Noor et al. AJPHN 2025; 2:2 - https://doi.org/10.62377/hwazwh41 Queeva Publishing

Oral Health Symptoms and Smokeless Tobacco Use Among Outpatients in Bangladesh: Insights from a Cross-Sectional Study

Ashek Elahi Noor[1], Russell Kabir[2]

[1]Atlantic Technological University, Letterkenny, Donegal, Ireland
[2]Anglia Ruskin University, United Kingdom
Corresponding author: rajet.elahi@gmail.com

Submitted: 09.06.2025
Revised: 26.07.2025
Accepted: 27.07.2025
Published: 03.08.2025

Abstract

Background: Smokeless tobacco (SLT) use is widespread in low-income countries like Bangladesh and is associated with serious oral health issues like cavities, tooth stains, and precancerous lesions. **Methods:** A descriptive cross-sectional study was conducted in the evening OPD of Sapporo Dental College and Hospital in Dhaka from April to October 2023. A standardized questionnaire and purposive sampling were used to survey 400 participants. Descriptive statistics and logistic regression were employed to examine the data. **Results:** Male respondents made up the majority (84.75%), while 39.5% of the total respondents were between the ages of 35 and 54. Teenagers and older adults used SLT more frequently. Bad breath (75%) and tooth stains (90.75%) were the most often mentioned oral concerns. Logistic analysis revealed that SLT use was significantly associated with age ≥14 years (OR = 6.58), reduced perceived harshness and benefits, and peer influence. Only 29.2% of those surveyed stated that they planned to cease after viewing the health warnings. **Conclusion:** Despite their ignorance of the health risks, adults in Dhaka who visit the dental outpatient department frequently utilize SLT. The results highlight the need for integrated oral health and tobacco cessation programs in community clinics and educational settings to improve public health outcomes in Bangladesh.

Keywords: Smokeless tobacco (SLT), Oral health, Adolescents, Bangladesh, Tobacco-related morbidity

Introduction

Using smokeless tobacco (SLT) raises the risk of oral cancer, gum disease, and tooth loss (Muthukrishnan and Warnakulasuriya, 2018). It is a global health issue, particularly in low-income countries like Bangladesh, where it is widely used due to ignorance and cultural norms (Siddiqi et al. 2015). SLT is especially popular among socioeconomically disadvantaged groups because of its low cost and cultural acceptability (Huque et al. 2024). International public health initiatives have not stopped the widespread use of SLT in South Asian societies (Huque et al., 2017). One of the highest rates of SLT use in Bangladesh disproportionately affects women (WHO, 2018).

Adolescents are particularly vulnerable due to peer pressure, ignorance of the health risks, and a lack of enforcement of tobacco control regulations (Hossain et al. 2014). Although earlier research has highlighted the connection between SLT use and oral morbidity, little is known about teenagers' attitudes, behaviors, and knowledge regarding SLT in hospital settings (Huque et al. 2024). Moreover, Perfetti and Rodgman (2012) claim that carcinogens such heavy metals and tobacco-specific nitrosamines, which can cause oral precancerous disorders, are commonly found in SLT products. There are still false beliefs that SLT will improve concentration or lessen stress whereas these concepts highlight the importance of targeted education and cessation programs while undermining public health initiatives (Sarker et al. 2023).

According to the Noor and Ramanarayana (2024) research report stated that there is currently a lack of research on adolescent-specific insights, particularly from clinical settings. The current study aims to assess the oral health symptoms, SLT using behaviors, and awareness levels among Bangladeshi OPD participants, including youth. The results will inform culturally relevant initiatives to help children stop smoking and become more

Noor et al. AJPHN 2025; 2:2 - https://doi.org/10.62377/hwazwh41 Queeva Publishing

conscious of their oral health, with practical implications for nursing and public health education (Petersen, 2003).

Methods

This descriptive cross-sectional study was conducted from April to October 2023 in the overnight outpatient department (OPD) of Sapporo Dental College and Hospital in Dhaka, Bangladesh, a variety of people with dental health difficulties can easily visit the site, which is why it was selected. A total of 400 people were recruited via purposive sampling. Despite the initial focus on adolescents, the final sample's participants ranged in age from 15 to over 75, with the majority being in the 35–54 age range (Sawyer et al. 2018). A structured questionnaire was developed by modifying the Global Youth Tobacco Survey (GYTS) (Bhawna, 2013).

The Brislin technique was used to translate it into Bengali and then back translated it to ensure accuracy (Brislin, 1970). Following a pilot trial with 20 participants, the tool's Cronbach's alpha was 0.78, indicating satisfactory reliability (Field, 2013). According to Creswell (2014), the questionnaire addressed sociodemographic, SLT use, oral health symptoms, perceptions, and knowledge. The inclusion criteria included consenting to participate, having used SLT in the past or present, and being able to access the evening OPD.

The exclusion criteria included non-residents, individuals with severe illnesses, those unable of giving consent, and non-SLT users. Data was collected through in-person interviews (Yin, 2017). The statistical analysis was conducted using SPSS Version 26. Descriptive data (frequencies, percentages) were used first, followed by logistic regression (95% CI), chi-square tests, and Fisher's exact tests to identify predictors of SLT use (Field, 2013).

Research ethics

The study was approved by Sapporo Dental College & Hospital's Institutional Review Board Ethics Committee and conducted in compliance with the Declaration of Helsinki's requirements (Ref No: SDC/C8/2023/1012; Date of approval: 12 March 2023). The study was carried out in accordance with the principles of the Declaration of Helsinki and was approved by the Institutional Review Board Ethics Committee of Sapporo Dental College & Hospital on March 12, 2023(World Medical Association., 2013). All study participants provided their informed permission. There was no information collected that could be used to identify a specific individual.

Research tool

A standardized questionnaire is used as the study tool for in-person interviews. The researchers assessed the structured questionnaire after it was translated from Bengali to English and had qualified translators verify the translation from Bengali to English (Brislin, 1970).

Information gathering

The questionnaire was delivered in person to the respondents in order to gather data. The researcher gave them an explanation of the study's goal before requesting that they complete the questionnaire. Data for this study were gathered between April and October 2023 by the Department of Dental Public Health at Sapporo Dental College and Hospital in Dhaka, Bangladesh.

Study variables

Participants' age, sex, marital status, occupation, education, religion, and occupation are among their attributes. Independent variables include things like oral health concerns, SLT behavior, perception, and knowledge.

Statistical analysis

The association between many factors linked to SLT using behavior and perception was investigated using a variety of statistical approaches. In the first stage, the researchers looked at how SLT is currently used, as well as perceptions and knowledge on its negative effects, using basic descriptive analytical approaches including frequency, percentage, mean, and median (Field, 2013). The association between various variables was investigated in the second phase using statistical research, such as Wald statistics, regression analysis with

Noor et al. AJPHN 2025; 2:2 - https://doi.org/10.62377/hwazwh41 Queeva Publishing

95% CIs, and the chi-square or Fisher exact test. The Statistical Package for Social Science, Version 26 was used to carry out each of the aforementioned studies.

Results

Demographics of Participants: A total of 400 participants were surveyed at the evening OPD of Sapporo Dental College and Hospital in Dhaka. Men made up the majority (84.75%), while the largest age group was 35–54 years old (39.5%). Of the participants, only 8% (n = 32) were younger than 19. Most participants (89.5%) had only completed secondary school or less and were married.

Table 1 Socio-demographic Characteristics of Participants (N = 400)

Variable	Category	n (%)
Gender	Male	339 (84.75)
	Female	61 (15.25)
Age group	≤19 years	32 (8.0)
	20–34 years	56 (14.0)
	35–54 years	158 (39.5)
	55–74 years	136 (34.0)
	≥75 years	18 (4.5)
Marital Status	Married	358 (89.5)
Education	Secondary or less	371 (92.75)

Table 1 gives a summary of the sociodemographic features. Several noteworthy tendencies emerged from the sociodemographic profile of the 400 individuals polled at the Sapporo Dental College and Hospital's evening outpatient service in Dhaka. There was a notable gender disparity, with only 15.25% of participants being female (n = 61) and the great majority being male (84.75%, n = 339). This gender gap can reflect regional cultural dynamics or more general trends in healthcare-seeking behavior.

The study population was primarily composed of adults in terms of age distribution. Those between the ages of 35 and 54 made up the largest segment (39.5%), closely followed by those between the ages of 55 and 74 (34.0%). Although the study was initially intended to focus on adolescent SLT use, adolescents aged 19 or under accounted for only 8% of the sample (n = 32), suggesting that the study captured a largely older group. Most participants (89.5%, n = 358) reported being married, which further reflected the older age profile. This is in line with the sample's adult-dominant makeup. Given that 92.75% (n = 371) of participants had only completed secondary school or less, the group's overall level of educational attainment was low, indicating little exposure to formal education.

All of these results point to a demographic bias toward older, less educated, and primarily male individuals. Although they were represented, teenagers' modest percentage in the total sample should be taken into account when interpreting the study's findings, particularly when it comes to the findings' applicability to younger populations.

Table 2 SLT Use Among Adolescents and Adults

Group	Ever Use (%)	Current Use (%)
Adolescents (≤19 y)	25	9.4
Adults (>19 y)	49.5	19.7
Total	47.25	18.5

Table 2 presents there were definite age-related variations in the use of smokeless tobacco (SLT) between teenagers (≤19 years) and adults (>19 years). A comparatively lower prevalence was seen among adolescents, with 9.4% reporting current SLT use and 25% reporting ever having used it. Adult SLT use, on the other hand, was far more prevalent, with 19.7% now using it and 49.5% reporting that they are using it. The overall prevalence of ever use was 47.25% among all participants, while the prevalence of current use was 18.5%. In line with the regression analysis, these results show a significant rise in SLT use with age, highlighting the necessity of age-specific intervention techniques. Because SLT is addictive and poses long-term health hazards, early onset use is still a major problem, even though rates among teens are decreasing.

Noor et al. AJPHN 2025; 2:2 - https://doi.org/10.62377/hwazwh41 Queeva Publishing

Table 3 Prevalence of Oral Health Symptoms Among Current SLT Users (n = 74)

Symptom	Frequency (%)
Dental stain	90.75
Bad breath	75
Dental plaque	65.25
Dental calculus	44.5
Dental caries	53
Loose teeth	26.5
Leukoplakia	7.25

Table 3 shows symptoms related to dental health and SLT use. Dental plaque (65.25%), poor breath (75.0%), and dental discoloration (90.75%) were the most frequently reported symptoms among all subjects. Although the findings were limited because of their small number, adolescents who reported using SLT also reported a higher frequency of stains and foul breath.

Table 4 Multivariate Predictors of Current SLT Use

Predictor	Odds Ratio (95% CI)	p-value
Age ≥14 years	6.58 (2.23–28.31)	0.002
Perceived SLT health advantage	0.21 (0.05–1.03)	0.029
Perceived seriousness of SLT use	0.36 (0.16–0.91)	0.046
Peer offering (self-efficacy)	5.78 (1.46–19.65)	0.006
Perceived difficulty quitting	0.30 (0.10–0.74)	0.014

Table 4 represents that participants aged ≥14 years had significantly higher odds of currently using SLT, according to a multivariate logistic regression model (OR = 6.58, 95% CI: 2.23–28.31, p =.002). Other important indicators included minimal felt harm, peer pressure, and perceived obstacles to stopping.

Figure 1 SLT Use by Age Group

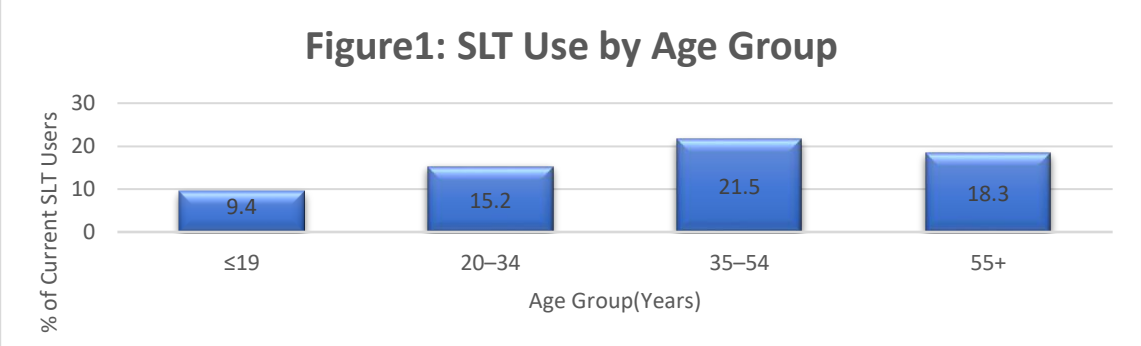

Figure 1 suggests that SLT use peaks in the 35–54 age range and is lowest among adolescents. The regression conclusion that age ≥14 is a strong predictor of current SLT use is supported by this visualization, which shows the age-related increase in SLT use. Thus, it supports the idea that youth should receive early intervention to avoid escalation in adulthood.

Discussion

According to the findings, SLT use and associated oral health issues are significantly more common, especially among middle-aged individuals (Huque et al., 2024). Despite the study's focus on minors, the hospital-based sample produced a plurality of older people (Etikan et al., 2016). However, knowing the behavioral aspects and knowledge gaps around SLT use will be beneficial for future study concentrating on adolescents (Hossain et al., 2014). There are still misunderstandings about the benefits of SLT and its social acceptability, especially in rural regions (Huque et al., 2024). Given the high intention to stop and the low effectiveness of

health warnings, more persuasive public health message is needed (WHO, 2025) whereas peer influence is still a major factor, so early school-based interventions are essential.

The study emphasizes the need for youth-centered, culturally appropriate oral health and tobacco cessation programs (Petersen, 2003). School nurses and public health educators can play a significant role in prevention and education (Creswell, 2014). Community outreach should include dental care, behavioral therapy, and policy lobbying to reduce SLT-related morbidity (Sarker et al., 2023).

Limitations

This research is subject to several limitations. First, the study's implications for teenagers were limited since, despite its intended focus on adolescents, most participants were adults between the ages of 35 and 54. Second, purposive hospital-based sample introduces selection bias that limits generalizability, especially for rural and school-based groups. Third, the cross-sectional design precludes drawing conclusions about causality. Finally, the reliance on self-reported data may have led to either an underreporting or an over reporting of SLT use and related symptoms.

Conclusion

The report highlights the pressing need for Bangladesh to put policies in place to prevent SLT and enhance oral health (Noor and Ramanarayana, 2024). Despite its widespread usage and detrimental consequences on oral health, few people are aware of it or are ready to quit using it (Huque et al., 2017). According to WHO (2025), we recommend that dental offices, community clinics, and secondary schools implement culturally relevant health education and SLT cessation programs. In these efforts, nurses and public health educators should be crucial because they can provide targeted support and promote positive behavior change (Petersen, 2003).

References

Bhawna, G. (2013) "Burden of smoked and smokeless tobacco consumption in India - results from the Global adult Tobacco Survey India (GATS-India)- 2009-201," Asian Pacific journal of cancer prevention: APJCP, 14(5), pp. 3323–3329. Available at: https://doi.org/10.7314/apjcp.2013.14.5.3323.

Brislin, R.W. (1970) "Back-translation for cross-cultural research," Journal of cross-cultural psychology, 1(3), pp. 185–216. Available at: https://doi.org/10.1177/135910457000100301.

Cancer Today (no date) Iarc.fr. Available at: https://gco.iarc.fr/today/en (Accessed: July 26, 2025).

Creswell, J.W. (2014) Research design: Qualitative, quantitative, and mixed methods approaches. Sage Publications.

Etikan, I. (2016) "Comparison of convenience sampling and purposive sampling," American journal of theoretical and applied statistics, 5(1), p. 1. Available at: https://doi.org/10.11648/j.ajtas.20160501.11.

Field, A. (2013) Discovering statistics using IBM SPSS statistics. Sage Publications.

Hossain, M.S. et al. (2014) "Prevalence and correlates of smokeless tobacco consumption among married women in rural Bangladesh," PloS one, 9(1), p. e84470. Available at: https://doi.org/10.1371/journal.pone.0084470.

Huque, R. et al. (2017) "Smokeless tobacco and public health in Bangladesh," Indian journal of public health, 61(Suppl 1), pp. S18–S24. Available at: https://doi.org/10.4103/ijph.IJPH_233_17.

Huque, R. et al. (2024) "Is smokeless tobacco use associated with lower health-related quality of life? A cross-sectional survey among women in Bangladesh," Tobacco induced diseases, 22. Available at: https://doi.org/10.18332/tid/185969.

IBM SPSS Statistics for Windows (Version 26.0) [Computer software (2019).

Muthukrishnan, A. and Warnakulasuriya, S. (2018) "Oral health consequences of smokeless tobacco use," The Indian journal of medical research, 148(1), pp. 35–40. Available at: https://doi.org/10.4103/ijmr.IJMR_1793_17.

Noor, A.E. and Ramanarayana, B. (2024) "Relationship of smokeless tobacco uses in the perspective of oral cancer: A global burden," Oral oncology reports, 10(100516), p. 100516. Available at: https://doi.org/10.1016/j.oor.2024.100516.

Petersen, P.E. (2003) "The World Oral Health Report 2003: continuous improvement of oral health in the 21st century--the approach of the WHO Global Oral Health Programme," Community dentistry and oral epidemiology, 31 Suppl 1, pp. 3–23. Available at: https://doi.org/10.1046/j..2003.com122.x.

Rodgman, A. and Perfetti, T.A. (2016) The chemical components of tobacco and tobacco smoke. 2nd ed. Boca Raton, FL: CRC Press. Available at: https://doi.org/10.1201/b13973.

Sarker, M.H.R. et al. (2023) "Smokeless tobacco consumption and its association with risk factors of chronic kidney disease in rural and peri-urban Bangladesh," Tobacco induced diseases, 21(October), p. 138. Available at: https://doi.org/10.18332/tid/171358.

Siddiqi, K. et al. (2015) "Global burden of disease due to smokeless tobacco consumption in adults: analysis of data from 113 countries," BMC medicine, 13(1), p. 194. Available at: https://doi.org/10.1186/s12916-015-0424-2.

World health organization (WHO) (no date) Who.int. Available at: https://www.who.int (Accessed: July 26, 2025).

World Medical Association (2013) "World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects: Ethical principles for medical research involving human subjects," JAMA: the journal of the American Medical Association, 310(20), pp. 2191–2194. Available at: https://doi.org/10.1001/jama.2013.281053.

Yin, R.K. (2017) Case study research and applications: Design and methods. Sage Publications.