USE OF MORE THAN ONE FORM OF TOBACCO AMONG THOSE FROM A LOW SOCIOECONOMIC BACKGROUND IN BANGLADESH

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Abstract. Tobacco has negative public health consequences. In this study we aimed to determine the prevalence of and factors associated with using more than one form of tobacco among people from a low socioeconomic background in Bangladesh in order to inform tobacco control and prevention programs for this population. Inclusion criteria for study subjects were current tobacco users, aged ≥ 15 years who were able and willing to participate. Study subjects were selected randomly from two industrial areas. An enumeration survey was conducted prior to actual data collection to identify the low income population by sex. Exclusion criteria for study subjects were age >65 years and being a temporary migrant. The number of subjects calculated to be needed for the study was 460. Each subject was asked to complete a semi-structured questionnaire that asked about sociodemographic characteristics, use of tobacco and types and potential associated factors. Descriptive statistics were used to summarize sociodemographic characteristics, a chi-square test and Fisher's exact test were used to determine associations between selected factors and tobacco use and logistic regression analysis was used to identify factors associated with using more than one form of tobacco. A total 460 subjects were included in this study 50% were males. The mean age of study subjects was 43.3 years. The most common occupation was housewives followed by service. Of the 460 subjects, 23% used more than one form of tobacco: 97.1% of them male subjects and 2.9% of female subjects. Use of more than one form of tobacco was significantly (p<0.049) more common among subjects aged <30 years. Significant associations were found between using more than one form of tobacco and no formal education level (p=0.009), marital status (p<0.031), family history of tobacco use (p<0.031) and monthly income (p<0.001). Logistic regression analysis revealed a significant association between being aged <30 years and using more than one form of tobacco [odds ratio (OR)=4.2; 95% confidence interval (CI): 1.53-11.54; p=0.020]. Logistic regression analysis also showed a significance association between having a tobacco related disease and use of more than one form of tobacco (OR=1.7; 95% CI: 1.03-2.82; p=0.040). Younger subjects and those with tobacco associated diseases are more likely to use more than one form of tobacco. Tobacco control programs targeting these groups need to keep this in mind and focus on more than just smoking cessation in this group.

Keywords: tobacco, dual use of tobacco, low-income, socio-economic-status, Bangladesh.

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INTRODUCTION

Use of more than one form of tobacco, usually tobacco smoking and at least one form of smokeless tobacco (SLT) is a public health problem. SLT includes chewing tobacco, dry snuff, moist snuff and e-cigarettes (Tomar *et al*, 2010). This combined use of more than one form of tobacco is a threat to global tobacco control efforts (Fong *et al*, 2006).

Among South and Southeast Asian countrie, Bangladesh has the highest prevalence of multiple forms of tobacco use (8.7%), followed by India (5.3%) and Thailand (3.2%) (Gupta *et al*, 2012). Bangladesh has a high prevalence of tobacco consumption and tobacco-related illnesses (Palipudi *et al*, 2012). Multiple forms of tobacco use increases the risk of oral, pharyngeal, and esophageal cancers (Winn *et al*, 1981). In addition to increasing cancer risk (Znaor *et al*, 2003), multiple forms of tobacco use also is associated with ischemic heart disease in Bangladesh (Teo *et al*, 2006, Rahman and Zaman, 2008). Many multiple forms of tobacco users have greater difficulty quitting tobacco use than single form users (Gupta *et al*, 2012). Disadvantaged and lower income people are more vulnerable to health hazards from tobacco use (Miá *et al*, 2017). Studies of the prevalence of and factors associated with multiple forms of tobacco use among the lower income community in Bangladesh are rare.

In this study, we aimed to evaluate the prevalence of and factors associated with multiple form of tobacco use among subjects from a low socioeconomic background in Bangladesh in order to inform tobacco control and prevention efforts.

MATERIALS AND METHODS

We conducted this cross-sectional survey in two urban industrial areas (Demra and Tongi) of Dhaka City, Bangladesh. These areas were chosen because most of the people living in these areas have a low-socioeconomic status (Gilani and Leon, 2013). We calculate the total number of subjects needed for the study was 460 using the formula for single proportion (Daniel, 2010). A simple random sampling technique was used to recruit study subjects. Study subject inclusion criteria were tobacco users, aged ≥ 15 years who were willing and able to participate. Exclusion criteria were people aged >65 years and temporary migrants. Each subject was asked to complete a semi-structured questionnaire using face-to-face interviews. The questionnaire was pre-tested at a non-sample site in another industrial area of Dhaka City among 20 subjects and any problems were corrected prior to use in the actual study. The actual study included 230 subjects from Demra (115 males and 115 females) and 230 subjects from Tongi (115 males and 115 females). The questionnaire asked about sociodemographic characteristics, specifically subject age, sex, education level, marital status, occupation, family history of tobacco use, income, religion, living area, number of other family members, the number of family members who use tobacco and subject's tobacco use history, specifying forms of tobacco used, duration of use and selected potential factors associated with tobacco use.

Statistical analysis

Statistical Package for the Social Sciences (SPSS) for windows, version 20.0 (IBM, Armonk, NY) was used for statistical analysis. Descriptive statistics were used to summarize sociodemographic data. The chi-square and Fisher's exact tests were used to evaluate potential associations. Binary logistic regression analysis was used to identify factors significantly associated with using at least two forms of tobacco. A p-value <0.05 was considered statistically significant.

Ethical considerations

Written informed consent was obtained from all subjects prior to participation in the study. The study was approved by the National Research Ethics Committee of the Bangladesh Medical Research Council (Ref: BMRC/NREC/2013-2016/418).

RESULTS

Characteristics of study subjects

A total of 460 subjects were included in the study; 50% females. Thirty-six percent of dual users were aged ≤30 years. The mean (±SD) age of the study subjects was 43.3 (±11.2) years. The mean (±SD) age of subject who used at least two forms of tobacco was 41.6 (±10.5) years. Ninety-seven percent of subjects who used at least two forms of tobacco were males among them 35.6 % were service holders and 40.4% were businessmen. Sixty-four percent of SLT users were female; 40.2% were housewives. Fifty-eight percent of subjects had no formal education. Thirty-two percent of subjects had a family history of tobacco use.

Seventy-two percent of study subjects planned to quit using tobacco**.** Twenty-seven percent of study subjects reported having a disease potentially associated with tobacco use, such as a duodenal ulcer (62.5%), heart disease (2.9%), stroke (1.7%) and cancer (1.3%). Sixty-two percent of subject used tobacco more than five times daily and 30.2% were using tobacco for more than twenty-one years (Table 1).

Prevalence of using at least two forms of tobacco

Twenty-three percent of subjects used more than one form of tobacco. Among subjects who used more than one form of tobacco significantly (p=0.049) more subjects were aged <30 years (36.1%), were business men (42.9%), were unmarried/divorced/widowed (55.5%), had a family history of tobacco use (28.8%), were from Demra (26.9%), had perviously tried to quit using tobacco (38.4%), had a plan to quit in the near future (29.3%), had a tobacco related disease (29.3%), had used for tobacco for 11-20 years (28.8%), were male (43.9%) and/or had no formal education (Table 1).

Determinants of multiple forms of tobacco use

Binary logistic regression analysis showed subjects aged <30 years were significantly more likely to use more than one form of tobacco [odds ratio (OR)=4.20; 95% confidence interval (CI): 1.53-11.55]. Study subjects with a higher income (above USD71) were significantly more likely to use more than one form of tobacco (OR=3.05; 95% CI: 1.90-4.90). Study subjects who used more than one form of tobacco were significantly more likely to have a tobacco related disease (OR=1.70; 95% CI: 1.03-2.82) (Table 2).

DISCUSSION

Use of more than one form of tobacco by the same person is common in Ban-

Table 1
Forms of tobacco use by study subject characteristics.

Characteristics	Smokeless tobacco (SLT) users *n* (%)	More than one form tobacco users (Dual users) *n* (%)	SLT users and dual users *n* (%)	% of dual users	*p*-value
Total	356	104	460	22.6	
Age in years					0.049
<30	23 (6.4)	13 (12.5)	36 (7.8)	36.1	
30-45	211 (59.3)	65 (62.5)	276 (60)	23.6	
>46	122 (34.3)	26 (25.0)	148 (32.2)	17.6	
Mean ± SD	43.7±11.34	41.6±10.46	43.3±11.2		
Sex					<0.001
Male	129 (36.2)	101 (97.1)	230 (50)	43.9	
Female	227 (63.8)	3 (2.9)	230 (50)	1.3	
Educational level					0.009
No formal education	216 (60.7)	50 (48.1)	266 (57.8)	18.8	
Primary	62 (17.4)	16 (15.4)	78 (17.0)	20.5	
Secondary	68 (19.1)	29 (27.9)	97 (21.1)	29.9	
High school and above	10 (2.8)	9 (8.7)	19 (4.1)	47.4	
Occupation					<0.001
Housewife	143 (40.2)	0 (0.0)	143 (31.1)		
Service	66 (18.5)	37 (35.6)	103 (22.4)	35.9	
Business	56 (15.7)	42 (40.4)	98 (21.3)	42.9	
Garments workers/Day Laborer/Others	91 (25.6)	25 (24.0)	116 (25.2)	21.5	
Marital status					0.031
Married	352 (98.9)	99 (95.2)	451 (98.0)	21.9	
Unmarried/Divorced/ Widowed	4 (1.1)	5 (4.8)	9 (2.0)	55.5	
Family size in persons					0.134
≤4	186 (52.2)	63 (60.6)	249 (54.1)	25.3	
≥5	170 (47.8)	41 (39.4)	211 (45.9)	19.4	
Mean ±SD	4.6±1.81	4.5±2.1	4.6±1.9		
Family history of tobacco use					0.031
Yes	104 (29.2)	42 (40.4)	146 (31.7)	28.8	
No	252 (70.8)	62 (59.6)	314 (68.3)	19.7	
Monthly income in US Dollars					<0.001
Up to 71	232 (65.2)	43 (41.3)	275 (59.9)	15.6	
Above 71	124 (34.8)	61 (58.7)	185 (40.1)	33.0	

Table 1 (Continued)

Characteristics	Smokeless tobacco (SLT) users *n* (%)	More than one form tobacco users (Dual users) *n* (%)	SLT users and dual users *n* (%)	% of dual users	*p*-value
Area of residence					0.036
Demra	168 (47.2)	62 (59.6)	230 (50)	26.9	
Tongi	188 (52.8)	42 (40.2)	230 (50)	18.3	
Any plan to quit using tobacco in future					<0.001
Yes	69 (19.4)	36 (57.8)	123 (28.0)	29.3	
No	287 (80.6)	44 (42.2)	331 (72.0)	13.3	
Has tobacco associated disease					<0.001
Yes	87 (24.3)	36 (34.6)	123 (26.7)	29.3	
No	269 (75.6)	68 (65.4)	337 (73.3)	20.2	
Frequency of tobacco use in times / day					0.198
Less frequent (up to 5)	134 (37.6)	39 (37.5)	173 (37.6)	22.5	
Frequent (6 - 10)	153 (43.0)	37 (35.6)	190 (41.3)	19.4	
More frequent (>11)	69 (19.4)	28 (26.9)	97 (21.1)	28.9	
Duration of tobacco use in years					0.036
1-10	124 (34.8)	34 (32.7)	158 (34.3)	21.5	
11 - 20	116 (32.6)	47 (45.2)	163 (35.4)	28.8	
>21	116 (32.6)	23 (22.1)	139 (30.2)	16.5	

gladesh. Among our study subjects, the prevalence was 23% of tobacco users; this result is similar to previous studies from Bangladesh (Rahman and Zaman, 2008; Zaman *et al*, 2014).

In our study, using more than one form of tobacco was more common among subjects aged <30 years and more common among male subjects, similar to the findings of a study from India (Gupta *et al*, 2012). Thirty-eight point four percent of subjects in our study had previously tried to quit using tobacco and 29.3% had a plan to quit. However, a previous study from Bangladesh (Flora *et al*, 2016) found 8.4% had previously tried to quit and 27.5% intended to quit using tobacco. In our study, tobacco associated diseases were more common among those who used more than one form of tobacco. Use of more than one form of tobacco has been found to be associated with inflammatory diseases, such as rheumatoid arthritis, inflammatory bowel disease and ulcerative colitis (Persson *et al*, 1993; Carlens *et al*, 2010) and greater risk of cardiovascular disease (Teo *et al*, 2006).

A limitation of our study was its cross-sectional design, preventing assessment of longitudinal patterns of tobacco use.

In summary, our study found a relatively high prevalence of using more

Table 2
Binary logistic regression analysis of factors associated with more than one form of tobacco among study subjects.

Factors	OR	95% CI	*p*-value
Age in years			
< 30	4.21	1.53 - 11.55	0.020
30-45	1.70	0.90 - 3.21	0.005
>46	Reference		
Duration of tobacco use			
Above 11 years	1.01	0.98 - 1.03	0.724
1-10 years	Reference		
Monthly income in US Dollar			
Above 71	3.05	1.90 - 4.90	0.001
Up to 71	Reference		
Living area			
Demra	2.04	1.26 - 3.30	0.004
Tongi	Reference		
Tobacco use by family members			
Yes	1.34	0.82 - 2.18	0.243
No	Reference		
Has a chronic disease			
Yes	1.70	1.03 - 2.82	0.040
No	Reference		

OR: odds ratio; CI: confidence interval.

than one form of tobacco among our study subjects. This was associated with younger age, higher income and more tobacco related disease. These groups need to be targeted in tobacco control and prevention programs in order to reduce the risk of public health problems caused by tobacco use.

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