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Prevalence of Cigarette Smoking and Its Associated Factors Among Adolescent Higher Secondary Students of Tokha Municipality, Kathmandu, Nepal

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Abstract: Cigarette smoking among youth and young adolescents remains high, particularly in high schools and colleges. Smoking and smokeless tobacco usage at such a young age can be detrimental, resulting in lower academic performance and an increased chance of developing dreadful diseases and other fatal conditions. However, the prevalence of cigarette smoking and its associated characteristics among high school students in the country have not been studied precisely. This study aimed to assess the prevalence of smoking and the factors that influenced the behavior of students in the Tokha municipality of Kathmandu district, which is the most populous district in Nepal. A descriptive cross-sectional survey was conducted using a standard, pre-tested questionnaire among the target population. The data was then entered and analyzed through SPSS. Descriptive statistics were used for data summarization. The significance level was set at $p < 0.05$. Bivariate and then multivariate logistic regression analysis was used to assess the magnitude of associations between dependent and independent variables. The prevalence was found to be among two-fifths of the respondents (20.6%). About 53% of them were 16 years of age or younger; 48.4% of them smoked because of peer pressure; and apparently 63.6% of students smoked with their friends only. Factors like gender, monthly expenditures, friend smoking status, increased price of cigarettes, and exposure to the anti-smoking campaign were statistically associated with the prevalence of cigarette smoking. The study revealed concerning prevalence rate of smoking. necessary plans, programs, and local policies should be made to address this issue.

Keywords: Prevalence, Smoking, Factors, High-School, Adolescent, Students, Association

1. Introduction

In recent times, cigarette smoking has become the cause of most preventable cause of mortality and morbidity in the world. Despite the established health risks connected with smoking, adolescents continue to smoke at alarming rates. “Every year, approximately one million young individuals under the age of 18 begin smoking [1].” However, not all young people who start smoking continue, data on adults show that between 80% and 90% of smokers started smoking before the age of 18, establishing the image of cigarette smoking as a “pediatric disease [2].” Moreover, Smoking is currently on the rise around the world, and it is strongly linked to higher rates of death and morbidity. It also has a negative impact on smokers' quality of life, life expectancy, academic performance, and costs, as well as an increased risk of contracting HIV/AIDS, mental health issues, and behavioral changes [3, 4].

Tobacco use is a major cause of disease and untimely death, with 5.4 million individuals passing away each year. Prevalence has decreased significantly since 1990, with high-income nations seeing the largest declines. Over 8 million individuals die from tobacco usage every year, mostly in low- and middle-income nations. The overwhelming number of deaths and disabilities caused ‘by tobacco emphasizes the necessity of tobacco control as a top global health concern. Based on recent trends in young people's smoking uptake and the assumption that the addiction will eventually kill half of

all smokers, cigarette smoking is estimated to have caused over 100 million deaths last century and will cause over 1 billion deaths this century unless more effective tobacco-control measures are implemented [5]. WHO also reported that tobacco use kills more than 8 million people each year, accounting for over half of all smokers. More than 7 million of those fatalities are the consequence of direct tobacco use, whereas around 1.2 million are the result of non-smokers being exposed to second-hand smoke [6]. Furthermore, smoking rates among teenagers climbed during the 1990s, while adult smoking rates declined. According to the findings of the Centres for Disease Control and Prevention's Youth Risk Behaviour Survey conducted by United States, total smoking rates among high school students grew by one-third between 1991 and 1997 [7].

Researchers have attempted to uncover the factors associated with adolescent smoking in order to better understand and maybe reverse this trend. The majority of research suggests that peer influence may be an important factor, as evidenced by early cross-sectional studies indicating significant correlations between adolescent cigarette smoking and the smoking behaviours of friends [8, 9], as well as current longitudinal studies indicating increased risks of cigarette smoking among those whose friends are smokers [10, 11]. The ability of the school environment to alter the actions of adolescents has been well-established [12, 13], however the processes by which context affects behavior are still being debated. According to contagion or epidemic theories, face-to-face peer contacts promote the spread of substance use among students When highly visible kids start using things like tobacco, other students will follow. As a result of their numerous connections inside a school, popular kids are potential transmitters of norms that promote or sanction specific actions [14, 15].

According to Nepal demographic health survey report of 2016, it established that the prevalence of cigarette smoking was inversely related to level of education. It was found that Tobacco use is more common in men than in women. In opposed to 6% of women, 27% of men use tobacco in some form. Cigarettes are the most popular tobacco product among smokers (27 percent of males and 6% of women). Almost 73 percent of men do not smoke, however 17 percent do so on a regular basis and 11 percent do so on occasion. Also, Women's smoking rates rise consistently with age, from less than 1% among those aged 15 to 49 to 19% among those aged 45 to 49. Cigarette smoking decreases with education level: 13% of women and 38% of men with no education smoke cigarettes, whereas only 1% of women and 19% of men with an SLC or above do [16].

comprehensive and sectoral report regarding tobacco and smoking conducted in Nepal found that the exposure of tobacco products and smoking among young population (15-24 years) is high. where WHO Reported on the Global Tobacco Epidemic, 2015 found that tobacco use is widespread in Nepal, especially among young people. The NCD Risk Factors STEPS Survey Nepal, 2013 found that 18.5% of people over the age of 15 smoke, and 17.8% use smokeless tobacco. The 2011 Global Youth Cigarettes Survey found that 20.4% of young people use tobacco, and 7.2% of students use cigarettes. Nepal is the country in South Asia with the highest rate of tobacco use, with men more likely than women to use cigarettes. In 2016, tobacco usage was a factor in 15.6% of male and 14.1% of female fatalities. this is much higher than the average for other low-income countries [17]. Despite the severe problems we are facing, very few studies have been conducted targeting the young population in Nepal. Therefore, this study aims to find out the prevalence of smoking among the young population at high school level in tokha municipality.

2. Methodology

To investigate the prevalence of cigarette smoking in Tokha municipality, one of the municipalities in the Kathmandu district, a descriptive cross-sectional design was used. The study population consisted of high school students from several schools in the municipality, with students in grades 11 and 12 included. For students under the age of 18, parental approval was obtained. The sample size was calculated by using Cochran's formula, i.e., $n = Z^2pq/e^2$, with allowable error at 5%, non-response rate at 10%, and prevalence at 26.7% [18]. the total sample size was calculated as 320.

For this investigation, multistage random sampling was employed to determine the number of samples. Firstly, four upper secondary schools were chosen at random using a lottery method from a list of nineteen high schools in the municipality. Second, a method known as probability proportionate to size (PPS) was used to determine the frequency of sample size from each selected higher secondary school depending on the number of students enrolled. Finally, the proportionate sample from PPS was assigned a random number, and students allocated with an even number were selected and a questionnaire was distributed to them.

A standard questionnaire from the Global Youth Tobacco Survey (GYTS) was used, which consisted of two sections: i) socio-demographic/ socio-economic section and ii) smoking status section. Furthermore, the student self-administration technique was used for the collection of data. Questionnaires were distributed to the students for selected classes after explaining the purpose of the study and the instructions to fill in the questionnaire with the assumption of confidentiality for their responses. There was no pretesting of the questionnaire as a standard tool was used; however, in order to minimize bias, students were informed and were briefly explained about the research. Data was entered and analyzed in SPSS. For calculating numeric data, mean, median and mode were used, whereas for categorical data, frequency and percentage were used.

The chi-square was also calculated to measure the association between the two variables. And logistic regression was employed to explain the odds of association between the two variables. Variables with p-value<0.05 in

bivariate analysis were further entered into multiple logistic regression model. Ethical approval was provided by the institutional review committee (IRC).

3. Results

3.1. Socio-Demographic and Socio-Economic Profile of the Respondents

The mean age was 17.48 years, and the standard deviation was 0.83. Out of 320 respondents, (45.31%) were from ages 15–17 and (54.69%) were from ages 18–19. Almost three-fourth of the total respondents were Hindu, (73.6%) and more than half of them were either Brahmin or Chhetri, (57.2%) and more than one-third of them (35.3%) were indigenous people. Almost three-fourth of the respondents (73.1%) had nuclear family. more than three-fifth of respondents' father (61.8%) had education higher or upto secondary level. Similarly, more than half of respondents 'mother (53.12%) also had more or upto secondary level of education. Majority of the respondent (85.3%) had pocket money of less than 200 rupees and almost of all of them received money (92.8%) from their parents only. More than half of the respondent, (52.4%) family income came from a job. Whereas, more than one-third family income of the respondent (35. 6%) also came from either farming or business. Huge number of respondents' reported that (85.3%) their monthly expenditure is sufficient and well-covered. very few numbers (3.8%) of respondents' had overwhelming expenditures.

Table 1. *Socio-Demographic and Socio-economic profile of the respondents.*

Variables	Frequency (n=320)	Percent (%)
Age		
15-17	145	45.31
18-19	175	54.69
Mean ± S. D = 17.48 ± 0.83		
Gender		
Male	192	60
Female	128	40
Religion		
Hindu	248	73.6
Buddhist	49	14.5
Others	23	6.8
Ethnicity		
Brahmin/Chhetri	183	57.2
Janajati (indigenous group)	113	35.3
Others	24	7.5
Family type		
Nuclear	234	73.1
Joint	86	26.9
Educational status of Father		
Secondary level and higher	198	61.8
Less than secondary level	111	34.6
Illiterate	11	3.4
Educational status of Mother		
Secondary level and higher	170	53.12
Less than secondary level	128	40
Illiterate	22	6.8
Daily pocket money		
Less than 200	273	85.3
More than 200	47	14.7
Source of pocket money/expenditure		
Parents	297	92.8
Relatives	6	1.9
Self-earn	17	5.3
Main income source of family		
Agriculture and Business	114	35.6
Salary based Job (gov and private)	171	53.4
Remittance	35	10.9
Monthly expenditure		
Sufficient	273	85.3
Insufficient	35	10.9
Surplus	12	3.8

3.2. Smoking Status Profile of the Respondents

More than three-fourth of the respondents, (79.4%, n=320) had not smoked till now. Almost all of them (95.6%, n=66) were occasional smokers. More than half of them (53%) of them smoked at an early age of 16. Most of them smoked for

the very first time because of their curiosity of its taste and peer pressure, it accounted for almost three fourth of the respondents. Almost three-forth (71.2%) of them were introduced to smoking by friends.

More than half of the respondents, (51. 5%, n= 66) had smoked in past month whereas, rest of them did not. Bad consequences to health, (68.7%) was the major driver for them not smoking whereas, about one third, (32.3%) of smokers consumed cigarettes for more than two weeks out of a month. One cigarette a day was the frequency among majority of the respondents. Public place was the most common (68.2%) preferred to smoke and friends (63.6%) were the one who accompanied them.

More than three-fourth of the respondents' guardian, (76.2%, n=76)) did not smoked whereas, rest of them did. More than half of the guardian (52. 1%) consumed 2-5 sticks a day. Almost three-fourth of them (73.7%) preferred cigarette than other type of smoking. One third of smokers 'friends (32.8%) were smokers as well. More than half of the respondent (64%, n=320) perceived about smoking being addictive and almost all of them, (95.6%) were aware about the harmful effects of second hand smoking. Almost three-fourth of the respondent (73.1%) expressed their views of increasing more taxes on cigarettes. almost nine out of then respondents' (87.2%) had seen anti-smoking ads and messages on different media platforms.

Table 2. *Smoking Profile of the Respondents.*

Variables	Frequency (n=320)	Percent (%)
Smoking prevalence		
Yes	66	20.6
No	254	79.4
Frequency of smoking	(n=66)	
Regular	14	4.4
Occasional	306	95.6
Age of Cigarette smoking initiation		
16 years and under	35	53
More than 16 years	31	47
Reason to smoke for first time*		
Peer pressure	32	48.4
Cultural practice	3	4.5
Stress/tension	20	30.3
Influence of advertisement	8	12.1
Curiosity to taste	31	47
Tried cigarette smoking in past 30 days	Frequency (n=66)	
Yes	34	51.5
No	32	48.5
Usually, smoking place*	(n=66)	
Home	15	22.7
Public places	45	68.2
Public Vehicles	17	25.7
School	12	18
Others	8	12
With whom do you usually smoke? *		
Alone	26	39.4
Friends	42	63.6
Family/Relative	10	15
Parent/guardian smoking status	(n=320)	
Yes	76	23.8
No	244	76.2
Parent/guardian smoking status per day	(n=76)	
Less than 2	14	29.2
2 and more	34	70.8
Type of smoking by parents/guardian	(n=76)	
Cigarette	56	73.7
Other products	20	26.3
Friends smoking status		
Yes	105	32.8
No	215	67.2
Is cigarette smoking addictive?	(n=320)	
Yes	205	64
No	115	36
Perception of harmfulness of second-hand smoking		
Yes	306	95.6
No	14	4.4
Price of cigarette should be increased?		
Yes	234	73.1
No	86	26.9

Variables	Frequency (n=320)	Percent (%)
Antismoking messages from any media		
Yes	279	87.2
No	41	12.8

* Multiple responses

3.3. Regression Analysis

Bivariate and multivariate logistic regression analysis were employed in Socio-demographic, Socio-economic and smoking variables with prevalence of cigarette smoking among higher secondary level students of Tokha municipality. We looked for the association between socio-demographic variables, socio-economic variables, cigarette smoking variables, and prevalence of smoking using logistic regression. this study displayed the statistical association in, socio-demographic, socio-economic variables between gender, family type, pocket money and monthly expenditure with prevalence of cigarette smoking. It can be seen that the adolescent student having pocket money of less than 200 rupees are three times more likely (Aor=3.156; 1.497, 6.654) to smoke than those students whose pocket money is more than that. similarly, students having sufficient money to cover their expenses are far more likely to smoke (Aor= 8.685; 3.058, 52.657). however, student belonging from nuclear family was the protective factor for smoking (Aor= 0.551; 0.232, 0.932). males are twice as likely (Aor= 2.050; 1.128, 4.258) to smoke.

Table 3. *Association Between Socio-Demographic, Socio-Economic And Smoking Prevalence.*

Variables	Prevalence of cigarette smoking				COR (95%CI)	AOR (95%CI)
	Yes		No			
	n	%	n	%		
Gender						
Male	53	27.6	139	72.4	3.373 (1.752, 6.491) **	2.050 (1.128, 4.258)**
Female	13	10.2	115	89.8	Ref	Ref
Family type						
Nuclear	58	24.8	176	75.2	0.373 (0.172, 0.683) **	0.551 (0.232, 0.932) **
Joint	8	9.3	78	90.7	Ref	Ref
Daily pocket money						
Less than 200	44	16.1	229	83.9	4.580 (2.373, 6.870) ***	3.156 (1.497, 6.654) ***
More than 200	22	46.8	25	53.2	Ref	Ref
Source of pocket money / expenditure						
Parents	54	18.2	243	81.8	5.062 (1.868, 13.720)***	2.407 (0.815, 7.107)
Relatives	3	50	3	50	1.125 (0.174, 7.243)	0.813 (0.115, 5.762)
Self-earn	9	52.9	8	47.1	Ref	Ref
Monthly expenditure						
Sufficient	41	15	232	85	12.976 (4.405, 25.750) ***	8.685 (3.058, 52.657) ***
Insufficient	16	45.7	19	54.3	3.562 (0.822, 15.475)	3.397 (0.714, 16.613)
Surplus	9	75	3	25	Ref	Ref

Adjusted for gender, family type, pocket money, source of pocket money, monthly expenditure
* indicates p<0.05, ** indicates p<0.02 ***indicates p<0.01

Similarly, the association between variables of cigarette smoking and prevalence was also subjected to regression analysis. It was found that smoking habit of a close friend of a respondent had a protective effect on smoking (Aor= 0.134; 0.068, 0.234) whereas, the thought of increasing the price of cigarettes among the students increased the odds of prevalence of smoking (Aor= 4.343; 2.262, 8.340). those we had seen antismoking ads on tv were less likely to smoke so the ads acted as a protective factor against smoking (Aor= 0.560; 0.230, 0.890). Other factors like parental smoking, the addictiveness of cigarettes, and perception of the harmfulness of second-hand smoke had no association with the prevalence.

Table 4. *Association Between Smoking Variables and Prevalence Of Smoking.*

Variables	Prevalence of cigarette smoking				COR (95%CI)	AOR (95%CI)
	Yes		No			
	n	%	n	%		
Parent/guardian smoking status						
Yes	25	32.9	51	67.1	0.412 (0.230, 0.739) ***	0.651 (0.321, 1.321)
No	41	16.8	203	83.2	Ref	Ref
Friends smoking status						
Yes	47	44.8	58	55.2	0.120 (0.065, 0.220) ***	0.134 (0.068, 0.234) ***
No	19	8.8	196	91.2	Ref	Ref
Is cigarette smoking addictive?						
Yes	42	20.6	162	79.4	1.304 (1.012, 1.787) *	1.525 (0.742, 3.133)

Variables	Prevalence of cigarette smoking				COR (95%CI)	AOR (95%CI)
	Yes		No			
	n	%	n	%		
No	24	20.9	91	79.1	Ref	Ref
Perception of harmfulness of second hand smoking						
Yes	59	19.3	247	80.7	4.186 (1.414, 8.234) **	3.359 (0.768, 9.346)
No	7	50	7	50	Ref	Ref
Increment in cigarette price						
Yes	28	12	206	88	5.824 (3.259, 10.408) ***	4.343 (2.262, 8.340) ***
No	38	44.2	48	55.8	Ref	Ref
Anti-smoking message from social media						
Yes	56	20.1	223	79.9	0.450 (0.120, 0.756) **	0.560 (0.230, 0.890) **
No	10	24.4	31	20.1	Ref	Ref

#adjusted for parental smoking, friend smoking status, addictiveness, perception of second-hand smoking, increment in price of cigarette, anti-smoking message from social media *Indicates $p<0.05$, ** indicates $p<0.02$ ***indicates $p<0.01$

4. Discussion

This study tried to assess the magnitude of cigarette smoking and factors associated with smoking among high school students of Tokha municipality, Kathmandu, Nepal. Our study indicates the prevalence of smoking at 20.6% which is somewhat similar to a study conducted in Jigjiga University [18], where 14.5% prevalence was reported, and Hawassa university [19]. In contrast, The findings of this study are significantly lower than the findings of other studies conducted at Calabar University in Nigeria, where 55.8% of students smoke on a regular basis [20]. the variance could be attributable to regional differences, and the prevalent of cultural practices. The mean age of the respondents was 17.48. it was found consistent with the study conducted Tehran Iran, [21] where mean age for smoking was 17.26 years.

Gender has a considerable impact on the prevalence of smoking in the current study. Male students were found to be more prone to smoke than female students. Various other studies have produced similar outcomes [22, 23]. Considering similar findings in research conducted in several parts of the world, it would be reasonable to conclude that male adolescent students are more likely to smoke than females. Smoking is more stigmatized in our society, which may account for the fewer prevalence of smoking among females. Societal aspects and family factors may impact whether or not someone decides to start smoking as well. Young people with smoking parents or close acquaintances are far more prone to the habit than those without one [24, 25].

In some research, smoking was not associated to a family history of smoking (parental) although smoking practices among friends were but in this particular study however, having a smoking family history or having smoking friends was not causally associated with current use of cigarettes. In addition, the majority of current smokers said they began smoking due to peer pressure. This implies that friends impact smoking behavior, and evidence from other studies indicates that the majority of people began smoking owing to the influence of friends [26]. our study also revealed that a substantial portion of student also smokes out of stress which also align with ability to cope with stress which was also one of the most common reasons given for smoking as reported in other studies [27].

This study provides other important information about how various other elements like type of family, amount of pocket money students get, relate with the prevalence of cigarette smoking among the high- school adolescent students. Similarly, other smoking variables like anti-smoking campaign ads and perception about increment in price of tobacco products were also associated with smoking of cigarette. Lastly, This study had limitation. the survey used a cross-sectional study that cannot show direct causality of smoking, whether beneficial or harmful, among students.

5. Conclusion

In conclusion, our survey found an alarming prevalence of current cigarette smoking among high school students, which could pose a major public health issue in the future. Despite the worrying prevalence, this survey also found that current smokers were fully aware of the harmful and addictive nature of tobacco-related products. Following the result of the study's findings, effective smoking prevention and cessation intervention programs are much needed and can be very helpful in advocating and reducing present smoking conditions among high school students.

Conflict of Interest

There is no conflict of interest.

Ethical Approval

Ethical Approval was provided by Institution Review committee (IRC) of Nobel College, Pokhara University.

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