

Original Research Article

## Prevalence of Risk Factors for Cardiovascular Diseases among Employees of Academic Institutions in Pokhara Sub-Metropolitan, Nepal

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### ABSTRACT

**Background:** Deaths due to cardiovascular diseases (CVD) are increasing day by day. Although there have been studies on risk factors for CVD amongst different population, no study has been done to assess prevalence of risk factors for CVD on employees of academic institutions.

**Materials and Methods:** A cross-sectional study was conducted to determine risk factors for CVD. Pretested Semi-structures questionnaire was designed to elicit the information on socio demographic characteristics, behavioral risk factors. Physiological risk factors and biochemical risk factors were assessed using the standard pretested tools.

**Results:** Amongst 140 participants mean age were  $46.65 \pm 8.75$  years. Around 24% of the respondents were currently smoking. Mean age of start of smoking was  $23.72 \pm 8.52$  years. Most participants were occasional drinkers (49%), 26% of them drank 1-3 days a month, 15% 1-4 days per week and 10%  $\geq 5$  days per week. Around 96% were found to take  $<5$  servings of fruits and vegetables per day. Physical activity was moderate in 61%, low in 26% and high amongst 13%. Survey showed 37.9% of individuals were having raised blood pressure. Around 24% had history of hypertension. Amongst them 50% were on antihypertensive medication. Around 16% had history of diabetes. During survey 9% showed elevated Fasting Blood Sugar Level. Amongst them 3.4% was newly diagnosed case. Around 80% of the individuals were overweight/obese.

**Conclusion:** The prevalence of risk factors for CVD amongst the study population was found to be higher.

**Keywords:** BMI, CVD, Physical inactivity, Risk factors.

### INTRODUCTION

An estimated 17.3 million people died from CVDs in 2008, representing 30% of all global deaths. <sup>[1]</sup> Over 80% of CVD deaths take place in low and middle income countries. Indian subcontinent has among the highest rates of cardiovascular disease (CVD) globally. <sup>[2]</sup> In Nepal, CVD accounts for 25% of total deaths of all ages. <sup>[3]</sup>

Although there have been many studies related risk factors for CVD amongst different population, No systematic analysis has been done to assess the prevalence of

risk factors for CVD on employees of academic institutions. This study aims at determining the prevalence of risk factors for CVD amongst employees of academic institutions. Behavioral risk factors (Smoking, Alcohol Consumption, physical inactivity, low intake of fruits and vegetables), physiological risk factors (Body fat percentage, Raised Blood Pressure, Increased BMI) and Biochemical risk factors (Fasting Blood Sugar) are established risk factors for CVD. <sup>[4]</sup> Employees are important part of school

environment. Addressing the health issues of the employees is beneficial in improving school Health.

## **MATERIALS AND METHODS**

A cross sectional study was conducted amongst the three randomly selected academic institutions. List of staffs from purposively selected academic institutions: Prithvinarayan Campus (PNC), Western Regional Campus (WRC) and Institute of Forestry (IOF) were taken. Of total 894 staffs, 153 were selected with systematic random sampling and were stratified according to teaching and non-teaching staffs according to population proportion to size (PPS).

Semi-structures questionnaire was designed to elicit information on socio-demographic characteristics and major risk factors for CVD. After consent of respondent, face to face interview was conducted. Physical activity was assessed in metabolic equivalent Task (Metmin/week) using Global Physical Activity Questionnaire (GPAQ).<sup>[5]</sup> Fruit and vegetable consumption was measured in standard serving size using flash cards with different size of fruits and standardized cup for vegetables intake. Respondents were advised study protocol for next day i.e. refraining from food and drinks for at least 8 hours. Pregnant women, people with fever, persons with any implanted electronic device, amputated limbs or edematous limbs were excluded from study.

Following day after interview, body weight was measured to nearest 0.1 kg in light indoor clothing without shoes, using a digital scale. A correction of 0.5 kg was made for weight of cloths. Height was measured using portable stadiometer. Body fat % was measured using a commercially available digital weight scale incorporating a bioelectric impedance analyzer (HBF-352, Omron Health care Co., Kyoto, Japan).<sup>[6]</sup> Blood pressure (Omron-T5) and fasting blood sugar level was measured using a commercially available digital scale (Gulcometre). Instrumental reliability of

machines was checked prior to start of survey.

Recorded data were entered into Spss-17 software. Descriptive statistics for all variables was used and differences of prevalence of risk factors amongst different variables were assessed using appropriate Statistical techniques. Socioeconomic status was categorized using the standardized Kuppuswamy Scale.<sup>[7]</sup> Ethnic wise distribution of respondents was done based on the hierarchy of Human Development Index (HDI) ranking.<sup>[8]</sup>

## **RESULTS**

Of total 153 individual only 140 respondents was able complete study as they were fulfilling study protocol clearly. Mean age of respondents was  $46.65 \pm 8.75$ . Majority 61% of respondents were teaching staffs. Male constitutes a huge proportion 83%. Majority 69% were from higher socioeconomic class, 24.3% medium class and 6.4% from lower socioeconomic class. Brahmin and Chhetri constitute major proportion of ethnic group in study population (70%). Table 1 shows description of the study population.

Major established risk factor for CVD was assessed using different standardized techniques. Table 2 shows profile of the reported behavioral, physiological, biochemical, risk factors for CVD amongst the study population.

Study showed around 24% of respondents was currently smoking. Mean age at start of smoking was  $23.72 \pm 8.52$ , which was independent of ethnic groups ( $p=0.066$ ), socioeconomic class ( $p=0.717$ ). No association was seen between use of tobacco products with ethnic groups ( $p=0.995$ ) and socioeconomic class ( $p=0.732$ ). Most participants were occasional drinkers (49%), 26% drank 1-3 days a month, 15% 1-4 days per week and 10% more than 5 days per week. Mean age taking alcohol was  $24.72 \pm 5.87$  years. Janajati and Dalit seems to take alcohol at younger age (21 years) as compared to Brahmin and Chhetri (27 years)

( $p=0.001^{**}$ ) and were more likely to take alcohol as compared ( $OR=2.93$   $p=0.008^{**}$ ). Alcohol intake was not associated with socioeconomic condition of respondents ( $p=0.995$ ).

Most of participants (96%) were found to take less than five servings of fruits and vegetables per day. No significant difference in mean intake of fruits and vegetables among different ethnic groups ( $p=0.207$ ). Participants from higher socioeconomic status seems take more servings compared to those from low socioeconomic status ( $p=0.012^*$ ).

Physical activity was found to be moderate in 61% of participants, low in 26% and high amongst 13% of participants. Female were more physically active (2104 metmin/week) than male (1361 metmin/week) ( $p=0.004^{**}$ ). There was no association between level of physical activity with ethnic groups ( $p=0.959$ ) and socioeconomic status ( $p=0.075$ ).

Survey showed 37.9% of individuals were having raised blood pressure. There was no significant association of gender and raised blood pressure though prevalence was higher in Males (25.6%) than in Female (17.4%) but was highly prevalent in Janjati and Dalit (57.6%) to Brahmin and Chhetri (30.8%) ( $OR=3.04$ ,  $p=0.005^{**}$ ). Raised blood pressure was independent with socioeconomic status of the respondents ( $p=0.902$ ).

Around 16% of participants had history of diabetes. During survey 9.3% of

participants showed elevated Fasting Blood Sugar (FBS) Level i.e. more than 130mg/dl. Amongst them 3.4% (4) was newly diagnosed case which was confirmed during follow up. There was positive correlation between FBS level and age ( $r=0.21$ ,  $p=0.015^*$ ).

There was no significant difference in mean body mass index (BMI) for women and men ( $p=0.984$ ). BMI for Janjati and Dalit was found higher (26.41 kg/m<sup>2</sup>) than Brahmin and Chhetri (25.01 kg/m<sup>2</sup>) ( $p=0.047^*$ ). Socioeconomic difference had no effect on difference on BMI amongst ( $p=0.79$ ). There was positive relation between increase in age with increase in BF % controlling for sex, socioeconomic class, physical activity, ethnicity ( $r=0.33$ ,  $p=0.001^{**}$ ). Exercise had good impact on reducing BF % ( $r=-0.27$ ;  $p=0.002^{**}$ ).

**Table 1: Description of the study population.**

Description of the study population	Percentage (n)
<b>Educational institutions (Sampling sites)</b>	
IOF	12.14% (17)
PNC	70% (98)
WRC	17.85% (25)
<b>Staffs category</b>	
Teaching staff	60.7% (85)
Non-teaching staffs	39.3 % (55)
<b>Sex</b>	
Male	83.6% (117)
Female	16.4% (23)
<b>Socioeconomic status</b>	
Upper	69.3% (97)
Middle	24.3% (34)
Lower	6.4% (9)
<b>Ethnic Groups</b>	
Brahmin	54.28% (76)
Chhetri	15.71% (22)
Janjati	22.8% (32)
Dalit	7.1% (10)
Total	140

**Table 2: Behavioral, physiological, biochemical, risk factors for CVD amongst study population.**

Risk factors	Prevalence (%) of the risk factors amongst the study population				
	Total	Male	Female	Brahmin & Chhetri	Janjati & Dalit
<b>Behavioral risk factors</b>					
Smoking & tobacco products	24.3	24	0	24.3	24.2
Alcohol	43.6	47.9*	21.7*	37.4**	63.6**
Physical inactivity (<600 Metmin/Week)	25.7	27.4	17.4	26.2	24.2
<b>Physiological risk factors</b>					
Blood pressure (>140/90)	37.1	34.8	37.6	30.8**	57.6**
Diabetic condition	15.7	17.9	4.3	15	18.2
Body Fat percentage (>22)		91.5**	50.9**		
BMI (>25)	55	47.8	56.4	50.5*	69.7*
<b>Biochemical risk factors</b>					
Fasting Blood Sugar (>130mg/dl)	9.3	9.4	8.7	9.3	9.1

## DISCUSSION

Epidemiological studies are showing the increasing trend of risk factors for CVD. Current study showed prevalence of risk factor for CVD amongst selected population. Study showed around 42 % of respondents were consuming tobacco products which was very high in comparison to the national average (23.3%), [3] stepwise surveillance conducted in Kathmandu valley (33%) [9] And other similar study conducted in Ilam, Lalitpur and Tanahu, [10] Prevalence of the smoking was found to be comparatively lesser in the study population as compared to the other studies. [3,9,10] But the gender difference was quite prominent in current studies likewise in other studies. Current study showed 4% respondents were taking more than 5 servings of fruits and vegetables as compared to 0.4% in Kathmandu and 0.9% in Ilam, Lalitpur and Tanahu. [9,10] This shows overall low consumption of fruits and vegetables in Nepalese population.

There seems a high variation about level of physical activity amongst different studies. The study population showed quite better amount of the physical activity compared to study conducted in Kathmandu. [9] On other hand level of the physical activity in current population was quite lower than the report published by NCD country profile, Nepal. [3]

Prevalence of diabetes and Hypertension was 16% and 24% respectively which was high compared to studies conducted in Kathmandu (Hypertensive 10.3%, Diabetes 3.8%), Ilam, Lalitpur and Tanahun (Hypertension 7.1%, Diabetes 3.8%). [9,10] Difference is probably due to difference in level of physical activity and mental stress over respondents. Similarly overweight and obesity was higher in study population compared to national average, and other stepwise surveillance conducted in Nepal. [3,9,10]

## CONCLUSION

Risk factors to CVD were found to be more amongst the employees in the educational institution compared to the normal population. Dalit and Janjati seems to be at more risk for CVD compared to Brahmin and Chhetri.

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