Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Smoking and its Association with Periodontal Disease in Adult Population- A Cross Sectional Study

[1]Irfan Ali, [2]Monika Kumari

[1]Tutor, Department of Public Health Dentistry, Government Dental College and Hospital, Srinagar, Jammu and Kashmir, India;
[2]Senior Lecturer, Department of Public Health Dentistry, Dental College Azamgarh, Azamgarh, Uttar Pradesh, India

ABSTRACT:
Introduction: Smoking tobacco is a common risk factor for a number of chronic diseases, including cancer, lung diseases, cardiovascular diseases, and periodontal diseases. Tobacco smoke contains a complex mixture of harmful substances, including carbon monoxide, various nitrosamines, and the most pharmacologically active compound, nicotine. WHO estimates that six million deaths worldwide each year are caused by tobacco use (smoking and smokeless). **Materials and Methods:** To determine the relationship between smoking and periodontal health status among the adult population of Modinagar city, a descriptive cross-sectional study was conducted. The institutional review board granted ethical clearance. The SPSS v21.0 software package was used to analyse all of the collected data, which was entered into the 2007 version of Microsoft Word Excel Sheet. **Results:** The highest CPI score was associated with smoking and not smoking, according to the Chi square test, and this association was statistically significant (p 0.05). In Table 4, the correlation between the number of missing teeth and frequency of smoking was found to be 0.448, while the correlation between the number of missing teeth and duration of smoking was discovered to be 0.351. The statistical significance of both correlations was 0.001 (p = 0.001). **Conclusion:** Therefore, it is necessary to launch dental public campaigns that highlighted smoking's importance in primary preventive strategies alongside the importance of maintaining good oral hygiene.
Keywords: Smoking, Periodontal Disease, Tobacco

Received: 16 December, 2021 Accepted: 21 January, 2022

Corresponding author: Irfan Ali, Tutor, Department of Public Health Dentistry, Government Dental College and Hospital, Srinagar, Jammu and Kashmir, India

This article may be cited as: Ali I, Kumari M. Smoking and its Association with Periodontal Disease in Adult Population- A Cross Sectional Study. J Adv Med Dent Scie Res 2022;10(2):158-161.

INTRODUCTION

Tobacco is the only legal drug that kills a large number of its users when used exactly as the manufacturer intended. According to WHO, tobacco use causes approximately six million deaths worldwide each year (smoking and smokeless). Among these, the effects of second-hand smoking cause approximately 600,000 deaths. [WHO global report on tobacco smoking prevalence trends, 2015] [3] As a result, smoking is now recognized as one of the leading causes of preventable death and disease. [1]

Tobacco smoking, which contains a complex mixture of harmful compounds such as carbon monoxide, various nitrosamines, and the most pharmacologically active compound nicotine, is a known risk factor for a variety of chronic diseases such as cancer, lung disease, cardiovascular disease, and periodontal disease. [1,2,4] According to the dental perspective, smoking tobacco, primarily cigarettes, is acknowledged as the most significant environmental risk factor that can negatively impact periodontal health. [4,5] Smoking is thought to impair the immune response and the periodontal tissue's capacity to heal after a period of disease activity. [5] Periodontal disease makes a sizable contribution to the overall burden of oral disease. [6] Periodontal diseases are chronic infectious conditions that harm the dentition's supporting structures. [1,4] The most common form of periodontitis, chronic periodontitis, can result in irreversibledestruction of the connective tissue attachment, resulting in the formation of periodontal pockets and eventually the loss of alveolar bone.[1]Tobacco smokers have a higher prevalence of periodontal disease than nonsmokers, according to

mounting evidence. [2,7] Smokers have greater probing depth, clinical attachment loss, periodontal bone loss, and so on than nonsmokers. [2] Tobacco smoking most likely plays a significant role in the development of refractory periodontitis as well as negatively impacting regenerative therapy, such as osseous grafting and guided tissue regeneration. [5] Although there is a large body of evidence linking smoking to periodontal disease and tooth loss, the majority of studies have been conducted in the Westernized world, where the form and type of smoking tobacco use differs from the Indian perspective. As a result of the significant impact of smoking on periodontal health and tooth loss in the Indian population, the current study was designed to assess the relationship of tobacco smoking with periodontal health and early tooth loss in the adult population of Modinagar City.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted to determine the relationship between smoking and periodontal health status in the adult population of Modinagar city. Before scheduling the survey, the Institutional Review Board of Divya Jyoti College of Dental Science and Research, Modinagar, obtained official permission and ethical clearance. After explaining the purpose and methodology of the study to the participants in their native language, all study subjects provided written informed consent.

DATA COLLECTION

The current study collected data using a structured prevalidated performa. The information gathered was divided into three categories: The study subjects' sociodemographic information, oral hygiene practises, and smoking status were assessed using the procedures outlined in the WHO Basic Oral Health Survey 2013 proforma. Periodontal health is assessed using the CPITN index.

STATISTICAL ANALYSIS

All data was entered into the Microsoft Word Excel Sheet 2007 version and analysed with the SPSS v21.0 software package. Mean, standard deviation, frequency, and percentage were used as descriptive statistics. The Chi-square test was used to investigate the relationship between smoking and the highest CPI scores and missing teeth. The Independent t-test was used to compare the mean of highest CPI scores and missing teeth between smokers and nonsmokers. Pearson correlation was used to examine the relationship between missing teeth and smoking frequency and duration. A p-value of less than 0.05 was deemed statistically significant.

RESULTS

Table 1: Demographic details of the study participants

AGE	Smokers		Non-Smokers	
	Number	Percentage	Number	Percentage
35-40 years	271	67.8%	145	36.2%
41-45 years	129	32.2%	255	63.8%
Frequecy Of Tooth Brushing Once	306	76.5%	236	59%
Twice	42	10.5%	110	27.5%
Presence Of Bleeding Gums Yes	42	10.5%	201	50.2%
No	358	89.5%	199	49.8%
Presence Of Systemic Diseases Yes	206	51.5%	109	27.2%
No	194	48.5%	291	72.8%

Table 2: Mean Number of sextants with Different CPI Scores among Smokers and Non-smokers

	SMOKERS	NON-SMOKERS	T VALUE	P VALUE
SCORE 0	-	-	-	-
SCORE 1	0.23 ± 0.935	3.54 ± 1.775	-32.943	**0.001 (Significant)**
SCORE 2	2.53 ± 1.668	1.84 ± 1.375	6.338	**0.001 (Significant)**
SCORE 3	1.99 ± 1.730	0.51 ± 1.369	13.417	**0.001 (Significant)**
SCORE 4	1.24 ± 1.013	0.11 ± 0.666	18.680	**0.001 (Significant)**

Table 3: Association and percentage of subjects by Highest CPI scores among smokers and non-smokers

	Score 0	Score 1	Score 2	Score 3	Score 4	Chi Square Value	P Value
Smokers	0	0	18 (4.5%)	68 (17%)	314 (78.5%)	5.828	**0.001 (Significant)**
Non-Smokers	0	55 (13.8%)	290 (72.5%)	44 (11%)	11 (2.7%)		

Table 4: Correlation between Frequency and Duration of Tobacco Smoking with Number of Missing teeth (Pearson correlation)

	Number of Missing teeth	
	Pearson correlation value	**P Value**
Frequency of Smoking	0.448	**0.001 (Significant)**
Duration of Smoking	0.351	**0.001 (Significant)**

According to Table 1, a total of 271 (67.8 percent) smokers and 145 (36.2 percent) non-smokers were in the age group of 35-40 years, whereas 129 (32.2 percent) smokers and 255 (63.8 percent) non-smokers were in the age group of 41-45 years. The majority of smokers [306 (76.5%)] and non-smokers [236 (59%)] brushed once daily, while 42 (10.5%) smokers and 110 (27.5%) non-smokers brushed twice daily. According to the findings, 201 (50.2 percent) nonsmokers and 42 (10.5 percent) smokers experienced bleeding gums. The remaining 358 smokers (89.5 percent) and 199 nonsmokers (49.8 percent) were not affected by bleeding gums.A total of 206 (51.5%) smokers and 109 (27.2%) non-smokers participated in the current study, with a history of systemic disease, while the remaining 194 (48.5%) smokers and 291 (72.8%) non-smokers were unaffected by any systemic diseases. According to Table 2, the mean number of sextants with score 1 was 0.23 + 0.935 and 3.54 + 1.775 among smokers and non-smokers, respectively, while the mean of score 2 was 2.53 + 1.668 and 1.84 + 1.375. The T-values for scores 1 and 2 were -32.943 and 6.338, respectively, and the relationship was statistically significant (p 0.05).The mean number of sextants with score 3 among smokers and non-smokers was 1.99 $\pm$ 1.730 and 0.51 $\pm$ 1.369 respectively, while the mean of score 4 was 1.24 $\pm$ 1.013 and 0.11 $\pm$ 0.666 respectively. The T-value for score 1 and score 2 was 13.417 and 18.680 respectively and this association was statistically significant ($p \leq 0.05$).In table 3 among the 800 subjects, nobody (0%) had a health periodontium (Score 0) while 0 (0%) smokers and 55 (13.8%) non-smokers had bleeding on probing (Score 1), 18 (4.5%) smokers and 290 (72.5%) 9 non-smokers had severe supra or subgingival calculus deposition (Score 2), 68 (17%) smokers and 44 (11%) non-smokers had a pocket depth of 4-5 mm (Score 3), and 314 (78.5%) smokers and 11 (2.7%) non-smokers had a pocket depth of 6 mm or more (Score 4). (Score 4). According to the Chi square test, the correlation between the highest CPI score among smokers and nonsmokers was 5.828 and was statistically significant (p 0.05). According to Pearson correlation, the correlation of number of missing teeth with frequency of smoking was 0.448, while the correlation with duration of smoking was 0.351, both of which were statistically significant (p = 0.001).

DISCUSSION

The current cross-sectional study included 800 participants, 400 of whom were smokers and 400 of whom were not. According to the findings of the study, 67.8 percent of smokers were between the ages of 35 and 39, while 63.8 percent of nonsmokers were between the ages of 40 and 44. In the current study, the majority of smokers (42.2 percent) and nonsmokers (58.8 percent) used a toothbrush and toothpaste for oral hygiene. These findings are consistent with the findings of Basavaraj P et al, who discovered that 54.5 percent of smokers and 75 percent of nonsmokers used toothbrushes and tooth paste for oral hygiene.[6]F. H. Qureshi et alcase-control.'s study also supported the current study findings, reporting that 76.1% of cases and 77.7 % of controls used tooth brush and tooth paste to maintain oral hygiene. [8] According to the frequency of tooth brushing, our study found that the majority of smokers (76.5%) and nonsmokers (59%) brush only once daily, while only 10.5% of smokers and 27.5% of nonsmokers brush twice daily. A cross-sectional study by Gautam et al found that 83.5% of smokers and 85 % of nonsmokers brush their teeth only once daily, while 9 % of smokers and 7 % of nonsmokers brush twice daily.[5]In our study, 50.2 % of nonsmokers and 10.5 %of smokers had bleeding gums. These findings are consistent with the findings of Al-Habashneh et al, who discovered that 27.4 % of smokers and 72.6 % of nonsmokers had bleeding gums. [9] According to the study by Al-Qurashi H et al, there is agreement in the case of nonsmokers (51.4 %), but not in the case of smokers (43.8 %). [10] Nicotine in cigarettes is a vasoconstrictor, which prevents gum bleeding, and this is why smokers have less bleeding gums than nonsmokers. [11] Systemic diseases were present in 51.5 % of smokers and 27.2% of nonsmokers in our study.These findings supporting the review by Vellappally S et al, who concluded that smoking is clearly linked to systemic diseases such as cardiovascular disease, various lung disorders, and various types of cancer.[12]

The mean number of sextants with different CPI Scores from 0 to 4 among smokers and non-smokers demonstrates statistically significant results. In the current study, 78.5 % of smokers had a CPI Score of 4 (pocket depth of 4-5mm) and 17 % had a Score 3, while 72.5 % of nonsmokers had a Score 2 (Calculus) and 13.8 % had a Score 1. (Bleeding).The findings are consistent with the findings of a study conducted by Basavaraj et al, which revealed that the majority of smokers had probing depths greater than 6mm, while the majority of non-smokers (44.2%) had bleeding gums and calculus. [6] The mean number of sextants with Score 3 and Score 4 was significantly higher among smokers than among non-smokers, while the mean number of sextants with Score 1 was

significantly higher among non-smokers than among smokers. The results are consistent with those of Goultschin et al. In a study conducted by Gautam et al, it was discovered that the majority of participants, including smokers (43.5%) and non-smokers (58%), had severe calculus deposition, and the association was statistically significant. [5]

CONCLUSION

The majority of adults with periodontal disease were smokers, according to the results of our study, suggesting that tobacco use is a frequent and important risk factor affecting adult periodontal health in Modinagar. In other words, adult smoking habits have a greater influence on the development and excessive loss of periodontal support in later life.Therefore, it can be inferred that this population has a greater need for oral health education and tobacco cessation. The results of the study also emphasise the need for preventive measures geared toward young adults, many of whom develop smoking habits early in life. Therefore, it was necessary to launch dental public campaigns that highlighted smoking's importance in primary preventive strategies alongside the importance of maintaining good oral hygiene.

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