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Prevalence of Non Communicable Diseases and Its Risk Factors among the Non-Teaching Staff of Medical College using WHO STEPS

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ABSTRACT

Introduction: Non-communicable diseases (NCDs) contribute to 65% of all the deaths and 80% of these are in developing countries. Medical colleges have a large workforce with risk for NCDs similar to general population.

Methodology: A cross-sectional survey among the 65 of 88 non-teaching staff members of the medical college was done to screen for NCDs using WHO STEPS with necessary modifications. This was done as part of student research project through regular undergraduate curriculum where the undergraduate medical students are taught basic research skills.

Results: There were six self-reported diabetics and five self-reported hypertensives. Risk factors such as high salt intake (77%), high waist-hip ratio (15% women), and overweight (22%) were detected.

Conclusion: The exercise gave an opportunity for screening and spreading awareness for health promotion and risk reduction for NCDs.

Key Words: Non-communicable diseases, prevention, health promotion, screening, WHO STEPS

INTRODUCTION

The second half of the twentieth century has seen some major health transitions with increasing industrialization, urbanization and technology innovations. Among all changes, the most globally pervasive change has been the rising burden of non-communicable diseases (NCDs).[1] These are also referred to as "chronic diseases" or "lifestyle diseases". World Health Organization (WHO) includes cardiovascular diseases (CVDs), diabetes, chronic obstructive pulmonary diseases (COPD), cancers, asthma, eye conditions, neuro-psychiatric conditions, congenital conditions, skin diseases and musculoskeletal diseases as chronic diseases.[2] However four main diseases dominate NCD related mortality and morbidity: cardiovascular diseases, diabetes mellitus, cancers and chronic respiratory diseases.[1]India, like most developing countries is experiencing a rapid health transition with rising burden of NCDs. According to a WHO report (2002), CVDs will be the largest cause of death and disability in India by 2020.[2]

India has more than 400 medical colleges for undergraduate medical training in India with more than 52,000 students studying at a time.[6] These institutions require a huge number of non-teaching staff for efficient and smooth functioning and it ranges from 100 to 200 or even more. It is important to strategize a change towards positive health behaviours, along with increased awareness for chronic conditions at institutional level. This can be achieved by various behavior change communication methods for a positive life style. Communication in many situations is more effective when there is adequate opportunity for interpersonal communication.[7]

Behavioral risk factor assessment and self reported NCDs give a snapshot assessment of burden of the problem in any community. The most important of risk factors are tobacco usage, alcohol consumption, physical inactivity and diet.[2] Moreover, body mass index (BMI) and blood pressure measurement can screen those at risk for most chronic diseases.[1] These are also simple tools in history and examination that undergraduate medical students learn during their medical curriculum.

The objective of the present study was to find prevalence of NCDs and its risk factors among the non-teaching staff of medical college in Mangalore.

METHODS

A cross sectional survey was planned covering the non-teaching staff in the medical college. There were 88 non-teaching staffs working at the time of study.

Process: A structured questionnaire based on WHO STEPS instrument modified to include relevant information was formulated.[8]

This was done as a part of student research activity during fourth semester of undergraduate curriculum in the department. It is a phase when they finish their basic sciences and enter into clinical postings in a phased manner. A formal request for ethical clearance was applied for in the first week of the student attachment.

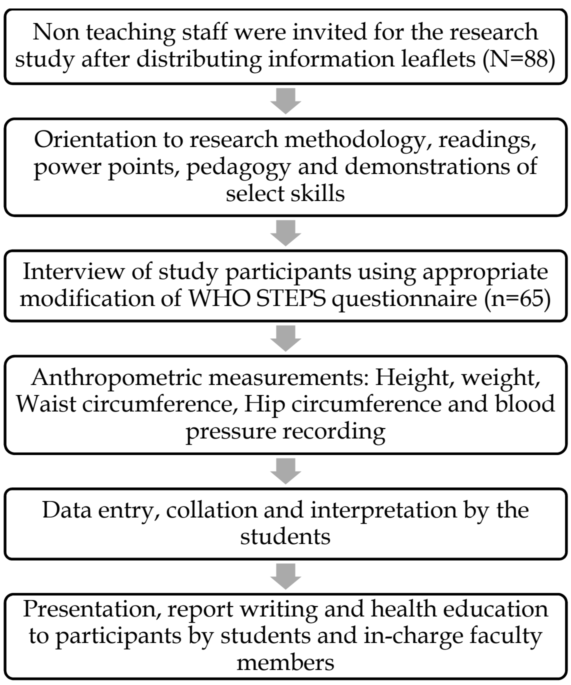

Figure 1: Outline of the student research project

Data collection: Initial permission from the administrative authorities was taken during the first week. A complete list of all non-teaching staff within the academic block of the medical college was compiled. An invitation letter was sent to all the concerned departments for participation. Personal visits for explaining the purpose and nature of the study were also made. There was a total of 88 non-teaching staff in the medical college.

Data collection was spread over the next 10 days of the student posting. It was done using interview method, followed by anthropometric measurements and blood pressure measurements. At the end of the questionnaire, the participant was given health education tailored to his NCD risk profile. Referrals were made for the clinical evaluation wherever required. (figure 1)

Anthropometric and Blood Pressure Measurement: Weight was recorded using digital weighing scale with accuracy upto 100 grams. The participant was made to stand still and upright with weight evenly distributed between the two feet. Height was measured using a wall mounted, easy-to-use and portable stature meter made of non-stretchable tape. The participant was made to stand without the shoes and heels slightly separated. The horizontal blade of the instrument was then brought straight on the head positioned in Frankfurt plane. Waist circumference was measured using a non-stretchable measuring tape with participant standing relaxed and tape positioned between the costal margins and iliac crests at minimal respiration. Hip circumference was taken at the greatest circumference, at the level of greater trochanters (the widest portion of the hip) on both sides. Blood pressure was measured using mercury sphygmomanometers, in sitting position, right arm. Two readings were taken fifteen minutes apart and mean was taken as the final reading.

Training of Undergraduates: This included readings on research methodology of cross-sectional studies and an overview of other study designs, NCDs, levels of prevention and method and content of health education. This was done using group readings, pedagogy, power-point presentations and demonstrations. Demonstrations were used mainly for anthropometric measurements, blood pressure recording and health education to be communicated at the end of each interview.

Operational Definitions: The concept of operational definition was introduced to the students and they were asked to make a list of study variables that need to be operationally defined. These were as follows: Alcohol Consumption: here the ‘current user’ was a person who is consuming alcohol for the past one year; ‘ex-consumer’ was a person who has quit using all forms of alcohol from the past one year and ‘non consumer’ was a person who has never consumed alcohol in his/her life. Similarly for tobacco consumption, the 'current user' was a person who is consuming any form of tobacco for the past one year; 'ex-consumer' was a person who has quit using all forms of tobacco from the past one year and 'non consumer' was a person who has never consumed tobacco in his/her life. The foods with high amount of salt (some spicy local preparation), dips and sauces, pickles, and salt crispies was prepared. Waist-hip ratio (WHR) was calculated by dividing the waist circumference and hip circumference in centimeters. The level of risk according to WHR for males was taken as ≤0.95, 0.96-0.99 and ≥1.00 respectively for low risk, medium risk and high risk and ≤0.80, 0.81-0.84 and ≥0.85 respectively for women. The Body Mass Index (BMI) was calculated using the standard formula of weight in (Kilograms) divided by height in meters squared. It was classified as thin (<18.49 Kg/M^2), normal (18.5-24.99 Kg/M^2) and overweight (25.00-29.99 Kg/M^2) and obese (≥30.00 Kg/M^2). Classification of hypertension was done according to Joint National Committee – 7 (JNC)[9] (the classification that was available in the standard textbooks of undergraduate medical students). The occupation was classified into housekeeping, attendants, laboratory staff and office desk workers.

Data management and presentation: Information was collected about demographic characteristics, education and type of occupation. Participants were asked about select dietary factors that contribute to the development of NCDs and information was collected for family history of any NCDs. Tobacco and alcohol use was recorded along with any self-reported, already existing NCD. Data entry was done in Microsoft Excel and analysis was done in SPSS. Percentages and proportions were calculated.

Ethical considerations: The study was approved by the Institutional Ethics Committee. Detailed information pertaining to the nature, objectives of the study and anthropometric and blood pressure measurements was provided to the study participants and written informed consent was obtained. Anonymity of the study participants was ensured and utmost confidentiality of the information collected was maintained.

RESULTS

Of the total 88 non-teaching staff members 65 participants agreed or were available for participation.

Demographic characteristics

Table 1 outlines the demographic characteristics of study participants. More than 60% of the participants were less than 40 years of age and dominated by female workers. While almost 57% were married, 37% were single. There was equal distribution with regards to urban and rural residence. More than 52% of the participants were Below Poverty Line (BPL) card holders. In terms of education, participants with education till graduation or more were 49% and almost 50% were educated upto pre-university college. Majority (31%) were desk workers, followed by attendants (28%), laboratory technicians (23%) and housekeeping (18.5%).

Risk factors of NCDs

Risk factors were assessed in terms of dietary factors, physical activity and addictions (Table 2). Barring three participants, most consumed mixed type of diet consisting of non-vegetarian food. A majority consumed non-vegetarian food 1-3 times in a week. More than 30% consumed it most days of the week (15% consuming it daily and 17% consuming non-vegetarian food 4-6 times a week). On enquiring about fruit intake, it was found that it was not a daily feature in the diet for majority of the participants. More than 32% of the participants used top-salt for diet and almost 77% reported consumption of foods with high salt.

Table 1: Demographic Characteristics of study participants

Characteristic (n= 65)	Frequency (%)
Age group	
≤ 40 years	40 (61.5)
> 40 years	25 (38.5)
Gender	
Males	13 (20)
Females	52 (80)
Marital Status	
Single	24 (36.9)
Currently married	37 (56.9)
Separated	2 (3.1)
Widowed	2 (3.1)
Religion	
Hindu	49 (75.4)
Muslim	8 (12.3)
Christian	8 (12.3)
Type of residence	
Urban	33 (50.8)
Rural	32 (49.2)
Ration Card	
Above poverty line	31 (47.7)
Below poverty line	34 (52.3)
Education	
Illiterate	1 (1.5)
Up to SSC	19 (29.2)
PUC	13 (20)
Graduate and more	32 (49.2)
Occupation	
Housekeeping	12 (18.5)
Attendant	18 (27.7)
Lab Technician	15 (23.1)
Desk workers	20 (30.8)

SSC= Senior Secondary School Certificate; PUC= Pre-University Certificate

Table 2: Diet, Physical activity characteristics and Risk factors for NCDs in study participants

Characteristics	Frequency (%)
Type of Diet	
Vegetarians	3 (4.6)
Mixed diet	62 (95.4)
Frequency of non-vegetarian food (n=62)	
Daily	11 (16.9)
1-3/week	38 (58.5)
4-6/week	10 (15.4)
Few times/month	3 (4.6)
Fruit intake	
Daily	16 (24.6)
1-3/week	24 (36.9)
4-6/week	4 (6.2)
Few days/month	21 (32.3)
Eating Out	
Yes	30 (46.2)
No	35 (53.8)
Use of Top-salt	
Most of the times	21 (32.3)
Sometimes	15 (23.1)
Never	29 (44.6)
Intake of food with High salt	
Yes	50 (76.9)
No	15 (23.1)
Perceived nature of occupation	
Light activity	17 (26.2)
Moderate activity	39 (60)
Heavy activity	9 (13.8)
Exercise before or after work	
Daily	11 (16.9)
1-3/day	10 (15.4)
Few times in month	6 (9.2)
Never	38 (58.5)
Transport to work place	
Active	15 (23)
50	50 (77)
Family History of diabetes mellitus	
Yes	19 (29.2)
No	46 (70.8)
Family History of Hypertension	
Yes	12 (18.5)
No	53 (81.5)
Ever users of Tobacco (n=4; 6%)	
Smoking	3 (75)
Smokeless	1 (25)
Ever users of Alcohol	
Yes	8 (12.3)
No	57 (87.7)

Such foods included pickles, sauces and savory crispies (called papadum in local language) which are a common feature of regular diet in this part of India. The use of lift was very common as opposed to stairs. Only five participants felt that their occupation involved vigorous physical activity. More than 77% used motorized transport to reach work place. On asking about exercise in any form, more than 58% reported no exercise of any form other than their daily routine. Tobacco was consumed in either smoke or smokeless form by four participants and eight were ever users of alcohol.

Anthropometric & Blood Pressure Measurements

Table 3 shows the anthropometric measurements and blood pressure of study participants. BMI of eight participants was less than 18.5 kg/m^2 (classified as thin), 14 were pre-obese (18.5 – 24.9 kg/m^2). There was only one participant who was obese with BMI more than 30kg/m^2. In terms of WHR, 8 female participants were classified as high risk with their WHR more than or equal to 0.85. On the other hand, only one male participant of 13 enrolled had a high risk for NCDs due to WHR ≥ 1. Blood pressure was recorded in the sitting position in the right arm to the nearest two mm Hg using mercury sphygmomanometer. Two readings were taken and mean of the two was taken as the blood pressure.

NCDs screened

Thirteen participants were identified as having pre-hypertension, four had stage-1 hypertension and one participant had stage-2 hypertension at the time of survey. Of 65 participants, six were known cases of diabetes and of these five also had co-existing hypertension (Table 3).

Health education and prevention

All the participants were given relevant health education after the screening and risk assessment as a part of ethical/moral responsibility of this student research. A group talk was given to raise awareness about the unhealthy food choices, reduced physical activity, harmful effects of alcohol, tobacco and high salt items in daily diet.

Table 3: Anthropometric measurements and Blood Pressure of study participants

Anthropometric Measurement	Frequency (n=65) (%)
Body Mass Index	
Thinness	8 (12.3)
Normal	41 (64.2)
Overweight	14 (21.9)
Obese	1 (1.6)
Waist-Hip Ratio (Male =13)	
Low risk	11 (84.6)
High risk	2 (15.4)
Waist-Hip Ratio (Females =52)	
Low risk	44 (84.6)
High risk	8 (15.4)
Blood Pressure (JNC 7)	
Normal	47 (72.3)
Pre Hypertension	13 (20)
Stage 1 Hypertension	4 (6.2)
Stage 2 Hypertension	1 (1.5)
Self reported NCDs	
Diabetes	6 (9.2)
Hypertension	5 (7.7)

NCD= Non-communicable diseases; JNC= Joint National Committee

Table 4: Demographic characteristics, modifiable risk factors and NCDs

Demographic characteristics	Known case of DM (%)		Known case of HT (%)		Overweight/Obesity*(%)	
	Yes (n=6)	No(n=59)	Yes (n=5)	No(n=60)	Yes (n=15)	No (n=50)
Gender						
Male	2 (33.3)	11 (18.6)	0 (0)	13 (21.7)	2 (13.3)	10 (20)
Female	4 (66.7)	48 (81.4)	5 (100)	47 (78.3)	13 (86.7)	39 (78)
Residence						
Urban	4 (66.7)	29 (49.2)	3 (60)	30 (50)	10 (66.7)	23 (46)
Rural	2 (33.3)	30 (50.8)	2 (40)	30 (50)	5 (33.3)	26 (52)
Ration Card						
APL	4 (66.7)	27 (45.8)	5 (100)	26 (43.3)	11 (73.3)	20 (40)
BPL	2 (33.3)	32 (54.2)	0 (0)	34 (56.7)	4 (26.7)	29 (58)
Occupation						
Housekeeping	0 (0)	12 (20.3)	0 (0)	12 (20)	3 (20)	9 (18)
Attendant	4 (66.7)	14 (23.7)	2 (40)	16 (26.7)	5 (33.3)	13 (26)
Lab Technician	0 (0)	15 (25.4)	1 (20)	14 (23.3)	4 (26.7)	11 (22)
Desk Workers	2 (33.3)	18 (30.5)	2 (40)	18 (30)	3 (20)	16 (32)
Education						
Illiterate	0 (0)	1 (1.7)	0 (0)	1 (1.7)	0 (0)	1 (2)
Upto 10th std	2 (33.3)	17 (28.8)	2 (40)	17 (28.3)	4 (26.7)	15 (30)
PUC	1 (16.7)	12 (20.3)	0 (0)	13 (21.7)	3 (20)	10 (20)
≥ Graduate	3 (50)	28 (47.5)	3 (60)	28 (46.7)	8 (53.3)	23 (46)
Smoking						
Yes	0 (0)	1 (1.7)	0 (0)	1 (1.7)	0 (0)	1 (2)
No	6 (100)	57 (96.6)	5 (100)	58 (96.7)	15 (100)	49 (98)
Alcohol						
Yes	1 (16.7)	7 (11.9)	0 (0)	8 (13.3)	1 (6.7)	7 (14)
No	5 (83.3)	51 (86.4)	5 (100)	51 (85)	14 (93.3)	42 (84)
High salt diet						
Yes	5 (83.3)	44 (74.6)	4 (80)	45 (75)	13 (86.7)	36 (72)
No	1 (16.7)	14 (23.7)	1 (20)	14 (23.3)	2 (13.3)	13 (26)

*based on BMI> 25 kg/m^2; NCD= Non-communicable diseases; DM=Diabetes Mellitus; HT=Hypertension; BMI=Body Mass Index; APL=Above Poverty Line; BPL=Below Poverty Line; PUC=Pre-University College

It was an interactive session where healthy alternatives were suggested by both the participants and the undergraduate students. This was followed by a power point presentation on healthy life style and optimum physical activity for adults. Moreover, all the participants who were found to be having pre-hypertension, hypertension and diabetes were given one-to-one counselling and medical consultation.

DISCUSSION

Global studies have revealed that the emergence of NCDs as a pandemic is not due to one or two factors but is multifactorial and these operate in cluster. Existing health systems need to be reorganized, and recruited for prevention, surveillance and management of the ever increasing burden.[1] A lot of stress has been given about important of partnerships of public, private and voluntary sectors.[10] But often the role of medical colleges, whether public or private is considered only in terms of secondary and tertiary prevention, i.e. health care delivery rather than important agencies for primary prevention as well. They are also in a unique situation where any activity towards improvement in health literacy can lead to sustainable changes in health behaviors in the workplace. Screening of staff members in a medical college or any institutional staff will not only improve their work performance but also bring about awareness regarding the problem of NCDs. Increased awareness and healthy life style can go a long way in having a motivated productive workforce.[11]

NCD Risk Factors

Based on WHO steps, we assessed the diet, habits, physical activity and disease prevalence among our employees. We found that nearly 95% consumed mixed diet and consumed non-vegetarian diet and fruit on alternate days. Around two third added top-salt and three fourth consumed high salt intake. Consumption of mixed diet can be attributed to regional habit. Mangalore being a coastal area consumption of non-vegetarian diet, especially fish is common here. Studies in other parts of India have shown lesser consumption of fruits and non-vegetarian diet.[12]

Almost one third of our participants were physically inactive. Based on BMI, one fourth of the participants were overweight. Higher WHR was seen in 30% of participants. When compared to population of similar settings in a study done in south India, almost half of the participants had sedentary lifestyle and three fourth were overweight.[12]

Tobacco consumption and alcohol consumption was 6 and 12 percent respectively. Other studies have shown a range of 12 to 36 percent of tobacco usage and one third usage of alcohol. Prevalence of behavioral risk factors was relatively lesser in our population compared to similar institutional studies.[13-18] This could be attributed to the fact that majority were females and were less likely to be habituated to alcohol and tobacco.

Self-reported HTN and DM was nine and seven percent respectively. Their family history was positive in 18% and 30% respectively. The reported prevalence of HTN was lower in our study. However, on including those who were diagnosed for the first time due to our screening, the overall prevalence was 12%. This almost follows the rule of halves where only half of the population suffering from HTN is aware about it.[19] Almost one fifth of them were in pre-hypertensive state which may progress to HTN if appropriate preventive measures are not taken care of. This underlines the importance of health education and behavior change communication. In a study by Aswin et al. in Puducherry the prevalence of hypertension was found to be 25.5% in their study population. [14]

The non-teaching staff that participated got the benefit of screening through this study. There is no institutional policy in India where all employees undergo periodic screening and check-ups. Many of the participants were screened only when they took up the employment as a part of pre-employment check-up (sometimes this could be before 10 years or even more), but had not got their blood pressure checked in a long time after that. The present study generated a lot of discussion around top salt, physical activity and diet which contributed in increasing of health awareness. It is important that any screening program should be linked to further management. All the 13 participants that were found to have pre-hypertension were given primary prevention counseling about diet, physical activity, adverse effects of alcohol and tobacco when relevant. Participants with stage-1 &2 hypertension were given appropriate referrals for further care and management. Importance and relevance of primary prevention measures in diagnosed cases was reinforced along with adherence to medication. This gave multiple opportunities to the participants for raising queries, clarifying doubts and getting right information for common modifiable risk factors of NCDs.

CONCLUSION

The present study screened the workers in a medical college with the help of undergraduate medical students. Even with a small sample size, a significant number of persons were found to have hypertension or risk factors for NCDs (overweight/obesity, high WHR, high salt users, sedentary behavior, alcohol and tobacco use) following screening. With more than 52,000 students in more than 400 medical colleges (which is increasing every year), NCD screening programmes within institutions can bring a small but significant change in reducing the burden of NCDs. Such activities have a potential of integrating all the levels of prevention including health education as primordial and primary, screening as secondary prevention, frequent health check up with follow up and referral as tertiary prevention constituting a complete package.

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