Original Article

Vol. 12, No. 2, 98-103
https://doi.org/10.15280/jlm.2022.12.2.98

Journal of Lifestyle Medicine

A Cross Sectional Assessment of the Profile of Risk Factors of Non-Communicable Diseases Among Health Care Staff of a Tertiary Cancer Hospital

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Background: Non-communicable disease (NCD) is the leading cause of death, accounting for 70% of total death globally, and posing a major public health challenge. In India, nearly 5.8 million people (WHO report, 2015) die from NCDs every year. The basic element of NCD prevention is the identification of the associated risk factors and risk modification. The objective of the current study was conducted to assess the prevalence of risk factors for NCDs among healthcare staff of the two units of a Tertiary Cancer Hospital in Varanasi, India, using WHO STEPS approach.

Methods: This cross sectional study was conducted among 528 participants who were willing to participate in the study, from among 967 healthcare staffs of the two units of the Tertiary Cancer Hospital. The participants were interviewed and the anthropometric and biochemical parameters were measured.

Results: The prevalence of risk factors, associated with NCD, tobacco use, alcohol use, extra salt in diet, less than 5 servings of fruits/vegetables, physical inactivity and self-perceived high stress score was found in 34 (6.43%), 90 (17.04%), 461 (87.3%), 412 (78.03%), 409 (77.4%) and 159 (30.11%) respondents, respectively. Multiple logistic regression revealed that Diabetes was significantly associated with male sex, high BMI and physical inactivity. Hypertension was found significantly associated with male sex, increasing age, tobacco and or alcohol consumption, high BMI and high stress. Dyslipidemia was also found significantly associated with high BMI, male sex, physical inactivity and high stress levels.

Conclusion: A high prevalence of risk factors for NCDs was found among the healthcare staff and it is the need of the hour to take preventive measures to reduce the prevailing burden of NCD.

Key Words: Risk factors, Diabetes mellitus, Hypertension, Non-communicable disease, Obesity, Physical inactivity

INTRODUCTION

Non-communicable diseases (NCDs) are well recognized cause of morbidity and mortality worldwide [1]. Globally, 70% of the total deaths (40 million approximately) are caused by NCDs. Among these, cardiovascular disease is the leading cause of death (17.7 million) followed by cancer (8.8 million), chronic respiratory diseases (3.9 million) and diabetes (1.6 million) [2]. Majority of deaths attributable to NCDs occur in low- and middle-income countries like

Received: March 17, 2022, Accepted: May 11, 2022

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India, where rapid urbanization has led to epidemiological health transition [3]. This has led to an increase in the NCD risk factors among people. In India, where the majority of population are in the younger age group, half of the total deaths are attributed to NCDs and these contribute to more than two third of the total deaths due to NCDs in the South-east Asian Region (SEAR) of World Health Organization (WHO) [2,4]. In the world health assembly in May 2008, WHO put forth an action plan of Global Strategy for the prevention and control of NCDs. India, being a WHO member state, is committed to implementing and taking steps required to meet these objectives [5].

A risk factor is defined as, "An aspect of personal behavior or lifestyle, and environmental exposure or a hereditary characteristic that is associated with an increase in the occurrence of a particular disease, injury or other health condition" [6]. Risk factors for NCDs have been classified by WHO into modifiable and non-modifiable risk factors. The modifiable risk factors include consumption of tobacco and alcohol, lack of physical activity, overweight and obesity, increased fat and salt intake, low intake of fruits and vegetables, raised blood pressure, raised glucose and raised cholesterol levels which predispose to the development of NCDs [7]. There is evidence that lifestyle and behavioral modifications drastically reduce the NCD burden in the population. Therefore, WHO has recommended major NCD risk factor surveillance through STEP approach for control and prevention of NCDs [8].

An Employee is an important asset to the institution. It is crucial to pay attention to NCDs among employees, because these NCDs can lead to decreased productivity of the employee with added financial burden towards the treatment cost [9]. Hence, this study was conducted with an aim to estimate prevalence of risk factors for NCDs among healthcare workers of Mahamana Pandit Madan Mohan Malviya Cancer center & Homi Bhabha Cancer Hospital, through WHO STEP wise approach.

MATERIALS AND METHODS

This cross-sectional study, after due approval by the Institutional Ethics Committee, was conducted among the healthcare workers during the period January 2021 to May 2021. All 967 healthcare workers were invited to participate in the study. Pregnant, lactating women and those who were not willing to participate were excluded from the study. A modified WHO STEPS Instrument v2.1 and Perceived Stress Scale-10 was used as the instrument for data collection. A trained interviewer visited each department/section of the hospital with prior appointment and collected the information after obtaining informed consent.

The data collection was done in three steps. In the first step, all the participants were interviewed by the trained interviewer using Modified WHO STEPS Instrument v2.1 and Perceived Stress Scale-10, which included information on sociodemographic variables and NCD risk factors (tobacco use, alcohol use, physical activity and unhealthy diet). In the second step, physical measurements were recorded (height, weight, BMI, blood pressure). The third step, included recording the biochemical parameters. For serum glucose and cholesterol estimation, the participants were instructed to come after overnight fasting for 8 hours and on the next day blood samples were collected using aseptic precautions by the phlebotomy staff. Blood samples for post prandial blood sugar (PPBS) estimation were collected two hours after meals.

The values of $\geq$ 126 mg/dl for fasting blood sugar (FBS), $\geq$ 200 mg/dL for PPBS and $\geq$ 6.5% for HbA1c were considered as indicators of Diabetes Mellitus. Individuals having systolic blood pressure of $\geq$ 140 mm of Hg and/or diastolic blood pressure of $\geq$ 90 mm of Hg were considered as hypertensive. Dyslipidemia included hypertriglyceridemia (serum triglyceride level $>$ 200 mg/dL) and/or hypercholesterolemia (serum total cholesterol level of $>$ 240 mg/dL). Along with this, self-reported history of diabetes, hypertension and dyslipidemia was also recorded and any participant, who was on medication for these, was considered as diseased irrespective of the current measurements.

RESULTS

Of the total 967 staff who were invited to participate in the study, only 528 (54.60%) participated voluntarily. Of these 528 participants, 179 (33.90%) were female and 349 (66.09%) were male with a mean age of 28.20±4.076 years and 33.77±8.82 years, respectively. Majority, i.e., 304

(57.57%) of the 528 participants were below 30 years of age with 319 (60.41%) being married and 209 (39.58%) were unmarried.

Table 1 presents the prevalence of various risk factors, among the participants, associated with NCD. Consumption of tobacco in any form was seen in 35 (6.62%) participants and out of these, 8 (1.51%) were females and 27 (5.11%) were males. Whereas 27 of 349 (7.73%) males used tobacco, 8 of 17 (44.65%) females had the habit. Consumption of alcohol was seen in 90 (17.04%) individuals and of these 22 (4.16%) were females and 68 (12.87%) were males. Again, whereas 68 of 349 (19.48%) males consumed alcohol, 22 of 179 (12.29%) females did so. More than three forth of the participants, i.e. 412 (78.03%), consumed less than 5 servings of fruits/vegetables daily. Lack of physical activity is one of the significant risk factors for NCDs among healthcare workers with 409 (77.4%) participants not indulging themselves in regular physical activity. With respect to self-perceived stress, 159 (30.11%) participants reported high stress levels, and of these 94 (52.51%) were females and 65 (18.62%) were males. More than four fifth of the participants, i.e. 461 (87.3%), were found to be consuming extra salt in their diet.

Multiple logistic regression (Table 2) revealed that Diabetes was significantly associated with male sex, high BMI and physical inactivity. Hypertension was found significantly associated with male sex, increasing age, tobacco and/or alcohol consumption, high BMI and high stress. Dyslipidemia was also found significantly associated with high BMI, male sex, physical inactivity and high stress levels.

Table 1. Prevalence of risk factors

Participant variables (N = 528)			Risk Factors					
	Age group	n	Tobacco use n (%)	Alcohol use n (%)	Less than 5 servings of fruits/vegetables n (%)	High stress levels n (%)	Physical inactivity n (%)	Extra salt in diet n (%)
Age in years	21-30	275	23 (8.36)	45 (16.36)	242 (88.0)	123 (44.72)	264 (96)	265 (96.36)
	31-40	162	6 (3.70)	32 (19.75)	117 (72.22)	21 (12.96)	126 (77.78)	124 (76.54)
	41-50	60	4 (6.67)	9 (15.0)	37 (61.67)	12 (20.0)	49 (81.67)	47 (78.33)
	51-60	31	2 (6.45)	5 (16.13)	16 (51.61)	3 (9.68)	17 (54.84)	27 (87.07)
	Total	528	35 (6.63)	91 (17.23)	412 (78.03)	159 (30.11)	456 (86.36)	463 (87.69)
Gender	Female	179	8 (4.46)	22 (12.29)	143 (79.88)	94 (52.51)	138 (77.09)	150 (83.79)
	Male	349	27 (7.73)	68 (19.48)	269 (77.07)	65 (18.62)	271 (77.65)	311 (89.11)
	Total	528	35 (6.62)	90 (17.04)	412 (78.03)	159 (30.11)	409 (77.4)	461 (87.3)

Table 2. Multiple logistic regression analysis of the risk factors

Participant variables		OR (95%CI)		
		Diabetes mellitus	Hypertension	Dyslipidaemia
Age group†	31-40 Years	1.10 (0.61-1.99)	1.02 (0.98-1.31)*	0.95 (1.21-1.98)
	41-50 Years	1.53 (1.18-4.51)	1.12 (1.21-3.32)*	1.06 (0.65-1.55)
	51-60 Years	1.98 (1.98-1.81)*	1.31 (0.98-2.32)*	1.89 (0.98-1.31)
Gender†	Male	1.38 (1.19-2.08)*	1.76 (0.98-2.19)*	1.08 (0.68-2.34)*
BMI†	BMI > 25 Kg/m^2	1.31 (1.18-4.15)*	1.87 (1.12-2.12)*	1.14 (1.98-2.12)*
Physical activity†	Physical Inactivity	2.14 (1.31-2.65)*	1.24 (1.08-1.98)	1.10 (0.95-1.96)*
Habbits†	Tobacco use	0.62 (0.56-3.12)	0.56 (0.51-1.54)*	0.67 (0.58-2.21)
	Alcohol use	0.78 (0.53-0.88)	1.23 (1.10-1.76)*	1.38 (1.09-1.54)
Stress level†	High stress level	1.28 (1.06-1.87)	1.02 (0.89-1.76)*	1.09 (0.87-1.62)*

OR: Odds Ratio, BMI: Body Mass Index.
*Significant;
†Reference value: 21-30 years, Female gender, BMI < 25kg/m^2, Physical activity, No. of tobacco use, No. of alcohol use, Low stress level.

Of the 528 healthcare workers who participated in the study, 90 (17.04%) were hypertensive, 34 (6.43%) were diabetic and 62 (12.5%) had dyslipidemia. Only 8 (1.51%) were known hypertensive, 5 (0.94%) known diabetic and 8 (1.51%) were known cases of dyslipidemia and were under medication. Among the known cases who were under medication, blood pressure, blood sugar level and lipid levels were under control in only 4 (50%), 3 (37.5%) and 2 (25%) participants, respectively.

DISCUSSION

The present study assessed the prevalence of various risk factors associated with common NCDs among health care workers in a Tertiary Cancer Hospital.

The prevalence of tobacco use was found to be 35 (6.6%) which is comparatively less than the national average of 28.6%, as revealed by the 2016-2017 Global Adult Tobacco Survey [10]. In a similar study, conducted in healthcare workers of a tertiary hospital in India, the prevalence of tobacco consumption was 43.4% [11]. The reduced tobacco use is quite expected in the healthcare staff who are working in a tertiary cancer hospital and are already sensitized towards the health hazards of tobacco use. Greater awareness regarding the health hazards associated with tobacco use is needed, with the goal to achieve zero tobacco consumption, for tobacco cessation among employees of the tertiary cancer hospital.

The prevalence of alcohol use, in the present study, of 90 (17.04%), was less compared to the national average of 41% as per the NFHS-4 data and the figure of 40.4% in a NCD risk factor population-based study conducted in Puducherry [12,13]. When compared with the general population, the prevalence of alcohol use is lower in healthcare staff. This is in line with a study conducted to assess consumption of alcohol among healthcare professionals [14]. The consumption of alcohol needs to be controlled, as it well established that South Asians have an increased risk of coronary artery disease, by consuming more than moderate level of alcohol [15].

The most prevalent risk factor for NCD among the healthcare staff, according to the current study, was extra salt in diet in 461 (87.3%) participants followed by prevalence of unhealthy dietary pattern with less than 5 servings of fruits/vegetables in 412 (78.03%) and physical inactivity in 409 (77.4%), which was considerably high as compared to another NCD risk factor study conducted in West Bengal, where unhealthy diet and physical inactivity were reported as (50.8%) and (61.4%), respectively [16]. This can be attributed to the sedentary lifestyle and socioeconomic status of the healthcare staffs. According to WHO, physical inactivity is the fourth leading cause of mortality globally, contributing to 6% of deaths annually [17]. A systematic review related to low- and middle-income countries, showed that high socioeconomic groups were found to be less physically active and consumed more fats, salt, and processed food than individuals of lower socioeconomic status [18]. India is the second largest producer of fruits and vegetables. Despite this, there is high prevalence of low intake of fruit and vegetables in most Indian states [19]. Our study has also shown a low intake of fruit and vegetables in 78.03% of healthcare staff. Similar finding was seen in the study conducted in a neighboring country, where 87.6 and 93.6% healthcare staffs consumed less than the recommended daily intake for fruits and vegetables, respectively [20].

In the present study, the perceived stress level recorded, using a self-perceived stress scale, showed 159 (30.11%) of the participants to be having high stress levels which is at par with a systematic review done among healthcare professionals, where moderate to high stress score was found in 50% participants. The high stress level can be attributed to the job profile [21].

Diabetes mellitus is the most common metabolic disorder having the highest disability adjusted life years (DALYs) [22]. In the current study, the prevalence of Diabetes mellitus was 12.5%, which was slightly higher compared to the national prevalence of 7.3% [23]. Our study showed that diabetes mellitus was significantly associated with male sex, high BMI and physical inactivity. The prevalence of hypertension was 6.43% and this was slightly lower compared to the national prevalence of 11.3% [24]. This could be because most of the healthcare staff were below 30 years of age. Hypertension was found to be significantly associated with male sex, increasing age, tobacco and/or alcohol consumption, high BMI and high stress. Dyslipidemia was also found significantly associated with high BMI, male sex,

physical inactivity and high stress. These findings were similar to that of another STEP study [16].

CONCLUSIONS

The prevalence of various risk factors associated with NCD highlights the necessity of an urgent attention in this regard to address the issues. It is the need of the hour to develop a comprehensive risk reduction strategy for healthcare professionals. A regular screening of NCD followed by health promotion activities can also be initiated for reduction of the NCD burden in our centre and in India.

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