

Abstract

INTRODUCTION: Dual use of tobacco (using smoking and smokeless forms) in Bangladesh is uncommon in women but common in men. Dual users are at additional risk of cancers and heart diseases compared with a single form of tobacco use. Knowledge about their socioeconomic background is necessary for planning appropriate interventions. We report here socioeconomic background of the dual users of tobacco from a nationally representative survey. **METHODS:** The study adopted a probability proportionate to size sampling technic of divisional population stratified into urban and rural areas to recruit men aged 25 years or older from their households. A total of 4312 men were recruited. Variables included questions on 20 household assets, tobacco use and other behavioral risk factors, and measurement of body weight and height. **RESULTS:** The average age of dual users was 46.7 years old compared to 43.4 and 52.3 years for smokers and smokeless tobacco users. Prevalence of “smoking only,” “smokeless only” and “dual use” of tobacco was 40.6%, 15.2%, and 14.2%, respectively. Among all tobacco users, dual users constituted 20%. These dual users had lower educational achievement, rural residence, lower intake of fruit, and higher intake of alcohol. They were more undernourished as indicated by a thin body mass index compared to nonusers and smokers. Dual users were of socioeconomically deprived as measured by wealth quartiles constructed out of household assets. **CONCLUSION:** Dual use of tobacco is common in Bangladesh, and it is intimately linked with socioeconomic deprivation. Poverty reduction strategy and campaigns should address tobacco control not only tobacco in general, but its dual use in particular.

Key Words: Bangladesh, dual use of tobacco, population, smoking and smokeless

Introduction

Noncommunicable diseases (NCDs) are causing more than half of hospital deaths in Bangladesh.^[1] Tobacco is the major preventable risk factor of NCDs. Bangladesh has a dual burden of high production and high use of tobacco.^[2] In addition, there is a custom of dual use of tobacco, i.e. using smoking and smokeless forms, especially in men. Fortunately, dual use of tobacco is rare in Bangladeshi women in whom the prevalence was 1.8% only.^[2] Dual use of tobacco increases the risk of some cancers^[3] and carries a higher risk of ischemic heart disease in Bangladeshi^[4,5] and other populations.^[6]

In spite of having a good law, vibrant civil society and professional networks in Bangladesh, a reduction in tobacco use yet to be achieved. Probably there is a resistant group, the dual users of tobacco, having high addiction level. It is necessary to have a better understanding about this group for designing an appropriate intervention.

Although dual use in Bangladeshi men is common, a systematic data analysis on dual users is not available. Accordingly, we report here a reanalysis of national NCD risk factors survey 2010^[7] data for men to have a first-hand impression about the socioeconomic background of dual users of tobacco in Bangladesh.

Methods

Details of the NCD Survey methods have already been reported.^[7] The original survey covered both men and women, but for this analysis only men were included. Briefly, the target population for this survey includes all Bangladeshi men aged 25 years or older living in 62 districts out of 64 districts of Bangladesh. Two of three hill districts were excluded because they were ‘difficult

to reach areas’. A total of 400 primary sampling units were identified from rural (*mauza*) and urban (*mahalla*) areas. Participants were recruited from their households using a probability proportionate to size approach stratified into rural and urban areas. Based on the sample size calculation for rural-urban subgroup analysis, 5600 men were targeted, but complete data could be obtained from 4312 men (77%). One man per household was interviewed by a male enumerator. No proxy interview was allowed. Data were collected for both households (socioeconomic variables) and individuals (risk factor variables).

Ethical clearance

Ethical clearance was obtained from Bangladesh Medical Research Council. Detailed study related information was read out to the participants and explained in *Bangla* (spoken language) from a printed handout. Before data collection, consent in the form of signature or finger impression (for those who cannot sign) was obtained. Confidentiality of data and privacy of the respondents were maintained.^[7]

The questionnaire

The questionnaire was based on World Health Organization (WHO) STEPwise Surveillance.^[8] The household component of the questionnaire included a 20-item asset information. Information of tobacco was collected for both smoking and smokeless forms. Those who smoked or used smokeless tobacco (SLT) in the past 30 days were considered as “current” users. Daily frequency of use of products was asked. Relevant information on education, occupation, and intake of fruit and alcohol was obtained. Height and weight were measured to calculate body mass index (BMI). Questionnaire was in standard *Bangla*, and it was field tested before deployment of the professional field team for data collection.

Data management and analysis

Data were entered into handheld personal devices (iPAQ) by interviewers. Data were transferred from the field to a file transfer protocol server on a daily basis. Data at central level were managed by a professional data manager.

Proportions between groups were obtained and compared by using the Chi-square test. Quantitative variable with a

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skewed distribution was compared by using Kruskal–Wallis test. Significance level was set at alpha threshold of 0.05. Wealth index of households was created from ownership of 20-item assets using principle component analysis.^[7] The sample was divided into wealth quartiles from one (lowest) to four (highest). Distribution of the various forms of tobacco use across the quartiles was then examined. Multiple Logistic Regression Analysis was done, keeping quantitative variable as quantitative, to identify independent significant socioeconomic variables related to dual use of tobacco. All analyses were done using SPSS 17.0 version.

Results

Socioeconomic background

Table 1 presents the results for a sample of 4312 men from all over the country. Their mean age was 45.5 years (standard deviation 14.5 years). Half (50.4%) of them were from urban areas as stipulated in the study design. They had a median schooling of five years. About one-fifth (22.8%) of them were farmers, one-fifth (19.7%) were laborer (agriculture, industrial or otherwise), one-fifth (22.5%) were businessmen, and 16% were salaried employee in public and nonpublic sectors. Ninety percent were Muslims.

Tobacco use overall

Single use

Proportion of current “smoking only” was 40.6% [Table 1]. They were mostly cigarette (69.0%) and *bidi* (42.8%) smokers. Rest (6.6%) used other forms. The percentages do not add to 100% because of multiple usages. Popularity of *bukkah* (water pipe) as a vehicle to smoke has been lost. Smoking prevalence across age groups was almost homogeneous with a substantial decline in the elderly people aged 65 years or older (27.6%), which might reflect

a survival effect. In this survey, 15.2% used “SLT.” As opposed to smoking only, its prevalence increased with age. Among the SLT users, 66.3% used *jarda/zarda*, 33.5% used *sada pata* and 17.4% used *gul*. As in the case of smoking, there have been multiple usages in SLT also.

Dual use

Table 1 also describes the prevalence of dual use of tobacco. In this sample, 14.2% men used dual forms. Men aged 45–64 years used dual forms more often (18.1%). In two extreme age groups, nearly one in ten men used dual form of tobacco. Their frequency (number of sticks and number of episodes of SLT) of tobacco use was 18/day, which was higher than any single form of tobacco use (smoking only 9/day and smokeless only 7/day). This gave a clue to a higher level of addiction in dual users compared to single users. Prevalence of dual use of tobacco was more in rural areas (16%) compared to urban areas (13.5%). Dual use was more common in laborers (19.5%) and by farmers (15.3%). Among all tobacco users, 58% were smokers only, 22% were SLT users only and 20% were dual users.

Socioeconomic gradient

The participants were grouped into four quartiles (first being the poorest) according to household assets based on principal component analysis. Figure 1 shows an intimate link of tobacco use in general (single use or in combination) with socioeconomic deprivation. There was a constant decline of prevalence after the second quartile. However, this decline was sharper in the case of dual users.

Table 2 gives the distribution of other socioeconomic factors across three groups of tobacco users in this sample. Tobacco users in general were found to have significantly lower educational achievements and wealth quartiles compared

Table 1: Prevalence (%) of tobacco use in smoking, smokeless or dual forms (n=4312) according to sociodemographic factors

	Number	Nonusers (n=1292) 30%	Smoking only (n=1752) 40.6%	Smokeless only (n=655) 15.2%	Dual users (n=613) 14.2%
Mean age, years		44.1	43.4	52.3	46.7
Median schooling, years		8	3	3	2
Age groups, years					
25-34	1172	37.6	44.0	7.9	10.4
35-44	1076	28.3	46.0	11.4	14.2
45-54	971	25.2	40.6	16.1	18.1
55-64	585	24.1	35.4	22.4	18.1
65+	508	31.5	27.6	29.9	11.0
Total	4312	30.0	40.6	15.2	14.2
Residence					
Urban	2175	35.2	39.5	12.8	12.5
Rural	2137	24.7	41.7	17.6	16.0
Major occupation					
Salaried, government or nongovernment	675	44.7	36.7	9.3	9.2
Farmers	984	24.1	40.9	19.7	15.3
Labourers	850	17.6	49.4	13.4	19.5
Business	972	33.0	36.8	18.5	11.7
Others	832	-	-	-	-

Table 2: Socioeconomic deprivation associated with dual use of tobacco (n=4312)

	Nonusers (n=1292)	Smoking only (n=1752)	Smokeless only (n=655)	Dual users (n=613)	P*
Less than primary education, %	35.4	58.3	59.2	65.1	<0.001
Size of the quartile 1 of wealth indices, %	14.0	23.9	22.6	27.7	<0.001
Alcohol use last 30 days, %	0.5	3.3	0.2	2.6	<0.001
Fruit intake, median serving/day	0.3	0.1	0.1	0.1	<0.001
BMI <18.5 kg/m ² , %	17.8	35.1	25.0	31.3	<0.001

*Kruskal-wallis for fruit intake and chi-square test for others. BMI=Body mass index

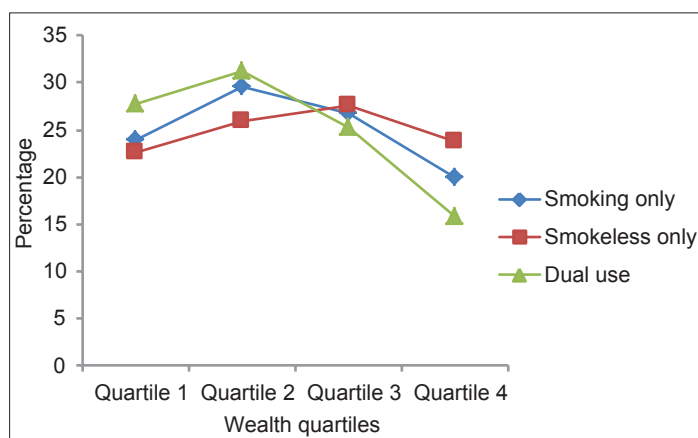


Figure 1: Prevalence (%) of tobacco use in single or combined forms according to wealth quartiles

with non-users. They had significantly lower intake of fruit. Some of them had an additional habit of using alcohol more than non-users of tobacco. As a result, they presumably had less money to buy nutritious food. This conviction is supported by their very thin body (BMI < 18.5 kg/m²). All the deprivations described above are more prominent in dual users compared to single user groups (in general) or non-users.

The above mentioned socioeconomic factors could be inter-dependent. To find out the independent factor(s) associated with the dual use of tobacco, Multiple Logistic Regression Analysis was performed entering age, residence, education, wealth indices, alcohol use, fruit intake and BMI altogether into the model. All variables except residence and alcohol consumption entered into the model had quantitative values. Significance of all other variables except wealth indices disappeared in the presence of wealth indices in the statistical model (data not shown).

Discussion

We report here for the first time in Bangladesh the factors associated with dual use of tobacco from a national survey.^[7] The dual users constitute exactly one in five of all tobacco users. Their addiction level probably provides a substantial resistance to the inventions for quitting. At the same time they are hard to reach people because of low media exposures as perceived from their lack of household assets like cell phone, radio and television.

Prevalence of dual use in India was >6% for comparable age group^[9] and 4% in US blue collar people^[10] and 6% in Nigerians.^[11] In India, dual use is more prevalent in

people having no or little education and those living in rural areas.^[9] Like our sample of Bangladeshi people,^[7] Nigerian dual users were less educated and the US dual users were binge drinkers. In this study, two-third Bangladeshi alcohols users are binge drinkers^[7] and most of them fall under dual user category. Our findings are similar to all studies mentioned above, but we report here a more rigorous assessment of the socioeconomic deprivation. The above facts may suggest that the dual users have fairly similar social characteristics in most of the places.

In our sample, the prevalence of SLT runs parallel to the prevalence of dual use. Almost half of all SLT users smokers as well. Many Bangladeshi people perceive that smoking brings more pleasure if it is done concomitantly with chewing of tobacco leaves with betel quid. Therefore, efficient control of smoking will depend on the control of SLT to a large extent. If we consider smoking alone and in combination with SLT, more than half of Bangladeshi men are addicted to tobacco.

The tobacco epidemic in South Asia is relatively complex because various forms of tobacco are being used. SLT itself has several forms, such as *jarda*, *sada pata*, *pan masala*, *gul*, *khoinee*, *gutka*, etc., SLT use in Bangladesh is one of the highest in the world. Many people believe that the SLT is not harmful. Contrary to this belief, SLT can cause several chronic diseases.^[12-6] Oral cancer is one of them.^[12] Oral cancer is the second leading cancer in Bangladeshi men after lung cancer.^[12] Therefore, control of SLT deserves special emphasis in Bangladesh. SLT use has a very high level of cultural acceptance. Accordingly, culturally appropriate public awareness campaigns will be required to combat it.

Bangladesh enacted the Tobacco Control Act in 2005. Unfortunately, SLT was not included in the definition of tobacco in that Act. This was controlled by the belief that SLT is not bad for health. Perhaps, in line with this many people quit smoking but started using SLT as a substitute. Considering its public health consequences, the Government of Bangladesh, has already amended the Tobacco Control Act 2005 in 2013 to include SLT in the definition of tobacco. The battle ground for combating the dual use of tobacco has started in the real sense in 2013. There has been a plateauing of tobacco use in Bangladesh in the past few years.^[13] A big push is now required to combat the tobacco menace especially the dual usages. Given that the dual use is intimately linked to poverty, poverty reduction strategies will supplement tobacco control activities. Along with the smoking products, smokeless products should also

be brought under stringent tax networks to get expected the benefit.^[14]

Conclusion

Dual use of tobacco is associated with socioeconomic deprivation in Bangladeshi men. Given that dual use is a common practice, especially among the poor, population-based interventions addressing inequity should be used. Poverty reduction strategies should consider tobacco control in general and their dual use in particular. Tobacco control campaigns should emphasize the cumulative harms of dual use of tobacco.

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