

Original Article

Knowledge and attitude of South-Indian smokers towards smoking associated health risk

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Abstract

Aim: To assess the knowledge and attitude of South-Indian smokers towards health effects of smoking and their intentions to quit.

Study design: A cross sectional questionnaire based survey was conducted among 550 smokers hailing from South India who reported to the out-patient department of the dental hospital.

Results: Highest incidence of smoking in men was seen in those who received moderate level of education and those residing in rural areas. In female smokers, the highest incidence was seen in those residing in urban areas (53.8%) with a high level of education (38.4%). We found that males continued their habit mainly to destress while females used it to socialize. Majority of the participants were aware that smoking causes a host of problems in the oral cavity and 68.18% were aware that passive smoking was injurious to the body. Most of the responders admitted to having observed warnings on tobacco products and were willing to quit the habit with help from their dentists.

Conclusion: Smokers are at risk for various diseases that include the cardiovascular, respiratory and reproductive systems as well as the oral cavity. This study sheds light on the level of awareness among current tobacco users and the areas of deficiency in patient education which should be addressed by clinicians.

Introduction

Tobacco is considered to be one of the major risk factors for oral cancer, oral cancer recurrence, dental caries, periodontal diseases and cleft lip and palate. Tobacco use is primarily due to nicotine, a tobacco alkaloid that contains a cyclic nitrogenous nucleus. This component of tobacco exerts a psychopharmacological effect which causes a need for repeated use.¹ Cigarette smokers have two to three times greater risk of developing oral cancer when compared to non-smokers. Although the risk decreases after abstinence, it takes several years for it to reach the levels seen in non-smokers.² In the Indian peninsula, tobacco smoking causes 50% of all of the cancers in males and 25% of all of the cancers in the female population.³

For over four centuries, smoking has been seen to be one of the most compelling addictions prevailing in the society. It affects numerous organs in the body and causes a number

of tobacco-related diseases, with the respiratory tract and cardiovascular system being the most commonly affected. Many of its effects occur due to secondary consequences of continuous exposure to the chemical constituents of tobacco smoke. This causes various inflammatory reactions which affect the immune system. In addition to this, smokers are predisposed to respiratory diseases as a consequence of allergy and have an increased vulnerability to infections.⁴ Burning of cigarettes produces nearly six thousand by-products which include metals, tobacco glycol proteins and polycyclic aromatic hydrocarbons, many of which are known to be mutagenic, carcinogenic or antigenic.⁵

As the heated air caused by burning tobacco is inhaled, it passes through the unburned tobacco dissolving its constituents on the way. When this heated air cools, the dissolved components condense to form smoke particles

which are then inhaled. The aerosol thus produced contains particles in the micron range which permits effective penetration in the lungs and rapid absorption into systemic blood.⁵ Oral cavity is the first to come across the various chemicals that are present in tobacco smoke. High concentrations of noxious compounds in cigarette smoke explain the prevalence of caries, periodontal disease and malignancies in the oral cavity of smokers. Cigarette smoke contains powerful oxidants like volatile aldehydes and oxygen free radicals which can cause serious damage to enzymes and proteins which leads to a host of physiologic problems.⁶ The present questionnaire survey was undertaken with the intention to gain information on the knowledge and attitude of smokers towards tobacco associated health risk as well as to assess their intentions to quit.

Materials and Methods

A cross-sectional survey was conducted among 550 smokers who reported to the out-patient department of the dental hospital. The target population included adult smokers from South-India who were over 18 years of age and who admitted to smoking at least one tobacco product per day since the last one year. Informed consent was obtained from the participants of the survey. Data was collected through face-to-face interview technique.

Demographic data such as age, sex, education and area of residence were included in the analysis. Age was divided into four categories as <20 years, 21-40 years, 41-60 years and >60 years. The participant's highest level of education was recorded and categorized into low (illiterate or primary), moderate (middle or secondary) and high (graduate and post-graduate) according to Sansone *et al.*⁷ Area of residence was categorised into rural, semi-urban and urban based on the address provided by the responders.

All participants were asked a series of questions regarding their knowledge and attitude towards smoking of various tobacco products; specifically if smoking caused the following health outcomes: stained teeth, tooth decay, bad breath, change in taste, gum problems, cardiac diseases,

reproductive problems and cancers of the lung and oral cavity. Their reason for continuing the habit was assessed and categorized into: socialising, increasing focus or to relax or destress. They were also assessed on their knowledge of the addictive properties of tobacco, adverse effects of passive smoking and the ill-effects of smoking during pregnancy. Participants were asked if they were aware of the ban on smoking in public places and if they have noticed the warning labels and pictures on the packaging around tobacco products. Their willingness towards quitting the habit was assessed by asking if they would expect their dentist to provide information regarding the effects of tobacco and if they expected the dentist's help during the period of quitting. All responses were coded as 'yes', 'no' and 'can't comment'.

Results

The socio-demographic details of the participants showed that the highest percentage of male smokers was in the 41-60 years age group (50.1%) while in females the highest incidence was in the 21-40 years age group (69.2%) (Table 1, Figure 1). Highest incidence of smoking in men was seen in those who received moderate level of education (36.4%) while in women it was seen in those who received high level of education (38.4%) (Table 1, Figure 1). Males residing in rural areas were found to have the highest incidence of smoking (51.7%) while women in urban areas showed the highest incidence (53.8%) (Table 1, Figure 1). 53.8% of males smoked 5-10 tobacco products per day while 80.7% of women smoked less than 5 tobacco products per day (Table 1, Figure 1).

Highest number of male smokers (52.2%) admitted to continuing their smoking habit to relax or destress while women (80.7%) said they mainly smoked in order to socialise (Table 2, Figure 2). Majority of smokers agreed that smoking caused bad breath (86.5%), change in taste (71.4%) and stains on the teeth (72%). However a bulk of the study population did not believe that the habit would lead to tooth decay (55.8%) (Table 3, Figure 3). Males were aware of health problems such as gum disease (52.8%), heart disease (69.4%), lung cancer (93.1%) and oral cancer

(65.07%). Female respondents were aware of smoking leading to heart disease (65.3%), lung cancer (100%) and oral cancer (73.07%). However the responders were not aware of the effect of smoking on reproductive health (76.3%) (Table 4, Figure 4). All participants were aware that smoking was addictive and a majority believed that smoking during pregnancy can have adverse effects on the baby (72%) and that passive smoking was also injurious to the body (68.18%) (Table.5)

All female smokers and 92.7% of males were aware of the ban on smoking in public places and all admitted to having observed the warning labels on these products (Table 6). Majority of the participants were in agreement that the dentist should be able to explain (71.45%), help and guide them towards quitting (82.18%) and that they believed that they could quit with the help of a dentist (75.09%) (Table 7, Figure 5).

Figure 1: Graph showing socio-demographic details of the study population.

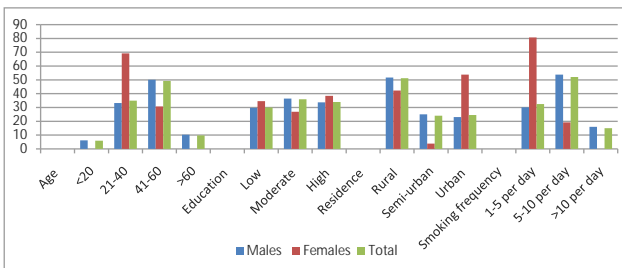


Table 1 : showing socio-demographic details of participants.

	Males (%)	Females (%)	Total (%)
Age			
<20	6.2	0	6
21-40	33.2	69.2	34.9
41-60	50.1	30.7	49.2
>60	10.3	0	9.8
Education			
Low	29.7	34.6	30
Moderate	36.4	26.9	36
High	33.7	38.4	34
Residence			
Rural	51.7	42.3	51.2
Semi-urban	25.1	3.8	24.1
Urban	23	53.8	24.5
Smoking frequency			
1-5 per day	30.1	80.7	32.5
5-10 per day	53.8	19.2	52.1
>10 per day	16	0	15

Figure 2 : Graph showing reasons for continuation of the habit.

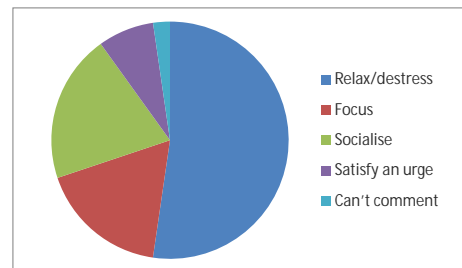


Table 2 : showing reason for continuing the habit

	Relax/distress (%)	Focus (%)	Socialise (%)	Satisfy an urge (%)	Can't comment (%)
Males	52.29	17.55	20.22	7.63	2.29
Females	19.23	0	80.76	0	0
Total	50.72	16.72	23.09	7.27	2.18

Table 3 : Showing knowledge of smokers towards health effects.

	Bad breath			stains			decay			Change in taste		
	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)
Yes	87.21	73.07	86.54	71.54	80.76	72	15.45	0	14.72	70.41	92.30	71.45
No	8.39	0	8	18.7	11.53	18.36	55.15	69.23	55.81	29.58	7.69	28.54
Can't comment	4.3	26.92	5.45	9.73	7.69	9.63	29.38	30.76	29.45	0	0	0

Figure 3 : Graph showing awareness regarding various health effects of smoking

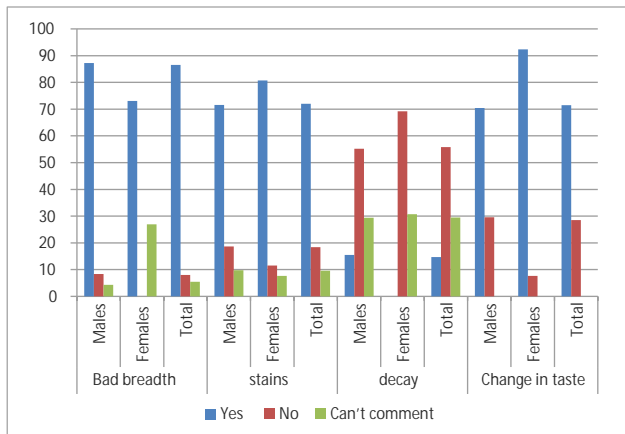


Figure 4 : Graph showing knowledge of smokers regarding ill-effects of smoking.

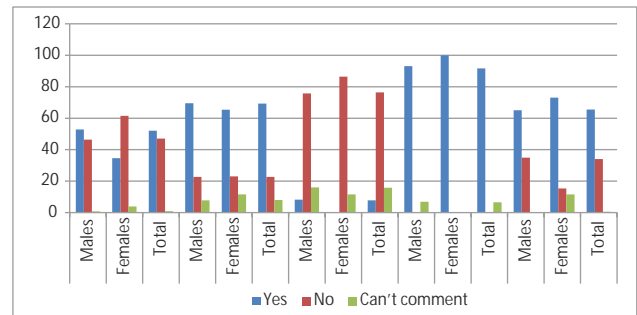


Table 4 : Showing knowledge of smokers regarding health problems caused by smoking.

	Gum disease			Heart disease			Reproductive problems			Lung cancer			Oral cancer		
	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)
Yes	52.86	34.61	52	69.46	65.38	69.27	8.2	0	7.81	93.12	100	91.63	65.07	73.07	65.45
No	46.37	61.53	47.09	22.70	23.07	22.72	75.76	86.46	76.36	0	0	0	34.92	15.38	34
Can't comment	0.76	3.84	0.9	7.82	11.53	8	16.03	11.53	15.81	6.87	0	6.54	0	11.53	0.54

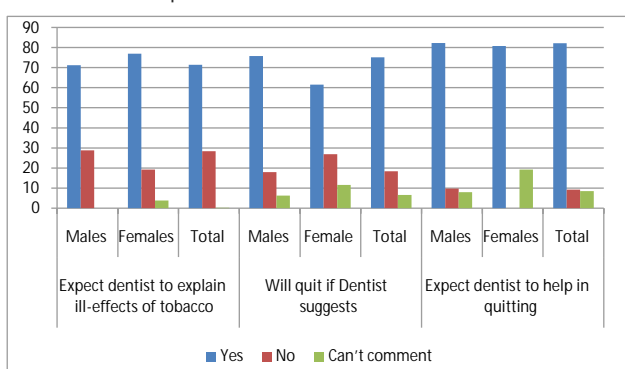
Table 5 : Showing awareness of ill-effects of smoking.

	Addictive property of tobacco			Tobacco is harmful during pregnancy			Passive smoking is injurious		
	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)
Yes	100	100	100	71.94	73.07	72	47.17	86.46	68.18
No	0	0	0	3.05	0	2.9	17.74	0	16.9
Can't comment	0	0	0	25	26.92	25.09	15.07	11.53	14.9

Table 6 : Showing awareness of ban and warning on tobacco products.

	Aware about ban of smoking in public places			Noticed warning labels on tobacco products		
	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)
Yes	92.74	100	93.09	100	100	100
No	7.25	0	6.9	0	0	0
Can't comment	0	0	0	0	0	0

Figure 5: Graph showing attitude of smokers towards quitting with dentist's help.



Discussion

Evidence of the daunting mortality concerns of smoking is well known. Smoking is an essential risk factor for a variety of pathologies. Pro-inflammatory effects of tobacco smoke include increased free radical burden, elevated neutrophil count and elevated circulatory T cells and CD4 activity. Tobacco smoke is also seen to be associated with immunosuppressive actions such as reduced interferon response, reduced antigen presenting activity, reduced circulating immunoglobulins, reduced T cell activity, reduced neutrophil activity and inhibition of inflammatory

Table 7 : Showing attitude of smokers towards the role of dentist in quitting of the habit

	Expect dentist to explain ill-effects of tobacco			Will quit if Dentist suggests			Expect dentist to help in quitting		
	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)	Males (%)	Females (%)	Total (%)
Yes	71.18	76.92	71.45	75.76	61.53	75.09	82.25	80.76	82.18
No	28.81	19.23	28.36	17.93	26.92	18.36	9.73	0	9.27
Can't comment	0	3.84	0.18	6.29	11.53	6.54	8.01	19.23	8.54

cytokines.⁵ Rani *et al* found that the incidence of smoking was higher in the poorer, rural and uneducated masses in both men and women in comparison with wealthier, urban and better educated population. These socioeconomic gradients were found to be steeper for females when compared to males. Higher probability of tobacco products was seen in the older population (>25 years) when compared with the younger population (15–24 years).⁸ In the present study we found that the incidence was higher in men of 41-60 year age group while women in the 21-40 year age group had a higher incidence. Men residing in the rural areas and with moderate level of education were found to have a higher incidence while for women it was those in an urban setting with high level of education.

Formidable evidence suggests that development of asthma and an increase in the severity of its symptoms are due to active smoking among adolescents and adults. Strachan *et al* found a dose response relationship between exposure to tobacco and development of asthma.⁹ the tars produced by tobacco combustion contain irritants like acroline and formaldehyde which are responsible for chronic bronchitis and emphysema. Smoking is a known cause of chronic obstructive pulmonary disease (COPD) and it was seen that 80% of the deaths of people below the age of 40 is related to smoking.¹⁰ There exists a dose-response relationship between smoking and cancer of the lung. The mortality rate of lung cancer is 23% more for males and 13% more for females who smoke more than 20 cigarettes per day in comparison with non-smokers. The risk for light smokers although lower, is still substantial.¹¹ In the present study we found that all female smokers and 93% of male smokers were aware that smoking could cause cancer of the lung.

Smoking is one of the key risk factors for atherosclerosis. The mechanism of smoking induced damage to the endothelium is not yet recognized but it can be attributed to the fact that smoking increases interactions between the platelet and vessel wall or the inverse relationship between smoking and high density cholesterol in the plasma.¹¹ Smoking causes a host of cardiovascular diseases ranging from peripheral vascular diseases to coronary heart disease and stroke. The risk of heart attack increases by a factor of two in a smoker when compared to a non-smoker and it takes a period of 6 months of abstinence from smoking for the risk to equal that of a non-smoker.¹² We found that only 69.2% of the smokers were aware of the adverse effects of smoking on the heart. Many epidemiologic studies have documented the effects of passive smoking in the development of coronary heart disease. Evidence suggests that passive smoking contributes to atherosclerosis by sensitizing and activating the neutrophils and causing tissue damage through oxidant mediated reactions.¹³ We found that 68.1% of the respondents were aware of the ill-effects of passive smoking on general health.

Sham *et al* identified various lesions in the oral cavity associated with tobacco use such as smokeless tobacco keratosis, erythroplakia, leukoplakia, oral cancer, halitosis, root caries, taste derangement, periodontal diseases, staining of teeth and restorations and peri-implantitis which they attributed to the carcinogens emitted from burning tobacco. It is also thought to arise from pH change, increased intra-oral temperature, alteration of immune response or altered resistance to infections. Proof for this theory exists in the fact that most of these conditions can be reversed after cessation of tobacco use.¹⁴ In the present study population a majority of the responders were aware

that smoking causes bad breath, staining of teeth, change in taste, gum disease and cancer of the oral cavity. However they were not aware the smoking could lead to tooth decay.

It was seen that 76.3% of the participants were not aware that smoking could cause problems of the reproductive system. However 72% agreed that smoking during pregnancy could harm the baby. Carbon monoxide and nicotine found in tobacco smoke is known to cause foetal hypoxia and retard growth of the foetus resulting in low birth weight. Passive smoke inhalation during infancy causes retardation of the growth of the child leading to decreased height and head circumference.¹⁵

Recognition by the International Classification of Diseases of 'tobacco dependence' as a disease has made it imperative that the medical personnel take serious note of this disease. Although all health professionals have a role to play in the reduction of tobacco use, the role of dentists is unique as they interact with the patients more frequently. Therefore, dentists have multiple occasions where they can educate tobacco users and help them in quitting of the habit. This makes the dental office an ideal setting for education, motivation, assessment, screening and follow-up.¹⁶ In the present survey population, all of the participants were in agreement that smoking was addictive. 71.4% said that they expected their dentists to explain about the ill-effects of smoking. 75.6% of the male responders and 61.5% of the female responders showed an inclination towards quitting and 82.1% said that dentists should assist them during their quitting phase.

Tobacco cessation practices are aimed at primary; secondary and tertiary levels.¹⁷ Primary prevention aims to limit the individual's exposure to causative agents and reduces their vulnerability to such agents.¹⁸ this could be done at policy level, community level and level of the individual. Government of India introduced the Cigarette Act in 1975 which necessitates the inclusion of strong and rotatory warnings on tobacco products in regional languages, ban of advertisement of tobacco products in mass media, ban on smoking in public places, tobacco

awareness programs in institutions and mass media and efforts to persuade farmers to cultivate alternative crops.¹⁷ All of the responders in the present survey agreed to having observed the warning on the labels of tobacco products and 93% were aware of the ban on smoking in public places. Secondary prevention mainly aims at early diagnosis and prompt treatment to prevent further progression. Tertiary care aims predominantly at surgically removing the tumour mass along with chemotherapy and radiotherapy followed by palliative care and post-operative follow-up to reduce morbidity.¹⁹

Cessation of smoking can be achieved either pharmacologically or through behaviour management. Pharmacological methods of cessation are frequently obtained as over the counter (OTC) medications. These are recommended for general population and high risk groups including adolescents, pregnant and breast feeding women and those suffering from cardiovascular disease.²⁰ Pharmacological approach includes two general strategies: nicotine replacement therapy (NRT) and bupropion therapy. NRT includes the use of lozenges, sublingual tablets, inhalers, nasal spray, transdermal patch and nicotine gum.^{14,20} The rate of cessation is seen to improve by 70% when measured at the end of the year.²⁰

Nicotine gums are available as a 2-4 mg preparation and transdermal patch which is worn for 24 hours provides a daily dose of 7-22 mg of nicotine which is comparable to the trough levels in the plasma of a heavy smoker. To increase compliance, a combination of gum with patch or nasal spray along with a prescription of anti-depressants or anxiolytics may be given. The combination of bupropion with NRT has the highest success in smoking cessation.^{20,21,22} However, adverse effects such as gastrointestinal disturbances and hiccoughs with gums; nasal irritation and irritation of the throat with nasal spray; burning sensation in the mouth, sore throat, hiccoughs, oral ulcers and cough with sublingual tablets should be kept in mind while prescribing NRT. NRT is also known to cause chest pain, heart palpitations, rise in blood pressure and heart rate and constriction of coronary vessels. However, since

cardiovascular effects of pharmacologic therapy will probably be less when compared to that caused due to smoking, patients should be encouraged to continue with their cessation efforts.^{20,23,24}

In the present study, 52.2% of the male responders stated the reason for their habit was to relax or destress. While 17.5% of men smoked in order to improve their focus, 7.6% said they smoked to satisfy an urge. However women denied these as being their reasons to continue their habit. 80.7% of women stated that they smoked to socialize. Similarly Sarason *et al* reported that among adolescents, females started the habit due to social pressure while both males and females continued the habit for the pleasure derived from smoking.²⁵ A study conducted by Khurshid *et al* stated that the main reason for smoking among teenagers was to cope with stress, to be socially acceptable

and since they liked the taste and feel.²⁶ To the best of our knowledge this study is the first of its kind to evaluate the reasons behind smoking among adults in India. This data will help in structuring tobacco cessation protocol to better suit this demographic and thereby improve the rates of quitting and compliance to cessation efforts.

Conclusion

Patient education, oral screening and preventive measures have always been integral parts of dental healthcare set-ups which makes it easy to administer tobacco counselling. Such clinical settings are increasingly gaining popularity for tobacco cessation counselling as patients are found to be more receptive to advice. This study sheds light on the level of awareness among current tobacco users and the areas of deficiency in patient education which should be addressed by the clinicians.

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