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Pattern of Quitting Methods Used to Promote Tobacco Cessation in Bangladesh and Its Correlates

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Abstract

Background: Promotion of smoking cessation has been proposed as one of the primary areas of focus for tobacco control in developing countries as prevalence is high over there. This paper aimed to analyze statistically quitting method followed by the smokers who wanted to quit tobacco use in the past 12 months of the survey.

Methods: The paper was based on secondary data of size 9629 collected from people aged 15 years and above by the Global Adult Tobacco Survey (GATS), 2010. Descriptive analysis and binary logistic regression had been performed using STATA-13 to analyze the data. Outcome variable was whether quitting method(s) was (were) followed by the tobacco user (1. Tobacco smoker, and 2. Smokeless tobacco user) who wanted to quit tobacco use in the past 12 months of the survey and independent variables were age, gender, residential status, education, occupation and wealth index.

Results: It had been found that 47.38% of smoker respondents tried to quit tobacco smoking and among them 27.13% used any method to quit. It had been also found that among the smokeless tobacco users, 31.89% tried to quit and among them 24.83% used any method to quit. Among the quitting methods, counselling was the most used method. From the logistic regression to methods used to quitting tobacco use, it had been found that age, education and wealth index were significantly associated with the use of methods to quit tobacco smoking; whereas, gender, age and wealth index were statistically significant to the use of methods to quit smokeless tobacco.

Conclusions: This study suggests that more active quitting methods should be invented targeting male, younger, lower educated and poorer tobacco users to make the cessation successful in Bangladesh.

Keywords: Tobacco use • Quitting method • Prevalence • Cessation • Odds ratio • Logistic regression

Introduction

Tobacco is considered as the silent killer, which is a leading risk factor for disease globally. A study found that nearly 6 million premature deaths, 6.9% of years of life lost, and 5.5% disability-adjusted life-years (DALYs) occur in 2010 [1]. Global age-standardized prevalence of daily tobacco smoking was 31.1% in 2012 for men [2]. It has been observed that nearly 80% of the more than one billion smokers worldwide live in low- and middle-income countries including Bangladesh, where the burden of tobacco-related illness and death is the heaviest. Bangladesh is one of the largest tobacco consuming countries in the world [2]. According to a previous study of Bangladesh, smoking causes about 25% of all deaths in Bangladeshi men aged 25 to 69 years and an average loss of life per smoker is seven years [3]. Tobacco use results in large and growing health care cost [4,5]. Among smokeless tobacco product, chewing tobacco (sadapata and zarda) is most commonly used by the Bangladeshi community which contains 28 cancer-causing agents (carcinogens). Smokeless tobacco is also highly associated with recession of the gums, gum disease, and tooth decay [6]. Due to its link with many chronic diseases various campaigns are going on worldwide to minimize tobacco use. Along with various national strategic policies, quitting methods are also initiated to cease tobacco use, such as medications, nicotine replacement therapy, telephone helpline, counselling etc. In a study of United States, Michael [7] had reported that cessation methods contributes about 23.6% people to succeed cessation. Hakim [8] had found that rate of unsuccessful quitter was higher (68%) among Bangladeshi smoker. Therefore, evolvement of cessation methods should be analyzed among Bangladeshi smokers who intended to quit.

In literature, some studies have been found to conduct in Bangladesh on tobacco use [9-16] which are limited to prevalence and predictors of tobacco use. Few studies address the issue of knowledge and attitude [17], marketing policy [18], tobacco use policy at home and offices [19] and cessation of tobacco smoking [8,20]. To our knowledge, no study has considered the issue of quitting methods of tobacco use in Bangladesh. Aims of the current study, therefore, are to obtain a nationally representative estimate of prevalence of methods used to quit tobacco use in Bangladesh and to identify significant correlates so that policy makers may find gap in existing quitting methods and get idea to make the cessation more successful.

Methods

Secondary data collected by the Global Adult Tobacco Survey (GATS), 2010 (http://www.who.int/tobacco/surveillance/survey/gats/en/) has been used for the current study. Details about the study design, survey method, questionnaire, and definitions of various terminologies can be found in literature [8,19,21-24]. The survey was conducted in 14 countries including Bangladesh, Brazil, China, Egypt, India, Mexico, Philippines, Poland, Russia, Thailand, Turkey, Ukraine, Uruguay and Vietnam from 2008 to 2010. GATS used a global standard methodology for the survey. It included information on the respondents' background characteristics, tobacco use (smoking and smokeless), cessation, second-hand smoke, economics, media, knowledge, attitudes and perceptions of tobacco use. In Bangladesh, GATS was conducted in 2009 as a household survey of persons 15 years of age or older by the National Institute of Preventive and Social Medicine in

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collaboration with the Bangladesh Bureau of Statistics (BBS) and National Institute of Population Research and Training (NIPRT). A multi-stage (three-stage), geographically clustered sample design was used to produce nationally representative data. At the first stage 400 Primary Sampling Units (PSUs) (Mauza in rural and Mohalla in urban areas) were selected with probability proportional to size (PPS), followed by a random selection of one Secondary Sampling Unit (SSU) per selected PSU. At the third stage households were selected systematically within the listed households from a selected SSU. One individual was randomly chosen from each selected household to participate in the survey. Survey information was collected using handheld devices. The household response rate was 97.7%, the individual response rate was 95.8% and the overall response rate was 93.6%. There were a total of 9629 completed interviews (male=4468 and female=5161). Outcome variable was whether the quitting method(s) was (were) used by the tobacco user who tried to quit in the last 12 months of the survey. Therefore, the sample size reduces to 1058 tobacco smokers and 745 smokeless tobacco users for binary logistic regression analysis (Figure 1).

Descriptive analysis had been executed to know the characteristics of the study subjects. For the purpose frequency with percentage had been reported for categorical data and mean with standard deviation had been reported for continuous data. A comparison of prevalence of quitting methods had been carried out to confounding factors: gender and residence. Binary logistic regression [24] had been used to identify significant socio-demographic and economic correlates of quitting methods in Bangladesh. If a tobacco user who tried to quit tobacco use in the last 12 months of the survey followed at least one quitting methods was consider as 1 and 0 if didn't follow any method. Logistic regression was suitable for such binary dependent variable. Therefore, two logistic regressions had been carried out: one was for tobacco smoker and another was for smokeless tobacco user. Therefore, the model estimated the Odds Ratio (OR) of using quitting methods among tobacco smokers who attempted to quit in the last 12 months of the survey versus no using any quitting method. The model for smokeless tobacco user estimates the similar OR. With 95% confidence interval had been reported. Statistical software StataSE version 13 (StataCorp, USA) has been used to carry out statistical analyses.

Results

It has been found that among the respondents, 23.19% are tobacco smokers and among them 47.38% tried to quit tobacco smoking in the preceding 12 months of the survey (Table 1). Of those intended smokers 27.13% used any one or multiple form of methods to quit: 13.71% used counseling, 0.76% used nicotine replacement therapy, 0.57% used traditional medicine, 0.09% used quit line or telephone support line, 7.47% used switching to smokeless tobacco and 6.85% used other methods (Figure 2). Among the respondents 24.26% used any form of smokeless

Figure 1. Data screening process.

Table 1. Characteristics of study subjects (GATS, 2010).

Characteristics	N=9629
Residence [n (%)]	
Urban	4857 (50.44)
Rural	4772 (49.55)
Gender [n (%)]	
Male	4468 (46.40)
Female	5161 (53.60)
Age (years) [mean (sd)]	36.89 (14.90)
15-24	2,073 (21.53)
25-34	2,665 (27.68)
35-44	2,232 (23.18)
45-54	1,329 (13.80)
55 and above	1,330 (13.81)
Education level [n (%)]	
No formal schooling	3416 (35.47)
Less than primary school completed	1487 (15.44)
Primary school completed	1115 (11.58)
Less than secondary school completed	1,937 (20.12)
Secondary school completed	663 (6.89)
High school completed	463 (4.81)
College/University completed	273 (2.84)
Post graduate degree completed	211 (2.19)
Don't know	64 (0.66)
Occupation [n (%)]	
Government employee	221 (2.30)
Non-government employee	740 (7.70)
Business-small	865 (9.00)
Business-large	128 (1.30)
Farming (land owner farmer)	826 (8.60)
Agricultural worker	374 (3.90)
Industrial worker	214 (2.20)
Daily laborer	631 (6.60)
Other self-employed	318 (3.30)
Student	463 (4.81)
Homemaker/housework	4,030 (41.85)
Retired	113 (1.17)
Unemployed, able to work	153 (1.59)
Unemployed, unable to work	165 (1.71)
Other	388 (4.03)
Wealth Index [n (%)]	
Poorest	1866 (19.38)
Poorer	2068 (21.48)
Poor	1732 (17.99)
Rich	2040 (21.19)
Richest	1923 (19.98)
Tobacco smoker* [n (%)]	2233 (23.19)
Tried to quit tobacco smoking during past 12 months [n (%)]	1058 (47.38)
Methods used to quit tobacco smoking †[n (%)]	287 (27.13)
Counseling	145 (13.71)
Nicotine replacement therapy	8 (0.76)
Traditional medicine	6 (0.57)

Quit line or telephone support line	1 (0.09)
Switching to smokeless tobacco	79 (7.47)
Other methods[a]	72 (6.85))
Smokeless tobacco user** [n (%)]	2336 (24.26)
Tried to quit smokeless tobacco during past 12 months [n (%)]	745 (31.89)
Methods used to quit smokeless tobacco[†] [n (%)]	185 (24.83)
Counseling	153 (20.54)
Nicotine replacement therapy	5 (0.67)
Traditional Medicine	4 (0.54)
Quit line or telephone support line	2 (0.54)
Other methods[b]	36 (4.90)

*daily and less than daily tobacco smoker, **Daily user, [†]Categories are not mutually exclusive. [a]Any other methods like herbal, peer pressure, etc. [b]Any other methods like herbal, betel leaf without *zarda*, peer pressure etc.

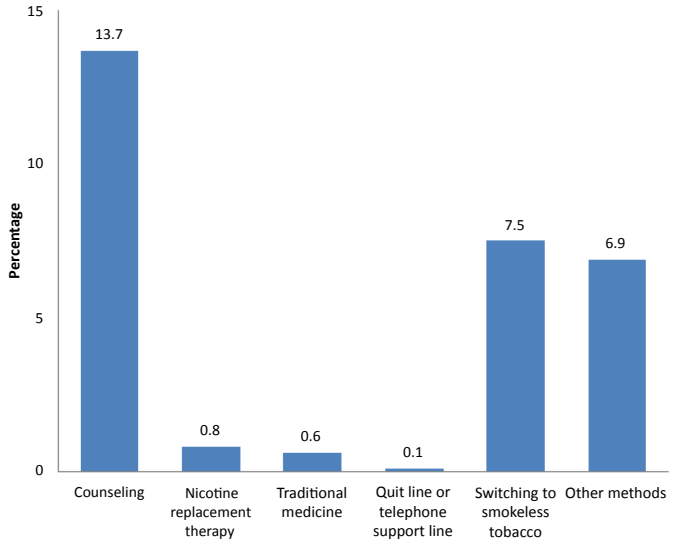

Figure 2. Prevalence of methods used to quit tobacco smoking.

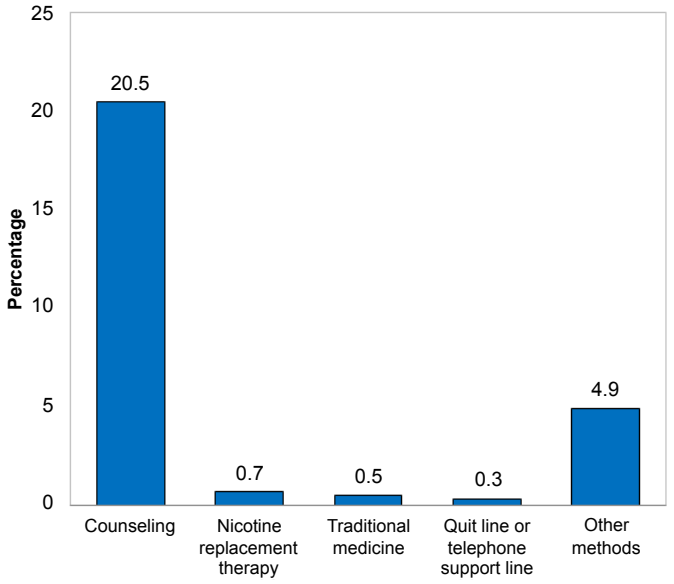

Figure 3. Prevalence of methods used to quit smokeless tobacco use.

tobacco product. Among the smokeless tobacco users 31.89% tried to quit in the preceding 12 months of the survey (Table 1). Among the intended group 24.83% followed any one or multiple form of methods to quit: 20.54% followed counseling, 0.67% followed nicotine replacement therapy, 0.54% used traditional medicine, 0.54% followed quit line or telephone support line and 4.90% followed other methods (Figure 3).

It has been also found that peoples who were using methods to quit tobacco smoking were more from urban area and were male (Table 2). On the other hand, peoples who were using methods to quit smokeless tobacco were more from rural area and were female.

From binary logistic regression (multiple) (Table 3) it had been found that rural people were 12% less likely to use methods to quit tobacco smoking than urban people with odds ratio (OR)=0.88 and 95% confidence interval (CI) = (0.65, 1.20). It had been also found that female were 26% more likely to use methods to quit tobacco smoking than male (OR=1.26, 95% CI=0.54, 2.95). Older peoples (age≥55 years) were two times more likely to use quitting methods to quit tobacco smoking than the youngest smokers of age 15-24 years (OR=2.24, 95% CI= 1.16, 4.32). Surprisingly, it has been found that more educated smokers were less likely to use quitting methods. Smokers who were employees (government or nongovernment), businessmen (small or large) and financially dependent peoples were more likely to use quitting methods than other occupation. Although it was not statistically significant. Intended smokers with higher wealth index were more likely to use quitting methods than the lowest and low wealth index.

On the other hand, for smokeless tobacco users it had been found that rural people were more likely to use quitting methods than urban people (OR=1.18 and 95% CI=0.81, 1.72). It was also found that female were 4 times more likely to use methods to quit smokeless tobacco use than male (OR=4.25, 95% CI=2.50, 7.24). Older peoples (age≥55 years) were two times more likely to use quitting methods to quit use of smokeless tobacco products than the youngest users of age 15-24 years (OR=2.57, 95% CI= 1.06, 6.22). Similar like tobacco smokers, it had been found that more educated smokeless tobacco users were less likely to use quitting methods. Among the intended group of smokeless tobacco users who were worker, daily laborer and self-employed were less likely to use quitting methods than government/non-government employees. Smokeless tobacco users with higher wealth index were more likely to use quitting policy than with low wealth index.

Discussion

This study tried to find pattern and correlates to quitting strategies of tobacco use in Bangladesh using nationally representative data. The study revealed that about 73% tobacco smokers didn't use any method to quit and about 75% smokeless tobacco users didn't use any methods to quit. There is evidence that smoker who tries to quit without any method, very few of quit attempts successful in the long-term [25]. It is also observed that combination of behavioral counseling and medications with other methods increase the rate of successfully quitting smoking, and a combination of behavioral counseling with a medication is more effective than any methods alone [26,27].

Counseling has been identified as the most used strategy to quit for both tobacco smokers and smokeless tobacco user. It has been found that age, education and wealth index were significantly associated to quitting methods used by tobacco smoker in Bangladesh. On the other hand, gender, age and wealth index were significantly associated with methods used to quit smokeless tobacco.

To quit both tobacco smoking and smokeless tobacco use, females used methods more than male. It might be one of the reasons that females were found to be more successful quitter than male [8]. In Bangladesh, due to social norm, tobacco smoking among females is not well accepted [14], but no restriction about smokeless tobacco use. Unregulated and unorganized marketing of smoking and smokeless products [18] and accessibility of varieties and attractive kind of the products [15] insists people to consume tobacco products more in Bangladesh than other developing countries. However, use some of the smoking (e.g, Bidi) and smokeless tobacco products (e.g, zarda, sadapata, gul, khoini, etc.) long time may make teeth and lips ugly looking. It might make the beauty aware females distressed and to take help of methods to quit. On the other hand, the prevalence of tobacco smoking among males in Bangladesh is higher than the neibouring

Table 2. Clustering prevalence of use of quitting methods to residence and gender in Bangladesh, GATS, 2010.

Variable	Tried to quit tobacco smoking in last 12 months (N=1058)			Tried to quit smokeless tobacco use in last 12 months (N=745)		
	Counseling N=145 % (95% CI)	All other methods* N=142 % (95% CI)	No method N=771 % (95% CI)	Counseling N=153 % (95% CI)	All other methods* N=32 % (95% CI)	No methods N=560 % (95% CI)
Residence						
Urban	50.34 (42.23,58.44)	57.75 (49.45,65.63)	50.84 (47.31,54.37)	47.06 (39.25,55.01)	40.63 (25.02,58.38)	50.18 (46.04,54.32)
Rural	49.66 (41.56,57.77)	42.25 (34.37,50.55)	49.16 (45.63,52.69)	52.94 (44.99,60.75)	59.38 (41.62,74.98)	49.82 (45.68,53.96)
Gender						
Male	95.17 (90.19,97.69)	98.59 (94.51,99.65)	97.67 (96.32,98.53)	25.49 (19.19,33.02)	40.63 (25.02,58.38)	50.71 (46.57,54.85)
Female	4.83 (2.31,9.81)	1.41 (0.35,05.49)	2.33 (01.47,03.68)	74.51 (66.98,80.81)	59.38 (41.62,74.98)	49.29 (45.15,53.43)

*Includes all methods other than counseling.

Table 3. Unadjusted and adjusted odds ratios from logistic regression to method used for quitting tobacco use in Bangladesh.

Variable	Method used for quitting tobacco smoking*		Method used for quitting smokeless tobacco use*	
	OR (95% CI) Unadjusted	OR (95% CI) Adjusted	OR (95% CI) Unadjusted	OR (95% CI) Adjusted
Residence				
Urban	1.00	1.00	1.00	1.00
Rural	0.88 (0.67,1.16)	0.88 (0.65,1.20)	1.18 (0.85,1.65)	1.18 (0.81,1.72)
Gender				
Male	1.00	1.00	1.00	1.00
Female	1.35 (0.60,3.05)	1.26 (0.54,2.95)	2.63 (1.83,3.78)	4.25 (2.50,7.24)
Age group				
15-24	1.00	1.00	1.00	1.00
25-34	1.94 (1.07,3.51)	1.91 (1.05,3.50)	1.29 (0.55,3.01)	1.48 (0.61,3.59)
35-44	1.98 (1.10,3.57)	1.89 (1.03,3.48)	1.64 (0.73,3.71)	1.81 (0.77,4.26)
45-54	3.23 (1.76,5.92)	2.94 (1.56,5.53)	1.88 (0.81,4.34)	1.79 (0.73,4.34)
55+	2.42 (1.29,4.56)	2.24 (1.16,4.32)	2.43 (1.05,5.60)	2.57 (1.06,6.22)
Education level				
No formal schooling	1.00	1.00	1.00	1.00
Primary or less	0.62 (0.44,0.87)	0.60 (0.42,0.87)	0.70 (0.47,1.04)	0.78 (0.50,1.20)
Secondary or less	0.68 (0.48,0.98)	0.58 (0.37,0.88)	0.59 (0.36,0.95)	0.66 (0.37,1.15)
Above secondary	0.54 (0.31,0.95)	0.35 (0.17,0.71)	0.32 (0.11,0.94)	0.38 (0.11,1.29)
Occupation				
Employment (Govt./Non-govt.)	1.00	1.00	1.00	1.00
Business (Small/Large)	1.17 (0.74,1.85)	1.03 (0.63,1.67)	1.74 (0.72,4.20)	2.01 (0.77,5.24)
Farming (Land owner and Farmer)	1.03 (0.64,1.65)	0.83 (0.48,1.45)	1.67 (0.69,4.06)	2.07 (0.76,5.64)
Daily labor or equal[a]	1.14 (0.74,1.74)	0.98 (0.60,1.63)	2.07 (0.99,4.32)	0.73 (0.31,1.71)
Dependent[b]	1.12 (0.66,1.91)	1.04 (0.58,1.86)	3.05 (1.32,7.07)	1.68 (0.68,4.20)
Wealth Index				
Lowest	1.00	1.00	1.00	1.00
Low	0.82 (0.54,1.25)	0.99 (0.64,1.53)	0.71 (0.44,1.17)	0.74 (0.44,1.25)
Middle	1.00 (0.64,1.55)	1.27 (0.80,2.04)	1.15 (0.69,1.93)	1.27 (0.72,2.22)
High	1.40 (0.93,2.12)	1.86 (1.18,2.94)	0.85 (0.51,1.40)	0.99 (0.57,1.74)
Highest	1.01 (0.64,1.60)	1.65 (0.90,3.00)	1.02 (0.59,1.76)	1.50 (0.77,2.90)
ROC analysis: AUC[c]		0.625		0.683

*Any method used, [a]Daily labor, agriculture worker, industrial worker, house maker, and other self-employed. [b]Retired, Unemployed (able and unable to work), Student, and Others. [c]Area Under ROC Curve (AUC) is for measuring prediction accuracy of the model.

country like Nepal [28] and Pakistan [29]. As the adverse effect of tobacco use is not prompt and as the males are not so beauty aware, they are less likely to quit tobacco use and hence they are not interested to take help of quitting methods.

Older peoples are more likely to use policy to quit tobacco use than the younger one. It might be due to the fact that after experiencing some tobacco related difficulties they realize necessity of quitting tobacco use. Moreover, older smokers experienced more health problems and visited healthcare professionals and received repeated advice to quit tobacco use (smoking and smokeless) which might encourage them to use quitting methods. Another reason might be that younger peoples are more confident in their decision which makes them less likely to use methods to quit tobacco use.

The study found that more educated peoples were less likely to use methods to quit tobacco use. Usually, educated peoples are more aware

about health hazards and their adverse effect which makes them lower degree of fatalism and less risk taking behavior [30]. This is also true in India [31] and Sri Lanka [32]. Because of all these characteristics along with confidence in themselves, educated peoples might be able to quit tobacco use without using any method. Occupation was not found to have significant effect on using methods to quit tobacco use. Richest peoples were found more likely to use methods to quit tobacco use. It might be due to their dependency on wealth which encourages them to use of methods to quit tobacco use. Another reason might be that peoples in Bangladesh are eager in spending on treatment for any disease even leaving them poorer [33] rather than following preventive strategies. Alternatively, it suggests the need of target smoker with lower wealth index with quitting interventions.

The major strength of the current study is the large sample size and coverage the nationally representative population which has already been discussed in literature [19]. In addition, to best of our knowledge, this is the first study that considered quitting methods that has been used by the intended group who tried to quit tobacco use in the past 12 months of the survey. However, there are several limitations that need to be addressed. Besides some common limitations of the data discussed in literature [8,19], the study could not find the trend of the quitting policies used over years, as the survey was cross-sectional. As the survey was based on self-reported information, the real pattern and prevalence of quitting methods used may be under or over reported. Addition, subtraction, or modification of any variable from (in) the model may change the result [34].

Conclusion

In conclusion, the study clearly found that a significant percentage of respondents who are higher educated, younger, of lower wealth index and male are less likely to use methods to quit tobacco use. Therefore, more active methods (e.g., "cold turkey" or, "self-help intervention") to quit tobacco use should be intervened and implemented in Bangladesh to promote quitting, especially targeting male with higher educated, young and of lower wealth index. Additional proactive quitting intervention outreach program as discussed may be intervened in reaching tobacco user with lower wealth index. In addition, irrespective of all socio-demographic and economic conditions, a nationwide campaign is needed to increase quitting of tobacco use advocating use of medication and behavioral counselling along with other methods simultaneously.

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