

Prevalence of Risk Factors of Non-Communicable Diseases and Screening of Possible Cardiovascular Diseases among Adults in Devchuli Municipality of Nawalpur District, Nepal

Samikshya Parajuli,¹ Tulsi Ram Bhandari¹

¹School of Health and Allied Sciences, Faculty of Health Sciences, Pokhara University, Kaski, Nepal

ABSTRACT

Introduction: The major Non-communicable diseases (NCDs) are cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases. Among the cardiovascular diseases, myocardial infarction and angina have high morbidity and mortality worldwide. This study assessed the prevalence of risk factors of NCD among adults, screened possible CVDs (myocardial infarction and angina) among adults and related presence of risk factors with possible CVDs (myocardial infarction and angina)

Methods: A cross-sectional study was conducted among an adult population of 30 to 50 years in Devchuli Municipality of Nawalpur district, Nepal from June to December 2018. We used WHO STEPS survey questionnaire to assess risk factors and Rose Angina Questionnaire given by WHO to find out the possible myocardial infarction and angina as study tools. We used complete filled 372 questionnaires to analyze and draw the results. Proportionate random sampling was performed to obtain the sample from each ward.

Results: The prevalence of the use of any type of tobacco products was 20.7% and consumption of alcoholic products was 19.62%. Prevalence of physically inactive was found at 44.9%. Out of the total participants 25%, 15.3%, and 3.5% reported hypertension, diabetes, and cardiovascular diseases respectively. Prevalence of possible rose angina and the myocardial infarction was found to be 8.06% and 2.7% respectively. Smoking ($\chi^2=9.685$, $df=1$, $p=0.02$) and alcohol consumption ($\chi^2=4.331$, $df=1$, $p=0.037$) were found significantly associated with Rose Angina.

Conclusions: The prevalence of risk factors of non-communicable diseases was high. Possible angina and the myocardial infarction were also found out in the adult population. Individual and community-based behavior change intervention program would be the way out to overcome the problem.

Keywords: Angina; myocardial infarction; cardiovascular disease; non-communicable diseases; STEPS survey.

INTRODUCTION

The global burden of non-communicable diseases (NCDs) is increasing rapidly due to various factors such as economic development, increase in the intake of processed foods high in fat, salt and sugar and change in cultural norms (increase in the use of tobacco and alcohol), decline in the physical activity, and increase in the sedentary lifestyles.¹ Non-communicable diseases (NCDs) encompass a vast group of diseases such as cardiovascular diseases, cancer, diabetes and chronic respiratory diseases.² Multiple risk factors are responsible to cause NCDs.³ National NCD risk factors survey 2013 detected considerably high proportions of smoking (18.5%), alcohol consumption (17.4%), insufficient fruits and vegetables consumption (98.9%) and obesity (4%) among Nepalese.⁴ Cardiovascular diseases are related to problems of the heart and circulation.⁵ The incidence of cardiovascular diseases (CVDs) is rapidly increasing worldwide and is currently considered to be the leading cause of death in both developing and developed countries.⁶ This study assessed the prevalence of risk factors of NCD among adults, screened

possible CVDs (myocardial infarction and angina) among adults and related presence of risk factors with possible CVDs (myocardial infarction and angina).

METHODS

A cross-sectional study was conducted among adults of Devchuli municipality from June to December 2018. The study population was adults above 30 years and below 50 years of age of Devchuli Municipality of Nawalpur district. The validated WHO STEPS instrument version 2.2 translated in Nepali by Nepal Health Research Council (NHRC) and Rose Angina Questionnaire was adopted for collecting the information. Socio demographic and behavioral information were collected in STEP I. Behavioral information included tobacco use, harmful alcohol consumption, low fruit and vegetable consumption, history of raised blood

Correspondence: Samikshya Parajuli, School of Health and Allied Sciences, Faculty of Health Sciences, Pokhara University, Pokhara, Nepal, Email: samikshyaparajuli1996@gmail.com

pressure and dietary salt consumption. In 1962, Rose introduced an administered questionnaire for determining the prevalence of chest pain that named Rose Questionnaire This questionnaire is used for determining of natural history of heart disease. Myocardial infarction was defined according to standard criteria as a severe pain across the front of your chest lasting for half an hour and pain should be for the first time. Definite angina was defined according to standard criteria as chest pain or discomforts which: 1- was brought on by exertion, 2- was situated in the central or left anterior chest, 3- forced the subject to slow down or stop, 4- was relieved if the subject did so and 5- was relieved within 10 min.⁷ The ethical approval was obtained from the Institutional Review Committee of Pokhara University. Similarly, written permission was taken from administrative section of Devchuli Municipality and informed consent was also taken from participants. Modified STEPS survey questionnaire was administrated on the census population 372 for the study. The collected data were entered into Epi-data 3.1 and analyzed using SPSS 20 version. We performed descriptive analysis considering the socio-demographic status of the respondents and risk factors of the NCDs. We further applied chi-square test to examine the association between risk factors of NCDs and CVDs (myocardial infarction and angina).

RESULTS

Majority (69.9%) of the participants were male. More half (50.3%) of the participants were Janajati, almost (88.2%) of the participants were Hindu (97%) were married, more than half (51.3%) had joint family. Nearly one-third (33.8%) of participants had received secondary level education.

Variable	Number (n)	Percent (%)	Mean
Sex of Participants			
Male	260	69.9	
Female	112	30.1	
Age of Participants			39.80±6.585
30 – 34	98	26.3	
35 – 39	89	23.9	
40 – 44	70	18.8	
45+	115	30.9	
Min 30, Max 50			
Ethnicity			
Dalit	13	3.5	
Disadvantaged Janajatis	111	29.8	
Disadvantaged non-dalit Terai caste groups	2	.5	
Relatively advantaged Janajatis	59	15.9	
Upper caste groups	187	50.3	

Religion		
Hindu	328	88.2
Buddhist	29	7.8
Christian	12	3.2
Muslim	3	.8
Marital Status		
Never married	3	.8
Married	361	97.0
Divorced	1	.3
Widowed	7	1.9
Type of Family		
Nuclear	175	47.0
Joint	191	51.3
Extended	6	1.6
Educational Status		
Illiterate	33	8.9
Informal	69	18.5
Basic	105	28.2
Secondary level	122	32.8
Graduate	36	9.7
Postgraduate more	7	1.9
Occupation		
Agriculture	91	24.5
Service	130	34.9
Labour	46	12.4
Business	100	26.9
Foreign employee	5	1.3

Risk factors of non-communicable diseases

Table 1: Risk factors of non-communicable diseases

Risk factors	Yes no (%)	No n (%)	Total
Currently smoke tobacco products (372)	77 (20.7%)	295(79.3%)	372
Currently smoke tobacco products daily (77)	52 (67.5%)	25(32.5%)	77
Smoked tobacco products in the past (372)	101(27.2%)	271(72.8%)	372
Ever consumed alcohol (372)	104(28%)	268(72%)	372
Consumed alcohol within past 30 days	73(83.9%)	14(16.1%)	87
Hard exercise	212(57%)	160(43%)	372
Medium exercise	299(80.4%)	73(19.6%)	372
Sufficient physical exercise	205(55.1%)	167(44.9%)	372
Heavy recreational activities	56(15.1%)	316(84.9%)	372
Medium recreational activities	144(38.7%)	228(61.3%)	372

Distribution of the respondents by NCDs (High blood pressure, Diabetes and CVD)

Table 2: Distribution of the respondents by NCDs (High blood pressure, Diabetes and CVD)

Condition	High blood pressure n=372				Diabetes n=372				Cardiovascular diseases n=372			
	Yes		No		Yes		No		Yes		No	
	N	%	N	%	N	%	N	%	N	%	N	%
History	150	40.3	222	59.7	85	22.8	287	77.2	24	6.5	348	93.5
Check up	213	57.3	159	42.7	155	41.7	217	58.3	94	25.3	278	74.7
Presence	93	25	120	32.3	57	15.3	98	26.3	13	3.5	81	21.8
Traditional check up	42	11.3	51	13.7	36	9.7	21	5.6	8	2.2	5	1.3
Ayurvedic medication	34	9.1	59	15.9	32	8.6	25	6.7	8	2.2	5	1.3

Screening of possible CVDs

Table 3: Screening of possible CVDs

Possible Myocardial infarction	No.	Percent
Presence	10	2.7
Absence	362	97.8
Possible Rose angina	No.	Percent
Presence	30	8.06
Absence	342	91.94

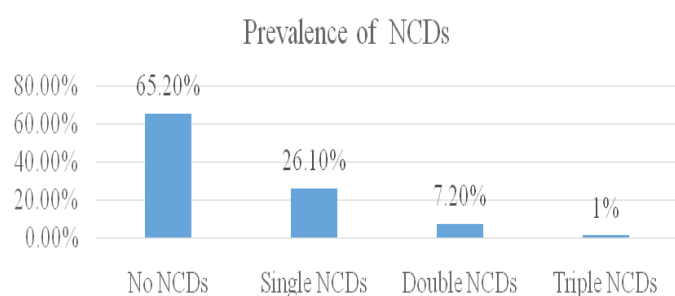
Prevalence of NCDs

Figure 1 Prevalence of NCDs

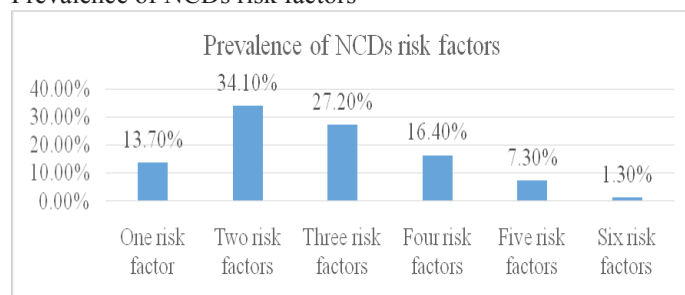
Prevalence of NCDs risk factors

Figure 2 Prevalence of NCDs risk factors

Figure shows the distribution of number of risk factors of NCDs to respondents. Majority (34.1%) had two risk factors and 1.3% had six risk factors.

Association of NCDs risk factors with possible CVDs (myocardial infarction and angina pectoris)

Table 4: Association of NCDs risk factors with Possible CVDs (myocardial infarction and angina pectoris)

Variables	Myocardial infarction p-value	Angina pectoris p-value
Demographic and economic factors		
Sex (Male/Female)	0.182	0.204
Age (<40 yrs. />40 yrs.)	0.121	0.884
Religion (Hindu/Non-Hindu)	0.375	0.236
Education (<Basic/>Basic level)	0.625	0.782
Smoking and alcohol habits		
Currently smoke tobacco products (Yes/No)	0.392	0.02*
Age of smoking initiation (<10/>10 yrs.)	0.392	0.002*
Smoked tobacco products in the past (Yes/No)	0.242	0.004*
Currently use smokeless tobacco daily (Yes/No)	0.092	0.009*
Ever consumed alcohol (Yes/No)	0.451	0.037*
Consumed alcohol within past 30 days (Yes/No)	0.600	0.470
Dietary intake		
Fruits intake (<4/>4 days)	0.375	0.236
Vegetables intake (<5/>5 days)	0.696	0.114
Physical exercise		
Hard exercise (Yes/No)	0.121	0.703
Moderate exercise (Yes/No)	0.214	0.221
History of NCDs		
History of HTN in family (Yes/No)	0.392	0.458
History of Diabetes in family (Yes/No)	0.121	0.452
History of CVD in family	0.304	0.155

DISCUSSION

Major risk factors of non-communicable disease were smoking, alcohol consumption, physical inactivity, history of hypertension and diabetes. Among those, the prevalence of current smoking, current alcohol drinker, history of hypertension, history of diabetes and heart diseases was 20.7%, 19.62%, 25%, 15.3% and 3.5% respectively. The findings of the study showed that the overall prevalence of NCDs (high blood pressure, diabetes and cardiovascular diseases) is 14.6%. Eight percent of the respondents had angina pectoris whereas less than three percent had the incident case of possible myocardial infarction.

The prevalence of current smoking was 20.7% which was lower than the result presented by Vaidya et al.⁸ But it was comparatively higher than prevalence (18.5%) demonstrated by nationwide NCD risk factors survey 2013⁴ and higher than prevalence (10.9%) demonstrated by the results presented by Dahiru et al. in Nigeria.⁵ The global targets are to bring tobacco consumption down to less than five percent by 2040 which was declared from the United Nations high-level meeting on NCDs in 2011. Nepal seems to be far from it. This presents the need for improving people's behavior as it appears to be not changing even when the law exists on the ban on the use of tobacco in public places including workplaces and at home.⁹ Current study showed that one out of two participants (19.62%) had a history of taking alcohol within last 30 days. However, NCD risk factors survey 2013 in Nepal had only detected one in every six people (17.4%) as a current alcohol drinker. The prevalence of currently taking alcohol was 3.5% showed by the results presented by Dahiru et al. in Nigeria.⁵ Notably higher numbers of indigenous people at study site had a strong influence on prevalence of alcohol consumption. The proportion of physically inactive was found to be 44.9%. However, the study conducted in Bahrain showed that proportion of physically inactive was found to be 50.8%.¹⁰

The prevalence of hypertension was 25% which was higher (12.3%) than the result presented by Dhungana et al.¹¹ The study conducted by Neupane et al showed that prevalence of hypertension was 18.6%.⁹ Current study shows that the prevalence of diabetes was 15.3% which was extremely higher than the results presented by Nepal STEPS survey 2013.⁴ The study conducted by Neupane et al. showed that prevalence of diabetes was 5.9%.⁹ The reason might be due to the busy and sedentary lifestyles. Current study shows that the prevalence of cardiovascular diseases was 3.5%. The study conducted by Neupane et al. showed that prevalence of cardiovascular diseases was 1.9%.⁹

Current study shows that the prevalence of possible rose angina was 8.06% while it was 21.1% in Iran.⁷ The reason behind the

high prevalence in Iran might be the high sample size. However another study in California shows that the prevalence of Rose angina was 7.4%.¹² Another study conducted in Brazil shows that the prevalence was 7.6% which is slightly lower than our study.¹³ This study revealed that the prevalence of possible myocardial infarction was 2.7%. However the study conducted in Bangladesh shows that the prevalence of Myocardial infarction was 12.9%.¹⁴ The reason behind the high prevalence of myocardial infarction might be the inclusion of population from 45 to 75 years.

This study revealed that there is no association between age and angina similar to the study conducted in California.¹² In this study there is no association between gender and angina which is similar to the study conducted in Bangladesh.¹⁴ However studies in California¹² and Iran shows⁷ that there is association between gender and angina. This study revealed the association between smoking and angina which is similar to the study conducted in Bangladesh which shows the association between smoking and coronary heart diseases.¹⁴ Another study from California also shows the association between smoking and angina. This study revealed the association between the alcohol consumption and angina which is similar to the study conducted in California.¹² This study showed that there is no association between physical exercise and angina pectoris which is similar to the study conducted in Bangladesh.¹⁴

There was no association between history of hypertension with angina in this study which is similar to the study conducted in California.¹² However the study conducted in Bangladesh shows that there is association between history of hypertension with Angina.¹⁴ There is no association between history of diabetes with angina in this study. However the study conducted in Bangladesh and California¹² shows that there is association between history of diabetes with Angina. This study showed that there is no association between history of heart diseases with angina and myocardial infarction which is similar to the study conducted in Bangladesh.¹⁴ This study has relied exclusively on self-reported symptom and did not include examination to verify the extent of myocardial infarction and angina among affected population.

CONCLUSION

Major risk factors of NCDs were smoking, alcohol consumption, physical inactivity, history of hypertension and diabetes. Eight percent of the respondents had incident of possible angina pectoris whereas less than three percent had the incident of possible myocardial infarction. All respondents were not found to be free of the established risk factors of NCDs and one-

fourth respondents were suffered from any NCDs. Smoking and alcohol consumption were seen significantly associated with Rose angina. From this research finding, it can be inferred this community has also been infiltrated by high prevalence of behavioral related NCDs risk factors. Cases of NCDs are likely to increase in near future if these risk factors continue unabated. Therefore, community based NCDs prevention program is the need of the day.

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REFERENCES

1. Rawal LB, Biswas T, Khandker NN, Saha SR, Bidat Chowdhury MM, Khan ANS, et al. Non-communicable disease (NCD) risk factors and diabetes among adults living in slum areas of Dhaka, Bangladesh. *PloS one*. 2017;12(10):e0184967.
2. Nethan S, Sinha D, Mehrotra R. Non Communicable Disease Risk Factors and their Trends in India. *Asian Pacific journal of cancer prevention : APJCP*. 2017;18(7):2005-10.
3. Mendy VL, Vargas R. Trends in major risk factors for cardiovascular disease among adults in the Mississippi Delta region, Mississippi Behavioral Risk Factor Surveillance System, 2001-2010. *Preventing chronic disease*. 2015;12:21.
4. Population MoHa. Non Communicable Diseases Risk factors: STEPS Survey Nepal 2013. 2014.
5. Dahiru T, Ejembi CL. Clustering of cardiovascular disease risk-factors in semi-urban population in Northern Nigeria. *Nigerian journal of clinical practice*. 2013;16(4):511-6.
6. Nangia R, Singh H, Kaur K. Prevalence of cardiovascular disease (CVD) risk factors. *Medical journal, Armed Forces India*. 2016;72(4):315-9.
7. Shojaei M, Rahmanian K, Moayed-Rad M. Association of Rose angina with cardiovascular risk factors among men and women: a population-based study. *Jentashapir J Health Res* 2014;477-82.
8. Vaidya A, Aryal UR, Krettek A. Cardiovascular health knowledge, attitude and practice/behaviour in an urbanising community of Nepal: a population-based cross-sectional study from Jhaukhel-Duwakot Health Demographic Surveillance Site. *BMJ open*.3(10).
9. Neupane R, Bhandari TR. Prevalence of Non-Communicable Diseases and its Associate Factors among Government Employees in Biratnagar, Nepal. *J Nepal Med Assoc*. 2017;497-503.
10. Al-Nooh AA, Abdulabbas Abdulla Alajmi A, Wood D. The Prevalence of Cardiovascular Disease Risk Factors among Employees in the Kingdom of Bahrain between October 2010 and March 2011: A Cross-Sectional Study from a Workplace Health Campaign. *Cardiology research and practice*. 2014;2014:832421.
11. Dhungana RR, Devkota S, Khanal MK, Gurung Y, Giri RK, Parajuli RK, et al. Prevalence of cardiovascular health risk behaviors in a remote rural community of Sindhuli district, Nepal. *BMC Cardiovasc Disord*. 2014.
12. Carpiuc KT, Wingard DL, Kritiz-Silverstein D, Barrett-Connor E. The Association of Angina Pectoris with Heart Disease Mortality Among Men and Women by Diabetes Status: The Rancho Bernardo Study. *Journal of women's health*. 2010;19.
13. Lotufo PA, Malta DC, Szwarcwald CL, Stopa SR, Vieira ML, Bensenor IM. Prevalence of angina pectoris in the Brazilian population from the Rose questionnaire: analysis of the National Health Survey. 2013.
14. Rahman MA, Spurrier N, Mahmood MA, Rahman M, Choudhury SR, Leedere S. Rose Angina Questionnaire: Validation with cardiologists' diagnoses to detect coronary heart disease in Bangladesh. *Indian Heart J*. 2013;65(1):30-9.