



SMOKELESS TOBACCO USE AND ASSOCIATED SOCIO-ECONOMIC DEMOGRAPHIC FACTORS AMONG ADULTS IN AN URBAN RESETTLEMENT COLONY OF DELHI

Community Medicine

Dr. Varun Singh	Junior Resident, Department of Community Medicine, Maulana Azad Medical College, New Delhi-110002.
Dr. Mongjam Meghachandra Singh	Director Professor, Department of Community Medicine, Maulana Azad Medical College, New Delhi 110002.
Dr. Reeta Devi*	Assistant Professor, School of Health Sciences, Indira Gandhi National Open University, Maidan garhi, New Delhi 110068. *Corresponding Author
Dr. Suneela Garg	Professor of Excellence and Director Professor, Department of Community Medicine, Maulana Azad Medical College, New Delhi 110002.
Dr. Bratati Banerjee	Professor, Department of Community Medicine, Maulana Azad Medical College, New Delhi 110002.
Dr. Warisha Mariam	Senior Resident, Department of Community Medicine, Maulana Azad Medical College, New Delhi 110002.

ABSTRACT

Background: Smokeless tobacco (SLT) consumption poses serious health problems and is considered to be a significant risk factor for oral, esophageal and pancreatic cancers. Estimation of the magnitude of consumption of SLT would be useful in planning for tobacco control activities in the community.

Objectives: The study was conducted to estimate the prevalence of smokeless tobacco (SLT) use among adult population and to identify the socioeconomic factors associated with the SLT use among them.

Methods: This was a community based cross-sectional study conducted in an urban resettlement colony of North East Delhi among adult population (>18 years age). A pre-tested interview schedule adapted from the Global Adult Tobacco Survey India (GATS India) was used for data collection. Data was analyzed using SPSS version 25.

Results: A total of 440 study participants were enrolled for the study. The overall prevalence of SLT use was 24.5% (95% CI: 20.6 - 28.8), higher in males (28.7%)(OR 1.75) as compared to females (18.7%), more in graduate or above educated (34.6%)(OR 2.02), and among government employees (48.6%)(OR 4.2)($p < 0.05$). The prevalence of common forms of SLT consumed were: pan masala with tobacco (15%), gutka (12.3%), zarda (10.5%), khaini (9.3%), and gul (5.2%). The most common reason for initiation of SLT use among the users was found to be seeking enjoyment 46(42.6%). Only 35 (37.6%) current SLT users planned to quit SLT in next one year of the survey.

Conclusion: Nearly one fourth of the study subjects used SLT and more among males, education level graduate and above, and Government employees. This highlights the need to plan behavior change communication strategies and counsel them for reduction or cessation of SLT use.

KEYWORDS

Smokeless Tobacco, Prevalence, Cessation

INTRODUCTION

Tobacco is the single most preventable cause of death in the world today, including south Asian countries like India where there are disparities in chronic diseases like cancer and cardiovascular disease that have surpassed infectious disease as the leading cause of death. The health impacts of tobacco consumption are well documented and known to cause a variety of cancer like oral, esophageal and pancreatic cancer.¹

It has been reported that more than 300 million adults in 70 countries across all World Health Organization (WHO) regions use smokeless tobacco. The South - East Asia Region has the largest share (89%) of SLT users. Global Adults Tobacco Survey (GATS) data from 13 low and middle-income countries account for more than 250 million users of smokeless tobacco. According to the National Report of Global Adult Tobacco Survey (2008-10) conducted in India and Bangladesh, the prevalence of smokeless tobacco use were 25.9% and 27.2% respectively.² The second round of GATS (GATS-2) conducted between August 2016 to February 2017 under the aegis of Ministry of Health and Family Welfare, Government of India reported that prevalence of tobacco use were 29.6% among men, 12.8% among women while 21.4% (199.4 million) of all adults used smokeless tobacco.³

A study by Pindborg JJ et al among dental outpatients in Lucknow, Uttar Pradesh, and industrial workers in Ahmedabad, Gujarat, and reported that only 2.1% and 2.6% chewed tobacco alone, respectively.⁴ Wahi PN et al observed that only 7% of the villagers used Mainpuri tobacco product in Uttar Pradesh (UP).⁵ Mehta FS et al reported that 22% of a rural population were mishri users

(39% among women and 0.8% among men).⁶ Use of Mishri as a form of SLT appears to be much more common among women owing to its social acceptability. A study conducted in an urban community of Imphal West district of Manipur among population aged 18 years and above reported the prevalence of tobacco use were 77.6% and 58.7% among men and women respectively.⁷ However, there is lack of information from urban resettlement colonies in Delhi regarding smokeless tobacco (SLT) use. Hence, the present study was conducted with the objectives to assess the prevalence of SLT among adult population in an urban resettlement colony of Delhi, to study the socioeconomic, demographic factors associated with SLT use and reason for initiation of SLT, and intention to quit SLT among the study subjects.

MATERIALS AND METHODS

It was a community based cross sectional study conducted during January-December 2019 in Gokalpuri, a slum resettlement colony located in the North East District of Delhi. The population of the area was 29242 residing in 7961 households. The sample size was 440, calculated considering 20% SLT use in GATS 2 study³, 4% absolute error and 10% non-participation. Study was conducted by house-to-house visit. One hundred and ten households were randomly selected from each of the four blocks of Gokalpuri using computer generated random number. In each household, one adult aged 18 years or above were selected by using KISH Grid table.⁸ The study subjects were explained the purpose of the study, and a written and informed consent was taken from those who agreed to participate. The investigator interviewed the subjects using an interview schedule which is a modified proforma used by Global adult tobacco survey, India (GATS India).² It was pre-tested, prepared in English, then translated into

Hindi and retranslated to English before finalization for consistency in language. The data collected were entered in MS Excel and analyzed using SPSS version 25. Descriptive analysis was done, expressed in percentage, Chi-square test was applied to find the association between SLT use and socio-economic demographic factors. 'p' value less than 0.05 was considered as statistically significant. Socioeconomic status was classified based on Modified Kuppuswamy Scale (2019).⁹ Unadjusted Odds ratio (OR) were also calculated for variables associated with SLT use. Quit ratio was also calculated. It is defined as the number of former SLT users divided by the number of people who have ever used SLT daily.

RESULT

The overall prevalence of SLT use among the study subjects was 108/440 (24.5%) (95 % C I : 20.6 - 28.9). It was found that SLT use was higher among males 74(28.7%)(OR=1.75) than females 34(18.7%) (p=0.016)(Table 1). Better educated subjects (graduates and above) used SLT more than other lower educated subjects (OR: 2.02). SLT use was highest among those who were government employee 17(48.6%)(OR: 4.2) as compared to other occupational groups (p=0.003). There was no statistical significance regarding SLT use within the subgroups with respect to age, income, number of family members, socio-economic status, religion and marital status (p > 0.05).

Table 1. Association Between Socio-economic Demographic Factors And SLT Use (N=440)

Variables (n)	SLT use (present) No (%) (95% C.I.)	X ² ,df, 'p' value	Unadjusted Odds ratio, 95% C.I., 'p' value
Gender		5.763,1,0.016	
Male (258)	74(28.7)(23.3, 34.6)		1.75, 1.10-2.77, 0.01
Female (182)	34(18.7)(13.5, 25.3)		
Age (in years)			
≤20 (57)	12(21)(11.8, 34.3)	2.13,4,0.711	1
21-30 (163)	40(24.5)(18.3, 32.0)		1.21,0.58-2.53, 0.59
31-40 (105)	23(21.9)(14.7, 31.2)		1.05,0.47-2.31,0.89
41-50 (84)	23(27.3)(18.5, 38.4)		1.41,0.63-3.13, 0.39
>51 (30)	10(33.3)(17.9, 52.8)		1.78,0.67-4.78,0.24
Education		8.34,3,0.03	
No formal education (25)	7(28.0)(12.8, 49.6)		1.48,0.58-3.77,0.40
Primary (91)	19(20.9)(13.3, 30.9)		1.00,0.55-1.84,0.97
Secondary (217)	45(20.7)(15.7, 26.9)		1
Graduate and above (107)	37(34.6)(25.8, 44.5)		2.02,1.2-3.38,0.007
Occupation		15.79,4,0.003	
Self employed (143)	31(21.7)(15.4, 29.5)		1.23,0.65-2.30,0.51
Student (109)	20(18.3)(11.8, 27.2)		1
Non-government (86) employee	26(30.2)(21.0, 41.2)		1.92,0.98-3.7,0.054
Government employee (35)	17(48.6)(31.7, 65.7)		4.2,1.84-9.56,0.0006
Others (67)	14(20.9)(12.3, 32.9)		
Income(in Rs)		3.83,2,0.14	
< 10000 (90)	15(16.7)(9.9, 26.3)		1
10001-20000 (142)	37(26.1)(19.2, 34.2)		1.76,0.9-3.44, 0.09
>20001 (208)	56(26.9)(21.1, 33.6)		1.84,0.97-3.47,0.058

Number of family members		2.37,3,0.49	
2 (38)	7(18.4)(8.3, 34.9)		1
3-4 (296)	71(24.0)(19.3, 29.4)		1.39,0.58-3.31,0.44
5-6 (80)	21(26.2)(17.3, 37.5)		1.57,0.6-4.11,0.35
>7 (26)	9(34.6)(17.9, 55.6)		2.34,0.74-7.41,0.14
Socioeconomic status		0.535,2,0.765	
Upper middle (188)	44(23.4)(17.7, 30.2)		1
Lower middle (214)	53(24.8)(19.3, 31.2)		1.07,0.68-1.7,0.75
Upper lower (38)	11(28.9)(15.9, 46.1)		1.33,0.61-2.9,0.46
Religion		0.02,1,0.88*	
Hindu (408)	100(24.5)(20.5, 29.0)		1
Muslim (30)	7(23.3)(10.6, 42.7)		1.02,0.44-2.35,0.06**
Others \$ (2)	1(50.0) (2.7, 97.3)		
Marital status		0.39,1,0.53*	
Married (294)	69(23.5)(18.8, 28.8)		1
Unmarried (142)	38(26.8)(19.9, 34.9)		1.18,0.75-1.87, 0.45###
Others # (4)	1(25.0)(1.3, 78.1)		

*For Chi-square calculation combined Muslims and others, unmarried and others ; \$ Includes one Christian, one Sikh, # Includes 2 living alone, one separated, one widowed, **Combined Muslims and others, ###combined unmarried and others

Out of 108 smokeless tobacco users, majority 66(61.1%) had initiated use before 18 year of age followed by 37(34.3%) in the age group 18-25 years. Only 5 (4.6%) had initiated between 26-35 years. The reasons for initiation of SLT among the users are shown in figure 1.

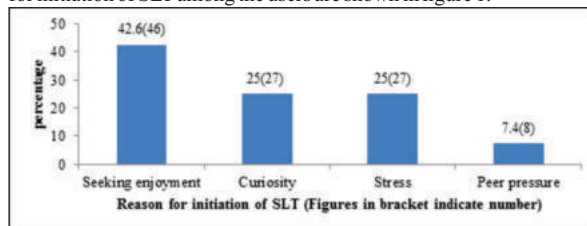


Figure 1. Reason For Initiation Of SLT Among Study Subjects (n=108)

It was observed that out of 108, chewing was the most common form of SLT consumption (95%). Majority of the SLT users consumed it daily 63(58.3%) followed by occasionally in 20(18.5%) and 25 (23.1%) consumed as and when needed.

The prevalence of various forms of SLT use were: pan masala with tobacco 66/440 (15%), gutka 54/440(12.3%), zarda 46(10.5%), khaini 41/440(9.3%), gul 23/440(5.2%).

Out of 108 SLT users, only 15(13.9%) were able to quit at some point of time. Out of 93 current SLT users, 35(37.6%) were planning to quit SLT in next one year while 37(39.8%) had yet not planned to quit SLT (Table 2).

Table 2. Distribution Of SLT Users According To Their Planned Timeline To Quit (n=93)

Planned timeline to quit	No (%) n=93
In next 30 days	2(2.1)
In next 6 months	9(9.7)
In the next 1 year	35(37.6)
More than year 1 from now	10 (10.8)
Not yet planned	37(39.8)

DISCUSSION

The overall prevalence of SLT use among the study subjects was found to be 24.5% (95% CI 20.6% - 28.8%) with higher prevalence among males (23.3%) (OR:1.75). It is consistent with Global Adults Tobacco Survey India (GATS India) data which reported prevalence to be 25.9% in adults overall, 32.9% among men and 18.4% among women.² Even the GATS-2 observed that smokeless tobacco was used by 29.6% of men, 12.8% of women and 21.4% (199.4 million) of all adults.³ In another study conducted in Delhi reported a significant association of gender and tobacco use (40.1% among males and 8.8% among females; $p < 0.001$).¹⁰ One of the factors for low prevalence of tobacco use among women could be due to social unacceptability or may be hidden due to societal taboos. However, this gender gap in the use of smokeless tobacco is less evident than the smoke form of tobacco due to its ease of availability and low cost. It has also been observed that the use of SLT by their husbands can also influence the behavior of women towards the same.¹¹ The finding of SLT use higher among men than in woman is also in consonance with the study by Mia MN et al in Bangladesh among 6178 individuals aged ≥ 13 years from 1753 households under the Chakaria area. They observed that 23% of the total respondents (men: 27.0%, women: 19.3%) used any form of SLT.¹²

According to GATS above 15 years, prevalence of SLT use among men was highest in India (33%) followed by 26% in Bangladesh, 4.1% in Egypt, 2.9% in Nigeria, 1.5% in Indonesia, 0.3% in Vietnam, 0.1% in Argentina and 0.0% in Uruguay. Prevalence of SLT use among women was highest in Bangladesh (28%) followed by India (18%), Thailand (6.3%), Vietnam (2.3%), Indonesia (1.9%), Philippines (1.2%), Brazil (0.3%), Egypt (0.3%), Argentina (0.2%), China (0.0%), Uruguay (0.0%).¹³

A study conducted by Jones et al observed that the prevalence of SLT use was higher in 2015 (3.6%) than in 2014 (2.3%, $p < 0.001$) and 2016 (2.7%, $p = 0.018$) among US adults.¹⁴ These variations in prevalence of SLT use could be due to geographical location, difference in culture and various factors influencing the behavior of the individuals living in that particular country. The significance of geographic variation in relation to SLT use is seen among the Indian subcontinent also. SLT products account for 27% of India's tobacco use and is used throughout India.¹⁵ The prevalence of tobacco consumption (smokeless and smoking form) varied between 1.6% in Jammu and Kashmir to 59.4% in Mizoram.¹⁶

The prevalence of SLT use in the present study (24.5%) is somewhere between 49% in Bihar and 2% in Goa as mentioned in the study by IIPS, Mumbai.² According to GATS – 2, the prevalence of smokeless tobacco use in Delhi was 8.8% which is much lower than that observed in the present study.³

In the present study, out of 108 study subjects who consumed smokeless tobacco, majority of the users 66(61.1%) had initiated before 18 year of age followed by 37(34.3%) who were initiated between 18-25 years. This is in contrast to GATS findings where it was observed that mean age at initiation of SLT use among adults aged 20-34 years was 25 years among Bangladeshi adults and 17.9 years among Indian adults. Bangladeshi men initiate SLT use 2 years earlier than women; in India, men begin SLT use about a year after women (18.2 years old for men and 17.1 years old for women).²

In the present study, out of 108 SLT users, reason for initiation of SLT was found to be seeking enjoyment in 46 (42.6%) followed by curiosity 27(25%) and stress 27(25%) and 6(5.5%) peer pressure. A study conducted by Azam MN et al observed that peer pressure, family, curiosity, hospitality and culture were the influencing factors for SLT initiation.¹⁷ A study by Ravishankar et al in Moradabad, Uttar Pradesh attributed curiosity and peer pressure were the main reasons behind trying smokeless tobacco. Parental tobacco status, especially place of use (at home or outside), had a significant influence on adolescents experimenting tobacco.¹⁸

The present study observed that chewing was the most common form of SLT consumption (95%). It has been reported that out of the 200 million tobacco consumers in India, 13% consumed it in the form of cigarettes, 54% in the form of beedi and the rest in raw/ gutka forms whereas worldwide, 85% of the tobacco cultivated is used in the production of cigarettes.¹⁸ Chewing tobacco has been found to be more common in central, western and northeastern states (Assam,

Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura) as compared to other states.¹⁹

In the United States (US), the predominant mode of SLT use is oral, besides placement in or inhalation into the nasal cavity.¹¹ In the present study, SLT users consumed it in more than one form (pan masala 61%, gutka 50%, zarda 42.6%) etc. This corroborates with the findings of Pindborg et al which mentioned that betel users often indulge in other habits in conjunction with betel chewing (e.g. chewing tobacco, pipe smoking and various forms of cigarette). Tobacco usage additional to quid chewing is reported throughout Asia.⁴

Present study observed that the prevalence of common forms of SLT consumed were: pan masala with tobacco (15%), gutka (12.3%), zarda (10.5%), khaini (9.3%), and gul (5.2%).

This is slightly different from GATS 2009-2010 survey findings in India wherein 11.6% used khaini, 8.2% used gutka, 6.2% used betel quid with tobacco, 4.7% in powdered tobacco form as oral snuff and 4.4% as other SLT products.² This is in contrast to findings of Bangladesh GATS 2009 survey where betel quid with tobacco was highest (24.3%) followed by gul (oral snuff) (5.3%), sadapatta (1.8%), khoinee (1.5%) etc.²⁰

The present study observed that out of 93 current SLT users, 37.6% were planning to quit SLT in next 1 year of the survey. Only 15 were able to quit for some point of time (Quit ratio = 13.9%). Quit ratio is an important indicator to compare quitting SLT between regions or population groups. Quit ratios among adults were low in both Bangladesh and India (5.5% vs. 4.8%).⁷ Also, as per observations of GATS-2 regarding cessation, 55.4% of current smokers were planning or thinking of quitting smoking and 49.6% of smokeless tobacco users were planning or thinking of quitting smokeless tobacco use but very little proportion were actually able to quit and sustain.³

CONCLUSION

The overall prevalence of SLT use among the study subjects was 24.5%. Male gender, occupation status (Government employee) and those with education level graduate and above were associated with SLT use among the study subjects. 37.6% of current SLT users were planning to quit SLT in next 1 year of the survey.

The study findings suggest the need to identify current smokeless tobacco users in the community, counsel them for reduction or cessation of SLT use and if required, refer them to tobacco cessation clinics. It is also recommended to encourage and involve community participation for Behavior Change Communication (BCC) focusing on avoidance of SLT use with the aim to achieve tobacco free society.

Ethical Clearance:

Cleared by Institutional Ethical Committee, Maulana Azad Medical College and associated hospitals, New Delhi.

Financial Support: NIL

Conflict of interest: NIL

REFERENCES:

1. U.S. Census Bureau, The Asian Population: 2000, Publication C2KBR/01-16, 2002. [internet][cited 12th march 2019 available from <http://www.census.gov/prod/2002pubs/c2kbr01-16.pdf>]
2. International Institute for Population Sciences (IIPS), Mumbai and Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey India (GATS India), 2009-2010.
3. Tata Institute of Social Sciences (TISS), Mumbai and Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey GATS 2 India 2016-17.
4. Pindborg JJ, Kier J, Gupta PC, Chawla TN. Studies in oral leukoplakias. Prevalence of leukoplakia among 10,000 persons in Lucknow, India, with special reference to tobacco and betel nut. Bulletin of the World Health Organization. 1967;37:109-116.
5. Wahi PN. The epidemiology of oral and oropharyngeal cancer. A report of the study in Mainpuri district, Uttar Pradesh, India. Bull World Health Organ. 1968; 38:495-521.
6. Mehta FS, Gupta PC, Daftary DK, Pindborg JJ, Choksi SK. An epidemiologic study of oral cancer and precancerous conditions among 101,761 villagers Maharashtra, India. Int J Cancer. 1972; 10:134-141.
7. Devi LJ, Singh WP. Prevalence and pattern of tobacco use among adults in an urban community. IOSR Journal of Humanities and Social Science (IOSR-JHSS).2015 Jan;20(1):38-41.
8. Kish Grid – what it is and how to use it.[internet] [accessed on 14th June 2019] Available from <https://www.statisticshowto.com/kish-grid/>.
9. Modified Kuppuswamy Socioeconomic Scale. [internet][accessed on 14th June 2019]. Available from https://www.researchgate.net/publication/323846030_modified_kuppuswamy_scale_updated_for_year_2018.

10. Garg A, Singh M, Gupta V, Garg S, Daga M, Saha R. Prevalence and correlates of tobacco smoking, awareness of hazards, and quitting behavior among persons aged 30 years or above in a resettlement colony of Delhi, India. *Lung India*. 2012; 29(4):336
11. Nair S, Schensul JJ, Begum S, Pednekar MS, Oncken C, Bilgi SM, et al. Use of Smokeless Tobacco by Indian Women Aged 18–40 Years during Pregnancy and Reproductive Years. *PLoS ONE*. 2015; 10(3): e0119814. <https://doi.org/10.1371/journal.pone.0119814>
12. Mia MN, Hamiti SMA, Rahman MS, Sultana A, Hoque S, Bhniya A. Prevalence, pattern and sociodemographic differentials in smokeless tobacco consumption in Bangladesh: evidence from a population-based cross-sectional study in Chakaria. *BMJ Open*. 2017; 7:e012765.
13. Asma S, Mackay J, Song SY, Zhao L, Morton J, Palipudi KM, et al. The GATS Atlas. 2015. CDC Foundation, Atlanta, GA.
14. Jones MD, Majeed BA, Weaver SR, Sterling K, Pechacek FT, Eriksen MP. Prevalence and factors associated with smokeless tobacco use, 2014–16. *Am J Health Behav*. 2017; 41(5):608–617.
15. Ray CS, Gupta PC. Bidis and smokeless tobacco. *Curr Sci*. 2009; 96(10):1324–34.
16. Thakur JS, Prinja S, Bhatnagar N, Rana SK, Sinha DN, Singh PK. Widespread inequalities in smoking and smokeless tobacco consumption across wealth quintiles in states of India: need for targeted interventions. *Indian J Med Res*. 2015; 14(6): 789–98
17. Azam MN, Shahjahan M, Yeasmin M, Ahmed NV. Prevalence of smokeless tobacco among low socio-economic population: A cross sectional analysis. *PLoS ONE*. 2016; 11(6):e0156887.
18. Ravishankar TL, Nagarajappa R. Factors attributing to initiation of tobacco use in adolescent students of Moradabad, (UP) India. *Indian J Dent Res*. 2009; 20:346–349.
19. Mohan and Lando. Oral Tobacco and Mortality in India. *Indian Journal of Clinical Medicine* 2016; 75–12 doi:10.4137/IJCM.S25889.
20. World Health Organization (WHO) Country Office for Bangladesh. Global Adult Tobacco
21. Survey: Bangladesh report, Bangladesh, 2009. Available from: http://www.int/tobacco/surveillance/global_adult_tobacco_survey_bangladesh_report_2009.pdf. [last accessed on 2021 May 24].