Prevalence of Risk Factors and its Association with Non-Communicable Disease among the Faculty Members of Teaching Institute of Ahmedabad City, Gujarat: A Cross-Sectional Study

Jatin Chhaya[1], Jayna Devalia[2], Geeta Kedia[3]

[1]Tutor, Department of Community Medicine, Government Medical College, Surat, Gujarat, India, [2]Post-graduate Student, Department of Physiology, Government Medical College, Surat, Gujarat, India, [3]Professor and Head, Department of Community Medicine, B. J. Medical College, Ahmedabad, Gujarat, India

Abstract

Background: Changing life style has been long associated with the development of many chronic diseases. Annual toll of 16 million people is dying prematurely due to non-communicable diseases (NCDs), according to a new WHO report. This study was aimed to know the prevalence of risk factors and its association with NCDs. It was a cross-sectional study among the faculty members (25-64 years of age) of teaching institutes and conducted in colleges and schools of Ahmedabad city of Gujarat.

Materials and Methodology: A semi-structures questionnaires, mercury sphygmomanometer, anthropometric measurements using standard procedure used as a study tool.

Results: The prevalence of risk factors such as smoking, use of smokeless tobacco, and alcohol consumption was as follow: 5.21, 12.15, and 5.90, respectively. The disease-specific prevalence for males' versus females' were: 23.40 versus 26.38, 4.51 versus 3.10, 30.55 versus 22.91, and 10.41 versus 7.29 for hypertension, diabetes, overweight, and obesity, respectively. Risk factors with the increase odds ratio for NCDs were: Tobacco consumption, job stress, physical inactivity, overweight, and obesity.

Conclusion: The higher prevalence of risk factors for NCDs even a high sophisticated background needs intervention programs and public health education approach.

Key words: Association, Non-communicable disease, Prevalence, Risk factors

INTRODUCTION

Non-communicable diseases (NCDs), such as heart and lung disease, stroke, cancer, and diabetes, have been leading cause of morbidity and mortality in almost all of countries. According to WHO, near about 16 million people dying prematurely due to NCDs.[1] Having of risk factors such as tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol and some medical conditions such as hypertension and diabetes increases the risk of development of NCDs. Tobacco use and being overweight are responsible for the death of at least 5 million and 2.8 million people, respectively, every year and, almost 7.5 million die because of having high blood pressure.[2] In the country like India, NCDs are not affordable in terms of human suffering, as well as the cost of treatment. Early detection can save the high cost of treating such NCDs when it is still relatively cheap to manage.[3]

Usually, teacher's habit and lifestyle behavior at school or college are well-observed by students. If the teachers are free from risk factors, only then positive role modeling may transmit to their students. This study aims to determine the prevalence of risk factors and its association with NCDs among the faculty members of teaching institute of the Ahmedabad city.

Corresponding Author: Dr. Jatin Chhaya, 24 - Jalaram Raw House, Nr. Gangeswar Mahadev Temple, Chhtrapati Shivaji Road, Aadajan, Surat - 395 009, Gujarat, India. Phone: +91-9978998810, 8690575837. E-mail: dr.jatinchhaya@gmail.com

MATERIALS AND METHODOLOGY

Sample Size
The sample size of 576 faculty members was calculated with allowable error 10% using the prevalence rate (41%) of any risk factors for NCDs found out during the pilot study.

Study Period
From July 2012 to August 2013.

Study Design
It was a cross-sectional study.

Study Area
The study was done in schools/colleges of Ahmadabad city.

Study Population
Total 288 male and 288 female faculty members from schools/colleges of Ahmedabad were included in the study.

Data Collection
List of schools and colleges of Ahmadabad received from District Office and the use of the internet. Cluster random sampling was used to collect sample data from six zones of Ahmadabad Municipal Corporation. Each zone of Ahmedabad was considered as a cluster and 96 faculty members, 48 males, and 48 females were taken as a study population from each zone and thus data from 576 faculty members collected. Schools/colleges from each zone selected randomly using the random number table. All the available teaching staff from randomly selected school/college interviewed with the permission of the principal or in charge head of the institute. Before collecting the data, informed consent was taken from study participants. The study population assured that information given by them would be kept confidential.

Study Tool
Data collected through interview with the help of structured questionnaire among the person age between 25 and 64 years age. Fruit and vegetable intake were measured using standard serving size. Physical measurement of the respondents was done using scientific instruments. Data entered in excel sheet and analyzed with the help of Microsoft Excel and Epi info7.1.2 software.

RESULT

Baseline Information of Study Participants
42.54% of study participants belonged to 45-54 years of age group. The mean age of male and female was 45.47 years and 42.76 years, respectively.

Distribution of Risk Factors of NCDs
Out of 288 male faculty members, prevalence of smoking, smokeless tobacco, and alcohol consumption were 15 (5.21%), 35 (12.15%), and 17 (5.90%), respectively. The prevalence of smoking and smokeless tobacco was higher in the age group of 45-54 years than another age group. Consumption of alcohol was higher in the age group of 35-44 years (10.00%). All the 288 female faculty members were lifetime abstainer for tobacco and alcohol consumption (Table 1).

The mean number of servings of fruit was 1.95 for male faculty members and 2.47 for female faculty members and of vegetable it was 2.80 for male faculty members and 2.63 for female faculty members. 229 (79.51%) males and 218 (75.60%) females involved themselves in various types of physical activity including jogging, cycling, running, swimming, meditation or pranayama, etc., for 150 min/week. Male faculty members were more overweight and obese (30.55% and 10.41%, respectively) as compared to female (22.91% and 7.29%, respectively). The prevalence of job stress was higher in female faculty members (16.66%) as compared to male faculty members (8.34%), and the difference was statistically significant ($\chi^2 = 9.14$, $P < 0.05$). The result also revealed that total prevalence of hypertension was found to be 23.26% among male faculty members and 26.38% in female faculty members. Among hypertensive, 34 (11.79%) males and 45 (15.62%) females had self-reported hypertension and rest of them 33 (11.45%) males and 31 (10.76%) females detected with high blood pressure during the study. 75 (26.04%) females versus 127 (44.09%) males tested for diabetes in last 1 year. 13 (4.51%) males and 9 (3.10%) females had self-reported diabetes and the majority of them belonged to the age group of 45-54 years (Table 2).

81 out of 288 (28.12%) males and 87 out of 288 (30.20%) females were suffering from different kind of NCDs and majority of them having hypertension (Table 3).

Among males, positive family history was about six times likely to have diabetes as compared to negative family history ($P = 0.001$, odd ratio (OR) = 6.65, and 95%

Table 1: Age distribution of tobacco and alcohol consumer - (male)

Age-groups (in years)	*n* (%)			
	Current smoking	Current users of smokeless tobacco	Alcohol consumption	Total
25-34	2 (5.89)	4 (11.77)	3 (8.82)	34 (100)
35-44	2 (2.22)	10 (11.11)	9 (10.00)	90 (100)
45-54	11 (8.67)	21 (16.53)	3 (2.36)	127 (100)
55-64	0	0	2 (5.40)	37 (100)
Total	15 (5.21)	35 (12.15)	17 (5.90)	288 (100)

confidence interval (CI) 2.12-20.81) while among females, positive family history was about eleven times likely to have diabetes as compared to negative family history (*P* = 0.001, OR = 11.28, and 95% CI 2.71-46.88) (Table 4).

Table 2: Gender wise distribution of risk factors of NCDs

Characteristic	Male (*n*=288)	Female (*n*=288)
Fruits and vegetable consumption		
Mean number of serving of fruits consumed	1.95	2.47
Mean number of serving of vegetables consumed	2.80	2.63
Details of exercise		
Percentage of study population involved in 150 min/week moderate to severe activity (walking, cycling, yoga, pranayam)	77.08	61.54
Physical measurement		
Percentage who are overweight (BMI≥25 kg/m²)	30.55	22.91
Percentage who are obese (BMI≥30 kg/m²)	10.41	7.29
Job stress		
Percentage of study population having job stress	8.34	16.66
Details of hypertension		
Percentage of self-reported cases of hypertension (SBP≥140 and/or DBP≥90)	11.79	15.62
Percentage of new cases detected during survey (hidden cases)	11.45	10.76
Details of diabetes		
Percentage of self-reported cases of diabetes	4.51	3.10

NCDs: Non-communicable diseases, BMI: Body mass index, SBP: Systolic blood pressure, DBP: Diastolic blood pressure

Table 3: Prevalence of non-communicable disease among study participants

Medical condition	Male (*n*=288) (%)	Female (*n*=288) (%)	Total (%)
Hypertension	67 (82.81)	76 (87.35)	143 (85.11)
Self-reported cases of diabetes	9 (11.11)	0	9 (5.35)
Hypertension+diabetes	4 (4.93)	9 (10.34)	13 (7.73)
Self-reported cases of cancer	1 (1.23)	2 (2.46)	3 (1.78)
Total cases of NCDs	81 (100)	87 (100)	168 (100)

NCDs: Non-communicable diseases

Table 4: Association between family history, hypertension, and diabetes

Medical condition	Family history positive (*n*)	Odds ratio	95% CI
For male faculty members			
Hypertension	16	1.85	0.94-3.63
Diabetes	7	6.65	2.12-20.81
For female faculty members			
Hypertension	20	1.53	0.82-2.84
Diabetes	6	11.28	2.71-46.88

CI: Confidence interval

The odds ratio of developing NCDs among male faculty members who consumed tobacco was 2.96 times more (*P* = 0.006, OR = 2.96, and 95% CI 1.49-5.14). The similar significant association found between job stress and NCDs development (*P* = 0.002, OR = 3.69, and 95% CI 1.57-8.64). The odds ratio of developing NCDs were 2.49 and 2.28 times higher in female faculty members significantly who had job stress (*P* = 0.005, OR = 2.49, and 95% CI 1.31-4.75) and were overweight and obese (*P* = 0.002, OR = 2.28, and 95% CI 1.37-3.94), respectively (Table 5).

DISCUSSION

576 faculty members (50% males vs. 50% females) from different schools/colleges included as study participants. 280 (97.23%) males and 270 (93.75%) females were married, and rests of them were unmarried. Teacher's ages ranged from 25 to 64 years with mean age of female were 42.76 years, and that of a male was 45.47 years. Ibrahim *et al.*, also observed compatible demographic profile in which males were 52.8% and females were 47.2% of total study population and teacher's age ranged from 22 to 60 years with a mean of 36.52 ± 7.62 and among them majority were married (83.7%).[4]

The prevalence of smoking, use of smokeless tobacco, and alcohol consumption found 5.21%, 12.15%, and 5.90%, respectively, in our study which is quite lower than the same found in Kerala (smoking 42% and alcohol consumption 26%) and Gandhinagar (smokeless tobacco consumption 23.1%).[5,6] Increased awareness regarding harmful effect of tobacco use was responsible for the lower prevalence of habit related behavior. We cannot rule out less reporting of alcohol consumption as Gujarat is a dry state (Table 1).

WHO/FAO recommends intake of a five servings or 400 g of green leafy vegetables and fruits consumption daily for the prevention of NCDs.[7] Our study revealed that men and women were consuming fewer amounts of fruit and vegetables than the recommended (average consumption, for male; 2.80 servings of vegetables and 1.95 servings of fruits in a day and for female; 2.63 servings of vegetables, and 2.47 servings of fruits in a day) (Table 1).

Females (38.46%) were more physically inactive as compared with males (22.92%), and the result was comparable with the findings given by Basu and Biswas (physical inactivity found 38.6% in females and 38.4% in males).[8] The double responsibility of the job and also domestic housework may be responsible for higher physical inactivity among female participants. 30.55% males versus 22.91% females and 10.41% males versus 7.29% females found overweight and obese, respectively, in our study which was fewer when

Table 5: Association of various risk factors with development of non-communicable disease (total NCDs cases among male=81 and among female *n*=87)

Variables	Male			Female		
	Odds of NCDs+ nt/-nt	*P* value	95% CI	Odds of NCDs+ nt/−nt	*P* value	95% CI
Tobacco consumption yes/no	2.96	0.006	1.49-5.14	-	-	-
Vegetable and fruits serving (<5 servings/≥ 5 servings)	-	-	-	-	-	-
Physical activity - min/week (<150 min/week/≥150 min/week)	0.24	0.001	0.13-0.43	0.51	0.012	0.30-0.86
Job stress yes/no	3.69	0.002	1.57-8.64	2.49	0.005	1.31-4.75
Overweight and obese yes/no	-	-	-	2.28	0.002	1.37-3.94

NCDs: Non-communicable diseases, CI: Confidence interval

compared with teachers of Western Saudi Arabia.[9] Serious concern should be taken as overweight and obese is a sign of physical inactive.

According to our survey, females were at more risk of getting hypertension (26.38) as compared to males (23.24%) but contradictory findings shown in the study done in Nepal in which male were prone to get hypertension (Table 3).[10] The prevalence of diabetes found almost equal among both the study group. The findings Alabdouli *et al.*, also supported by our findings that family history associated with the occurrence of diabetes (Table 4).[11]

Smoking, smokeless tobacco chewing, overdose of alcohol, unhealthy diet, physical inactivity, and overweight/obesity are modifiable risk factors for the development of NCDs, according to WHO.[12] The same finding observed in our study that use of tobacco, job stress, and overweight and obesity attributed for the development of NCDs.

CONCLUSION

The high prevalence of modifiable risk factors of NCDs was present even in the high socio-economical background. Hidden cases of hypertension revealed that lack of health seeking behavior among faculty members. The risk factors such as physical inactivity, tobacco use, overweight, obesity, and job stress needs sound public health education.

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