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RESEARCH ARTICLE

Tobacco Consumption and its Associated Factors among Nepalese Students

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Abstract:

Background:

Tobacco smoking is one of the major issues among the adolescent population worldwide. WHO has estimated that tobacco use causes six million deaths worldwide each year and predicts reaching eight million by 2030. Our study aims to assess the proportion of tobacco use and its associated factors among Nepalese students.

Methods:

A cross-sectional analytical study was conducted among 430 students in Syangja, Nepal. Samples were selected through the cluster sampling technique. Data were collected by a self-administered questionnaire. Chi-square (χ^2) test was used to find out the associated factors of tobacco consumption.

Results:

The prevalence of tobacco usage was found to be 22.8% (males 37.2%, females 8%). Students were regularly exposed to tobacco smoking in public places (70.3%) and at home (62.2%). Peer pressure (62.3%) was the most influencing factor for tobacco consumption, followed by experimentation (18.2%) and tobacco advertisements (7.8%). Cigarette (75.5%) and Hookah (74.5%) were the most common type of tobacco consumed by the participants. Tobacco consumption was higher among private school students (24.5%) than government school students (19.6%).

Conclusion:

Gender, family type, occupation, and pocket money were associated with tobacco usage ($p < 0.05$). Although the majority of students were aware of the negative health impacts of tobacco use, the usage of tobacco products is still prevalent among Nepalese adolescent students. School-based health education and intervention programs should be implemented to reduce the habit of tobacco consumption.

Keywords: Tobacco use, Smoking, Adolescents, Students, Smokers, Pocket money.

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1. INTRODUCTION

Tobacco use is characterized as utilizing any tobacco item, either smoked or smokeless [1]. Tobacco smoking is named as the burning of the tobacco leaves and breathing in of the smoke. Chewing tobacco, wet snuff, and dry snuff are examples of smokeless tobacco consumed through the mouth or nose without combustion or burning [2]. Tobacco smoking is a preventable health concern that also causes financial problems across the world [3, 4]. China daily smokers start smoking before the age of 20, where peer influence is one of

the major factors to consume tobacco [5, 6]. Because of the powerless authorization of tobacco control measures, the easy accessibility and affordability of these items are the main leading to the rise of the epidemic of tobacco use in the youth [7]. WHO estimated that in 2013, the worldwide prevalence of current tobacco smoking was 21.2%. WHO has estimated that tobacco use (smoking and smokeless) causes six million deaths worldwide each year and predicts to reach 8 million by 2030 [8, 9]. About 1.1 billion individuals smoke worldwide, 80% of whom lived in low and middle-income countries [10, 11]. In India, the overall prevalence of tobacco consumption was 48.9% [12]. There is a connection between smoking and many diseases such as coronary artery disease, lung cancer, bladder cancer, pulmonary emphysema, peripheral vascular disease,

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and neonatal mortality [13]. Furthermore, the U.S Surgeon General report proposes that smoking influences the menstrual function of women by increasing the danger of dysmenorrhea, amenorrhea, and irregular menstruation. The Family Smoking Prevention and Tobacco Control Act of 2009 (also known as the Tobacco Control Act) approved the FDA to manage the manufacture, distribution, and marketing of tobacco products [14]. In Nepal, adolescents comprise one-fifth (22%) of the total population [15 - 24]. In Nepal, behavior, attitude, and imitation from parents and peers are the most influencing factors for tobacco consumption [1]. Peer influence is one of the major factors where adolescents are more likely to smoke if they have friends who smoke [5]. Both smoking and smokeless tobacco are quite high among youth in the Southeast Asian Region. In South Asian Countries, tobacco use is prevalent among male students from Bangladesh (9.1%), Bhutan (28.6%), India (16.8%), Maldives (8.5%), Nepal (13.0%), Pakistan (12.4%), and Sri Lanka (12.4%) [25]. Geographical variation comprises various parts of the country. Based on the studies, female smoking prevalence was 71.6% in the Mountain region and 12.9% in Eastern Terai of Nepal [10, 26].

1.1. Rationale of the Study

Tobacco consumption is a rapidly growing problem of public health concern, leading to the causes of preventable morbidity and mortality. Tobacco consumption is increasing at a high rate among youth and is one of the serious problems affecting the lungs. College students are in the transition phase. They start to consume tobacco from this stage due to peer pressure, lack of knowledge, *etc.* They are exposed to social media, so they are more prone to tobacco consumption. Most of the people are from low and middle-income countries due to the lack of knowledge about the health risks of tobacco consumption. Nepal is one of the developing countries of the world which is facing the burden of diseases regarding respiration due to tobacco consumption. In Nepal, the proportion of deaths due to non-communicable diseases are at a highly increased rate. People are still consuming tobacco products besides knowing about health hazards due to tobacco consumption. There is still a lack of proper implementation of laws focusing on the usage of tobacco products. Limited studies have been carried out to determine the factors associated with tobacco users among college students in Nepal. Therefore, we aim to conduct this study to find out the current scenario of tobacco consumption among students of higher secondary school. Our findings will be helpful to concerned authorities to plan and implement necessary programs and policies for addressing tobacco product usage among the young population.

2. METHODOLOGY

2.1. Study Design and Population

A cross-sectional analytical study was conducted to assess the proportion of tobacco use (both smoked and smokeless tobacco products) and its associated factors among 430 higher secondary level students in Syangja, Nepal. Students from grades 11 and 12, both male and female students, were included in the study. Students who refused their participation

were excluded.

2.2. Sampling Technique and Sample Size

A total of 13 higher secondary schools were included in the study. Out of the 13 schools, six schools were selected by simple random sampling method. Faculty were chosen randomly with lottery methods. Finally, a cluster sampling technique was used to collect the study samples. The sample size was calculated using the formula,

Z = standard normal variable at 95% CI (1.96), N = Total number of higher secondary level students (1388), p = estimated proportion ($p = 0.209$) based on the previous similar study [27], $q = 1-p$, d = desirable error (0.05). With the application of 10% non-response rate, the sample size (n) for this study was 215. The final sample size for this study with the design effect for cluster sampling ($215 * 2$) was 430.

2.3. Data Collection and Management

A self-administered questionnaire was used for the purpose of data collection. Face to face interview was conducted from August to October 2019. Pretesting was done on 10% of the total sample size in a similar setting. Tools were developed and translated into simple and clear English language and back-translated into the Nepali language. To minimize the limit error, 10% of the entered data were randomly selected using decision analyst software and manually checked. If the error exceeds 1%, the collected data were re-entered. Descriptive data analysis was carried out in terms of frequency and percentage. Chi-square (χ^2) test was used to find out the associated factors of tobacco consumption. Data entry, management, and analysis were done with EpiData 3.1 and SPSS Ver [20].

2.4. Study Variables

Age, sex, ethnicity, school type, occupation, and income were considered socio-demographic variables for the study. The reasons for tobacco consumption and health hazards due to tobacco consumption were assessed as knowledge of related factors. Peer pressure, advertisements, and perceptions towards tobacco consumption were assessed as exposure to behavioral factors. Tobacco consumption among higher secondary students was assessed as the dependent variable of this study.

Ethical approval was approved by the Institutional Review Board (IRB) of Pokhara University. (IRB Ref. No. 39/076/077). Informed consent was taken from each participant's parent before the interview. Confidentiality was maintained throughout the study. Permission was also taken from the concerned authorities of Syangja, Nepal, to conduct this study.

2.5. Operational Definitions

Cigarettes: A thin cylinder of shredded tobacco that is wrapped in paper, lit and smoked.

Bidi: Cigarettes consisting of sun-dried tobacco flakes rolled in a tendu leaf and tied with a string at one end.

Khaini: A form of chewing tobacco-containing slake lime.

Paan masala: A mixture of chopped areca nut, lime, and other ingredients, including tobacco for chewing, wrapped in a betel leaf.

Gutkha: A form of chewing tobacco preparation made of crushed areca nuts.

Hookah: Hookahs are water pipes used to smoke specially made with different flavors like apple, mint, cherry, watermelon.

Surti: A sun-dried form of tobacco flakes.

3. RESULTS

Table 1 demonstrates the socio-demographic characteristics of the respondents. The majority of students (94.4%) were of age between 15 and 18 years. The majority of the participants were followers of the Hindu religion. Among the participants, 64.4% of the students were from government schools, whereas 35.6% were from non-government schools. The study found that the major occupation of the participants' fathers was a job abroad, whereas most mothers were involved in agriculture. The nuclear family type was found to be common among the participants, followed by a joint type of family.

The study found that the majority (80.2%) consumed tobacco in the form of surti followed by smoking cigarettes (47.2%), gutkha (41.6%), bidi (26%), paan masala (25.8%), khaini (73.5%), and hookah (23.3%). Almost all of the students claimed to have knowledge about the harmful effects of tobacco. The majority of the participants told mouth cancer as a type of health problem due to the consumption of tobacco followed by lung cancer, gum, and teeth problem. Table 2 shows that the majority of the participants (77.2%) did not consume tobacco, whereas 22.8% consumed different tobacco products. The majority of participants who consumed tobacco did so due to the peer pressure followed by family members, for experimental purposes, advertisements, and stress. Nearly three-quarters of students who consumed tobacco did so using cigarettes and hookah.

More than half (51%) of the respondents tried consuming tobacco products at the age of 13-15 years. About 32.7% of students regularly consumed tobacco. The majority of the participants (66.5%) were occasionally exposed to Second Hand Smoking (SHS) at public places, whereas 43.7% were exposed at home, as shown in Table 2. Television was the most influencing advertisement medium for tobacco consumption among the respondents, followed by cinema hall and radio.

Table 1. Socio-demographic characteristics of the respondents.

Variables	Frequency	Percentage (%)
Age		
15-18	406	94.4
19-22	24	5.6
Mean=16.83, Median=17, S.D.=1.114, Mini=15, Max=22		
Gender		
Male	218	50.7
Female	212	49.3
Religion		
Hindu	392	91.2
Muslim	9	2.1
Christian	5	1.2
Buddhism	24	5.6
Type of School		
Non-Government	153	35.6
Government	277	64.4
Pocket Money (NRs)		
<1500 (<12.75\$)	308	71.6
>1500 (>12.75\$)	122	28.4
Ethnicity		
Brahmin/Kshetri	165	38.4
Janajati	196	45.6
Dalit	60	14
Muslim	9	2.1
Family Type		
Nuclear	230	53.5
Joint	174	40.5
Extended	26	6
Fathers' Occupation		
Agriculture	88	20.5

(Table 1) contd....

Variables	Frequency	Percentage (%)
Civil Service	77	17.9
Business	69	16
Private Services	59	13.7
Abroad	135	31.4
Labor	2	0.5
Mothers' Occupation		
Agriculture	148	34.4
Civil Service	12	2.8
Business	70	16.3
Private Services	23	5.3
Abroad	1	0.2
Unemployed	176	40.9

Table 2. Tobacco consumption among the study population.

Variables	Frequency	Percentage
Tobacco Consumption		
Yes	98	22.8
No	332	77.2
Influencing Factors for Tobacco Consumption (N=98)		
Peer-Pressure	48	62.3
Family-members	2	2.6
Experimentation	14	18.2
Advertisements	9	11.7
Stress	4	5.2
Types of Tobacco Consumed*		
Cigarette	74	75.5
Surti	10	10.2
Khaini	16	16.3
Paan masala	25	25.5
Bidi	13	13.3
Hookah	73	74.5
Age of the Initiation (N=98)		
<10	6	6.1
10-12	10	10.2
13-15	50	51.0
>15	32	32.7
Frequency of Tobacco Consumption (N=98)		
Regular	32	32.7
Occasional	14	14.3
Consumed in the past	23	23.5
Experimental purpose	29	29.6
Influence of Tobacco Advertisements (N=98)		
Yes	59	60.2
No	39	39.8
Most Influencing Tobacco Advertisements*		
Television	42	70
Mobile phone	11	18.3
Radio	17	28.3
Newspaper	15	25
Poster	12	20
Cinema Hall	23	38.3
Expose to SHS at Public Places		

(Table 2) contd.....

Variables	Frequency	Percentage
Regularly	37	8.6
Occasionally	286	66.5
Never	107	24.9
Expose to SHS at Home		
Regularly	37	8.6
Occasionally	118	43.7
Never	205	47.7
Knowledge about the Harmful Effects of Tobacco		
Yes	417	97
No	13	3
Knowledge About Health Problems Due to Tobacco Consumption*		
Cough	173	41.5
Asthma	172	41.2
Problem in Gum	93	22.3
Problem in teeth	190	45.6
Lung Cancer	283	67.9
Wound in mouth	219	52.5
Mouth Cancer	306	73.4

*Multiple Responses

Study results showed that 43.9% of the respondents consumed tobacco in hotels/restaurants, followed by college (20.4%), canteen (18.4%), public places (8.2%), home (5.1%), toilet (3.1%), and cinema hall (1.0%). It was found that gender (p-value 0.000, $\chi^2 = 51.85$), family type (p-value 0.000, $\chi^2 = 20.45$), mothers' occupation (p-value 0.002, $\chi^2 = 16.59$) and pocket money (p-value 0.001, $\chi^2 = 11.32$) were significantly

associated with tobacco consumption while other variables were not statistically significant. Our study investigated the association between exposure to behavioral actions and tobacco consumption. It was found that exposure to Second Hand Smoking (SHS) at home (p-value 0.000, $\chi^2 = 52.55$) and public places p-value 0.000, $\chi^2 = 36.51$) were significantly associated with tobacco consumption (Table 3).

Table 3. Association of tobacco consumption with socio-demographic factors and exposure to behavioral actions.

Variable	Tobacco Consumption				Total	χ^2	df	P-Value
	Yes		No					
	N (98)	% (22.8)	N (332)	% (77.2)				
Age								
15-18	91	22.4	315	77.6	402	0.58	1	0.443
18-22	7	29.2	17	70.8	28			
Gender								
Male	81	37.2	137	62.8	218	51.85	1	0.000*
Female	17	8	195	92	212			
Family Type								
Nuclear	36	15.7	194	84.3	230	20.45	2	0.000*
Joint	13	50.0	13	50.0	26			
Extended	49	28.2	125	71.8	174			
Ethnicity								
Brahmin/Chhetri	30	18.2	135	81.8	165	3.93	3	0.269
Janajati	48	24.5	148	75.5	196			
Dalit	17	28.3	43	71.7	60			
Muslim	3	33.3	6	66.7	9			
Mothers' Occupation								
Agriculture	21	14.2	127	85.8	148	16.59	4	0.002*
Service	7	20.0	28	80.0	35			
Business	14	20.0	56	80.0	70			
Abroad	1	100.0	0	0.0	1			
Unemployed	55	31.2	121	68.8	176			

(Table 3) contd....

Variable	Tobacco Consumption				Total	χ^2	df	P-Value
	Yes		No					
	N (98)	% (22.8)	N (332)	% (77.2)				
Fathers' Occupation								
Agriculture & labor	14	15.6	76	84.4	90	6.62	3	0.085
Service	27	19.9	109	80.1	136			
Business	18	26.1	51	73.9	69			
Abroad	39	28.9	96	71.1	135			
Pocket Money (NRs)								
<1500 (<12.75\$)	57	18.5	251	81.5	308	11.32	1	0.001*
>1500 (>12.75\$)	41	33.6	81	66.4	122			
Type of School								
Government	30	19.6	123	80.4	153	1.36	1	0.242
Non-Government	68	24.5	209	75.5	277			
Fathers' Education								
Illiterate	2	66.7	1	33.3	3	1.27	1	0.26
Literate	96	22.5	331	77.5	427			
Mothers' Education								
Illiterate	6	22.2	21	77.8	27	0.005	1	0.942
Literate	92	22.8	311	77.2	403			
Exposed to SHS at Home								
Regularly	26	70.3	11	29.7	37	52.55	2	0.000*
Occasionally	31	16.5	157	83.5	188			
Never	41	20.0	164	80.0	205			
Exposed to SHS at Public Places								
Regularly	23	62.2	14	37.8	37	36.51	2	0.000*
Occasionally	58	20.3	228	79.7	286			
Never	17	15.9	90	84.1	107			

*Statistically significant at 5% level of CI.

The perceptions about tobacco consumption were measured on a five-point scale on given statements. Students were asked to mark any one option among "strongly agree," "agree," "can't say," "strongly disagree," and "disagree." Finally, the responses "strongly agree" and "agree" are merged into agree, and responses "strongly disagree" and "disagree" were merged into disagree.

The proportion of respondents who agreed with the statement that 'tobacco users have more friends' was found to be higher than those who disagreed, but there was not any significant association with the gender of the participants. The proportion of students who studied in government schools

agreed with the statement that 'tobacco users have more friends' was found to be higher (86.3%) than those who studied in non-government schools. The study showed that most of the participants agreed with the statement that 'smoking should be banned in public places' and found it to be significantly associated with the gender of the participants (p-value 0.001, $\chi^2 = 16.841$). The proportion of students who studied in government school agreed with the statement that 'smoking should be banned in public places' was found to be higher (94.8%) than those who studied in non-government schools. Similarly, the proportion of the male participants who agreed on both perception statements about tobacco consumption was higher as compared to female participants, as shown in Table 4.

Table 4. Factors associated with perception towards tobacco consumption.

Variable	Smoking should be banned in public places						Total	χ^2	df	p-value
	Agree		Can't say		Disagree					
Gender										
Male	195	89.4%	1	0.5%	22	10.0%	218	16.841	2	0.001*
Female	171	80.7%	10	4.7%	31	14.0%	212			
Type of school										
Government	145	94.8	0	0.0	8	5.2	153	0.650	2	0.701
Non-government	259	93.5	1	0.4	17	6.1	277			
Variable	Tobacco users have more friends						Total	χ^2	df	p-value

(Table 4) contd.....

Variable	Smoking should be banned in public places						Total	χ^2	df	p-value
	Agree	Can't say			Disagree					
	Agree	Can't say			Disagree					
Gender										
Male	183	83.9%	6	2.8%	29	13.3%	218	1.390	2	0.499
Female	171	80.7%	10	4.7%	31	14.6%	212			
Type of school										
Government	132	86.3%	2	1.3%	19	12.4%	153	4.570	2	0.102
Non-Government	222	80.1%	14	5.1%	41	14.8%	277			

*Statistically significant at 5% level of CI.

4. DISCUSSION

4.1. Socio-demographic Information

Most of the respondents (45.6%) were Janajati, followed by Brahmin/Chhetri, Dalit, and Muslim, which is similar to the findings of the study from Pokhara, Nepal [28]. Another study found that Janajati was six times higher than Brahmin/Chhetri, which was similar in this research [29]. In this study, a majority (97.0%) of the participants were aware of the harmful effects of tobacco. In a similar study conducted in Pokhara, a majority (93.6%) of participants were known about the harmful effects of tobacco [28]. The majority of the participants know about the harmful effects of tobacco because they might have studied tobacco consumption in the school curriculum. In this study, a majority of the participants were included from the nuclear family (53.5%), but the prevalence of tobacco consumption was significantly associated with the joint family (50%) defined by the p-value <0.001. In a similar study conducted in Dharan, the majority of the tobacco consumer was from a joint family (22.9%) [7]. In a joint family, there might be old-age people consuming tobacco, and children also follow them. In this study, most of the respondents (64.4%) were from government schools rather than non-government schools. However, tobacco consumption among respondents was higher in non-government schools (24.5%) than in government schools (19.6%). A similar study was conducted involving 89.6% of students from non-government schools [7]. One study conducted in Doula, Cameroon, showed that the prevalence of tobacco use among students was 10.6% and 11.3% from public and private schools, respectively [30].

This study showed a significant association between gender and tobacco consumption, which is similar to one of the study findings conducted in Nepal [7]. Male consumed more tobacco than females because males were more open to talking about tobacco consumption than females. This study showed the association of tobacco consumption with various factors. To reduce stress, they consumed tobacco either by smoking or chewing tobacco. In this study, students who have more pocket money were more likely to consume tobacco than students with less pocket money. Pocket money was significantly associated with tobacco consumption. Similarly, in the study from Kerala, there was a significant association between pocket money and tobacco consumption. Those who have more pocket money were four times more likely to consume tobacco than those with less pocket money [7, 29].

4.2. Prevalence of Tobacco Consumption

In this study, the prevalence of using tobacco among secondary-level students was found to be 22.8%. Similarly, in Nigeria, the prevalence of tobacco consumption was 22.0%, followed by Kerala (15.7%) [31]. Another study conducted in Dharan, Nepal, showed that the prevalence of tobacco consumption aged 16-26 was 24.8% which was nearly similar to this study [7]. The prevalence of tobacco consumption in this study was found to be higher than the other studies except for the study from Dharan, Nepal. One study conducted in the mountain area of Nepal showed that the overall prevalence of smoking was 73.7%, as the study was conducted in the mountain region, so cold might be influencing them to smoke [10].

4.3. Factors Associated with Tobacco Consumption

In this study, the age of the initiation to try cigarette smoking was 10 years old. Only 6.1% of participants consumed tobacco before the age of 10, but from the Global Youth Tobacco Surveillance (GYTS), 23.1% of adolescents consumed tobacco before the age of 10 years in Nepal. This might be because GYTS included all the young people, but in our study, only secondary level students were included; therefore, there was high consumption of tobacco before the age of 10 years. The mean age of tobacco initiation was 14.70, which was nearly similar to the study of Kathmandu (14.15), Noida (12.4), and Kerala (13.2). In this study, most of the participants consumed cigarettes (75.5%) and hookah (74.5%). In the study conducted in Birgunj, Nepal, cigarettes (70%) were the most common among the participants, which was similar to this study [1]. In this study, students consumed tobacco due to peer pressure (62.3%), which was found to be consistent with study findings from Bangladesh. In the study conducted in Dhaka, Bangladesh, and Birgunj, Nepal, students were found to be consuming tobacco due to the influence of friends (62.26%) and (48.8%), respectively [1, 32]. In this study, more than half of the tobacco consumers were influenced by tobacco advertisements. National Youth Tobacco Survey (NYTS) reported that 90% of participants were exposed to pro-tobacco advertisements [33]. In NYTS, a higher rate of participants was found to be influenced by pro-advertisements compared to this study; the reason behind this is that it included all the youth. In our study, television and radio were the main sources of information about tobacco consumption.

Students regularly exposed to SHS at home were more likely to consume tobacco than those who were non-exposer.

Parents smoking in front of them might also influence them to adopt the habit of smoking. In this study, the prevalence of tobacco consumption is strongly significant among the participants exposed to SHS at home. The p-value was found to be < 0.0001 , which was similar to the study of Pokhara and Kalaiya, Nepal. Students regularly exposed to SHS at public places were more likely to consume tobacco than those who were non-exposed. Exposure to SHS in a club and restaurants might influence them to adapt to the habit of smoking. Prevalence of tobacco consumption is strongly significant with the participants exposed to SHS at public places (p-value 0.000), which was also similar to the study from Pokhara and Kalaiya, Nepal [28, 29].

CONCLUSION

The prevalence of consumption of tobacco was higher in males as compared to female students. Type of family, gender, mother education status, occupation, pocket money, and education level were the major predictors of the prevalence of tobacco consumption among the students. Peer pressure and tobacco advertisements were major influencing factors associated with tobacco consumption. School-based education and intervention programs should focus on the vulnerable person to prevent tobacco use. Policy for the prohibition of smoking in public places, a ban on advertisements related to tobacco products, and smoke-free environments are highly recommended. It is also very necessary to provide knowledge among school students about the hazards of tobacco.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was approved by the Institutional Review Board (IRB) of Pokhara University, Nepal (IRB Ref. No. 39/076/077). Permission was also taken from the concerned authorities of Syangja, Nepal, to conduct this study.

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

CONSENT FOR PUBLICATION

The informed consent was taken, and confidentiality was maintained.

AVAILABILITY OF DATA AND MATERIALS

The study data and materials are not publicly available due to the confidentiality and privacy of the participants.

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None.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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