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## Tobacco use: A Major Risk Factor for Non-Communicable Diseases in Central Nepal.

Kishor Adhikari<sup>1, 2\*</sup> and Neena Gupta<sup>1</sup>.

<sup>1</sup>Faculty of Health Sciences, Sam Higginbottom Institute of Agriculture Technology and Sciences, Allahabad, India.

<sup>2</sup>National Medical College and Teaching Hospital Birgunj, Nepal.

### ABSTRACT

This was a cross-sectional study conducted in Central Development Region of Nepal to assess the tobacco behaviour and its association with blood pressure. Tobacco use, which is one of the major modifiable risk factors of Non-communicable diseases, is a serious public health problem in the central developmental region of Nepal. Out of total respondents, 42.1% Male and 18.4% female respondents were currently using tobacco. ( $p < 0.001$ ) About 17% of total respondents were found currently using chewing tobacco where over a quarter (25.26%) of male respondents and 7.47% of female respondents were doing so. ( $p < 0.001$ ) There was no significant relation between tobacco using habit and systolic blood pressure but the relation observed between diastolic blood pressure and tobacco habit. ( $p < 0.05$ ) Logistic regression showed that tobacco use increases level of diastolic blood pressure. (Odds ratio: 1.332, 95% CI: 0.992-1.788,  $p < 0.001$ ) Reducing tobacco use is one of the best resolutions along with harmful use of alcohol, salt reduction and promotion of physical activity for preventing NCDs. Integrating tobacco control with broader population services in the health system framework is crucial to achieve control of NCDs in Nepal.

**Keywords:** Non-communicable Diseases, Risk Factor, Tobacco, Blood Pressure

*\*Corresponding Author*



## INTRODUCTION

Non-communicable diseases (NCDs) are the leading causes of death globally, killing more people each year than all other causes combined [1]. Contrary to popular opinion, available data demonstrate that nearly 80% of NCD deaths occur in low- and middle-income countries [2]. There is an extensive literature demonstrating that NCDs are more likely to occur with unhealthy diet, physical inactivity, active and passive smoking, and use of betel nut and smokeless tobacco, whereas prevention of these factors has positive effects on reducing NCDs rates and all-cause mortality [3-5]. It has been reported that up to 80% of deaths due to heart disease, stroke, and type 2 diabetes and 40% of deaths due to cancers could be prevented by eliminating known lifestyle risk factors [6].

Nepal is facing double burden of diseases, as there is still high prevalence of communicable diseases and at the same time non-communicable diseases are increasing dramatically as its economy has been inching up gradually [7]. Concurrently, risk factors that contribute to CVD such as tobacco and alcohol consumption, obesity and physical inactivity have increased, posing a major public health problem. This change in the dynamics of diseases is highlighted by studies done in Nepal [8-15].

Tobacco use is the single greatest preventable cause of death in the world today which is responsible to kill 5.4 million people a year and if left unchecked that number will increase to more than 8 million a year by 2030 [16]. In industrialized countries, where smoking has been common for decades, it is estimated to cause over 90% of lung cancer in men and about 70% of lung cancer among women, and about 22% of all cardiovascular disease [16].

Tobacco use either in the form of smoking, chewing or keeping tobacco dusts between lips and gums, has been in practice in Nepal. According to a national survey, there are 23.8% current smokers in Nepal [13].

Main objective of this study was to assess the tobacco behaviour and its association with blood pressure among 15-64 years population of central Nepal

## MATERIALS AND METHODS

This was a community based cross sectional study among urban and rural population which was based on WHO's STEP approach for surveillance of NCD risk factors [17]. The study was conducted in six urban and same numbers of rural wards from six randomly selected districts from all three ecological belts viz. Mountain, Hill and Terai of Central Development Region (CDR). Multi-staged sampling technique was used to get study sample. Male and female individual between the age of 15 and 64 from both urban and rural setting constituted the study population. The final sampling unit was contacted and collected information with a pre-tested questionnaire. A pre-tested structured questionnaire was used to collect information regarding tobacco behaviour. Blood pressure was measured for all the adults by auscultatory method using sphygmomanometer at the study site in the seating position after the participant rested for at least five minutes. Three consecutive measurements were taken with interval of three minutes between consecutive

measurements. Average systolic and diastolic blood pressure was determined from all three measurements. BP classification was followed by JNC-VII recommended criteria [18].

Sample size was determined by applying the formula  $n = 4pq / L^2$ .  $p$  was taken as 26.2%, the minimum known overall prevalence of some of the risk factors under consideration [13].

Calculated value from the given formula was 1126. Adding non response rate of 10%, the estimated sample size became 1238.7. To avoid fraction or to make the sample in zero figure, sample size is finalized as 1240.

Ethical approval letter was sought before the commencement of data collection from the Nepal Health Research Council (NHRC).

## RESULTS

The total study sample comprised of 665 (53.64%) male and 575 (46.36%) female drawn from the selected urban 1009(81.4%) and rural 231(18.6%) areas. Out of total respondents, 42.1% of male and 18.4% of female respondents were currently using tobacco. The highest proportion of current tobacco users falls under the age group of 55-64 years closely followed by 45-54 years i.e. 28.2% and 28.0% respectively.

Of the total smoking tobacco users, majority of them (98.9%) consume cigarette followed by Bidi (37.4%). Only 4% of total current smokers were found using Hukka (pipes). Of the total smokeless tobacco users, highest percentage i.e. 93.0% consume chewing tobacco which is commonly known as Surti or Tamakhu in Nepal which is followed by chewing battle which is consumed nearly half of the smokeless tobacco users. Slightly more than one-tenth of smokeless tobacco users were also found using snuff. About 17% of total respondents were found currently using chewing tobacco where over a quarter (25.26%) of male respondents and 7.47% of female respondents were doing so.

Majority of tobacco users stated that they were influenced by friends for using tobacco (48.4%) followed by parents (24.9%). More percentages of female were influenced by friends (53.8%) than their male counterpart (46.4%). Sex difference was found statistically significant. ( $p < 0.001$ ) (Table 1)

Out of total 37.8%, 15.8% and 2.9% of respondents were categorized as pre-hypertensive, stage I hypertensive and stage II hypertensive respectively based on SBP whereas there were 33.0%, 16.9% and 2.7% of respondents who fall under respective categories. A sex wise difference was not observed in SBP but it was statistically significant in DBP. ( $p = 0.007$ ) (Table 2)

Twenty percent of tobacco users and 18.0% of tobacco non-users were classified as hypertensive based on systolic blood pressure whereas 22.8% of tobacco users and 18.1% of tobacco non-users were classified as hypertensive based on diastolic blood pressure. There was statistically significant difference between tobacco users and non-users with the hypertension status in terms of diastolic blood pressure. ( $p = 0.007$ ) (Table 3)

There was no significant relation between tobacco using habit and systolic blood pressure but the relation observed between diastolic blood pressure and tobacco habit. ( $p < 0.05$ ) Logistic regression showed that tobacco use increases chances of hypertension. (Odds ratio: 1.332, 95% CI: 0.992-1.788,  $p < 0.001$ )

**Table 1: Distribution of tobacco behaviour by sex**

Tobacco behaviour	Male	%	Female	%	p
<b>Currently using tobacco</b>					
Yes	280	42.1	106	18.4	<0.001
No	385	57.9	469	81.6	
<b>Age</b>					
15-24	45	16.1	9	8.5	<0.001
25-34	19	6.8	8	7.5	
35-44	65	23.2	22	20.8	
45-54	64	22.9	44	41.5	
55-64	87	31.1	23	21.7	
<b>Types of smoking tobacco*</b>					
Cigarette	256	99.2	96	98.0	
Hukka (pipes)	9	3.5	5	5.1	
Bidi	87	33.7	46	46.9	
<b>Frequency of smoking tobacco use</b>					
Daily	227	81.1	95	89.6	<0.001
Occasionally	53	18.9	11	10.4	
<b>Types of smokeless tobacco*</b>					
Snuff	18	10.1	9	18.4	
Chewing tobacco	168	94.4	43	87.8	
Chewing battle	92	51.7	21	42.9	
<b>Frequency of smokeless tobacco use</b>					
Daily	145	81.9	34	69.4	<0.001
Occasionally	32	18.1	15	30.6	
<b>Influencer for tobacco use</b>					
Friends	130	46.4	57	53.8	**
Parents	70	25.0	26	24.5	
Siblings	12	4.3	12	11.3	
Co-workers	46	16.4	8	7.5	
Cinema or Multimedia	22	7.9	3	2.8	

\*Multiple response \*\* Chi square cannot be calculated because of small figure

**Table 2: Sex wise distribution of respondents in different BP categories**

Systolic blood pressure							p value
BP Categories	Sex				Total		
	Male		Female		n	%	
	n	%	n	%	n	%	
Normal BP	272	40.9	267	46.4	539	43.5	0.321
Pre-hypertension	265	39.8	204	35.5	469	37.8	
Stage 1 hypertension	119	17.9	77	13.4	196	15.8	
Stage 2 hypertension	9	1.4	27	4.7	36	2.9	
<b>Total</b>	665	100.0	575	100.0	1240	100.0	
Diastolic blood pressure							0.007
Normal BP	282	42.4	306	53.2	588	47.4	
Pre-hypertension	235	35.3	174	30.3	409	33.0	
Stage 1 hypertension	139	20.9	71	12.3	210	16.9	
Stage 2 hypertension	9	1.4	24	4.2	33	2.7	
<b>Total</b>	665	100.0	575	100.0	1240	100.0	

**Table 3: Association between current tobacco use status and BP**

Systolic blood pressure							p value
	Tobacco user		Tobacco non-user		Total		
	n	%	n	%	n	%	
Normotensive	308	79.8	700	82.0	1008	81.3	0.203
Hypertensive	78	20.2	154	18.0	232	18.7	
<b>Total</b>	386	100.0	854	100.0	1240	100.0	
Diastolic blood pressure							0.034
Normotensive	298	77.2	699	81.9	997	80.4	
Hypertensive	88	22.8	155	18.1	243	19.6	
<b>Total</b>	386	100.0	854	100.0	1240	100.0	

### DISCUSSION

In the present study, nearly one third of all respondents were currently using tobacco. Out of total respondents, more than two-fifth of male and one-fifth of female respondents were currently using tobacco. This finding is higher as compared to a national risk factors survey of Nepal where 35.5% of male and 15.9% of female respondents were

recorded as current smoker. [13] A similar study from western Nepal reported the prevalence of current smoking as 17%. [19] The low prevalence of current smokers in this study could be because of taking younger respondents only.

About 17% of total respondents were found currently using chewing tobacco out of which 25.26% of male and 7.47% of female respondents were involved in chewing tobacco. This finding is closely identical to some other studies. [13, 20] In terms of smokeless tobacco, male outnumbers females and the sex wise difference was found statistically highly significant. This pattern of male dominancy in smokeless tobacco use is equivalent to South-East Asian Region (SEAR). [21]

Among a total of 280 smoking tobacco users, majority (three-fourth) were daily smokers. The rate is quite high as compared to some other studies. [17, 22, 23, 24] This increased proportion of daily smoker in the current study may be due to inclusion of comparatively older respondents. Majority of respondents (53.6%) had started using tobacco at the age of 16-20 years followed by 35% at the age of 10-15 years. In terms of tobacco initiation, male respondents had initiated it at earlier age ( $16.97 \pm 2.9$ ) as compared to their female counterparts ( $17.38 \pm 3.5$ ). Similar finding was found in a study conducted in Nepal where mean age of initiation of smoking was recorded as  $16.8 \pm 2.8$  years. [19] But the figure is just reverse as compared to the finding of national NCDs risk factors survey of Nepal where mean age of initiation of tobacco is lesser among female (12.9 years) than males (18.8 years). [13] in the current study, rural tobacco users were found initiating tobacco earlier ( $14.37 \pm 2.2$ ) than urban users ( $17.84 \pm 2.9$ ). The mean numbers of consumption of tobacco product was found  $6.46 \pm 4.2$  in male and  $6.32 \pm 3.9$  in female. Mean number of use of tobacco product is found more among urban residence ( $6.79 \pm 4.3$ ) as compared to rural residence ( $5.08 \pm 3.2$ ). Differences between urban and rural area was found statistically highly significant in terms of both parameters of tobacco behaviours.

Majority of tobacco users stated that they were influenced by friends for using tobacco (48.4%) followed by parents (24.9%). More percentages of female were influenced by friends (53.8%) than their male counterpart (46.4%). Sex difference was found statistically significant. Logistic regression between tobacco use and DBP showed that tobacco users have 1.32 times more chances of becoming hypertensive than tobacco non-users.

### CONCLUSION

Present study showed high prevalence of smoking as well as non-smoking tobacco use in Central development region of Nepal. Nearly one third of all respondents were current tobacco user. Both forms of tobacco use found in practice but highly significant difference was observed between two sexes in relation to tobacco behaviour. There observed a close relationship between tobacco behaviour and diastolic blood pressure. Reducing tobacco use is one of the best resolutions along with harmful use of alcohol, salt reduction and promotion of quality of life for preventing NCDs. Integrating tobacco control with broader population services in the health system framework is crucial to achieve control of NCDs, a pre-requisite to achieve Millennium Development Goal (MDG), in Nepal.



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