Consumption pattern of Tobacco and related products among adult population in a village of coastal Karnataka: A Cross-Sectional Study

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Key words:

Tobacco Products, Smoking, Smokeless Tobacco, Tobacco use, Hypertension

Abstract:

Introduction: Tobacco usage is one of the most rising and concerning causes of a range of diseases such as cancer, heart diseases, stroke, etc. eventually leading to death. There are over 267 million tobacco users in India. Of adults, 28.6% use tobacco products (males 42.4%, women 14.2%). Adults who use smokeless tobacco make up 21.4%. So this study was done to estimate the proportion of tobacco and related products consumption among adults in Ira village and to analyze the Systolic blood pressure and Diastolic blood pressure among consumers and non-consumers of tobacco and related products.

Methodology: This community-based cross-sectional study was conducted in Ira village and included residents aged 18 years and above with a total sample size of 200. It is done by using the simple random sampling method using a pre validated, pretested structured questionnaire prepared after referring to the Global Adult Tobacco Survey and measuring their blood pressure. Statistical analyses like Chi-square and T-test were performed.

Results: Among the females,7.6% are tobacco users compared to 46.3% males ($p<0.001$). 31-45 year age group showed significantly higher consumption and employed individuals had higher consumption rates. SBP(123.66 ± 12.76 mm of Hg V/s129.70 ± 15.19 mm of Hg; $p = 0.007$) and DBP (79.99 ± 9.99 mm of Hg V/s 85.06 ± 9.72mm of Hg; $p = 0.003$) was significantly higher among users as compared to non-consumers.

Conclusion: Gender, age and employment status were important predictors for tobacco consumption. SBP and DBP were significantly higher among users of tobacco highlighting the need for primary prevention strategies against hypertension and tobacco cessation.

Introduction:

Tobacco usage is one of the most rising and concerning causes of a range of diseases such as cancer, heart diseases, stroke, etc. eventually leading to death. Nicotine is the component of tobacco that leads to dependency[(1)] . The potentially harmful components of tobacco smoke, including as tar, carbon monoxide (CO), polycyclic aromatic hydrocarbons (PAHs), and nicotine, have been the subject of numerous studies[(2)]. Smoking causes lung problems, diabetes, cancer, heart disease, stroke, and chronic obstructive pulmonary disease (COPD), which includes emphysema and chronic bronchitis. Furthermore, smoking increases the likelihood of acquiring immune system disorders such rheumatoid arthritis, several eye problems, and tuberculosis.

Globally 19% adults currently smoke (men 33%, women 6%). The majority of smokers worldwide is more than 80% who lives in low and middle-income nations. Smokers make up 22% of adults in high-income countries, 19.5% in middle-income countries, and 11% in low-income ones [(4)(5)]. There are over 267 million tobacco users in India. Of adults (15 years of age and older), 28.6% use tobacco products (males 42.4%, women 14.2%). Adults who use smokeless tobacco make up 21.4% (men, 29.6%, women, 12.8%). Adult smoking rates are 10.7% (19.0% men and 2.0% women). The majority of adult smokers (7.7% of adults overall) smoke bidis [(6)(7)].
The southern state of Karnataka has a disproportionate share of the burden associated with tobacco use in the region. In 2016, 12 million people in Karnataka, which is 22.8% of the total population, were tobacco users. One in ten women and nearly one in three men reported using tobacco[(8)].
Gutkha (paan masala with tobacco) is a popular smokeless tobacco product in India. The tobacco industry has pushed tobacco and paan masala as an alternative product considering the prohibitions on Gutkha advertising and promotion as well as the mandate for warning labels on tobacco products. Although pan masala poses a health risk, it is not currently considered into tobacco control policies. Examining the frequency and reasons for use (with or without tobacco) was essential [(9)].
So, this study which is done in coastal Karnataka due to lack of previous studies, illustrates not only the impact of tobacco on blood pressure but also the prevalence of both smokeless and smoked tobacco in the population. Additionally, it dives into the use of smokeless tobacco, such as paan, which is not included by the tobacco control policies in place but needs to be looked at to determine its prevalence and impact on the general public.

Methodology:
This study was done to estimate the proportion of tobacco and related products consumption among adults in Ira village and to analyze the Systolic blood pressure and Diastolic blood pressure among consumers and non-consumers of tobacco and related products.
This community-based cross-sectional study was conducted in Ira village and included residents aged 18 years and above.

Sample size was calculated using the formula:

$$N = \frac{z^2_{(1-\alpha)}\, pq}{d^2}$$

Sample size for this study is calculated by using the prevalence of 22.8% in Karnataka obtained by India Global Adult Survey 2016-2017 [(6)]. At 95 % Confidence interval and absolute error as 6 % aa sample size of 188 was calculated. Anticipating nonresponse rate of 5% of N the final sample size calculated was 200.
Study is done by using the simple random sampling method and using a pre validated, pretested structured questionnaire prepared after referring Global Adult Tobacco Survey (GATS).[(6)]

A Questionnaire-based survey for socio demographic factors was conducted. A pre validated, pretested structured questionnaire tool to assess the tobacco and related products consumption was used. Systolic blood pressure and Diastolic blood pressure of all study participants were measured using sphygmomanometer. Their height and weight were recorded using a stadiometer and weighing scale.

The data derived from this study is expressed using frequency along with mean and standard deviation, median and interquartile range. Statistical tests like Chi-Square tests have been performed to find the association.

The study participants involved in this study have given their informed consent after explaining about the study in vernacular language. The confidentiality of the study participants was maintained throughout the study.

RESULTS

Total study population involved in this study is 200. The mean age of the study population is 43.13 ± 14.75 years. The mean height of the study population is 159.15 ± 10.36 cm. The mean weight of the study population is 59.64 ± 13.14 kg.

The mean Systolic blood pressure of the study population is 125.08 ± 13.58 mm of Hg. The mean Diastolic blood pressure of the study population is 81.18 ± 10.13 mm of Hg.

Table 1: Sociodemographic factors of the study population:

Socio-Demographic factors		Frequency (N=200)	Percentage
Gender	Male	82	41%
	Female	118	59%
Age	18-30 Years	50	25%
	31-45 Years	67	33.5%
	46-60 Years	61	30.5%
	>60 Years	22	11%
Education level	No formal education	35	17.5%
	Primary school education	80	40%
	Higher secondary school education	54	27.0%
	College or above	31	15.5%
Employment status	Employed	89	44.5%
	Homemaker	87	43.5%
	Retired or Unemployed	13	6.5%
	Student	11	5.5%
Marital status	Married	164	82.0%
	Single	29	14.5%
	Widow	6	3.0%
	Separated / Divorced	1	0.5%
Literacy rate	Literate	160	80%
	Illiterate	40	20%
Socioeconomic status	APL	52	26%
	BPL	148	74%

Table 2: Tobacco and other products consumption pattern among the study subjects:

Factors		Frequency	Percentage
Percentage of tobacco users (N=200)	Consume Tobacco	47	23.5%
	Do not consume Tobacco	153	76.5%
Smoking inside the household (N=200)	Yes	16	8.0%
	No	184	92.0%
Type of cooking fuel used (N=200)	Firewood	22	11.0%
	LPG	178	89.0%
Type of Tobacco consumed (N=47)	Smokeless Tobacco	20	42.6%
	Smoked Tobacco	18	38.3%
	Both smoked and smokeless form	9	19.1%

Figure 1: Distribution of co-morbidities in the study population:

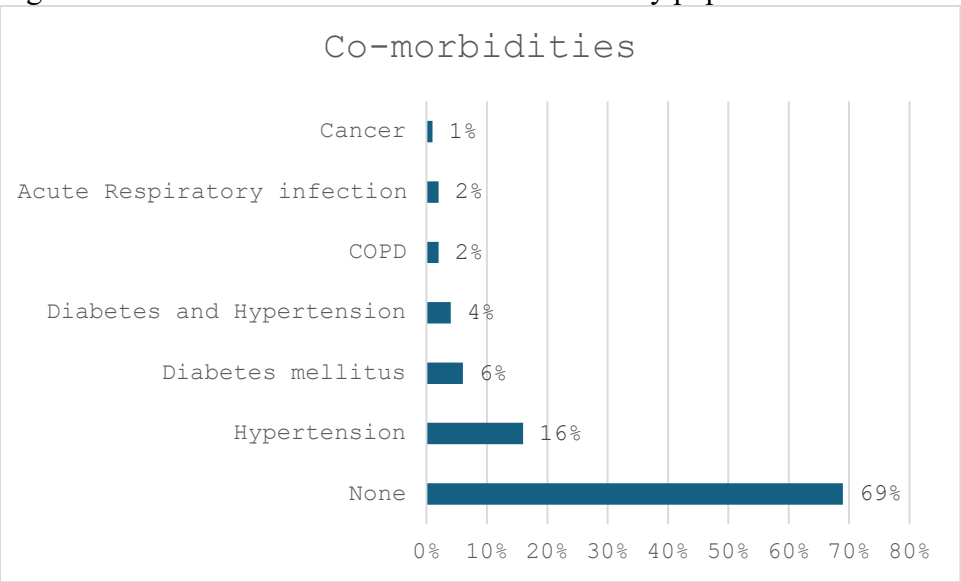

Figure 1 depicts the presence of comorbidities; among the study population of 200 people, 69% of the population under the study had no comorbidities, whereas around 31% of the population have comorbidities - Hypertension (16%), Chronic obstructive pulmonary disease (2%), Acute respiratory infection (2%), cancer (1%), Diabetes mellitus (6%), further around 4% of the study population has both Diabetes mellitus and Hypertension.

Table 3: Shows the tobacco consumption pattern based on various factors (N=200)

Factors	Groups	Non-User	Tobacco user	P Value
Gender	Female	92.4%	7.6%	**P < 0.001**
	Male	53.7%	46.3%	
Level of formal education	College or above	80.6%	19.4%	p>0.05
	Higher secondary school education	77.8%	22.2%	
	No formal education	71.4%	28.6%	
	Primary school education	76.3%	23.8%	
Employment status	Employed	60.7%	39.3%	**P<0.001**
	Home maker	94.3%	5.7%	
	Retired or Unemployed	69.2%	30.8%	
	Student	72.7%	27.3%	
Marital status	Married	76.8%	23.2%	p>0.05
	Separated / Divorced	100.0%	0.0%	
	Single	75.9%	24.1%	
	Widowed	66.7%	33.3%	
Literacy level	Literate	80.0%	20.0%	p>0.05
	Not literate	75.6%	24.4%	
Socio-economic status	APL	78.8%	21.2%	P>0.05
	BPL	75.7%	24.3%	

* Chi-square test was performed to find association and p<0.05 is considered as statistically significant.

Table above depicts that among the female study population 7.6% are tobacco users compared to 46.3% males being the tobacco users. 53.7% of the males are non-consumers of tobacco as compared to 92.4% females. On performing Chi-Square test, p value is <0.001 which is statistically highly significant.
Among the employed study population, 60.7% do not consume tobacco as compared to 39.3% who consume tobacco. 94.3% of homemakers did not consume tobacco, while 5.7% consumed tobacco. The retired/unemployed group comprised of 69.2% non-consumers, whereas 30.8% consume tobacco. Among the students in the study population, 72.7% do not consume tobacco

and 27.3% consume tobacco and related products. On performing Chi-Square test, p value obtained was <0.001 which is statistically highly significant.
Thus our research revealed that men had a higher consumption of tobacco products compared to women making gender a highly significant factor in our study. There was a noticeable uptrend in tobacco product consumption among individuals aged 31- 45 years indicating age as a significant factor in our findings. Employed individuals showed higher rates of tobacco consumption emphasising employment as a highly significant factor in our study.

Table 4: Shows mean and standard deviation in tobacco users and non-consumers based on age and blood pressure. (N=200)

	Group	**N**	**Mean**	**Std. Deviation**	**T value**	**Significance***
Age	**Non-User**	153	41.771	14.14	-2.39	**p = 0.018**
	Tobacco User	47	47.574	15.97		
Systolic Blood Pressure	**Non-User**	153	123.660	12.76	-2.71	**p = 0.007**
	Tobacco User	47	129.702	15.19		
Diastolic Blood Pressure	**Non-User**	153	79.993	9.99	-3.06	**p = 0.003**
	Tobacco User	47	85.064	9.72		

*Independent sample T-test was performed and p<0.05 is considered as statistically significant.
Table above depicts that the mean age of non-consumers of tobacco is 41.77 ± 14.14 years as compared to mean age of tobacco users is 47.57 ± 15.97 years. On performing Independent T test, p value = 0.018, which suggests that mean age of tobacco users was significantly higher as compared to non-users.
The mean systolic blood pressure of non-consumers of tobacco is 123.66 ± 12.76 mm of Hg as compared to 129.70 ± 15.19 mm of Hg of tobacco users.
On performing Independent t test, there was statistically significant difference in mean systolic blood pressure with p value of 0.007. thus mean SBP of tobacco users was statistically significantly higher than non-users.
The mean diastolic blood pressure of non-consumers of tobacco is 79.99 ± 9.99 mm of Hg as compared to 85.06 ± 9.72mm of Hg of tobacco users.
On performing Independent t test, p value=0.003, which suggests results are statistically significant.

Table 5: Shows the amount of smoked / smokeless tobacco consumption per day. (N=200)

	N	Mean	Std. Deviation
Age	47	47.57	15.97
Age at first consumption of smoked / smokeless tobacco	47	21.89	7.37

Amount of smoked tobacco consumption per day (Among smoked tobacco users)	30	12.23	11.57
Amount of smokeless tobacco consumption per day(Among smokeless tobacco users)	29	4.52	3.88

Table above depicts mean age of tobacco users is 47.57 ± 15.97 years.
The mean age of people who consumed smoked/smokeless tobacco for the first time is 21.89 ±7.37 years. Among those who use smoked tobacco, mean consumption of smoked tobacco per day is 12.23 ± 11.57 as compared to mean consumption of smokeless tobacco per day is 4.52 ± 3.88.

DISCUSSION:
Our study shows that the population of Ira village consumes tobacco and related products at a prevalence of 23.5%, which is similar to "Center for Disease Control and Prevention (CDC). India Global Adult Tobacco Survey (GATS) 2016-17"[6] which is valued 22.8% .Our study also shows that out of the study population, which consisted of 41% males and 59% females, the men who use tobacco in any form are 46.3% and the women who consume tobacco and associated products are 7.6% which is similar to WHO tobacco fact sheet which states 36.7% men and 7.8% women are tobacco consumers.[5] Henceforth we can say that gender is a highly significant factor and we can also conclude that male consume tobacco and related products more as compared to females.
In the current study, the percentage of smoked tobacco users is 38.3%, while smokeless tobacco consumers are 42.6%. Dual users account for 19.1% of the total. As given in a study by Sarkar A et.al. titled as "population-based study on tobacco consumption in urban slums: Its prevalence, pattern, and determinants."[10], the smoked tobacco users were 47.5%, the smokeless tobacco consumers were 28.2%, and dual users were 24.3% in urban slums. Hence, we can safely say that in our study population the consumers of smoked tobacco products are more as compared to those who consume tobacco in smokeless form and the dual users.
Another piece of information we can conclude from the study by Sarkar A et.al. titled as "population-based study on tobacco consumption in urban slums: Its prevalence, pattern, and determinants." [10],is that the most commonly used smoked product is cigarette, while the most commonly used smokeless product is khaini, which differs from our study since the coastal Village of Ira is a producer of beedi, therefore the majority of the workers are consumers of beedi , and the usage of pan was found to be more common in our study. Our study shows that among the study population of those who consume tobacco by smoking 55% are bidi users while 45% smoke cigarette.
According to the study titled "Socio-economic patterning of tobacco use in Indian states" by S.Agrawal et al [12], 52% of households used tobacco products in some capacity. In certain Indian states, higher household income and education levels were linked to a higher chance of smoking cigarettes, but not of using bidi or smokeless tobacco. But in our study level of education and level of income were not related to consumption pattern of tobacco products, whereas the employed people were found to have a higher association with tobacco consumption.

Another finding from our study was that there was a substantial rise in BP in 16% of the population who were tobacco users, with SBP(123.66 ± 12.76 mm of Hg V/s129.70 ± 15.19 mm of Hg; p = 0.007) and DBP (79.99 ± 9.99 mm of Hg V/s 85.06 ± 9.72mm of Hg; p = 0.003) significantly higher as compared to non-consumers. The prevalence of hypertension was reported to be 31.5% in the study titled "Prevalence and Predictors of Hypertension: Evidence from a Study of Rural India" by Vijna et al[11]. Another important predictor in tobacco use is age (p = 0.018) was found to be significant.

CONCLUSION:

Thus the study found multiple factors contributing to the consumption pattern of tobacco and its related products. The statistically most significant factors were Gender, Age, and employment status. The mean age of the consumers was higher than the non-consumers. We also found that the mean systolic and the mean diastolic blood pressure were significantly higher in consumers of tobacco and its related products.

Based on our study, our recommendations to the community are as follows:

- The tobacco consumers in the community must be made aware of the tobacco cessation programs.
- The people of the community should be informed of the ill effects of tobacco consumption. Additionally, users should be informed of the pharmacological substitutes available to aid tobacco cessation, like nicotine patches.
- Since we observed that the mean systolic and diastolic blood pressure was high in majority of the entire study population, we advised them to reduce their salt intake, and to cultivate an active lifestyle.

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Conflict of interest: None declared

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