Association between Socio-Demographic Factors and the Type of Tobacco Consumption among Subjects Attending a Rural Hospital, South India

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Authors' contributions

This work was carried out in collaboration between all authors. Authors KS and JJ designed the study, wrote the protocol, and wrote the manuscript. Authors SRA and SS managed the literature searches, analysis of the study results and authors KNA and MS helped in field work. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aim: To assess the association between socio-demographic factors and type of tobacco consumption among subjects attending a rural hospital in south India.
Methods: A pre-tested questionnaire was designed for recording the relevant data pertaining to selected socio-demographic variables and the details of tobacco consumption. Patients as well as persons accompanying them formed the study sample and they were chosen by systematic random sampling method. Chi-square test was used to assess the association between the variables.
Results: A total of 350 subjects were included in the study. There was statistically significant association between age groups, gender, education, occupation, economic status and the type of

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tobacco consumption.
Conclusion: The present study revealed a significant association between selected socio-demographic factors and the type of tobacco consumption.

Keywords: Education; poverty line; rural hospital; smoking; smokeless tobacco; tobacco consumption.

1. INTRODUCTION

Tobacco was introduced to the world by Christopher Colombus, who discovered tobacco among the treasures of the new world in 1492 [1]. The American-Indians were apparently the first to use tobacco in various forms. They smoked chewed and sniffed tobacco through their nostrils [1]. They used tobacco to relieve toothache, to treat ulcers and skin wounds, diseases of the lungs, spleen and womb, insect bites, as an anti fatigue agent and as a tooth-whitening agent [1]. The Portuguese introduced tobacco to India 400 years ago and established the tradition of tobacco trade in their colony of Goa. Two hundred years later the British introduced commercially produced cigarettes to India and established tobacco production in the country. Presently, India is world's third largest tobacco growing country [1].

As per WHO report 1997, prevalence of tobacco habits in India was found to be Bidis (34%), Cigarettes (31%), Chewing tobacco (19%), Hookah (9%), Cigars cheroots (5%), and Snuff (2%) [2].

In India, tobacco smoking is becoming the popular form of tobacco consumption in rural and urban population. Out of 930 million global tobacco consumers, India alone accounts for 182 million smokers [3].

In India tobacco consumption is growing at the rate of 2-3% per annum. Tobacco consumption has been considered to be a major contributor to the total mortality rate and in 1990, an estimated 1.5% of total deaths were tobacco related [3]. India has one of the highest rates of oral cancer in the world, with 65% of all cancers in men and 33% of all cancers in women being tobacco-related [1]. More so, the use of tobacco is harmful to general health, as it is a common cause of addiction, preventable disease, disability and death. The use of tobacco causes an increased risk of oral cancer, periodontal disease, oral mucosal lesions and other deleterious oral conditions and it adversely affects the outcome of oral health care including esthetics [1] World Health Organization (WHO) assessment estimated that by 2020 tobacco

related death may exceed 1.5 million annually or 13% of all deaths in India [4]. Tobacco use and its pattern are closely linked to age, sex, social class, education, income, etc among many other factors. A report from different countries of South-East Asian region (SEAR) revealed that tobacco use is higher among the rural, illiterate, and poor population. Consumption of smokeless tobacco by rural population and lower socio-economic groups have increased the disease burden and hence it becomes imperative to address this issue with special attention [5].

With this background, the present study was designed to assess the association between socio-demographic factors and type of tobacco consumption among subjects attending a rural hospital in South India.

2. MATERIALS AND METHODS

The study was carried out on patients visiting a rural hospital, in Virajpet, a hilly area in Coorg District, South India. Permission was obtained from administrative officer of the rural hospital. The ethical approval for the study was obtained from the Institutional Review Board of Coorg Institute of Dental Sciences, Virajpet. The details of the study were elaborated to each participant and written consent was taken from them.

Training and calibration of the interviewer was done in Department of Public Health Dentistry, Coorg Institute of Dental Sciences, Virajpet. Data was collected by face to face interview by a single calibrated interviewer. The study was conducted between February 2014 and May 2014.

A questionnaire was designed in English for recording the relevant data pertaining to selected socio-demographic variables and the details of tobacco consumption. The pilot study was done to establish content validity of the questionnaire. Internal validity of the questionnaire was tested using Cronbach's alpha and the alpha value was found to be 0.8. The reliability of the questionnaire used in the survey was also checked during the pilot study. Questions not found to show test-retest reliability were omitted from the final questionnaire.

Questionnaire was divided into two parts,

Part 1: containing survey questions on demographic variables.
Part 2: containing survey questions on tobacco consumption. (Adopted from GATS 2009-10).

The results of the pilot study showed tobacco consumption of 65% among the participants. Based on pilot study results the sample size (n) calculation was done using the following relation:

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

Where, n = required sample size, t = confidence level at 95% (standard value of 1.96, p = prevalence of tobacco use (p= 0.65), m = margin of error at 5%. The final sample size obtained was 350.

Systematic Random Sampling technique was used to recruit the study participants. A random number of '3' was picked by balloting and then every 3rd tobacco consumer visiting the rural hospital reception was included in the study.

Participants were categorized into educational and occupational groups in similar way as considered in Global Adult Tobacco Survey India, [6] Categorization of participants in upper and lower socioeconomic classes was done based on BPL (Below Poverty Line) or APL (Above Poverty Line) card provided by Government of India [7].

Individuals consenting to participate, aged 18 years and above and consuming tobacco were included in the study. Individuals with systemic diseases were excluded.

2.1 Statistical Analysis

The survey data so obtained from the selected sample was compiled, systematized, tabulated and master sheet was prepared (MS-Office, Excel). The data was analyzed by applying the descriptive & inferential statistical analysis.

The collected data on type of tobacco habit and selected demographic variables was subjected to statistical analysis. Analysis was carried out using SPSS package version-16 (SPSS Inc., Chicago). Chi-square test was used to measure the association between independent and dependent categorical variables. The level of significance was set at 5%.

3. RESULTS

In the present cross sectional study, participant's age ranged from 19 to 84 years. Smokeless tobacco consumption was more evident among participants aged 40-47 years (27.7%), smoked tobacco was consumed more among participants aged 26-33 years (21.4%) and participants aged 47-54 years consumed tobacco in both (smoking and smokeless) forms more frequently (27.5%) compared to other age groups. Association between age groups and type of tobacco consumption was found to be statistically significant (p value - 0.0015) (Table 1).

Table 1 shows that 89.4% of males consumed tobacco against 10.6% of females. Among females, the preferred form of tobacco consumption was chewing or smokeless tobacco (91.8%) and among males it was smoked tobacco (75.4%). There was a statistically significant association between gender and type of tobacco consumed (p value - 0.001).

Table 1. Association between age groups, gender and the type of tobacco consumption

Socio demographic factors		Type of tobacco consumption			Total N(%)	X^2 Value	P Value
		Smokeless N(%)	Smoking N(%)	Both N(%)			
Age Groups	19-26	12(14.4)	19(7.9)	1(3.4)	41(11.9)	31.7833	0.0015[*]
	26-33	18(21.9)	51(21.4)	4(13.8)	68(19.4)		
	33-40	12(14.4)	27(11.3)	5(17.2)	55(15.7)		
	40-47	23(27.7)	32(13.4)	3(10.3)	48(13.7)		
	47-54	8(9.6)	32(13.4)	8(27.5)	45(12.9)		
	54-61	7(8.4)	30(12.6)	5(17.2)	42(12)		
	> 61	3(3.6)	47(19.7)	3(10.3)	51(14.6)		
Gender	Male	49(15.65)	236(75.4)	28(8.94)	313(89.4)		
	Female	34(91.89)	2(5.41)	1(2.70)	37(10.6)	10.65	0.001[*]

* Statistically significant

Association between tobacco consumption and education revealed that the illiterate group accounted for 26.9% of tobacco consumption and the post graduate group for 1.1%. This association was statistically significant (p value - 0.001) as shown in Table 2.

Table 3 depicts that non-government employees are commonly indulged in tobacco consumption in all type as compared to other occupational groups and this association was found to be statistically significant at p value 0.0001.

As shown in Table 4, 247(70.57%) study participants belonged to Below Poverty Line group. There was a statistically significant association between economic status and type of tobacco consumed (p value - 0.0001).

Also, it shows that 93.1% of study participants were married & there was no statistically significant association between marital status and type of tobacco consumed (p value - 0.084).

Fig. 1 shows that, in smokeless tobacco users, tobacco with betel-quid was the most commonly used form (63.39%), followed by tobacco lime mixture, gutkha and other forms of tobacco such as tobacco snuff, nasal use of tobacco snuff.

Cigarette (48.3%) was the preferred smoked form of tobacco followed by beedi (43.8%). Both cigarette and beedi were consumed by 7.12% of study participants. This is as depicted in Fig. 2.

4. DISCUSSION

Tobacco use is a major preventable cause of disease and premature death. It is the cause of over five million deaths each year worldwide which is expected to rise to over eight million deaths yearly by 2030. The vast majority of these deaths are projected to occur in developing countries. Nearly 0.8-0.9 million people die every year in India due to diseases related to tobacco consumption [6]. Also, tobacco use and its association with oral diseases is a major contributor to the global oral disease burden [8]. Hence the pattern of tobacco consumption as well as the form in which it is consumed in a community becomes important to plan preventive programmes. Keeping this in mind, the present study was designed to assess the association between socio-demographic variables and type of tobacco consumption among subjects attending a rural hospital in south India.

Table 2. Association between Education and the type of tobacco consumption

Education	Type of tobacco consumption			Total n (%)	X^2 Value	P-Value
	Smokeless N(%)	Smoking N(%)	Both N(%)			
No formal education	38(45.7)	47(19.7)	9(31)	94(26.9%)	35.036	0.001[*]
Less than primary	6(7.2)	19(7.9)	6(20.6)	31(8.9%)		
Primary Education	13(15.6)	38(15.9)	6(20.6)	57(16.3%)		
Secondary school	13(15.6)	61(25.6)	5(17.2)	79(22.6%)		
Higher secondary school	9(10.8)	52(21.8)	1(3.4)	62(17.7%)		
College/University completed	4(4.8)	17(7.1)	2(6.8)	23(6.6%)		
Post graduation	0	4(1.6)	0	4(1.1%)		

* Statistically significant

**Table 3. Association between Occupation and the type of tobacco consumption**

Occupation	Type of tobacco consumption			Total N(%)	X^2 Value	P-Value
	Smokeless N(%)	Smoking N(%)	Both N(%)			
Government employee	3(3.6)	10(4.2)	2(6.8)	15(4.3)	49.727	0.0001[*]
Non-Government employee	60(72.2)	129(54.2)	21(72.4)	210(60)		
Self-employed	12(14.4)	75(31.5)	4(13.7)	91(26)		
Student	0	6(2.5)	1(3.4)	7(2)		
Homemaker	7(8.4)	0	0	7(2)		
Retired	0	9(3.7)	0	9(2.6)		
Unemployed	0	3(1.2)	1(3.4)	4(1.1)		
Unable to work	1(1.2)	6(2.5)	0	7(2)		

* Statistically significant

Table 4. Association between economic status, marital status and the type of tobacco consumption

Sociodemographic factors		Type of tobacco consumption			Total N(%)	X² value	P-value
		Smokeless N(%)	Smoking N(%)	Both N(%)			
Economic Status	BPL	72(86.7)	151(63.4)	24(82.7)	247(70.57)	18.35	0.0001*
	APL	11(13.2)	87(36.5)	05(17.2)	103(29.43)		
Marital status	Married	80(96.3)	217(91.1)	29(100)	326(93.1)	4.94	0.084
	Unmarried	3(3.7)	21(8.9)	0	24(6.9)		

* Statistically significant, BPL – Below Poverty Line & APL - Above Poverty Line
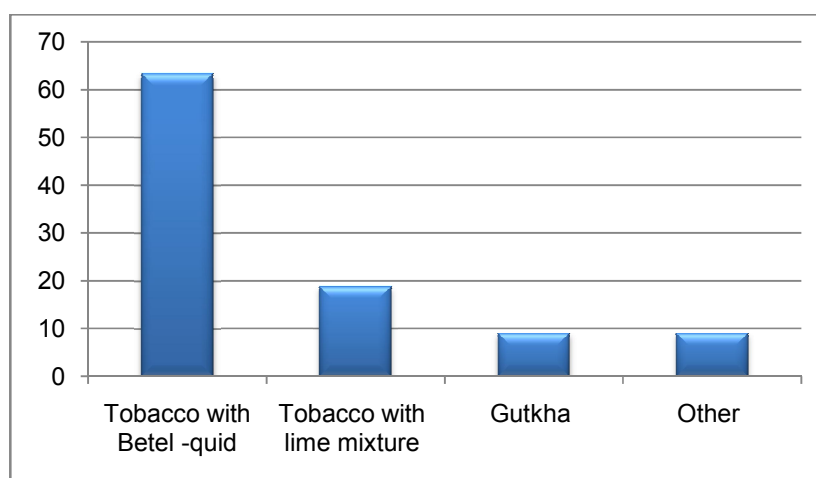
Fig. 1. Bar Diagram showing different type of smokeless tobacco consumed among the study population

In the present study, tobacco consumers were interviewed using a structured questionnaire to reduce the non-response or incomplete filling of questionnaires, to overcome problems in understanding a question, to facilitate illiterates to participate in the study and to minimize errors that might occur with a self-administered questionnaire. The interview was carried out in a private room to ensure that participants were able to concentrate on the interview and also to provide confidentiality for their probable non-desirable responses. However, social desirability cannot be completely eliminated in the responses.

The results of the study showed that males consume tobacco more frequently than females. Smoking was found to be the more common form of tobacco consumption among males (75.4%), whereas in females (91.8%) smokeless tobacco was the preferred form. Documented data from the study by Vellappally S et al. [3] showed this similar trend in the whole Indian population i.e only very few females smoke compared to the males (35% males and 3% females), but both men and women use smokeless products to

approximately the same extent. A report of the National Family Health Survey conducted in 2005-2006 showed tobacco use as being more prevalent among men than women [7] which is in accordance with the present study. A similar result was observed in Global Adult Tobacco Survey India 2009 i.e. the prevalence of both smoking and smokeless tobacco use among males is higher than among females with exceptions in Pondicherry, Tamil Nadu, Meghalaya, Tripura and Mizoram, where prevalence of smokeless tobacco is higher among females than males. A study in Aligarh, Uttar Pradesh by Dixit S et al. [6] revealed gender as a strong predictor of tobacco use. A study by Gilani SI et al. [9] in Pakistan documented that a large proportion of males smoked cigarettes and cigarette use was negligible among females, but they used other forms of tobacco (Smokeless Tobacco) [10]. Korea National Health and Nutrition Examination Survey Data (2008 to 2010) reported that the smoking prevalence was higher among men (42.3%) compared to women (5.6%) [11]. Also a study by Mushtaq N in U.S. showed that the prevalence of cigarette and smokeless tobacco

(CiST) use was higher among males (1.6%) compared to females (0.3%) [1]. The probable reason for less female smoking in India is the traditional values which do not favour smoking among women. But there is no such taboo against using smokeless tobacco. Therefore, most of the women who use tobacco use it in smokeless forms [3]. A study conducted in Chennai, also reported that chewing tobacco was more frequent among women (75.2%) compared to men (24.8%) [3].

The overall tobacco consumption was more frequent in the illiterate group i.e. 26.6% and it was least among graduates (6.6%) and postgraduates (1.1%). People in postgraduate group were mainly smokers and no one from this group consumed smokeless tobacco. According to Global Adult Tobacco Survey India, tobacco use has been inversely related to literacy levels. Among adults, tobacco use decreases sharply with education [6]. Similar results were also reported in the study conducted by Mushtaq N et al. [12]. A study conducted by Dixit S et al. [10] in Aligarh district of Uttar Pradesh showed, tobacco use was more prevalent among the individuals who are illiterate or less educated [9]. Also a similar result was observed in the study by Vellappally S et al. [3] conducted in Chennai which one revealed a higher percentage of people with higher education as non-tobacco users. This may be reasoned by the fact that with increasing literacy people are better informed and become aware regarding ill effects of tobacco. Hence as the education level increases there is a decrease in the consumption of tobacco.

With respect to occupation, it was observed that non-government employees are most commonly involved in tobacco consumption compared to other occupational groups. Among occupation groups, tobacco consumption was lowest among students and homemakers. In accordance to the present study, GATs also showed that in all occupational categories, tobacco use was less frequent in students as most of the students belong to the younger age group. The study also showed that tobacco use was highest among self-employed people [6]. A study in U.S. by Mushtaq N et al. [12] showed that who were out of work, students, or persons unable to work had increased likelihood of CiST use, but self employed, retired, and homemaker had decreased odds of CiST use.

In addition, subjects categorized as below poverty line were found to indulge more into different types of tobacco consumption habits compared to people above poverty line. A study by Vellappally S et al. [3] showed that tobacco consumption is often found to be disproportionately higher among lower socioeconomic groups. Also a study conducted by Dixit S et al. [10] in Aligarh district of Uttar Pradesh showed that tobacco use is significantly associated with low socioeconomic strata [9]. This might be because people of lower socioeconomic strata consider tobacco as a tool to cope with boredom, relieve stress and as a companion to alcohol and caffeine.
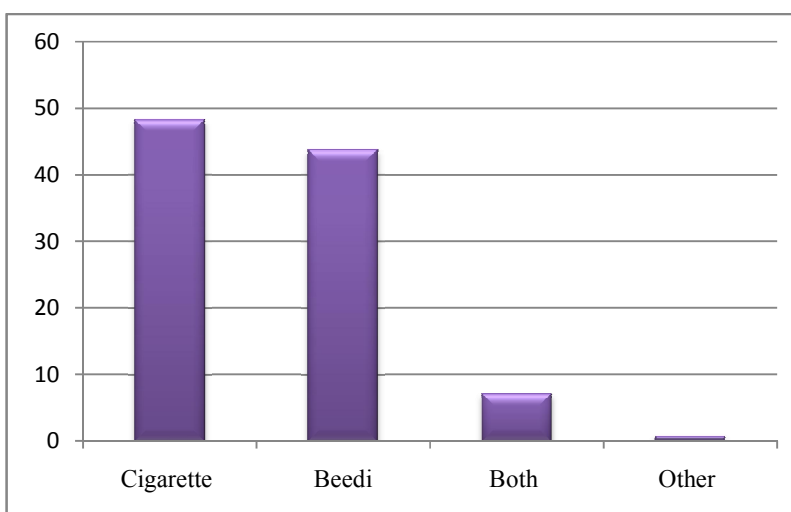

Fig. 2. Bar diagram showing different type of smoking tobacco consumed among the study population

Although married people showed high prevalence of tobacco consumption (93.1%), there was no significant association between marital status and type of tobacco consumption. This was in contrast to a study by Dixit S et al. [10] which reported significant relationship between marital status and smoking and nonsmoking tobacco [9]. Makwana et al. also showed significant association between marital status and tobacco consumption [13].

The inquiry into type of tobacco consumption revealed that among smokeless tobacco consumers, tobacco with betel-quid is most commonly consumed (63.3%) followed by tobacco lime mixture, gutkha and other forms of tobacco such as tobacco snuff. A GATs India survey showed, khaini or tobacco-lime mixture (12%) as the most commonly used smokeless tobacco product, followed by gutkha, a mixture of tobacco, lime and areca nut (8%), betel quid with tobacco (6%) and applying tobacco as dentifrice (5%). Among smokers, cigarette (48.3%) was the most commonly used type followed by beedi (43.8%). Seven percent of the participants used both. In GATs India survey, the most common smoked form of tobacco consumed was beedi (9%), followed by cigarette (6%) and hookah (1%) [6]. The study by Dixit S et al. reported that smoked tobacco was used most commonly in the form of beedi, cigarette and hookah. Gutkha, khaini and chunna were major forms of non smoked tobacco [9].

The present survey findings are limited to a population visiting a rural hospital in south India. Hence, the findings cannot be generalized to whole Indian population. Therefore, further nationwide surveys should be conducted to assess the association between socio-demographic factors and types of tobacco consumption. Some previous studies have reported significant relationship between type of tobacco use and certain tobacco use characteristics, such as age at smoking initiation, number of days (per month) of tobacco use, and quantity used per day and alcohol consumption. However, not all these information could be elicited in the present study. So, further studies are necessary.

5. CONCLUSION

Within the limits of this study, socio-demographic factors such as age, gender, employment status, educational attainment and economic status showed an association with type of tobacco consumed. Such information might be helpful in targeting these risk groups and reducing the burden of disease in the community.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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