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RESEARCH ARTICLE

SMOKELESS TOBACCO PREVALENCE AMONG MALE AND FEMALE IN THE EMPOWERED ACTION GROUP (EAG) STATES IN INDIA 2009-2010

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ABSTRACT

This paper is an attempt to find the prevalence of different types of Smokeless Tobacco (ST) products use among male and female, in their age at start consumption and which factors are associated with smokeless tobacco users in EAG states. This study is based on the data from the Global Adult Tobacco Survey India (GATS India). GATS India was carried out in all 29 states and the two union territories of Chandigarh and Pondicherry, covering about 99.9 percent of the total population of India. Findings reveal that prevalence of ST among male is very high comparatively female in EAG States. In Urban male and female differentials in the prevalence of ST among male is considerably higher, in rural areas the use of ST is very common which is almost 46 percent among male and 26 percent among female, whereas in urban area 35 percent among male and 16 percent among female. In the male age group 15-24 years addicted to ST 44 percent when their age at <15 years and 33 percent of age between 15-18 years, the study depicts 77 percent of young males addicted to ST their early age of before 18 years. Hence greater concentration is essential to strengthen the use of evidence based policies for control of Smokeless Tobacco (ST) use, which could include having tobacco industries disclose the contents of ST products and more research is necessary in order to develop country-specific ST intervention programs and to explore the best ways to make these interventions accessible to ST (Smokeless Tobacco) users.

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INTRODUCTION

Tobacco use is the leading cause of preventable death, and it is estimated to causes nearly 6 million deaths per year worldwide and current trends show that tobacco use will cause more than 8 million deaths annually by 2030 (WHO 2011). Smokeless tobacco use is also associated with the increasing risk of cancer. Smokeless tobacco is also highly addictive and causes cancer of the head and neck, esophagus and pancreas, besides many oral diseases (WHO 2008). Oral cancer is the most common cancer caused by smokeless tobacco. Nearly 90 percent of the oral cancers in South-East Asia region are linked to tobacco chewing and tobacco smoking. Most of these deaths are in low- and middle-income countries. The Region carries the highest burden of oral cancer at over 95 000 oral cancer cases each year. According to the International Agency for Research on Cancer (IARC), over half of all oral cancers in Asia are caused by tobacco (<http://www.searo.who.int/media/centre/releases/2013/pr1563/en>). The use of smokeless tobacco is rampant in South-East Asia.

Lack of public awareness and incomplete knowledge about the harmful effects of smokeless tobacco are powerful obstacles in creating effective tobacco control policies," said Dr Samlee Plianbangchang, WHO's Regional Director for South-East Asia (<http://timesofindia.indiatimes.com/india/90-of-smokeless-tobacco-users-live-in-South-East-Asia/articleshow/22817310.cms>). While many people are aware that tobacco is dangerous, the majority of users are not aware about the lethal connection between chewing tobacco and fatal diseases like cancers or that product like betel quid (Areca-nut/betel-leaf/tobacco) or mishri or gutka (tobacco mixed with areca nut) are dangerous.

India is one of the country in the world where prevalence of smoking and smokeless tobacco use are high and is characterized by dual use of tobacco (use of both smoking and smokeless tobacco products) also contributes to a noticeable proportion (Singh and Ladusingh, 2014). Tobacco consumption has been identified as the single most preventable cause of death and disease in India. Tobacco is a major risk factor for non communicable diseases which are on the rise in the country. Smoking increases the incidence of clinical tuberculosis and is a cause of half of the male Tuberculosis deaths in India.

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Nearly half of cancers among males and one fourth of cancers among females are tobacco related. World Health Organization calculates that tobacco deaths in India may exceed 1.5 million annually by 2020 (Murray and Lopez, 1996). India is the second largest consumer of tobacco products and third largest producer of tobacco in the World. A study of health care costs attributable to tobacco in India estimated that in 2004, the direct medical costs of treating smokeless tobacco-related diseases in India amounted to US\$ 285 million (<http://www.searo.who.int/mediacentre/releases/2013/pr1563/en/>). In addition to damage to personal health, tobacco use results in severe societal costs like reduced productivity and health care burden, environmental damage and poverty of the families. The degree of destruction brought to bear upon the individual and society surpasses. The returns generated by tobacco production and consumption in terms of revenue and employment (WHO, 2009). In some parts of India, such as the states of Bihar and Maharashtra, smokeless tobacco use is more common than smoking. Apart from regional preferences due to differing socio-cultural norms the preference for smokeless tobacco is inversely related to education and income (Gupta, 1996).

Using data from the National Family Health Survey second round (NFHS II 1998–99), prevalence of tobacco use in India was estimated to be 37 percent among the population of 15 years and above (NFHS II, 1998–99). The National Household Survey of Drug and Alcohol Abuse in India (NHSDAA) conducted in 2002 among males, covered over 40,000 individuals aged 12–60 years in nearly 20,000 households in 25 states. The overall prevalence of current tobacco use from the NHSDAA was found to be 55.8% (Srivastava et al., 2004). According to GATS India 2009 survey, prevalence of tobacco use is relatively higher in the rural area (38%) than in urban area (25%). Tobacco use increases with age in India, though it is sizeable even among youth, especially among young males. Thirty-five percent of adults in India use tobacco in some form or other. Among them 21 percent use only smokeless tobacco, 9 percent use only smoke and 5 percent smoke as well as use smokeless tobacco. Prevalence of smoking among males is 24 percent whereas the prevalence among females is 3 percent. The extent of use of smokeless tobacco products among males (33%) is higher than among females (18%). The use of tobacco among both females and males in all the states in the North-Eastern region is much higher than other regions. Tobacco use among males in the North-Eastern states ranges from 62 percent in Sikkim to 83 percent in Mizoram (IIPS 2010). The reported high prevalence of tobacco in the North-Eastern part of India is consistent with the findings of the Global School Personnel Survey in the North-Eastern part of India.

### Govt. of India action

In India, to counter the challenges of tobacco problems the Government act out comprehensive tobacco control legislation, namely “The Cigarettes and Other Tobacco Products (*Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and distribution*) Act, 2003. Furthermore to bring about greater awareness regarding harmful effects of tobacco and fulfil obligations under the WHO Framework Convention on Tobacco Control (WHO

FCTC) the Government of India launched the National Tobacco Control Programme (NTCP) in the country.

### EAG States

In India, the eight socioeconomically backward states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal and Uttar Pradesh, referred to as the Empowered Action Group (EAG) states, lag behind in the demographic transition and have the highest infant mortality rates in the country

### Objective of the study

In the view of above scenario the present study attempts to find the prevalence of different types of smokeless tobacco products users, in their age at start consumption and which factors are associated among male and female users of smokeless tobacco (ST) in EAG states.

### Types of tobacco use in India

Smoking tobacco products include *bidis*, manufactured and hand-rolled *cigarettes*, *pipes*, *cigars*, *hookah*, *water pipes* and other locally produced smoking tobacco products, e.g. *chuttas*, *dhumti* and *chillum*, etc.

Smokeless tobacco is used either by chewing or applying to teeth and gums, or sniffing Smokeless tobacco products used in India include chewing tobacco products, such as *betel quid with tobacco* (A ‘betel quid’ generally contains betel leaf, areca nut and slaked lime, and may contain tobacco. Other substances, particularly spices, including cardamom, saffron, cloves, aniseed, turmeric, mustard or sweeteners, are added according to local preferences), *khaini*, *gutkha*, *paan masla*, and other such products like *mishri*, *mawa gul*, *bajjar*, *gudakhu*, *snuff*, etc.

## METHODS AND MATERIALS

This study is based on the data from the Global Adult Tobacco Survey India (GATS India). GATS India was conducted in 2009–10 as a household survey of persons in the age group 15 and above. The data of GATS India is the global standard for monitoring adult’s tobacco use (smoking and smokeless) and tracking key tobacco control indicators. GATS India was carried out in all 29 states of the country and the two union territories of Chandigarh and Pondicherry, covering about 99.9 percent of the total population of India. A national probability survey was used to provide national and regional estimates by residence and gender and state estimate by gender. The survey was designed to produce internationally comparable data on tobacco use and other tobacco control indicators using a standardized questionnaire, sample design, data collection and management procedures. A total of 69,296 interviews were completed among which 33,767 and 35,529 were of males and females respectively. Details about the contents and coverage of the GATS-India along with the methodology can be obtained from the national report (IIPS and MOHFW, 2009–10).

## Analysis

In this study, we have used the descriptive statistics, Bivariate and Multivariate technique to analysis to examine the prevalence of smokeless tobacco among male and female. Smokeless tobacco have taken as a dependent variable and other independent variable are place of residence, education level, Notice health warning, perceived impact on health, Occupation, Mass Media Exposure, etc.

## RESULTS

The results have been discussed under the various sub-headings

### Smokeless tobacco (ST) Prevalence

Table 1: presents percentage of current smokeless tobacco users among male and female with some selected background characteristics in EAG States.

**Table 1. Percentage of male and female current smokeless tobacco users and their selected background characteristics in EAG states, 2009-10**

Characteristics	Male	Total No.	Female	Total No.
<b>Age</b>				
15-24	35.9	810	16.0	1388
25-44	57.3	3135	26.0	4685
45-64	48.4	1899	33.9	2167
65+	47.7	661	37.7	663
<b>Residence</b>				
Rural	45.9	8071	25.2	8570
Urban	35.1	3482	16.2	3648
<b>Educational levels</b>				
No formal schooling	53.6	2729	29.9	5787
Less than primary	53.4	1514	28.9	1350
Primary but less than secondary	44.1	3562	16.3	2659
Secondary and above	31.4	3712	6.4	2360
<b>Occupation</b>				
Govt. and non-govt. Employee	49.6	3796	36.2	1557
Self-employed	49.2	5518	25.2	1158
Student	10.0	937	8.0	799
Homemaker	52.2	272	22.1	8323
Retired and unemployed	47.9	1019	31.3	378
<b>Mass Media Exposure</b>				
Not at all exposed	36.6	969	21.2	566
Partially exposed	38.1	1088	14.1	255
Fully exposed	40.1	242	12.0	30
<b>Notice any Health Warning</b>				
No	39.4	1274	23.4	1332
Yes	47.8	3539	26.7	1242
<b>Perceived impact of smokeless tobacco</b>				
No	45.6	195	27.3	145
Yes	43.4	4635	22.9	2516
<b>EAG States</b>				
Bihar	62.2	1141	34.6	1251
Chhattisgarh	52.5	997	41.6	1067
Jharkhand	60.0	979	35.4	1082
Madhya Pradesh	43.4	826	18.4	984
Odisha	50.8	1033	35.5	1056
Rajasthan	28.7	1009	8.5	1037
Uttarakhand	16.6	921	2.1	1029
Uttar Pradesh	35.4	2042	13.7	2099
Total EAG States	43.7	8948	23.4	9605
India	32.9	33767	18.4	35529

The use of current smokeless tobacco among male is higher in age group is 25-44, which is almost 57 percent, where as in

older age females (65+) proportion is 38 percent, this means that younger male and older female are more likely to consume smokeless tobacco than their counter parts. Looking to age as age is increasing there is considerable increase has been noticed in the current smokeless tobacco users among both in males as well as in females in EAG states. Urban male to urban female differentials in the prevalence of smokeless tobacco among male show that prevalence is considerably higher in rural areas the use of smokeless tobacco is very common which is almost 46 percent among male and 26 percent among female, whereas in urban area 35 percent among male and 16 percent among female. The prevalence of smokeless tobacco among male is very high comparatively female in EAG States nearly two in one (44 percent) are use smokeless tobacco while only one in four (25) percent female are using smokeless tobacco. In India currently male smokeless tobacco users are 33 percent while this proportion is lower in female which is 18 percent. The use of smokeless tobacco among all males and females show variation within EAG states. Percentage of smokeless tobacco users among females varies from high of 42 percent in Chhattisgarh to the lower of two percent in Uttarakhand. The prevalence of smokeless tobacco use among males varies from highest in Bihar (62 percent) to the lowest (17 percent) in Uttarakhand. As the education level is increasing from no formal schooling to secondary and above, considerable decrease has been found in use of smokeless tobacco both among males and females. Students both male as well as female are the more prominent category in occupation where less users of current smokeless tobacco are found. Among males homemakers have the highest proportion (53 percent) and among female government and non-government employee (36 percent) group is the highest user in EAG states.

### Types of smokeless tobacco products use

Tables 2: shows the percentage distribution of male and female using various types of smokeless tobacco products by selected background characteristics in EAG States. The percentage use of Khaini (tobacco mixed with lime) is highest (68 percent) in the age group 25-44, whereas it is lowest (51 percent) among adults aged 15-24. It has been found that Gutkha (tobacco mixed with areca nut) is more common among adolescents aged 15-24 (58 percent) but the use of betel quid with tobacco it is more concentrated among 65 and above aged population. Use of Khaini is highest among older age females (42 Percent), whereas Gutkha is more common among 25-44 aged women (18.2 percent). The use of betel quid and Khaini is more common in old age people both among males and females.

The use Khaini and other products is highest in rural areas, whereas the proportion of male and female who are using Gutkha and Betel quid with lime mixture are highest in Urban areas. It has been observed that the level of education has significant impact on the use of Khaini. The prevalence of Khaini use among males is highest among low educated males; whereas, as the level of education increases the use of Khaini is decreases. Also in occupation, homemaker is more prominent than any other group of occupation. Use of betel quid is more common among both males and females who have passed secondary and above as compare to other products.

**Table 2. Percentage distribution of currently using various types of smokeless tobacco products among male and female and their selected background characteristics in EAG states, 2009-10**

Characteristics	Type of Smokeless tobacco products							
	Male				Female			
	Betel Quid with tobacco	Khaini with Tobacco mixture	Gutkha or areca nut mixture	Other chewing Products	Betel Quid with tobacco	Khaini with Tobacco mixture	Gutkha or areca nut mixture	Other chewing Products
Age								
15-24	14.8	51.3	58.8	3.1	3.3	14.5	13.0	44.7
25-44	13.4	60.6	31.8	5.6	13.7	27.7	18.2	25.8
45-64	13.0	68.0	15.9	4.8	21.4	38.0	11.6	18.6
65+	15.8	67.4	12.5	5.1	33.3	43.4	13.2	23.6
Residence								
Rural	15.0	59.5	32.0	5.7	16.7	31.9	12.8	26.3
Urban	22.6	43.6	43.2	4.1	30.4	23.0	25.7	24.4
Educational level								
No formal schooling	11.5	66.3	23.6	3.8	18.1	35.6	14.2	23.6
Less than primary	20.0	58.1	33.0	8.1	19.4	24.9	9.0	28.9
Primary but less than secondary	15.2	50.6	41.0	5.0	18.1	16.5	22.2	32.4
Secondary and above	22.6	51.8	38.3	6.6	27.8	9.7	14.2	40.5
Occupation								
Government and non-government employee	16.0	57.5	39.0	4.1	15.3	37.6	18.4	26.2
Self-employed	16.0	55.9	31.6	6.4	8.8	36.3	8.9	16.4
Student	27.3	27.8	56.0	14.3	4.7	0.4	0.0	81.5
Homemaker	26.1	68.6	39.0	1.9	22.3	27.1	16.1	27.2
Retired and unemployed	13.8	64.9	16.7	4.7	24.7	41.2	5.3	14.6
Mass media exposure								
Not at all exposed	23.8	46.2	37.3	6.7	35.5	29.2	18.9	29.9
Partially exposed	22.7	42.3	48.0	9.9	44.1	34.9	26.0	26.8
Fully exposed	27.6	46.4	46.5	1.0	25.3	18.9	24.9	12.7
Notice any Health Warning								
No	19.3	61.8	21.1	3.8	27.1	28.4	13.2	35.3
Yes	15.7	54.1	39.6	6.0	14.1	33.5	17.1	16.4
Perceived impact of using smokeless tobacco								
No	10.9	60.1	34.0	2.0	38.2	42.7	26.3	37.1
Yes	16.7	55.8	35.0	6.0	18.3	30.4	15.0	27.1
EAG States								
Bihar	7.6	78.9	13.3	9.8	6.0	11.9	1.0	81.5
Chhattisgarh	3.4	50.1	26.1	2.4	11.9	36.9	14.7	9.3
Jharkhand	5.9	78.0	20.3	4.8	2.3	46.8	0.9	31.9
Madhya Pradesh	19.8	45.1	58.9	7.1	17.9	39.2	27.3	8.6
Odisha	43.1	23.5	32.1	19.4	34.2	26.4	3.4	30.0
Rajasthan	5.4	42.8	55.2	0.0	2.8	13.4	50.7	7.7
Uttarakhand	0.0	57.1	29.0	9.1	47.8	35.3	14.8	0.0
Uttar Pradesh	20.2	57.1	42.1	.6	32.5	40.5	26.3	10.2
Total	16.3	56.9	33.9	5.4	18.6	30.6	14.6	26.1

**Table 3. Percent distribution of currently using Smokeless tobacco users, their age at start ST consumption and their selected background characteristics among male and female in EAG States, 2009-10**

Characteristics	Age at start ST consumption							
	Male				Female			
	<15 years	15-18 years	18 above	Total	<15 years	15-18 years	18 above	Total
Age								
15-24	43.9	32.7	23.3	250	58.8	21.0	20.2	163
25-44	23.3	16.7	60.0	1413	39.8	11.2	49.0	952
45-64	16.3	10.3	73.5	750	28.6	9.8	61.6	550
65+	17.5	7.5	75.0	278	30.1	7.0	62.8	197
Residence								
Rural	24.0	18.3	57.7	3003	40.5	12.6	46.9	1595
Urban	23.0	17.1	59.9	1148	28.4	8.5	63.1	500
Educational Level								
No formal schooling	25.6	13.8	60.6	1178	36.1	10.7	53.3	1341
Less than primary	28.5	18.4	53.0	660	40.6	17.7	41.7	347
Primary but less than secondary	25.5	22.0	52.5	1351	51.4	11.9	36.8	320
Secondary and above	14.9	17.4	67.7	945	32.9	20.1	47.0	70
Occupation								
Government and non-government employee	23.8	21.2	55.0	1542	47.3	10.9	41.8	436
Self-employed	22.0	16.5	61.5	2047	36.2	15.9	47.9	245
Student	46.3	31.0	22.6	72	93.5	5.6	0.8	26
Homemaker	24.6	11.8	63.6	85	32.9	12.2	54.8	1289
Retired and unemployed	28.2	11.8	59.9	402	45.2	8.4	46.4	98
Mass Media Exposure								
No exposed	23.6	23.6	52.8	782	39.2	7.7	53.1	409
Partially exposed	23.2	19.7	57.1	864	52.8	17.0	30.2	193
Fully exposed	23.8	25.2	51.0	200	40.2	4.9	55.0	25

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Notice any Health warning								
No	29.7	15.2	55.1	986	39.5	9.5	50.9	933
Yes	22.6	19.2	58.2	2943	40.3	14.7	44.9	914
Perceived impact of smokeless tobacco								
No	34.4	12.4	53.2	161	38.7	3.3	58.0	100
Yes	22.8	18.8	58.4	3374	39.6	12.3	48.1	1793
EAG States								
Bihar	18.5	16.6	64.9	633	33.7	8.5	57.8	281
Chhattisgarh	32.5	18.6	48.8	419	47.2	16.3	36.4	417
Jharkhand	23.1	15.7	61.2	552	37.7	14.7	47.6	261
Madhya Pradesh	27.7	12.5	59.8	298	37.3	10.5	52.3	141
Odisha	28.0	26.1	45.9	473	54.5	16.5	29.0	337
Rajasthan	25.5	27.1	47.5	263	43.3	12.6	44.0	72
Uttarakhand	14.5	18.2	67.3	139	14.3	20.7	65.0	17
Uttar Pradesh	21.2	15.8	63.0	671	18.1	5.0	76.9	205
Total	23.8	18.1	58.1	4151	38.8	12.0	49.1	2095

Those who have completed primary level of education but not completed secondary education, among them use of Gutkha is more common in both categories of sex as compare to others. The use of smokeless tobacco products varies from one state to another. Use of betel quid with tobacco is the most widespread in Odisha (43 percent) among males and 48 percent among females of Uttarakhand, whereas its prevalence is very negligible among females in Uttarakhand and Rajasthan (3 percent). The highest use of Khaini among males is reported in Bihar (79 percent) followed by Jharkhand and Uttar Pradesh, whereas among females the use of Khaini is highest in Jharkhand followed by Madhya Pradesh and Jharkhand. Use of Gutkha among males is highest in Madhya Pradesh males (59 percent) and lowest in Bihar (13 percent) and among females it is highest in Rajasthan (51 percent).

#### Age at start consumption of Smokeless Tobacco

Table 3: presents percentage distribution of males and females at their age at start consumption of smokeless tobacco with various background characteristics in EAG States age at start consumption of smokeless tobacco is categorised into 3 categories, i.e., less than 15 years, 15 to 18 years and after 18 years. Findings reveals that in EAG States 44 percent of males reported that the age of initiation of smokeless tobacco before age 15 years and 23 percent after 18 years. In age group 15-24 forty-four percent of males started using smokeless tobacco products in there early age and 33 percent started in age 15 to 18 years. Twenty three percent of males in age group 25-44 reported that there age of initiation was less than 15 years, 60 percent in same age group were reported that they started after 18 years. Nearly about 23 percent of males in urban areas as well as rural areas were reported that there age of initiation of smokeless tobacco were less than 15 years.

As the years of schooling is increasing percentage of male's age of initiation is decreasing from no formal schooling to secondary and above. The males without any formal schooling, among them 26 percent reported that they have started smokeless tobacco products when they were less than 15 years and 61 percent reported when they were more than 18 years old. The males who have completed secondary and above level of education, among them 15 percent started at the age of below 15 years where as 68 percent started when they completed their 18 years. Among different occupational groups, forty seven percent students were stated that they have started the use of smokeless tobacco before 15 years whereas

23 percent of them reported that there age of initiation of smokeless tobacco were after 18 years. About 55 percent of the government and nongovernment employee and 60 percent among retired and unemployed males reported that their age of initiation was after 18 years. Increasing Mass media exposure does not contribute any significant role in increasing the age of initiation of smokeless tobacco use. Those males who notice health warning among them age of initiation is lowest in age group 15-18 years. In Chhattisgarh 33 percent of males and in Uttarakhand 15 percent of males reported that they have started taking smokeless tobacco products before completing age 15 years.

The data shows that in EAG states among female who are fully exposed to media, among them 55 percent of them started smokeless tobacco use after 18 years whereas; it is 53 percent among female with high media exposure. Nearly 55 percent of female in Odisha started smokeless tobacco products before age 15 years which is highest among all EAG states and lowest percentages was found in Uttarakhand (14 percent). Thirty-nine percent of females reported about their age of initiation before age 15 years, whereas about 12 percent of them reported about starting age between of 15-18 years. In rural areas, percentage of females in the all three categories of age at initiation is higher as compared to their urban counterparts. Among every second women, who have completed primary but less than secondary education, early age of initiation (<15 years) is the highest. Over one third of the women who have completed secondary and above level of education has reported their age of initiation before age 15 years.

#### Association between male and female smokeless tobacco users and selected characteristics in EAG states and India

Table 4: shows the adjusted odds ratio for smokeless tobacco use among males and females by some selected background characteristics. The results show that the age, educational level, and occupational structure have significant impact on smokeless tobacco use. Male Respondent those who are in the age group 25-44 are 1.4 times more likely to use smokeless tobacco as compare to those respondents who are in the age group 15 to 24. It is interesting to see that male with less than primary level of education along with primary but less than secondary educated males are 1.51 and 1.54 times respectively are more likely to use smokeless tobacco as compare to those males who have no formal schooling. Whereas, males with

secondary and above level of schooling are 25 percent less likely to use smokeless tobacco as compared to uneducated group of males. Occupational structure shows that males who are self employed, student and homemaker are 28 percent, 83 percent and 77 percent respectively less likely to use smokeless tobacco as compare to those who are Govt. and Non-Govt. Employee. Female who are in age group 25-44, 45-64 and 65 above are 1.9, 2.9 and 2.6 times respectively more likely to use smokeless tobacco as compare to those who are in the age group 15-24. This indicates that, the use of smokeless tobacco increases with increasing age also increasing. Female those who are less than primary educated are 1.6 times more likely to use smokeless tobacco whereas, those female who are secondary and above level educated are 50 percent less likely to use smokeless tobacco as compare to those who have no formal schooling. Women those who are self-employed, student and homemakers are 50 percent, 88 percent and 62 percent respectively less likely to use smokeless tobacco as compare to those who are in Govt. and Non-Govt. employee. Females with medium mass media exposure are 32 per cent less likely to use smokeless tobacco as compare to those who have low media exposure.

smokeless tobacco as compare to those who have no formal education. Among the occupational groups student and home maker are 86 percent and 43 percent less likely to use smokeless tobacco as compared to government and non-government employee. Here also it is interesting to see that those males who have noticed any health warning on tobacco products are 2.1 times more likely to use of smokeless tobacco than those who didn't noticed any health warning.

Females age 25-44, 45-64 and 65 above are 1.5, 2.2, 2.4 times are more likely to use smokeless tobacco as compare to those in the age of 15-24. Further, the females residing in urban areas are 39 percent less likely to use smokeless tobacco as compare to female living in rural areas. Among different educational groups, female those who have less than primary level of schooling are 1.1 times more likely to use smokeless tobacco whereas, on the other hand those females who have completed their primary schooling but less than secondary educated and secondary & above level educated are 32 percent, 69 percent respectively, less likely to use smokeless tobacco as compare to females with no education.

**Table 4. Association between selected background characteristics and male and female smokeless tobacco users in EAG States 2009-2010**

Characteristics	Male			Female		
	Exp(B)	95percent C.I. for EXP(B)		Exp(B)	95percent C.I. for EXP(B)	
Age		Lower	Upper		Lower	Upper
15-24 <sup>#</sup>						
25-44	1.486***	1.100	2.008	1.958***	1.310	2.927
45-64	1.241	0.901	1.711	2.983***	1.946	4.573
65 and above	1.183	0.762	1.836	2.639***	1.521	4.580
Residence						
Rural <sup>#</sup>						
Urban	0.888	0.726	1.087	0.842	0.653	1.085
Educational level						
No formal schooling <sup>#</sup>						
Less than primary	1.519***	1.177	1.960	1.634***	1.260	2.120
Primary but less than secondary	1.546***	1.226	1.950	0.956	0.727	1.257
Secondary and above	0.759*	0.567	1.016	0.509*	0.307	0.841
Occupational Type						
Government and non-government employee <sup>#</sup>						
Self-employed	0.728**	0.595	0.890	0.500**	0.311	0.806
Student	0.175***	0.085	0.362	0.224*	0.074	0.681
Homemaker	0.335***	0.178	0.630	0.388***	0.287	0.523
Retired and unemployed	0.869	0.616	1.224	1.125	0.620	2.042
Mass media exposure						
low exposure <sup>#</sup>						
medium exposure	1.146	0.951	1.381	0.682**	0.537	0.866
high exposure	1.176	0.846	1.635	0.608	0.302	1.224
Notice Health warning						
No <sup>#</sup>						
Yes	1.830	1.525	2.196	1.348	1.055	1.720
Perceived impact on health						
No <sup>#</sup>						
Yes	1.144	0.804	1.627	1.107	0.748	1.639

# =Shows the reference category \*\*\*P<=0.01, \*\*P<=0.05, \*P<=0.1

Table 5: presents that adjusted odds ratio for smokeless tobacco use among males by some selected background characteristics in India. Males those who are in the age group 25-44 are 1.2 times more likely to use smokeless tobacco as compare to those males who are in age group 15-24. If we look it by place of residence, males exist in urban area are 31 percent less likely to use smokeless tobacco as compare to those males who are living in rural areas. Males of secondary and above educational level are 49 percent less likely to use of

Males those who are student and home makers are 44 percent and 52 percent less likely to use smokeless tobacco as compare to Govt. and Non-Govt employee categories among different occupational structure. Those who have medium exposure of media are 22 percent less likely to use smokeless tobacco as compare to females of low exposure of media. Here as well, females who have noticed health warning are 2.0 times more likely to use smokeless tobacco as compare to those who have not noticed any health warning.

**Table 5. Association between selected background characteristics and male & female smokeless tobacco users in India 2009-2010**

Characteristics	Male			Female		
	Exp(B)	95 percent C.I. for EXP(B)		Exp(B)	95 percent C.I. for EXP(B)	
		Lower	Upper		Lower	Upper
Age						
15-24 <sup>#</sup>						
25-44	1.299**	1.055	1.599	1.517**	1.172	1.962
45-64	1.015	0.815	1.263	2.242***	1.710	2.939
65 and above	0.838	0.627	1.121	2.469***	1.784	3.418
Residence						
Rural <sup>#</sup>						
Urban	0.695***	0.612	0.788	0.611***	0.528	0.707
Educational level						
No formal schooling <sup>#</sup>						
Less than primary	1.121	0.945	1.330	1.182*	0.997	1.401
Primary but less than secondary	1.078	0.923	1.259	0.689***	0.582	0.816
Secondary and above	0.515***	0.423	0.628	0.316***	0.228	0.438
Occupational Type						
Government and non-government employee <sup>#</sup>						
Self-employed	0.917	0.801	1.050	0.953	0.743	1.222
Student	0.142***	0.074	0.271	0.369**	0.187	0.731
Homemaker	0.578**	0.407	0.819	0.482***	0.391	0.593
Retired and unemployed	1.013	0.804	1.276	1.323	0.909	1.925
Mass media exposure						
low exposure <sup>#</sup>						
medium exposure	1.087	0.960	1.230	0.787***	0.684	0.907
high exposure	0.918	0.724	1.164	0.877	0.581	1.322
Notice Health warning						
No <sup>#</sup>						
Yes	2.107***	1.866	2.380	2.023***	1.753	2.335
Perceived impact on health						
No <sup>@</sup>						
Yes	0.796**	0.634	1.000	0.674***	0.536	0.846

# =Shows the reference category \*\*\*P<=0.01, \*\*P<=0.05, \*P<=0.1

Those female who are aware of impact of smokeless tobacco use are 33 percent less likely to use smokeless tobacco as compared to its reference group.

## DISCUSSION AND CONCLUSION

On the whole analysis of this study reveals that in EAG states the prevalence of current smokeless tobacco users are considerably higher than national average (which are the reported among males 33% and females 18%) it is 44 percent among males and 23 percent among females. In rural areas the proportion of smokeless tobacco users is more in both the categories as compared to people living in urban areas. In rural areas the use of smokeless tobacco is very common which is almost 46 percent among male and 26 percent among female, whereas in urban area 35 percent among male and 16 percent among female. Educational discrepancies in the prevalence of smokeless tobacco depict thoughtful difference across different categories of educational attainment among male as well as female. Little more than half of men with no educational attainment have reported smokeless tobacco and prevalence of smokeless tobacco declines sharply with increasing educational attainment. Only one third of men with higher level of education attainment have reported smokeless tobacco. Socio-economic and spatial variations in smokeless tobacco use across the country represents that EAG states have disproportionally higher prevalence of smokeless tobacco, though the overall prevalence of tobacco use is higher in the North Eastern region of the country. One more important feature of the use of smokeless tobacco in EAG states is the limitation of the National tobacco control programme in

addressing smokeless tobacco, which is one of leading cause of increasing prevalence of oral cancer in developing countries. In the context of factors affecting tobacco control measures, it is surprising to note that among those who are better exposed to media and have also noticed health warnings on package of various tobacco products among men as well as female, are more likely to use smokeless tobacco. These findings clearly advocate that any strategy to enhance people awareness to tobacco use and its negative repercussions may not lead to quit using smokeless tobacco. Therefore, all the tobacco control programmes should have a provision to motivate users in one hand and provide them opportunity to quit through increased access to cessation centres on the other.

The nature of variation in the type of various tobacco products, it is worth mentioning that Khaini (tobacco mixed with lime) and Gutkha (tobacco mixed with areca nut) are the two most prominent tobacco products used by majority of men, while Khaini and other chewing products are the prominent forms of smokeless tobacco use among female. Another priority use is the early initiation (age at start consumption) of smokeless tobacco use, where 44% among men and almost 59% among female reported to start using smokeless tobacco even before attaining age 18 years, which should be considered as a matter of great concern which requires holistic understanding and which are indeed deep-rooted in our social, cultural and spiritual factors. A proportional scenario in the use of smokeless tobacco reveals that male and female in EAG states are 1.3 times more likely to use smokeless tobacco than in the country as a whole. Findings are extremely important in the context that gender gap in the use of smokeless tobacco is

much narrower than in the case of smoking. A relatively narrow gender gap in the use of smokeless tobacco is another priority issue for the tobacco control programme as use of smokeless tobacco may be harmful not for the female in their reproductive ages but also for their foetus during pregnancy and baby during breastfeeding. Therefore, positioning of the use of smokeless tobacco in a gender context is important for the programme and may be accorded due importance while designing community based prevention programmes and practices.

### Policy recommendations

In order to minimize tobacco related diseases burden the study suggests measures to National Tobacco Control Programs (NTCP) and concerned Govt. bodies by addressing local and regional drivers to control the speed of increasing use of smokeless tobacco, especially among the most vulnerable groups, adolescents, and which are the have high prevalence areas. Preventive programs such as;

Need Greater concentration is essential to strengthen the use of evidence-based policies for control of ST use, which could include having tobacco industries disclose the contents of ST products.

Establishing effective and relevant health warning labels; increasing taxes on ST products; banning or restricting ST promotions, sponsorship, or marketing;

Raising public awareness of the toxicity and health effects of ST products, providing school based, family based and community based prevention programs this may lead to short-term reductions in prevalence.

In addition, print and electronic media have to play important role in creating awareness among youth of male and females and more research is necessary in order to develop country-specific ST intervention programs and to explore the best ways to make these interventions accessible to ST users.

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