Prevalence and Determinants of Smoking Behaviour among the Secondary School Teachers in Bangladesh

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ABSTRACT

Background	Despite country's tobacco control law, cigarette smoking by the young people and the magnitude of nicotine dependence among the school personnel is alarming.
Objective	To determine the prevalence of smoking and to examine the determinants of smoking behaviour among the secondary school teachers in Bangladesh.
Methods	A two-stage cluster sampling was used with a selection of schools on Probability Proportional to Enrolment (PPE) size followed by stratified random sampling of government and private schools and then all the teachers present on the day of the survey were selected for the study. The 66-item questionnaire included smoking behaviour, knowledge, attitude, second-hand smoking, tobacco free school policy, cessation, media advertisement and curriculum related topics. Seven additional questions were included to assess the socio-demographic characteristics of the teachers. Data analysis was performed using SPSS 17 software. A total of 60 schools were selected with school response rate of 98.3%. An anonymous self-administered questionnaire was filled in by all teachers present at the day of the survey. The sample consisted of 559 teachers with response rate of 99.5%.
Results	The prevalence of smoking was 17% (95% CI: 14%, 20.4). About half of the teachers (48.4%) smoke daily followed by 25.3% smoke 1-2 days in last 30 days. The mean duration smoking of was 13.7(95% CI: 11.6, 15.9) years. Logistic regression analysis revealed that male teachers smoke 37.46(95% CI: 5.078, 276.432) times higher than their female counterparts. The graduate teachers were 2.179(95% 1.209, 3.926) times more likely to be smoke than master's degree holder teachers. Smoking by friends appeared to be the strongest predictor for teachers smoking behaviour (OR 4.789, 95% CI: 1.757, 13.050). However, no statistically significant association was found between type of school, second-hand smoking and curriculum related factors and smoking behaviour of the teachers ($p>0.05$).
Conclusions	Prevalence of smoking among the teachers is high in Bangladesh. Effective smoking prevention program should take into account within the dominant of socio-environmental influence to reduce smoking behaviour. The school curriculum items had less impact in preventing smoking behaviour.
Keywords	Bangladesh - Secondary School – Smoking - Teachers

INTRODUCTION

Tobacco consumption in any form has negative consequences on human health and become a significant public health concern around the globe. Tobacco related deaths involved more than 5 million people yearly and it is projected to exceed 8 million by the year 2030. Tobacco use is recognized as the major cause of preventable death. Tobacco smoke causes non communicable diseases and disability [1]. A nationally representative household survey by The Global Adult Tobacco Survey in Bangladesh (2009) found the overall prevalence of tobacco consumption as 43.3% (41.3 million) [2]. Tobacco consumption is responsible for 57, 583 deaths in 2004, which accounted for (8.7%) of total illnesses of those aged 30 years and above [3]. Eight years survey by The Global School Personnel Survey (GSPS, 2008) in Bangladesh [4] showed that 26% and 12% of school personnel are cigarette smokers, in male and female respectively. Other tobacco consumption is also higher in male school personnel (12%) compared to female (7%) [4]. Teachers are highly respected in the communities as they influence the evolution for each aspect of life. Majority of the people believe that tobacco consumption is a wasting of money and hazardous to health [5]. Teachers and administrators are role models for students, conveyors of tobacco prevention curricula, and key opinion leaders for school tobacco control policies. School teachers and administrators have daily interaction with students and thus represent an influential group for tobacco control [6]. Previous research reported tobacco consumption habit to be associated with socio-demographic variables such as age, education level, income and marital status [7-11]. Age, gender and household assets are identified predictors for tobacco use [7, 10, 11].

Tobacco consumption in school is an important matter for investigation due to its association with smoking habit among school teachers and students. Smoking habit among teachers affects students' attitude regarding smoking [12], leads to perceive smoking as positive and acceptable, later develop personal belief and subjective norms and eventually intention to take up the habit [13]. Teachers' smoking behaviour also increases risk of smoking among adolescents especially their students by 2.51 times [14]. Despite health promotions being carried out, there is still a rise of smoking in Bangladesh, especially among the youths. It is crucial for the country to take prompt actions to ensure healthy behaviours among school personnel. A study is, therefore, needed to understand the magnitude and factors influencing the smoking behaviour among the school personnel, in order to plan for more effective strategies and interventions to curb this social issue.

METHODOLOGY

Study design and sampling procedure: This was a school-based cross-sectional study based on framework of the Global Youth Tobacco Survey (GYTS) 2007; Bangladesh [4] designed and conducted by the World Health Organization (WHO) and Centers for Disease Control (CDC). A multistage cluster sampling technique was adopted to select 30 districts using probability proportional to enrolment (PPE), i.e. schools with high number of students were more likely to be selected than schools with small number of students. In the second stage, all the schools in the district were divided into government and non government, and one school from each district was selected randomly. All the available teachers at the day of the survey were included in the sample.

Instruments development and data collection procedure: The questionnaire consisted of a "core" component adapted from GYTS questionnaire and an "additional" component which included Bangladesh-specific policy options for tobacco free school questions prepared in view of the multiple varieties of tobacco use in Bangladesh. The 66-item questionnaire contained several different sections on demographic data, use of both smoking and non-smoking forms of tobacco, attitude to tobacco use, knowledge of tobacco hazards, and exposures to environmental tobacco smoke (ETS), school curriculum, media advertising and other variables. Each item had a multiple-choice question with a single answer. There was no skip or branching pattern of any question. It was a self-administered questionnaire and all questions were required to be answered. We used Bangla version of questionnaire for field operation. Following the pre-test, some modifications in the order of the questions and terminology were made in the final questionnaire. A questionnaire development workshop was conducted to finalize the questionnaire. Data were collected by using an anonymous self-administered questionnaire. Informed verbal consent from the school authority was obtained after explaining the purpose of the study. The questionnaire was distributed to the teachers after explaining the purpose of the study and the instructions to fill in the questionnaire. Teachers were assured that the information they provided would remain confidential and were encouraged to be truthful in their responses. They were informed that their participation was voluntary and they could withdraw from the study at any time. The study proposal was approved by the Technical Review Committee of the Directorate General of Health Services (DGHS), Bangladesh. The field operation was conducted after obtaining the permission from the Directorate of Secondary and Higher Education, Ministry of Education and of the Headmasters of the selected schools. Ethical clearance was also

taken from Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM), Mohakali, Dhaka-1212.

Data analysis: The data entry was started simultaneously along with data collection. The survey data were checked, verified and then entered into the computer using MS Access 2007. Incomplete and inconsistent data were discarded and were not included for final analysis. Finally, data of 559 respondents were used for analysis. Data analyses were done using SPSS version 17 software (Statistical Package for Social Sciences). Simple frequencies, bi-variate, multivariate analyses were done as appropriate. Statistical significance was tested at 5% probability level.

RESULTS

Socio-demographic characteristics: A total of 559 teachers participated in the study. The mean age of the teachers was 39.1 (95% CI 38.4, 39.9) years. Majority of the teachers were male (70%) while the remaining 30% were female. Majority of the teachers participated in the study were assistant teachers (89%). More than half of the teachers had Masters degree (53.8%) followed by graduate (34.4%). Very few teachers had higher secondary level of education. The median monthly family expenditure was Taka 12000 (95% CI: 10525.6, 12000). The mean family size of the teachers was 5.14 (95% CI: 4.9, 5.3). More than half of the teacher's house were built on Tin (56.8%) followed by concrete (41.2%). More than half of the teachers from government school (57.8%) and the rest were from private school (42.2%) (Table 1).

Table 1 Socio-demographic characteristics of the teachers

Characteristics	No.	%	95% CI
Age in years			
<30	63	11.3	8.8, 14.0
30-39	236	42.4	38.5, 46.4
40-49	176	31.7	27.7, 35.6
≥50	81	14.6	11.7, 17.6
Mean (95%CI)	39.13 (38.4, 39.9) years		
Sex			
Male	390	70.1	66.2, 73.7
Female	166	29.9	26.3, 33.8
Designation			
Head and others	61	11.0	8.3, 13.8
Assistant teacher	495	89.0	86.2, 91.7
Academic qualifications			
Higher secondary	31	5.6	3.8, 7.7
Graduate	191	34.4	30.2, 38.3
Masters	299	53.8	49.5, 58.1
Others	35	6.3	4.3, 8.3
Monthly expenditure			
≤5000	59	10.6	8.1, 13.1
5001-10000	190	34.2	30.0, 38.5
10001-15000	176	31.7	27.5, 36.0
≥15001	131	23.6	20.0, 27.2
Median (95%CI)	Tk. 12000.0 (10525.6, 12000.0)		
Family size			
1-3	93	16.7	13.8, 20.0
4-5	291	52.3	48.2, 56.7
≥6	172	30.9	27.3, 34.7
Mean (95%CI)	5.14 (4.9, 5.3)		
Construction materials			
Straw	11	2.0	0.9, 3.2
Tin	316	56.8	52.5, 61.0

Concrete	229	41.2	37.1, 45.7
Type of school			
Government	323	57.8	53.6, 62.1
Private	236	42.2	37.9, 46.4

Smoking status and its pattern: The prevalence of current smoking among teachers was 17% (95% CI: 14%, 20.4%). Half of the teachers smoked daily (48.4%). One fourth of them smoked 1 to 2 days in last month (25.3%). One third (34.7%) of the respondents smoked 2 to 5 sticks per day followed by 6 to 10 sticks per day (20%). However, 5.3% teachers smoked more than 20 sticks per day. Most of the teachers collected cigarette from shop or street hawkers (78.9%). The mean duration of smoking was 13.7 years (95% CI: 11.6, 15.9) (Table 2).

Table 2 Smoking behaviour and its pattern

Variables	No.	%	95% CI
Smoking			
No	464	83.0	(79.6, 86.0)
Yes	95	17.0	(14.0, 20.4)
Smoking in last 30 days			
1-2 days	24	25.3	(16.8, 33.7)
3-5 days	7	7.4	(3.2, 12.6)
6-9 days	6	6.3	(2.1, 11.6)
10-19 days	9	9.5	(4.2, 15.8)
20-29	3	3.2	(0.0, 7.4)
30 days	46	48.4	(37.9, 58.9)
Frequency of smoking			
Less than one per day	17	17.9	(10.5, 25.3)
One cigarette per day	12	12.6	(6.3, 20.0)
2-5 sticks/day	33	34.7	(25.3, 44.2)
6-10 sticks/day	19	20.0	(12.6, 28.4)
11-20 sticks /day	9	9.5	(4.2, 15.8)
>20 sticks/day	5	5.3	(1.1, 9.5)
Where from cigarette was collected			
Shop, store or hawker	75	78.9	(70.5, 86.3)
Gave someone else money to buy them for me	4	4.2	(1.1, 8.4)
Borrowed them from someone else	6	6.3	(2.1, 11.6)
Got them some other way	10	10.5	(5.3, 16.8)
Duration of smoking (years)			
<10	33	34.7	(25.3, 44.2)
10-19	35	36.8	(27.4, 46.3)
≥20	27	28.4	(20.0, 37.9)
Mean (95% CI) years	13.7 (11.6, 15.9)		

Exposure to second hand smoking: Several environmental factors were found to influence smoking behavior among the teachers. From the study, 16.1% of the teachers reported having at least one member who was a smoker and about three fourth (73.4%) of the teachers reported that their colleagues or friends are smokers. During seven days prior to the study, about one third (36.2%) of the teachers reportedly seeing more than one person smoked in front of them at home and equal percentage had smoked in school. However, 80% of the teachers had seen at least one person smoking in the public places (Table 3).

Table 3 Environmental smoking or second-hand smoking

Variables	No.	%	95% CI
Smoking by family members			
None	469	83.9	(80.9, 86.9)
Parents	6	1.1	(0.4, 2.0)
Father	70	12.5	(9.8, 15.2)
Mother	4	0.7	(0.2, 1.4)
Spouse	10	1.8	(0.7, 3.0)
Smoking by friends			
None	148	26.6	(22.8, 30.3)
Someone	364	65.4	(61.2, 69.5)
Majority	38	6.8	(4.8, 9.0)
All	7	1.3	(0.5, 2.2)
Smoking at house in last 7 days			
None	352	63.8	(59.6, 67.6)
1-2	138	25.0	(21.4, 28.8)
3-4	26	4.7	(3.1, 6.5)
5-6	11	2.0	(0.9, 3.1)
7 and above	25	4.5	(2.9, 6.3)
Smoking at school in last 7 days			
None	372	67.1	(63.2, 70.8)
1-2	141	25.5	(22.0, 29.2)
3-4	34	6.1	(4.2, 8.3)
5-6	3	0.5	(0.0, 1.3)
7 and above	4	0.7	(0.2, 1.4)
Smoking at public places in last 7 days			
None	111	20.1	(16.8, 23.5)
1-2	203	36.7	(32.7, 40.9)
3-4	72	13.0	(10.1, 15.9)
5-6	36	6.5	(4.3, 8.7)
7 and above	131	23.7	(20.4, 27.3)

Logistic regression analysis of smoking status and selected independent variables: To identify the factors influencing smoking, a logistic regression model was fitted with smoking status (dichotomous) being the dependent variable, and the selected independent variables on socio-demographic characteristics, environmental variables which have shown statistical significance in the chi-square analyses. Although several factors were significantly associated with smoking status in bivariate analysis, in logistic analysis, only sex, smoking by friends and academic qualifications appeared to be important predictors of smoking ($p<0.05$). Results showed that male teachers smoke 37.46(95% CI: 5.078, 276.432) times higher than their female counterparts. The graduate teachers were 2.179(95% CI: 1.209, 3.926) times more likely to be smoke than the master's degree holder teachers. Smoking by friends appeared to be the strongest predictor for teachers smoking behaviour (OR 4.789, 95% CI: 1.757, 13.050). However, no statistically significant association was found between type of school, second-hand smoking and curriculum related factors and smoking behaviour of the teachers ($p>0.05$) (Table-4).

Table 4 Factors influencing the smoking by teachers: Logistic analysis

Variables	β	Odds ratio	95% CI
Sex			
Male	3.623	37.467***	(5.078, 276.432)
Female (RC)	-	-	-
Designation			

Head and others	0.412	1.511	(0.735, 3.104)
Assistant teacher (RC)	-	-	-
Type of school			
Government	0.135	1.144	(0.641, 2.043)
Private(RC)	-	-	-
Smoking by friends			
Yes	1.566	4.789**	(1.757, 13.050)
No RC)	-	-	-
Smoking at school in last 7 days			
No (RC)	-	-	-
Yes	-0.243	0.784	(0.453, 1.356)
Smoking at public places in last 7 days			
Yes	0.153	1.166	(0.531, 2.561)
No (RC)	-	-	-
Smoking by colleagues			
Yes	0.298	1.347	(0.790, 2.297)
No(RC)	-	-	-
Academic qualifications			
Secondary	0.250	1.285	(0.550, 2.998)
Graduate	0.779	2.179*	(1.209, 3.926)
Masters (RC)	-	-	-
Constant	-6.665	0.001	
Chi square		89.727	
df		9	
n		556	
p value		0.001	

*p<0.05; **p<0.01; ***p<0.001
Smoking as dependent variable

DISCUSSION

In our study, the prevalence of smoking among secondary school teachers in Bangladesh was 17%. The finding is lower compared to other studies in school personnel [1, 4, 5,7 15, 16]. Gender is a statistically significant predictor for smoking among the school teacher in this study. Result showed that male was 37.46 times more likely to smoke than female. This finding is consistent with other findings of high proportion of male tobacco user [1, 4, 5, 7, 9, 10, 16]. There are less female smokers than males, especially in developing countries, probably related to the social norm that has been long formed in many societies. This may because many females smoke to control weight, and found difficult for them to quit smoking due to weight gain upon quitting [17]. A lower prevalence of cigarette smoking among female may not be reflective of their prevalence on tobacco-related deaths. Previous study reported the prevalence of cigarettes smoking among females, but most Bangladeshi women who use tobacco would use it in a smokeless form [18]. This study shows that smoking teachers were significantly more likely to have smokers as their friends. Colleagues or friends who are smokers increased risk of smoking by 4.79 times. Having peers who smoked is one of the most dominant environmental factors of smoking for its potential effects of role model [12, 14, 19]. Actually smoking started during adolescence due to peer influences. Wang *et al.,* (1995) reported that peer influence, such as the smoking status of best male/female friends, proved to be the most significant and consistent predictor across all ages, while parental influence had little effect on adolescent smoking status. Gender-specific effects were noted in the peer influence of adolescent smoking [20]. Cigarette smoking is prevalent among school personnel in Bangladesh. In view of the long term effects of smoking on the health and socio-economic development of the country, there is a need of public health interventions, with special attention to the determinants of their smoking behaviour. Obviously, it is important to involve the teachers in smoking prevention program in school to increase their awareness on hazardous smoking as well to discourage them to smoke in school places. Legislation enforcement on smoking prevention in school should be emphasized. Restriction of smoking in school will give protective effect on smoking uptake among school personnel and students and therefore reduce the exposure and prevalence of smoking [13,14].

However, the study is not without limitation. Even though anonymity was emphasized and effort has been made to assure the teachers that their responses would be confidential, the possibility remains that some teachers may have under-reported their smoking status.

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REFERENCES

1. World Health Organization (2009). WHO report on the global tobacco epidemic. Available at http://www.who.int/tobacco/mpower/en/index.html [Accessed November 1, 2010].
2. Ministry of Health and Family Welfare. Global adult tobacco survey: Bangladesh report 2009. New Delhi, 2009. h*ttp://www.searo.who.int/LinkFiles/Regional_ Tobacco_ Surveillance_System_GATSBAN_FullReport2009.pdf]*.
3. World Health Organization (2007). Impact of tobacco-related illnesses in Bangladesh. Available at http://www.searo.who.int/LinkFiles/Tobacco_Free_Initiative_Health_Cost bangladesh.pdf [Accessed November 1, 2010].
4. World Health Organization (2008). Report on Global Youth Tobacco Survey (GYTS) and Global School Personnel Survey (GSPS) in Bangladesh. Available at http://www.searo.who.int/LinkFiles/GYTS_BAN2007.pdf [Accessed November 1, 2010]
5. Sah, 2007, Sah, S.K. (2007). A study on patterns of tobacco use among school teachers in Mahottary district of Nepal. *Journal of Nepal Health Research Council*, 5(1), 44-49. Available at http://www.jnhrc.com.np/files/2007/1/8.pdf [Accessed November 4, 2010].
6. The GTSS Collaborative Group, Tobacco Control 2006;15(Suppl II):ii20–ii30. doi: 10.1136/tc.2006.015693, Available at http://tobaccocontrol.bmj.com/ content/15/suppl_2/ii20.pdf.[Accessed February 3, 2011].
7. Choudhury, K., Hanifi, S.M.A., Mahmood, S.S. & Bhuiya, A. (2007). Sociodemographic Characteristics of Tobacco Consumers in a Rural Area of Bangladesh. *Journal of Health, population and Nutrition*, 25(4), 456-464. Available at http://www.icddrb.org/ uploads/originaluploads/jhpn254_Sociodemographic.pdf [Accessed November 1, 2010]
8. Djibuti, M., Gotsadze, G., Mataradze, G. & Zoidze, A. (2007). Influence of household demographic and socio-economic factors on household expenditure on tobacco in six New Independent States. *BMC Public Health*, 7(222). Available at http://www.ncbi.nlm.nih.gov/ pmc/articles/PMC2031901/pdf/1471-2458-7-222.pdf [Accessed November 6, 2010]
9. Siziya, S., Ntata, P.R.T., Rudatsikira, E., Makupe, C.M., Umar, E. & Muula, A.S. (2007). Sex differences in prevalence rates and predictors of cigarette smoking among in-school adolescents in Kilimanjaro, Tanzania. *Tanzania Health Research Bulletin*, 9(3), 190-195. Available at http://www.bioline.org.br/pdf?rb07033 [Accessed November 4, 2010].
10. Sreeramareddy, C.T., Kishore, P.V., Paudel, J. & Menezes, R.G. (2008). Prevalence and correlates of tobacco use amongst junior collegiates in twin cities of western Nepal- A cross-sectional, questionnaire-based survey. *BMC Public Health*. Available at http://www.biomedcentral.com/1471-2458/8/97 [Accessed November 7, 2010].
11. Yang, T., Li, F., Yang, X., Wu, Z., Feng, X., Wang, Y., Wang, X. & Abdullah, A.S.M. (2008). Smoking patterns and sociodemographic factors associated with tobacco use among Chinese rural male residents: A descriptive analysis. *BMC Public Health*. Available at http://www.biomedcentral.com/content/pdf/1471-2458-8-248.pdf [Accessed November 1, 2010].
12. Mohammed, H.R.A, Newman, I.M & Tayeh, R. (2006). Sheesa smoking among sample future teachers in Kuwait. *Kuwait Medical Journal,* 38(2), 107-113. Available at http://www.kma.org.kw/KMJ/Issues/June2006/Original%20Article/97-04%20Sheesha%20Smoking.pdf [Accessed February 17, 2011]
13. Poulsen, L.H., Osler, M., Roberts, C., Due, P., Damsgaard, M.T. & Holstein, B.E. (2002). Exposure to teachers smoking and adolescents smoking behavior- An analysis of cross sectional data from Denmark. *Tobacco Control*, 11, 246-251. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/ PMC1759003/pdf/v011p00246.pdf [Accessed February 17, 2011]

14. Zhang, L., Wang, W., Zhao, Q. & Vartiainen, E. (2000). Psychosocial predictors of smoking among secondary school students in Henan, China. *Health Education Research,* 15 (4), 415-422. Available at http://her.oxfordjournals.org/content/15/4/415.full.pdf [Accessed February 17, 2011]
15. Rani M, Bonu S, Jha P, Nguyen SN, Jamjour L. (2003). Tobacco use in India: Prevalence and predictors of smoking and chewing in a national cross sectional household survey. *Tob Control* 2003;12:e4. Available at http://tobaccocontrol.bmj.com/content/12/4/e4.full [Accessed February 24 2011]
16. Sinha, D.N. (2006). India Global School Personnel Survey (GSPS): Fact Sheet. *World Health Organization*. Retrieved from: http://www.searo.who.int/ [Accessed on 19th October 2010]
17. WHO. (2003). Gender, Health and Tobacco. *World Health Organization*. Retrieved from: http://www.who.int/gender/documents/Gender_Tobacco_2.pdf [Accessed on 19th October 2010]
18. Gupta, P.C. & Ray, C.S. (2003). Smokeless tobacco and health in India and South Asia. *Respirology*, *8,* 419–431.
19. Marcinkova, D., Majdan, M., Gergelova, P., Rusnak, M., Pekarcikova, J. & Baska, T. (2009). Socioeconomic predictors of smoking behavior among school-aged children, in the Slovakia. Bratisl Lek Listy, 110(6), 345-349. Available at http://www.bmj.sk/2009/11006-05.pdf [Accessed February 20, 2011]
20. Wang, M.Q., Fitzhugh, E.C*, & Westerfield, R.C., Eddy, J.M. (1995). Family and peer influences on smoking behavior among American adolescents: An age trend. Journal of Adolescent Health, 16, 3, 200-203. Available at https://libres.uncg.edu/ir/*uncg/f/J_Eddy_Family_1995.pdf. [Accessed February 24 2011].*