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## Research Article

# Knowledge and Awareness of Dental Patients Regarding Adverse Effects of Smoking on Periodontal Health

### Abstract

**Background:** Smoking is considered as a global epidemic. Its adverse effects are well known which ranges from staining of teeth to life threatening diseases such as cancer. Smoking also has serious consequences on periodontal health and even affects periodontal treatment outcomes. Though awareness among people has increased about the ill-effects of smoking, less is known about its side effects on periodontium.

**Materials and methods:** A questionnaire study was performed in which total 304 dental patients participated. The questionnaire consisted of 22 questions, which was made in two languages, English and Hindi. Data was collected and analysed using SPSS version 18.0.

**Results:** Out of 304, 149 were smokers and most of them (64.43%) were of the age group 25-50 years. Majority of the respondents (92.11%) were aware of the harmful effects of smoking on general health, however only 42.11% (26.17% smokers and 57.42% non-smokers) were familiar with its effects on periodontal health. It was also seen that several smokers (64.08%) wanted to quit the habit but could not do so.

**Conclusion:** Smokers have significantly less awareness about the adverse effects of smoking on oral and periodontal health as compared to non-smokers. Many efforts are required to increase the awareness, where health professionals including dental, medical and allied health professionals should encourage smokers to quit the habit. 4 I have also been proposed to assist smokers to quit the habit.

## Introduction

Tobacco, both in smoked and smokeless form is considered as a global epidemic [1], which is one of the most common causes of deaths all over the world [2]. Smoked forms include cigarette or bidi (rolled tendu leaves), cigar, chillum, hookah while smokeless forms are khaini, gutka, zarda, gul, gudaku, tuibur [3-6].

Adverse effects of smoking are well documented and established that affect various organs and parts of the body causing lung cancer, bronchitis, premature birth, cardiovascular diseases [7-11]. The oral and dental problems include staining or discoloration of teeth, oral mucosal lesions such as leukoplakia, oral submucous fibrosis and smokers palate, acute necrotizing ulcerative gingivitis, delayed and impaired wound healing, periodontal diseases, bone loss, mobility of teeth, failure of dental implants to life threatening diseases such as oral cancer [7-10,12-14] However, electro-pulsing treatment can be used in implant dentistry for achieving better results [15,16].

Various studies have been conducted all over the world about knowledge and awareness of ill-effects of smoking on general and oral health. However, not many studies have been conducted in which awareness regarding harmful effects of smoking on periodontal health has been estimated. Few studies which have been conducted in the past found that patients are less aware about the adverse effects of smoking on periodontal health [14,17-20].

Thus, the aim of the present study was to assess awareness and knowledge of dental patients about effects of smoking on periodontal

health, and using the findings of the study, motivating the patients to quit the habit.

## Materials and Methods

A cross-sectional questionnaire-based survey was conducted during the month of February, 2014. Patients were randomly selected from Out Patient Department (OPD) of Periodontology of People's College of Dental Sciences and Research Centre, Bhopal. Ethical clearance was obtained from ethical committee of People's College of Dental Sciences and Research Centre, Bhopal. Informed consent from each patient was taken. The study consisted of a total of 304 patients which included 149 smokers and 155 non-smokers.

The study questionnaire consisted of total 22 questions which was made in 2 languages, i.e. English and Hindi for the convenience of the patients. The questionnaire included socio-demographic variables which included gender, marital status, age and educational level. These were followed by questions related to knowledge and awareness regarding the effects of smoking on general and periodontal health. Patients were even asked if they wanted to quit the habit, reasons for the same and methods that may assist to quit the habit.

Data was analysed using statistical package for social sciences version 18.0. Frequency of smoking and reasons for smoking were calculated in terms of percentage. Differences in knowledge and awareness between smokers and non-smokers were assessed using Chi-square test.

## Results

### Sample characteristics and prevalence of smoking

Out of the 304 patients, 217 (71.38%) were males and 87 (28.62%) were females. Total number of self-reported smokers included 149 (49.01%), out of which 68.66% of total males who participated in the study were smokers and 31.34% were non-smokers, while none of the females smoked (Table 1).

The highest rates of smokers (64.43%) were among 25-50 years of age group. The other socio-demographic like marital status, age group and literacy level are reported in Table 1.

### Literacy level and smoking

Table 2 shows that smoking is more popular among those who have graduated in any field (36.91%) followed by people who have attained education till higher secondary (27.52%). Analysis in terms of type of smoking shows that cigarette smoking is more common in the graduates (47.83%) and negligible among illiterates (0%). On the other hand, bidi smoking was found to be more common among high school group (52.94%) and nonexistent among post graduates (0%). Similarly, use of both bidi and cigarettes was more prevalent in people who attained education till high school (64.71%).

### Reasons for starting smoking

It has been observed that most of the people started smoking mainly due to peer pressure or because of friends, followed by stress. Few gave other reasons such as status symbol, pain in teeth and liking (Figure 1). The results demonstrate that friend circle was the main reason for starting smoking in the age group <25 years, while stress was the chief reason in the 25-50 years of age group (Table 3).

### Attitudes, awareness and knowledge

Most of the respondents (both smokers and non-smokers) were aware that smoking is not good for general health, while non-smokers were much more aware than smokers that smoking is not good for oral and dental health ( $p < 0.05$ ) (Table 4).

Non-smokers had more knowledge than smokers regarding effect of smoking on healing after periodontal surgery ( $p < 0.05$ ). However, both smokers and non-smokers did not have knowledge about the reversibility of side effects of smoking after cessation (Table 4).

Figure 2 illustrates the perception of effect of smoking on oral health. Both smokers and non-smokers believed that smoking mainly causes oral cancer (73.36%), staining of teeth (60.86%) and decayed teeth (42.43%). However, less number of patients were aware of the other adverse effects such as halitosis (36.51%), mouth ulcers (27.96%), and decreased mouth opening (0.66%).

## Discussion

Smoking is on the rise in the developing world, but falling in developed nations [21]. Use of tobacco and, knowledge and awareness of populations regarding its use has been evaluated in the past. About 15 billion cigarettes are sold daily or 10 million every minute [7]. National Household Survey of the drug and alcohol abuse

in India 2002 has quoted that prevalence of tobacco use among 12-18 years old as 55.8%. [22] According to the World Health Organization (WHO), it is estimated that tobacco use will be responsible for 13.3% of all the deaths in India by the year 2020 [6].

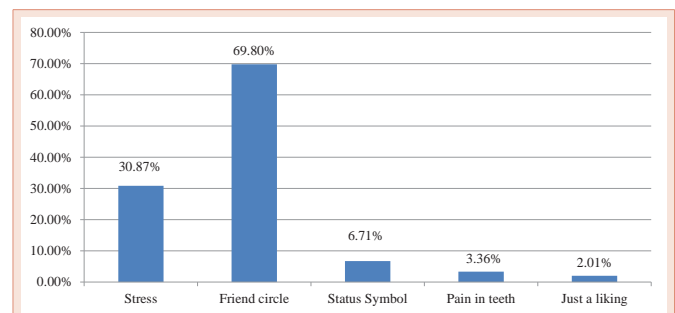
The majority of the participants in the study were males (71.38%). Among these, 49.01% smoked, while none of the females (28.62%) smoked. This may be either due to the social image that females do not smoke or they do not reveal about it. Among males, increased prevalence of smoking was found in married subjects, which may be due to increased occupational stress [2], even though it cannot be attributed as the sole reason for smoking.

**Table 1:** Socio-demographic variables of study patients.

Variable	Total (n=304) n (%)	Smokers (n=149) n (%)	Non-smokers (n=155) n (%)
<b>Gender</b>			
Male	217 (71.38)	149 (100)	68 (43.87)
Female	87 (28.62)	0 (0)	87 (56.13)
<b>Marital status</b>			
Married	214 (70.39)	108 (72.48)	106 (68.39)
Unmarried	90 (29.61)	41 (27.52)	49 (31.61)
<b>Age group</b>			
<25 years	87 (28.62)	40 (26.85)	47 (30.32)
25-50 years	193 (63.49)	96 (64.43)	97 (62.58)
>50 years	24 (7.89)	13 (8.72)	11 (7.10)
<b>Literacy level</b>			
Illiterate	7 (2.30)	1 (0.67)	6 (3.87)
High school	55 (18.09)	32 (21.48)	23 (14.84)
Higher secondary	88 (28.95)	41 (27.52)	47 (30.32)
Graduation	114 (37.5)	55 (36.91)	59 (38.06)
Post-graduation	40 (13.16)	20 (13.42)	20 (12.90)

**Table 2:** Literacy level and smoking status.

Literacy level	No. of smokers (n=149)	Only Cigarette (n= 115)	Only Bidi (n= 17)	Both Cigarette and Bidi (n=17)
Illiterate	1	0	1	0
High school	32	12	9	11
Higher secondary	41	28	7	6
Graduation	55	55	0	0
Post-graduation	20	20	0	0



**Figure 1:** Reasons for starting smoking among smokers.

Most of the smokers are under the age group of 25-50 years. Youth is the age where expectations from self and others create pressure on the individual, where they consider smoking is an easy way out of releasing the stress. This is in accordance with the findings in the Table 3, where it can be seen that stress is the most common reason for starting smoking. As the age advances, people quit smoking either due to respiratory diseases and various other health hazards caused due to smoking, and increase in awareness about its harmful effects.

In this study, smoking was found higher in illiterate people as well as those who have attained graduation. Bidi is found to be common

in people with low literacy level. This may be also related to low socio-economic status as literacy has an impact on economic status. Cigarette smoking is found to be popular among people who have attained graduation. It might be because of the easy affordability of cigarettes by the people with higher education and thus better socio-economic status. Moreover, it is known that cigarette is less harmful than bidi due to lesser nicotine content as well as presence of filter which hinders direct entry of smoke in lungs [23].

In this study it has been found that friend circle (69.80%) influences the most followed by stress (30.87%), status symbol (6.71%) and pain in teeth (3.36%). The result is similar to the research done by Prasanth YM and Bhat M in 2014 [24]. It was also seen that people below 25 years of age were influenced most by peer group and initiated smoking, while people in the age group of 25-50 years started smoking due to stress.

Smoking plays a significant role in the development of refractory periodontitis. Smokers have poorer success rate with periodontal treatments including scaling, curettage and even after periodontal surgeries [9]. Varsha Rathod in 2010 reported that increase in gingival inflammation, calculus formation is associated with individuals in the age group of 20-35 years, and moderate pocket formation is seen in individuals in age group of 36-55yrs of age [22]. In this study, awareness on the topic of healing after periodontal surgery and reversibility of the side effects of smoking after cessation is found to be more in non-smokers as compared to smokers.

Reduced gingival bleeding in smokers may be attributed to vasoconstriction caused due to nicotine, and increased gingival keratinization [7]. Increase in probing pocket depth is due to alveolar bone loss [13]. Smoking is a known risk factor for the development of early onset periodontitis, and smokers have poor prognosis or negative impact on periodontal treatment [14]. It also causes alteration in neutrophil functions such as chemotaxis and phagocytosis [25].

The majority of subjects in this study were aware that smoking causes oral cancer (73.36%), tooth staining (60.86%), decayed teeth (42.43%), and halitosis (36.51%). Due to advertisements, audio-visual aids and print media, increase in awareness about oral cancer has been seen over the years [14]. However, the other diseases and conditions like alveolar bone loss (17.76%), periodontal diseases (30.59%), oral ulcers (27.96%) caused by smoking are not known to many people.

It was also seen that quite a lot of the smokers (64.08%) wanted to quit the habit but were not able to do so. Health institutions, both dental and medical, and their staff play an important role in supporting the people who wish to quit tobacco. It is recommended that 4 I approach may be adopted to help people quit smoking, where:

**Identify:** the habit by asking

**Interpret:** Interpret or understand the reason behind smoking

**Illustrate:** Illustrate or explain the harmful effects of smoking through posters, videos, photographs, pamphlets, etc.

**Incite:** Incite or encourage and motivate to quit the habit at frequent intervals.

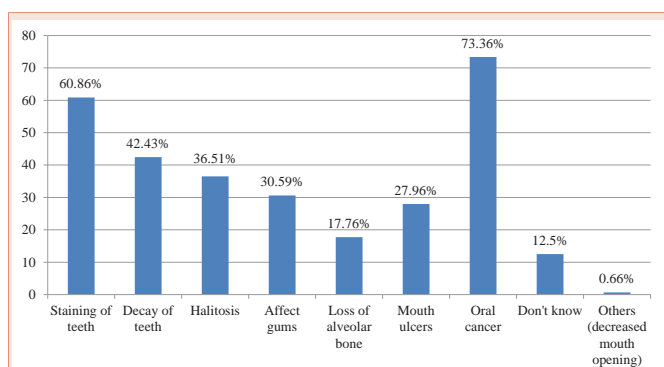
Apart from the general and oral side effects of smoking, people

**Table 3:** Number of smokers with reasons for initiating the habit.

Reason n (%)	<25 years n (%)	25-50 years n (%)	>50 years n (%)
Stress 46 (30.87)	1 (2.17)	36 (78.26)	9 (19.57)
Friend circle 104 (69.80)	39 (37.5)	61 (58.65)	4 (3.85)
Status symbol 10 (6.71)	3 (30)	6 (60)	1 (10)
Pain in teeth 5 (3.36)	1 (20)	3 (60)	1 (20)
Just a liking 3(2.01)	1 (33.33)	2 (66.67)	0 (0)

**Table 4:** Awareness and knowledge between smokers and non-smokers.

Variable	Smokers (n= 149)	Non-smokers (n=155)	$\chi^2$	p-value
<b>Awareness</b>				
Smoking is not good				
Smoking is not good for general health	145 (97.32%)	150 (96.77%)	0.07	0.78
Smoking is not good for oral & dental health	133 (89.26%)	147 (94.84%)	3.25	0.07
	116 (77.85%)	147 (94.84%)	18.787	0.0001
<b>Knowledge</b>				
Smoking affects healing after periodontal surgery	39 (26.17%)	89 (57.42%)	30.425	0.00
Reversibility of the side effects of smoking after its cessation	67 (44.97%)	75 (48.39%)	0.357	0.55



**Figure 2:** Perception of effect of smoking on oral health.

should also be made aware of the adverse effects of smoking on periodontal health as well as its effects on the periodontal treatments.

## Conclusion

Within the limitations of this study, the results of this study show that smokers have significantly less awareness about the adverse effects of smoking on oral and periodontal health as compared to non-smokers. More studies need to be conducted with larger sample size covering more geographical areas, relation between smoking and socioeconomic status for better understanding on the subject.

Dental health professionals, along with medical and other allied professionals play a key role in educating and informing patients about the risks of tobacco consumption and also supporting smokers in the cessation of the habit. 4 I that have been proposed in this study can be implemented for helping smokers quit the habit. A proper training and education may be the most efficient method in increasing the awareness against smoking among dental patients and the population in general.

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