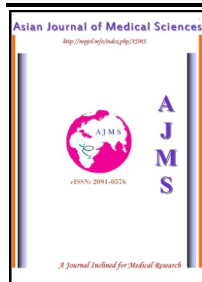# ASIAN JOURNAL OF MEDICAL SCIENCES

Prevalence and Determinants of Cigarette Smoking among the College Students of Kathmandu Valley

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Abstract

Objective: To estimate the prevalence of smoking among the college students and to identify the factors associated with smoking.

Material & Methods: This is a cross sectional study carried out on 304 college students in Kathmandu valley using purposive sampling during the months of December 2009 to January 2010.The self administrated questionnaire was adopted from Global Youth Tobacco Survey2007 (GYTS) and data were collected after the verbal consent taken. The statistical analysis was done using descriptive statistics, univariate and binary logistic regression to measure prevalence of smoking and to identify the association between dependent and independent variables.

Results: We found 7 in 10 students were currently smokers. Among currently smokers, 78% were established smokers. The mean age of smoking onset was 14.15 years (SD=2.62). The mean number of cigarettes smoked per day was 5.03 (SD=3.72) and average daily expenditure was Rs. 15.18 (SD=7.87). About 90% students tried to quit smoking and 17% non smokers were susceptibility smokers. The following factors: sex (adjusted odds ratio(aor)=3.88,95% CI= 2.12;7.11), living with or without family members (aor=1.79,95% CI=1.01;3.17), father occupation (aor=1.85,95% CI=1.04;3.30), and friend's smoking habits (aor=4.60,95% CI =1.92;11.0) were associated with cigarette smoking.

Conclusion: There is the need of effective intervention programs to control cigarette smoking among college students.

Key Words: Cigarette smoking; College students; Prevalence of smoking; Risk factors

1. Introduction

Cigarette smoking is a major public health problem in both developing and developed countries. Globally, there are 1.3 billion smokers of which 80% live in developing countries and by the year 2030 the deaths toll will increase from 5.4 million deaths per year to more than 8 million deaths a year. It is also reported that 7 of every 10 people killed by smoking will be in low and middle income nations.[1]

College life is an important transition period during which young adults begin to explore tobacco use.[2] Many studies have reported that tobacco smoking is rising in young adult between the ages of 18-24 years as they are legal targets of tobacco industry marketing and increased the prevalence of smoking among college students.[3,4] The

study conducted in Asian countries like Pakistan, China and India also showed there was high prevalence of tobacco smoking among college students.[5-7] These studies showed several factors like smoking habits of parents and friends, age, sex, socio-economic status, living with or without family members, father's occupation, faculty (medical and other subjects) etc attributed to cigarette smoking among the college students.[3-7]

Prevalence data on tobacco smoking in Nepal is limited. The tobacco smoking is very common in general population of Nepal with higher prevalence in men compare to women.[8] A literature review revealed that there was variation in prevalence of smoking in different parts of Nepal ranging from 20% -72% and annual deaths related to smoking have been estimated to be 15 thousand.[9,10] Non Communicable Disease risk factors study conducted in Nepal, 2008, showed the percentage of current smokers above 15 years of age was 26.2% of which 35.5% were

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men and 15% were women.[11] Among them, 12.5 % smokers belong to age group 15- 24 years and prevalence of smokers increased with the increased age from 15 years to 64 years with prevalence of 12.5 % to 57.6%.[11] Global Youth Tobacco Survey (GYTS-2007) showed prevalence of tobacco smoking among adolescents was 3.9% and 7.9% students were ever smoked cigarette.[12] The study conducted in 2006 at 13 junior colleges in Pokhara, Nepal showed 9.4% students were currently smokers and correlates risk factors like age, sex, Smoking habits of family members etc associated with smoking.[9]

In Nepal, there is not sufficient data on risk factors associated with smoking which are very important for implications of effective intervention programs on smoking prevention and cessation for college students. Kathmandu valley is the capital city of Nepal where large numbers of students from different parts of the country are enrolled in different colleges. No study has been conducted in Kathmandu valley to understand smoking behavior and risk factors associated with smoking among college students and this is the reason why we have conducted the study.

The main objective of the study was to estimate the prevalence and determinants of cigarette smoking among the college students in Kathmandu valley.

2. Material and Methods

This cross-sectional study was conducted in Kathmandu valley from December 2009 to January 2010. Respondents, who were currently studying bachelor level in any faculties between ages of 18-25 years, were eligible for the study. For, the sample size estimation, following formula was used[13]:

$$n = \frac{z^2 pq}{d^2}$$

Where, we considered p=50% which was prevalence of currently smokers in colleges (no previous data available), with precision of ±5%, and a level of confidence 90%. Based on these parameters, the minimum required sample size was 271. Since smoking is sensitive issues in our culture especially in societies, families and colleges, some students reluctant to disclose their smoking status therefore we decided to take high non response rate i.e.12% and gave sample size of 304 students. The purposive sampling technique was adopted to conduct the study. Self administrated questionnaire was adopted from GYTS-2007.

This cross-sectional survey measured demographic and smoking characteristics including age, sex, faculty, parent's occupation, staying habits (with or without family members), residence (rural vs. urban) of students, parental history of smoking, friends smoking behavior, age of smoking initiation, number of cigarette smoked in last 30 days, monthly pocket expenditure on smoking, quitting behavior, continue smoking next year and in the next five years, favor of banning smoking in public places, problems of asthma and perceived benefits of smoking- weight loss.

The following definition was used in the study to classify the smoking status of an individual.[14,15]

a). Never Smoker: Someone who never smoked cigarettes (not even a puff) in his/her life time.

b). Trier: Someone who had ever tried one cigarette or less in life time.

c). Currently Smoker: The smoker who smoked cigarette one or more in the past 30 days prior to the survey.

d). Established Smoker: The smoker who smoked cigarettes for more than 19 days in last 30 days before survey.

e). Susceptibility for Smoker: Susceptibility was measured by asking the respondents following questions (using a four-point ordinal scale):

   a. Do you think you will be smoking cigarettes five years from now?

   b. If one of your best friends offered you a cigarette, would you smoke it?

   c. At any time during the next 12 months do you think you will smoke a cigarette?

A four point ordinal scale was developed by categorizing responses of aforesaid questions categories 'definitely not, probably not, probably yes, definitely yes' students who answered 'definitely not' to all three questions were considered non-susceptible and remaining responses were considered as susceptible.

2.1. Ethics

The selected students were initially explained the purpose of the study and also assured that the participation was voluntary and the survey was anonymous then the informed verbal consent was taken. The ethical clearance was taken from institutional review board of Nobel College, Pokhara University, Nepal.

2.2. Statistics

The collected data was entered and edited in Microsoft Excel 2007 and analyzed in SPSS 11.5 version (SPSS Inc. Chicago, Illinois (USA)) and Intercooled STATA9.1 (statacorp, Texas (USA)). Descriptive statistics (Percentage, mean, standard deviation), univariate analysis (Chi square test) and binary logistic regression were applied only in those variables which was significant

in univariate analysis. The p value less than 0.05 is considered as significant in the study.

3. Results

3.1. Socio-Demographic Characteristics

There were 304 bachelor level students of which around 75% were male. Majority of students (66.4%) belonged to age group above 20 years [Mean (SD) =20.44 (1.95)]. About 48% respondents stayed with family members followed by 22% were staying with friends, 16% were staying in hostels and 15% staying alone. More than half of the respondents were from urban area (52.3%).

Table-1: Univariate analysis of factor associated with smokers among college students

Variable	Currently Smokers (%)	odds ratio	95% CI	
			Lower Limit	Upper Limit
Sex (P Value:0.00)				
Male	60	4.87	2.79	8.5
Female	11.8			
Age (Years) (P Value:0.9)				
<20	24.73	0.99	0.57	1.68
≥20	48			
Residence (P Value:0.2)				
Urban	75.5	1.38	0.84	2.29
Rural	69			
Staying Habits (P Value:0.02)				
without family Members	40.8	1.81	1.05	3.11
with family Members	31.6			
Faculty (P Value:0.03)				
Others (management, arts)	65.8	2.17	1.05	4.48
Medical	6.6			
Father Occupation (P Value:0.001)				
Non Service Holder	41.1	2.36	1.41	3.98
Service Holder	31.3			
Mother Occupation (P Value:0.20)				
Working	37.8	1.39	0.84	2.31
Non Working	34.5			
Parental History of Smoking (P Value:0.30)				
Yes	33.2	0.76	0.45	1.3
No	39.1			
Friends Smoking Habits (P Value:0.000)				
Yes	69.1	7.9	3.57	17.53
No	3.3			

*Only significant variables in univariate analysis was included

About 36.84% respondents were from management faculty followed by 32.20% from science faculty, 19.4% from humanities faculty and the remaining were from medicine faculty (11.51%) The major occupation of the father was service holder (49.01%) and the remaining had occupation of business (35.53%) and

agriculture (15.46%). Out of 304, 44% had parental history of smoking of which 90% had smoker father, 9% had smoker mother and the rent of all had both parents smoker. About 89% respondents had smoker friends.

3.2. Cigarette Smoking behavior

Among 304 respondents, 78.3% were Trier of which 95% were male. The current prevalence rate of smoking was 72.4 % (95% CI- 66.97-77.31) of which 78% were established smokers. The mean age of initiation of cigarette smoking was 14.85 years (SD= 2.62; 95% CI -14.52; 15.19). About 82% were susceptibility smokers of which 16.9% had never smoked cigarettes and 83.1% were current smokers. Similarly, 90% of respondents tried to quit smoking and 52.9% wanted to stop smoking then. The prevalence of consumption of chewable tobacco products was found to be 8 times higher in smokers compare to non smokers. (40.0% vs. 4.76%, p=0.000).

In last 30 days, the average number of cigarette smoked per day by a smoker was 5.03 (SD=3.72; 95% CI-4.60; 5.45). The daily pocket expenditure for non smokers was Rs. 78.57 ($1.08)[#] (SD= Rs. 67.34 ($0.93) and smokers 93.76($1.3) (SD=59.55 ($0.82). Similarly, the average daily expenditure on cigarette was Rs.15.18 ($ 0.21) (SD =7.87 ($ 0.11); 95% CI -14.20; 16.15). There is statistical evidence that on average smokers spend more daily pocket expenditure than non smokers (P =0.04).

Table-2: Factor associated with smokers among college students using binary logistic regression

Variable	Adjusted Odds Ratio	95% CI	
		Lower Limit	Upper Limit
Sex (P Value:0.00)			
Male	3.88	2.12	7.11
Female			
Staying Habits (P Value:0.02)			
without family Members	1.79	1.01	3.17
with family Members			
Faculty (P Value:0.06)			
Others	2.15	0.97	4.8
Medical			
Father Occupation (P Value:0.03)			
Non Service Holder	1.85	1.04	3.3
Service Holder			
Friends Smoking Habits (P Value:0.001)			
Yes	4.6	1.92	11
No			

It was found that the higher proportion (37.72%) of smokers smoked cigarette in public places followed by college (24.54%), friend's house (19.09%), at home (6.81%) and at social events

(5.90%). Among the smokers, about 5% had experienced the Asthma problem and 43% of them said that weight loss as benefit of smoking. About 86% smokers had knowledge about dangerous sign of smoking during school education. Nearly 75% respondents were in favor of banning the smoking in public places and the proportion was found to be significant difference in smokers and non smokers respondents (69.5 % Vs 86.93%,P =0.002). There is statistical evidence that the higher proportion of non smokers were aware of harmful effects of smoking in comparison to smokers (87% vs. 42%, p = 0.0000).

3.3. Socioeconomic variables associated with cigarette smoking

Results from the univariate and binary logistic regression are shown in table 1 & 2. It was known from table 1 that sex, staying habits, faculty, father occupation, friend smoking habits were associated with smoking (P<0.05).

In binary logistic regressions, it was found -2Log likelihood ratio was 297.27 with Nagelkerke R Square 0.263 which indicates only 26.3% variation in current smoking behavior was explained by the socio economic variables (table 2) and remaining variation in current smoking was explained by the other factors (not included in the study). It was also identified that overall percentage of the model will be able to predict correctly 80.3% i.e. the probability that the logistic model will predict correctly is 0.803. (Data not shown in table)

In binary logistic regression (table-2), the friend's smoking habits had strong association with smoking. However, there was no association found in faculty with smoking.

4. Discussion

To our knowledge, this is the first study which shows high prevalence of cigarettes smoking among college students i.e. 8 in every 10 were Trier and 7 in every 10 were currently smokers. The study conducted in two hill areas of Nepal also showed that 7 in 10 adults (73.7%) were smokers in Nepal.[16] Non Communicable Disease risk factors 2008 also reported the prevalence of current smokers among young adult was 75.6%. Similarly, our study reported that the use of smokeless tobacco products was very common among smokers. These findings were similar with the findings by Sreeramareddy CT et.al in Pokhara Nepal.[9] The main reason for the higher prevalence rate is the price of cigarettes and other tobacco products which are more affordable and other reasons are they are easily available in market, no age bar for purchasing, and believe that the danger comes only after using too much.

The proportion of smokers was higher in age group after 20 years. It indicates that prevalence of smokers increased with increased age. It was also reported by NDHS 2006, Non Communicable Disease Risk Factors 2008 and an economic survey 2003.[8,11,17]

The present study reported the median age of smoking onset was 15 years (data not shown in result) which is similar to the findings reported by Sreeramareddy CT et. al in Pokhara (Nepal) and Karki YB et. al (2003) in Nepal.[9,17] From these findings it is known that majority of smokers initiate smoking by the age of 18 years.

The average number of cigarettes smoked per day by college students was 5 and similar result was reported in 15-24 years population by non communicable risk factors studied carried out in Nepal.[11] The currently smokers spend on average Rs.455.84 ($ 6.32) more than non-smokers per month from their pocket money. If the smokers continue to smoke for whole year one can spend Rs.5470 ($75.34). This amount covers 15.92% of per capita GDP at current price ($473).[18] It was also reported that the household spend about 5% of their annual expenditure on tobacco products.[17] All total currently smokers of our study were spending Rs. 1203400 ($16575.86) per year.

This study also identified that two third of respondents were in favour of banning smoking in public places which supports the findings of GYTS(2007) though the Government of Nepal has passed an executive order restricting smoking in public places, offices and transportation but has not yet been effectively enforced.[12] It requires a strong political commitment which is lacking in the country. It is also suggested to ban the single stick sale and allowed to sale in certain area and restriction to sell to the children and adolescents.[9]

The current study found the several factors that were associated with smoking and might play a role in support of smoking among college students. The finding showed that friends circle was the most common factors in smoking, which is similar to the study conducted among students in different parts of Asia: Nepal-Pokhara (44%), Pakistan (42.5%), Saudi Arab (24.7%) and India (25.5%).[5,6,9,2,9] It was found that non medical students smoked more than medical students and this was supported by the study conducted at 12 universities in China.[20] The study conducted at Rawalpindi Pakistan revealed the similar results.[21] It may be due to medical education that has exposed to preventive effect on smoking.

Our study revealed male students were more likely to be smokers. Another study carried out in Pokhara (Nepal) among junior collegiate also showed similar results.[9] The

other study reported that in Nepal men smokers in 15-24 years of age group were 6 times more in number than female smokers.[11] The reasons for higher prevalence in male may be due to feeling matured, independence and, solidarity. Similar study carried out in China and India also published the similar results.[3-6] The present study showed the student staying without family members liked to smoke more than those who were living in family. This finding was similar with the study conducted at university of Saudi Arabia.[19] In the cultural context, family is the protective measures of initiation of smoking.

The father's occupation was also associated with the smoking habits of the college students. The study conducted in China revealed similar results.[7] The study conducted in New Zealand showed that the socioeconomic status of parents was inversely associated with smoking.[22] Another study conducted in the same country showed the lowest-status occupational group was twice as likely as to be smokers than those whose fathers occupied the highest status occupational group.[23] The present study was unable to establish such a relationship due to no data on economic status of the parents.

The students having working mothers like to smoke slightly more as compared to students having non working mothers. It may be due to the working mother does not have time enough to spend with their children and these children start to pastime with friends where they learn to smoke cigarette.

Finally, there are still many factors that are determinants of cigarette smoking and consumption of other tobacco products among Nepalese college students. The longitudinal study design will identify the factors which can be utilized to more effective strategies for tobacco prevention and cessation interventions to reduce prevalence of smokers among college students and other young adults.

5. Limitations

Our study was based on purposive sampling and self reported information on cigarette smoking so there was possibility of bias and over reporting. This findings needs to be further analyzed by future studies using probability sampling techniques.

6. Conclusion

The prevalence of smoking is very high in college students and will continue to increase unless intervention programs are implemented urgently. Thus, the study recommends that aforesaid factors should be taken into account when designing effective tobacco control programs to reduce smoking prevalence among college students.

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