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Original Research Article

Risk factors for non communicable diseases among transport and security personnel of a health sciences university in coastal Karnataka

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ABSTRACT

Background: Non communicable diseases (NCDs) are on the rise among workers in various occupations resulting in morbidity and mortality. This study was conducted to assess the various risk factors and associated socio-demographic factors among the security and transport personnel working in a health sciences university in Mangaluru.
Methods: It was a cross-sectional study conducted among all the security and transport personnel. Questionnaire based on WHO-STEPS approach was used. Blood pressure (BP) measurements were recorded.
Results: Total 167 study participants were enrolled; 57.5% were security and rest were transport personnel. Physical activity was perceived as light by 63.5% participants. Current smokers constituted to 26% and 33.5% consumed alcohol in past 12 months. Eighteen percent of them top salted their food. Among participants who were apparently healthy, 12.5% and 23.4% had raised systolic and diastolic BP. Associations between the areas of residence ($p=0.004$) and type of occupation ($p<0.001$) were found to be significant.
Conclusions: Prevalence of risk factors of NCDs was high among study participants. Only few study subjects were physically active and majority of them felt that their routine work provided them with light physical activity. Around one third of the participants consumed tobacco and alcohol. Around 1/4th of the study participants who were not known hypertensive, were found with increased levels of blood pressure.

Keywords: Non-communicable diseases, Occupational health, Screening

INTRODUCTION

Non communicable diseases (NCDs) like hypertension, diabetes and cardiovascular diseases are seen to be on rise in workers of various occupations. These can be attributed to change in lifestyle, work related stress, intricate jobs and psychosocial changes. The inherent sedentary nature of the work along with decreased physical activity can precipitate the development of NCDs at early age and further lead to development of complications. NCDs and their complications like diabetic foot, stroke, retinopathy and nephropathy decrease the efficiency of the workforce and also form economic burden to the family and health care delivery system. NCDs also reduce the quality of life of the affected individuals and family.[1,2]

Adverse habits like tobacco usage and alcohol consumption have been known to increase the risk of developing NCDs.[3,4] Global adult tobacco survey (GATS) 2016 to 2017, which is a global standard for systematically monitoring tobacco use indicates that 42.4% of men, 14.2% of women and 28.6% of all adults in India use tobacco (smoking and smokeless forms).[5] Alcohol consumption was found to be 28.4% in males, 5.4% in females and 17.2% among all adults in India.[6] Diet also is known to play an important role in development of NCDs. Inadequate intake of fruits and vegetables, high salt intake,

physical inactivity are known risk factors for NCD development.[7]

Health, well-being and safety of the employees in any institution or an industry are important aspects. These factors not only affect the workers at individual and family levels, but also have impact on their workplace productivity. Work productivity and sustainability of an institution depends on the manpower and its efficiency.[2] Individuals with driving as profession have been observed to be at a greater risk of developing NCDs. Low intense physical activity, long duration of sitting, stress, alteration in circadian rhythm etc having been predisposing factors for development of obesity. Irregular eating habits and sedentary lifestyle contribute further for development of NCDs among the transport personnel.[8] Similar lifestyle is observed among the security personnel. Further day and night shift duties are done by the security personnel which adds on to the stress perceived. Appropriate screening of the common NCDs encountered and timely interventions to halt the progress of the disease will lead to significant health and economic benefits. Hence, this study was conducted to assess the prevalence of various risk factors of NCDs and their association with the socio-demographic factors among the transport and security personnel in a health sciences university of coastal Karnataka.

METHODS

It was a cross-sectional study conducted among all the transport and security personnel of a health sciences University, Mangaluru, Karnataka employed during December 2017. Ninety-six security personnel and 71 transport personnel of the institution who provided written informed consent were involved as study participants. A pre-tested semi-structured questionnaire based on WHO STEPS instrument was used for data collection.[4] Demographic details and information regarding the substance use were captured. Operational definitions were used for measuring tobacco and alcohol consumption. A "current user" was defined as a person who was consuming any form of tobacco for the past one year. A person who had quit using all forms of tobacco from the past one year was defined as "ex-consumer" and a person who has never consumed tobacco in his/her life was considered as "non consumer". For alcohol consumption a "current user" was a person who was consuming alcohol for the past 1 year. An "ex-consumer" was a person who had quit using all forms of alcohol from the past 1 year. A "non consumer" was a person who had never consumed alcohol in his/her life.

Waist-circumference and blood pressure were measured. Waist-circumference ≥102 cm in men and ≥88 cm in women was taken as cut-off point to define central obesity.[9] In diet history, one cup of raw leafy vegetables or half cup of other vegetables (cooked) was considered one serving. One medium-sized piece of fruit (apple or banana or orange) or half cup of chopped fruit was measured as one serving. Low physical activity was defined as <150 minutes of moderate physical activity per week.[10] Raised blood pressure (hypertension) was defined if systolic blood pressure was ≥140 mm of Hg and/or diastolic pressure ≥90 mm of Hg, or diagnosed cases taking antihypertensive drugs.[11]

Data was entered in Microsoft Excel and was analysed using SPSS (SPSS Inc, Chicago, USA; Version 23.0). Institutional ethics committee approval was obtained before the start of the study (protocol no 2017/325, approved on 12th December 2017).

RESULTS

Among the 167 study participants, 81 (48.5%) belonged to age group of less than 48 years and rest were above 48 years of age. Ninety-six (57.5%) of the participants were security personnel and seventy-one (42.5%) were transport personnel. Majority of the participants i.e. 159 (95.2%) were married (Table 1).

Table 1: Socio-demographic profile of study participants screened for risk factors of NCDs, 2017 (n=167).

Variable	N (%)
Gender	
Male	163 (97.6)
Female	4 (2.4)
Religion	
Hindu	133 (79.6)
Islam	26 (15.6)
Christian	8 (4.8)
Education	
Uneducated	2 (1.2)
Primary	15 (9.0)
Secondary	127(76.0)
High secondary	22 (13.2)
Under graduate	1 (6.0)
Area of residence	
Urban	77 (46.1)
Rural	90 (53.9)
Socio-economic status	
Above poverty line	40 (24.0)
Below poverty line	127 (76.0)

The physical activity due to occupation was assessed and it was found that 63.5% of the participants had light physical activity. Only 4.2% of the participants opined that their work involved vigorous activity. Seventy four percent of the participants used lift while climbing up the floors. Only 16.2% of them exercised daily apart from their work-related activity. Forty six percent of the participants did some workout occasionally and the remaining were physically inactive. The mean duration of time spent sitting or reclining per day was found to be 5.8 hours (±1.79). Minimum time spent on sitting was 1 hour and maximum was 12 hours.

Table 2: Association between socio-demographic factors (age, occupation and education) and alcohol consumption, tobacco use and physical activity (n=167).

Risk factors		Alcohol consumption			Tobacco use			Physical activity		
Socio-demographic factors		**Yes N (%)**	**No N (%)**	**P value**	**Yes N (%)**	**No N (%)**	**P value**	**Light N (%)**	**Moderate N (%)**	**P value**
Age	Up to 48 years (n=81)	23 (39.5)	58 (60.5)	0.069	32 (28.4)	49 (71.6)	0.445	57 (70.4)	24 (29.6)	0.072
	More than 48 years (n=86)	36 (45.3)	50 (54.7)		39 (41.9)	47 (58.1)		49 (57)	39 (43)	
Occupation	Security (n=96)	43 (44.8)	55 (55.2)	0.489	34 (35.4)	62 (64.6)	0.978	73 (76)	23 (24)	<0.001*
	Transport (n=71)	28 (39.4)	43 (60.6)		25 (35.2)	46 (64.8)		33 (46.5)	38 (53.5)	
Education	Below secondary (n=13)	4 (30.8)	9 (69.2)	0.372	4 (30.8)	9 (69.2)	0.720	6 (46.2)	7 (53.8)	0.177
	Secondary and above (n=154)	67 (43.5)	87 (56.5)		55 (35.7)	99 (64.3)		100 (64.9)	54 (35.1)	

*Significant p-value, Test applied: Chi-square test.

Table 3: Association between socio-demographic factors (marital status and residence) and alcohol consumption, tobacco use and physical activity (n=167).

Risk factors		Alcohol consumption			Tobacco use			Physical activity		
Socio-demographic factors		**Yes N (%)**	**No N (%)**	**P value**	**Yes N (%)**	**No N (%)**	**P value**	**Light N (%)**	**Moderate N (%)**	**P value**
Marital status	Unmarried (n=8)	2 (25)	6 (75)	0.304	1 (12.5)	7 (87.5)	0.166	4 (50)	4 (50)	0.417
	Married (n=159)	69 (43.4)	90 (56.6)		58 (36.5)	101 (63.5)		102 (64.2)	57 (35.8)	
Residence	Urban (n=77)	34 (44.2)	43 (55.8)	0.692	23 (29.9)	54 (70.1)	0.172	40 (51.9)	37 (48.1)	0.004*
	Rural (n=90)	37 (41.1)	53 (58.9)		36 (40)	54 (60)		66 (73.3)	24 (26.7)	

*Significant p-value; Test applied: Chi-square test.

Tobacco and alcohol consumption were assessed among the study participants. It was found that 16.2% of the participants started smoking when they were less than 20 years of age. Twenty six percent of the participants were current smokers and 12.8% of them smoked more than 10 cigarettes per day. Non-smoke form of tobacco consumption was found to be gutkha, khaini and paan with 1.2%, 24% and 1.8% respectively. Alcohol was consumed by 33.5% of the participants in last 12 months. Among them, 9.6% of the participants consumed alcohol in past 30 days of the interview.

Majority of the study participants (98.2%) were consuming mixed diet. Diet predominant of non-vegetarian origin was consumed by 33.5% of the population on daily basis. Seventy two percent of the participants consumed vegetables in their diet daily. Twenty two percent of the participants ate fruits daily. Salt intake was assessed and it was found that 18% of the participants top salted their food most of the times. Half of the participants used coconut oil for cooking.

Waist circumference was used to observe the central obesity. Thirteen percent of the male participants and 50% of the female participants had central obesity. Among the participants, 12% were known hypertensive, 7.8% were known diabetic and 3.6% had both the disorders. Among participants who were apparently healthy (n=128), 12.5% had raised systolic and 23.4% had raised diastolic blood pressure.

Association between socio-demographic factors with the prevalence of NCD risk factors was analyzed. Association between place of residence and physical activity when checked, it was found that, 51.9% of the urban area residents and 73.3% of rural area residents were having light physical activity and this association was found to be significant (Table 2). With regard to occupation, 76% of

the security personnel and 46.5% of the transport personnel were engaged in light amount of physical activity and this association was found to be significant (Table 3).

DISCUSSION

This study was conducted among the two sedentary groups of employees of a health sciences university. Mean age of the study participants was 48 years and majority of them were males. Most of them were educated upto secondary school. This is comparable with the findings of similar studies among the occupational groups from other parts of India studies where mean age of the participants was 44.5 years and 43.5 years respectively.[12,13]

Among the 167 study participants, 26% were current smokers, which is comparable with the findings of the study among auto-rickshaw drivers, where 35.45% of the participants were current smokers and were in the age group of 30-39 years.[12] Similar findings were obtained in the study conducted among bus drivers where 24.8% of the participants were smokers.[14] These findings correlate with the national average of 28.6% too.[5] Alcohol consumption was assessed and it was found that 33.5% of the participants consumed alcohol in past 1 year. This is comparable with the findings from another where 43.6% of the participants consumed alcohol.[12] However, these findings were higher than the national average of 17.2%.[6]

Physical inactivity is one of the major risk factors for development of NCDs. In our study, it was found that 63.5% of the participants had only light physical activity due to work and only 16.2% of them exercised daily apart from work related activity. Similar findings were obtained from two other studies from the Indian context.[7,13]

Majority of the participants consumed mixed diet and one-third of them consumed non-vegetarian diet daily. Only 22% of the population consumed fruits in their diet. Diet low in fruit and vegetable content is a known risk factor for development of NCDs and these findings are comparable with the study conducted in Kerala.[15] Top salting the food is a common practice in this region of Karnataka along with high intake of salted fish and sea food. In our study, 18% of the participants top salted their food regularly. Increased sodium intake is a known risk factor of development of hypertension and hence, low sodium diet is recommended in dietary approaches to stop hypertension (DASH) along with consumption of nuts, legumes etc.[16] Coconut oil was predominantly used for cooking purposes which is rich in saturated fatty acids. Consumption of oils and fats rich in saturated fatty acids is a known risk factor for atherosclerosis.[17]

The socio-demographic factors like age, education, occupation, area of residence and marital status were checked for association with presence of NCD risk factors. When association between age and alcohol consumption was looked, it was found that participants belonging to younger age groups had less tendency of consuming alcohol. Thus, the habit of alcohol consumption increased with increasing age, which is also the age of developing NCDs. No difference was found in the distribution of participants across the age groups in relation to tobacco consumption. With reference to the occupation of participants, the security personnel were found to perceive the physical activity as light, compared to that of the transport personnel. This can be attributed to the sedentary nature of the security personnel and this association was found to be significant. Individuals with education of secondary level and above were found to have less tendency of tobacco consumption.

The area of residence of the participants was checked for association with the risk factors. There were no associations with smoking and alcohol consumption with area of residence. However, participants from rural areas perceived light physical activity compared to the urban residents and this association was found to be significant.

This study involved does not represent a larger population, hence findings cannot be generalized. Another limitation is that are we have not undertaken lab investigations for the study participants for screening of diabetes and other metabolic diseases.

CONCLUSION

In our study, we observed that prevalence of risk factors of NCDs were high among study participants. Only few study subjects were physically active and majority of them felt that their routine work provided them with light physical activity. Around one third of the participants consumed tobacco and alcohol. Majority of the subjects ate mixed diet and used oil with saturated fatty acids for cooking purposes.

Physical activity was found to be associated significantly with the area of residence and the type of occupation. Around one quarter of the study participants who were not known hypertensive, were found with increased levels of blood pressure. Thus, we would recommend that regular screening for the presence of non-communicable diseases like diabetes mellitus and hypertension and their risk factors in workplace should be conducted. Modifiable risk factors can be addressed and follow ups can be provided for the diagnosed cases, thus reducing the development of complications.

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