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Smokeless Tobacco use among Male and Female in Northeast State, India

Kh Jitenkumar Singh ^α & Neeru Singh ^σ

Abstract- Smokeless tobacco has been found as harmful as smoke tobacco. Smokeless tobacco associated with the various oral diseases including mouth cancer and adverse reproductive outcome. Objective of this study is to examine the prevalence of smokeless tobacco consumption in Northeast state, India and to study the socioeconomic, demographic correlates of tobacco use in the form of smokeless tobacco only. We used the cross sectional survey DLHS-4 (2012-2013) data of northeast state, India. All men and women living in the study area, aged 15 years and above were included. Information on socio demographic characteristics and smokeless tobacco consumption was administered. Smokeless tobacco consumption was categorized as 'Current consumers' and "non consumers". Associations between smokeless tobacco consumption and the explanatory variables were examine using bivariate and multivariate statistical technique. 67,930 individual men and 75,799 individual women were the unit of analysis in the study. The prevalence of 'Current consumption' among men 65% and women 51% respectively. Current consumption was associated with level of education, religion, caste, occupation, residence, marital status, and age.

The present study found that the prevalence of smokeless tobacco consumption is high among urban area in northeast states, there is a considerable amount of variation among the consumption of tobacco by educational level, age, locality, religion etc. Smokeless tobacco consumption among men and women is associated with education, religion, caste, age, residence, occupation, marital status. Therefore, this study recommended that the effective government and non government strategies and plans should be starting to "control Smokeless tobacco consumption" and nukar natak should be played addressing "How smokeless tobacco affects the health of a person" in all Northeast states, India.

Keywords: cross sectional study, men, women, smokeless tobacco and Northeast state.

I. INTRODUCTION AND REVIEW OF LITERATURES

Consumption of tobacco kills approx six million people each year moreover, it is the measure threat of disease and death [1, 2]. Tobacco is the most important oral cavity and pharyngeal cancer risk factors. Approximately 90% of people with mouth cancer are tobacco users. Some 7.5% of the world's (53.9 million) deaths were attributable to tobacco use in 1998 and if same smoking patterns continue, that number will

rise to 10 million deaths annually by 2030 [3]. Tobacco can be consumed both in smoke and smokeless form.

Smokeless tobacco is tobacco that is not burned; it is also known as chewing tobacco, oral tobacco, spit or spitting tobacco, dip, chew, and snuff. Harmful health effects of smokeless tobacco include: mouth, tongue, cheek, gum, and throat cancer. Smokeless tobacco also causes nicotine addiction. South Asian people consume smokeless tobacco the most. More than one third of total tobacco consumption in this region is in the form of smokeless tobacco [4-6]. Smokeless tobacco consumption in south Asia is a major public health threat, in India (prevalence: 18.4%), Bangladesh (32.6%), Sri Lanka (6.9%) and Nepal (6%) by the estimation of WHO [7].

India is the second most populous country and one of the world's largest producers and consumers of tobacco. Here, tobacco is available in a variety of different types and brands e.g. bidi, gutkka, khaini, pan masala, hookah, cigarettes etc [3] and also the form of consumption varies from place to place like smoke cheroot in Odisha and Andhra Pradesh, dry snuff in western part, while creamy snuff in northeast part of India. Mostly the tobacco is consumed in smokeless form in northeast states. The prevalence of tobacco consumption in India, either smoked or smokeless tobacco, in the population aged 15 year and above was 47 per cent among men and 14 per cent among women while overall prevalence was 37 percent [8,9]. Consumption of smokeless tobacco products in India is increasing rapidly [10, 11], which is showing a negative effects for both male and female. As smokeless tobacco is quite famous among women, affecting their oral morbidity and perinatal health, including premature delivery, low birth weight and shortened length [12-17]

In northeast states of the India, smokeless tobacco is a part of the socio cultural [18]. They have different customs, food habits, life-style, diverse ethnic groups, type and pattern of tobacco consumption as compared to the rest of the country. Research have shown that in northeast states, betel quid (55.4%), is the most popular smokeless tobacco followed by tuibur (13.1%), gul (12.0%) and khaini (9.1%), Gul and tubur are primarily used by women and recent study shows that the prevalence of smokeless tobacco in northern, eastern and northeast states is 8.4%, 31.8% and 23.8% [18-20]. Betel quid is a combination of betel leaf, areca nut, and slaked lime. Like other smokeless tobacco

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products, betel quid and gutka are known to cause Esophageal cancer, Lip cancer, Mouth cancer, Pharynx cancer, Tongue cancer. The most harmful cancer-causing substances in smokeless tobacco are tobacco-

specific nitrosamines (TSNAs). TSNA levels vary by product, but the higher the level the greater the cancer risk.

Table 1 : Prevalence of smokeless tobacco use in northeast States India by sex

	AR	MN	MG	TR	NG	SK	MZ
Smokeless tobacco, GATS(2009-2010)							
Male	44.9	52.1	20.7	39.4	53.1	27.6	32.6
Female	27.7	37.0	35.9	43.5	36.6	23.3	49.1
Smokeless tobacco, DLHS-4 (2012-2013)							
Male	56.8	65.6	86.7	66.6	64.2	39.3	79.3
Female	33.7	51.4	87.2	65.8	34.5	23.6	77.4
Source: GATS 2009-2010 and DLHS 2012-2013							
AR : Arunachal Pradesh, MN: Manipur, MG: Meghalaya, TR: Tripura, NG: Nagaland, SK: Sikkim, MZ: Mizoram							

Table 1 shows the prevalence of smokeless tobacco, Meghalaya, Tripura and Mizoram was higher in women while in Arunachal Pradesh, Manipur, Nagaland and Sikkim males are consuming more smokeless tobacco in GATS (2009-2010), while in DLHS (2012-2013) Meghalaya, Manipur and Tripura have the highest prevalence of smokeless tobacco among both male and female in DLHS (2012-2013). Hence, the objective of this study is to examine the prevalence of smokeless tobacco consumption among male and female in northeast state, India and to study the socioeconomic and demographic characteristics correlates with tobacco use in the form of smokeless tobacco only.

II. DATA AND THE METHODS

Data for this study was taken from the fourth round of the District Level Household Survey (DLHS-4) conducted during 2012-13. DLHS-4 adopted a multi-stage stratified systematic sampling design. Detailed information about sampling employed in this survey can be obtained from the DLHS-4 report. All seven states, namely, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim separate CAB (Clinical Anthropometric and Biochemical) data files (excluding Assam) were merged together for this study. The outcome variable included in the analysis is "personal habit of age 15 and above using smokeless tobacco". Where the response was further divided into two categories like "Current Consumption" and "No Consumption" the household members was considered current consumers if they had responded that they were consuming (smokeless tobacco) and they coded as 1, while the never consumers, ex-consumers and don't know (0.3%) are coded as 0. To measure level of prevalence and association of smokeless tobacco with factors, this study used both bivariate and multivariate analyses. Chi-square test is used to check the association of the current users with selected characteristics like age, literacy, occupation etc

characteristics (result not shown). For computation of age-adjusted prevalence rate, we use 2011 census data, RGI, Govt. of India as the standard population structure. We computed the standard age proportion by dividing the age-specific census population by the total census population number and standardizing proportion sum to 1. Then, age-adjusted factors for 6 (six) age grouping (10 year intervals each) were used for computation of age-adjusted prevalence. Binary logistic regression was applied to measure the association and to check the net effect of factors on the current consumers for males and females. Variance inflation factor (VIF) of all the variables were computed to check collinearity prior to inclusion in multivariate logistic regression problem of collinearity among independent variables not found (highest VIF, 2.36). The results of logistic regression, are presented in the form of estimated odds-ratios with 95% CI. The whole analysis was performed using STATA version 13.0 with survey commands and R software.

Ethical statement: This study is based on data available in public domain, therefore no ethical issue is involved.

III. RESULTS AND DISCUSSION

Table 2 presents the unweighted count of sampled respondents and population estimates classified by selected socio demographic and occupational background. The estimated population of person age 15 year and above in northeast state in DLHS (2012-2013) was 143,729 where 67,930 were male and 75,799 were female respondent were taken as unit of analysis.

a) Differentials in current smokeless tobacco consumption

Table 3 represents the age adjusted prevalence of male and female among those who were consuming smokeless tobacco. In males, illiterate peoples having the highest age adjusted prevalence while in female below middle 52.7% is the highest. Christian males

(70.1%) having the highest adjusted prevalence than female (55.8%). We have also found that the wide variation in adjusted and unadjusted age prevalence especially non working male and unmarried male, female. Among states, Meghalaya have the highest prevalence followed by Mizoram.

b) Factors associated with smokeless tobacco consumption

Table 4 presents odds ratio among male and female after performing logistic regression models which examine the effect of individuals household and

community characteristics on current smokeless tobacco consumption in northeast states, India. The results show that age group, social group, sex and education are significantly associated with current smokeless tobacco consumptions in both sexes. In table 4 the male in age group (20-34 and 35-59) are 3 times more consuming smokeless tobacco than the males in age group (15-19). Non ST, non Christian and the males who are unmarried are consuming less smokeless tobacco than ST, Christian and married males.

Table 2 : Percent distribution for males and females according to the selected background characteristics northeast states, India, DLHS-4(2012-2013).

Background characteristics	Male (n=67,930)		Female (n=75,799)		Total (N=143,729)
	Percent	Sample size	Percent	Sample size	
Age					
15-19	47.6	7,512	52.4	8,263	15,775
20-34	42.9	21,552	57.1	28,628	50,180
35-59	48.1	28,578	51.9	30,860	59,438
60+	56.1	10,288	43.9	8,048	18,336
Level of education					
Illiterate	35.0	11,196	65.0	20,753	31,949
Below Middle	46.8	16,066	53.2	18,229	34,295
Middle	50.2	16,636	49.8	16,473	33,109
Secondary	54.2	24,049	45.8	20,359	44,408
Religion					
Christian	47.1	39667	52.9	44520	84,187
Non Christian	47.5	28280	52.5	31294	59,574
Caste					
Scheduled tribe	47.2	51243	52.8	57390	108,633
Nonscheduled tribe	47.6	16704	52.4	18424	35,128
Occupation					
Working	69.5	41,633	30.5	18,302	59,935
Not working	31.4	26,314	68.6	57,512	83,826
Marital status					
Unmarried	51.4	18,634	48.6	17,653	36,287
Married	45.9	49,311	54.1	58,159	107,470
Place of residence					
Urban	46.4	16,832	53.6	19,442	36,274
Rural	47.6	51,115	52.4	56,372	107,487
States					
Arunachal Pradesh	47.8	17643	52.2	19272	36,915
Manipur	46.1	10678	53.9	12473	23,151
Meghalaya	39.2	5429	60.8	8407	13,836
Mizoram	48.8	11720	51.2	12309	24,029
Nagaland	50.0	14456	50.0	14460	28,916
Tripura	48.3	3260	51.7	3486	6,746
Sikkim	46.8	4761	53.2	5407	10,168
Total	47.2	67,930	52.8	75,799	143,729

Source: Based on authors' computation.

Table 3 : Prevalence of smokeless tobacco use among male and female according to background characteristics, northeast states, India, DLHS-4 (2012-13).

Background characteristics	Male (n=67,930)		Female (n=75,799)	
	Crude	Age adjusted	Crude	Age adjusted
Level of education				
Illiterate	65.2 (0.4)	66.7 (1.0)	47.2 (0.7)	46.9 (0.8)
Below Middle	68.1 (0.7)	66.9 (0.7)	54.5 (0.7)	52.7 (0.7)
Middle	65.4 (0.7)	64.6 (0.7)	52.6 (0.7)	51.9 (0.7)
Secondary	63.8 (0.7)	62.6 (0.4)	49.7 (0.7)	50.4 (0.8)
Religion				
Hindu	61.7 (0.7)	59.2 (0.6)	48.6 (0.9)	46.9 (0.9)
Christian	69.8 (0.6)	70.1 (0.6)	56.0 (0.7)	55.8 (0.7)
Others	56.3 (0.7)	54.7 (0.7)	37.0 (0.8)	36.2 (0.9)
Caste				
Scheduled tribe	66.9 (0.5)	66.4 (0.5)	51.9 (0.6)	51.3 (0.6)
Scheduled caste	62.8 (1.6)	60.3 (1.4)	48.7 (1.9)	47.2 (1.2)
OBC	55.1 (1.2)	53.5 (1.2)	42.4 (1.1)	41.3 (1.1)
Others	63.1 (0.9)	60.7 (0.9)	49.7 (1.1)	47.5 (1.1)
Occupation				
Working status	71.7 (0.4)	71.3 (0.5)	57.5 (0.7)	56.2 (0.7)
Not working	55.7 (0.5)	61.2 (0.5)	48.7 (0.6)	48.6 (0.6)
Marital status				
Unmarried	54.5 (0.6)	61.4 (0.9)	43.0 (0.7)	51.4 (0.7)
Married	69.6 (0.4)	70.7 (0.5)	53.3 (0.6)	52.8 (0.6)
Place of residence				
Urban	65.7 (0.7)	65.0 (0.7)	53.9 (1.3)	52.9 (1.2)
Rural	65.3 (0.5)	64.1 (0.5)	49.3 (0.5)	48.5 (0.5)
States				
Arunachal Pradesh	57.0 (0.7)	55.4 (0.6)	33.8 (0.8)	33.4 (0.7)
Manipur	65.4 (1.2)	64.1 (1.2)	51.9 (1.2)	50.5 (1.1)
Meghalaya	86.8 (1.2)	86.9 (1.2)	87.2 (1.1)	86.3 (1.1)
Mizoram	79.4 (0.6)	78.7 (0.6)	77.4 (0.6)	76.5 (0.6)
Nagaland	64.3 (1.1)	65.9 (1.2)	34.5 (0.9)	36.1 (0.9)
Tripura	66.6 (1.8)	64.4 (1.3)	65.8 (2.0)	65.1 (1.5)
Sikkim	39.4 (1.3)	37.4 (1.4)	23.6 (1.5)	22.5 (1.4)
Total	65.4(0.4)	64.6 (0.6)	51.0 (0.5)	50.8 (0.5)

Source: Based on authors' computation.

Note: Figure given in the parenthesis is standard error

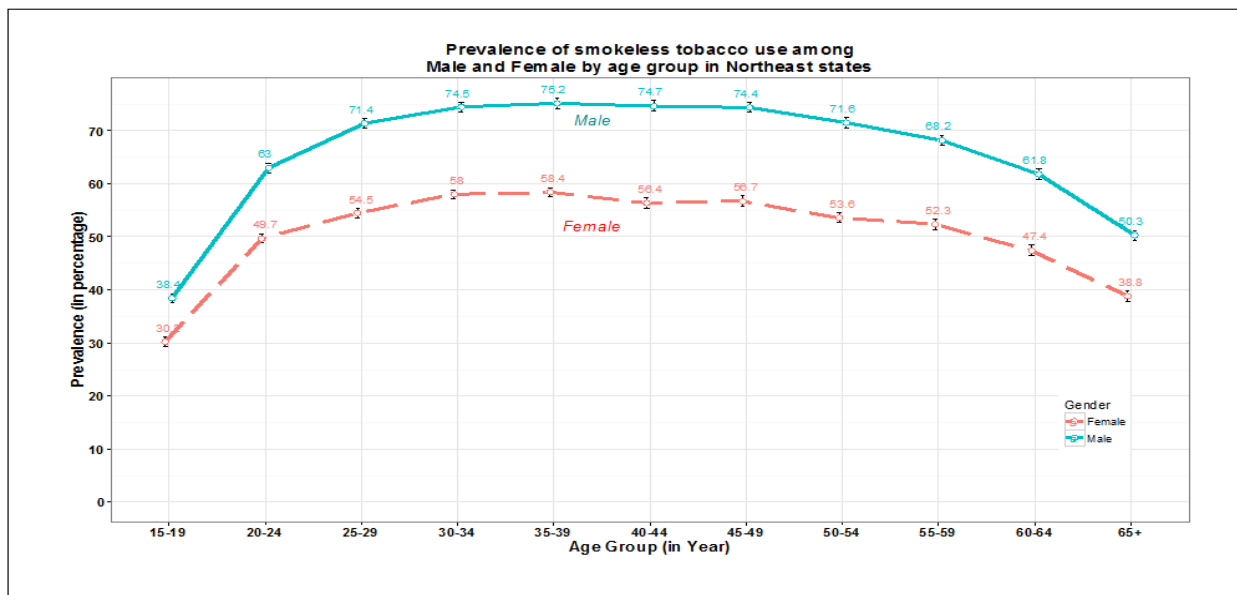


Figure 1.1 : Age wise prevalence of smokeless tobacco use by gender

Table 4 : Adjusted odds ratios of selected individual, household and community characteristics of person among Male and Female in DLHS-4 (2012-13) Northeast states, India.

Background characteristics	Male (n=67,930)		Female (n=75,799)	
	Odds Ratio	p value	Odds Ratio	p value
Age				
15-19 [#]	1		1	
20-34	3.18	0.00	2.56	0.00
35-59	3.05	0.00	2.64	0.00
60+	1.19	0.00	1.50	0.00
Level of education				
Illiterate	1.24	0.00	0.97	0.56
Below Middle	1.28	0.00	1.14	0.00
Middle	1.16	0.00	1.15	0.00
Secondary [#]	1		1	
Religion				
Non Christian [#]	1		1	
Christian	1.78	0.00	1.87	0.00
Caste				
Non Scheduled tribe [#]	1		1	
Scheduled tribe	0.92	0.08	0.81	0.00
Occupation				
Working [#]	1		1	
Not working	2.45	0.00	2.3	0.00
Marital_status				
Unmarried [#]	1		1	
Married	1.50	0.00	1.17	0.00
Place_of_residence				
Rural [#]	1		1	
Urban	1.07	0.103	1.20	0.00

Source: Based on authors' computation. # : reference category

Figure 1.1 shows age wise prevalence of smokeless tobacco consumption among male and female in northeast states, India. From the above figure, the male are consuming more amounts of smokeless tobacco than the female while the consumption of smokeless tobacco increases with the age till 40-44 after which it starts to decline in both genders.

The prevalence of smokeless tobacco consumption among male and female in our study is 69.6% and 50.8%. Present study reveals that education is significantly associated with smokeless tobacco consumption. This is consistent with observations that those with a lower level of education are more likely to consume smokeless tobacco [23, 24]. In this study, the age wise prevalence of smokeless tobacco consumption is higher as the age advanced and the highest rate is found in the age group of 20-34 and 35-59 years and then declined after 60 years in both sexes, similar finding was also reported [23, 25]. Those who are married have a higher rate of smokeless tobacco consumption as compared to the unmarried respondents. This may be due to influences of the spouses consuming smokeless tobacco. Similar association between smokeless tobacco consumption and marital status was also reported [25].

IV. CONCLUSION

In northeast states, India smokeless tobacco consumption is strongly associated with the level of education, religion, caste, marital status, occupation and place of residence. A comprehensive ban on tobacco advertising, promotion and sponsorship needs to be implemented according to the standard outlined in 'Article 13' in the WHO Framework Convention on Tobacco Control. Display and visibility of smokeless tobacco products at points of sale constitutes advertising and promotion and should therefore be banned [22]. In addition to proper enforcement of the new law, there is a need for a nationwide campaign educating people in both rural and urban areas about the law and health risks of smokeless tobacco.

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