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Original Research Article

Factors associated with knowledge about the health effects of exposure to secondhand smoke among youth in Bangladesh

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ABSTRACT

Background: Despite the high prevalence of secondhand smoke exposure among Bangladeshi adults, little is known about the knowledge regarding the health effects of exposure to secondhand smoke among the youth aged 15-24 years in Bangladesh. Against this background, the present study was conducted among the youth in Bangladesh to ascertain their levels of knowledge regarding health effects of secondhand smoke and its associated factors.
Methods: This was a cross-sectional study of 656 respondents between the age of 15-24 years old selected by multistage cluster sampling. This study was conducted in Dhaka Division, Bangladesh. Data was analyzed using Chi square testing and multivariate logistic regression.
Results: The proportion of good, average and poor knowledge scores among respondents were 30.5%, 50.0% and 19.5% respectively. Age and education were significant independent predictors of good knowledge. Furthermore, education and gender were tended as independent predictor of average knowledge. OR for age: 1.12 (95% CI: 1.01 to 1.25); OR for education: 1.27 (95% CI: 1.15 to 1.40).
Conclusions: Overall, the results of this study found that less than one-third of the youth had a good level of knowledge on secondhand smoke health effects. The government needs to focus more on less-educated individuals and adolescents if a successful policy is to be implemented.

Keywords: Knowledge, Secondhand smoke, Youth, Bangladesh

INTRODUCTION

Tobacco use contributes to more than 8 million deaths every year.[1] However, the association of tobacco smoking and health are not limited to those who smoke, tobacco also affects the people who are exposed to secondhand smoking.[2] Secondhand smoke (SHS) is formed from the burning of cigarettes and from smoke exhaled by the smoker.[3] Each year, exposure to SHS is responsible for approximately 0.8 million deaths and 10·9 million disability-adjusted life years (DALYs) lost worldwide.[4] Secondhand smoking has been recognized to cause potential health ailments in adults such as cardiovascular problems, chronic obstructive pulmonary disease and cancer.[5-7] Children exposed to SHS are at an increased risk of sudden infant death syndrome, acute respiratory infections, middle ear disease, and asthma.[2] Some studies show that, there is a direct proportional relationship between low birth weight in infants and mothers exposed to second hand smoking.[8] Considering the undesirable realities of SHS, the Bangladesh government has introduced an anti-smoking policy with the aim of reducing the number of people exposed to SHS.[9] In spite of policy makers' efforts to curb SHS, people are still not well protected from tobacco smoke air pollution. A report shows that at least 42.7% and 39.0% of adults are exposed to second-hand smoke in enclosed areas at their workplaces and homes respectively.[10] Moreover, more than half (51.4%) of adults breathe in tobacco smoke either at public places or when they use public transport.[10] A lack

of knowledge about the dangers of SHS exposure may be one of the reasons behind these alarming facts and figures. People's knowledge about the hazards of SHS is a fundamental factor in reducing SHS exposure.[11] Furthermore, besides many other factors, knowledge attainment is an imperative step in the process of health behavior change.[12] Despite the high prevalence of SHS exposure among Bangladeshi adults, little is known about the knowledge regarding the health effects of exposure to SHS among youth aged 15-24 years in Bangladesh. To fill the gap, this study was designed to assess levels of knowledge regarding health effects of SHS and its associated factors among youth in Dhaka division, Bangladesh.

METHODS

Study design and participants

This community-based, cross-sectional study was conducted in Dhaka division, Bangladesh. Dhaka is one of the 8 divisions in Bangladesh, located in central Bangladesh, it comprises thirteen districts and 88 subdistricts. All the households in aforementioned areas were the source population of the study. Individuals aged 15-24 years were included in the study. The sampling units were households, while the study units were youth individuals available in the household during the interview. If there were more than one eligible member within a household, one respondent was selected randomly by lottery.

Sample size determination

Sample size was calculated based on the prevalence of adults exposed to SHS at any public places from the following assumptions: p=45% which is the prevalence of adults exposed to tobacco smoke at any public places in Bangladesh.[13] Z (1.96) is the value under standard normal table for confidence level of 95%, margin of error (d)= 5%, and using the formula for estimation of single population proportions,

$$N = \frac{Z^2 P(1-P)}{d^2} = 570$$

with design effect= 1.5 and adding a nonresponse rate of 15%, the final sample size became 656 youths, where N is the required sample of the study.

Sampling procedure

Multi-stage cluster sampling was used to choose 656 households: 394 from rural areas, 262 from district towns (urban areas) (rural: urban= 60:40). Accordingly, two districts were randomly selected from the list of 13 districts of Dhaka division. Secondly, from each of the selected districts one Upazila (subdistrict) was randomly selected to be included in the study, with further random selection used to identify one village within each Upazila for data collection. Selected villages represented the rural community and each village was considered a cluster. All households in the villages were included in the study. The district headquarters of the two selected districts constituted the urban areas. In the urban areas, wards (lowest unit of the city corporation) served as clusters and one ward was selected randomly from each district headquarters. The sample size was divided according to the proportionate distribution of population at each district. Households were selected using systematic random sampling from a complete household listing.

Study variables and instruments

Data were collected from the respondent through a pre-designed semi-structured questionnaire. Knowledge about health effects of exposure to SHS was assessed by 16 statements on a 5-point Likert Scale. To measure knowledge of the health effects of SHS exposure, respondents were asked: based on what you know, does passive smoking affects the health of adults/children …? Respondents were then read a list of eight health effects in adults (breathlessness, cough, cancer, asthma, stroke, chest infections, physically unfit adults, heart attack) and eight health effects in children (low birth weight, breathlessness, cough, chest infections, physically unfit children, cancer, otitis media). For each statement, strongly agree and agreed responses were recorded into a 'yes' response, and neutral, disagree, and strongly disagree responses were recorded into a 'no' response. Each corrected answer was allocated 1 point, giving a total score of 16 points. The total score for knowledge was classified as follows- (a) Good knowledge= score >70% of knowledge items correctly; (b) Average knowledge= score 50-70% of knowledge items correctly; and (c) Poor knowledge= score <50% of knowledge items correctly.[14]

Statistical methods

Data were analyzed using SPSS version 23 statistical package software (SPSS Inc., Chicago, IL). Descriptive statistics like frequencies and proportions were used to summarize the data. The association of knowledge level (dependent variable) with the independent variables including sociodemographic and smoking status were analyzed using a chi-squared test. Multinomial logistic regression was carried out to analyze the independent factors of 'good' and 'average' knowledge; results are presented as odds ratio (OR) with 95% confidence interval (95% CI). Statistical significance was set at p values of less than 0.05.

RESULTS

The characteristics of all the respondents including socio-demographic and smoking, categorized by gender, are shown in Table 1. According to the descriptive analysis, the mean (SD) score of knowledge about the health effects of exposure to SHS of the respondents were 9.6 (3.4). Out of 656 respondents, there were 50.0% within the average

knowledge range, whereas 30.5% and 19.5% showed good and poor knowledge respectively.

In cross tabulating knowledge level and participants characteristics, there were significant associations between level of knowledge and the age (p=0.038), gender (p=0.031), education (p≤0.001), place of residence (p=0.005), income (p=0.025) and occupation (<0.001).

No significant association of knowledge score was observed with the smoking status (p=0.095), or amount of smoking (p=0.893) (Table 2).

The significantly associated variables were entered in a multivariate logistic regression analysis to further investigate their independent relationships with good and average knowledge. Results of the analysis are presented in Table 3. In model 1, age and education, were significant independent predictors of good knowledge. OR for age: 1.12 (95% CI: 1.01 to 1.25); OR for education: 1.27 (95% CI: 1.15 to 1.40). In the second model education and gender were tended as independent predictor of average knowledge, OR for education: 1.18 (95% CI: 1.08 to 1.30); OR for gender: 1.73 (95% CI: 1.06 to 2.83). Age did not play any significant role in this model.

Table 1: Characteristics of the study participants categorized by gender (N=656).

Variables	Male N (%)	Female N (%)
	N=508	N=148
Age categories (years)		
Mean (SD)	18.6 (3.0)	18.3 (3.1)
15-19	327 (64.4)	97 (65.5)
20-24	181 (35.6)	51 (34.5)
Place of residence		
Rural	300 (59.1)	94 (63.5)
Urban	208 (40.9)	54 (36.5)
Educational status		
Illiterate	11 (2.2)	3 (2.0)
Primary to 8th grade	106 (20.9)	40 (27.0)
Secondary to higher secondary	293 (57.7)	82 (55.4)
Graduate and above	98 (19.3)	23 (15.5)
Occupation		
Student	359 (70.7)	88 (59.5)
Other than student	149 (29.3)	60 (40.5)
Monthly household income (in BDT)		
≤7500 (≤ 89 USD)	103 (20.3)	34 (23.0)
7501-12000 (89 to 142 USD)	140 (27.6)	46 (31.1)
12001-20000 (142 to 236 USD)	144 (28.3)	36 (24.3)
>20000 (>236 USD)	121 (23.8)	32 (21.6)
Family type		
Nuclear	417 (82.1)	109 (73.6)
Joint	91 (17.9)	39 (26.4)
Smoking status		
Current smokers	201 (39.6)	-
Non-smokers	307 (60.4)	148 (100.0)
Daily cigarettes (among smokers)		
0-3 cig	64 (31.8)	-
4-10 cig	89 (44.3)	-
11-30 cig	48 (23.9)	-

Results are expressed as number (%) and mean±SD; 1 US$= 84.7 Bangladeshi Taka (BDT).

Table 2: Summary results of χ2 analysis between level of total knowledge vs participants characteristics (N=656).

Factors	SHS knowledge level			P value
	Good	Average	Poor	
	N (%)	N (%)	N (%)	
Age of the respondent (years)				
15-19	117 (27.6)	227 (53.5)	80 (18.9)	0.038
20-24	83 (35.8)	101 (43.5)	48 (20.7)	

Continued.

Factors	SHS knowledge level			P value
	Good	Average	Poor	
	N (%)	N (%)	N (%)	
Gender				
Male	158 (31.1)	262 (51.6)	88 (17.3)	0.031
Female	42 (28.4)	66 (44.6)	40 (27.0)	
Place of residence				
Rural	129 (32.7)	177 (44.9)	88 (22.3)	0.005
urban	71 (27.1)	151 (57.6)	40 (15.3)	
Educational status*				
Illiterate	1 (7.1)	1 (7.1)	12 (85.7)	< 0.001
Primary to 8th grade	30 (20.5)	64 (43.8)	52 (35.6)	
Secondary to higher secondary	118 (31.5)	200 (53.3)	57 (15.2)	
Graduate and above	51 (42.1)	63 (52.1)	7 (5.8)	
Occupation				
Student	140 (31.3)	251 (56.2)	56 (12.5)	< 0.001
Other than student	60 (28.7)	77 (36.8)	72 (34.4)	
Monthly household income (in BDT)				
≤7500 (≤ 89 USD)	36 (26.3)	66 (48.2)	35 (25.5)	0.025
7501-12000 (89 to 142 USD)	61 (32.8)	81 (43.5)	44 (23.7)	
12001-20000 (142 to 236 USD)	59 (32.8)	91 (50.6)	30 (16.7)	
>20000 (>236 USD)	44 (28.8)	90 (58.8)	19 (12.4)	
Family type				
Nuclear	158 (30.0)	267 (50.8)	101 (19.2)	0.735
Joint	42 (32.3)	61 (46.9)	27 (20.8)	
Smoking status				
Non-smokers	127 (27.9)	237 (52.1)	91 (20.0)	0.095
Current smokers	73 (36.3)	91 (45.3)	37 (18.4)	
Daily cigarettes (among smokers)				
0-3 cig	26 (40.6)	27 (42.2)	11 (17.2)	0.893
4-10 cig	29 (32.6)	43 (48.3)	17 (19.1)	
11-30 cig	18 (37.5)	21 (43.8)	9 (18.8)	

Note: The knowledge level of good for *Educational status were clubbed together with average knowledge while performing χ2test.

Table 3: Multinomial logistic regression for estimating the odds ratio and 95% confidence interval for good and average knowledge (with poor knowledge as the reference category) by the selected factors.

Level of knowledge	Independent variables	ß	Sig.	Odds ratio	95% CI for EXP(ß)	
					Lower	Upper
Good	**Age in years**	0. 117	0.027	1.124	1.014	1.247
	Habitat					
	Urban	0.038	0.896	1.039	0.583	1.851
	Rural	Reference				
	Gender					
	Male	0.462	0.097	1.587	0.920	2.737
	Female	Reference				
	Education	0. 237	0.000	1.268	1.152	1.395
	Occupation					
	Student	0.614	0.122	1.847	0.848	4.022
	Other occupation	Reference				
	Monthly income (in BDT)					
	>20000 (>236 USD)	0.235	0.577	1.265	0.554	2.887
	12001-20000 (142 to 236 USD)	0.384	0.295	1.468	0.715	3.012
	7501-12000 (89 to 142 USD)	0.296	0.372	1.345	0.702	2.578
	≤7500 (≤89 USD)	Reference				
Average	**Age (years)**	-0.001	0.983	0.999	0.908	1.099
	Habitat					
	Urban	0.453	0.091	1.573	0.930	2.660

Continued.

Level of knowledge	Independent variables	ß	Sig.	Odds ratio	95% CI for EXP(ß)	
					Lower	Upper
	Rural	Reference				
	Gender					
	Male	0.548	0.029	1.730	1.057	2.832
	Female	Reference				
	Education	0.167	0.000	1.182	1.084	1.290
	Occupation					
	Student	0.690	0.060	1.993	0.972	4.086
	Other occupation	Reference				
	Monthly income (in BDT)					
	>20000 (> 236 USD)	0.247	0.515	1.280	0.609	2.691
	12001-20000 (142 to 236 USD)	0.068	0.837	1.071	0.558	2.055
	7501-12000 (89 to 142 USD)	-0.005	0.987	0.995	0.553	1.790
	≤7500 (≤89 USD)	Reference				

Note: ß for standardized regression coefficient. Level of knowledge was taken as dependent variable whereas other variables were taken as independent variables.

DISCUSSION

The current study was designed to examine factors associated with knowledge about the health effects of exposure to SHS among the youth in Bangladesh. Nearly one third (30.5%) and half (50.0%) of the participants had a good and average level of knowledge on health effects of exposure to SHS respectively. After adjusting for confounders, correlates of a good level of knowledge included age and high educational level.

High educational level was also identified as a correlate of average level of knowledge with male gender. In addition, the present study makes an attempt to investigate whether smoking is related to second-hand smoke knowledge. The findings contradict the popular assumption that smokers are less acquainted with the effects of second-hand smoke than the non-smokers. Results of the study revealed that half of the participants had average knowledge about health effects of exposure to SHS. This finding is consistent with another study from Bangladesh that reported a medium level of knowledge of the study participants.[15] Furthermore, nearly one third (30.5%) of participants had good knowledge which is slightly higher (20.2%) than the aforementioned study.[15] On the contrary, Sun et al in Mauritius reported that less than two thirds of the participants (63.2%) had good knowledge of SHS.[16] Possible reasons that can be attributed to this difference of response are demographic variation of the study population and study tools.

In this study, education has been identified as determinant of both good and average knowledge, given that well-educated individuals are more likely to be acquainted of the health effects of SHS than less-educated individuals. This finding is consistent with other study conducted in Jordan.[17] Similar findings were evidenced by previous studies that focused on awareness of diseases.[18,19] It is accepted that people with higher education level might have a higher health knowledge which makes them easily understand health information. Age has also been identified as determinant of good knowledge. This result is in line with a study conducted among non-smoking pregnant women living in Vietnam.[20] This finding could be explained by the fact that elder participants have better understanding than youngsters. Therefore, in general, younger participants tend to find it difficult to understand the adverse health impacts of SHS on people. Moreover, as age increases, theoretical knowledge by the individuals also increases.

Gender was significantly associated with average knowledge towards SHS health effects. Males significantly had more average level of knowledge compared to females. Similar results have been reported by Sim et al in South Korea where men were more knowledgeable about harmful effects of SHS.[21] This finding is, however, at variance with another study done among hospital staff in a medical institution in South Korea, where females are more knowledgeable than males.[22] The different finding could be because of the different study population. Interestingly males have a higher tendency to smoke cigarette than female although they have the more knowledge level towards secondhand smoke health risk. In fact, all surveyed females in the present study were non-smokers. In this study levels of knowledge about SHS were not impacted by smoking status. This could be explained by the fact that there are factors other than knowledge about SHS health effects that cause smokers to smoke. Nonetheless, this finding is similar to what is obtainable in a previous study.[23] However, this assertion should be done with caution since this study did not assess a causal relationship between smoking status and knowledge about SHS health effects.

Limitations

This study had some limitations. Firstly, it was conducted in one division in the country, thus the results may not be applicable to other parts of the country. Secondly, the data was obtained by cross-sectional study design, and therefore, cause and effect relationships cannot be

established. However, efforts were made to design the study such that the participants may serve as much as the representatives of the study population as possible. This was achieved by employing probability sampling and reaching out to reasonable number of respondents.

CONCLUSION

The study concluded that less than one-third of the youth had a good level of knowledge on SHS health effects. The education level and age of the respondents were significant predictors of good knowledge. Therefore, to increase the knowledge of SHS, there is a need to actively impart education regarding its health effects among adolescents and less-educated individuals.

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REFERENCES

1. WHO. Tobacco: fact Sheet, 2020. Available at: https://www.who.int/newsroom/factsheets/detail/tobacco. Accessed on 10 May 2021.
2. Yousuf H, Hofstra M, Tijssen J, Leenen B, Lindemans JW, Rossum A, et al. Estimated Worldwide Mortality Attributed to Secondhand Tobacco Smoke Exposure, 1990-2016. JAMA Netw Open. 2020;3(3):201177.
3. Lu L, Mackay DF, Pell JP. Secondhand smoke exposure and risk of incident peripheral arterial disease and mortality: a Scotland-wide retrospective cohort study of 4045 non-smokers with cotinine measurement. BMC Public Health. 2018;18(1):348.
4. Mdege N, Fairhurst C, Ferdous T, Hewitt C, Huque R, Jackson C, et al. Muslim Communities Learning About Second-hand Smoke in Bangladesh (MCLASS II): study protocol for a cluster randomised controlled trial of a community-based smoke-free homes intervention, with or without Indoor Air Quality feedback. Trials. 2019;20(1):11.
5. Raupach T, Schafer K, Konstantinides S, Andreas S. Secondhand smoke as an acute threat for the cardiovascular system: a change in paradigm. Eur Heart J. 2006;27(4):386-92.
6. Jordan RE, Cheng KK, Miller MR, Adab P. Passive smoking and chronic obstructive pulmonary disease: cross-sectional analysis of data from the Health Survey for England. BMJ Open. 2011;1(2):153.
7. Kim AS, Ko HJ, Kwon JH, Lee JM. Exposure to Secondhand Smoke and Risk of Cancer in Never Smokers: A Meta-Analysis of Epidemiologic Studies. Int J Environ Res Public Health. 2018;15(9):1981.
8. Nadhiroh SR, Djokosujono K, Utari DM. The association between secondhand smoke exposure and growth outcomes of children: A systematic literature review. Tob Induc Dis. 2020;18:12.
9. Khan A. An Analysis of the Anti-Tobacco Laws in Bangladesh. IJEER. 2018;1-15.
10. Bangladesh Bureau of Statistics and National Tobacco Control Cell. Global Adult Tobacco Survey Bangladesh Report 2017. Dhaka: Bangladesh Bureau of Statistics and National Tobacco Control Cell, 2019. Available at: https://ntcc.gov.bd/ntcc/uploads/editor/files/GATS%20Report%20Final-2017_20%20MB. Accessed on 10 May 2021.
11. Wang CP, Ma SJ, Xu XF, Wang JF, Mei CZ, Yang GH. The prevalence of household second-hand smoke exposure and its correlated factors in six counties of China. Tob Control. 2009;18(2):121-6.
12. Evans KA, Sims M, Judge K, Gilmore A. Assessing the knowledge of the potential harm to others caused by second-hand smoke and its impact on protective behaviours at home. J Public Health. 2012;34(2):183-94.
13. Sinha DN, Palipudi KM, Choudhury SR, Zaman MM, Islam MS, Hassan MA, et al. Global adult tobacco survey: Bangladesh report 2009. Available at: http://rgdoi.net/10.13140/RG.2.1.1075.1526. Accessed on 10 May 2021.
14. Almualm YK, Banafa NS, Hanshi AS. Knowledge, attitude and practice (KAP) about hepatitis B and C among students of Hadhramout University, Al-Mukalla City, Yemen. Acta Sci Med Sci. 2018;2(7):87-95.
15. Rahman M, Hasan SMM, Haque SE, Haque N, Rahman M, Mostofa G, et al. Secondhand smoking, knowledge/attitudes and socioeconomic status among married Bangladeshi women: a cross-sectional study. Sao Paulo Med J. 2019;137(1):13-24.
16. Sun MC, Frederic JDS. Knowledge of secondhand smoke and behaviour towards its exposure among teachers in Mauritius. Tob Prev Cessat. 2020;6:32.
17. Gharaibeh H, Haddad L, Alzyoud S, Shahawy O, Baker NA, Umlauf M. Knowledge, attitudes, and behavior in avoiding secondhand smoke exposure among non-smoking employed women with higher education in Jordan. Int J Environ Res Public Health. 2011;8(11):4207-19.
18. Fatema K, Hossain S, Natasha K, Chowdhury HA, Akter J, Khan T, et al. Knowledge attitude and practice regarding diabetes mellitus among Nondiabetic and diabetic study participants in Bangladesh. BMC Public Health. 2017;17(1):364.
19. Haque MA, Hossain MSN, Chowdhury MAB, Uddin MJ. Factors associated with knowledge and

awareness of HIV/AIDS among married women in Bangladesh: evidence from a nationally representative survey. SAHARA J. 2018;15(1):121-7.
20. Vu GV, Ngo CQ, Phan PT, Doan LPT, Nguyen TT, Nguyen MH, et al. Inadequate Knowledge, Attitude and Practices about Second-Hand Smoke among Non-Smoking Pregnant Women in Urban Vietnam: The Need for Health Literacy Reinforcement. Int J Environ Res Public Health. 2020;17(10):3744.
21. Sim HS, Lee KS, Hong HS, Meng KH. The Awareness and Countermeasures against Harmful Effect of Passive Smoking in Korean Adults. Korean J Prev Med. 2000;33(1):91-8.
22. Lee SR, Cho AR, Lee SY, Cho YH, Park EJ, Kim YJ, et al. Secondhand smoke knowledge, sources of information, and associated factors among hospital staff. PLoS One. 2019;14(1):210981.
23. Alzahrani S. Levels and factors of knowledge about the related health risks of exposure to secondhand smoke among medical students: A cross-sectional study in Jeddah, Saudi Arabia. Tob Induc Dis. 2020;18:1-14.

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