

RESEARCH ARTICLE

Analysis of Motivating Factors for Smokeless Tobacco Use in Two Indian States

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Abstract

Background: This study was conducted to gauge how the demographic profile of smokeless tobacco (SLT) users from Gujarat and Andhra Pradesh, India, differs from that of smokers. It also addresses how factors associated with the initiation and continuation of smokeless tobacco vary by age, gender, and education. **Materials and Methods:** We analyzed 2011 cross-sectional survey data collected from 4,759 respondents (smokers/SLT users/non-users) in both states. Chi-square analysis was used to make comparisons between the demographic profiles of smokers and SLT users. Multivariable logistic regression analysis was used to obtain the odds ratios (ORs) for initiation and continuation factors regressed on socio-demographic variables (age, gender, education). **Results:** Initiation-women were less likely than men to report “peer pressure”, “fashion statement”, and “stress/coping” as relevant factors for SLT use (OR: 0.45 CI: 0.30-0.70; OR: 0.42 CI: 0.24-0.74; OR: 2.47, CI: 1.47-4.15). Older age groups had lower odds of choosing “peer pressure” than the 15-24 year olds. Respondents with 11 or more years of education were more likely to report “stress/coping” than those with no education (OR: 2.82, CI: 1.06-7.48). Continuation-women were less likely than men to choose “relaxation”, and “distance from family” as important continuation factors (OR: 0.50, CI: 0.32-0.80; OR: 0.20, CI: 0.06-0.65). All age groups were less likely to choose “stimulation” as a factor than the youngest group. **Conclusions:** Along with confirming and expanding upon previous literature, the findings of this study should encourage further SLT research in women and younger age groups (15-24 and 24-44). They also confirm the need for SLT prevention and cessation interventions in India in other community-based settings, besides schools.

Keywords: Smokeless tobacco - tobacco control India - COTPA - logistic regression - oral cancer

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Introduction

India is the second largest consumer of tobacco in the world. According to the 2009-2010 Global Adult Tobacco Survey (GATS) for India, more than one-third (35%) of adults in India use tobacco in some form. Among them, 21% of adults use only smokeless tobacco (SLT), 9% only smoke and 5% both smoke and use smokeless tobacco. Tobacco is a known risk factor for several chronic diseases, such as cancer of the lungs, mouth, and throat. Hence, there has been the vehement push for tobacco control measures over the past ten years (GATS India, 2009). While GATS and other studies highlight this difference in tobacco use patterns, various stakeholders have expressed increased interest in exploring determinants that contribute to the use and cessation of SLT use in India.

Even though a substantial body of research on the smoking form of tobacco in India has been conducted in the last 12 years, smokeless tobacco still requires further exploration. Thus far, the epidemiological significance is well known: India's high oral cancer rates can be attributed to the use of smokeless tobacco (SLT) forms. This is also

the case for other South and Southeast Asian countries (Rao et al., 2013). The various forms are chewed, sucked or applied to teeth and gums. These include items such as betel quid with tobacco, khaini, gutkha, paan masala. Products applied to the teeth include mishri, gul, bajjar, gudakhu (GATS India, 2009).

Understanding how SLT compares to smoking form of tobacco is a major gap in SLT research, with the exception of a recent study by Sarkar and colleagues that used the same survey baseline data used for this study (Sarkar et al., 2013). Although smoking rates have decreased across India, the prevalence of smokeless tobacco remains high. India's tobacco control issues are complex due to the mixture of smoking and smokeless tobacco forms. The mixture raises many important questions and considerations for tobacco-control intervention designs. While India's tobacco control efforts around smoking have shown success, the case of smokeless tobacco differs in terms of its users, addiction dynamics, and cultural acceptance. In India and other South and Southeast Asian countries, the lattermost factor perpetuates the idea that SLT use is somehow less harmful than smoking (Kyaing

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The overall aim of this research is to characterize smokeless tobacco users in two states in India, Gujarat and Andhra Pradesh, and the factors associated with the onset and continuation of smokeless tobacco use. This leads us to two main questions. What is the demographic profile of smokeless tobacco users from Gujarat and Andhra Pradesh, and how does that profile differ from the smokers in the sample? How do the factors associated with the initiation and continuation of smokeless tobacco vary by age, gender and education?

Materials and Methods

The study is cross-sectional, and is based on baseline data from the community survey under Project STEPS (Strengthening of Tobacco control Efforts through innovative Partnerships and Strategies). Andhra Pradesh and Gujarat were identified as having the highest number of producers of tobacco in India, apart from a high prevalence of tobacco use.

Overall, there was a multistage sampling design for the six selected districts in each state. Within this design, random sampling was at the last stage when households were selected at random; also an adult in each selected household was further randomly selected. Adults age 15 years and above in the Primary Sampling Units (PSUs) of both Gujarat and Andhra Pradesh were the respondents for the larger survey. The adult respondents were selected randomly in the PSU for the survey.

In order to have representative sample size estimation for each group in an intervention and control study for the baseline and end-line surveys, equal sample sizes were allocated among the all five groups. Each group listed above consisted of 25 PSUs with 500 adults in Gujarat and 27 PSUs with 540 adults in Andhra Pradesh. With the five groups combined, 2500 adults were in 125 PSUs in Gujarat and 2700 adults were in 135 PSUs in Andhra Pradesh. Based on the knowledge level of the anti-tobacco campaign presented in GATS India (the proportion of adults that noticed any anti-cigarette message during the last 30 days prior to the survey), the sample size was determined for each group. Rural and urban samples were allocated based on the state's urban population ration in each group. For the selection of rural PSUs in each group, all of the villages of that particular group were put into one rural file using the Population Proportion to Size (PPS) procedure.

The study was conducted through an interviewer administered survey schedule from March to May 2011. The total number of people interviewed in 2,510 in Andhra Pradesh and 2,249 in Gujarat. While data collection for Gujarat and Andhra Pradesh were conducted independently of each other, for the purposes of providing a robust sample size for this analysis, we combine the two states' data. Differences in the demographic composition of SLT users were also found between states, another reason for combining.

The primary outcomes of interest were each of the factors related to initiation of smokeless tobacco use, and

Table 1. Demographic Composition of Smokeless Tobacco Users in Gujarat (n=2249) and Andhra Pradesh (n=2510)

Characteristics	Entire Sample Combined n (%)**	Gujarat n (%)	SLT Only Users- Gujarat n (%)	Andhra Pradesh n(%)	SLT Only Users- Andhra Pradesh n(%)
Overall*	4759	2287(48.06)	550(24.04)	2472 (51.94)	234 (9.47)
Age group					
15-24	1032 (21.69)	517 (22.61)	86 (15.64)	515 (20.83)	27 (11.54)
25-44	2246 (47.19)	1108 (48.45)	279 (50.73)	1138 (46.04)	120 (51.28)
45-64	1186 (24.92)	529 (23.13)	148 (26.91)	657 (26.58)	63 (26.92)
65+	294 (6.18)	132 (5.77)	36 (6.55)	162 (6.55)	24 (10.26)
Gender					
Male	2238 (47.03)	1109 (48.49)	373 (67.82)	1219 (49.31)	101 (43.16)
Female	2431 (51.08)	1178 (51.51)	177 (32.18)	1253 (50.69)	133 (56.84)
Education					
Illiterate	1,633 (34.31)	612 (26.76)	189 (34.36)	1021 (41.30)	118 (50.43)
1-4 years	1,534 (32.23)	738 (32.27)	174 (31.63)	796 (32.2)	63 (26.92)
5-10 years	1,222 (25.68)	731 (31.96)	160 (29.09)	491 (19.86)	45 (19.23)
11 & above	370 (8.08)	206 (9.01)	27 (4.90)	164 (6.63)	8 (3.42)
Asset index quintile (income estimators)					
Q5 Poorest	912 (19.16)	429 (18.76)	85 (15.45)	483 (19.54)	47 (20.09)
Q4	736 (15.47)	399 (17.45)	76 (13.82)	337 (13.63)	31 (13.25)
Q3	1,145 (24.06)	499 (21.82)	125 (22.73)	646 (26.13)	57 (24.36)
Q2	883 (18.55)	406 (17.75)	113 (20.55)	477 (19.30)	49 (20.94)
Q1 Richest	1,083 (22.76)	554 (24.22)	151 (27.45)	529 (21.40)	50 (21.37)
Area					
Rural	3,304 (69.43)	1462 (63.93)	378 (68.73)	1842 (74.51)	168 (71.79)
Urban	1,455 (30.57)	825 (36.07)	172 (31.27)	630 (25.49)	66 (28.21)
Type of Smokeless Tobacco					
Betel quid with Tobacco			40 (7.27)		50 (21.37)
Khaini or Tob. Lime			85 (15.45)		98 (41.88)
Gutkha or Tbc Lime, Areca Nut Mixture			312 (56.73)		48 (20.51)
Snuff, Mishri, qul, guadkhu			30 (5.45)		8 (3.42)
Panmasala and Betel quid w/out Tobacco			12 (2.18)		25 (10.68)
Nasal Use of Snuff/Other			71 (12.91)		5 (2.14)

*These percentages refer to the percent of the total sample combined **These percentages are column based-of each subsample

each of the factors related to continuation of smokeless tobacco use. The intent of the analysis is to examine how each of the initiation and continuation factors relates to demographic characteristics of survey participants. This was made possible through the use of the statistical software STATA 11.2.

Results

Table 1 presents the general overview of the sample by different demographic factors for the two states combined. It then presents the states separately with smokers, SLT users, and non-users, as well as the subset of the SLT users from each state. This table also shows SLT use in each state by type of SLT product.

In Gujarat and Andhra Pradesh, SLT use was more common among age group 25-44 than the other age groups. In Gujarat, there was a higher proportion of SLT use among males than females, whereas in Andhra Pradesh, SLT users are almost equal between males and females. Gutkha was the most commonly used SLT product in Gujarat (56.73%) and was more commonly used there than in Andhra Pradesh (20.71%). Khaini was more commonly used in AP (41.88%) than in Gujarat (15.45%). Nasal use of snuff was more common in the Gujarat SLT sample (12.91%) than in AP (2.14%). Betel quid was more common in AP (21.37%) than in Gujarat (7.27%).

Table 2 shows the combined data for both states and compares smokers to SLT users. This comparison is represented by a prevalence ratio that indicates how large

Table 2. Unadjusted Prevalence of Smokers and SLT users in Combined Sample of Gujarat and Andhra Pradesh (n=4759)

Characteristics	Prevalence of SLT Users n (%)	Prevalence of Smokers n (%)	Prevalence Ratios (SLT / Smoking)	P-Values
Overall	784(16.47)**	681(14.31)**	1.15	
Age group				
15-24	113(14.41)	41 (6.02)	2.39	p<0.001
25-44	399(50.89)	281(41.26)	1.23	p<0.001
45-64	272(34.69)	359(52.72)	0.66	p<0.001
65+	60 (7.65)	74(10.82)	0.71	P=0.034
Gender				
Male	474(60.46)	635(93.25)	0.65	p<0.001
Female	310(39.54)	46 (6.75)	5.86	p<0.001
Education				
Illiterate	307(39.16)	293(43.02)	0.91	p=0.133
1-4 years (Primary)	237(30.23)	236(34.65)	0.87	p=0.71
5-10 years (secondary)	205(26.15)	128(18.80)	1.39	p=0.001
11 yrs & above	35 (4.46)	24 (3.52)	1.27	p=0.361
Asset index quintile				
Q5 Poorest	132(16.84)	84(12.33)	1.37	p=0.015
Q4	107(13.65)	88(12.92)	1.06	p=0.683
Q3	182(23.21)	176(25.84)	0.9	p=0.243
Q2	162(20.66)	134(19.68)	1.05	p=0.639
Q1 Richest	201(25.64)	199(29.22)	0.88	p=0.125
Area				
Rural	546(69.64)	532(78.12)	0.89	p<0.001
Urban	238(30.36)	149(21.88)	1.38	p<0.001

*Respondents answering smokeless and smoke tobacco were dropped from the population and sample sizes. This co-user group was n=79 **Both of these percentages refer to the percentage of the total sample size (which includes non-tobacco users)

the prevalence of an event/outcome is in one group of subjects/individuals (e.g., SLT users) relative to another group (e.g., smokers). Beside the prevalence ratio is a chi-square analysis to determine whether the difference between groups is statistically significant.

Statistically significant differences between SLT users and smokers were detected for each age group and by gender. Generally speaking, smokers were older than the SLT users and SLT use in females was higher in prevalence than in smoking. In terms of educational status, more SLT users were in each education subgroup, but the statistically significant difference was in the 5-10 years (secondary schooling) group. With the asset quintile index, more SLT users than smokers in each group, but the statistically significant difference was in the poorest (Q5) group. Finally, SLT use was more common in urban areas than smoking, with statistically significant differences in both rural and urban groups.

Overall, the analysis of the initiation factors showed that women were less likely than men to report "peer pressure" and "fashion statement" as factors, but more likely to report "stress/coping" as a factor. Respondents from older age groups were less likely to choose "peer pressure" as a factor than the 15-24 year old age group. Respondents of all educational subgroups were more likely to answer "fashion statement" than those who were illiterate. They were all also less likely to answer "peer pressure" and "smokers at home" than those with no education. Compared to those who were illiterate, those with 11 or more years of education were also more likely to report "stress/coping" as an important initiation factor.

Similar to the structure for the initiation factors, Table 4 assesses the continuation factors through a logistic regression. Across all age groups, for both males and females, and for all levels of education, "habit" was the most commonly reported reason why they continued SLT use. Aside from this apparent concentration of responses among all sub-groups, the middle age groups (24-44, 44-65) reported "tension reduction" and "relaxation" as other common reasons for continuing the use of SLT.

The second most commonly reported continuation factors for men, aside from "habit," were "relaxation" and "tension reduction"; the same was true for women. Across all educational subgroups, except for the 11 years and above of education group, the proportions for "financial independence" remained small compared to other continuation factors; "relaxation" and "tension reduction" were other commonly reported factors.

The reference groups are again the first subgroup for each demographic group. Women were 0.20 times more likely than men to say that "being distant from family" is a factor for their continued SLT use. They were also half as likely as men to say that "relaxation" was also a factor for their continued SLT use. In the age groups, SLT users age 25-44 were 0.41 times more likely than respondents age 15-24 to say that "stimulation" was a factor in their continued use of SLT. Those in the 45-64 age group were 1.95 times more likely to cite "relaxation" as a reason for continued SLT use than the 15-24 group, while the 65+ age group was 0.25 times more likely to respond with "stimulation". With the educational subgroups, those

Table 3. Odds of Each Initiation Factor among SLT Users, Adjusted for Demographic Variables-n=784

Demographic Factors	Initiation Factors						
	Peer Pressure Odds Ratio (95% CI) P-value	Smokers at Home Odds Ratio (95% CI) P-value	Fashion Statement Odds Ratio (95% CI) P-value	Stress/Coping Odds Ratio (95% CI) P-value	Experimenting Odds Ratio (95% CI) P-value	Curiosity Odds Ratio (95% CI) P-value	
Gender	**Male						
	Female	0.45 (0.30-0.70) <0.001	0.62 (0.32-1.20) 0.16	0.42 (0.24-0.74) 0.003	2.47 (1.47-4.15) 0.001	0.96 (0.58-1.58) 0.87	1.14 (0.77-1.67) 0.52
Age	**15-24						
	25-44	0.90 (0.57-1.44) 0.69	1.75 (0.59-5.17) 0.31	0.64 (0.40-1.04) 0.24	1.18 (0.62-2.24) 0.49	0.64 (0.37-1.11) 0.12	0.99 (0.53-1.59) 0.99
	45-64	0.50 (0.29-0.88) 0.02	1.87 (0.59-5.91) 0.29	0.83 (0.46-1.50) 0.54	1.25 (0.61-2.56) 0.54	0.73 (0.39-1.36) 0.32	1.15 (0.68-1.94) 0.61
	65+	0.47 (0.21-1.07) 0.07	3.37 (0.94-12.10) 0.06	0.80 (0.31-2.09) 0.66	0.71 (0.26-1.97) 0.51	0.47 (0.18-1.21) 0.12	1.18 (0.59-2.36) 0.65
Education	**Illiterate						
	1-4 years	0.84 (0.51-1.24) 0.46	0.50 (0.24-1.04) 0.06	2.49 (1.35-4.60) 0.004	1.08 (0.63-1.87) 0.78	0.80 (0.47-1.37) 0.41	0.91 (0.60-1.38) 0.65
	5-10 years	0.60 (0.36-1.00) 0.05	0.41 (0.18-0.96) 0.04	4.77 (2.52-9.03) 0.001	1.09 (0.56-2.12) 0.81	0.79 (0.43-1.46) 0.45	0.90 (0.60-1.46) 0.68
	11 years or more	0.47 (0.21-1.07) 0.07	*NA *NA	6.33 (2.59-15.77) <0.001	2.82 (1.06-7.48) 0.04	0.53 (0.16-1.70) 0.29	0.53 (0.21-1.32) 0.17

*Multiple Logistic Regression-adjustments are made for one demographic factor to control for confounding of others. Others category has been removed here **The referent group for the demographic category for odds ratio comparison *NA The model does not converge with this demographic subgroup

Table 4. Odds of Each Continuation Factor Among SLT users, Adjusted for Demographic Variables

Continuation Factors Demographic Profile	Financial Independence Odds Ratio (95% CI) p value	Being Distant from Family Odds Ratio (95% CI) p value	Tension Reduction Odds Ratio (95% CI) p value	Relaxation Odds Ratio (95% CI) p value	Stimulation Odds Ratio (95% CI) p value	Habit Odds Ratio (95% CI) p value	
	Gender	**Male					
	Female	0.14(0.01-1.29) 0.08	0.20(0.06-0.65) 0.008	1.34(0.84-2.13) 0.22	0.50(0.32-0.80) 0.004	0.77(0.43-1.36) 0.37	1.39(0.96-2.02) 0.08
Age	**15-24						
	25-44	0.67(0.19-2.39) 0.54	0.89(0.38-2.09) 0.79	1.52(0.86-2.70) 0.15	1.70 (0.97-3.00) 0.07	0.41(0.23-0.74) 0.003	1.07(0.69-1.64) 0.77
	45-64	0.72(0.14-3.55)	0.77 (0.26-2.27) 0.68	1.88(1.00-3.55) 0.18	1.95(1.04-3.65) 0.05	0.55(0.28-1.07) 0.04	0.67(0.41-1.10) 0.07 0.11
	65+	NA* NA	2.96(0.84-10.42) 0.09	0.99 (0.39-2.54) 0.99	1.75(0.85-4.09) 0.2	0.25(0.08-0.79) 0.02	0.91(0.47-1.79) 0.79
Education	**Illiterate						
	1-4 years	0.35(0.05-2.32) 0.28	2.08(0.71-6.04) 0.18	1.22(0.73-2.03) 0.44	0.86 (0.53-1.41) 0.56	0.51(0.27-0.96) 0.04	0.85(0.57-1.27) 0.43
	5-10 years	1.15(0.24-5.38) 0.86	2.15 (0.71-6.51) 0.18	2.13(1.22-3.75) 0.008	0.96(0.56-1.63) 0.87	0.75(0.38-1.46) 0.4	0.58(0.37-0.92) 0.02
	11 years or more	1.68(0.23-12.23) 0.61	1.41(0.24-8.21) 0.7	1.62 (0.61-4.28) 0.33	0.90 (0.36-2.24) 0.81	0.67(0.22-2.04) 0.48	0.48(0.22-1.05) 0.07

*Multiple Logistic Regression-adjustments are made for one demographic factor to control for confounding of others **Reference Categories NA*: The Model does not converge at this point-observations were dropped

with 5-10 years of education were 2.13 times more likely than those with no education to cite “tension reduction” as a continuation factor. This same group was 0.58 times more likely than those with no education to cite “habit” as a factor.

In summary, the continuation factors showed that women were less likely than men to choose “relaxation” and “distance from family” as continuation factors. All age groups were less likely to select “stimulation” as a factor than the youngest group. Compared to those who were illiterate, those with 5-10 years of education were more likely to report “tension reduction” as an important continuation factor and less likely to report “habit.”

Discussion

Tobacco control measures continue to face many implementation and knowledge dissemination challenges,

despite policy achievements since the passage of the Cigarettes and Other Tobacco Products Act (COTPA) (Kaur and Jain, 2012; Panda et al., 2012). While smoking may represent a more “westernized” phenomena, the history and cultural rooting of smokeless tobacco presents a different set of challenges in India’s tobacco control measures (Stigler et al, 2010). An essential part of addressing this challenge is assessing the significance of socio-demographic variables in India on smoking and smokeless tobacco use.

Demographically, our results from Table 1 and 2 matched closely to the prevalence results found in GATS analysis for smokers and SLT users across thirteen lower and middle-come countries, including India. Prevalence was mostly higher among, men, urban, less educated and low economic groups and people with less knowledge about effects of smoking (Palipudi et al., 2012; Thakur et al., 2013). However, we delved into nuances of SLT

use that are not always apparent from simply observing prevalence rates.

Gutkha was commonly used in both states; however, in Gujarat, more than 50% of SLT users reported using gutkha, while khaini was the more prevalent SLT form in Andhra Pradesh. In the past year 26 states and 7 union territories have specifically targeted gutkha through bans on selling it. However, some states have adopted bans on other products. It will be useful to understand the impact of the gutkha bans in coming years, as well as identify new opportunities for SLT control, in particular. Apart from policy measures such as gutkha bans on manufacture, sale and use, identifying the determinants of SLT use is important for tailoring interventions that can change the culture of acceptance of SLT use.

The analysis of motivation for smokeless tobacco use was measured through the assessment of initiation and continuation factors. This is not a novel assessment, but rather an expansion of previous literature that establishes and measures motivational, situational, and personality determinants of SLT users. These have been measured through questionnaires, such as the EPQ, the State-Trait Personality Inventory, and the Anger EXpression (AX) Scale of the State-Trait Anger EXpression Inventory (STAXI), which were administered to both SLT-Users and smokers in the U.S (Spielberger et al., 1995).

Initiation factors, the common initiation factors of “peer pressure” and “curiosity” suggest the need for further SLT research among younger age groups (15-24 and 25-44), as “peer pressure” and “curiosity” factors were most prevalent among these groups. On a surface level, this finding is parallel to the findings of focus groups conducted through the Project for Advancing Cessation of Tobacco in Vulnerable Indian Tobacco Consuming Youth (ACTIVITY). ACTIVITY was a randomized intervention trial focused on disadvantaged youth (aged 10-19 years) in 14 low-income communities in Delhi, India, in which a key finding was that socio-environmental determinants and peer pressure influenced youth tobacco initiation (Arora et al., 2013).

Although the “peer pressure” factor differed between those who were illiterate and those who had some form of education, all education groups were less likely to say that peer pressure was a reason for initiation. This presents some new questions of interventions that go beyond school environments, as shown with ACTIVITY. An example of such an intervention is Kumar and colleagues’ community-based tobacco cessation for men in rural Tamil Nadu (Kumar et al., 2012). Other potential settings for such components include integrating existing government health and health system programs, health professional trainings, and educational institutions in India (Sorenson et al., 2005; Datta, Sood & Prasad, 2011).

Contrary to expectations from literature, “having users at home” and “financial independence” were not significant factors across most demographic groups, particularly youth. Numerous studies in India and Asia have shown parental, sibling, and peer use of tobacco as an influential determinant in continued use (Jeganathan et al., 2013; Odukoya et al., 2013). Tomar and colleagues (1998) provide a caveat beyond this association, finding that

smokeless tobacco use by people in the home environment (as well as relatives) were not only marginally predictive of an “experimentation” level of SLT use, but were also significantly predictive of continued use (Tomar et al., 1998). For this reason, we can infer that this finding may be based on a survey design limitation.

Continuation factors, the results from the continuation factors confirmed the expected addictive nature of smokeless tobacco. Across all groups, habit was consistently an important reason for continuation of smokeless tobacco use. These findings are confirmed in numerous qualitative and quantitative studies on the nicotine dependence that comes with SLT use across South Asians, both in the region and living abroad (Kakde, 2012). However, there was variation in importance.

After “habit,” the “tension reduction” and “relaxation” factors presented interesting findings. Spielberger’s various studies, as referenced earlier, were the first studies to not only compare the personality and demographic profiles of SLT users and smokers, but also to assess reasons for initiation and continuation of smokeless tobacco use. While our study did not divide respondents based on level of usage (i.e. occasional or frequent/regular), Spielberger and colleagues found that regular SLT users reported stronger motivations than occasional users to continue SLT use because it was an “enjoyable, intellectually stimulating, enhanced positive affect, and helped to reduce tension and anxiety” (Spielberger et al., 2000).

Hence, our findings for “tension reduction” and “relaxation” can be comparable to Spielberg’s “positive affect” and “reducing tension and anxiety” findings, but we present some nuances within the demographic subgroups. While not statistically significant, the difference in likelihood between men and women of choosing “tension reduction” was an interesting finding, despite having the same percentages in Table 4. Generally, when women are tobacco users, it is in smokeless form, even when considering the urban and rural divide (Gupta, 2013). However, our findings delve into an unexplored issue, suggesting that women continue SLT use for reasons other than habit and different from men.

As expected, this study is not without limitations. The most apparent is in the cross-sectional design. This design makes it difficult to establish causality and there is not a distinction between prevalent and incident SLT cases (Carlson and Morrison, 2009). The latter aspect of the cross-sectional study design limitation is especially relevant to this analysis with the assessment of initiation factors. The nature in which the initiation and continuation factor questions were asked in the survey could lead to potential recall bias. Since the questions were presented to respondents at only one point in time, older respondents may underestimate the effects of initiation factors such as “peer pressure,” “experimenting,” and “curiosity” as reasons for starting the use of SLT.

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References

- Arora M, Tewari A, Dhavan P, et al (2012). Discussions with adults and youth to inform the development of a community-based tobacco control programme. *Health Educ Res*, **28**, 58-71.
- Carlson MD, Morrison RS (2009). Study design, precision, and validity in observational studies. *J Palliat Med*, **12**, 77-82.
- Datta P, Sood S, Prasad S (2011). Tobacco prevention and cessation in adolescents: role of oral health professionals. *Indian J Dentistry*, **2**, 139-46.
- Global A, Tobacco S (GATS India) 2009: Executive Summary (Rep.). (n.d.). Retrieved March 23, 2013, from Ministry of Health and Family Welfare, Government of India website
- Global Adult Tobacco Survey. Retrieved May 7, 2013, from Ministry of Health and Family Welfare, Government of India
- Gupta, B. (2013). Burden of smoked and smokeless tobacco consumption in India-results from the global adult tobacco survey India (GATS-India)- 2009-2010. *Asian Pac J Cancer Prev*, **14**, 3323-9
- Jeganathan PD, Hairi NN, Sadat NA, Chinna K (2013). Smoking stage relations to peer, school and parental factors among secondary school students in Kinta, Perak. *Asian Pac J Cancer Prev*, **14**, 3483-9.
- Kakde S, Bhopal RS, Jones CM (2012). A systematic review on the social context of smokeless tobacco use in the south asian population: Implications for public health. *Public Health*, **126**, 635-45.
- Kyaing NN, Islam MA, Sinha DN, Rinchen S. (2011). Social, economic and legal dimensions of tobacco and its control in South-East Asia Region. *Indian J Pub Health*, **55**, 161-8.
- Kaur J, Jain DC (2011) Tobacco control policies in India: implementation and challenges. *Indian J Public Health*, **55**, 220-7.
- Kumar MS, Sarma, PS, Thankappan KR (2012). Community-based group intervention for tobacco cessation in rural Tamil Nadu, India: A cluster randomized trial. *J Subst Abuse Treat*, **43**, 53-60.
- Odukoya OO, Odeyemi KA, Oyeyemi AS, Upadhyay RP (2013). Determinants of smoking initiation and susceptibility to future smoking among school-going adolescents in Lagos state, Nigeria. *Asian Pac J Cancer Prev*, **14**, 1747-53.
- Palipudi KM, Gupta PC, Sinha DN, et al (2012). Social determinants of health and tobacco use in thirteen low and middle-income countries: evidence from Global Adult Tobacco Survey. *PLoSOne*, **7**, 1-9.
- Panda B, Rout A, Pati S, et al. (2012). A tobacco control law enforcement and compliance in Odisha, India - implications for tobacco control policy and practice. *Asian Pac J Cancer Prev*, **13**, 4631-37.
- Rao SVK, Mejia G, Roberts-Thomson K, Logan R (2013). Epidemiology of oral cancer in Asia in the past decade - an update (2000-2012). *Asian Pac J Cancer Prev*, **14**, 5567-77.
- Sarkar BK, Arora M, Gupta V, Reddy KS (2013). Determinants of tobacco cessation behaviour among smokers and smokeless tobacco users in the states of Gujarat and Andhra Pradesh, India. *Asian Pac J Cancer Prev*, **14**, 1931-5.
- Spielberger C, Foreyt J, Reheiser E, Poston W (1998). Motivational, emotional, and personality characteristics of smokeless tobacco users compared with cigarette smokers. *Personality and Individual Difference*, **25**, 821-32.
- Spielberger C, Reheiser E, Carlos P, Foreyt J (2000). Personality, motivational and situational determinants of regular and occasional use of smokeless tobacco. *Personality and Individual Differences*, **28**, 1159-70.
- Stigler M, Dhavan P, Van Dusen D, et al (2010). Westernization and tobacco use among young people in Delhi, India. *Social Science and Medicine*, **71**, 891-7.
- Thakur JS, Prinja S, Bhatnagar N, Rana S, Sinha DN, Singh PK (2013). Socioeconomic inequality in the prevalence of smoking and smokeless tobacco use in India. *Asian Pac J Cancer Prev*, **14**, 6965-9.
- Tomar SL, Giovino GA (1998). Incidence and predictors of smokeless tobacco use among US youth. *Am J Public Health*, **88**, 20-6.