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Prevalence of Risk Factors of Cardiovascular Diseases among Government Employees of Hetauda Sub-Metropolitan City

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ABSTRACT

Introduction: The epidemiological transition in Nepal has increased the burden of non-communicable diseases which have resulted in lower production and longer disability. Thus, the aim of the study was to estimate the prevalence of risk factors of Cardiovascular Diseases (CVDs) among government employees of Hetauda Sub-Metropolitan City.

Methods: A cross-sectional descriptive study was conducted among 393 government employees of Hetauda sub metropolitan city. The ethical approval was taken from Nepal Health Research Council and informed consent was taken from each respondent before conducting the study. Cluster sampling was done where a modified WHO STEPS survey questionnaire was self-administered among the respondents. The collected data was entered and analyzed using SPSS Version 20.

Results: Out of 393 respondents, the prevalence of current smokers was 16.3%, more than two-third (72.9%) consumed alcohol in the past 30 days, and a vast majority did not consume both fruit and vegetables in adequate amounts. Similarly, more than two-third respondents (67.2%) never practiced any physical activity. The self-reported diabetes was found among 11.7% of participants whereas 19.4% had hypertension. Majority (70%) had normal BMI however; both male and female were found to be at risk for waist/hip ratio.

Conclusions: Almost every government employee was found to have one or more established risk factors of CVDs. This emphasizes the importance of taking quick action to avert the epidemic of cardiovascular disease.

Keywords: Cardiovascular Disease; Government Employees; Prevalence; Risk Factors.

INTRODUCTION

Cardiovascular diseases (CVDs) are the leading cause of premature death and disease burden worldwide where over three quarters of CVD deaths take place in low and middle-income countries.[1,2] An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths.[2] Similarly, in 2017, CVDs contributed to 26·9% of total deaths and 12·8% of total DALYs in Nepal.[1]

According to studies, there are some major risk factors which play the most important role in the development of NCDs. Tobacco use, harmful alcohol use, unhealthy diets and physical inactivity are all known behavioral risk factors for NCDs.[3] Cardiovascular diseases, on the other hand, can be avoided by addressing these behavioral risk factors and it is also a cost-effective interventions for people with established disease and for those at high risk of developing disease.[2] Thus, this study aimed to find out the prevalence of risk factors of CVDs among government employees.

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METHODS

We conducted a descriptive cross-sectional study among government employees of Hetauda sub-metropolitan city of Makawanpur district, Nepal. The ethical approval was taken from Nepal Health Research Council (NHRC) (Ref no: 484/2018) as well as the concerned government offices for the conduction of this study. All the government employees who were present at the time of data collection were included in the study after obtaining their informed consent and those unwilling to participate were excluded from the study.

For the calculation of sample size, we used the formula of infinite population, $n=z^2pq/e^2$ (where n= sample size) at 95% confidence interval and taking prevalence of 22.3% (according to the study done in Nepal), [4] the calculated sample size was 261, but after accounting for the design effect of 1.5 and the non-response rate of 5%, the adjusted sample size was 410. However, complete responses were missing in 17 of the 410 questionnaires, resulting in a final sample size of 393. Similarly, a cluster sampling method was used in the study where the government offices were divided into five clusters out of a total of 46 offices. The probability proportional to size method was used to select the number of offices from each cluster, and a simple random sampling method was used to select the respective offices.

The WHO STEPS survey questionnaire was modified and self-administered among the participants.[3] The participants' anthropometric measurements were taken with a standard stadiometer for height, an analog weighing machine for weight, a measuring tape for waist and hip circumference, and a sphygmomanometer for blood pressure measurement. The questionnaires were divided into four sections: the first contained questions about the participants' socio-demographic information, the second included questions about individual behavior, the third covered the clinical history, and the fourth contained the respondents' anthropometric data. The collected data was entered using Microsoft Excel (version 2016) and Statistical Package for the Social Sciences (version 20) was used for statistical analysis.

RESULTS

Out of total respondents, 16.3% of the total respondents were current smokers. Almost a quarter of those polled said they used smokeless tobacco 5-7 times per week (16.8 %). More than half of the respondents (55.7%) had consumed alcohol at least once in their lives, with 72.9 percent having done so within the previous 30 days. Similarly, when it came to fruit and vegetable consumption, the majority of respondents consumed both occasionally, accounting for 85% and 90%, respectively. Cold drinks were also consumed on an occasional basis (82.4%). In terms of physical activity, the majority did not engage in moderate intensity activity (67.2 percent) and the majority spent their 5-9 hours sedentary (52.4%).

Table 1. Description of behavioral CVD risk factors (n=393)

Characteristics	n(%)
Category of smoking habit	
Current Smokers	64(16.3)
Ex-Smokers	29(7.4)
Current use of smokeless tobacco	
Never	284(72.3)
weekly 1-2 days	28(7.1)
weekly 3-4 days	15(3.8)
weekly 5-7 days	66(16.8)
Ever consumed an alcoholic drink	
Yes	219(55.7)
No	174(44.3)
Consumption of an alcoholic drink within 30 days	
Yes	160(72.9)
No	59(27.1)
Category of fruits consumptions	
Never	33(8.0)
Occasionally	336(85.0)
Regular	24(6.0)
Category of vegetables consumptions	
Occasionally	357(90.3)
Regular	36(9.7)
Consumption of Cold Drink	
Almost Daily	39(9.9)
Occasionally	324(82.4)
Never	30(7.6)
Physical Activity	
Regular	47(12.0)
Occasionally	82(20.8)
Never	264(67.2)
Sedentary Behavior(hours/day)	
1-4	45(11.5)
5-9	206(52.4)
10-14	127(32.3)
15-19	15(3.8)

Table 2 shows each respondent's individual clinical risk factor. Nearly a quarter of the total respondents (19.4%) were found to have hypertension, with 41.2 % having a family history of hypertension. Similarly, 11.7% of respondents had been diagnosed with diabetes, and

16.3% and 8.4% of respondents, respectively, had a family history of diabetes and heart disease.

Table 2. Description of individual clinical risk factors (n=393)

Characteristics	n(%)
Diagnosed Hypertension	
Yes	76(19.4)
No	317(80.6)
Family history of Hypertension	
Yes	162(41.2)
No	231(58.0)
Diagnosed Diabetes	
Yes	46(11.7)
No	347(88.3)
Family history of Diabetes	
Yes	64(16.3)
No	329(83.7)
Family history of Heart Disease	
Yes	33(8.4)
No	360(91.6)

The majority of respondents had normal BMI 275(70%). The waist/hip ratio, on the other hand, was found to be high risk in both male and female participants, with 260 (85.5%) and 87 (97.8%) respectively.

Table 3. Description of metabolic CVD risk factors (n=393)

Characteristics	n(%)
BMI Category	
Underweight	75(19.1)
Normal Weight	275(70.0)
Over weight	41(10.4)
Class I obesity	2(0.5)
W/H Ratio	
Male	
Low Risk	44(14.5)
High Risk	260(85.5)
Female	
Low Risk	2(2.2)
High Risk	87(97.8)

Table 4 shows the socio-demographic characteristics of respondents, with the majority (52.2 %) being of middle age and male (77.4 %). The majority of the people were married (76.1%) and living in a nuclear family (68.7 %). A majority of participants (92.2 %) practiced Hinduism as their primary religion, and more than half were hill

Brahmins (51.4 %). According to data on educational status more than a third had completed their bachelor's degree. Similarly, the majority of the employees were non-gazetted staff (71%).

Table 4. Socio-demographic characteristics (n=393)

Characteristics	n(%)
Age Group	
Young age	111(28.2)
Middle age	205(52.2)
Senior age	77(19.6)
Sex	
Male	304(77.4)
Female	89(22.6)
Marital Status	
Single	85(21.6)
Married	299(76.1)
Separated	5(1.3)
Widowed	4(1.0)
Family Type	
Nuclear	270(68.7)
Joint	123(31.3)
Religion	
Hindu	364(92.6)
Buddhist	22(5.6)
Muslim	5(1.3)
Christian	2(0.5)
Ethnicity	
Hill Brahmin	202(51.4)
Hill Chhetri	63(16.0)
Hill Janajati	65(15.3)
Hill Dalit	7(1.8)
Terai Brahmin	14(3.6)
Terai Janajati	20(5.1)
Other Terai Caste	19(4.8)
Islam	2(15.8)
Madhesi	1(0.3)
Educational Status	
Primary level(1-5)	25(6.4)
Lower secondary (6-8)	40(10.2)
SLC/SEE	49(12.5)
PCL/Diploma	51(13.0)
Bachelors	143(36.4)
Masters	72(18.3)
Literate	13(3.4)
Designation	
Gazetted Officer	115(29.0)
Non-Gazetted Staff	278(71.0)

DISCUSSION

The prevalence of major NCD risk factors among government employees was investigated, including both modifiable behavioral risk factors (current smoking, alcohol consumption, low fruit and vegetable consumption, and physical inactivity) and biological risk factors (overweight, obesity, raised blood pressure, and raised blood glucose).

This study showed the prevalence of smoking (16.3%) among government employees which is consistent with the NCDs risk factor survey of Nepal 2013 where the prevalence was found to be 18.5%. However, studies conducted in some other countries like China, Poland, Turkey, Thailand and Russia reported comparatively higher prevalence of smoking.[5] This might be due to the existing cultural differences between Nepal and referred countries.

The harmful use of alcohol is a risk factor for multiple adverse health and social outcomes, including cardiovascular diseases.[6] This study found more than two-third respondents who consumed alcohol. Similar study conducted in Biratnagar reported higher prevalence but comparatively lower than the findings of our study.[4] Regarding, the consumption of fruit and vegetables this study reported very few proportions of respondents who consumed appropriate servings of fruits and vegetable which is identical with the study conducted in Bahrain.[7]

Similarly, physical activity plays a critical role in the primary and secondary prevention of cardiovascular diseases. According to epidemiological studies, active people are found to have half the risk of coronary artery disease as sedentary people.[8] Despite of having well educational background among the participants of the present study, majority were did not practice any physical activity and spend more about 5-9 hours of their time in sedentary behaviors which is similar to another study conducted in a different location of Nepal.[4] The less proportion of employee involved in physical activity might be due to poor work life balance of an individual.

Raised blood pressure is a major risk factor for coronary heart disease and cerebrovascular disease. Studies have shown that the risk of stroke and coronary heart disease is progressively and positively related to the increased level of blood pressure. In addition to that obesity, which is a major public health concern in both developed and developing countries, has negative metabolic consequences such as high blood pressure, cholesterol, triglycerides, and insulin resistance. With a growing BMI, the risks of coronary heart disease, ischemic stroke, and type 2 diabetes mellitus rise steadily.[6] In this context we found less than a quartile (10.4%) of respondents with high BMI which is lower than the NCDs survey 2013.[3] A study conducted in Indonesia and China, in contrast to our findings, found a significant prevalence of hypertension. This could be related to the fact that the referred study was conducted in a larger scale than ours.[9, 10]

CONCLUSIONS

Almost all the government employees were found to have one or more established risk factors of cardiovascular diseases which indicates the unbearable burden of CVDs in the near future. Rather than expensive treatments, adoption of easier and cost-effective strategies like behavior change intervention may be the best way to minimize the prevalence of risk factors.

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