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| Title: | Factors Influencing Smokeless Tobacco Use in Rural Communities of Bangladesh |

| Authors: | Umme Hamida Arifin[1], Quazi Zahangir Hossain[2*] and Qazi Azad-uz-Zaman[3] |

| | [1]Research Fellow, Environmental Science Discipline, Khulna University, Khulna-9208, Bangladesh.
[2*]Professor, Environmental Science Discipline, Khulna University, Khulna-9208, Bangladesh.
[3]Research Manager, Japan Association of Drainage and Environment, Bangladesh. |

| *Corresponding Author: | Quazi Zahangir Hossain   Email: zahangirkues@gmail.com |

ABSTRACT

Smokeless tobacco, SLT is a tobacco product used for chewing, sniffing, placing between teeth and gum. The situation and tradition of SLT use, influential personal and socio-cultural factors and awareness about harmful effect were observed from 552 SLT users using a semi-structured questionnaire for comparative analysis. Rural communities were selected in 2-districts where tobacco is cultivated traditionally (Kushtia) and tobacco is not cultivated (Khulna). Respondents' mean age was 48.6±14.4 and about half without any formal education. Most of the respondents (92%) use SLT daily and among them three-fourths were the user of *zarda* followed by *gul* and *sadapata*. More number of respondents in Khulna use *gul* (27.9%) than Kushtia (20.7%), reversely *sadapata* is used more in Kushtia (22.1%) compared to Khulna (11.9%). Almost half of the respondent's (45.7%) parents and wives (41.7% and 32.6% respectively) were more likely to use SLT in Kushtia (37.0%) than in Khulna (30.0%). Only 13.0% of the respondents were influenced to intake SLT by their family members. The reasons behind consuming SLT as mentioned by the respondents in Khulna are to reduce depression (32.7%), remove mouth odor (27.7%) and control vomiting (19.8%). Irrespective of the locations, almost half of the respondents (47.3%) were influenced by social factors such as peer group (79.3%) and gossiping partners (64.4%). It was also noted that, 95.8% of the respondents offer SLT to the guests during the wedding ceremony. A good portion of the respondents (84.6%) believe that SLT has harmful effects as they got such information from product cover (31.7%), medical professionals (23.6%) and television (14.1%). About 40% of the respondents believe that cancer may be caused by regular consumption of SLT, though yet they use SLT for the remedy from toothache and gum pain (31.9%), on peer pressure (28.6%) and for amusement only (10.1%). It could be concluded that, the use of SLT in the study areas is at an alarming level which should be noticed by the concerned authority to control the promotional activities and to imposing restrictions on the availability of SLT as traditional items.

INTRODUCTION

Smokeless tobacco (SLT) is a family of tobacco or a tobacco products in which the nicotine is intended to consume directly from tobacco in an unburned state (Rogozinski, 2002) rather than burning tobacco and inhaling the smoke as a means of nicotine delivery (Anchorage, 2008). SLT products are produced in various forms -chewing [three sub-forms: twist, plug (brick form), and loose-leaf (packaged in a pouch)], sniffing (a generic term for fine-ground tobacco products), and dissolvable tobacco products (placing

the product between the teeth and gum, or application to the skin). Sniff is a powdered tobacco in cans that is put between the lower lip and the gum –known as dipping (American Academy, 2016). The traditional forms are betel quid, tobacco with lime and tobacco tooth powder which are commonly used by men but also by children, teenagers, women of reproductive age, medical and dental students in the south Asian diasporas (NICE, 2012). Boffetta (2008) noticed substantial and increasing use of SLT among Indian women. Similarly, Azam (2016) opined that the bulk of the women use SLT during their pregnancy. In India, women are currently familiar with five main types of smokeless tobacco as *paan* (betel quid) with tobacco, *mishri* (toasted powdered tobacco), *gutkha* (packaged tobacco with chemicals and flavoring), chewed (loose and packaged) tobacco and *gul* (Nair et al., 2015). Use of SLT and *paan* products is common amongst certain population groups as Bangladeshi expatriates in Britain (Rahman et al., 2015), women residing in old Dhaka (Noor et al., 2016), and people residing in India, Nepal, Pakistan and Sri Lanka (Wright et al., 2013). Moreover, Boffetta (2008) claimed that south Asia (NICE, 2012), particularly India is one of the world's largest producers and consumers of tobacco, much of it in SLT form.

Mia et al. (2017) showed that SLT use is significantly higher among men, older people, illiterate, married, day labors and relatively poorer people. The increased likelihood of SLT use among the illiterate and less educated may indicate that some factors are involved in the initiation of SLT use and smoked tobacco among the people of Bangladesh (WHO, 2009; Abu et al., 2014). Smoking tobacco is not always accepted in a family environment or in front of or with seniors like parents, elder brothers, sisters, relatives and others but uses of some sorts of SLT are accepted by the same kind of people who have in confusion about health effects and the awareness level of SLT. Consumption of SLT causes oral, head and neck cancer, diabetes, hypercholesterolemia, myocardial infarction and adverse effects on pregnancy (Gupta and Ray, 2003). Bangladesh has been ranked among the top tobacco-consuming countries in the world where 68% of the total mortality reported in 2006 was due to non-communicable diseases (Aziz et al., 2015). SLT is highly addictive (WHO, 2007; Czoli et al., 2016) and one of the leading preventable causes of early death, disease, and disability around the world (Ezzati et al., 2002). In every 6.5 seconds one tobacco user dies in the world from a tobacco-related disease (Guidon and Boisclair, 2007).

The pattern and correlation of SLT use were studied by different researchers in Bangladesh and abroad (Abdullah et al., 2014; Rahman et al., 2015; Azam et al., 2016 and Mia et al., 2017). Though a number of studies are there related to smoking tobacco but very few are found on the factors behind the addiction of the people on SLT. In this light, the current study has been planned to identify the real picture of the factors that influence the tradition of SLT use in marginal communities of southwestern part of Bangladesh.

MATERIAL AND METHODS

This is a comparative study in two districts of southwestern part of Bangladesh considering land use for tobacco cultivation. One district was Khulna (Upazillas: Phultola, Batiaghata and Rupsha) where tobacco cultivation is not yet recognized and the other was Kushtia (Upazillas: Kumarkhali, Bheramara and Mirpur) where it is significantly increasing. The study was conducted from March to November, 2017.

SLT users living in selected villages of each upazilla were the study population. Six villages from 3 unions of 3 upazilla were selected from both of the districts through multistage cluster sampling method. One respondent was surveyed from one household. Simple random sampling technique was followed for the households' selection. The total household (HH) and village in Khulna was 5,38,801 and 1,119 respectively (PHC, 2016). On the other hand, the total household and village in Kushtia was 474,997 and 978, respectively (PHC, 2016). As the target population in 6 villages of Khulna and Kushtia were 2,889 (~3,000) and 2,914 (~3,000), respectively and the following formula was used to calculate the sample size for the survey (Kothari, 1990):

$$n = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{N \times e^2}\right)}$$

Where,

Z= 1.96 for 5% level of significance

p= Expected proportion in the population =27.2% (GATS, 2009)

e= Margin of error = 0.05 (considered)

N= Population size = 3000

So, n = 276.25 ≈ 276

In quantitative approach, a semi-structured questionnaire was used for interview. Only 46 respondents were randomly selected from each of the two villages from three selected upazillas of each of the districts. Thereby, a total of 552 households were surveyed through face to face interview in Khulna (276 respondents) and Kushtia (276 respondents) districts. The collected data on socio-economic status and SLT consumption behavior of the respondents were analyzed statistically by using the statistical package and then comparative analyses were performed as appropriate to test the difference among the variables.

RESULTS AND DISCUSSION

The study was conducted to understand the status of SLT use in Khulna and Kushtia districts by comparing the socio-economic situations; personal and socio-cultural factors and tradition of SLT use; awareness about harmful effect of SLT in the rural communities. As Kushtia is a renowned tobacco growing area and Khulna has no record of growing tobacco, but the result shows no such difference between frequencies of using SLT in respect of localities.

Socio-demographic information

The mean age of the respondents in Khulna was 47.6 (±14.7) years while it was 49.7(±14.2) years in Kushtia where 48.2% were female and 51.8% were male (Table 1). About half of the respondents from Khulna (34.1%) and Kushtia (60.9%) were without formal education with a small number of graduates and above level of education (2.2%). Most of the respondents from both of the areas were from the nuclear family (86.2%), married (90.4%) and housewife in Khulna (34.4%) and in Kushtia (38.8%). The other occupations were day laborer (18.5%, 14.9%), farmer (15.9%, 24.3%), business (11.2%, 10.9%), service holder (7.6%, 2.5%), and rickshaw/ van puller (3.6%, 2.2%) in Khulna and Kushtia, respectively

Situation of SLT use

Table 2 shows the mean age of the respondents when they started intake of SLT. In Khulna it is at early age (24±10.9) compared to Kushtia (30±11.9). Azam et al. (2016) found very similar result of the present study regarding initiation age (males: 26.43±8.57 years and females: 25.83±9.75 years) of the people of Demra and Tongi in Dhaka, Bangladesh. Research showed most people start smoking tobacco at teen age compared to SLT using at later. Most of the respondents (92.0%) intake SLT daily and only a few others were using occasionally; the proportion of daily user was a bit higher in Kushtia (94.0%) than in Khulna (90.0%). A study conducted among women of Dhaka city found differently from the results that three-fourths of the respondents were daily user and the remaining used to take occasionally (Noor et al., 2016). The proportion of regular user was much lower compared to the present study.

The most frequently used SLT were *zarda*, *gul*, *sadapata*, and *vijapata*. About three-fourths (75.3%) were taking *zarda* with betel leaf is similarly presented by Rahman et al. (2015) followed by *gul* (24.2%). More respondents in Khulna were using *gul* (27.9%) compared to Kushtia (20.7%). Survey shows that *gul* was being used for brushing teeth; sometimes keep inside the mouth for a longer time. The most dreadful misuse of using *gul* was for healing toothache and removing the odor of mouth. More respondents from Kushtia use *sadapata* which is almost double than of Khulna (22.1% vs.11.9%). *Sadapata* and *vijapata* were

also being used with betel leaf. *Vijapata* is a highly scented, soggy and informally packed tobacco leaf.

According to the respondents, the major reasons for consuming SLT are to recover from toothache and gum pain (31.9%), followed by peer influence (28.6%). The other reasons mentioned by a moderate to a small portion of respondents are amusement (10.1%) relative's influence (10.0%), tasty feelings (7.6%), curiosity (7.4%) etc. Both peer (33.3%) and relative's influence (10.9%) were higher in Kushtia. The respondents mostly intake SLT after having their meal in breakfast (75.5%), lunch (74.6%) and dinner (67.2%). Approximately one-fifth (20.1%) of the respondents use SLT at the early morning and one tenth (10.1%) use it before going to toilet. Around two-fifth (41.3%) of the respondents have no fixed time for using SLT. The most of the respondents (62.9%) use SLT alone (without partner), followed by 48.2% use it with peers. The commonplace of using SLT is at home (81.7%) and most of the respondents are non-smokers (84.2%).

Factors at family level influencing the use of SLT

The family members influence the intake of SLT by the respondents where about half of the respondents' father (45.7%) and mother (41.7%) intake SLT including other family members as wife (32.6%) (Table 3). The other members as uncle and spouse also influenced the respondents (31 to 81%) to use SLT. Rahman et al. (2015) reported that 17% of SLT users were influenced by relatives or neighbors; 16% were influenced by grandparents, parents-in-law, and teachers. However, in both of the cases of smoking tobacco and using SLT, people are mainly influenced by peers and/ or start following family member(s). But usually, in Bangladeshi culture, family members hinder smoking tobacco and it is unaccepted to smoke tobacco in a family environment, while SLT has social acceptance. The mean (±SD) duration of using SLT among respondents' family in Khulna is 23.2±14.0 years, which is higher than Kushtia (18.9±14.1). The family members are fond of *zarda* with betel leaf (76.0%) followed by *gul* (13.2%) and *sadapata* (10.7%).

Influential personal and socio-cultural factors

More than half of the respondents (62.3%) were not influenced by personal factors for consuming SLT. However, the influential personal factors as reported by the respondents from Khulna are relieving from depression (32.7%), removing odor from mouth (27.7%), and vomiting tendency (19.8%) which was 7.5%, 11.2% and 5.6% in Kushtia, respectively (Table 4). Some respondents were advised to use *gul* by village doctors to reduce toothache and prohibit bleeding from gum. Females were sometimes advised by mothers and/or mothers-in-law to take *zarda* with betel leaf during her pregnancy to get relief from pregnancy symptoms. Rahman et al. (2015) reported similarly as female were taking *zarda* with betel leaf to

get relief from pregnancy symptoms such as anorexia, nausea, and vomiting. Many scholars have shown depression as a risk factor for initiating smoking tobacco but from the current study it revealed that the people are using SLT to reduce depression. It was also found to be used as remedial measure from personal problems which is very harmful behavior leading to inverse effects on health.

About 47.3% of the respondents were influenced by different types of social factors where the peer groups occupy the top (79.3%) and they intake it during gossiping (64.4%) followed by after marriage (6.5%), being advised by mother-in-law (5.7%) and to feel older after daughter's marry or to become pretty to spouse (overall 2.3%). It was observed that, though most of the respondents know about the harmful effect of consuming SLT, but many of them may not believe it. Due to misconceptions among family members and limited knowledge on harmful effect of SLT, it is getting social acceptability and may increase the use of SLT products. Scholars have similarly reported that misconceptions about the harmlessness of SLT use have led to increased social acceptability and uptake of SLT products (Gale and Boyd, 1989; Sussman, 1989).

As a part of tradition, the respondents offer SLT both in wedding ceremonies (95.8%) and to welcome guest at their home (86.1%). The proportion of respondents offering SLT as tradition during wedding or welcoming guests was a bit higher in Kushtia (89.0% and 87% respectively) compared to Khulna (83.3% and 78% respectively). Wright et al. (2013) also have reported about such tradition as *paan* products regularly offered after meals during celebrations such as marriages. These events are source for people to take SLT occasionally. Such occasional use may motivate people using SLT regularly.

Awareness about harmful effect of SLT use

Most of the respondents (84.6%) know about the harmful effect of SLT. They came to know about it from tobacco pack (31.7%), general people (26.4%), doctors (23.6%) and TV (14.1%). They believe that people can suffer from cancer (37.8%), heart disease (25.0%), ulcer (24.5%) and toothache (13.0%) by regular consumption of SLT.

A considerable portion of respondents (27.0%) increased their SLT consumption where majority of them did it due to addiction (89.9%). The proportion of the addicted people was bit higher in Khulna (84.3%) than Kushtia (78.8%). They also become addicted to SLT to reduce depression (15.4%) and toothache (2.7%). However, 35.9% of the respondents reported that they are trying to stop using SLT due to acidity problem (41.4%), physician's suggestion (17.2%) and repelling mouth odor (14.6%). More than half of the total respondents (50.9%) believe consumption of SLT would create health risks for pregnant women though the other half are not aware about these risks (Table 5 and 6).

Table 1. Socio-demographic information

Variables	Categories	Khulna n= 276 (%)	Kushtia n= 276 (%)	Overall n= 552 (%)
Age	Mean (SD) (in year)	47.6 (±14.7)	49.7 (±14.2)	48.6 (±14.4)
Gender	Female	135 (48.9)	131 (47.5)	266 (48.2)
	Male	141 (51.1)	145 (52.5)	286 (51.8)
Education (HH Head)	No formal education	94 (34.1)	168 (60.9)	262 (47.5)
	Primary	80 (29)	73 (26.4)	153 (27.7)
	Secondary	78 (28.3)	28 (10.1)	106 (19.2)
	Higher Secondary	13 (4.7)	3 (1.1)	16 (2.9)
	Graduate and above	9 (3.3)	3 (1.1)	12 (2.2)
	Others	2 (0.7)	1 (0.4)	3 (0.5)
Family type	Nuclear	230 (83.3)	246 (89.1)	476 (86.2)
	Joint	46 (16.7)	30 (10.9)	76 (13.8)
Marital status	Married	244 (88.4)	255 (92.4)	499 (90.4)
	Unmarried	12 (4)	6 (2.2)	18 (3.3)
	Divorced	5 (1.8)	0 (0)	5 (0.9)
	Widowed	15 (5.4)	15 (5.4)	30 (5.4)
Occupation	Housewife	95 (34.4)	107 (38.8)	202 (36.6)
	Farmer	44 (15.9)	67 (24.3)	111 (20.1)
	Service holder	21 (7.6)	7 (2.5)	28 (5.1)
	Businessman	31 (11.2)	30 (10.9)	61 (11.1)
	Student	4 (1.4)	1 (0.4)	5 (0.9)
	Day laborer	51 (18.5)	41 (14.9)	92 (16.7)
	Van/ rickshaw puller	10 (3.6)	6 (2.2)	16 (2.9)
	Others	20 (7.2)	17 (6.2)	37 (6.7)

Table 2. The situation of SLT use among the respondents (* = multiple responses)

Variables	Characteristics	Khulna n= 276 (%)	Kushtia n= 276 (%)	Overall n= 552 (%)
Initiation age	Mean(SD) (in year)	24 (±10.9)	30 (±11.9)	27 (±11.4)
Frequency	Daily	248 (90.0)	259 (94.0)	507 (92.0)
	Weekly	3 (1.0)	3 (1.0)	6 (1.0)
	Occasionally	25 (9.0)	14 (5.0)	39 (7.0)
Types of SLT*	*Zarda*	212 (76.8)	204 (73.9)	416 (75.3)
	Gul	77 (27.9)	57 (20.7)	134 (24.2)
	Sadapata	33 (11.9)	61 (22.1)	94 (17.0)
	Vijapata	15 (5.4)	3 (1.1)	18 (3.2)
Main reason	Curiosity	36 (13)	5 (1.8)	41 (7.4)
	Tasty	38 (13.8)	4 (1.4)	42 (7.6)
	Peer influence	66 (23.9)	92 (33.3)	158 (28.6)
	After pregnancy	7 (2.5)	8 (2.9)	15 (2.7)
	After marriage	3 (1.1)	6 (2.2)	9 (1.6)
	Toothache and gum pain	68 (24.6)	108 (39.1)	176 (31.9)
	Amusement	33 (12.0)	23 (8.3)	56 (10.1)
	Relatives influence	25 (9.1)	30 (10.9)	55 (10.0)
Time of SLT intake*	Early morning			111 (20.1)
	Before going to toilet			56 (10.1)
	After breakfast			417 (75.5)
	After lunch			412 (74.6)
	After dinner			371 (67.2)
	Any time			228 (41.3)
	At afternoon			67 (12.1)
Partner*	Peer group	133 (48.2)	133 (48.2)	266 (48.2)
	Alone	162 (58.7)	185 (67)	347 (62.9)
	Wife	22 (8.0)	18 (6.5)	40 (7.2)
	Family members	22 (8.0)	16 (5.8)	38 (6.9)
Influence of family member	Yes	150 (54.3)	92 (33.3)	242 (43.8)
	No	126 (45.7)	184 (66.7)	310 (56.2)
Smoking habit during SLT use	Yes			87 (15.8)
	No			465 (84.2)
Place of using SLT	At home	229 (83.0)	222 (80.4)	451 (81.7)
	At friend's home	4 (1.4)	1 (0.4)	5 (0.9)
	At social events	1 (0.4)	0 (0)	1 (0.2)
	At tea stall	23(8.3)	18(6.4)	41(7.4)
	At public place	19(6.9)	35(12.7)	54(9.8)

Rahman et al. (2015) reported that almost all participants mentioned that SLT is harmful and causes heart disease, cancer, and tuberculosis. The number of informed respondents was much higher in other study compared to the present study. However, 21.4% of the respondents in present study are not used to believe about harmful effect of SLT, though they suggested to involve mass media to address the harmful effects of smokeless tobacco on health (Noor et al., 2016).

Therefore control of the use of SLT in Bangladeshi society will require a massive social awareness program using the education system and various electronic media alongside the tobacco control program (Mia et al., 2017).

Contributing factors for using SLT by gender

Smokeless tobaccos are most popular forms of tobacco product used in Bangladesh. It is revealed from the study that there are some factors that are related with the gender shown in Table 7. Higher percentage of male (21%) compared to female (14%) was found to use multiple types of SLT, though the frequency of SLT use (P<0.632) are independent of the gender. Both male and female were influenced by the peer group to initiate SLT but the percentage of male (45.5%) were higher than female (10.5%). Reasons of initiation SLT are highly significantly associated where P-value is <0.001.

Table 3. Factors at family influencing the use of SLT (* = multiple response)

Variables	Characteristics	Khulna n= 276(%)	Kushtia n= 276(%)	Overall n=552 (%)
SLT user in family*	Father	73 (48.7)	38 (41.3)	111 (45.7)
	Mother	67 (44.7)	34 (37.0)	101 (41.7)
	Wife	45 (30.0)	34 (37.0)	79 (32.6)
	Other members	31 (20.7)	13 (14.1)	44 (18.1)
Duration (year)	Mean(SD)	23.2 (±14.0)	18.9 (±14.1)	21.0 (14.0)
Type of SLT use in family	*Zarda* with betel leaf	112 (74.7)	72 (78.3)	184 (76.0)
	Gul	26 (17.3)	6 (6.5)	32 (13.2)
	Sadapata	12 (8.0)	14 (15.2)	26 (10.7)
Influenced by family	Yes			72 (13.0)
	No			480 (87.0)
Influencing person	Father	11 (2.0)	3 (1.0)	
	Mother	14 (4.0)	5 (2.0)	
	Sibling	3 (5.9)	0 (0)	
	Grandfather	4 (3.0)	1 (1.0)	
	Grandmother	9 (17.6)	3 (14.3)	
	Others (uncle/wife/husband)	16 (31.4)	17 (81.0)	

Table 4. Influential personal and socio-cultural factor for using SLT (* =multiple response)

Variables	Characteristics	Khulna n=276 (%)	Kushtia n=276 (%)	Overall n=552 (%)
Distribution of personal factor	Yes			208 (37.7)
	No			344 (62.3)
Influential personal factor	Pregnancy	4 (4.0)	2 (1.9)	6 (2.9)
	Remove odor from mouth	28 (27.7)	12 (11.2)	40 (19.2)
	Nausea	1 (2.0)	2 (1.9)	4 (1.9)
	Vomiting tendency	20 (19.8)	6 (5.6)	26 (12.5)
	To reduce depression	33 (32.7)	8 (7.5)	41 (19.7)
	Other's	33 (32.7)	84 (78.5)	117 (56.2)
Influential social factor*	Gossiping			355 (64.4)
	Peer influence			438 (79.3)
	Mother-in-law asked			31 (5.7)
	Looking pretty to husband			13 (2.3)
	To feel older after daughter's marriage			13 (2.3)
	Early marriage			36 (6.5)
SLT offered in cultural programs	Yes			529 (95.8)
	No			23 (4.2)
During wedding ceremony	Tradition	220 (83.3)	236 (89.0)	456 (86.2)
	Entertainment	44 (16.6)	29 (10.9)	73 (13.8)
In welcoming guests	Yes			475 (86.1)
	No			77 (13.9)
The welcome event	Tradition	199 (78.0)	241 (87.0)	440 (92.6)
	Guest choice	28 (12.3)	7 (2.8)	35 (7.4)

Personal and socio-cultural factors for using SLT by gender

To find the association between genders with some personal and socio-cultural factors chi-square analysis was carried out and found most of the personal factors are independent with gender. But some social factors such as peer influence (P<0.009) is significantly associated with gender. About 87% male respondents believe that there was negative health effect. Hence ulcer is seen significantly associated with the gender of the respondents. Providing SLT in wedding ceremony was independent in nature (P<0.134) where, 97.2% male respondents reported in favor of it (Table 8).

Association between social factors and localities

In both Khulna and Kushtia almost half (49.0% and 50.9% respectively) of the respondents were influenced by social factors (Table 9).

Association between tobacco growing and non-growing areas

The Table 10 shows the association of growing and non-growing area with different factors. The initiation age (20-29) of thegrowing and non-growing area were more or less same though showed highly significant variation (P<0.000) among age groups. In growing area about 48.2% respondents were influenced by social factor.

Table 5. Awareness about harmful effects of SLT use (*= multiple responses)

Variables	Characteristics	Overall status in Khulna and Kushtia (n= 552 (%))
Know about harmful effect	Yes	467 (84.6)
	No	85 (15.4)
Source of knowledge about harmful effect	Television discussion	78 (14.1)
	Radio	3 (0.5)
	Packet of product	175 (31.7)
	Social media	6 (1.1)
	Medical professional	130 (23.6)
	Hear from people	146 (26.4)
	Others	14 (2.5)
Awareness of health effect*	Toothache	72 (13.0)
	Stone in tooth	50 (9.0)
	Loss of appetite	42 (7.6)
	Loss of taste	82 (10.8)
	Ulcer	124 (24.5)
	Cancer	209 (37.8)
	Abdominal complication	66 (11.9)
	Heart disease	138 (25.0)
	Not aware	118 (21.4)

Table 6: Current status of consumption and rejection to consume SLT

Variables	Characteristics	Overall status in Khulna and Kushtia (n= 552 (%))		
Increased SLT consumption	Yes	149 (27.0)		
	No	403 (73.0)		
		Positive response		
		Khulna (n= 83)	Kushtia (n= 66)	Total (n= 149)
Reasons of increasing consumption	Addiction	70 (84.3)	52 (78.8)	122 (89.9)
	Reduce depression	13 (15.7)	10 (15.2)	23 (15.4)
	Toothache	0 (0)	4 (6.0)	4 (2.7)
Tried to stop consumption	Yes			198 (35.9)
	No			354 (64.1)
		Positive response		
		Khulna (n= 122)	Khulna (n= 76)	Khulna (n= 198)
Reasons to stop	Acidity	50 (41.0)	32 (42.0)	82 (41.4)
	Cannot give up	36 (29.5)	17 (22.4)	53 (26.8)
	Physician suggestion	20 (16.4)	14 (18.4	34 (17.2)
	Repelling mouth odor	16 (13.1)	13 (17.1)	29 (14.6)
		Overall status in Khulna and Kushtia (n= 550 (%))		
Health risk during pregnancy	Yes	280 (50.9)		
	No	65 (11.8)		
	Don't know	205 (37.3)		

Table 7. Contributing factors for using SLT by gender

Variable	Factors	Female n (%)	Male n (%)	Total n (%)	P-Value
Frequency	Daily	247 (92.9)	260 (90.9)	507 (91.8)	0.632
	Less than daily	2 (0.8)	4 (1.4)	6 (1.1)	
	Occasionally	17 (6.4)	22 (7.7)	39 (7.1)	
Starting age (years)	<10	10 (3.8)	9 (3.1)	19 (3.4)	0.554
	10-19	48 (18.0)	61 (21.3)	109 (19.7)	
	20-29	85 (32.0)	106 (37.1)	191 (34.6)	
	30-39	73 (27.4)	65 (22.7)	138 (25.0)	
	40-49	30 (11.3)	28 (9.8)	58 (10.5)	
	>50	20 (7.5)	17 (5.9)	37 (6.7)	
Reason of initiation	Curiosity	15 (5.6)	26 (9.1)	41 (7.4)	<0.001
	Tasty	21 (7.9)	21 (7.3)	42 (7.6)	
	Peer Influence	28 (10.5)	130 (45.5)	158 (28.6)	
	After pregnancy	14 (5.3)	1 (0.3)	15 (2.7)	
	After marriage	7 (2.6)	2 (0.7)	9 (1.6)	
	Toothache and gum pain	128 (48.1)	48 (16.8)	176 (31.9)	
	Amusement	20 (7.5)	36 (12.6)	56 (10.1)	
	Relatives influence	33 (12.4)	22 (7.7)	55 (10.0)	
Married at time of initiation	Yes	232 (87.2)	171 (59.8)	403 (73)	<0.001
	No	34 (12.8)	115 (40.2)	149 (27)	
With whom use SLT	Peer group	56 (21.1)	75 (26.2)	131 (23.7)	<0.001
	Alone	154 (57.9)	96 (33.6)	250 (45.3)	
	Other family members	8 (3.0)	5 (1.7)	13 (2.4)	
	Spouse	7 (2.6)	12 (4.2)	19 (3.4)	
	Multiple people	41 (15.4)	98 (34.3)	242 (43.8)	
Family members use	Yes	119 (44.7)	123 (43.0)	245 (44.0)	0.731
	No	147 (55.3)	163 (57.0)	310 (56.2)	

Table 8. Personal and socio-cultural factors for using SLT by gender

Variable	Factor	Female n (%)	Male n (%)	Total n (%)	P-Value
Personal factor	Yes	144 (54.1)	64 (22.4)	208 (37.7)	0.000
	No	122 (45.9)	222 (77.6)	344 (62.3)	
Social factor	Yes	105 (39.5)	156 (54.5)	261 (47.3)	0.000
	No	161 (60.5)	130 (45.5)	291 (52.7)	
Peer influence	Yes	70 (66.7)	137 (87.8)	207 (79.3)	0.000
	No	35 (33.3)	19 (12.2)	54 (20.7)	
Negative health effect	Yes	216 (81.2)	251 (87.8)	467 (84.6)	0.034
	No	50 (18.8)	35 (12.2)	85 (15.4)	
Toothache	Yes	40 (15.0)	32 (11.2)	72 (13.0)	0.206
	No	226 (85.0)	254 (88.8)	480 (87.0)	
Ulcer	Yes	42 (15.8)	82 (28.7)	124 (22.5)	0.000
	No	224 (84.2)	204 (71.3)	428 (77.5)	
Cancer	Yes	88 (33.1)	121 (42.3)	209 (37.9)	0.028
	No	178 (66.9)	165 (57.7)	343 (62.1)	
Provide SLT in wedding ceremony	Yes	251 (94.4)	278 (97.2)	529 (95.8)	0.134
	No	15 (5.6)	8 (2.8)	23 (4.2)	
Provide SLT to welcome guest	Yes	229 (86.1)	246 (86)	475 (86.1)	1.000
	No	37 (13.9)	40 (14)	77 (13.9)	
Influenced by advertisement	Yes	13 (4.9)	17 (5.9)	30 (5.4)	0.708
	No	253 (95.1)	269 (94.1)	522 (94.6)	

Table 9. Association between social factor and two districts

District	Variable	Frequency (%)	p- value
Khulna	Yes	128 (49.0)	
	No	148 (50.8)	0.667
Kushtia	Yes	133 (50.9)	
	No	143 (49.1)	

Table 10. Association between tobacco growing and non-growing areas

Variables	Factors	Non-growing Area n (%)	Growing area n (%)	Total n (%)	P-value
Frequency of using SLT	Daily	248 (90.2)	259 (93.8)	507 (92.0)	
	Less than daily	2 (0.7)	4 (1.4)	6 (1.1)	0.096
	Occasionally	25 (9.1)	13 (4.7)	38 (6.9)	
Starting age	<10	17 (6.2)	4 (1.4)	21 (3.8)	
	10-19	65 (23.6)	42 (15.2)	107 (19.4)	
	20-29	107 (38.9)	83 (30.1)	190 (34.5)	
	30-39	55 (20.0)	83 (30.1)	108 (25.0)	0.000
	40-49	16 (5.2)	42 (15.2)	58 (10.5)	
	>50	15 (5.5)	22 (8.0)	37 (6.7)	
Main reason	Curiosity	36 (13.1)	5 (1.1)	41 (7.4)	
	Tasty	38 (13.8)	4 (1.4)	42 (7.6)	
	Peer influence	65 (23.6)	92 (33.3)	157 (28.5)	
	After pregnancy	7 (2.5)	8 (2.9)	15 (2.7)	
	After marriage	3 (1.1)	6 (2.2)	9 (1.6)	0.000
	Toothache and gum pain	68 (24.7)	108 (39.1)	176 (31.9)	
	Amusement	33 (12.0)	23 (8.3)	56 (10.2)	
	Others	25 (9.1)	30 (10.9)	55 (10.0)	
Types of SLT use	*Zarda* with betel leaf	112 (74.7)	71 (78.0)	183 (75.9)	
	Gul	26 (17.3)	6 (6.6)	32 (13.3)	0.020
	Sadapata	12 (8.0)	14 (15.4)	26 (10.8)	
Personal factor	Yes	102 (37.9)	107 (38.9)	109 (38.4)	0.441
	No	167 (62.1)	168 (61.1)	335 (61.6)	
Social factor	Yes	128 (46.4)	133 (48.2)	261 (47.3)	0.367
	No	148 (53.6)	143 (51.8)	291 (52.7)	
Provide SLT during wedding ceremony	Yes	264 (95.7)	265 (96.0)	529 (95.8)	
	No	12 (4.3)	11 (4.0)	23 (4.2)	0.831
Welcoming guest	Yes	227 (82.2)	248 (89.9)	475 (86.1)	
	No	49 (17.8)	28 (10.1)	77 (13.9)	0.010

CONCLUSIONS

The current study was conducted in two districts of Bangladesh known as tobacco growing and non-growing areas. It was aimed to identify the influential factors behind the tradition of SLT use in marginal communities of southwestern part of Bangladesh. A semi-structured questionnaire was used to collect information from randomly selected 552 respondents from these localities (276 respondents from each). From the study it revealed that, irrespective of the locations, almost half of the respondents (47.3%) were influenced to intake SLT by social factors such as peer group (79.3%) and gossiping partners (64.4%). Most of the respondent (95.8%) reported that they offer SLT to the guests during the wedding ceremony. A good portion of the respondents (84.6%) believe that SLT has harmful effects and they got such information from product cover (31.7%), medical professionals (23.6%) and television (14.1%). However, misconceptions exist on use of SLT products. They generally believe that, SLT products can be used as a remedy from a toothache, gum pain and odor from the mouth. Only a few people have noticed health advisory levels on the packets and containers to stop using SLT and to cope with those situations. SLT products (*vijapata*) are being manufactured, packed and marketed informally in

some places where effective monitoring can help to limit such harmful activities. Availability of SLT could be restricted at social events like a wedding ceremony. Some of the SLT products smell much and impose health difficulties to the users those arrests further attention as it has been importantly being considered in the case of secondhand smoking.

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ETHICAL ISSUE AND APPROVAL

The ethical approval of the study was given by the academic committee at the time when the study was approved as an MSc thesis at Environmental Science Discipline under Life Science School of Khulna University, Khulna -9208, Bangladesh.

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