



## Factors Associated with Smoking Among Male College Students in Dhaka city, Bangladesh

Most Nargis Parvin<sup>a</sup>, Rungrat Srisuriyawet<sup>b\*</sup>, Pornnapa Homsin<sup>b</sup>

<sup>a</sup> MS Candidate, Community Nursing Department, Faculty of Nursing, Burapha University.

<sup>b</sup> Department of Community Nursing, Faculty of Nursing, Burapha University, Chonburi, Thailand

\* Corresponding author. Email address: sroongrat12@gmail.com

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### Abstract

Adolescent smoking is a significant problem, especially in males. However, there is little information regarding smoking behavior among adolescents particularly concerning the association between related factors and smoking experience. The purposes of this cross-sectional study were to investigate the prevalence of smoking and to examine related factors to smoking among male college students in Dhaka city, Bangladesh. The Precede-Proceed model was used as conceptual framework in this study. A sample of 290 male students in grade 11-12 at public colleges located in Dhaka city was randomly selected to participate in this study during March 2014. Data were collected by self-administered questionnaires (SAQ) comprising Demographic Data Questionnaire, Smoking Refusal Self-efficacy Scale (SRSS), Attitude Towards Smoking Questionnaire (ATTQ), Social Influence Questionnaire (cigarette accessibility, peer smoking, parental approval of smoking), and Smoking Questionnaire. Descriptive statistics and Binary logistic regression [Adjusted Odds Ratio (AOR) with 95% Confidence Interval (CI)] were used for the data analysis. The results showed that about 18.3 % of participants reported current smoking. The influential predisposing factors on smoking among male adolescents were age (AOR = 4.21, 95% CI = 1.73-10.21), educational level (OR=2.77; 95% CI 1.10 - 6.93), academic achievement (GPA) (AOR = 3.50, 95% CI = 1.56 - 7.84), smoking refusal self-efficacy (AOR = 10.82, 95% CI = 3.47- 33.72). The significant enabling factors of smoking was peer smoking (AOR = 3.95, 95%CI = 1.65 - 9.45) and reinforcing factors was parental approval of smoking. (AOR = 2.88, 95% CI = 1.26 - 6.54). However, attitude towards smoking (AOR= 1.27, 95%CI =.56 - 2.83), and cigarette accessibility (AOR = 2.16, 95% CI = .99 - 4.74) were not found to be significant. The findings suggest that Bangladesh has unveiled new health warnings for cigarette smoking among adolescents. Health care providers and people who involved should develop an effective adolescent smoking prevention program for adolescents, considering multi-component factors which have been identified in this study. Future study should include more diverse sample-i.e. private college students or female students.

**Keywords:** Smoking, Male adolescents, Bangladesh

### Introduction

Smoking is a worldwide problem that directly impacts on the health. It is the second leading cause of death and the fourth most common risk factor for diseases worldwide. Moreover, among young people tobacco is considered as a “gate way” drug because it often precedes and anticipates the use of alcohol, cocaine and other dangerous drugs (World Health Organization [WHO], 2011). In developing countries including Arab and South Asia countries,

smoking among adolescents has risen steadily (ELMhamdi, Wolfcarius-Khiari, Mhalla, Ben Salem, & Soltani, 2011). The prevalence of smoking among school-age adolescents is high. There were 9% to 17.5% of smoking among junior college students (Binu, Subba, Menezes, Kumar, Ninan, & Rana, 2010; Pradhan, Niraula, Ghimire, Singh, & Pokharel, 2013; Sreeramareddy, Kishore, Paudel, & Menezes, 2008).

Bangladesh is one of the largest tobacco consuming country in the world. Overall, cigarette



consumption has been rising in Bangladesh in recent years, with cigarette smoking rising by over 40% to 80% in the year of 1997 to 2010. Many tobacco companies have come to invest in Bangladesh. The cigarettes are sold at a cheaper price and every store has cigarette. So, people can easily access to cigarettes. Consequently, smoking rose rapidly among all ages. Tobacco use has been socially accepted, especially in men. The prevalence of smoking is high among the general male population in Bangladesh. It is estimated that men are much more likely to smoke than women, with smoking prevalence among men at nearly 45%, as compared to 1.5% among women (Alam, et al., 2013; Khan, Khan, Kraemer, & Mori, 2009). Young smoking is a major public health problem in Bangladesh. Most Bangladeshi smokers start smoking before 15 years of age (Flora, Mascie-Taylor, Rahman, & Akter, 2012). The prevalence of smoking both sexes was 18.6% among college students in Bangladesh. Of these, 35.5% was male students and 3.1% was female students (WHO, 2008). The prevalence of current smokers aged 15–22 years has increased to 22 % in the recent study (Tarafdar, Nahar, Rahman, Hussain, & Zaki, 2009).

Many previous studies indicated several individual, social and environmental factors related to smoking among adolescents. The important individual factors including age, gender, academic success, smoking refusal self-efficacy and attitude towards smoking were significantly related to smoking among adolescents (Homsin, 2006; Homsin, Srisuphan, Pohl, Tiansawad, & Patumannond, 2009; Kim, Son, & Nam, 2005; Ma, et al., 2008; Piko, 2001; Tuan, Homsin, & Junprasert, 2012). Social and environmental factors significantly related to smoking were peer smoking (Tarafdar et al., 2009; Tuan, et al., 2012), cigarette accessibility (Doubeni, Li, Fouayzi, & DiFranza, 2009; Pradhan, et al.,

2013; Rahman, Ahmad, Karim, & Chia, 2011) and parental approval of smoking (Barreto, et al., 2011; Homsin, 2006; Lin, et al., 2008; Shakib, et al., 2005). According to The Precede–Proceed Model (Green, & Kreuter, 2005), the Precede Model provides three important factors in changing the behavior and environment. These are predisposing, enabling, and reinforcing factors that cover important factors based on prior evidence.

Most of knowledge from abroad studies provides ample evidence of cigarette smoking among adolescents. However, the findings of existing studies seem not application for Bengali due to different socio-cultural contexts. Besides, among the studies investigated smoking in Bangladesh: all of them only examine the prevalence of smoking (Khan, et al., 2009; Rahman, et al., 2011; Tarafdar, et al., 2009); only one study examined the association between factors in male college students (Tarafdar, et al., 2009). Therefore, the purposes of this study were to investigate the prevalence of smoking and to examine related factors to smoking among male college students in Dhaka city, Bangladesh. The knowledge derived would be useful for the development of smoking prevention strategies in male adolescents.

### Material and Methods

A cross-sectional study design was used to examine the prevalence of smoking and related factors to smoking among male college students in Dhaka city, Bangladesh.

The sample was 290 male college students who were studying in full-time programs (Grade 11 and 12) during 2013–2014 academic years in public colleges located in Dhaka city, Bangladesh. An inclusion criterion was students without having circulatory and/ or respiratory health problem such as



heart disease and asthma, because these health conditions are contraindication of smoking. An appropriate sample size was calculated by using formula of the prevalence study (Lemeshow, Hosmer Jr, Klar, & Lwanga, 1990). Statistical variations were represented by 95 % confident interval, tolerable error of 0.05, and the proportion of smoking among Bangladesh adolescents was 22 % (Tarafder, et al., 2009). The total number of male college students was 7,614.

The multi-stage sampling technique was used to obtain the sample. Colleges were randomly selected by size of Thana [region of city (large, middle, small)]. In each Thana, only one public college was randomly selected. In each college three classes was randomly selected from each grade level for a total of 9 classes (three classes X three colleges).

A self-report questionnaire was given to each student. The questionnaire consisted of five parts, i. e., Demographic Data Questionnaire, Smoking Questionnaire, Smoking Refusal Self-efficacy Scale (SRSS), Attitude Towards Smoking Questionnaire (ATTQ), Social Influence Questionnaire (parental approval of smoking, peer smoking, and tobacco accessibility). The questionnaire was prepared in English version and it was subsequently translated into Bengali by back-translation technique. The reliabilities (Cronbach's alpha coefficients) for SRSS and ATTQ in this study were reported 0.90 and 0.74, respectively. Details of the questionnaire are as below:

Part 1 Demographic Data Questionnaire. The Demographic Data Questionnaire (DDQ) was developed for this study to obtain students' information: age, educational level, GPA, parent education, parent occupation, parent's marital status, and living condition.

Part 2 Smoking Questionnaire. This part was developed using data from Homsin, et al. (2009)

The first item was "Have you ever smoke a cigarette, even a few cigarettes? The second item was "How often do you smoke? " Smoking is categorized into two groups: non-smoker and current smoker. The non-smoker is classified as never ; only 1-4 cigarettes in your life; or about 5 - 100 cigarettes in my life; had ever smoke but I do not smoke any more than 6 months). The current smoker is classified as occasional or at least once a week or every day.

Part 3 Smoking Refusal Self-efficacy Scale (SRSS). SRSS was developed by Velicer et al. (1990) in English version. The scale contains 10 items that relevant to refusal situation. The questionnaire was measured an individual's belief in their ability to resist smoking under social pressure, for emotional relief or when present with the opportunity. The items of the instrument include statement to avoid smoking in several situations such as "With my close friends who is smoking", "When I am frustrated/ angry about someone or something". Participants scored on a 4- point Likert scale ranging from 1 "definitely yes" to 4 "definitely no". The total score of each response was categorized into two groups compared to the questionnaire's mean score: low smoking refusal self-efficacy (<mean) and high smoking refusal self-efficacy (>=mean).

Part 4 Attitude towards Smoking Questionnaire (ATTQ). ATTQ was developed by Homsin et al. (2006). The scale developed based on three components by Weber (1992). These dimensions of attitude include the cognitive dimension, affective dimension and behavioral dimension. The original ATTQ was included 20 items testing among Thai adolescents by Homsin (2006). Now, it's available in different languages; Thai, English, and Vietnamese. Recently, the scale was translated to Vietnamese version (Tuan, et al., 2012). Participants scored on 4-point Likert scale ranging from 1 "strongly disagree" to 4 "strongly agree". The total score of each response



was categorized into two groups compared to the questionnaire's median score: unfavorable attitude towards smoking ( $<$ median) and favorable attitude towards smoking ( $\geq$ median).

**Part 5 Social Influence Questionnaire.** This scale examines parental approval of smoking, peer smoking, and cigarette accessibility. The parental approval of smoking was used by a single item adapted from the work by Flay, et al. (1994). Participants were asked how their parents would feel about their smoking. Participants scored on a 5-point scale ranging from 1(definitely approve) to 5 (definitely disapprove). The total score of each response was categorized into two groups: (approval (1 to 3), disapproval (4 to 5). Peer smoking was measured using one item developed for this study to examine the influence of peer smoking on cigarette smoking. Participants were asked to indicate whether their close friends who smoke (yes/no). Accessibility was measured using one item developed for this study to indicate how difficult it is to access cigarette. Participants scored on a 4-point scale ranging from 1 easy, to 4 difficult. Total score of each response was categorized into 2 groups: easy (1 to 2) and difficult (3 to 4).

**Data collection.** The study was approved by the Institutional Review Board Faculty of Nursing, Burapha University. Data collection was carried out during March, 2014. Eligible participants were approached and informed of the purposes, procedure and benefits of the study. Information sheets providing details regarding the research protocol and consent forms were also sent to the parents of selected students. After obtaining consents of parents and students, these students were given questionnaires in an unsealed envelop, in the classroom at a most convenient time for students without the presence of teacher. They filled out the questionnaire in approximately 15–20 minutes.

**Data analysis.** The statistical software packages, IBM SPSS statistic version 20, was used for data analysis. Descriptive statistic including frequency, percentage, range, mean and standard deviation (SD) was used to describe the demographic characteristics of the sample, the prevalence of smoking, and the independent variables (i. e., age, educational level, smoking refusal self-efficacy, attitude towards smoking, accessibility, peer smoking, and parental approval of smoking) and dependent variable (current smoking). Binary Logistic Regression (adjusted the Odds Ratio with 95% confidence interval) was used to examine the relationship between the independent variables and the dependent variable.

## Results

A total of 290 completed questionnaires describing male college students was obtained in this study. The age of the respondents ranged from 15 to 19 years with a mean age of 17.46 years. Almost all of respondents (91.4%) were Muslim. With regard to parents' educational level, majority of fathers (77.6 %) finished secondary schools or higher level, while majority of mothers (78.6%) finished secondary schools or lower. For the parental occupation, the most common occupation of fathers was a businessman (47.9%) and that of mothers was 67.6 %. The remaining 19.7 % and 18.6 % of fathers were farmers and government officers, respectively. Meanwhile 13.4 % and 11.0 % of mothers were employees and government officers, respectively. Most of the participants (68.3 %) were living with their parents. Majority of their parents (93.8%) was living together as a couple.

69.0% of respondents reported that they have never smoked in their life while 31.0% of them reported that they are smoking. For those current



smoking, 18.3 % of them still was a current smoker. The average age of the first use was 17.47 years old (SD = .86).

Results of binary logistic regressions demonstrated factors associated with smoking (table1). Age was significant related to smoking among male students (AOR = 4.21). The respondents aged  $\geq 17$  were 4 times more likely to smoke than those aged below 17. In term of educational level, respondents in grade 12 had more than three times of smoking than those in grade 11 (OR=2.77). In addition, the results revealed that the respondents with low GPA ( $< 4$ ) were 3.50 times

more likely to smoke cigarettes (AOR = 3.50), compared to those with high GPA. The respondents with low refusal self-efficacy were 11 times more likely to smoke than those with high smoking refusal self-efficacy (AOR = 10.82). Respondents were more likely to smoke when their close friends also smoked (AOR = 3.95). Finally, the respondents having parental approval of smoking were 3 times more likely to smoke than those whose parental disapproval of smoking (AOR = 2.88). However, attitude towards smoking and cigarettes accessibility were not found to be significant factors related to smoking.

**Table 1** Adjusted odds ratios and 95% confident intervals for associations between factors and smoking (N = 290)

Variables	Non-smoker (n = 237)		Smoker (n = 53)		AOR	95%CI	p-value
	n	%	n	%			
Age							
<17 <sup>r</sup>	112	86.2	18	13.8			
$\geq 17$	125	78.1	35	21.9	4.21	1.73-10.21	.001
Academic success							
High <sup>r</sup> (> 4.0)	168	90.8	17	9.2			
Low ( $\leq 4.0$ )	69	65.7	36	34.3	3.50	1.56 – 7.84	.002
Educational level							
Grade 11 <sup>r</sup>	165	82.5	35	17.5			
Grade 12	72	80.0	18	20.0	2.77	1.10 – 6.93	.029
SRSE							
High <sup>r</sup>	145	97.3	4	2.7			
Low	92	65.2	49	34.8	10.82	3.47– 33.72	.000
Attitude towards smoking							
Unfavorable <sup>r</sup>	127	87.0	19	13.0			
Favorable	110	76.4	34	23.6	1.27	.56 – 2.83	.561
Parental approval of smoking							
Disapproval <sup>r</sup>	164	92.7	13	7.3			
Approval	73	64.6	40	35.4	2.88	1.26 – 6.54	.011
Cigarette accessibility							
Difficulty <sup>r</sup>	160	86.0	26	14.0			
Easy	77	74.0	27	26.0	2.16	.99 – 4.74	.052
Peer smoking							
No <sup>r</sup>	146	92.4	12	7.6			
Yes	91	68.9	41	31.1	3.95	1.65 – 9.45	.002

R= reference group



### Discussion

In the present study, the prevalence of current smokers among college students was 18.3%. The study result was quite similar to the previous studies in Asian countries. Assanangkornchai, Pattanasattayawong, Samangri, & Mukthong. (2007) studied male high school students and male vocational students in Southern Thailand. They found the percentage of tobacco smoking was 19.8%. Mak, et al. (2010) surveyed 29,397 Chinese students, aged 12–18 years. The prevalence of current smokers was 15.7%. Tuan, et al. (2012) found that the prevalence of current smokers was 31.0% in Vietnam. In Bangladesh study, the Global Health Professional survey was undertaken in 2006 and found that 22.2% of the dental students currently smoke cigarettes (MOHFW, 2006). Compared to Bangladesh study, the standard deviation of prevalence in this study is lower than the previous study due to different background of age and area of study. The explanations might be that the operational definition of smoking in this study focused only current smoker, not including experienced smokers. That is why the prevalence in this study was lower. Tobacco use has been socially accepted, in Bangladesh especially in male. Majority of the students started smoking because of curiosity 41.1%, relief of tension 26.7% and peer pressure 25.5% (Pradhan, et al., 2013).

The results of this study showed that influential predisposing factors on smoking among male adolescents were age, educational level, academic achievement (GPA), and smoking refusal self-efficacy. Male adolescents with 17 years old and over were more likely to smoke than the younger. The results were similar to previous studies (Aryal, Deuba, Subedi, Shrestha, & Bhatta, 2010; Pradhan et al., 2013; Sharma, Grove, & Chaturvedi, 2010;

Tarafder, et al., 2009). Mid-to late adolescent (17 to 19 years) begin to separate from their parents and establish their own identity. A strong need for peer approval may entice a young person to try dangerous feats, or take part in risk-taking behaviors, for example, sexual experience, alcohol drinking, or smoking. Youth smokers believe that they will look more attractive and have more friends, (Tarafdar, et al., 2009). Besides, in this study, male students start smoking at 17 years old that is the turning point of risk taking for male adolescents in Bangladesh. The result of this study is consistent with the prior study in Bangladesh (Tarafder, et al., 2009).

In this study results also revealed that academic achievement was consistent with previous studies which showed that GPA is an important predictor of smoking (ELMhamdi, et al., 2011; Homsin, et al., 2009; Tuan, et al., 2012). Academic success is the predisposing factors that represent person's knowledge that facilitate or hinder motivation for change (Green, & Kreuter, 2005). It can be explained that students with low GPA may have inability to focus or short concentration, which make them more risk to reinforcement of smoking. The other reason may be associated with a loss self-value. They may experience more frustration by their school grade achievement. Consequently, they are more likely to skip classes and spend more evening time with friends, which increasing the chances to engage in risky behavior, including smoking.

Not surprisingly, this study found that smoking refusal self-efficacy was the strongest associated factor of smoking among male students. The finding is consistent with past research (Hiemstra, Otten, De Leeuw, Van Schayck, & Engels, 2011; Fagan, et al., 2003; Tuan, et al., 2012). Adolescents who had low smoking refusal self-efficacy were 10 times more likely to smoke than those who had high smoking refusal self-efficacy. According to



Bandura's theory (Bandura, 1986) people with high self-efficacy, those who believe they can perform well, are more likely to make efforts to complete a task. Self-efficacy beliefs are cognitions that determine whether health behavior change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures. Self-efficacy influences how people set their health goals (e.g., "I intend to reduce my smoking," or "I intend to quit smoking altogether"). This means that adolescents who have high smoking refusal self-efficacy could refuse to smoke because they believe they can avoid cigarette smoking.

This study also found that a significant enabling factor of smoking was peer smoking, which is in keeping with behavioral change theories of adolescent behavior, which postulate that the key predictors of behavioral performance was peer influence (Ajzen, & Fishbein, 1980). Adolescents were more likely to smoke when their close friends smoke. The finding of this study is consistent with many previous studies (Ahmed, Rashid, McDonald, & Ahmed, 2008; Ali, Nalini, & Delzell, 2006; Tarafdar, et al., 2009). The possible reasons can be explained since an individual's behavior is influenced by the environment and characteristics of the person. The major influences on adolescent smoking are social environments and psychological factors (Bandura, 1986). Specifically, environmental smoking has been found to affect adolescent smoking through processes of modeling (Engels, Knibbe, & Drop, 1999) and friends exert socializing efforts through constructive forms of statement (Otten, et al., 2007). Majority of the students started smoking because of peer pressure 25.5% (Pradhan, et al., 2013).

Data from this study showed that a reinforcing factor, parental approval of smoking, was significantly related to smoking among male students.

This result was similar to previous studies (e.g. Homsin, et al., 2009; Lin, et al., 2008). Parental disapproval of smoking was a protective factor against increased adolescent smoking and help in reducing opportunities for youth smoking with their peers. Feedback from their parents may affect continuation of the behavior. In Bangladesh family, parents dominantly deliver anti-smoking message to their children. The culture of smoking is deeply rooted in Bangladesh, particularly among men. Tradition, culture, and the family appear to have important roles in forming and cultivating norms and values related to smoking (Ghosh, 2012). In addition, this study found that most of students live with their parents (63.8%) and their parent still are couple (93.8 %). This implied the parental influences on their children behavior.

However, this study did not find an association between attitude towards smoking and smoking among male students. This finding was in contrast to several past researches, which reported attitude towards smoking was significantly associated with smoking among adolescents (Homsin, et al., 2010; Piko, 2001; Tuan, et al., 2012). The difference in findings might be a reflection of different background characteristics of the sample, especially Muslim context. Smoking in Bangladeshi men view as typical of men and social acceptance. Therefore, smoking in Bangladeshi men was more deeply socially ingrained (Bush, White, Kai, Rankin, & Bhopal, 2003). Consequently, all men may hold very similar beliefs with respect to tobacco use. However, Bangladesh adolescents were not driven primarily by attitudes in men.

The result for cigarette accessibility was inconsistent with expectations and past research. This may be due to lack of variation in cigarette accessibility. There is high cigarette availability in Bangladesh. Even though, Bangladesh government



has strictly enforcing laws prohibiting tobacco sales to minors which reduce youth smoking and is an important component of any comprehensive tobacco prevention campaign, the cigarettes were sold at a cheaper price and every store sell cigarettes. Adolescents can easily purchase cigarettes, with more than one third (38.3%) of 13–15 year olds reporting buying cigarettes in stores (Barkat, et al., 2012).

### Conclusion and Recommendations

The findings on prevalence of current smoking and factors affecting smoking resulted in theory-based correlates of smoking among Bangladesh participants. The result showed that age, educational level, GPA, peer smoking, parental approval of smoking and smoking refusal self-efficacy were the significantly related factors. Especially, smoking refusal self-efficacy was the strongest associated factor of smoking among male students. Culture-specific intervention using a peer-leading, parental-monitoring, and refusal skill building might prevent smoking in Muslim community.

Using multivariate analysis approach in this study could help us to gain a better understanding of smoking among adolescents in Muslim context. However, this study had limitation that should be taken into account when interpreting result. It included only public college male students. Thus, the sample might not be representative of all Bangladesh adolescents. Future study should be duplicated this study in more diverse sample–i.e. private college students or female students.

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