Prevalence and Patterns of Tobacco Use: A Cross Sectional Study in Santa Cruz, Goa, India

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Abstract: Tobacco use is the single most preventable cause of premature disease and death, currently leading to over five million deaths globally each year which is expected to rise to over eight million deaths by 2030.

Aims/Objective: To study the prevalence of tobacco use and some socio-demographic factors associated with tobacco use in the individuals aged 20 years and above in the urban field practice area of Santa Cruz, Goa.

Materials and methods: The present cross sectional community based study was conducted in Santa Cruz an urban area of Goa. 311 households were chosen using systematic random sampling and 935 individuals aged 20 years and above from the 311 households were recruited in the study. The data was collected in a pre-designed structured questionnaire by face to face interview.

Results: The prevalence of tobacco use was found to be 34.8%.The prevalence of smoking tobacco use was found to be 20.3%, smokeless tobacco use was found to be 14.1 % and tobacco use in any form was found to be 0.4%. Tobacco use was found to be highest (40.8%) in the age group of 40-49 years. Tobacco use was higher in males as compared to females. Tobacco use was higher in illiterate (40%), unemployed (65.2%) and low socio-economic status (51.5%).

Conclusion: Tobacco Control Policy would have to consider type of tobacco consumption, age at initiation of tobacco use, education and employment status of individuals while striving to decrease tobacco use. Priority should also be given to smokeless tobacco control efforts.

Keywords: Smokeless Tobacco, Smoking, Tobacco use, Urban Population.

1. INTRODUCTION

Tobacco use is the single most preventable cause of premature disease, disability and death, currently leading to over five million deaths each year worldwide which is expected to rise to over eight million deaths, that is, one of every six adult deaths yearly by 2030. Giving the existing trends in mortality, about 500 million people alive today will die prematurely as a result of tobacco use, with 1 billion deaths from tobacco expected during this century.[3] More important is the fact that this epidemic of disease and death caused by tobacco is increasing very rapidly.[1]

There are almost 275 million tobacco users in India. Among adults over one- third (35%) of population use tobacco products, with 48% males and 20% of females using some form of tobacco.[4] In India, tobacco consumption is responsible for half of all the cancers in men and a quarter of all cancers in women,[5] in addition to being a risk factor for cardiovascular diseases and chronic obstructive pulmonary diseases.[6] India also has one of the highest rates of oral cancer in the world, partly attributed to high prevalence of tobacco chewing.[10]

Many studies[8,9,10] have shown that the morbidity and mortality associated with tobacco use is largely preventable by taking measures to prevent initiation & promote cessation of tobacco use. However the varied patterns of tobacco use and diversity of socio-economic determinants substantially influence the profile of tobacco related diseases. Data from research studies is required to quantify the problem and identify its determinants which need to be area specific to reduce the burden of tobacco use and provide a credible basis for evolving tobacco control policies.[1] Hence this paper seeks to

determine the prevalence of tobacco use in the individuals aged 20 years and above in the urban area of Santa Cruz. It also seeks to determine the prevalence of the various forms of tobacco used in the study population. Some socio-demographic factors associated with tobacco use have also been examined.

2. MATERIAL AND METHODS

The present cross sectional community based study was conducted in the urban area of Santa Cruz in Goa. The study was carried out over a period of 6 months from November 2012 to May 2013 in individuals aged 20 years and above. Sample size for the study was calculated with the formula:

$N = Z\alpha^2 pq / d^2$

Where,

N= Sample size, Zα = Confidence level = 1.96, p= Prevalence of Tobacco use in Goa, Q= 1-p, d = Permissible error.

311 households were chosen using systematic random sampling and 935 individuals aged 20 years and above from the 311 households were recruited in the study. The data was collected in a pre-designed structured questionnaire by face to face interview.

Written consent was obtained from all the study subjects...

Questionnaire included both open and close ended questions. It consisted of 2 parts:

1. Household Questionnaire and
2. Individual Questionnaire.

The results of the present study were analysed using SPSS version 14 and statistical test (Chi Square test) was used where applicable.

3. DEFINITIONS

Ever users of tobacco: Ever Users of Tobacco include Current and Former smoking, smokeless and any form tobacco users and was defined as an adult who had smoked 100 cigarettes and/or 20 or more smokeless tobacco forms orally within the six months prior to commencement of the study.[11,12,13,14]

Current Smoking tobacco user: An adult who had smoked 100 smoking forms in his or her lifetime and/or who had smoked within the six months prior to commencement of the study..[13]

Former Smoking tobacco user: Former smoker was defined as an adult who had smoked 100 smoking forms in his/her lifetime and did not smoke during the last six months prior to commencement of the study.[13]

Current Smokeless Tobacco Users: Current smokeless tobacco user was defined as an adult who had used 20 or more smokeless tobacco forms orally within six months prior to commencement of the study..[12,14]

Former Smokeless Tobacco Users: was defined as an adult who had used 20 or more smokeless tobacco forms but did not use for the last six months prior to commencement of the study.[12,14]

Any form (Both forms): referred to use of both smoking and smokeless forms of tobacco by an adult at any period of time wherein more than 100 smoking forms and more than 20 smokeless forms have been used prior to commencement of the study.[12,13,14,15]

Never Users: A never user was defined as one who has never used tobacco in any form, or who had used either less than 100 smoking tobacco forms or less than 20 smokeless tobacco forms in his or her lifetime. [14,16,17]

4. RESULTS

In the present study, socio demographic and general characteristic of study population is given in table 1. It reveals highest percentage of males (25.7%) in the age group of 20-29 years and lowest percentage of males (15.6%) in the age group of 60 years and above. Highest percentage of females (25.8%) was found in the age group of 20-29 years and lowest percentage of females (15.4%) was found in the age group of 60 years and above. The mean age of study population was found to be 41.73 ±15.5 years.

The prevalence of tobacco use was found to be 34.8%. i.e. 326 individuals out of total 935 individuals were found to be using tobacco. The prevalence of smoking tobacco use was found to be 20.3% i.e. 190 individuals out of total 935 were found to be using smoking form of tobacco. The prevalence of smokeless tobacco use was found to be 14.1 i.e. 132 individuals out of total 935 were found to be using smokeless form of tobacco. The prevalence of tobacco use in any form was found to be 0.4% i.e. 4 individuals out of total 935 were found to be using any forms of tobacco.

It was observed that, in males, the highest percentage of ever users of tobacco (40.8%) was found in the age group between 40-49 years of age and lowest (10.7%) in the age group of 20-29 years. In females, the highest percentage of ever users of tobacco (9.1%) was found in the age group between 40-49 years of age and lowest (4.8%) in the age group of 60 years and above. The mean age of ever users of tobacco was 43.31 $\pm$ 11.5 years in males and 40.63 $\pm$ 12.9 in females.

The prevalence of smoking in males was found to be higher (39.2%) than that in females (0.8%). The prevalence of smokeless tobacco use was also found higher in males (16.6%) than that in females (11.4%).

The commonest smoking tobacco form used was found to be cigarette (92%), followed by Beedi (6%) and Dhumti (2%) and the commonest smokeless tobacco product used was found to be Betel Quid (51%), followed by Gutkha (38%), Toothpaste (6.0%), Mishri (3%) and Khaini (1%).

It was observed that highest percentage of both male and female ever users of tobacco were below 20 years of age at initiation of tobacco. In males mean age at initiation was 18.85 $\pm$ 4.3 years and in females the mean age at initiation was 18.19 $\pm$ 1.5 years.

It was observed that, the percentage of tobacco use was found to be highest in Muslims (39.5%), followed by Hindus (34.6%) and Catholics (33.6%). The percentage of tobacco use was found to be highest in married people (39.8%), followed by among widow/widower/divorced/ separated group (29.0%) and unmarried people (12.7%).

In the present study it was observed that, the percentage of tobacco use was found to be highest in illiterate individuals (40.0%) and lowest in individuals with graduation and above education (21.3%). The percentage of tobacco use was found to be highest in unemployed (65.2%). No student was found to be an ever user of tobacco. The percentage of ever users of tobacco was found to be highest in individuals belonging to lower socio-economic class (51.5%) while lowest in those belonging to upper socio-economic class (17.3%).

In the present study the association between various socio-demographic factors i.e. age, sex, marital status, education, occupation and socio-economic class and tobacco use was found to be statistically significant.

5. DISCUSSION AND CONCLUSION

Prevalence of Tobacco Use:

In the present study, the prevalence of tobacco use was found to be 34.8%. i.e. 326 individuals out of total 935 individuals were found to be using tobacco. The prevalence of tobacco use in the present study was found to be similar to the prevalence in other studies. Global Adult Tobacco Survey India (GATS India)[19] found the prevalence of 35% in the population aged 15 years and above. In a study conducted by Rani et al in 2003[26], it was found that 30 percent of the population aged 15 years and above were tobacco users. Survey conducted by the Indian Council of Medical Research in Karnataka and Uttar Pradesh found the prevalence of tobacco use as 29.6% in Karnataka and 34.6% in Uttar Pradesh[18].

In males, the highest percentage of ever users of tobacco (40.8%) was found in the age group between 40-49 years of age and lowest (10.7%) in the age group of 20-29 years. In females, the highest percentage of ever users of tobacco (9.1%) was found in the age group between 40-49 years of age and lowest (4.8%) in the age group of 60 years and above. The mean age of ever users of tobacco was 43.31 $\pm$ 11.5 years in males and 40.63 $\pm$ 12.9 in

females. Similar findings have been reported in other studies. Rani et al[26] reported that the prevalence of tobacco use increased up to the age of 50 years and then levelled or declined which was similar to the present study. As also Laishram Jenibala Devi et al[25] in their study found that the age wise prevalence of tobacco use was higher as the age advanced and the highest rate was found in the age group of 40-49 years and then declined gradually as age advances.

Sex and Tobacco use:

The prevalence of ever users of tobacco was higher in males (56.7%) than that in females (12.3%), which was found to be statistically significant (x^2 = 202.75; df = 1; p = 0.000). Similar findings were reported in other studies. In GATS India

2010[19], the prevalence of both smoking and smokeless tobacco use in males was higher than in females. So also, Rani et al[26], in their study found that, 47% men and 14% of women either smoked or chewed tobacco. In a survey in rural Nagaur, Rajasthan, 51% of males and 5% of females were tobacco users among 3148 respondents 21 years of age and above [23]. In urban Jaipur, in three successive studies about 39% of men 17% of women 20 years and above were tobacco users [22].

Forms of Tobacco used:

In the present study prevalence of smoking tobacco use was found to be 20.3% i.e 190 individuals out of total 935 were found to be using smoking form of tobacco. The prevalence of smokeless tobacco use was found to be 14.1 i.e 132 individuals out of total 935 were found to be using smokeless form of tobacco.The prevalence of tobacco use in any form was found to be 0.4% i.e. 4 individuals out of total 935 were found to be using any forms of tobacco. Similar findings were reported in other studies. In a survey conducted by the Indian Council of Medical Research on prevalence of tobacco use in Karnataka and Uttar Pradesh in India[18], the prevalence of current use of tobacco in smoking, smokeless form and mixed type was observed to be 14.6%, 12.9% and 0.9%, respectively in Karnataka and 16.9%, 16.4% and 1.1% respectively, in Uttar Pradesh. Rani et al[26] reported, 16% of the study population (29.3% men and 2.3% women) smoked tobacco; 20% of the study population (28.1% men and 12.0% women) chewed tobacco/pan masala; and 30% of the study population (46.5% men and 13.8% women) either smoked or chewed tobacco.

The highest percentage (28.7%) of current smoking tobacco use was found to be in the age group of 40-49 years and lowest percentage (4.1%) was found to be in the age group of 20-29 years. The highest percentage (13.1%) of former smoking tobacco use was found to be in the individuals 60 years and above. It was also observed that the highest percentage (19.5%) of current smokeless tobacco use was found to be in the age group of 40-49 years and lowest percentage was found to be (8.2%) in the individuals 60 years and above. Only 1 former smokeless tobacco user in the age group of 30-39 years was reported in the study. The percentage of current tobacco users of any forms was found to be highest (1.3%) in individuals 60 years and above. Similar findings were reported in other studies. Ansari et al[3] reported that the highest number of smoking tobacco users were in the age group of 40-49 years of age, however highest number or of smokeless tobacco users were reported in the age group of 30-39 years of age. H. K. Chaturvedi et al[24] in their study reported that highest number (35.7%) of current smokers were in the age group of 30-49 years of age and highest number (29.5%) of smokeless tobacco users were also in the age group of 30-49 years of age.

The percentage of current smoking in males was found to be highest (35.9%) in the age group of 40-49 years and the lowest percentage (4.6%) was found in the age group of 20-29 years. The percentage of current smoking in females was found to be highest (1.5%) in the age group of 50-59 years. In males the highest percentage of former smokers was found in the age group of 60 years and above and above. Only one female was found to be former tobacco user in the age group of 60 years and above. The prevalence of smoking in males was found to be higher (39.2%) than that in females (0.8%). Similar findings were reported in other studies. GATS India[19] found the prevalence of smoking tobacco use was higher (15%) in males than in females (1.9%). Ankur Garg et al[2] also in their study found the prevalence of smoking in males to be higher (40.1%) than in females (8.8%). The commonest smoking tobacco form used was found to be cigarette (92%), followed by Beedi (6%) and Dhumti (2%). However, in a survey Conducted by the Indian Council of Medical Research on prevalence of Tobacco Use in Karnataka and Uttar Pradesh in India[18], Bidi was observed to be the most popular modality of tobacco smoking accounting for 91.7% and 84.5% of smoking habit (with or without other tobacco habits) in Karnataka and Uttar Pradesh. The difference in the predominant smoking form used in the present study could probably be attributed to the high socio-economic status of the people as well urban culture.

The percentage of current smokeless tobacco use in males was found to be highest (18.0%) in the age group of 40-49 years and the lowest percentage (5.0%) was found in the age group of 20-29 years. The percentage of current smokeless tobacco use in females was found to be highest (3.8%) in the age group of 20-29 years. Only 1 male individual was found to be former smokeless tobacco user in the age group of 60 years and above. No female former tobacco user was found in the study. The prevalence of smokeless tobacco use in males was found to be higher (16.6%) than that in females (11.4%). Similar findings were reported in other studies. GATS India[19] found that the prevalence of smokeless tobacco use was higher (20.3%) in males than in females (17.3%). Avinash Kumar et al[4] found in their study that the prevalence of smokeless tobacco use in males was higher (76.41%) than that in females (63.70%).

In the study the commonest smokeless tobacco product used was found to be Betel Quid (51%), followed by Gutkha (38%), Toothpaste (6.0%), Mishri (3%) and Khaini (1%). However, Avinash Kumar et al in their study found that the

khaini was the commonest form of smokeless tobacco used by all the groups. Ghutka was the second most commonly used tobacco among all the groups except business and service class where betel quid was more common. Gupta and Ray, 2003[21]; Dobe et al., 2006[13] reported that smokeless tobacco is consumed predominantly by chewing in form of pan (piper betel leaf filled with sliced areca nut, lime, catechu, and other spices chewed with or without tobacco), pan-masala or gutkha and mishri.

The combinations of Cigarettes and Gutkha, Cigarettes and Betel Quid and Bidi and Betel Quid were used, and only 4 male individuals reported using them. Of the three combinations used cigarette and gutkha was the predominant combination used.

The percentage of tobacco use was found to be highest in Muslims (39.5%), followed by Hindus (34.6%) and Catholics (33.6%). Similarly, Dixit S et al[27], in their study found high prevalence in Muslims though religion was found to be insignificantly related to tobacco use.

It was observed that, the percentage of tobacco use was found to be highest in married people (39.8%), followed by among widow/widower/divorced/separated group (29.0%) and unmarried people (12.7%). This is attributed to the fact that the sample size of married people is quite higher as compared to both other groups. The variables tobacco use and marital status were found to be associated i.e. there is statistically significant difference in tobacco use among different marital groups. Similarly, T. Rooban et al[28], in their study on tobacco use among men in urban slums and non slums, found that tobacco use in smokeless, smoking and in any form was highest in married (67.3%, 72.1% and 63.3% respectively) among slum dwellers and (67.9%, 71.1%, and 67.4% respectively) among non slum dwellers. So also S. Dixit et al[27] reported that tobacco use was highest in married people (Smoking-85.1%, Smokeless- 80%).

It was observed that, the percentage of tobacco use was found to be highest in illiterate individuals (40.0%) and lowest in individuals with graduation and above education (21.3%). The variables tobacco use and education were found to be associated i.e there is statistically significant difference in tobacco use among different educational groups. Similar findings were reported in other studies. Laishram Jenibala Devi et al[25] in their study found that the educational status was significantly associated with tobacco use. This is consistent with observations that those with lower level of education are more likely to use tobacco. In a survey Conducted by the Indian Council of Medical Research on prevalence of Tobacco Use in Karnataka and Uttar Pradesh in India 2001[18], negative association between education and prevalence of tobacco use was observed overall in both the States. In a study by Basan Gauda Patil[16], the higher prevalence of tobacco use was found among illiterates (35.1%) and lower in postgraduates (15%).

It was observed that, the percentage of tobacco use was found to be highest in unemployed (65.2%). No student was found to be an ever user of tobacco. The variables tobacco use and occupation were found to be associated i.e there is statistically significant difference in tobacco use among different occupational groups. Similarly, GATS India 2010[19] found that amongst all occupational categories tobacco use is lowest among students. B. Prabhakar et al[5] reported that the prevalence of current tobacco use was seen to be the lowest among students for both men and women. Also in a prospective cohort study conducted in Mumbai[20], unskilled male workers, male service workers and unemployed individuals were more at risk than professionals.

It was observed that, the percentage of ever users of tobacco was found to be highest in individuals belonging to lower socio-economic class (51.5%) while lowest in those belonging to upper socio-economic class (17.3%). The variables tobacco use and socioeconomic status were found to be associated i.e. there is statistically significant difference in tobacco use among different socioeconomic classes. Similar findings were reported in other studies. In a study by Basan Gauda Patil[16], the prevalence in class I was 23.6% and it increased steadily across group to reach a maximum level of 37.5% in class V. In a survey conducted by the Indian Council of Medical Research on prevalence of Tobacco Use in Karnataka and Uttar Pradesh in India 2001[18], it was found that higher family income levels were associated with a lesser prevalence of current tobacco use.

Conclusion:

The high prevalence of tobacco use among men and women points towards the fact that mere knowledge about the health hazards is not sufficient to make them stop using tobacco. So there is a need to develop effective health education and multi-factorial tobacco quitting strategies with focus on help and support for those who wish to quit tobacco.

TABLE 1: Socio demographic profile and general characteristic of study population

Socio-demographic and general profile	Male		Female		Total	
	No	%	No	%	No	%
Age						
20-29	122	25.7	119	25.8	241	25.8
30-39	113	23.8	111	24.0	224	24.0
40-49	88	18.5	86	18.6	174	18.6
50-59	77	16.2	74	16.0	151	16.3
>=60	74	15.6	71	15.4	145	15.5
Religion						
Hindu	360	59.1	249	40.9	609	65.1
Catholic	168	71.5	67	28.5	235	25.1
Muslim	55	60.4	36	39.6	91	9.8
Marital Status						
Unmarried	78	58.2	56	41.8	134	14.3
Married	365	51.6	343	48.4	708	75.7
Widow/Widower/Divorced/Separated	19	20.4	74	79.6	93	9.9
Levels of Education						
Illiterate	71	33.0	144	67.0	215	22.9
Primary	66	47.1	74	52.9	140	14.9
Secondary	144	53.7	124	46.3	268	28.6
Higher Secondary	77	55.8	61	44.2	138	14.7
Graduation and Above	104	59.8	70	40.2	174	18.6
Occupation						
Unemployed	52	36.9	89	63.1	141	15.0
Unskilled	92	53.8	79	46.2	171	18.2
Skilled	114	78.1	32	21.9	146	15.6
Business	234	91.8	21	8.2	255	27.2
Professional	121	71.2	49	28.8	170	18.1
Student	25	48.1	27	51.9	52	5.5
Socio-Economic class						
Upper class	50	51.0	48	49.0	98	10.4
Upper middle	125	51.0	120	49.0	245	26.2
Lower middle	116	51.3	110	48.6	226	24.1
Upper lower	86	49.4	88	50.6	174	18.6
Lower	99	51.6	93	48.4	192	20.5

TABLE 2: Distribution of tobacco use according to age and sex

Age Group	Ever Users (Tobacco)		Never Users		Total
	Male	**Female**	**Male**	**Female**	
20-29	26 (10.7%)	12 (4.9%)	96 (39.8%)	107 (44.3%)	241 (100.0%)
30-39	61 (27.2%)	13 (5.8%)	52 (23.2%)	98 (43.7%)	224 (100.0%)
40-49	71 (40.8%)	16 (9.1%)	17 (9.7%)	70 (40.2%)	174 (100.0%)
50-59	60 (39.7%)	9 (5.9%)	17 (11.2%)	65 (43.0%)	151 (100.0%)
>=60	51 (35.1%)	7 (4.8%)	23 (15.8%)	64 (44.1%)	145 (100.0%)
Total	**269 (28.7%)**	**57 (6.0%)**	**205 (21.9%)**	**404 (43.2%)**	**935 (100%)**

(Figures in parenthesis indicate percentage)

TABLE 3: Distribution of forms of tobacco used according to age

Age Group	Tobacco Forms						Never User	Total
	Smoking		Smokeless		Any forms			
	Current	**Former**	**Current**	**Former**	**Current**	**Former**		
20-29	10 (4.1%)	0	28 (11.6%)	0	0	0	203 (84.2%)	241 (100.0%)
30-39	39 (17.4%)	0	34 (15.1%)	1 (0.4%)	0	0	150 (66.9%)	224 (100.0%)
40-49	50 (28.7%)	1 (0.5%)	34 (19.5%)	0	1 (0.5%)	0	87 (50.0%)	174 (100.0%)
50-59	42 (27.8%)	4 (2.6%)	23 (15.2%)	0	1 (0.6%)	0	82 (54.3%)	151 (100.0%)
>=60	25 (17.2%)	19 (13.1%)	12 (8.2%)	0	2 (1.3%)	0	87 (60%)	145 (100.0%)
Total	**165 (17.6%)**	**24 (2.5%)**	**78 (8.3%)**	**1 (0.1%)**	**4 (0.4%)**	**0**	**609 (65.1%)**	**935 (100%)**

(Figures in parenthesis indicate percentage)

TABLE 4: Socio-demographic factors and Tobacco use

|	Ever users (Tobacco)		P value
	Number	**%**	
Religion			
Hindu	211	34.6	p>0.05
Catholic	79	33.6	
Muslims	36	39.5	
Marital Status			χ^2=38.10;
Unmarried	17	12.7	df=2;
Married	282	39.8	p-0.000
Widow/Widower/Divorced/Separated	27	29.0	
			χ^2=20.56;
			df=4;
Levels of Education			p=0.001
Illiterate	86	40.0	
Primary	51	36.4	
Secondary	105	39.1	
Higher Secondary	47	34.1	χ^2=162.8;
Graduation and Above	37	21.3	df-7;
			p=0.000
Occupation			
Unemployed	92	65.2	
Unskilled	80	47.0	χ^2=16.28;
Skilled	41	28.1	df-4;
Business	76	44.4	p=0.003
Professional	37	14.5	
Student	0	-	
Socio-Economic class	17		
Upper class	81	17.3	
Upper middle	76	33.0	
Lower middle	53	33.6	
Upper lower	99	30.4	
Lower		51.5	
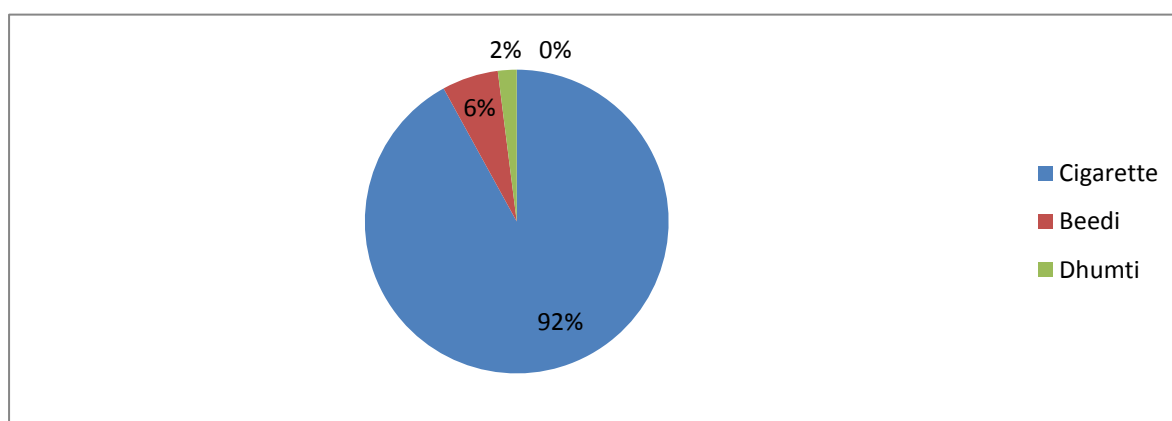
Fig 1: Pie chart showing distribution of smoking forms of tobacco
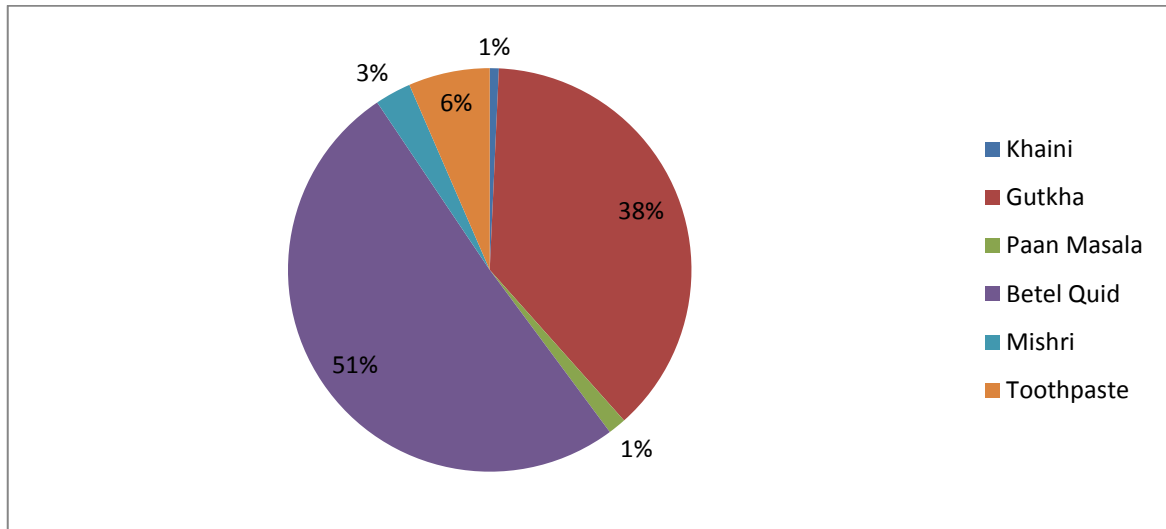
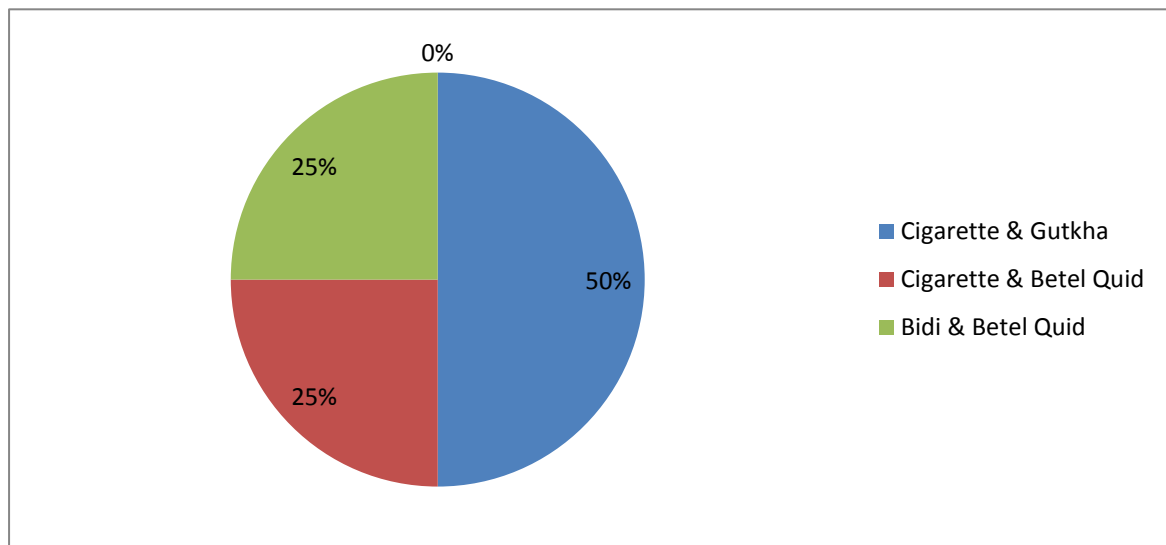**Fig 2: Pie chart showing distribution of smokeless forms of tobacco**

Fig 3: Pie chart showing distribution of any forms of tobacco

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