

Prevalence and Factors Associated with Tobacco Use among High School Students

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ABSTRACT

Background: Tobacco use is the leading cause of morbidity and mortality worldwide. Tobacco use among school-level students is a growing public health problem in Nepal. A number of factors may be associated with tobacco use, but there is lack of literature showcasing an in-depth understanding of the growing prevalence of tobacco use in the Nepalese context. Therefore, our study aims to determine the prevalence of tobacco use and examine the factors associated with tobacco use among high school students at public schools in Budhanilkantha municipality, Kathmandu, Nepal.

Methods: A cross-sectional survey was conducted, and 378 students were selected for this study. The schools were selected randomly. Data collection was carried out using the self-administered questionnaires adapted from the World Health Organization used Global Youth Tobacco Survey and the Center for Disease Control and Prevention used Youth Tobacco Survey.

Results: Overall, 31.7% of the students ever consumed any tobacco products, and 20.1% were current tobacco users. One in five students started smoking when they were less than ten years of age. The proportion of students seeing at least one family member smoking and using smokeless tobacco was 52.1% and 47.1% respectively. Male and older students were significantly more likely to consume tobacco products than female and young students.

Conclusions: This study showed that a significant proportion of school students had experienced tobacco use. Age and sex of the students were significantly associated with the status of current smoking and the use of smokeless tobacco.

Keywords: Nepal; school; students; tobacco use

INTRODUCTION

Tobacco use is a significant public health problem. The prevalence of tobacco use is high in southeast Asian countries¹ and as per Global Youth Tobacco Survey (GYTS) 2011, about one-fifth of students in Nepal were current tobacco users.² Studies carried out in other Asian countries have shown an association between tobacco use with their socio-demographic characteristics.³ However, there is a knowledge gap in understanding factors associated with the current tobacco use among school students in urban Nepal. Regular monitoring of tobacco consumption is one of the critical components of the six evidence-based components of the MPOWER

package for tobacco control⁴ and a periodic systematic survey of tobacco use through GYTS is a vital task for measuring tobacco use to ensure the data availability for tobacco control.¹ This study aimed to determine the prevalence of tobacco consumption among school students and its associated factors.

METHODS

A cross-sectional study was conducted between February and March 2016 in Budhanilkantha municipality of Kathmandu, Nepal.

Students studying in grades eight and nine were

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identified from five randomly selected schools out of ten public schools in the study area. A total of 408 students participated in a survey and 378 students filled the questionnaire completely to be included in the analysis.

The questionnaire comprised of four sections, namely background information and tobacco use behaviour adapted from the GYTS of WHO⁵ and the youth tobacco survey of the Center for Disease Control and Prevention.⁶ Similarly, the questionnaire regarding knowledge about harmful effects of tobacco use was adapted from Ballal, K, et al⁷ and questionnaire regarding attitude towards tobacco use were adapted from different studies.⁷⁻⁹

Knowledge about the harmful effects of tobacco use on health was assessed by six questions with options as true, false, and don't know. Likewise, questionnaires developed for measuring perceptions and attitudes were based on Health Belief Model (HBM), and this section contained 18 items of questions. The various answer options for all 18 items were 1 (Strongly disagree), 2 (Disagree), 3 (unsure), 4 (Agree), and 5 (Strongly agree).

Among the constructs of the HBM model, perceived susceptibility and perceived severity were defined as the perceived risk and unwanted consequences of tobacco use, respectively. Perceived susceptibility was measured with two items about individual subjective perception of the risk of the adopting behavior. The internal consistency for this 2-item scale was 0.622. Perceived severity was also measured with two items about the perceived seriousness of an illness like lung cancer or serious disease. This two-item scale had an internal consistency of coefficient of 0.85. Higher the score, greater was the level of perceived susceptibility/severity. Three items were used to assess the perceived benefit of not using tobacco. Cronbach's alpha coefficient for this 3-items scale was 0.77. Perceived barriers to not using tobacco were assessed by 6 items. Cronbach's alpha coefficient for this 6-items was 0.64. Self-efficacy was measured using a five-item scale assessing the confidence of not using tobacco product or having ability to quit tobacco. The internal consistency estimate (Cronbach's α) for this 3-item scale was 0.81.

Data entry was done in EpiData version 3.1, exported to IBM SPSS version 25 and cleaned. For analysis purpose, the response of "strongly disagree" and "disagree" were merged as "disagree" in five-point Likert scales; and "strongly agree" and "agree" responses were merged as "agree". The "not sure" responses were included in the "disagree" category. A logistic regression analysis was performed to determine the association between independent and the outcome variables. The unadjusted

odds ratio was computed at 95% confidence interval (CI) to determine statistical significance.

Written informed consent was taken from the legal guardian of the students. Ethical approval was taken from the Institutional Review Board of the Institute of Medicine, Tribhuvan University, Nepal (Reference No. 215/072/73).

RESULTS

Among the study participants, 31.7% had ever used any tobacco products. The current use of any tobacco products was 20.1%. Similarly, 16.7% were current tobacco smokers and 6.1% were current smokeless tobacco users.

More than half of the current smokers (57.7%) started smoking between the ages of 12 to 15 years, while 20.0% started smoking when they were less than 10 years of age. Among current cigarette smokers, 31.7% smoked one cigarette per day, 9.5% smoked 2-5 cigarettes per day while 4.7% smoked more than five cigarettes a day (Table 1).

Table 1. Tobacco use characteristics among study participants.

Variables	Male (N=183) n(%)	Females (N=195) n(%)	Total (N=378) n(%)
Ever any tobacco user	88(48.1)	32(16.4)	120(31.7)
Current any tobacco user	64(34.9)	14(7.2)	78(20.6)
Ever tobacco smoker	70(38.25)	20(10.25)	90(23.8)
Current tobacco smoker	52(28.4)	11(5.6)	63(16.7)
Ever smokeless tobacco user	42(23.0)	15(7.7)	57(15.0)
Current smokeless tobacco user	19(10.4)	4(2.0)	23(6.1)
Age of initiation of smoking (n=90; M: 70, F: 20)			
Below 10 years	15(21.4)	3(15.0)	18(20.0)
10-11 years	6(8.5)	5(25.0)	11(12.2)
12- 13 years	20(28.6)	6(30.0)	26(28.9)
14-15 years	21(30.0)	5(25.0)	26(28.9)
16 years or older	8(11.4)	1(5.0)	9(10.0)
Number of cigarettes smoked (n=63; M: 52, F: 11)			
Less than one per day	27(51.9)	7(63.6)	34(53.9)
One per day	17(32.6)	3(27.2)	20(31.7.)
2-5 per day	5(9.6)	1(9.0)	6(9.5)
More than five per day	3(5.7)	-	3(4.7)

Almost all the students correctly reported that 'passive smoke is harmful to others' (99.2%), 'tobacco use/cigarette smoking is harmful to health' (98.4%) and 'cigarette smoking causes lung cancer' (98.1%). However, correct responses reported for 'tobacco contains addictive substance nicotine' was 69% and 'tobacco is addictive' was 77.5% (Table 2).

More than half of the students (53.9%) disagreed that it was difficult to quit smoking. Similarly, three in five students disagreed that those who smoke had more friends. Likewise, just half of the students disagreed that those who smoke were more attractive than non-smokers.

80.9% of students agreed that smokers can get serious disease like lung cancer and possibly dies from the diseases. Gender wise, males were less likely to agree than females to have the disease due to smoking.

Approximately 80% of the students agreed that non-smokers were liked by everyone in the society (Table 3).

In the bivariate analysis, age and sex of the study participants were associated with the current smoking and smokeless tobacco use status. Students of age group 16-18 were >2-fold likely to smoke tobacco and >3-fold likely to use smokeless tobacco as compared 12-15 years. Similarly, male students were > 6-fold likely to smoke tobacco and >7-fold likely to use smokeless tobacco as compared to female students (Table 4).

HBM constructs namely perceived severity, perceived benefit and self-efficacy are significantly associated with the current tobacco use. However, the perceived susceptibility and perceived barrier were not found significantly associated with the current smoking and current tobacco use (Table-5).

Table 2. Knowledge about harmful effect of tobacco use.

Statements	Male n=183 (%)	Female n=195 (%)	Total N=378 (%)
Tobacco use/cigarette smoking is harmful to health	180 (98.4)	192 (98.5)	372 (98.4%)
Second hand/passive smoke (smoke exhaled from cigarette smoker) is harmful to others	182 (99.5)	193 (98.9)	375 (99.2%)
Tobacco is addictive	145 (79.2)	148 (75.9)	293 (77.5%)
Tobacco contains addictive substance nicotine	139 (75.9)	122 (62.6)	261 (69.0%)
Cigarette smoking causes lung cancer	178 (97.2)	193 (98.9)	371 (98.1%)
Chewing tobacco cause cancer of the mouth	169 (92.3)	168 (86.1)	337 (89.1%)

Table 3. Agreed category of attitude towards tobacco use by sex.

Agreed category of attitudes toward tobacco use	Category	Male n(%)	Female n(%)	Total N(%)
I think most of the friends in my age smoke	Agree	127 (69.4)	138 (70.8)	265 (70.1)
I think most of the friends in my age use smokeless tobacco products	Agree	111 (60.7)	129 (66.1)	240 (63.5)
If I smoke it is likely that I will get serious disease and possibly die from that disease	Agree	136 (74.3)	170 (87.2)	306 (80.9)
If I use smokeless tobacco it is likely that I will get a serious disease like oral cavity cancer or heart disease and possibly die from it	Agree	129 (70.5)	167 (85.6)	296 (78.3)
Those who don't smoke have money saved	Agree	126 (68.9)	172 (88.2)	298 (78.8)
Everyone in the society like me if I don't smoke	Agree	132 (72.1)	168 (86.2)	300 (79.4)
I agree that not smoking makes my health better	Agree	121 (66.1)	147 (75.4)	268 (70.9)
Those who smoke have more friends	Agree	117 (63.9)	113 (57.9)	230 (60.8)
Those who smoke are more attractive	Agree	87 (47.5)	98 (50.3)	185 (49.9)
Smoking helps social interaction	Agree	68 (37.2)	67 (34.3)	135 (35.7)
I belief that peer pressure influence me to use tobacco in my life	Agree	72 (39.3)	70 (35.9)	142 (37.6)
If my friend pressured me to smoke with them I will probably go along	Agree	50 (27.3)	34 (17.4)	84 (22.2)
Once someone has started smoking it would be difficult to quit	Agree	90 (49.2)	84 (43.1)	174 (46.0)
I belief I can say no to smoking if my friends pressure me to smoke	Agree	132 (72.1)	158 (81.0)	290 (76.7)

I believe I can say no to use smokeless tobacco, even if my friends pressure	Agree	128(70.0)	163(83.6)	291(77.0)
I don't have to smoke if all of my friend do	Agree	130(71.0)	167(85.6)	297(78.6)
If I smoke I can control myself from becoming addicted	Agree	104(56.8)	125(64.1)	229(60.6)
If I use smokeless tobacco, I believe I can control myself from being addicted	Agree	108(59.0)	120(61.5)	228(60.3)

Table 4. Relationship of socio-demographic factors with current smoking behaviour.

Variables	Current smoking N (%)	OR (95%CI)	Current smokeless tobacco use N (%)	OR (95% CI)
Age (years)				
12-15	35 (13.2)	Ref	12 (4.5)	Ref
16-18	28 (25.0)	2.20 (1.26-3.84)*	11 (9.82)	2.3. (0.98-5.39)*
Sex				
Male	52 (28.4)	6.64 (3.34-13.21)*	19 (10.3)	5.53 (1.84-16.59)*
Female	11 (5.6)	Ref	4 (2.07)	Ref

Table 5. Relation of HBM constructs and Tobacco use.

Health Belief Constructs (Statements as per Table 5)	Current tobacco users		Current tobacco non-users		Significance P at 95% CI
	N	Mean Rank	N	Mean Rank	
Perceived Susceptibility (S1, S2)	78	177.67	300	192.58	0.278
Perceived Severity (S3, S4)	78	164.53	300	196.69	0.014
Perceived Benefit (S5-S7)	78	161.84	300	196.69	0.009
Perceived Barrier (S8-S13)	78	192.65	300	188.68	0.775
Self- Efficacy (S14-S18)	78	159.81	300	197.82	0.006

DISCUSSION

Our study showed almost one in three high school students used tobacco ever in their lifetime. In the 2016, Nepal Demographic Health Survey (NDHS) showed a decline in tobacco smoking in between 2006-2016 among general population.¹⁰ However, overall tobacco use was in increasing trend among male adolescents and a decreasing trend in female adolescents between 2006 and 2016.¹¹ Despite the tobacco control act in 2011 which bans the use of tobacco products in public places and restricts purchase of tobacco products for below 18 years, a higher prevalence of tobacco use in the adolescent population clearly shows inadequate efforts to put policy into practice.¹²

Previous studies from Nepal have shown tobacco use prevalence among adolescent students between 14%-25%.^{11,13} A study carried out in Eastern Nepal showed only one-fifth of the adolescent using any form of tobacco in their lifetime which is less than our finding.¹¹ Among South Asian countries, the proportion of ever any tobacco product user is higher in Bhutan (48.1%) and lower in Sri Lanka (11.1%).

The prevalence of current tobacco use was significantly higher in boys than that of girls in our study. This finding is similar to the GYTS 2011 finding of Nepal.² However, the previous study has shown a much lower percentage of current tobacco smokers among school level students in Nepal.¹⁴ The patriarchal society in Nepal, on the other way, sees girl smoking as a cultural taboo which might have resulted in a lower prevalence of tobacco use among female students. Although more than half of the adult Indians are current tobacco users, only 14.6% of Indian students were current tobacco users which is less than our finding.^{15,16} Our study showed a lesser proportion of smokeless tobacco users as compared to the GYTS study (16%) done in Nepal in 2011.²

One in five students-initiated smoking when they were less than ten years of age. This is similar to findings from Bhutan, Bangladesh, and Pakistan.¹⁷⁻¹⁹ Interestingly, in India, almost half of the boys students and one-third of girls students started smoking before 10 years of age¹⁵ and Australia had a higher proportion (25%) while Jordan had a fewer proportion (2.7%).^{20,21} Our study also depicted that almost three out of five students started smoking when they were between 12-15 years of age and the finding is consistent with the results of most of the

countries such as Bangladesh (65.9%), Nairobi (72.2%), Jordan (57.3%).^{18,21,22}

In our study, 9.5% and 4.7% of the students smoked more than one and five cigarettes respectively per day (Table 1). If one takes 1-4 cigarettes per day, there is a distinct increase in the risk of death from ischemic heart disease among all causes.²³ In Bangladesh, 7.7% of students smoked more than five cigarettes per day¹⁸ which is similar to our finding. However, in contrast to these findings, a study done in Iran found that 22% of adolescents smoked more than five cigarettes per day.²⁴

In our study, more than half of the students saw family members smoking inside their home and nearly half of them saw family members using smokeless tobacco. In India, one in five students saw their family members smoking inside the home, far less than our study.¹⁵ Studies elsewhere have also shown that culture and belief, low level of education, modernization, peer pressure, family environment and frustration are the precursors of smoking among young people.^{20,25} This indicates that both home and school-based interventions are required to discourage children from smoking.

In our study, the knowledge about the harms of tobacco among students was quite excellent. However, the current tobacco use is not associated with the knowledge level. On the other hand, perceived severity, perceived benefits and self- efficacy of the HMB construct showed statistically significant relationship with the current tobacco use behaviour while the perceived susceptibility and perceived barriers are not significantly associated with the current tobacco use.

Our study provides useful information about the patterns of tobacco use among school students which might be an important resource for designing interventions against tobacco use in Nepal and other similar settings. Despite the strengths, our study has some limitations. The data collected in this research are self-reported and may have encountered information bias. Similarly, the research was conducted in a semi-urban area of Kathmandu and only in public schools, which might affect in generalizability.

CONCLUSIONS

In this study, nearly one in three students had experienced tobacco use ever in their lifetime and one in five was currently using tobacco products. The initiation of tobacco use behaviour started quite early in their life as one in five initiated even before the age of 10 years. Age and sex of the students were significantly

associated with the status of current smoking and use of smokeless tobacco. These findings suggest the need for urgent necessary interventions at home and school settings, and even at a broader level to address the higher prevalence of tobacco use among the young population of Nepal.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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