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Awareness About The Effects Of Smoking On Periodontal Health – A Cross Sectional Study

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Abstract

Introduction: Smoking is a well-established and prominent risk factor for a multitude of systemic diseases, including lung carcinoma, chronic respiratory illness, and cardiovascular pathologies. Smoking is a long standing risk factor associated with an increased susceptibility to developing periodontitis The study aimed to investigate the awareness of the link between smoking and periodontal disease among the population seeking periodontal treatment.

Materials and methods: A total of 250 individuals comprising of equal number of smokers and non-smokers participated in this survey. The questionnaire consists of 20 questions constructed on knowledge about smoking on periodontal disease.125 each of smokers and non-smokers were asked to fill the questionnaire to evaluate their understanding of the impact of smoking on periodontal disease.

Results: The present study found that 94.4%(n=236) of respondent were aware of the link between smoking and increased risk of oral cancer. 6% of the study respondents were unaware that smoking could cause oral cancer despite the high prevalence of oral cancer worldwide. Moreover, 10%of the respondents were not aware that smoking could potentially affect periodontal disease.

Conclusion: It is important for dental practitioners to regularly counsel and educate patients about the negative impact of smoking, motivate them to quit smoking, and provide the support needed for smoking cessation.

Keywords: Smoking, Periodontal health, Awareness, Oral health

Introduction

Smoking is a well-established and prominent risk factor for a multitude of systemic diseases, including lung carcinoma, chronic respiratory illness, cardiovascular pathologies[1], adverse pregnancy outcomes like miscarriage, and intrauterine growth restriction[2]. Compelling scientific evidence establishes a broad spectrum of detrimental effects associated with tobacco use in the oral cavity. This spectrum ranges from aesthetic complications, such as tooth discoloration, to potentially life-threatening malignancies, including oral cancer [3].

The periodontium, the supportive tissues surrounding the teeth, is susceptible to a diverse range of inflammatory conditions collectively known as periodontal diseases. Gingivitis and periodontitis are the most frequently encountered forms of disease affecting the periodontium[4]. Untreated periodontitis, a common inflammatory disease in adults, inevitably

leads to tooth loss. This sequela can significantly compromise masticatory function and negatively affect aesthetics. Additionally, it is associated with adverse downstream effects on overall health, quality of life, and economic productivity[5].

Globally, tobacco use, particularly through inhalation, stands as the most significant and modifiable risk factor contributing to the prevalence and progression of periodontal disease[6]. Smoking is a long standing risk factor associated with an increased susceptibility to developing periodontitis[7]. It is associated with a 2- to 7-fold increased prevalence of periodontitis compared to non-smokers[8,9]This phenomenon is attributed to the creation of an environment within the oral cavity that is conducive to the proliferation of periodontal pathogens[10]. Smokers exhibit a significantly higher prevalence of dental calculus compared to non-smokers. This finding demonstrates a positive correlation with the intensity and duration of their smoking habit [11-13] . The strength of the association between smoking and periodontal disease is such that a distinct diagnosis of smoking-associated periodontitis has been established. This specific diagnosis is characterized by gingival fibrosis, with a diminished presentation of gingival redness and edema relative to the overall severity of the disease. Moreover, smoking-associated periodontitis is characterized by a distinctive pattern of increased probing depths, particularly in the facial and lingual aspects of the anterior dentition. This is accompanied by accentuated gingival recession at the facial aspect of the anterior teeth. Interestingly, the degree of periodontal destruction in these patients may not exhibit a strong correlation with oral hygiene practices[14].Furthermore, smokers are reported to experience increased risk of tooth loss during periodontal interventions[15].Smoking also negatively impacts the efficacy of a broad range of periodontal treatments. This includes both non-surgical approaches, such as mechanical debridement and antimicrobial therapy, as well as surgical interventions encompassing regenerative procedures and dental implant placement[16].

Conversely, quitting smoking presents a significant opportunity for periodontal health restoration and potentially promotes the healing of the oral microbiome[17,18], by reducing the rate of periodontal destruction and even the possibility of degree of tissue repair and regeneration. Although the detrimental impact of smoking on oral health is well-documented, a significant knowledge gap exists regarding dental patient's awareness of these risks, especially in Asian populations. This survey aimed to investigate the awareness of the link between smoking and periodontal disease among the population seeking periodontal treatment.

Materials And Methods

This is a cross-sectional survey study. A total of 250 individuals comprising of equal number of smokers and non-smokers participated in this survey. The study was explained in local language and informed written consent was obtained from all the participants. The study was conducted from January 23, 2024, to April 1, 2024.

The questionnaire consisted of 20 questions constructed on knowledge about smoking on periodontal disease.125 each of smokers and non-smokers were asked to fill the questionnaire to evaluate their understanding of the impact of smoking on periodontal disease.

The questionnaire was divided into two domains [19].

Sociodemographic variables which consist of gender, marital status, age and educational level.

Questions related to knowledge and awareness regarding the effects of smoking on general and periodontal health.

Statistical analysis was done using IBM SPSS Software version 20. Descriptive statistics and Chi-square test were used to analyse the data. $p < 0.05$ is considered as statistically significant.

Results

Table 1 shows that among the overall study respondents 79.2%(n=198) were males and the remaining 20.8%(n=52) were females. Majority of the participants were in the age group of 25-50 years n=155 (62%). The education qualification of majority of the participants was graduation n=116 (46.4%). The survey predominantly included individuals from the urban region n=190 (76%).

Among the respondents 57.6% (n=144) were non - smokers, 32.4%(n=81) were smokers and 10%(n=25) were former smokers. Upto 30.4% of the smoking respondents had been smoking for more than 10 years.

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44.4% respondents having visited the dentist over one year, while 38.4% said they never visited the dentist.

Table 2 depicts the level of awareness regarding the negative effects of smoking on oral health. Nearly 94.4%(n=236) of respondent were aware of the link between smoking and increased risk of oral cancer. Additionally, 63.2% of respondents were aware of bad breath,85.6% were aware of staining of teeth due to smoking. However, the awareness of the effect of smoking on altered taste, loosening of teeth and delay in wound healing was 19.6%,7.2%,and 2% respectively, which was significantly low.

This study revealed a high level of awareness(>95%) across all smoking groups (former, non-smoker, smoker) regarding the negative impact of smoking on dental health. A majority (92.6%) of respondents were aware that passive smoking had an impact on the general health regardless of smoking status. However, none of the respondents (0%) were aware that passive smoking could affect periodontal health. In the present survey more than 85% respondents regardless of their smoking status were mindful that smoking could affect the success of periodontal treatment. However, majority (>90%) of the smokers were not aware that smoking negatively affected implant therapy. The above findings seemed to be uniform in all the smoking groups (p>0.05). [Table-3]

Though, the awareness that smoking could negatively impact dental health was higher in males(79.8%) ,and in individuals ho were graduates(46.3%) and aged between 25-50 years (61.6%); there were no statistically significant associations found between awareness with respect to age(p=0.686),gender (p=0.064) or education level(p=0.310).[Table-4]

Awareness of the negative impact of smoking on dental health varied by location. Residents in urban areas had the highest awareness (73.2%), followed by rural (23.2%) and semi- urban (0.4%) areas. Furthermore, the nonsmokers were found to be more aware of the smoking effects on oral health than smokers (58.3%). Respondents without smoking history (50.4%) were more aware about negative impact of smoking on dental health. However, no statistically significant associations(p>0.05) was found between awareness and location, smoking status or duration of smoking. [Table-5]

Discussion

Smoking is an established risk factor for the development and progression of periodontal diseases[20]. Extensive research over several decades has undeniably confirmed the negative impact of smoking on oral health. Tobacco smoking reduces the gingival blood flow, thereby compromising the supply of oxygen and vital nutrients to gingiva. This compromised supply weakens the tissues, rendering them more susceptible to opportunistic periodontal pathogens. Hence, smoking is now added as a grade modifier for periodontitis in 2017 classification of periodontal disease.

In the present study most of the respondents were aware of the negative impact of smoking on oral cancer but their awareness on periodontal and implant health was lesser. The level of public awareness in the present survey was higher compared to previous reports, by Lung et al(2005)[21] in the United Kingdom who reported the level of awareness was 7% ,a study by Shetty (2015)[22] in Kingdom of Arab Saudi reported the level of awareness was 11.3%. and Nwhator et al (2010)[23] reported a merely of 2.2% awareness in a study conducted in Nigeria.

The observed higher awareness in the present survey may be attributed to regular dental health education programmes and rallies that are conducted by the institution in the district of Visakhapatnam. Also, the smoking cessation units in the institution educate the patients about the negative effects of smoking and motivate the patients to quit smoking.

In contrast to Al-Shammari et al (2006)[24] who showed 66.8%; in the present survey 94% of the respondents were aware of the effect of smoking on oral cancer. However, 6% of the study respondents were unaware that smoking could cause oral cancer despite the high prevalence of oral cancer worldwide. Moreover, 10%of the respondents were not aware that smoking could potentially affect periodontal disease.

Clinicians should be aware that even in urban settings, there is a population not fully educated on these risks. This emphasizes the importance of dental health education programs. While the number may appear insignificant, it's crucial to address the knowledge gap concerning smoking's impact on periodontal health in this population. Moreover, data suggests that individuals who have attempted smoking cessation prioritize the resolution of aesthetic concerns, such as tooth discoloration and halitosis, as their primary

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motivator for quitting, rather than focusing on broader oral health outcomes as their motivational drive.

Conclusion

The study found that while the majority of dental patients had good knowledge about the systemic and oral effects of smoking, there were still some who were unaware of the link between smoking and periodontal disease. It is important for dental practitioners to regularly counsel and educate patients about the risks of smoking and to provide support for smoking cessation.

As a periodontist we should take an initiative to educate the patients about the effect on smoking not only on the oral health but also the general health. The patients should be regularly monitored, even after the periodontal treatment to reinforce the oral hygiene and motivate for tobacco cessation. The dentist should identify the patients who want to quit smoking and refer them to smoking cessation clinic for management.

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Table 1: Sociodemographic Data

Socio demographic variable	Number (n)	Percentage (%)
Gender		
Female	52	20.8
Male	198	79.2
Age		
<25 years	15	6.0
>50 years	80	32.0
25-50 years	155	62.0
Education		
Graduation	116	46.4
Post-graduation	12	4.8
Primary education	99	39.6
Uneducated	23	9.2
Location		
Rural	59	23.6
Semi urban	1	.4
Urban	190	76
Smoking Habit		
Yes	125	50
No	125	50

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Smoking Sattus		
Former Smoker	25	10.0
Non smoker	144	57.6
Smoker	81	32.4
Duration of smoking		
<1	10	4.0
>10	76	30.4
0	125	50.0
1-5	15	6.0
5-10	24	9.6
Last dental visit		
<6 months	32	12.8
7-12 months	11	4.4
Never	96	38.4
Over one year	111	44.4

Table 2: Awareness On The Effect Of Smoking On Oral Health

Smoking effect	n	%
Bad breath	158	63.2
Altered taste	49	19.6
Stained teeth	214	85.6
Loose teeth	18	7.2
Increased risk of oral cancer	236	94.4
Delay in wound healing	5	2
None	3	1.2

Table 3: Association Between Smoking Status And Awareness Of Smoking Effects On General Health, Oral Health, And Gum Disease Treatment (Chi-Square Test)

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		Smoking status			
		Former Smoker	Non smoker	Smoker	
Are you aware that smoking can negatively impact your dental health?	No	1 4.0%	2 1.4%	2 2.5%	.627
	Unsure	0 0.0%	1 0.7%	2 2.5%	
	Yes	24 96.0%	141 97.9%	77 95.1%	
Do you think passive smoking affects	General health	22 88.0%	128 88.9%	75 92.6%	.348
	Gum health	0 0.0%	0 0.0%	0 0.0%	
	Both	2 8.0%	13 9.0%	4 4.9%	
	None	1 4.0%	3 2.1%	2 2.5%	
Do you think smoking can affect the success of	Gum treatment	21 84.0%	129 89.6%	72 88.9%	.271
	Implant therapy	0 0.0%	6 4.2%	1 1.2%	
	No effect	4 16.0%	9 6.2%	8 9.9%	

Table-4 Analysis On The Association Of Different Variables With Respondents' Awareness Of The Link Between Smoking And Periodontal Disease

	Are you aware that smoking can negatively impact your dental health?			p-value
	No	Unsure	Yes	
<25 years	0 0.0%	0 0.0%	15 6.2%	

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Age	>50 years	2 40.0%	0 0.0%	78 32.2%	.686
	25-50 years	3 60.0%	3 100.0%	149 61.6%	
Gender	Female	3 60.0%	0 0.0%	49 20.2%	.064
	Male	2 40.0%	3 100.0%	193 79.8%	
Education	Graduation	3 60.0%	1 33.3%	112 46.3%	.310
	Post-graduation	0 0.0%	1 33.3%	11 4.5%	
	Primary Education	1 20.0%	1 33.3%	97 40.1%	
	Uneducated	1 20.0%	0 0.0%	22 9.1%	

Table-5 Analysis On The Association Of Different Variables With Respondents' Awareness Of The Link Between Smoking And Periodontal Disease

		Are you aware that smoking can negatively impact your dental health?			**p-value**
		No	**Unsure**	**Yes**	
Location	Rural	1 20.0%	0 0.0%	58 24.0%	.906
	Semi-urban	0 0.0%	0 0.0%	1 0.4%	
	Urban	4 80.0%	3 100.0%	183 75.6%	
	Former smoker	1 20.0%	0 0.0%	24 9.9%	
	Non smoker	2 40.0%	1 33.3%	141 58.3%	

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Smoking status	Smoker	2 40.0%	2 66.7%	77 31.8%	.627
Duration of smoking	<1	0 0.0%	0 0.0%	10 4.1%	.787
	>10	3 60.0%	2 66.7%	71 29.3%	
	0	2 40.0%	1 33.3%	122 50.4%	
	1-5	0 0.0%	0 0.0%	15 6.2%	
	5-10	0 0.0%	0 0.0%	24 9.9%	

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