2)

Table 4: Common barriers among health care workers

Health care workers	Most common Barriers of screening practice for BC
Doctors	Lazziness-28.6%(n=20)
	Lack of time-25.7%(n=18)
Nurses	Lack oftime-27.1%(n=19)
	Fear-11.4%(n=8)
classIVworkers	Reluctanttoexamination-20%(n=14)
	Financialreason-17.4%(n=12)

The doctors had a significantly higher knowledge score than the other categories of health care workers, ie out of the7%ofgoodknowledgescoreallareweredoctorsanditisstatistically significant(Chisquarevalue-81.373 ,P value-0.000) figure 2 shows the knowledge score among health care workers. It is important to note

that a few of the respondents 8(3.8%) believed that breast cancer cannot be cured even if the treatment is given. Even though the knowledge score is higher among doctors the attitude towards breast cancer and the screening practice was found to be almost same among the health care workers.

There have been many studies in India concerning clinical presentation of breast cancer among Indian women and late presentation has been observed in all the reports .This late presentation is directly related to the level of awareness about breast cancer, the risk factors and practice of the screening methods among Indian women. There has been reports about knowledge, attitude and practice of breast cancer screening methods among health and non-health workers in various parts of India. Studies in developed countries show that attitude and orientation of healthcare providers are important determinants of use of breast cancer screening programs [12,13] In order to function as effective promoter of breast cancer control through early detection, health workers must possess the relevant knowledge as well as appropriate attitude and belief concerning the disease and its early detection

Out of the 8 questions about attitude only 25% (n=53)had positive attitude towards breast cancer screening. The perceived risk of breast cancer among the participants majority of class IV workers 55/70 says that they never get breast cancer in their life lifetime period.Most of the nurses and doctors says that they have some chance of getting breast cancer. Figure 3 shows the attitude score among each participant groups.

Among the health care workers only 39.6% (n=79) had done screening for breast cancer and remaing 62.38%(n=131) had never done any type of screening for breast cancer in the past. Table 2 shows the frequency(percentage) of type of screening done among the health care workers.

Common barrrier among the health care workers for screening breast cancers which are noticed from this study are shown in the (tabel 3). Results (table 4)shows that the most common barrier of breast cancer screening was lazziness among doctors(28.6% ,n=20) , lack of time for nurses (25.7%,n=19) and among classIV workers was relutent to examination(20% n=14). These barriers can only removed by continues motivation and education for health care workers .

Health care providers are one should provide adequate information on Breast Cancer Screening Test(BCST) to general population . With more accurate, and complete information, women might be motivated to participate in BCST rather than just hoping that they would not have breast cancer because they do not have symptoms, had breastfed, or do not have a family history, etc so for that adequate knowledge must be there for health care workers and they should done the screening practice for their health and also for motivating others. **Conclusion**

Health care providers have good knowledge; equivocal attitude and poor screening practice with regards to breast cancer. So the study highlights the need for educational programs to create awareness regarding regular breast cancer screening. Most common Barriers found from the study was laziness and lack of time which can only be tackled with motivation. Risk assessment score shows doctors are at higher risk compare to class IV workers.

This is an eye opener for them to enhance the screening practice and for life style modification.

Assessment of a woman's risk of breast cancer can be used for counseling and decision making about clinical management of risk.

Acknowledgements

The authors thank the health workers in the SGMC$RF ,Trivandrum who participated in the study.

Conflict of interest & funding: nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(033-036)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

A STUDY ON PREVALENCE & DETERMINANTS OF OVERWEIGHT/OBESITY AMONG MEDICAL COLLEGE STUDENTS IN KANCHEEPURAM DISTRICT

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

INTRODUCTION: Obesity is an important disease of the new epidemic wave and is an emerging serious health problem. It is increasing in number and overtakes the communicable diseases with respect to morbidity and mortality. Nutritional transition from typical carbohydrate diet to junk food dietary habits is taking place in India particularly among young adults like medical students. Overweigh/Obesity is one of the important risk factor for many chronic diseases. Overweight and obesity are preventable risk factors.***AIM AND OBJECTIVES:*** 1.To study the prevalence of overweight and obesity among students of Sree Balaji medical college.2.To find out the association of risk factors causing over weight and obesity. ***MATERIALS AND METHODS:*** A Cross-sectional descriptive study was conducted in Sree Balaji Medical College using a pretested questionnaire for data collectionand anthropometric measurements of the students taken.462 medical students who were willing to participate were included in the study. ***RESULT:*** The prevalence of overweight and obesity among 462 medical students is 27.9% (129) and 8.4% (39) respectively. The frequency of consumption of junk food per week (p=0.000) and hours spending in sedentary life per day (p=0.000) is high among the overweight and obese students when compared with underweight and normal weight students. ***CONCLUSION:*** Prevalence of overweight and obesity is high among the medical students who are spending more hours per day in sedentary life and who are eating junk food more frequently in a week. Hence awareness should be created among the students about their ideal weight; factors influencing their weight gain and promote habit of doing exercise among students.

KEYWORDS: Weight gain, sedentary life, Junk food, Medical students

INTRODUCTION:

Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyper plastic obesity) or a combination of both[1]. However, obese individuals differ not only in the amount of excess fat that they store but also in the regional distribution of the fat within the body. The distribution of fat induced by the weight gain affects the risk associated with obesity and the kind of disease that results[2]. The various cause of adult obesity are diet, genetic predisposition, lack of physical activity and other behavioural factors[3,4]. In India, the attraction of health workers was under nutrition, because the obesity in children and adolescents was seldom noted. However, during the recent years, the rate of obesity in children and adolescents is progressively being noted with the altered lifestyle of families with enhanced purchasing power, elevated hours of inactivity because of television,video games, and computers, which have substituted outdoor games and other social activities. Obesity can be noted as the initial wave of a defined group of noncommunicable diseases called “new world syndrome,” generating a huge socioeconomic and public health burden in low- and middle- income countries. It is highly possible for obesity to persevere when its beginning is in late childhood or adolescence. Mortality risk increases with increased weight of children[5]. Obesity is associated with large number of life threatening disorders, such as

cardiovascular, metabolic and other non-communicable diseases. The obese has major social problems which is often neglected, the obese, do less well academically, have poorer job prospects and lower self-esteem. Since this obesity becomes an alarming sign it is necessary to take approaches like changes in life style and health education to prevent the obesity[6]. Before starting a health education programme to our students we want to assess the burden of the problem in our Institution.

PREVALENCE OF OVERWEIGH/OBESITY IN INDIA: In recent years, occurrence of Overweight and obesity are very high affecting both developed and developing countries like India[7,8]. Even as India battles malnutrition, the country has developed another nutritional problem-obesity. In past 10 years, the number of obese people has doubled in the country; Prevalence of overweight and obese in India is men-18.6% and women 20.7%. In Tamilnadu 28.2% of men are overweight or obese and 30.9% of women are overweight or obese. Prevalence of overweight and obesity among the urban population when compared to rural population is high in Tamilnadu (Urban men-30.6% and women-36.2%) (Rural men-25.6% and women-25.4%). In Kancheepuram the prevalence is 28.3% among men and 39.2% among womens[9].

Hence this study was carried out with the objectives of estimating the prevalence of overweight and obesity among the students of our Institution.

MATERIALS AND METHODS:

A cross sectional descriptive study was conducted among medical students ofSree Balaji Medical college and Hospital in Kancheepuram, District, Tamilnadu from 2nd January to 26th February 2017. Medical students who are willing to participate in the study were included. And 462 students were selected by convenient sampling method. Data collection was done for each semester separately. The objective of the project was explained to the students. After getting written consent from the students, a pretested questionnaire was administered. The questionnaire comprised of information regarding factors related to obesity like socio – economic, life style choices like over eating and sedentary life. Anthropometric measurements were taken for calculating BMI (table-1). The measurements were taken using a standardized weighing machine and a height measuring scale. The Sedentary life style was assessed by noting the number of hours spent in watching TV, sitting in front of computer, reading and others like talking over phone and listening to music per day. The consumption of junk food was also assessed by noting the frequency of eating chicken/mutton/meat and fast food items more than 3 times per week .The data was entered in MS excel and analyzed using SPSS 22 version**.** Significance of factors influencing body weight was done by chi square test. The level of significance was set at p value <0.05.

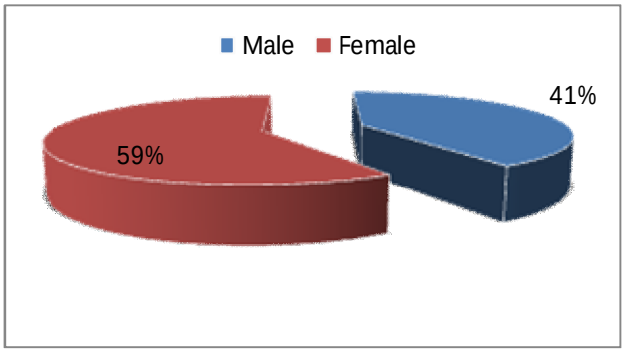
Table – 1: Classification of overweight and obesity (WHO criteria)

Classification	BMI (Kg/m^2)
Under weight	<18.5
Normal weight	18.5-24.9
Overweight or pre obese	25.0 – 29.7
Obese	>30.0

RESULTS:

A total of 550 students, 462 (84%) participated in the study. Among them 41% male and 59% female ***(Figure - 1)*** and 23% were vegetarian and 77% were mixed diet takers ***(Figure -2)***. The prevalence of overweight is 27.9% and obesity is 8.4%***(Figure- 3)***according to WHO guidelines ***(Table -1)***

Figure-1: Percentage of male and female students participated in the study



Frequency of eating junk food is high among obese & overweight individuals when compare to normal and underweight which is statistically significant. *(Table – 2)*

Figure-2: Type of diet

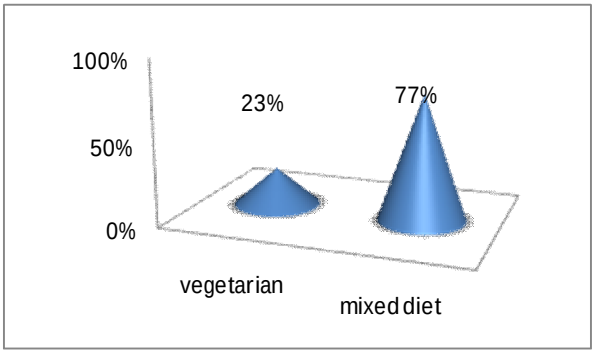


Figure – 3: Prevalence of overweight and obesity among medical students

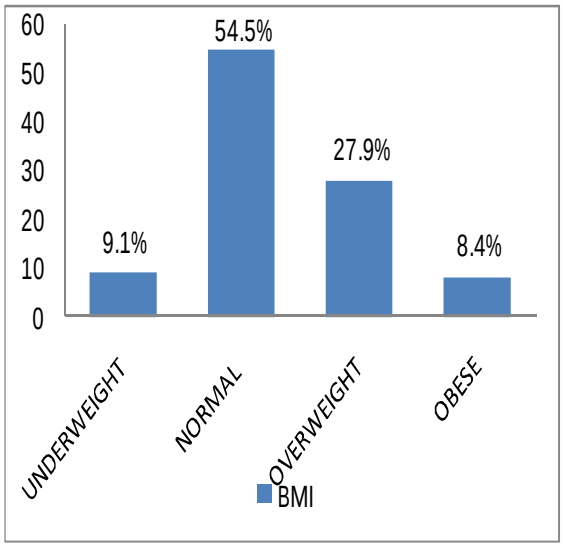


Table – 2: BMI and junk Food Intake Per Week

BMI	*JUNK FOOD CONSUMPTION PER WEEK*			*P VALUE*	Chi square value 99.344
	< 3 TIMES	3 TIMES &>3 TIMES	TOTAL (n=462)		
UNDERWEIGHT &NORMAL	219	75	294	*0.00* *	
	-74.50%	-25.50%	-100%		
OVERWEIGHT & OBESE	45	123	168		
	-26.70%	-73.30%	-100%	Degree of freedom	
TOTAL	264	198	462	1	

Over weight and obese individuals are spending more time on sedentary life style when compare to normal and underweight individual thought it was not statistically signification.***(Table-3)***

Table – 3: BMI and Sedentary Life Style (In Hrs/Day)

BMI	SEDENTARY LIFE (In Hrs/Day)			TOTAL (n=462)	P VALUE	Chi square Value
	< 2 HOURS	2-4 HOURS	>4 HOURS			
UNDERWEIGHT &NORMAL	120	144	30	294	0.00*	145.23
	-40.80%	-48.90%	-10.30%	-100%	Degree of freedom	
OVERWEIGHT & OBESE	9	59	100	168		
	-5.40%	-35.10%	-59.50%	-100%	2	
TOTAL	129	203	130	462		

DISCUSSION:

In our study, 8.4% of medical students were obese which was almost similar to study conducted in West Bengal in India among undergraduate medical students and also similar to study conducted in Tamilnadu (8.6%)[10,6]. Another similar study also reported a prevalence of 11.7% overweight and two per cent obesity among medical students of Delhi[11].And another study conducted among Malaysia medical students shows a prevalence of overweight 14.8% and obese 5.2%[12]. In our study the time spent in sedentary life per day is high among the overweight and obese students when compared to underweight and normal weight which was similar to another study conducted in tamilnadu[6]. We were not able to assess the exact calorie intake but the frequency of junk food consumption per week is high among the overweight and obese students which were similar to another study conducted in tamilnadu[6].And in our study 9.1% of medical students were underweight; another study conducted in Tamilnadu shows a prevalence of 10% underweight among the medical students[6]. Thus on comparing the studies conducted in medical students of Tamilnadu and other state of India, the overweight and obesity when accounted as a single entity seem to be higher in our study population.

CONCLUSION:

It can be concluded from the study that the overweight and obesity is more common among medical students. And mainly the prevalence of overweight and obesity is high among the students who spent more time in sedentary life per day and who takes the junk food more frequently in a week. Because of the education curriculum and the examination pattern the medical students have less time to concentrate on physical activities like sports, exercise, yoga which will have a protective effect against these problems among the medical students and also lead them to sedentary life style. Hencethis study shows the importance of healthy life style, healthy food habits and regular physical activity among the students in preventing them getting overweight/obese and complication due to obesity in the future. As Students are the back bone of our future nation, healthy lifestyles and healthy food habits should be adopted from young adulthood and regular screening for overweight and obesity should be done for obesity prevention and development of complications.

ACKNOWLEDGEMENT:

First of all i would like to thank my college management and my Department of Community Medicine for supporting me to do this study. I would like to extend my thanks to our department HOD Dr S.Gopalakrishnan, Dr R.Umadevi and all my professors, associate professors and assistant professors for guiding me throughout the study. A special mention to all my co postgraduates, undergraduates' student, friends and family members for helping me to complete the study.

Conflict of interest: Nil

Source of funding: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(037-042)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Impact of adherence to lifestyle factors on glycemic control among individuals with type 2 diabetes

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Background: Diabetes is one among the non communicable diseases which is an upcoming public health problem in India. Due to its chronic nature, the disease leads to complications which are life threatening and also affects the quality of life of the patients. **Objectives:** To evaluate compliance to lifestyle management among type 2 diabetes patients and To study the effect of lifestyle management on glycemic control. **Methodology:** A hospital based cross sectional study was done in a tertiary care teaching hospital. The study involved 600 type 2 diabetes patients who were on treatment for diabetes, attending the outpatient department of the hospital. The study participants were interviewed using a semi structured interview schedule to obtain information on duration of diabetes, awareness and practice of pharmacological and non pharmacological treatment for diabetes, complication of diabetes. Fasting and postprandial blood sugar levels were measured. The data was entered and analyzed using IBM SPSS version 20.0 and presented in the form of mean and percentages. Chi-square test, binary logistic regression were used to find the association between parameters assessed and glycemic control. **Results:** Among the diabetic patients, 50.7% were males and mean age was 52.19±11.08 years. Mean duration of the diabetes was 7.3±3.2 years. About 50% of the patients were overweight, 29% were obese and 21% had normal BMI values. Glycemic control was unsatisfactory for 50% of the patients using fasting blood glucose (>125mg/dl) and 44% using 2 hour postprandial blood glucose levels (180mg/dl). With bivariate analysis young age, regular physical activity, non alcoholic and compliance to pharmacological treatment had significantly low blood glucose level. **Conclusion:** Along with pharmacological treatment, adherence to healthy behavioral factors should be emphasized to achieve better glycemic control among diabetics.

Key words: behaviour factors, compliance, diabetes, glycemic control

Introduction:

Diabetes mellitus is one among the four most important non communicable diseases targeted for prevention worldwide, which occur due to metabolic disorder characterized by increased blood glucose values. Diabetes occurs either due to insulin insufficiency which happens due to reduction in insulin production by pancreas (Type 1) or resistance to insulin due to metabolic disorder (Type 2).[1] Of these two types, type 2 is more common. All age groups and both genders are prone to develop the disease. Over a long time, if the disease is not identified early or not controlled it would lead to complications involving damage to multiple organs and organ systems including blood vessels, nerves, kidney and eyes. This results in myocardial infarction, stroke, renal failure, loss of vision due to retinopathy and other micro vascular problems.[2,3,4] All these complications increase the health care expenditure for the disease due to direct medical expenditure and indirect economic loss due to loss of wages and it also affects the quality of life of the affected persons.[5] The prevalence of diabetes has increased drastically in the past three decades all over the world from 108 million estimated adult diabetics in 1980 to 422 million in the year 2014.[6] The rate of increase in prevalence is more marked in the low and middle income countries in the past decade compared to high income countries. The estimated number of individuals living with diabetes in expected to increase due to rapid urbanization, sedentary life style, obesity and increasing proportion of elderly due to increasing life expectancy.[7]

Diabetes had caused 1.5 million deaths in the year 2012 and uncontrolled/high blood glucose among diabetics has caused additional 2.2 million deaths due to the increased occurrence of cardiovascular diseases and other complications of diabetes. The prevalence of diabetes in India was 6.9%[8] and prevalence in Tamil Nadu was 8.4%[9] which was higher than the national average. Due to its increasing prevalence and the impact of complications, the disease has gained importance as a public health problem globally. Multiple behaviour related risk factors like unhealthy eating habits, sedentary life style, tobacco and alcohol use are involved in the development of diabetes.[10] All these life style related factors also have association with glycemic control and further occurrence of complications among diabetic patients. The present study focused to evaluate compliance to lifestyle management and assess the impact of lifestyle factors on glycemic control among type 2 diabetes patients.

Methodology:

A hospital based cross sectional type of study was done among patients with type 2 diabetes mellitus. Patients attending outpatient department of a tertiary care teaching hospital located in rural area of Tiruchirappalli district of Tamil Nadu were selected. Duration of study was 4 months from April to July 2016. Calculated sample size was 565 (p=25%[11], q=75%, relative precision of 15% and non response rate of 10%). Adult patients those who were aged more than 20 years and those who were on treatment for diabetes atleast for the past one year, attending the OPD of Medicine department of the hospital were included in the study. In the total duration of 4 months, 621 diabetic patients have attended the medicine OPD, among which 21 patients did not come for the fasting blood glucose (FBG) measurement. Two telephonic communications were made with the patients by the investigators to ensure FBG measurement and even after that 21 (3.4%) patients did not turn up for FBG investigation. Informed written consent was obtained from the participants. The study participants were interviewed using a pretested, semi structured, interviewer administered questionnaire. The questionnaire included information on socio-demographic details, duration of diabetes and its treatment, associated co-morbidities, awareness on lifestyle factors, detailed information regarding the pharmacological and non pharmacological treatment (life style modifications like diet, physical activity, alcohol and tobacco use) advised to the patient and adherence to them by the patient in the past 6 months. Patient records were also checked to note their previous blood sugar values and complications of diabetes. Patient was considered to have compliance to life style management if he/she had followed the advices given to them previously either during diagnosis or follow up. If the patient has not received any such advice, for compliance to diet, patient who has reduced the quantity of food in each meal and increased the frequency of food intake, increased the intake of fibres, vegetables in diet, reduced the intake of saturated fat was considered to be compliant.[12,13] If the patient has done aerobic physical activity for at least 150 to 175 minutes in a week was considered as adherence to physical activity.[14] For alcohol and tobacco use, quitting the habit was considered as compliance. Anthropometric measurements like height and weight were measured following standard operating procedures to calculate body mass index (BMI). BMI recommended for Asian population was used for classification.[15] Fasting and postprandial blood sugar levels were measured on the next day of the interview. Blood glucose levels were categorized as ideal, satisfactory and unsatisfactory based on the Indian Council of Medical Research (ICMR) guidelines on targets for control of diabetes.[16] The data was entered and analyzed using IBM Statistical Package for Social Sciences version 20.0 and presented in the form of mean and percentages. Chi-square test, Pearson correlation, binary logistic regression were used to find the association between the parameters assessed and glycemic control.

Results:

Table 1: Characteristics of the study participants

	Frequency	Percent
Age (years)		
20-29	20	3.3
30-39	48	8
40-49	132	22
50-59	228	38
≥60	172	28.7
Gender		
Males	304	50.7
Females	296	49.3
Education status		
Primary school	48	8
High school	208	34.7
Higher secondary	132	22
Graduate	84	14
Illiterate	128	21.3
Duration of diabetes		
1-10 years	500	83.3
11-20 years	72	12
21-30years	28	4.7
Total	600	100

A total of 600 type 2 diabetes patients participated in this study. Mean age was 52.19±11.08 years ranging from 22 to 70 years and 50.7% of them were males. Almost 80% of the study participants were literates and majority

Figure 1: Status of glycemic control among diabetic patients

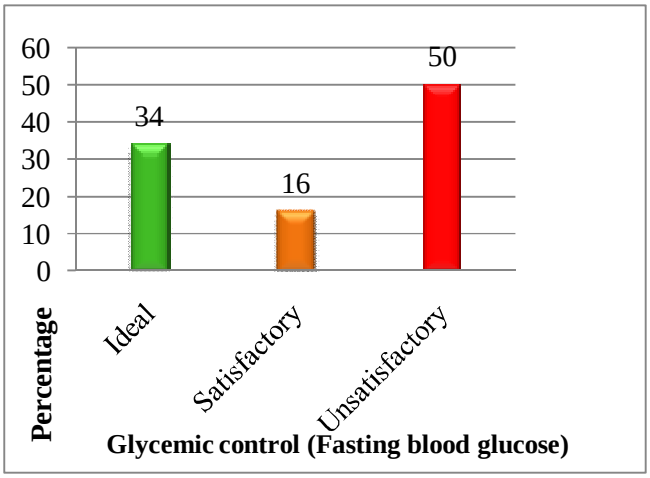
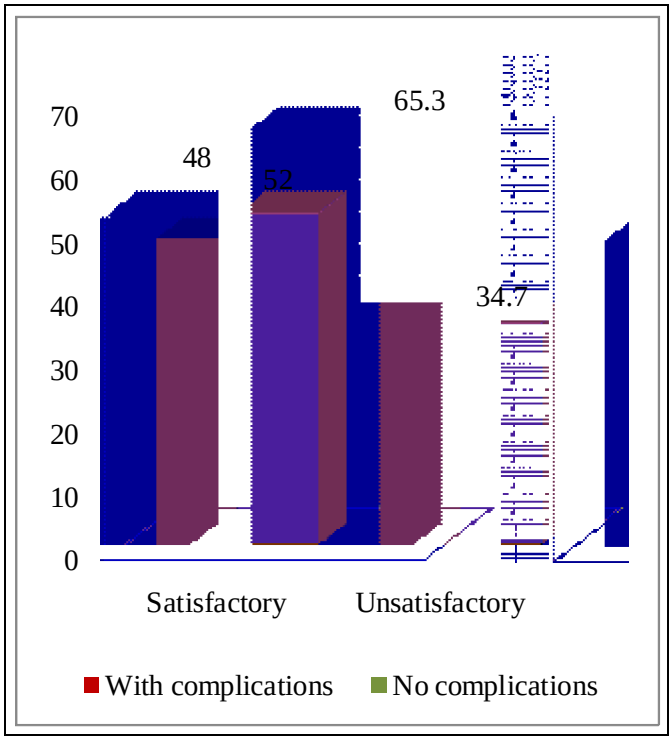


Figure 2: Association between glycemic status and complications of diabetes



(30.5%) have completed secondary school education. Mean duration of the diabetes was 7.3±3.2 years with minimum duration of 1 year and maximum of 30 years. Majority of the patients (83.3%) were diabetic for past 10 years, 12% and 4.7% were diabetic for past 11-20 years and 21-30 years respectively (Table 1). Associated co morbidity of hypertension was present among 165 (27.5%) diabetics. Based on the occupation majority of the participants followed moderate physical activity (68.7%) and rest of the participants followed heavy (17.3%) and sedentary physical activity (14%). About 50% of the patients were overweight, 29% were obese and 21% had normal BMI values. Positive family history was present among 25.3% of the study participants. Information on the food substances to be avoided by a diabetic patient was known to 73.3% of the study group. Only 23.3% of the diabetic patients practiced regular meal plan in their diet. Sixty percent of the diabetics were not restricting any food item which has to be avoided by them to maintain their blood glucose levels. Simple sugars were avoided by 39% of the patients; in addition to this, 35.3% and 21.9% were restricting salt and foodstuffs containing high saturated fat. Almost 50% of the diabetics had knowledge about the importance of regular physical activity, but only 23.4% were practicing physical exercise. Almost 80% were not using tobacco in any form and 72% were non alcoholics. Ninety three percent of the patients were aware about the importance of regular drug intake for diabetes and 72.8% reported compliance to the prescribed pharmacological treatment. Based on the fasting blood glucose values, only 34% of the patients had ideal blood glucose level. Glycemic control was satisfactory and unsatisfactory for 16% and 50% respectively (Figure 1). Glycemic control was ideal, satisfactory and unsatisfactory for 24.7%, 31.3% and 44% of the patients respectively using postprandial blood glucose levels. Patients those who had unsatisfactory fasting blood glucose levels suffered with complications of diabetes than those who had satisfactory and ideal fasting blood sugars values (Figure 2).

For further analysis, glycemic control was categorized into two groups as good (ideal and satisfactory fasting blood glucose) and poor control (unsatisfactory FBG level). With chi-square test, gender, duration of diabetes, meal plan, tobacco use and BMI status did not have significant effect on glycemic control. Being physically active, regular intake of drugs, non alcoholic and young diabetics had good glycemic control which was statistically significant (Table 2). Multivariate analysis using binary logistic regression showed significant association between glycemic control and age of the patient, life style practices like physical activity and alcohol use when all the related factors were included for analysis in model 3 (Table 3). Patients aged ≥55 years, physical inactivity, alcoholics had poor glycemic control.

Discussion:

The study included almost equal number of males and females. Gender did not have a significant effect on glycemic control. In contrast to this, Sasisekhar et al identified poor glycemic control among females.[17] Mean age of the participants was 52.19±11.08 years and patients aged <55 years had good glycemic control than elderly diabetics. This result was contrary to the results reported by Unnikrishnan et al[18] and Ahmad et al[19] where poor glycemic status was noticed among elderly diabetics. In the present study, proportion of diabetics practicing physical activity, diet control, regular drug intake and alcohol intake was more among young patients which has resulted in good glycemic control among them than elderly patients. Duration of diabetes was less than 10

Table 2: Association between risk factors of diabetes and glycemic control

	Glycemic status		Total N (%)	χ2 value (degree of freedom)	p value
	Satisfactory N (%)	Not satisfactory N (%)			
Age					
<55 years	160 (54.1)	136 (45.9)	296	**3.841** (1)	**0.05***
≥ 55 years	140 (46.1)	164 (53.9)	304		
Gender					
Male	156 (51.3)	148 (48.7)	304	0.42 (1)	0.51
female	144 (48.6)	152 (51.4)	296		
Duration of diabetes					
1-10	260 (52)	240 (48)	500	4.92 (2)	0.08
11-20	28 (38.9)	44 (61.1)	72		
21-30	12 (42.9)	16 (57.1)	28		
BMI					
Normal	64 (51.6)	60 (48.4)	124	0.16 (2)	0.68
Overweight and obese	236 (49.6)	240 (50.4)	476		
Diet control					
Yes	80 (57.1)	60 (42.9)	140	3.72 (1)	0.054
No	220 (47.8)	240 (52.2)	460		
Physical activity					
Yes	136 (59.6)	92 (40.4)	228	**13.6** (1)	**0.00***
No	164 (44.1)	208 (55.9)	372		
Tobacco use					
Yes	68 (54.8)	56 (45.2)	124	1.46 (1)	0.22
No	232 (48.7)	244 (51.3)	476		
Alcohol use					
Yes	56 (33.3)	112 (66.7)	168	**25.9** (1)	**0.00***
No	244 (56.5)	188 (43.5)	432		
Regular drug intake					
Yes	247 (52.7)	222 (47.3)	469	**6.1** (1)	**0.01***
No	53 (40.5)	78 (59.5)	131		

*p value significant

Table 3: Binary logistic regression for factors associated with glycemic control

Factors	Model 1		Model 2		Model 3	
	AOR(95%CI)	P value	AOR(95%CI)	P value	AOR(95%CI)	P value
≥ 55 years	1.2 (0.8to1.8)	0.17	1.2(0.9to1.8)	0.15	**1.9(1.3to2.9)**	**0.001**
Males	0.8(0.6 to1.2)	0.52	0.8(0.6to1.2)	0.41	0.6(0.4to1)	0.07
Duration 11-20 years 21-30 years	 1.1(0.3to1.8) 1.4(0.6to3.1)	 0.13 0.34	 1.1(0.3to1.6) 1.4(0.6to3.2)	 0.16 0.36	 1.2(0.3to2.1) 2.2(0.8to6.1)	 0.08 0.10
Normal BMI	0.9(0.6to1.4)	0.86	0.9(0.6to1.4)	0.85	0.8(0.5to1.2)	0.36
Regular drug intake	-	-	**0.6(0.4to0.8)**	**0.01**	0.7(0.5to1.2)	0.29
Diet control	-	-	-	-	0.7(0.4to1.1)	0.13
Physical activity	-	-	-	-	**0.4(0.3to0.6)**	**<0.001**
Alcoholic	-	-	-	-	**0.2(0.1to0.3)**	**<0.001**
Tobacco user	-	-	-	-	1.6(0.9to2.7)	0.054

years for 83.3% and poor glycemic status was noticed among patients having diabetes for more than 10 years, but the relation was not statistically significant. In few other studies done in India, long duration of diabetes was found to be associated with poor control of glycemic status. [18,19,20] In the present study, majority of the participants had diabetes for <10 years and most of this group were young which has resulted in good glycemic control. Along with diabetes, 27.5% had hypertension. Associated co-morbidity of hypertension among diabetics in the present study was less than the proportion of hypertensives reported by another study.[21] Overweight and obesity was present among 79%. However it did not affect the glycemic status significantly. Similar obesity

prevalence among diabetic patients was reported by Patel M et al.[21] In contrary to the results in the present study, Patro et al reported lower prevalence of overweight and obesity (14%) in diabetic patients.[22] This difference has occurred due to the variation in the classification of BMI used to categorize obese and normal individuals in these two studies. Meal plan was followed regularly by 23.3% and non significant higher proportion of diabetics with poor glycemic control was noted among patients those who were not following regular meal plan. Lower and also higher proportion of diabetics following good diet control was reported by other studies done in Indian population.[19,21] A study done in Andhra Pradesh found significant positive association between diet control and glycemic status.[23] Thirty eight percent followed sedentary lifestyle without involving either in physically active labour in work place or additional physical exercise. Being physically active was a found to be a significant factor for good glycemic control among the participants of the present study. Effect of physical exercise in lowering blood glucose level was noticed and recommended by multiple researches on diabetic patients.[23,24,25,26,27] Reduction in blood glucose level with regular physical exercise occurs mainly by increasing insulin sensitivity and increasing glucose uptake.[28] Physical inactivity has also been shown to be associated with high mortality among diabetics.[29] In this study, 72% and 79% of the diabetics were non alcoholic and non tobacco user respectively. Non alcoholics had significantly lower blood glucose levels than alcoholic diabetics. Almost 73% had adherence for regular drug intake and it had significant impact on good glycemic control. Similar observation was made by Padma et al.[23] Ideal blood glucose level was present among 34% of the diabetic patients and 56.7% suffered with at least one complication of diabetes. Higher proportion of patients had good glycemic control in the present study.[19,21] Presence of complications was high among patients with poor glycemic control similar to the report by Mohan V.[20] Lifestyle factors had significant impact on glycemic control than pharmacological management which implies that lifestyle management has to be given importance along with pharmacological management to reach good glycemic control.

Conclusion:

Life style factors have significant effect in reducing the blood glucose levels and there by plays a role in reducing the complications related to diabetes. Maintaining optimal or ideal blood sugar level is crucial in preventing complications of diabetes.

Recommendations:

In addition to pharmacological management, adherence to structured lifestyle interventions should also be included in the management of diabetes. Effective implementation of the preventive measures mainly health promotion towards positive behavioural factors on large scale involving general population and special population settings like schools and work place is the most important key factor in reducing the occurrence of diabetes and the related complications.

Conflicts of interest: Nil
Financial support: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(043-047)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Impact of a structured Life Skill management intervention on undergraduate medical students

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Background:Adolescence, which is a period of transformation can be a period of creativity, idealism, buoyancy and a spirit of adventure. But it is also a period of experimentation, risk-taking, uninformed decision making. Acquiring necessary life skills to face the daily challenges is vital in this period. **Objective**: To assess the impact of a structured intervention programme on life skills of first year MBBS students.**Methods**:A total of 68 students have participated in a pre test and post-test design study. The intervention consisted of a combination of interactive lectures, role plays and group discussion and counselling by trained facilitators. A structured self-administered assessment tool was used to assess the students life skills in various dimensions, before and after the intervention. The median scores, before and after were compared using Wilcoxon signed rank test, using IBM SPSS version 21. **Results** :The pre interventions median scores indicated, median score of 5 (IQR 3 to 6) for many aspects like critical thinking, communication, inter personal relationship, dealing with stress and emotions. After the intervention, maximum improvement was observed in knowledge about WHO life skills (5, IQR 2.25 to 7). All life skills have shown statistically significant improvement in median scores($P < 0.01$) **Conclusion:** Organised intervention programme had resulted in significant improvement in life skills of undergraduate medical students.

Key Words : Like Skills,Impact,Adolescence,Medical Students

Introduction :

Adolescence is a vital stage of growth and development. It is a period of transition from childhood to adulthood. It is characterized by rapid physiological changes and psychological maturation.These are also years of risk taking, solving their own problems, taking decisions on crucial issues, peer pressures and coping with stress[1]. This transition is so crucial that any problem results in negative view of self, mismatch between abilities and desires. The persons may become directionless and are unprepared for the challenge of the world.Acquiring necessary life skills to face the daily challenges is vital in this period[2].

According to the World Health Organisation (WHO) [3], Life skills are abilities for adaptive and positive behaviour that enables individuals to deal effectively with the demands and challenges of everyday life. The WHO categorizes life skills into the following three components (1997):1) Critical thinking skills/Decision-making skills including the skills of Problem solving, Decision making, Critical thinking and Creative thinking, 2) Interpersonal/Communication skills, consisting of Effective communication, Interpersonal skills and Empathy, 3) Coping and self-management skills like Coping with emotions, Coping with stress and Self awareness. Medical undergraduates have high demands in multiple dimensions. They have higher reported rates of psychological illness [(4-7)]. They must be empowered to handle the complexities of the profession. The development of physically healthy and psychologically balanced future Health Care Professionals is the need of the hour.

Objective: To assess the impact of a structured intervention programme on life skills of first year MBBS students

Methods:

Samplie Size : The sample size was 68 , calculated to pick up a difference of 22% between the pre & post levels when the expected proportion of students with knowledge of Life Skills is 16%, at 95% confidence level with a power of 80%.[7]

Sampling Methodology: Of the two batches of First MBBS students who come on rotation to the Department of Community Medicine, one batch was randomly selected for the study. However the other batch was also given the Life Skills Intervention later.

Methodology: The study was conducted among first year MBBS students in a Government Medical College. A pre post study design was adopted. Sixty eight (68) students participated in the programme. A self-rated, validated questionnaire was used for the study which includes questions covering the ten Life skills. All the items had a score range of 0 to 10, 0 being worst, and 10 being best.

Intervention: All the facilitators who participated in the workshop were intensively trained on the concepts of adolescent development, challenges and opportunities in adolescence, life skills, values, LS education, facilitation, using the activities to impart LSE in the workshop.by an expert in the field of adolescent Health.

During the workshop, initial lecture was given by the expert. Later the students were divided into five groups. Each group had facilitators to guide them. A real life case study[8], where the protagonist overcame many hurdles in her life using various Life Skills was given to them for discussion. The students were asked to identify the various Skills in the case study. This was followed by a group discussion, Role Play and Participative activities. The post test evaluation was done using a self-rated questionnaire immediately after the completion of the workshop as a preliminary baseline test to evaluate the recall memory and comprehension. As the students will be with the Department of Community Medicine throughout their course, the impact of the session with subsequent reinforcements would be studied at various periods in the future.

Data Analysis: The data collected was entered in epi info version 7. Median and Interquartile range was calculated as the results were non normally distributed. The median scores, before and after were compared using Wilcoxon signed rank test, using IBM SPSS version 21.

Results :

An arbitrary cut off of 4 was taken as indicative of Inadequate knowledge about Life Skills. In the pre intervention assessment the proportion of students who scored 4 or less was 46 (67.66%) i.e had inadequate knowledge .In the Post intervention assessment, 65 (95.59%) students had adequate knowledge of Life Skills. Life Skills Education impact analysis (Table 1) has shown that the knowledge level improved in all the ten skills and the results were significant (p value < .01). The pre interventions median scores indicated, median score of 5 (IQR 3 to 6) for many aspects like critical thinking, communication, inter personal relationship, dealing with stress and emotions. The median score 6, (IQR 4 to 7) was highest for empathy as a life skill and lowest for knowledge about WHO life skills (2.50, IQR 1to 5). After the intervention, maximum improvement was observed in knowledge about WHO life skills 5, (IQR 2.25 to 7). Knowledge about the Importance of Life Skills & Dealing with emotions also showed improvement 4,(IQR 2 to 5).All life skills have shown statistically significant improvement in median scores Figure 1, as for most factors, post interventions median scores reached to 8 or 9 (IQR 7 to 9) . Regarding knowledge gained from this workshop Figure 2, 18(26.47%) students said that they gained knowledge in all aspects, 15 (22.06%) students felt they learnt about better communication and 13 (19.12%) felt they gained knowledge about self awareness.

Table1: Comparison of different life skill parameters before and after (N=68)

Parameter	Before Median (IQR)	After Median (IQR)	P value
Life skills importance	4.50(3.00,6)	9.00(7.00,9)	<0.01
Knowledge of WHO life skills	2.50(1.00,5)	8.00(7.00,9)	<0.01
self awareness as life skill	5.00(3.00,6.75)	9.00(7.25,9)	<0.01
Empathy as a life skill	6.00(4.00,7)	9.00(8.00,9)	<0.01
Creative thinking as a life skill	5.00(3.00,6)	8.00(8.00,9)	<0.01
Critical thinking as a life skill	5.00(3.00,6)	8.00(7.00,9)	<0.01
Communication skill	5.00(3.00,7)	9.00(8.00,10)	<0.01
Interpersonal relationship as a life skill	5.00(3.00,7)	9.00(8.00,9)	<0.01
Dealing with stress	5.00(3.00,6)	8.00(8.00,9)	<0.01
Dealing with emotions	5.00(3.00,6)	8.00(7.00,9)	<0.01

Table 2 shows the descriptive statistics on the met objectives. 65(95.59%) students felt that the Objectives of the Life Skill workshop had been met.The facilitating factors of the workshop were Interactive nature of the sessions 17(25.00 %),Motivation by facilitators 13 (19.12 %) ,and Team Work 11(16.18%) (Table 3). Table 4 shows Forty seven (69.12%) students felt there were no barriers for learning in the Life Skill workshop. Lack of

time 7(10.29%) and Distractions1 (1.47%) were felt as barriers by some of the students. Only 3 (4.41%) had felt the workshop to be of Boring nature. In the overall rating of the life skill intervention programme , 27 (39.71%) felt it was excellent, 20 (29.41%). Only one had felt it was average.

Figure 1. Pre Post Intervention Improvement in median Scores

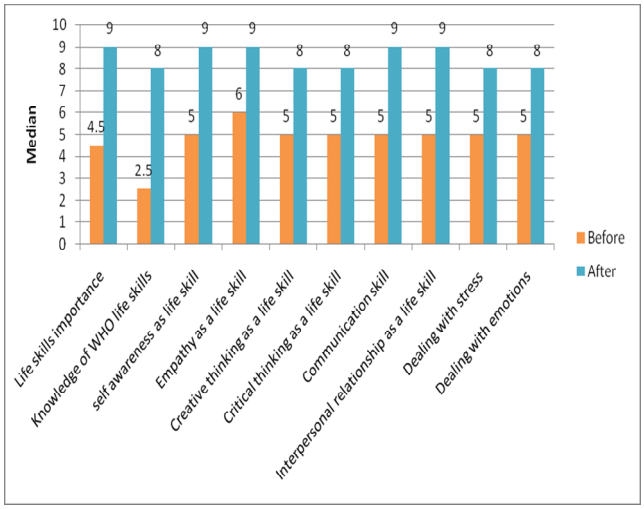

Figure 2 Learning outcome after the intervene

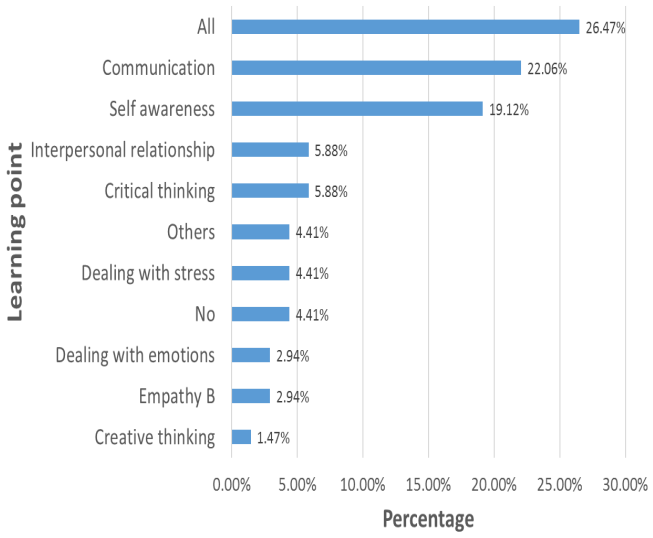

Table 2: Descriptive analysis of Objective met in study group (N=68)

Objective met	Frequency	Percentage
Yes	65	95.59%
No	3	4.41%
Total	68	100.00%

Table 3: Facilitating Factors for Learning

Facilitating factors	Frequency	Percent
Motivation by facilitators	13	19.12%
Group discussion	10	14.71%
Interaction	17	25.00%
Creative thinking	4	5.88%
Environment	3	4.41%
Team work	11	16.18%
Roleplay	10	14.71%

Table 4: Descriptive analysis of Barrier in study group (N=68)

Barrier	Frequency	Percentages
Nothing	47	69.12%
Lack of time	7	10.29%
Bored	3	4.41%
Distraction	1	1.47%
Others	10	14.71%
Total	68	100.00%

Discussion:

Life Skills Training is a novel program that imparts LS through participatory learning methods of role-plays, group discussion and other participative activities like games, debates etc. Conceptual understanding and practicing of the skills repeatedly in a non-threatening setting is essential for the skills to be imbibed by the adolescents.

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Life Skills impact analysis in our study showed an overall improvement in all the ten Life skills. The maximum improvement was seen with knowledge about Life Skills. Almost all of the participants felt that the Objectives of the Life Skills Programme were met. And the training as a whole was a positive learning experience. Knowledge gained was much higher with respect to Communication skill and Self-awareness as compared to the other life skills .Similar results were found by R. Kazemiet al[9] , who found Life Skills Training improved communication skills and Self esteem in students with Dyscalculia .The factors that facilitated learning were the interactive nature of the programmes, Motivation by facilitators, Team work etc. The participants gave an excellent overall rating for the programme.. There were some barriers to learning though, like lack of time, boring nature of the sessions, distractions etc.

The merit of our study was that 1) the intervention was administered in a friendly manner. Participatory learning methods like role-plays, chart making and group discussion were employed. Such initiatives provide the adolescent medical undergraduates with a wide range of alternative and creative ways of solving problems.2) Medical Teachers can be trained as

life skills educators/facilitators to train undergraduate 3) It is the first time such programme was tried among Undergraduate Medical Students. The study had some limitations like it is conducted in a limited number of samples. Another limitation of the study is that we only evaluated the students at a single time point, immediately after the completion of intervention. It will be important in future research evaluating this sort of training in medical students over longer follow-up periods. There is need to evaluate the long term impact on the students by prospective studies.

In a study done by B.Srikala et al[10]among secondary school going adolescents, Life Skill Education improved self-esteem, Coping Skills and Confidence. Parvathy et al [11], in a study done among adolescents in rural schools found results similar to our study that there was significant improvement in all the Life Skills with the programme. Pujar et al [12] concluded that the intervention on life skill education is helpful for the rural adolescent girls to take positive actions and improving their coping skills of stress and problem solving ability. Ana et al [13], in a study done among medical students found Life skill training decreased hostility and improved clinical judgement. Aparna et al [14] opined that Life Skills training must be conducted with trained personnel and should have a planned programme and should be part of every educational system. Talcade et al [15]concluded that Life skills training program, promoted self-esteem, peace education and self-confidence. Botvin et.al [16,] Pentz et al[17]found that Life Skills training prevented antisocial activities and behaviours like Substance Abuse and violence related behaviour among adolescents. Life skills enabled individuals to translate knowledge, attitudes and values into actual abilities and enable individuals to behave in healthy ways, given the desire to do so and given the scope and opportunity to do so (Errecart et al., [18] ; Perry and Kelder, [19] ; Caplan et al.,[20]). Results of research studies also proved that life skill education improved the academic performance of individuals (Weissberg et.al. [21])

Conclusion: Structured Life Skill intervention had resulted in significant improvement in life skills. Repeated practicing of these skills will result in a mastery and encourage adolescent medical students to apply such skills to real life situations and gain control over the situation. It also helps in the development of Empathy, Self-awareness and most importantly Communication Skills among young medical students.

Recommendation: In the era of public antagonism towards doctors, Life Skills Training must become an important aspect of medical undergraduate training.

Acknowledgement: We would like to thank Dr.Latha Ravichandran, Professor of Paediatrics, Sri Ramachandra Medical University, for her support and for being the trainers trainer.

Conflict of Interest : Nil
Source of Funding: None

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(048-050)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Prevalence of Anemia among Female Medical Students, Pondicherry

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Abstract

Introduction: Anemia remains a public health challenge worldwide. Anemia is the common disorder of blood in the world. ***Aim:*** This study was aimed to estimate the prevalence of anemia among female medical students in Pondicherry. ***Methodology:*** Through convenient sampling, 200 female medical students from Private Medical college, Pondicherry, were taken as study subjects and were subjected to interview and estimation of *Hb* using Sahli's method. Basic information was collected from study subjects through self-structured questionnaire. ***Result:*** It was found that as many as 58% of female medical students were suffering from anemia. In regard to severity of anemia, approximately half (41%) were having mild anemia and only few (17%) have moderate anemia. None of them was found severe anemia. ***Conclusion:*** Considering the result, it was concluded that anemia is very much prevalent more than half (58%) among female medical students, not less as non-medico students.

Key Words: *Anemia, Female Medical students,* Sahli's method, Pondicherry

Introduction

Anemia is a major public health problem worldwide and is often ignored in both developing and developed countries. Preschool children, pregnant women and adolescents constitute vulnerable groups for anemia(1).
Nutritional anaemia is a disease syndrome caused bymalnutrition in its widest sense (2). It has been defined byWHO as "a condition in which the haemoglobin content ofblood is lower than normal as a result of a deficiency ofone or more essential nutrients, regardless of the cause ofsuch deficiency"(2). By far the most frequent cause ofnutritional anaemia is iron deficiency, and less frequentlyfolate or vitamin B12(3).
Anemia is classified into 3 degree according to WHO: mild, moderate, severe. With Hb cut-off values of anemia were classified as mild, moderate and severe - 10-11.9g/dl, 7.0-9.9g/dl, <7.0g/dl respectively(4).

The world is home to 1.2 billion individuals aged 10-19 years. India has largest population of adolescents (243 million) followed by China (207 million)& United states (44 million) (5). A recent report from UNICEF says more than half of adolescent girls in India are anemic. PARK (1998) suggested that in many developing countries 22-44% of natural deaths are due to anemia during pregnancy

A high prevalence of anemia in adolescent girls is a matter of great concern as they enter reproductive life soon after menarche and iron requirements are increased and remains almost high in girls after menarche to replace menstrual losses.(6)

Even-though, being in medical profession, many female students are ignoring their health status especially illness like anemia, and hence the presence of anemia will decrease the efficiency of learning capacity indirectly. And there is huge gap in research area about such illness among medical students, so in order to reduce such gap this study was planned to assess the prevalence of anemia and to make necessary recommendation for female medical college student

Aim of the Study: To assess the prevalence of anemia among female medical students

Materials and Methods

With the above objective, we conducted a cross sectional study with the convenient sampling of 200 female students (50 in each academic year) from a Private Medical College, Puducherry, between September 2016 to October 2016. Students not willing to participate and not available duringinterview and investigations were excluded from the study. A pre designed semi structured questionnaire was used to collect basic details about the participants and Hb estimation was done through Sahli's method. A pre designed semi structured questionnaire was used to collect basic details about the participants. Analysis was done by using frequency table with percentage. Chi square with p value was used wherever it is needed; Odds ratio was calculated by using 2*2 table to asses risk of exposure

RESULTS

The socio demographic characteristics of the study subjects revealed that nearly (73%) of the study subject were from age group of 21-24 years and maximum (77%) belongs to urban area. Regarding type of family, maximum (73%) were of nuclear families. most of the subjects (72.3%) were non-vegetarian.

Table 1:Association of food habit, residence and menstrual problem with the anemia

Factor	Anemic	Normal	OR(CI)/p value
Food Veg	44 (73)	16 (27)	
Mixed	72 (51)	68 (49)	2.9) <0.01
Residence			
Hostel	81 (79)	22 (21)	
Days scholar	35 (36)	62 (64)	6.5, (3.4-12.1) <0.0001
Menstrual problem			
yes	34 (74)	12 (26)	
no	82 (53)	72 (47)	5.1) <0.001

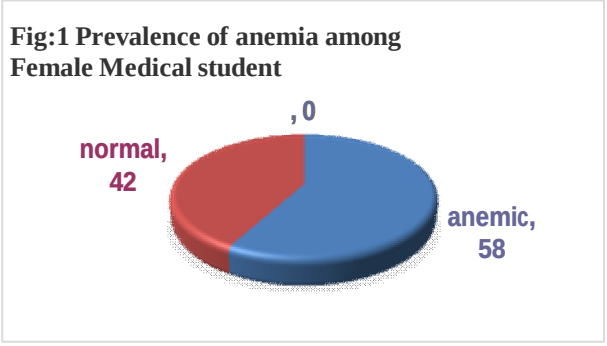
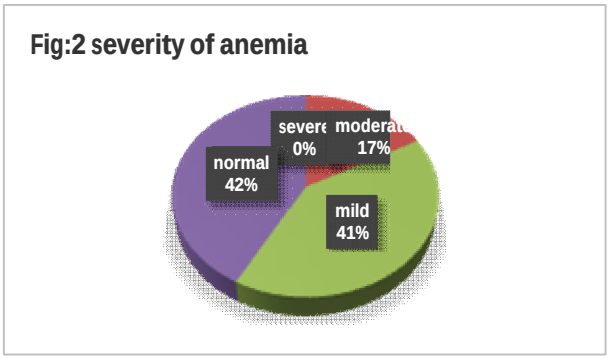


Table no 1, depicts the association of food habit, residence and history of menstrual problem with the presence of anemia. Menstrual problems include, irregularity, dysmenorrhea, polymennorhea. It was found that strong association of these three factor with OR of 2.5, 6.5 and 2.4 respectively. The confidence interval was narrow enough to support the finding and it was found statistically significance with p value less than 0.05. Prevalence of anemia was found as high as 58%.



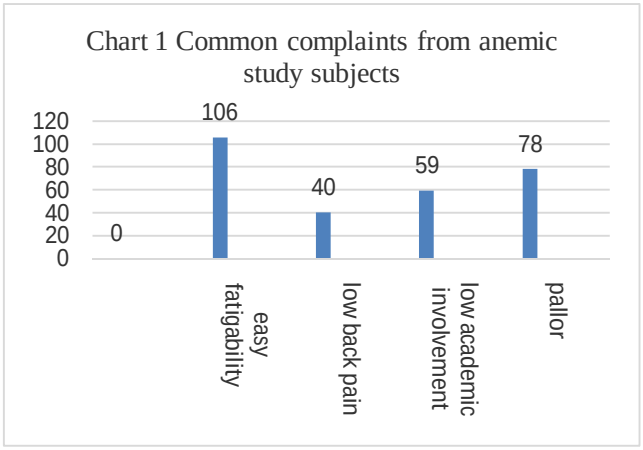


Fig 1 explains the prevalence of anemia among study subjects i.e about 58% which is quite bigger when compared with general population. And based on severity (Fig 2) there was no severe anemia but about 41 % were classified as mild (10-11.9g/dl,) and 7 % of study subjects were as moderate anemia (7.0-9.9g/dl). Most common complaints among anemic subjects were easy fatigability (106 subjects) and pallor was identified with 78 subjects (Chart 1).

Discussion

We found that more than half of our study population was found anemic as high as 58 %. Similarly Bulliyy et al. found 96.5% prevalence among non-school going adolescent girls in three districts of Orissa, of which, 45.2%, 46.9%, and 4.4% had mild, moderate, and severe anemia(7), whereas another study conducted by sachinPandeyet al. in Bilaspur, Chhattisgarh stated that The anemia was observed in 29 (30.20%) students out of total 96 students selected to carry out study from whole MBBS batch of 100 students of 3rd year (8). Sanjeev M Chaudhary and Vasant R Dhage et al carried out a study in an urban area under Urban Health Training Center of a medical college, Nagpur, among a total of 296 adolescent females (10–19 years old) and according their

observations the prevalence of anemia was found to be 35.1 %.(9)

In our study prevalence of anemia was more with vegetarian than mixed group and it was statistically significant, with an odds ratio of 2.5, similar study conducted inUdhaypur, Rajasthan by KamlaMahajani et al, found that 40%of vegetarians were having moderate anaemia, 60 percent were mild anaemic whereas 46.66 percent non vegetarian respondents were in normal category.(10)

Regarding residence, about 79 % of students residing at hostel were reported as anemic, few other studies like

Shireen Jawed et al, in their study on Frequency of nutritional anemia among female medical students of Faisalabad reported that 33.4% of the students were found to be anemic. Significantly high number of hostelites (39.2%) was anemic as compared to day scholars (23.1%) (P value= 0.015*)(11) similarly we observed that prevalence of anemia was more among hostelites(79%) when compared with days scholar (36%) with ODDs ratio of 6.5 and the difference between these two groups were found statistically significant with p value of <0.001

Regarding menstrual problem, a study conducted in Nagpur by PatleRupali A, Kubde Sanjay S., reported that it was also found that non-anemic girls were having regular menstrual cycle than those with anemia. This difference was significant (χ^2=4.78, p=0.0289,df=1). To add on this they observed that those who were anaemic were more likely to suffer dysmenorrhoea (χ^2=10.28, p=0.0059, df=1) as well as premenstrual syndrome (χ^2=32.64, p=0.0000, df=1)(12). Similarliy in our study we found study population who have menstrual irregularity are having 2.4 times more risk of developing anemia than the normal group.

Conclusion: Prevalence of anemia among female medical students was found to be 58% and 42% of girls are with no anemia. In regard to severity of anemia,approximately half (41%) were having mild anemia and only few (17%) have moderate anemia, and no one has been identified as severe anemia

Acknowledgement:

We would like to thank the department of Pathology to extend their Laboratory support for carrying out the investigation. We would like to extend our warm regards and thanks to all the interns and other para medical workers participated in the study.

Source of funding and conflict of Interest: None

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(051-056)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

A STUDY ON PREVALENCE OF DEPRESSION, ANXIETY AND STRESS AMONG UNDERGRADUATE MEDICAL STUDENTS

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Abstract

Objective: To assess the prevalence of depression, anxiety and stress among undergraduate medical students and its associated factors **Methods:** A cross sectional study was carried out among 289 MBBS students from a private medical college of Tamil Nadu with equal representation from 2nd, 4th, 6th and 8th semester students. Data was collected using semi structured questionnaire and DASS scale for assessment of Depression, Anxiety and Stress. All the scales of DASS have been shown to have high internal consistency. It is suitable for screening adolescents and adults. Data analysis was done using SPSS. **Results:** The data analyzed showed higher levels of depression among medical students. The prevalence of Depression was 46.8%, Anxiety 57% and Stress 26.7%. Moderate form of anxiety was seen in 27% of them. In contrary to depression, anxiety amongst students from joint families was more. Difference in anxiety among hostellers and day scholars between smokers and non smokers, drinkers and non drinkers were significant. Prevalence of stress was 26.7% among whom 10.5% had mild stress. Females were found to have more stress than males. Stress among various semesters showed more stress among the 8th semester students and less stress among second semester students. Students from nuclear family had 1.4 times higher stress than joint families. There was significant difference in stress among hostellers and day scholars. Difference in stress among students who travelled less than 1 hour and more than 1 hour was very significant. Smoking didn't have statistical relevance with stress. Drinkers had more stress than non drinkers **Conclusion:** The prevalence of mental morbidity is very high among medical students with stress at 26.7%, anxiety57% and depression 46.8%. In general, females, other state students, hostellers, students who don't have hobbies, seem to suffer the most. This higher level of psychological morbidity warrants need for interventions like social and psychological support to improve the quality of life for these medical students

Key words: Depression, Anxiety,Stress, prevalence, Medical Students, Cross sectional study

Introduction

Stress is a normal physical reaction to an internal or external pressure that is placed on a person's system and is a normal part of our daily lives[1]. Of the many groups who are affected by such emotional states and disorders, medical students who have very busy and demanding schedule are known to be victims of tremendous mental stress. Medicine is an emotionally demanding training and therefore a career in medical education can sometimes be stressful. Psychological stress is common among medical students and is associated with depression [2] Students are subjected to different kind of stresses, such as pressure of academics with an obligation to succeed and an uncertain future. The students also face social, emotional, physical and family problems which may affect their learning ability and academic performances [3],[4].Too much stress can cause physical and mental health problems, it reduces the students' self esteem and it may affect the student's academic achievements [5],[6]

Preventive intervention with medical students in order to reduce stress and improve their lifestyle is a very important factor in achieving an improved level of health. As stress has a detrimental effect both on health as well as academic performance, the college administration should incorporate stress management plans as a co-curricular

activity. The influence of variables like gender, economic background, change in medium of education and hostel environment on the medical student's academic stress levels discussed with proper coping assistance should be provided to individual students. As the medical students have a significant vulnerability to the adoption of health risk behaviors and lifestyles such as eating habits, physical exercise, alcohol and drug consumption etc. should be monitored The studies on psychological stress, its sources and severity are less among medical students, while many have been done among adolescent groups. There seems to be varying levels of prevalence stress related issues among undergraduate medical students in various countries. The Indian scenario seems to be last due to lack of adequate studies. Hence this study was done to find the prevalence of stress anxiety and depression among undergraduate medical students and identify the associated factors.

MATERIALS AND METHODS

This cross-sectional study was conducted among MBBS Students studying in all years in a private medical college in Tamil Nadu. The sample size was estimated to be 378[15]. Considering 10% as non-responsive rate, the total sample was fixed at 420.

Stratified random sampling method was used in this study. Therefore to get an equal representation among all the year, 105 students from each year was planned to be interviewed. Every student was assigned a digital code from the attendance register list of every year separately where 105 students was randomly selected from each batch.

Study tool used in this study was a standard self-administered questionnaire DASS [13],[14]. (Depression Anxiety Stress Scale), to elicit the presence of stress, anxiety and depression in the study population. The Depression Anxiety Stress Scales (DASS), a modified version, was a 21-item self-report instrument designed to measure the three related negative emotional states of depression, anxiety and stress.

All the scales of DASS have been shown to have high internal consistency [13],[14]. It is suitable for screening adolescents and adults. In addition, a pre-tested open on close ended and self prepared questionnaire was used in study for getting socio demographic details and identifying the factors and their association with stress, anxiety and depression.

The students selected for the study was contacted by the investigator personally and a written consent was taken during which the respondent was counseled to provide correct information. Students who couldn't be contacted after two attempts, the students who were on leave for 2 or more than 2 days in 7 days preceding the date of interview were not included in the study.

The information thus collected on the tools was transferred to a computer using Microsoft Excel Software. Subsequently analysis of the data was done using SPSS software.

RESULTS

Out of the 389 respondents, many were not willing to share information about their parent's educational status and income. There were few who chose not to respond to queries about involvement in fights /jealousy with classmates. Excluding those variables that didn't fetch details from all respondents, the remaining variables were taken for analysis.

The following results were obtained.

The respondents were more or less equally distributed with 99 each from 6th and 8th semester and 96 and 95 each respectively from 2nd and 4th semester. The mean age of respondents was 19.81 with Standard Deviation of 1.37.Age Sex distribution showed nearly 70% of respondents were in the age 19 to 21.

Majority of the students were Hindu (N =299, 77%). Christians were 13% and Muslims 9%. Students from Tamil Nadu were 80%. Majority came from Nuclear family (89%). Hostellers were 218 (56%).

Among 218 hostellers the hostel environment was found to be stressful in 191 students. 165 students reported that the mess/eating facility was bad 15.2% [59] reported smoking while 19% reported the habit of drinking

Table 1. **Prevalence of Depression,Anxiety and Stress**

	Depression	Anxiety	Stress
	Frequency (%)	Frequency (%)	Frequency (%)
Normal	207 (53.2)	167 (42.9)	285 (73.3)
Mild	49 (12.6)	40 (10.3)	41 (10.5)
Moderate	83 (21.3)	106 (27.2)	26 (6.7)
Severe	21 (5.4)	31 (8.0)	18 (4.6)
Extremely severe	29 (7.5)	45 (11.6)	19 (4.9)
Total	389	389	389

National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(051-056)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Table 2. **Factors associated with Depression, Anxiety and Stress**

Factors (N)	Depression present (%)	Statistical test	Anxiety present (%)	Statistical Test	Stress present (%)	Statistical Test
Sex						
Male (183)	75 (40%)	χ^2 =4.674, df=1, p=0.031	87 (47.5%)	χ^2 =12.806, df=1, p=0.0000	41 (22.4%)	χ^2 =3.309, df=1, p=0.067
Female (206)	107 (51.9%)		135 (65.5%)		63 (30.9%)	
Semester						
Second (95)	44(45.8%)	χ^2 =1.816, df =3, p=0.611	55 (57.29%)	χ^2 =3.332, df=3, p=0.343	20 (20.8%)	χ^2 =3.202, df=2, p=0.361
Fourth (95)	42(44.2%)		47 (49.5%)		24(25.3%)	
Sixth (99)	44(44.4%)		59 (59.6%)		29 (29.3%)	
Eighth (99)	52(52.5%)		61 (61.6%)		31 (31.3%)	
Nativity						
Tamil Nadu (312)	145 (46.5%)	χ^2 =0.062, df=1, p=0.804	177 (56.7%)	χ^2 =0.074, df=1, p=0.786	81 (25.9%)	χ^2 =0.482, df=1, p=0.488
Others (77)	37 (48.1%)		45 (58.4%)		23 (29.9%)	
Family Type						
Nuclear (346)	164 (47.4%)	χ^2 =0.471, df=1, p=0.491, OR=1.25	195 (56.3%)	χ^2 =0.646, df=1, p=0.422, 0R=1.3	95 (27.5%)	χ^2 =0.832, df=1, p=0.362, OR=1.4
Joint (43)	18 (41.9%)		27 (62.8%)		9 (20.9%)	
Time for Hobby						
Yes (222)	91 (41%)	χ^2 =6.977, df=1, p=0.008, OR=1.72	116 (52.3%)	χ^2 =4.898, df=1, p=0.027	43 (19.4%)	χ^2 =14.324, df=1, p=0.000
No (167)	91 (54.5%)		106 (63.5%)		61 (36.5%)	
Hostelite status						
Yes (218)	107 (49%)	χ^2 =1.050 df=1,p=0.306	128 (58.7%)	χ^2 =0.549, df=1, p=0.459, OR=0.85	59 (27%)	χ^2 =0.027, df=1, p=0.869
No (171)	75 (43.9%)		94 (54.9%)		45 (26.3%)	
Travel time to college						
Less than 1 hour (238)	113 (47.5%)	χ^2 =14.28, df=2, OR=1.07	142 (59.7%)	χ^2 =10.612, df=2, p=0.005	64 (26.9%)	χ^2 =2.799, df=2, p=0.247
1-2 hour (126)	49 (38.8%)		60 (47.6%)		30 (23.8%)	
more than 2 hour (25)	20 (80%)		20 (80%)		10 (40%)	
Perception about Hostel environment						
Very stressful (66)	49 (74.2%)	χ^2 =24.49, df=2, p=0.0000	51 (77.2%)	χ^2 =12.97, df=2, p=0.00	30 (45.5%)	χ^2 =16.99, df=2, p=0.000
Somewhat stressful (125)	46 (36.8%)		65 (52%)		22 (17.6%)	
Not stressful (27)	12 (44.4%)		13 (48.1%)		7 (25.9%)	
Smoking						
Not at all (330)	149 (45.2%)	χ^2 =4.44, df=2, p=0.11	188 (57%)	χ^2 =0.149, df=2, p=0.928	80 (24.2%)	χ^2 =7.404, df=2, p=0.025
Regularly (30)	14 (46.7%)		18 (60%)		11 (36.6%)	
Occasionally (29)	19 (65.5%)		16 (55%)		13 (44.8%)	
Drinking Alcohol						
Regularly (26)	15(57.5%)	χ^2 =3.66, df=2, p=0.16	18 (69.2%)	χ^2 =1.785, df=2, p=0.410	9 (34.6%)	χ^2 =4.508, df=2, p=0.105
Occasionally (48)	27 (56.3%)		28 (58.3%)		18 (37.5%)	
Not at all (315)	140 (44.4%)		176 (55.8%)		77 (24.4%)	

Depression:

Prevalence of depression was seen in 46.8% of students. Moderate form of depression was seen in 83 students and extremely severe depression in 29 students. 51.9% of females had depression as against 40% in males. More number of eighth semester or final year students were affected 52.5% , while others had 44 – 45%. Nativity had a marginal difference with students from the same state have 2% lesser prevalence than the others. Students from nuclear family had 47.4% depression, while the joint family had 41.9%. Students who had time for hobbies showed depression in 54.5% among them. Hostellers had 5% more prevalence of depression than non hostellers. Travelling time to college, particularly more than 2 hours seem to have higher correlation. (80%).

The differences in the depressed state of students between sexes were not significant. There was a significant difference in depression among the different semesters and nativity. Even though the difference in the presence of depression among the family types is found to be insignificant, Odds ratio of 1.25 shows students from nuclear family has more risk for depression. There was no significance in the difference of depression among hostellers and day scholars. The travel time to college was not an influencing factor. There was a significant difference in depression among smokers and drinkers.

Anxiety:

Anxiety was found among 57% of students. Mild form of anxiety was seen in 40(10.3% of total), Moderate in 106, severe in 31 students and extremely severe in 45 students. Females showed more prevalence 65.5% than males 47.5% The 2nd, 6th and 8th semester students had more anxiety than 4th. Not much difference in prevalence of anxiety was seen among the natives of Tamil Nadu and others. Students who came from joint family had more anxiety than those who came from nuclear family .This is contrary to the prevalence of stress and depression. Here again, Students with time for hobby 52.3% had anxiety against 63.5% who didn't had time for hobby. Hostellers had 3.6% more prevalence than non hostellers. Travel for more than 2 hours showed influence in the presence of anxiety. There was no statistical significance in the difference in anxiety among the sexes. Students from other states (other than Tamil Nadu) had more anxiety than the localites.. Difference in anxiety among hostellers and day scholars between smokers and non smokers, drinkers and non drinkers were significant.

Stress:

Prevalence of stress was 26.7%. Mild was seen in 10.5%, Moderate in 6.7%,Severe in 4.6% and extremely severe in 4.9% of the total students .Females 30.9% had stress against males 22.4%. Stress in 8th semester (final year) students was more (31.3%) against 2nd semester (first year). There is gradual increase in prevalence of stress along with semesters. Students 29.9% from other states had stress than the local state students 25.9%. Nuclear family students had 27.5% stress, while students from joint family had 20.9%. Those who had time for hobby showed lesser level of prevalence than others. Students who travelled more had greater level of stress.

Students from nuclear family had 1.4 times higher stress than joint families. There was significant difference in stress among hostellers and day scholars. Difference in stress among students who travelled less than 1 hour and more than 1 hour was very significant. Smoking didn't have statistical relevance with stress. Drinkers had more stress than non drinkers.

Among 59 smokers 18 mentioned stress as their reason for smoking while 17out of 74 alcoholics [drinkers] reported stress as their reason.166/171 day scholars stay with their parents.

DISCUSSION

The Prevalence of depression was seen in 46.8% of students, which is considerably higher but consistent with data from other developing countries. Moderate form of depression was seen in 83 students and extremely severe depression in 29 students. The reasons for high level of depression need to be explored in this group of students. Study on undergraduate Chinese medical students found nearly half of them were depressed with 2% having severe depression [16].

The differences in the depression state of students between sexes, family types, and place of stay were not significant. However, there seem to be a significant difference in presence of depression among

the different semesters and nativity, which need to be assessed. There were more students depressed in the 8th semester who were on the verge of their final exams. Nativity had significant difference in depression levels probably indicating the need for academic institutions to give special care and orientation to these students who come from faraway places with different cultural and social back ground. Odds ratio of 1.25 shows students from nuclear family has a marginally higher risk for depression. However smokers and drinkers show significant levels of depression. We need to identify whether these habits are a consequence of depression or not. 51.9% of females had depression as against 40% in males. Female students were more likely to report symptoms suggestive of depression as compared to male students which are consistent with western reports [17]. A possible explanation for this finding is due to the fact that women articulate depressive symptoms, even very minor ones, more easily than men, and that the excess could actually be due to this fact as much as to a true expression of greater distress [18].

Anxiety was found among 57% of students. Moderate form of anxiety was seen in 27% of them. Severe and extremely severe form of anxiety was seen in 20% of students. This needs to be intervened as anxiety leads to failure in academic performance.

Similar to depression, students from other states (other than Tamil Nadu) had more anxiety than the localites. In contrary to depression, anxiety amongst students from joint families was more, which needs to be explored. Difference in anxiety among hostellers and day scholars between smokers and non smokers, drinkers and non drinkers were significant. The reasons for more anxiety among hostellers could be the moral responsibility towards academic excellence being away from family and peer pressure.

Females were found to have more stress than males. Stress among various semesters showed more stress among the 8th semester students and less among second semester students, Almost 30% students from other state had stress as against 26% among localites. Students from nuclear family had 1.4 times higher stress than joint families. There was significant difference in stress among hostellers and day scholars. Difference in stress among students who travelled less than 1 hour and more than 1 hour was very significant. Smoking didn't have statistical relevance with stress. Drinkers had more stress than non drinkers.

In general the prevalence of psychological morbidity in the form of depression anxiety and stress is seen more among women, who came from other states, who came from nuclear family and significantly duration of travel to college. These higher levels are consistent with other studies done in Pakistan, Saudi Arabia, Malaysia and western countries.

CONCLUSION

The prevalence of mental morbidity is very high among medical students with stress at 26.7%, anxiety57% and depression 46.8%. In general, females, other state students, hostellers, students who don't have hobbies, seem to suffer the most.

Preparing medical students for life as doctors require more than acquisition of knowledge and skills [19]. Constant monitoring of performance, professional conduct and behavior associated with mental health is equally important. Although, the subject is of prime importance but unfortunately literature search done by Shapiro yielded over 600 articles discussing the importance of addressing the stress of medical education, only 24 studies reported intervention programs, and only 6 of those used rigorous scientific method [20].

RECOMMENDATIONS

Earnest efforts should be made targeting these students. Intervention strategies such as group activities, meditation, relaxation techniques, and extracurricular activities may be introduced to bring down the levels of stress, anxiety and depression among students.

The study poses additional challenges for students' support services delivery which may require addressing mental health problems along with common health strategies for our students. The study results warrants need for interventions like social and psychological support to improve the quality of life for these medical students. Student advisors and counselors may train students about stress management.

Source of funding and conflict of interest: Nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(057-062)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

Prevalence of risk factors for cervical cancer among women in the rural areas of Kolar, Karnataka

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Introduction: Globally Cervical cancer is the fourth most common cancer and is the second leading cancer among Indian women. The highest risk for cancer cervix is HPV (Human Papilloma virus) types 16 and 18. **Objectives: 1.** To study the socio- demographic and reproductive health risk factors for cervical cancer. 2. To estimate the prevalence of precancerous cervical lesions.**Methodology:** A cross sectional study conducted among women in age group of 30-60 years in rural communities of Kolar. Around 445 women were administered a questionnaire to assess their risk factors for cervical cancer out of whom 300 women attended the screening at PHC. Statistical analysis performed using SPSS 22 and Chisquare test was used for qualitative data. **Results:** About 53% of women were in 30-39 yrs group, 43% were married and 22.6 % had become pregnant before attaining 18yrs. Of the 300 women screened 30 (10%) had cervical precancer. The pre cancer among 30-45 yrs age was 83.4% (1.3 times risk)and 23.4% cases were women with history of RTI had 2.7 times high risk.**Conclusion:** There is a high prevalence of cervical pre cancer and its risk factors among women in the rural communities of Kolar. Hence there is a need to organize community based screening camps.
Key words: Cancer cervix, risk factors, screening

Introduction

The estimated global burden for new cases of uterine cervical cancer is 5,28,000 and deaths is 2,66,000 each year accounting to 7.9% of all new cancer cases and 7.5% of all female cancer deaths.[1] Globally cervical cancer is the fourth most common cancer in women and in the WHO south east Asian region (SEAR) it is the second most common cancer after breast cancer.[2] The estimates of cancer of cervix in India accounts for 22.9% of new cancer cases and 23.3% of all cancer deaths in women.[2]

Genital human Papilloma virus (HPV) infection which is sexually transmitted has been detected in all cervical cancer tumours tested worldwide, the highest risks are associated with HPV types 16 and 18.[3,4] The age at first intercourse, number of lifetime sexual partners, age at first child birth, history of previous miscarriage, cigarette smoking, poor genital hygiene, co infection with other reproductive tract infections, long term use of oral contraceptive pills and family history of cancer cervix are some of the risk factors.[5-9]

The incidence of cervical cancer has declined by 70-90% in the developed countries and has been attributed to well established cancer cervix screening programs.[10,11] Apart from the availability of pap smear, effective screening strategies, availability of facilities for diagnostic follow up and treatment are attributed to a reduction in cancer cervix burden in these countries.[12] In developing countries the access to screening services are often not existent or limited and contributes for the higher incidence and mortality due to cancer cervix in women.[13,14] There is no organized screening program for cancer cervix in the country. Hence a large proportion of women with cancer of the cervix present in advanced stages of cancer.[11]

Most women are unaware of cervical cancer, its risk factors and do not have access to the appropriate screening tests and treatment.[15] Hence this study to find the prevalence of cervical cancer including its risk factors was undertaken in the rural primary health centre area attached to a private medical college in Kolar.

Methodology

Study setting: A cross sectional study was undertaken in the rural communities that receive primary health care services from Devarayasamudra Primary health centre(PHC) which is the rural health training centre of Sri Devaraj Urs medical College, Kolar for a period of 2 years (november 2011 to November 2013)

Study population: Six out of twenty villages in the Devarayasamudra PHC area were randomly selected for the study. In low-resource settings, the optimal age-group for cervical cancer screening to achieve the greatest public health impact is 30–39-year-olds.[16]Screening women twice, at ages 35 and 40, was predicted to reduce lifetime cancer risk by 65% (with VIA) or 76% (with HPV DNA testing).[17] A study conducted by Sankaranarayana et al showed a reduction of 25% in cancer cervix incidence and 35% reduction in mortality by cancer among women in the 30-59 year age group.[18]Hence women in the age group of30-60yr in these selected villages were enumerated and included in the study.A total of 475 women were enumerated in the study villages of Devarayasamudra, V.Guttahalli, Kothamangala, Kamadatti, Kamanur and Ramasandra. Of the 475 enumerated women, 445could be contacted with 3 repeated household visits and were administered a questionnaire to assess their risk for cancer cervix. Since 30 of these women had already underwent hysterectomy they were excluded from the study. All the women were invited for cancer cervix screening clinic at PHC on fixed date and a total of 300 women attended screening.

Sample size: Sample size was estimated by considering the prevalence of precancerous cervical lesions at 10%.[2] Using Z^2PQ/l^2, considering an error of 5%, a design effect of 2 and a nonresponse of 10% the estimated sample size was 300 women.

Data collection:A structured and pre tested questionnaire was administered to the women to assess the various socio demographic and reproductive health related factors. Additional information about any symptoms like post coital pain, inter menstrual bleeding, white discharge, any history of STI/RTI were collected. The investigator took the assistance of the female Health worker (ANM) and ASHA serving the selected community to undertake the survey.The women were informed about cancer of the cervix and the importance of early cancer cervix screening. They were informed about the screening clinic in the PHC organized on specified date.

Height and weight were measured and recorded. After obtaining the written informed consent from the women, clinical examination and screening for cancer cervix was performed.The investigator underwent training for Pap smear collection and performing VIA test for 15 days in the Dept. of Obstetrics and Gynaecology of the Medical College hospital in Kolar. The procedure was standardized with the trainer to perform speculum examination, to collect Pap smear, perform VIA and to interpret the results.Using an un-lubricated bivalve Cusco's speculum the cervix was exposed, excess mucus was cleaned if present and the direct visual evaluation of the cervix was made to identify the external os with pinkish squamous epithelium and reddish columnar epithelium and transformation zone. A Pap smear was collected from the transformation zone (SCJ) of the cervix using a sterile plastic Ayres spatula by a 360^0 rotatory motion.[19] It was smeared onto the glass slide and was fixed immediately using Biofix spray (90% ethyl alcohol) fixative.

Following this, VIA was performed (Visual inspection with acetic acid)using 5% acetic acid which was applied on the cervix by using a sterile stick fixed with a small piece of sterile cotton. After one minute a naked eye evaluation was performed under 100 watt illumination. VIA was considered positive when an acetowhite lesion was observed within the transformation zone.[20]The Pap smears were submitted to the Dept. of Pathology for staining and later were reported by a single Pathologist according to Bethesda system. Women with VIA positive result were informed about the result and were asked to collect Pap smear report after one week. All the women who were positive for Pap smear were advised to come to the medical college for cryotherapy/biopsy. If Pap smear was negative in a VIA positive woman they were administered a course of oral antibiotics for 15 days and instructed to come for follow up Pap smear. If the repeat smear was positive the patient was advised Cryotherapy/ Biopsy. All the women who attended screening clinic were advised to undergo Pap test once in every three years. Institutional ethical committee permission was obtained before the start of the study.

Statistical analysis: Data collected was coded and entered into Microsoft Excel sheet and analysis was done using Open epi 2.3 version software. The summarized data is presented as frequencies, proportions, mean and Standard deviation. The association between cervical cancer cancer and its risk factors was analysed using Chisquare test. P value of ≤ 0.05 is considered as statistically significant.

Results:

The total population of six villages was 4,354 and 445 women in the age group of 30-60 years were surveyed for cancer cervix risk factors. A total of 300 women who attended the screening clinic at PHC were screened for cancer cervix.

Table 1: Distribution of women according to Sociodemographic profile

Characteristics (n=445)	n (%)
Age distribution in yrs	
30-39	235 (52.8)
40-49	117 (26.3)
50-60	93 (20.9)
Education status	
Illiterate	130 (29.2)
Primary/ secondary level	138 (31)
High school level	139 (31.3)
College level and above	38 (8.5)
Occupation	
Housewives	207 (46.6)
Manual labour	233 (52.2)
Semi professional	05 (1.2)
Marital status	
Married	426 (95.8)
Widow	17 (3.8)
Unmarried	2 (0.4)
Religion	
Hindu	440 (98.9)
Muslim	5 (1.1)
Caste distribution*	
SC,ST	233 (52.3)
OBC	177 (39.8)
General	35 (7.9)
Socioeconomic status	
BPL**	292 (65.6)
Lower class	135 (30.4)
Middle class	18 (4)

* SC- Schedule caste, ST- Schedule tribe, OBC- Other backward caste ** BPL – Below poverty line

Table 1- Most(79%) of the women were in the age group of 30-49yrs and 29.2% of themwere illiterate. Around 46.6% of the women were housewives and the majority (52.2%)worked as labourers in the agricultural fields. Majority of the women (52%)belong to scheduled caste and schedule tribe and 65.6% of the women were belonged to below poverty line (BPL) by the government.

Table 2- Around 43 % of the surveyed women were married before they had attained 18 yrs of age and 22.6 % had become pregnant before attaining 18yrs. About 49.2% of women were multipara and only 3.2% of the women had ever used an Oral contraceptive pill (OCP). Around 25.6% of the women had attained menopause.

Table 2: Distribution of study subjects according to Reproductive health profile

Characteristics (n= 443)*	n (%)
Mean age at marriage (yrs) **18.7 ± 1.9**	
Mean age at first pregnancy (yrs) **20.2 ± 1.9**	
Age at marriage	
≤18 yrs	190 (43.0)
>18 yrs	253 (57.0)
Age at first pregnancy	
≤18 yrs	100 (22.6)
>18 yrs	343 (77.4)
Parity status	
≤2 child birth	225 (50.8)
>2 child birth	218 (49.2)
Abortions(≥ 1)	22 (5.4)
Use of Oral contraceptive pill (OCP)	14 (3.2)
Attained Menopause	114 (25.6)
Irregular menstrual cycles	33 (7.4)
Vaginal discharge in the past one year	114 (25.7)

*** Among the women surveyed 2 were unmarried.**

Table 3: Prevalence of cervical cancer among study subjects by both VIA and Pap smear methods.

Cancer cervix screening results (n=300)*	n (%)
Positive (precancerous lesion)	30 (10)
Negative	270 (90)

***300 women attended screeningfor cervical cancer**

Table 3- A total of 30 (10%) women were identified to have cervical precancerous lesions by VIA and Pap smear. It was observed that 23 (7.6%) women were positive for VIA and 9 (3%) were Pap smear positive out of which 5 were HSIL (High grade squamous intraepithelial lesion) and 4 were LSIL (Low grade squamous intraepithelial lesion). Only 02 (0.6%) women were found to have both VIA and Pap smear positive for precancerous cervical lesions. There were no invasive cervical cancer detected.

Table 4 –The prevalence of cervical precancerous lesions was 10%.The majority of the cases 25 out of 30 (83.4%) were in the 30-45 yrs age group and the cases were 1.3 times higher among younger women and 2.1 times higher among BPL category compared to APL but both are not statistically significant. Age at marriage has no association with precancerous cervical lesions in this study. There is 1.5 times higher risk of precancerous lesions among multipara and only 23.4% of the cases were among women with history of vaginal tract infections although the difference was not statistically significant.

Table 4: Determinants of Social and Reproductive risk factors among the study subjects

Risk factors	Screening outcome		Total (n=300)*	OR (95% CI)	P value
	Positive n (%) (n=30)	Negative n (%) (n= 270)			
Age distribution (30-60 yrs)					
30-45 46- 60	25 (83.4) 05 (16.6)	214 (79.2) 56 (20.8)	239 61	1.308 (0.4793-3.572)	0.5989
Socioeconomic status					
BPL APL	26 (86.6) 4 (13.3)	204 (75.5) 66 (24.5)	230 70	2.103 (0.708-6.246)	0.1724
Age at marriage					
≤ 18 yrs >18 yrs	15 (50) 15 (50)	136 (50.3) 134 (49.7)	151 149	0.9853 (0.4634-2.095)	0.9693
Age at first Pregnancy					
≤ 18 yrs >18 yrs	10 (33.4) 20 (66.6)	73 (27.1) 197 (72.9)	83 217	1.349 (0.6032-3.018)	0.4646
Parity					
> 2 ≤ 2	19 (63.4) 11 (36.6)	145 (53.7) 125 (46.3)	164 136	1.489 (0.6825-3.249)	0.317
Vaginal tract infections (clinical findings)					
Present Absent	7 (23.4) 23 (76.6)	105 (38.8) 165 (61.2)	112 188	0.4783 (0.1982-1.154)	0.0947

***300 women attended screening for cervical cancer**

Discussion:

The prevalence of precancerous cervical lesions is high in the rural area because of social and reproductive risk factors. In the present study the prevalence is 10% which is similar to the study conducted by Mhaske M et al at Pune where the prevalence of dysplasia was 12.7% and cervical cancer was 4.4%.[21]The prevalence of cervical cancer and precancer lesions was 1.7% and 5.9%, respectively in the study conducted by Makuza JD in Rwanda.[22]

Around 93.6% of the enumerated women could be contacted during the household survey. Similarly in a uterine cervix screening and follow up trial in Maharashtra by Nene B and coworkers between 1999 to 2003 on women aged 30-59 years, 92.4% of the enumerated women could be contacted and invited for cancer cervix screening.[23]Around 65.6% of the women belong to the below poverty line (BPL) in present study andDLHS 3(District Level Health survey) survey data shows 66.4% of the households having a BPL card in 2008.[24] Similarly in a study conducted by Aswathy and co workers showed majority of women (59.6%) belong to low socioceconomic status.[25]

It is alarming to note that 43% of the women in rural areas of Kolar region are married before 18 yrs and a significant percent of them are bearing children before attaining18 yrs. Age at marriage had no association with precancerous cervical lesions in this study and similar findings were observedin a study by Chankapa et al.[26]Also only 3.2% of study subjects gave a history of using an oral contraceptive pill. According to DLHS reports only 0.2% of the rural women utilize oral contraceptive pill as a method of family planning.[24]This observation strongly argues that family planning services delivery and utilization in the study area is extremely poor and may be considered as an important factor behind 49.2% women in this study having more than 2 child births.

In present study majority of precancerous cervical lesions were seen among younger age group (30-45) whereas in a study conducted by Zhang Q et al at China showed that women in the older age group (41-66) were at higher risk.[27]Younger age, earlier age of the first pregnancy, early sexual debut, and higher number of children born were all risk factors for cervical cancer in the Rwanda study.[22]

In the present study the precancerous cervical lesions was more among the people with younger age, low socio economic status and higher parity. The role of other factors like age at marriage, age at first pregnancy and vaginal tract infections was not evident.The awareness regarding cancer cervix risk factors and its screening methods is also very poor. In a study conducted by Jain, et al at Maharashtra among nursing staff showed that only 42% were aware about risk factors, 27% about symptoms of cancer cervix and 86.2% were aware about Pap smear examination for screening.[28]There is no organized screening program for cancer cervix in the country. Hence a large proportion of women with cancer of the cervix present in advanced stages of cancer.[11] In the absence of screening program, nearly 70% of cervical cancer affected women presents in stage 3 and 4.[29] Detection of precancerous lesions (CIN) leads to virtual cure with the use of current methods of treatment.[30]

Opportunities for providing cancer cervix screening and treatment services through the medical colleges which usually has diagnostic and treatment facilities can be utilised. There is a scope to initiate cancer cervix screening and treatment programs in the communities accessible to these medical colleges to increase cancer cervix screening coverage.

Limitations: one of the risk factors for cancer cervix were not measured in this study namely details of menstrual hygiene practices, history of consumption of tobacco and its products and history of exposure to multiple sexual partners. The working hours and weekly day off, was not enquired from the women during the survey. Such information is necessary for planning the appropriate time schedule of cancer cervix screening clinic in their community.

Conclusion: The prevalence of cervical pre cancer among women in the rural communities of Kolar was 10% which is high.Hence there is a need for organized cancer cervix screening programs in our country and also to create awareness about risk factors for cancer cervix among women.This approach of cancer cervix screening and treatment involving medical college can be carried out to reduce the burden of cancer cervix among Indian women.The health workers have to be trained adequately to strengthen the screening program and to reduce the prevalence of cervical cancer.

Acknowledgement: We thank ICMR for providing the financial assistance under MD Dissertation category.(No.3/2/2012-13/PG-thesis-HRD-9)

Financial support: ICMR under MD dissertation category

Conflict of interest: None declared

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(063-068)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

PREVALENCE AND FACTORS INFLUENCING SELF CARE PRACTICES IN RURAL DIABETIC POPULATION, A COMMUNITY BASED CROSS SECTIONAL STUDY

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

BACK GROUND: Considering the role of the self care practices in achieving the glycemic control and prevention of complications in diabetic patients, this study is done on the prevalence of these self care practices and factors influencing themin diabetic patients. **OBJECTIVE:** Main objective of the study is to assess the pattern of various diabetes self-care practices in rural diabetic patients and also to assess the determinants of these self-care practices. **METHODS**: This was a cross sectional study which included all the residents of field practice area, of RHC Pooncheri, who are known diabetic patients and on treatment. Study questionnaire was developed, which had questions regarding self-care practices, knowledge, behaviour and their attitude towards the condition. **RESULTS**: A total of 256 participants were included in this study, where majority (58.2%) of the participants were between 41 to 60 years and females constituted 52% of the total study population. Among (82%) of the study subjects, the duration of diabetes was less than 5 years and 38 (14.8%) had family history of diabetes, 35 (13.6%) had reported co-morbid hypertension, only 5(2%) had hypercholesterolemia, 2(0.7%) have other co morbidities. Of the total study population, 125(48.8%) were following proper dietary practice, 53(20.7%) were doing adequate Physical activity and only 76(29.7%)were doing regular monitoring of blood sugar. Regular medication intake was reported by 231(90.2%) patients. Only 38(14.8%) people had good problem solving skill, 36(14.1%) had positive attitude towards healthy coping and fundoscopy was done only in 80(31.3%) participants. Only 63(24.6%) participants were following good self-carepractices and 193(75.4%) were following poor self-care practice. **CONCLUSION**: Compliance to medication and regular monitoring of drug intake was seen in most the study subjects.Good self-care practice and physical activity were reported in very few subjects.Knowledge and positive attitude towards disease would improve the quality of life in patients with diabetes.

Keywords: Diabetes, Glycemic control, Selfcare, quality of life

INTRODUCTION:

Diabetes Mellitus is fast emerging as the one of major public health problem, with significant burden of morbidity and mortalityacross the globe.In the year 2013, approximately 347 million people were suffering from diabetes worldwide. According to a projection of a WHO database, in the year 2025 the countries with the largest number of people with diabetes are projected to be, India, China and the U.S.A. The greatest increase between 1995 and 2025 is expected to occur in India (195%).[(1)]

As per ICMR-INDIAB national study there are 62.4 million people with type 2 diabetes and 77 million people with pre-diabetes in India at present.[(2)]Poorly controlled diabetes can lead to plethora of micro vascular, macro vascular and metabolic complications.[(3, 4)]Population based studies have reported the "prevalence of diabetic retinopathy in 17.6%, micro albuminuria in 26.9%, neuropathy in 26.1%, coronary artery disease in 21.4% and peripheral vascular disease in 6.3% of diabetic population. India thus faces a huge health care burden due to high prevalence of Type 2 diabetes and its complications". [(5-8)]

To achieve an optimal glycemic control and prevent complications, apart from pharmacological treatment, the

patients required to follow many self-carepractices. The core self-care practices issued specified in various national and international guidelines include healthy eating, being active, monitoring, taking medication, problem solving, healthy coping, and reducing risks to be followed by diabetic patients in its standard treatment guidelines. All these components are labeled as diabetes self-management education (DSME) underAmerican Diabetes Associationguidelines.[9]Multiple studies have found that DSME is associated with improved diabetes knowledge and improved self-care behaviour, improved clinical outcomes such as lower A1C lower self-reported weight, improved quality of life, healthy coping and lower costs. [10-12]The epidemic of diabetesmellitus has moved from itspredominance in urban areas and high socio economic strata of the society to rural and disadvantaged sections of the society in recent times.But the quality of care provided by the medical practitioners, especially in relation to the self-care practices mentioned above and patient'scompliance with these practices is quite variable and at times very poor in developing countries. Considering the role of the self care practices in achieving the glycemic control and prevention of complications, studies documenting the prevalence of these practices and factors influencing them are the need of the hour. Hence this study is done with objectives to assess the pattern of various diabetes self-care practices and its determinants in rural diabetic patients.

MATERIALS & METHODS:

This was a cross sectional study which included all the residents of field practice area, of RHC Poonjeri, who are known diabetic patients and on treatment.Study questionnaire was developed, which had questions regarding self-care practices, knowledge, behaviour and their attitude towards the condition. Considering prevalence of any particular self-management behaviours about 20%, taking 95% power of study & 95% absolute precision, the required sample size obtained is 256. To account for non-participation, it was decided to include total of 280 subjects in the study.

Sampling Method: Multi stage random sampling was used to select the study subjects in to the study. Out of 12 villages of the field practice area of RHC poonjeri, 3 villages were selected by simple random sampling. List of all known diabetic patients was obtained from the family folder of those 3 villages. From the list of diabetic patients the sample of subject were selected by simple random sampling, which was included in the final study.

The selected study participants were contacted at their household. Any subject, who was not available at house at first visit, two more visits have been made in the evening or early morning. After even three visits if the selected subject was not available, he or she was dropped from the study. For all available study subjects, informed consent was obtained. Subjects consented to participate were included in the study. For those who refused to give consent, reasons for the same were documented.

Study questionnaire and formats:

Study tool have been developed based on self care practice guidelines by ICMR and American Diabetic Association, Diabetic self-management education (DSME) core behaviours. Study tools are pretested and validated before the beginning of the study

Ethical consideration: Ethical approval of Human ethical committee was obtained from Chettinad Hospital and Research Institute informed written consent from all the study participant was obtained after thoroughly explaining purpose and nature of study. Only those participants who gave consent were included in the study.

Statistical method: The data obtained through the study are entered in excel sheet and the results are analysed through the SPSS software 2014.

Operational definitions:

1. **Healthy eating:** Proper eating practice defined as any person who is having four or more of the following dietary practices.
    - Avoiding refined sugar like sweets, Maida etc.
    - Taking frequent and small meals.
    - Reduced intake of polished rice and Maida.
    - Restriction intake of roots and tubers
    - Restriction intake of high glycemic index fruits like banana, mango, jackfruit etc.
2. **Being active:** Adequate physical activity defined as compliance with the following physical activity principle
    - Frequency (At least five days a week)
    - Intensity (Moderate)
    - Type (Aerobic, jogging and swimming)
    - Time at least 45 minutes per day
3. **Monitoring:** Regular monitoring was defined as blood glucose monitoring at least once in three months
4. **Taking medication:** Proper medication intake was defined as proper timing of different oral hypoglycemic drugs or insulin with food. (Example Metformin to be taken after food, sulfonylurea's and insulin to be taken before food)
5. **Problem solving:** Good problem behavior was defined as awareness regarding effects of fasting – illness and blood glucose level and skipping the dose of oral hypoglycemic drug.
6. **Healthy coping:** Healthy coping was defined as having a positive attitude like feeling confident, reassured about living with diabetes.
7. **Reducing risks:** Reducing risk was defined as any patient who was examined at least once by an eye specialist for diabetic retinopathy using fundoscopy.
8. **Good self-care practice (overall):** Good self-care practice was defined as compliance with 5 or more of above mentioned self care behaviors. Otherwise it was labeled as poor self care behavior.

Results:

A total of 256 participants were included in the study.

Table 1: Socio Demographic profile of study participants and social parameters of study participants

Parameter	Number of study participants	Percent (%)
I. Age group (years)		
Below 40 years	48	18.80%
41 to 60 years	149	58.20%
Above 60 years	59	23.00%
II. Gender		
Female	133	52.00%
Male	123	48.00%
III.Socioeconomic status		
Upper class	26	10.20%
Upper middle class	127	49.60%
Middle class	64	25.00%
Upper lower class	38	14.80%
Lower class	1	0.40%
IV.Religion		
Hindus	224	87.50%
Muslims	17	6.60%
Christians	15	5.90%
III. Education		
Illiterate	70	27.30%
Up to primary	95	37.10%
Secondary(up to +2)	51	20%
Graduate	40	15.60%

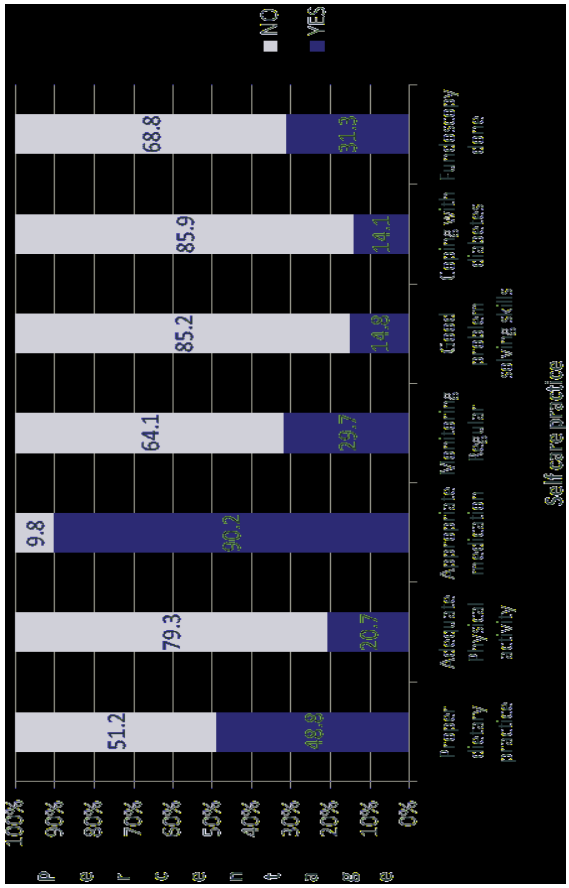
Majority (58.2%) of the participants were between 41 to 60 years. There were Out of 48(18.8%) patients below 40 years' age group. Females constituted 52% of the study subjects. As per modified Prasad classification majority of the subjects were in upper middle class (49.6%) and middle class (25%). Hindus, 17(6.6%) were87.5%Muslimsand Christians constituted 87.5%,6.6% and 5.9% of the study population. Illiterates constituted 70(27.3%) subjects, 95(37.1%) studied up to primary school, 51(20%) were studied up to secondary school (up to +2), 40(15.6%) were graduate. (Table 1)

In majority (82%) of the subject the duration of diabetes was less than 5 years and 38 (14.8%) had family history of diabetes, 35 (13.6%) had reported co-morbid hypertension, only 5(2%) had hypercholesterolemia, 2(0.7%) have other co morbidities, 214(83.6%) did not report any co morbidity. (Table 2)

Table 2: Disease related parameters among study participants (n=256)

Parameter	Number of study participants	Percent(%)
I. Duration of diabetes (in years)		
0-5	210	82.00%
06-Oct	33	12.90%
Nov-15	3	1.10%
16-20	5	2.00%
Above 20 years	5	2.00%
II. Family history of Diabetes		
Yes	38	14.80%
No	218	85.20%
IV. Co morbidity		
Hypertension	35	13.60%
Hypercholesterolemia	5	2%
Others	2	0.70%
None	214	83.60%

Figure 1: Prevalence of various self-care practices of study participants



Out of 256 participants 125(48.8%) were following proper dietary practice, 53(20.7%) were doing adequate Physical activity and only 76(29.7%)were doing regular monitoring of blood sugar. Regular medication intake was reported by 231(90.2%) patients. Only 38(14.8%) people had good problem solving skill, 36(14.1%) had positive attitude towards healthy coping and fundoscopy was done only in 80(31.3%) participants. (Figure 1)

Table 3: overall self-care practices in study population

Self care practices	Number	Percentage
Good self-care practice (Following 5 or more self-care behaviours)	63	24.60%
Poor self-care practice (Following 4 or less self-care behaviours)	193	75.40%

Only 63(24.6%) participants were following good self-carepractices and 193(75.4%) were following poor self-care practice.(Table 3)

The prevalence of good self-care practices increased with age and was highest in people above 60 years. Male had higher prevalence of good self-care practices, compared to females. But these differences in prevalence basing on both age and gender were not statistically significant. No statistically significant differences were observed in proportion of people with good self-care practices among people with different levels of education, socio economic status or religion.

The prevalence of good self-care practices was higher in participants, who were taking treatment in a health facility located at less than a kilometre and was highest in people seeking care from a health facility located at > 10 km. These differences were statistically significant, but there was no increasing or decreasing trend with increasing distance. The type of health care facility or the type of medical record being used had no statistically significant influence on prevalence of good self-care practices. (Table 4)

Table 4: Association between demographic parameters and self-care practice behaviour in study population (n=256)

Age groups	Overall self-care practices		Chi square value	P-value
	Good	Poor		
I. Age group				
40 yrs and below	9 (18.8%)	39 (81.3%)		
41-60 yrs	36(24.2%)	113(75.8%)		
>60 yrs	18(30.5%)	41(69.5%)	2.011	0.366
II.Gender				
Male	36(29.3%)	87(70.7%)	2.77	0.096
Female	27(20.3%)	106(79.7%)		
III.Socio economic status				
Upper	4(15.4%)	22(84.6%)		
Upper middle	27(21.3%)	100(78.7%)		
Middle	17(26.6%)	47(73.4%)		
Upper lower and	15(38.5%)	24(61.5%)		
Lower lower			6.126	0.106
IV. Religion				
Hindu	56(25.0%)	168(75.0%)		
Muslim	4(23.5%)	13(76.5%)		
Christian	3(20.0%)	12(80.0%)	0.201	0.904
V. Education				
Illiterate	15(21.4%)	55(78.6%)		
Up to primary school	23(24.2%)	72(75.8%)		
Secondary	14(27.5%)	37(72.5%)		
school(up to +2)				
Graduate	11(27.5%)	29(72.5%)	0.792	0.851
VI. Place of treatment				
Government hospital	52(25.2%)	154(74.8%)		
Private clinic	3(30.0%)	7(70.0%)		
Private hospital	8(20.0%)	32(80.0%)	0.659	0.719
house				
<=1 km	33(35.5%)	60(64.5%)		
2-4 Km	12(14%)	74(86.0%)		
5-10 Km	8(19.5%)	33(80.5%)		
>10 km	10(27.8%)	26(72.2%)	11.96	0.008*
VIII. Education				
Normal Slip	43(27.4%)	114(72.6%)		
Hard opd sheet/book	20(20.2%)	79(79.8%)	1.69	0.194

Discussion:

The present study was done to assess the practice of diabetes self-care activities among rural diabetic patients. Only 63(24.6%) participants were following good self care practices and 193(75.4%) were following poor self-care practice. Out of 256 participants 51.2% were not taking proper dietary practice, which was comparatively lower than 76% which was reported by Dinesh PV et al.,[(14)].The study participants knowledge regarding the dietary practice are less and they should be educated regarding the healthy dietary practices. The importance of following a regular dietary plan in terms of both quantity and quality lies in the fact that adequate blood sugar control and proper weight management are linked to it. Adequate intake of fruits and vegetables not only helps in better control of blood sugar levels but also keeps at bay complications such as cardiovascular diseases, stroke, gastrointestinal tumors, etc[(15)]

A Systematic Review by Povey R and studies by Bantle JP shown the importance of healthy eating. The authors of these reviews have concluded that there is a good evidence that shows the benefits of healthy eating for people with diabetes. The authors of these reviews have concluded that there is a good evidence that shows the benefits of healthy eating for people with diabetes. Similarly Robbins JM et al. [(11)],have reported that nutritionist visits were more strongly associated with reduced hospitalizations than diabetes classes. Each nutritionist visit was associated with a substantial reduction in hospital charges, suggesting that providing these services in the primary care setting may be highly cost-effective for the health care system. The benefits

include improvement in glycemic control and lipid profiles, maintenance of blood pressure in the target range, and weight loss. [16]Many guidelines have advocated, the education on nutrition should begin with an assessment of each individual's current eating habits and preferences.

Only 53(20.7%) were doing adequate Physical activity and 203(79.3%) participants were not doing adequate Physical activity. Similar findings were observed in studies conducted in India by Gopichandran.V et al.,[15] and Shobana et al.,[17] and in the U.S by Cayley WE et al.,[18], and .Regular exercises are recommended for people with diabetes as they have got many beneficial effects like better blood sugar control, reduction in insulin resistance, better control of blood pressure levels and cardio-protective action.[19]

Only 38(14.8%) people had good problem solving skill, which was slighty higher than what was reported by SJ Raithatha et al[20].,36(14.1%) had positive attitude towards healthy coping and fundoscopy was done only in 80(31.3%) participants, for 176 (68.7%) participants fundoscopy was never done.

Self-efficacy, problem solving, and social-environmental support were independently associated with diet and exercise, increasing the variance accounted for by 23 and 19%, respectively.In this current study the prevalence of good self care practices, increased with age and was highest in people above 60 years. Males had higher prevalence of good self care practices, compared to females. But these differences in prevalence basing on both age and gender, were not statistically significant.

In this study proper medication intake was seen in 90.2% and regular monitoring of treatment was seen in 29.77% of the study population, which was similar to the results reported by Srikanth KM et al.,[21]

In this study there were no statistically significant differences were observed in proportion of people with good self care practices among people with different levels of education, socio economic status or religion. (Table 4)The prevalence of good self care practices was higher in participants, who were taking treatment in a health facility located at less than a kilometre and was highest in people seeking care from a health facility located at > 10 km. These differences were statistically significant, but there was no increasing or decreasing trend with increasing distance. The type of health care facility or the type of medical record being used had no statistically significant influence on prevalence of good self care practices.

The practice of self-care practices was found to be unsatisfactory in almost all aspects except the treatment. As the self-care practices are essential for prevention of diabetic complications and better quality of life, more efforts should be put to educate the patients through existing facilities in both government and private healthcare facilities. Future research should be conducted regarding self-care practices with the help of community-based studies to increase the awareness of prevention of complications in diabetic patients.Group-based training for self-management strategies in people with type 2 diabetes is effective by improving fasting blood glucose levels, glycated haemoglobin and diabetes knowledge and reducing systolic blood pressure levels, body weight and the requirement for diabetes medication.[12]

Majority of the studies which are being carried out are culturally inappropriate, which have short term effects on glycemic control and knowledge of diabetes and healthy lifestyles. The heterogeneity of studies made subgroup comparisons difficult to interpret with confidence[22]. There is a need for standardized studies which are culturally appropriate and with a longer duration.

CONCLUSION: Only about a quarter of the study population had good overall self-care practices. Apart from medication intake, the proportion of subjects following the other desired self-care practices was very low in study population. Inadequate physical activity, lack of problem solving skills and no screening for eyedisease were the major problem areas in the rural diabetic population. Knowledge and positive attitude towards disease would improve the quality of life in patients with diabetes.Higher age, longer duration of diabetes, male gender, proximity to a health center was associated with good self-care practices in study population.

Conflict of interest and source of funding: nil

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(069-072)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

INDIAN DIABETIC RISK SCORE- A SCREENING TOOL FOR DETECTING TYPE 2 DIABETES MELLITUS AT THE PRIMARY HEALTH CARE LEVEL

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

AIM: To assess the use of Indian diabetic risk score (IDRS) as a screening tool for diagnosing undetected diabetic patients at the primary health care level. **METHODS**: It is a cross sectional, community based study. The study group consisted of 150 participants aged more than 20 years from the rural field practice area of a Private Medical College in Chennai. Standardized questionnaire was used to calculate data on IDRS using age, family history of diabetes, physical activity and waist measurement. **RESULTS: A**mong the 44 diabetics, 70% falls on high risk, 27% on medium risk and 2.7% on low risk according to IDRS. Among 106 non-diabetics, 24.5% falls on high risk, 50.9% falls on medium risk, and 24.5% falls on low risk. At a score of >50 IDRS predicted the risk of diabetes with a sensitivity of 95.5% and specificity of 52.8%. Hence this study validates the IDRS tool for screening diabetics at the primary care level with a high sensitivity rate.

Key words: IDRS, Screening tool, Diabetes, Cross sectional study.

Introduction:

Worldwide the burden of diabetes mellitus is increasing multi fold and more than half of them are still undiagnosed.[1] Diabetes has turned out to be a global emergency. The world health organization (WHO) estimates that more over 180 million people all around the world have diabetes. Also these numbers will more than double over the next twenty years to reach a total of 366 million by 2030.[2]In 2000, India (31.7 million) topped the world with the highest number of people with diabetes mellitus followed by China (20.8 million) with the United States (17.7 million) in second and third place respectively.[3,4,5]For developing countries like ours, urbanization is considered to be increasing risk factor of diabetes with altered dietary habits, obesity, lack of physical activity and also stress in urban dwellers. Unfortunately majority of these pre diabetics and diabetics remain asymptomatic and doesn't seek treatment. Majority among them seek health care only when they develop complications or incidentally detected in a routine screening camps. Studies have documented that patients with diabetes Mellitus or impaired glucose tolerance had already developed subclinical atherosclerosis even before diagnosis of diabetes mellitus is confirmed.[6] It has also been found that every year around 5%-10% of individuals with impaired fasting glycaemia and impaired glucose tolerance have a greater risk of being diagnosed with Type 2 diabetes mellitus[7] Hence it is of utmost importance to identify the pre-diabetics and the diabetic patients at the earliest level possible to prevent the occurrence of complications. This could be possible with the help of Diabetes risk scores which are easy to administer, less time consuming, non-invasive, and cost effective approach to assess an individual's risk of Undiagnosed Type 2 diabetes mellitus and dysglycaemia.[8] In this study we have used the Indian diabetic risk score (IDRS)developed by Mohan and his

colleagues which was derived by conducting study on a representative sample of Chennai. [9,10] It includes four parameters of age, waist circumference, family history and physical activity.

IDRS makes the screening program more cost effective as it reduces the cost by 50% if replaced for screening programs with blood sugar estimations. Hence in our study we have evaluated the IDRS usage as a screening tool at the primary care level among the rural population.

Objective

To evaluateIndian diabetic risk score (IDRS) as a screening tool for diagnosing undetected diabetic patients at the primary health care level.

MATERIALS AND METHODS

This is a cross sectional community based study, done in the rural field practice area of a Private Medical College in Chennai during the period of June 2016 to August 2016. 150 individuals more than 20 years of age participated in the study. The data was collected from the study participants after obtaining informed oral consent. Complete confidentiality was ensured throughout the study.

STUDY TOOL: It consists of a pre tested, structured questionnaire which consisted of the following sections:

- General information including age, sex, socio economic status and co-morbid illness.
- Questions on risk factorslike use of tobacco, smoking, alcohol,poor dietary habits.
- Questions on diabetic history like type of diabetes, duration of illness, treatment and complications were also included. Known diabetic status, diagnosed previously by Oral Glucose Tolerance test by a registered medical practitioner was taken as a Diabetic patient in the present study.
- IDRS data of age, waist circumference, physical activity and family history. A detailed family history of diabetes was obtained by using pedigree chart. Waist circumference (WC) was measured with a non stretchable tape to the nearest 0 .1cm at the midpoint between the lowest rib and the iliac crest after normal expiration in standing position with feet together and arms by the side of the body. Indian Diabetic Risk Score was assessed based on the data collected using the scoring given below:
  - Waist circumference <80cm(female)and<90cm (male) is score 0, 80-89cm for females and >90-99cm for male score is 10 and WC >90 cm for female and >100cm for male scored as 20.
  - Physical activity scored as regular vigorous exercise or strenuous (manual) activities at home/ work(score =0), regular moderate exercise or moderate physical activities at home/ work(score=10), regular mild exercise or mild physical activities at home/ work(score=20), no exercise and/or sedentary activities at home/ work(scored=30).
  - For age groups, age < 30years, 35-49 years and more than 50 years is scored as 0, 20 and 30 respectively.
  - Family history of type II diabetes mellitus, no family history=0, positive family history in either parent =10 and both parent =10.

The individuals are then classified as having high risk (score>60), moderate risk (score 30-50),and low risk (score<30) out of a total score of 100[9,10].

The data was collected after obtaining informed oral consent from the study participants. Complete confidentiality was ensured throughout the study.

STATISTICAL ANALYSIS: Sensitivity, specificity, positive predictive value, negative predictive value, false negatives and false positive values were calculated for the IDRS scores. Receiver operating curve with 95% confidence interval(CI) using IBM SPSS version 21.0 to assess the optimal IDRS cut off point.

RESULTS

Among 150 samples, the mean age of the study population is 41.47±14.7years.In the study conducted in 150 randomly selected individuals, among which 44 are diabetic and 106 are non-diabetics. The general demographics of the study population are given in table 1.

Among 44 diabetics,31 falls on high risk ,12 on medium risk and 1 on low risk according to IDRS. Among 106 non-diabetics, 26 falls on high risk, 54 falls on medium risk, and 26 falls on low risk according to IDRS. (Table 2)

The area under the ROC curve is C= 0.810, S.E=0.036, 95%CI= 0.739-0.882 with a sensitivity of 95.5% and specificity of 47.2% at a cut off score of less than or equal to 50 (p<0.001). Figure 1 shows the ROC curve of IDRS as a screening tool for Diabetes at the primary health care level. And table 3 shows the screening performance of IDRS at various cut off points.

Table 1: General Demographics of study population

Attribute	Frequency n=150 (%)	Diabetic subjects=44 (%)
Age		
20-30years	45(30)	2(4.5)
31-40 years	33(22)	6(13.6)
41-50years	29(19.3)	12(27.2)
51-60 years	23(15.3)	10(22.7)
>60 years	20(13.3)	14(31.8)
Sex		
Male	81(54)	26(59)
Female	69(46)	18(41)
Education		
Illiterate	27(18)	7(15.9)
Primary schooling	5(3.3)	1(2.2)
Middle schooling	14(15.3)	3(6.8)
Higher schooling	38(25.3)	14(31.8)
Graduate	66(44)	19(43.2)
Socio economic class		
I	59 (39.3)	18(40.9)
II	51(34)	19(43.2)
III	26(17.3)	4(9.1)
IV	13(18.6)	2(4.5)
V	1(0.7)	1(2.3)
Current smokers	43(28.6)	14(13.8)
Current alcoholics	26(17.3)	2(4.5)

Table 2: IDRS score among study population

IDRS	N=150 (%)	Diabetics n=44 (%)
Low	26(17.3)	1(2.3)
Medium	67(44.7)	12(27.2)
High	57(38)	31(70.5)

Figure 1: ROC curve of IDRS

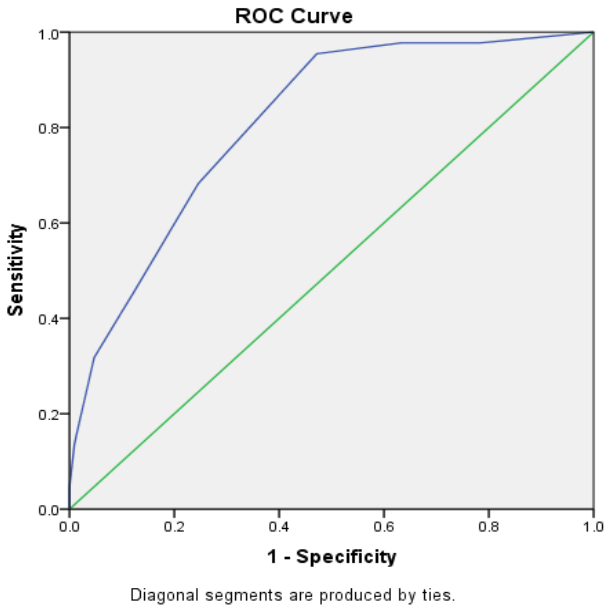

Table 3: screening performance of IDRS

IDRS score	Sensitivity (%)	Specificity (%)	Youden index	LR +	LR-
30	97.7	21.7	.19	1.24	9.5
40	97.7	36.8	.34	1.54	16.1
50	95.5	52.8	.48	2.02	11.6
60	68.2	75.5	.43	2.77	2.3
70	45.5	87.7	.33	3.7	1.6
80	31.8	95.3	.27	6.7	1.4
90	13.6	99.1	.12	14.4	1.04

DISCUSSION:

Among the many screening questionnaires and tools developed by various national and international diabetic associations throughout the world Indian Diabetic Risk score (IDRS) is a very useful screening tool developed by Madras Diabetic Research Foundation (MDRF). IDRS takes in account only four risk factors like age, waist circumference, physical activity and family history. The inclusion of waist circumference in IDRS instead of Body mass Index is more appropriate for screening Type II diabetes in Indians who have a lean body mass but are more prone for diabetes.

In our study sensitivity of 95.5% and specificity of 52.8% at a cut off score of more than or equal to 50 was seen. Whereas the results of a large population based study CURES, shows that The Indian diabetic risk score has a sensitivity of 72.5% and specificity of 60.1%.[6]Also showed low specificity of 7.2% for IDRS score less than or equal to 30. Similar studies done by Nandeshwar et al shows that at IDRS score of more than or equal to 60 had sensitivity of 94.68 % and specificity of 44.87%. And the score of <30 and 30 - 50 showed very low specificity of 3.2% and 23.7% respectively. Thus the specificity showed an increase with increasing IDRS score. [11]Contrastingly in the study done by B. Taksande et al. the score of more than or equal to 60 has 97.50%sensitivity and 87.89% specificity. And the score of <30 and 30 - 50 has 100%

and 99.85% specificity respectively with very low sensitivity in a population at Bhopal.[12]
Results of a study conducted in rural Tamilnadu shows a sensitivity of 85.7% and specificity of 43% at IDRS score ≥60.[13]

It is evident that IDRS can be used effectively at the primary care level for detecting the undiagnosed diabetics as it is simple to use, cost effective and has a sensitivity and specificity of 95.5% and 52.8% at a cut off value of score more than or equal to 50 as seen in the present study.

CONCLUSION

The result of our study demonstrate that Indian diabetic risk score(IDRS) being a simple, easy to use and cost effective tool can be reliably applied as effective tool for mass screening of diabetes in the community at the primary care level.

Conflict of Interest: Nil

Source of funding: None

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(073-076)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

ACADEMIC STRESS AMONG HIGH SCHOOL STUDENTS IN THALASSERY EDUCATIONAL BLOCK, KERALA: A CROSS SECTIONAL STUDY

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Date of Submission: 21.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

Background: Chronic or high levels of academic stress among school students may lead to both physical and mental stress related diseases. If not managed promptly, may aggravate to serious psychological problems and even end in suicides. India has one of the highest rates of suicide rates among students, which peaks in the southern regions of the country. By this study, we intend to assess the academic stress levels faced by the high school children and factors associated with it. **Objectives:**To assess academic stress and its determinants among high school students in Thalassery educational block, Kerala. **Materials and Methods:**A Cross sectional study conducted among high school students for a duration of one month with sample size 600 by using convenient sampling method. After getting consent of school authorities and students, Academic Anxiety Scale for Children by A K Singh & A Sen Gupta (AASC – SG) questionnaire was used. Data was entered in MS Excel sheet and analyzed using EpiInfo Chi-square test was used to check the associations. **Results:**Among 600 students, 53.3 % were males and 46.7 % were females. The mean stress score was 10.86±3 and the proportion of academic stress (High and Medium) was 64 %. There was no association between gender and academic stress and also between class and academic stress, however it was significantly associated among rural schools compared to urban schools (p =0.008) and in private schools compared to government schools (p= 0.0001). **Conclusion:**Among the study population, half of the students face high academic stress and it was significantly associated among 10th standard students, rural students and private school students but there was no association between academic stress and gender. Time management lessons, counselling services and yoga classes may prove beneficial if added to curriculum.

Key Words: Academic stress, high school students, AASC-SG, Kerala.

Introduction:

As the world is moving at a fast pace, competition and ambition for achievements become need of the hour. The eventual rat race has made stress an occurrence of daily lives, not even sparing our children. Just as adults face stress at work and households, children too are stressed at their schools. Academic stress is defined as stress that comes from schooling and education. The stressors may be increase in homework load, high expectations from teachers and parents, lack of social support, tight schedules, or strict school authorities.

Not all stress is bad. Researchers agree that moderate amount of stress is essential to keep people motivated and responsible and also helpful for people in having a more sustainable and prosperous life.[1] However, when there are chronic or high levels of anxiety it may manifest as stress related disease; physically as tension headaches, heart diseases and mentally as anxiety and mood disorders etc.[2] In extreme cases, may even end in suicides. India has one of the highest rates of suicides among youth.[3]Many studies done on stress among high school students showed that students with higher stress will have poor academic performance along with some physical or mental health problems.[1,4–10]Children are the pillars of our future generations and we are duty bound to guide them. So, understanding academic stress gains importance when we are concerned with each child's individual abilities to

cope with stress, which in turn paves way for a productive life later on in adulthood.

So, with this background, we conducted this study with the objective to assess the level of academic stress and its determinants among high school students in Thalassery educational block, Kerala.

Material and Methods:

It was a cross sectional study conducted at high schools in the Thalassery educational block, Kannur district.The students of 8th, 9th and 10th classes of Thalassery educational block, who were willing to participate were included in the study.The study was conducted over a period of 2 months (December 2016- January 2017).According to the study done by Deb S et al, the proportion of academic stress among high school students was 63.5%,[6] with an absolute precision at 4%, sample size of 557 was calculated using OpenEpi Version 3.03 which was rounded off to 600. In the field practice area of Department of Community Medicine, Kannur Medical College, educational block covered is Thalassery education block. Under this block, approximately around 34 high schools are there, among that we choose randomly three government and three private schools for the study. Data collection tool consists of two parts – I. Basic details (age, sex, class, area of residence, type of school administration, parent's occupation) II. Academic Anxiety Stress Scale for Children by Singh AK and Gupta SA (AASC-SG) questionnaire was used to assess the stress.[11]

*AASC-SGQuestionnaire and Scoring:*AASC-SG is a validated questionnaire used to assess the stress among the high school students. It consists of twenty questions with 'yes' or 'no' options to answer. The maximum possible score of this test is 20 and each question will be scored either +1 or 0. It consists of 16 positive and 4 negative questions. All positive questions which are endorsed by the students as *'Yes'* and all negative questions (4,9,16,18) which are endorsed as *'No'* are given a score of +1. A score of zero is given to all other answers. The categorization of stress was done based on the total score obtained as high, average and low with different score cut offs for rural and urban students by the authors (Table 1).[11]

Table 1: Categorization of stress based on AASC-SG score cut off for rural and urban high school students.

Stress Category	Rural	Urban
High Academic Stress	≥11	≥12
Average Academic Stress	9.5-10.99	10.5-11.99
Low Academic Stress	<9.5	<10.5

The study was conducted after taking ethical clearance from the Institutional Ethics Committee, Kannur Medical College.The data was collected after taking the permission from the respective institute heads and consent from the parents. After explaining the purpose of the study and assent was taken from the students who were willing to participate in the study. Data was collected by administering questionnaire to the students with the instructions to choose best answer how they felt over past one month.Data were entered in Microsoft Excel and analyzed using EpiData Analysis. Descriptive statistics such as frequencies, proportions, mean and standard deviation were used. Student t test and ANOVA test were used for comparison of mean stress score whereas Chi-square test was used to check the difference stress categories and p value <0.05 considered as statistically significant.

Results:

Socio-demographic Details:
A total of 600 high school students participated in the study and the mean age of the study population was 13.8±0.8years. Among the participants 53.3% (320) were males and 46.7% (280) were female students. About 43.5% (261) students were studying in 8th standard, 66.8% (401) were from rural areas, 68.2 (409) were studying under state syllabus and 65% (390) were studying in private schools (Table 2).

Table 2: Sociodemographic details of the study population

Sociodemographic variables	Values (n=600) (%)
Age (in years)	
• Mean ± SD	13.8±0.8
• Median	14
Gender	
• Male	320 (53.3)
• Female	280 (46.7)
Class	
• 8th Standard	261 (43.5)
• 9th Standard	223 (37.2)
• 10th Standard	116 (19.3)
Residence	
• Rural	401 (66.8)
• Urban	199 (33.2)
Syllabus	
• State	409 (68.2)
• CBSE	191 (31.8)
School Administration	
• Government	210 (35.0)
• Private	390 (65.0)

Academic Stress and factors associated with it:
The overall mean score of the academic stress was 10.86 with a standard deviation (SD) of 3.0 (95% CI 10.62-

11.12). The mean score was higher among male students, 10th standard students, students from rural areas, students studying under state syllabus and private schools. However, significant difference was only found between stress and students studying under state syllabus and private management schools. The stress was more among 10th standard students compared to 8th and 9th students (Table 3).

Table 3: Factors associated with mean academic stress score among the students.

Factors	Mean Academic Stress Sore	Standard Deviation	95% CI	p value
Gender				
Male	10.91	3.05	10.57-11.24	0.69
Female	10.81	2.95	10.46-11.16	
Class				
8th Standard	10.64	2.87	10.29-10.99	
9th Standard	10.79	3.18	10.37-11.21	0.033*
10th Standard	11.5	2.87	10.97-12.03	
Residence				
Rural	10.92	3.08	10.62-11.22	0.52
Urban	10.75	2.84	10.35-11.15	
Syllabus				
State	11.05	3.01	10.75-11.34	0.027
CBSE#	10.47	2.96	10.04-10.89	
School Administration				
Government	10.37	2.95	09.97-10.77	0.003
Private	11.13	3	10.83-11.43	
Total	10.86	3	10.62-11.10	

** ANOVA Test used*
 # CBSE- Central Board for Secondary Education

About 49.3% (296) students were having high stress and 36% (216) were having low stress.High stress was more among males, 10th standard students, rural students and private school students. However, high stress was significantly more among rural students and private school students compared to urban students and government school students (Table 4).

Table 4: Association between academic stress categories and sociodemographic characters among the study population.Discussion

Factors	Low Academic Stress n (%)	Average Academic Stress n (%)	High Academic Stress n (%)	Total	p value
Gender					
Male	113 (35.3)	46 (14.4)	161 (50.3)	320	0.877
Female	103 (36.8)	42 (15.0)	135 (48.2)	280	
Class					
8th Standard	100 (38.3)	36 (13.8)	125 (47.9)	261	
9th Standard	082 (36.8)	37 (16.6)	104 (46.6)	223	0.296
10th Standard	034 (29.3)	15 (12.9)	067 (57.8)	116	
Residence					
Rural	128 (31.9)	59 (14.7)	214 (53.4)	401	0.008
Urban	088 (44.2)	29 (14.6)	082 (41.2)	199	
Syllabus					
State	146 (35.7)	61 (14.9)	202 (49.4)	409	0.957
CBSE	070 (36.6)	27 (14.1)	094 (49.2)	191	
School Administration					
Government	099 (47.1)	29 (13.8)	082 (39.0)	210	<0.001
Private	117 (30.0)	59 (15.1)	214 (54.9)	390	

Adolescent students experience academic stress very often in their life because of various reasons. The mean academic stress score in our study was 10.86 and was slightly less compared to studies done in India by Bihari S and Mahajan G.[4,5]

In our study, academic stress was more among males but there was no association was found among gender which was similar to study done by Bihari S and Mahajan G.[4,5]The mean academic stress score among students studying in 10th standard was more which is may be due to people preparing for board exams. Academic stress statistically associated more among the students from rural residence which was not so in other studies.[4,5] Stress was more among students studying state syllabus and it was statistically significant. High academic stress was statistically significantly associated with the students studying in private schools which was different to study done by Bihari S which showed government school students having higher academic stress and study done by Mahajan G did not show any association.[4,5] The high academic stress among private school and rural resident students may because of high competition and time management issues.

The limitations of the study were other socio-demographic factors such as income, occupation of parents, parental and academic pressure were not used in

the study which would have been added good information about the reasons for stress.Proportionate sampling among governmnet and private students and different classes was not done.

Conclusions:

Almost half of the students were having high academic stress and it was associated more among students studying in 10th standard, from rural background, studying under state syllabus and under private administration. Time management lessons, counselling services, extracurricular activities and yoga classes may prove beneficial if added to curriculum because the students with high academic stress may develop psychological disturbances such as depression, anxiety and suicidal tendency.

Acknowledgments:

We are highly thankful to staff of Department of Community Medicine, Kannur Medical College for their support in this work. We also thank House surgeons of Kannur Medical College for their help in collecting data. We highly grateful for all the school principals and school management for giving us permission to conduct study. We immensely thank all theparticipants for their valuable time and co-operation. We also acknowledge the Management of Kannur Medical College for their support.

Source of Funding: None
Conflict of interest: None declared
Ethical approval: Ethical approval taken from Institutional Ethics Committee, Kannur Medical College, Kannur.

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National Journal of Research in Community Medicine. Vol.6. Sup. Issue 1. 2017(077-082)
ISSN - Print: 2277 – 1522, Online: 2277 – 3517

Original Research Article

SMARTPHONE APPS USAGE FOR PHYSICAL ACTIVITY RELATED LIFESTYLES AMONG MEDICAL STUDENTS

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Date of Submission: 01.04.2017 **Date of Acceptance: 01.07.2017**

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Abstract

INTRODUCTION: Medical undergraduates are prone to be physically inactive owing to academic pressures. Smart phone applications popularly known as "apps" could play a vital role in enhancing the physical activity related behaviors among users. They can also act as motivational agents for regular physical activity by tracking the daily progress and by sending reminders for a specific activity. **OBJECTIVE:**To study the aptitude and usage of smart phones based physical activity enabling apps among medical students. **METHODOLOGY:** A cross sectional study was conducted among medical students of a private medical college in Chennai. An e- survey questionnaire link is shared through a free messaging app, WhatsApp to medicos and data collected were analyzed by using SPSS- V21. Self - reported physical activity-related information, data to assess aptitude to smart phone apps usage to enable their physical activities is captured. **RESULTS:** A total of 420 medicos responded to e- survey of whom females were 254(60.47%).Though 259 (63.2%) medicos reported that they believe regular physical activity as very important for promoting health, only 113(27.6%) medicos reported a regular physical activity for five or more days in a week. About 347 (82.6%)medicos have been using smart phone for two years or more and 163(44%) are aware about apps for physical activity. 189(45%) of the medicos consider the role of apps in enabling physical activity as important. Around 80(22.4%) participants reported using apps to guide their physical activity and 123 (33.5%) students expressed their interest to download and use in future. Among the apps used for physical activity 96(41.7%) students used apps for demonstrating exercises, 80(34.8%) students use apps to track the fitness and 67 (29.1%) students use apps to provide personal training modules. **CONCLUSION:** Though medicos are informed about apps for physical activity there seems to be a gap in its use on a regular basis. Creating more awareness about the smart phone apps might encourage medicos to adapt a regular physical activity enabled by apps.

KEY-WORDS: Smartphone apps, Physical activity, Medical students.

BACKGROUND

Physical inactivity contributes to approximately 3.2 million deaths annually and is the fourth leading risk factor for premature death [1].Insufficient physical activity is a key risk factor for non-communicable diseases (NCD) such as cardiovascular diseases, cancer and diabetes [2].Strong evidence shows that physical inactivity increases the risk of many adverse health conditions including breast and colon cancers and shortens life expectancy[3]. Elimination of physical inactivity would remove between 6% and 10% of major NCDs of coronary heart disease (CHD), type 2 diabetes, breast and colon cancers also increasing life expectancy[3].

Globally, around 31% of adults aged 15 years and above were insufficiently active in 2008 (men 28% and women 34%)[2] .The prevalence rates for insufficient physical activity in the South East Asian region showed 15% for men and 19% for women[2]. ICMR-INDIAB-5 study involving about 14227 individuals across four states in India reports that the prevalence of physical inactivity in Tamil Nadu as 60%[4].The study also mentions that the physical inactivity rates were high among urban areas compared to rural areas (65.0% vs 50.0%) and among females compared to males (63.0%vs 45.7%;$p < 0.001$)[4].

Young adults such as medical students lack physical activity and ignore it mainly due to their academic schedules, stress, lack of time, depression and laziness.
In a study conducted in a medical school in southern Thailand,50.50% of the medical students have insufficient PA because of study related activities and overtime of medical shift duties[5].
Smart phones have become an essential multi-purpose gadget in modern daily life and an indispensable item when on the go. Among the recent phone acquirers in general 93% chose to purchase a smartphone[6]. Review of smartphone owners by age reveals penetration being highest among millennials aged 18-24[6].It has been reported in a study that about 80% of the medicos have at least one medical app not always a physical activity related app, right in their smart phone [7]. The physical activity apps automatically track the physical activity, progress towards goals such as reduction in weight, BMI, waist-circumference and are also cost-effective, and also being user friendlyhas potential to act as motivational agents for regular users. Smart phone apps can be efficacious in promoting physical activity although small number of studies shows the magnitude of the apps effecting physical activity is modest [8].

There is good number of studies about physical activity apps about its barriers and facilitators among adult population and patients[9,10],but to our knowledge studies exploring the potential of the apps to enhance physical activity among medicos who are ubiquitous users of smart phones are limited in number[1,11]. In this generation where most of the medicos are owning smartphone and using it mainly for social networking and medical related apps we would like to study the usage and aptitude of medicos to physical activity related apps.

OBJECTIVE: To study the aptitude and usage of smart phones based physical activity enabling apps among medical students.

METHODOLOGY

A cross sectional study was conducted (January, February 2017) in Tagore Medical College and Hospital among 420 medicos owning a smart phone using E -Survey questionnaires with a convenient sampling method. E – Survey creator is a website enabling quick and easy creation of e-survey tools and has inbuilt software for automatic analysis of web survey results on any possible topic. The link of the e- survey creator can be opened in any of the devices like I-pad, tablet, mobile, laptop or a computer. There is no limit on number of questions or pages or participants per survey. The participant's answers will be automatically analyzed and displayed in charts and figures. Results can be immediately exported into Microsoft Excel™ or CSV (e.g. For SPSS PASW Statistics ™). An account was opned in www.esurveycreator.com and the survey tool, e-questionnaire was created.

The link was then circulated to medicos through the WhatsApp groups after announcement was in the classes by their respective batch representatives. A special focus was given for the 1st year MBBS students. They were first sensitized about the research project by the authors and later the e-survey link was shared for completion of the questionnaires. In the e- questionnaires the medicos were asked about their attitudes and aptitude towards physical activity, their participation in any sports activity on a regular basis. The data on years of usage of smart phone, their awareness and usage of physical activity apps, features of the apps being used by the medicos were also collected. The medicos responded by opening the link and answering the questions online. For about 20 participants 'survey responses the e-survey tool was free and for more than those numbers, to unlock the answers we were required to make a payment as per website rates. Their recorded answers were then downloaded in the excel sheet and analyzed using SPSS V 21.

Results:

Table 1 : Baseline characteristics of medical students participating in smart apps enabled physical activity survey

MBBS Year	Total No of students	No of students who participated in survey	Percentage who participated in survey
1	150	130	86.60%
2	134	120	89.55%
3	112	80	71.43%
4	127	70	55.11%
CRRI	42	20	47.62%
Total	565	420	74.33%

**CRRI: Compulsory Rotatory Residential Internship

Of total eligible 565 medical students only 420 medical students participated in the survey. Participation from 1st year students is 130(86.6%) second year 120(89.55%), third year 80(71.43%), final year 70(55.11%) students participated, from the interns batch 20(47.62%) students responded to the online survey.

Of 420 medicos 166(39.52%) are males and 254(60.47%) are females. The participants are ranging from 17 to 23 years in age. In 17 years, 10(2.3%) males and 22(5.23%) females. In 18 years, 33(7.85%) males and 64(15.23%) females. In 19 years, 46(10.9%) males and 62(14.76%) females. In 20 years, 41(9.7%) males and 66(15.71%) females. In 21 years, 29(6.9%) males and 31(7.85%)

females. In 22 years, 2(0.47%) males and 3(0.71%) females.In 23 years, 5(1.1%) males and 6(1.42%) females.(Table-2)

Table 2 : Age and Gender distribution of medical students participating in smart apps enabled physical activity survey

Age in years	Male		Female		Total	
	N	%	N	%	N	%
17	10	2.3	22	5.23	32	7.61
18	33	7.85	64	15.23	97	23
19	46	10.9	62	14.76	108	25.71
20	41	9.7	66	15.71	107	25.47
21	29	6.9	31	7.85	60	14.28
22	2	0.47	3	0.71	5	1.19
23	5	1.1	6	1.42	11	2.61
Total	166	39.52	254	60.47	420	100

*N = FREQUENCY

Table 3 : Attitude and Practice of physical activity and sports activity of medical students who participated in smart apps enabled physical activity survey

Physical activity	Attitude		Practice	
	Not Important	Important	Regular Activity	No Activity
N	6	414	118 (Male 63Female 55)	312
%	1	99	28 (Male 53 Female 47)	72

Although 414(99%) medicos feel physical activity is important only 118(28%) do regular physical activity in which male medicos are 63(53%) and female medicos are 55(47%).296(72%) have stated they don't do regular physical activity as they don't have time for it. 6(1%) medicos feel physical activity is not important. Of the 118(28%) medicos who do regular physical activity, they are mainly involved in sports. Of the 118(28%), 26(22%) perform individual sports , 29(24.6 %) team sports ,6(5.1%) are involved in both the team and individual sports.57(48.3%) are not involved in sports but do some other regular physical activity.

Table 4 : Duration of smart phone usage among medicos who participated in smart apps enabled physical activity survey

Duration of Smart phone usage	Frequency	Percentage
<1 year	66	15.7
1-2 years	166	39.5
2-5 years	147	35
>5 years	34	8.1
Not at all	7	1.7
Total	420	100

About 66 (15.7%) students are using smart phone for less than one year.166 (39.5%) students are using smart phone for one to two years. 147(35%) students are using smart phone for two to five years. 34(8.1%) students are using smart phones for more than five years. 7 (1.7%) students are not using smart phones.

Table 5:Knowledge, and aptitude towards physical activity appsamong medicos who participated in smart apps enabled physical activity survey

Physical activity apps	Medical students	
	Frequency	%
Aware about Apps	365	87
Believe physical activity apps are important	252	60
Using physical activity apps	140	33
Believe physical activity apps influence undertaking physical activity	110	26

Though 413(98%) medicos have smart phone, only 365(87%) are aware about the physical activity apps of which 252 (60%) believe the apps are important but only 140(33%) of them use it, of which 110(26%) believe that the physical activity apps influence their physical activity.

Table 6: Physical activity related apps usage among among medicos who participated in smart apps enabled physical activity survey

Physical activity Apps characteristic	Frequency	Percentage
Total eligible study population	565	100
Total number Participated in survey	420	74.33
Total Smart Phone users among surveyed	413	98
Downloaded and using physical activity apps	140	33
Downloaded and not using	34	8
Not downloaded but interested to download and use in future among	172	41
Not downloaded and not interested to download and use in future	74	18

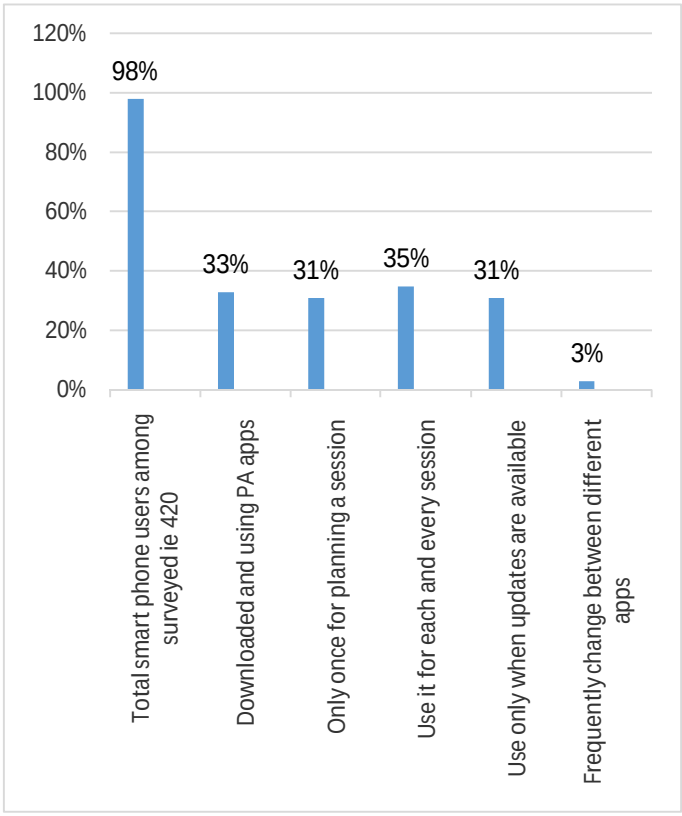
From the survey, it is clear that 172(41 %) have downloaded the app of which 140(33%) use it, 34(8%) have downloaded but not using the app.74(18 %) have stated that they are not interested in the app and next set of172(41%) have stated that they are interested in the app and will download it in the future

TABLE 7: Features ofphysical activity apps used by medical students who participated in smart apps enabled physical activity survey

Features in the app used by the subjects	Frequency	Medical students%
Total smart phone users among surveyed ie 420	413	98
Total physical activity apps downloaded	172	41
Downloaded and using physical activity apps	140	33
Male	71	50.7
Female	69	49.3
Demonstrates various exercise	97	23
Fitness tracking activity	82	20
Personal training module	68	16
Yoga module	50	12
Log book for workout	43	10
Pair with devices in gym	22	5
Others	58	14

Of the medicos who use the apps97(23%) have stated that they use the app as it demonstrates various exercises,82(20%) for its fitness activity tracking, 68(16%) for personal training module ,50(12%)for yoga module ,43(10%)log book for workout and 22(5%) pair with devices in gym.

Figure 1: Consistency in usage of PA apps among medical students who participated in smart apps enabled physical activity survey



In assessing the consistency in usage of apps for medicos 44(31%) use it once to plan their session,48(35%) for each and every session, 44(31 %) use it only during updates and 4(3%) frequently change between apps

DISCUSSION

We attempted to understand the usage of physical activity related apps among medical students in our college. Physically active medical students in our study are found to be 118(28%).In a study conducted among 279 medical students in southern Thailand, 49.5 % of the participants were physically active and reasons for insufficient physical activity is because of study related activities and overtime shift work[5]. This rate of physically active students is higher compared to our study, which reflects that Indian students are giving priority to studies than physical activity.

In a study conducted to assess the lifestyle disease risk behavior among 120 medical students in central India, 67% of the medical students were not doing regular

physical exercise, which is comparable with 72% of medical students not doing regular physical activity[8]. Also, in the same study 58% were not involved in sports activity whereas in our study 48.3% are not involved in sports activity, which is a bit better when compared. This can be explained by the fact that inTamilNadu, sports culture is strongly encouraged in schools and college level, and these students may be continuing these activities into medical school. Also majority of these students are also hostellers, which could also explain that they have sports equipment and ground facilities available in the campus for them to practice these sports activities. Involvement in sports and physical activity was found less among female students[12].In our study the involment of females students (47%)were as equal as male students(53%).

In our study the usage of physical apps is quite low which is only about 33% though smart phone usage is almost universal among medical students[12.] The medical app usage is high about 78.3% among the UK medical students, though a distinction about physical activity apps in not mentioned[13]. Though studies among medical students and usage of physical activity related apps are rare to be found, in a primary care population, an intervention to increase physical activity among the study participants using apps significantly increased physical activity over 8 weeks[8]. In a study conducted among adult population in U.S it has been proven physical activity has increased with mobile devices equipped with physical activity apps[8]. Also, though medicos are informed about apps for physical activity there seems to be a gap in its utilization on a regular basis. This is reflective of the trends that usage of social apps such as Facebook, Twitter and Instagram is on an impressive rise compared to the decline in use of personalization apps which focus on holistic or individual area specific developments such as physical activity, meditation etc[14]. This meta analysis study has also provided framework for interventions using mobile technology to increase physical activity behaviour[14]. Reports suggest employing immersive features in design of apps with lesion components such as games and virtual reality with user engagement to be having greater potential in increase user adherence[15] by enhancing the appeal and delivery of interventions to increase the levels of physical activity in young people[15]
Literature suggests that for adults who want to track their general activity, smartphones will meet their needs but we believe that in young adults such as medical students with competing priorities such as studies and social life, perhaps physical activity figures low in the order of priorities for them[16]. We believe the above being the fact in our study as medical students demonstrated very low usage of physical activity enabling apps to improve their physical activity related behaviors. Even among the students who are physically active, they are still adopting traditional ways of engaging in physical activity through sports or games participation rather than having personal or individual physical activity goals, and also less interested in exploring different approaches for improving fitness through digital/mobile tools such as apps. This also highlights that medical students in our part of the world are not yet at a stage to harness the potential of digital tools such as apps, personalized fitness tracking devices and integrate digital tools enhanced physical activity as a life style as seen in western counterparts. We believe that there needs to be a shift in culture and mindset of the young adults to experiment with available digital tools which has demonstrated the potential to revolutionize the physical fitness goals elsewhere in the world. Increasing awareness about apps to enhance the quality and diversity in maintaining physical activity related life styles among medical students has to be undertaken in medical schools through awareness sessions. This might ultimately motivate young medicos to improve their physical activity behaviors with integration and adoption of technology assisted tools such apps into their routine daily living.Further studies are required to assess the lack of interest for using physical activity apps by youth for uptake or enhancement of physical activity.

RECOMMENDATION

Creating more awareness about the attractive features of smart phone apps might encourage the medicos to adapt a regular physical activity enabled by apps.

Source of funding: Nil
Conflict of Interest: None

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National Journal of Research in Community Medicine