

# RELATION BETWEEN PERIODONTITIS AND SYSTEMIC HEALTH AMONG YOUNG DENTAL PRACTITIONERS IN TWIN CITIES OF PAKISTAN

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## ABSTRACT

The study aims to investigate the awareness of the relationship between periodontitis and systemic diseases among young dental practitioners working in private dental hospitals of Islamabad and Rawalpindi, Pakistan. This will help in identifying the knowledge gap and accordingly modify the training of house officers in the periodontology department and hence improve their patient management in the future. The cross-sectional study was carried out among 190 house officers after attaining permission from the six respective dental hospitals in twin cities of Pakistan. Written consent was taken, and a questionnaire was filled out by the participants. A score of 1 was given for each correct answer and the level of awareness was categorized as poor (0-3), fair (4-6), and excellent (7-8). Data was entered and analyzed using SSPS version 23. Percentages were calculated for the levels of awareness and each question respectively. Results demonstrated that 61(32.1%) of house officers possessed poor, n=109(57.4%) possessed fair and 20(10.5%) possesses excellent awareness regarding the relationship between periodontitis and systemic disease. About 146(76.8%) house officers were aware of bi-directional relationships whereas only 50(26%) house officers were aware regarding the relation of periodontitis with atherosclerosis. More than half of the house officers showed fair awareness regarding the relation of periodontitis to systemic disease. Further analysis revealed that the majority were not aware of the relation between periodontitis and atherosclerosis. Knowledge about the indication of antibiotics for the treatment of periodontitis in diabetic patients was also lacking.

**Key words:** Periodontitis, Systemic diseases, Cardiovascular disease, Smoking, Diabetes.

## Introduction

Periodontal disease is one of the most prevalent chronic diseases of the oral cavity across the world including gingivitis and periodontitis [1]. A local study conducted in Pakistan in 2015 on 1918 patients reported periodontitis in 1/4th of their study sample [2]. Periodontitis is a multifactorial inflammatory disease of the supporting structures of the teeth which can result in early tooth loss [3]. Diagnosis of periodontitis is made when there is clinical attachment loss at  $\geq 2$  non-adjacent teeth or there is an attachment loss and periodontal pocketing of  $\geq 3$ mm in  $\geq 2$  teeth and the observed finding cannot be attributed to non-periodontitis related cause [4].

Several systemic risk factors have historically been associated with periodontitis such as smoking, diabetes, medication, age, and stress [5]. Certain systemic conditions accelerate the destructive inflammatory process of periodontium by affecting neutrophils, macrophages, and lymphocyte function, thus impairing the host defense mechanism. Studies report that there is a potential link between periodontitis and systemic diseases, like diabetes mellitus, preterm low birth weight, and cardiovascular diseases [6].

Exhaustive literature is available regarding the bidirectional relationship between diabetes and periodontitis. Three times increased risk of periodontitis is reported in patients suffering from diabetes [7]. Evidence also supports that poor glycemic control worsens periodontal health and that such individuals have a 2.8-fold greater chance of developing destructive periodontal disease and a 4.2-fold greater chance of having progressive alveolar bone loss. Similarly, diabetic patients suffering from severe periodontitis have 3.2 times increased risk of ischemic heart disease and diabetic neuropathy [8]. Regarding the effect of periodontal treatment on glycemic control, a Cochrane review reported a 0.4% reduction in HbA1C after non-surgical periodontal therapy [9]. Some studies have reported 83%-88% awareness of bidirectional relationships amongst dental practitioners and 68% to 71% were aware that there is a positive impact of periodontal treatment in improving glycemic control [10-12].

Smoking is the major risk factor leading to periodontitis. There is a higher prevalence of periodontitis in smokers than in non-smokers [13]. It affects 90% of the population worldwide. It also leads to various diseases such as cardiovascular diseases, cancer, pulmonary diseases, and periodontal disease [14]. A study conducted in Saudi Arabia

reported a 3.5 times higher risk of chronic periodontitis among smokers and the overall prevalence of chronic periodontitis was 81.6 % which increased in heavy smokers. They also reported an increase in severity of periodontitis among heavy smokers as compared to moderate and light smokers [15].

Periodontitis can also pose a risk for atherosclerosis and cardiovascular diseases. Out of 14 South Asian studies carried out from 2001-2012, 12 studies showed a strong association between periodontal disease and cardiovascular disease [16]. A meta-analysis conducted to estimate the odds ratio of association between periodontitis and myocardial infarction (MI), supported that the patients with periodontitis had higher odds of suffering from MI. Similarly, patients who suffered from an episode of MI had worse periodontal and oral hygiene status as compared to their controls [17]. Studies also show a higher risk of fatality in periodontitis patients due to cardiovascular disease (CVD) and respiratory disease as compared to non-periodontitis individuals [6, 18].

According to the STEPS survey, there is a risk of increased prevalence of for-non-communicable diseases in Pakistan and the global burden of diseases reported that Pakistan has a high prevalence of diabetes and cardiovascular diseases [19, 20]. Literature extensively indicates a possible link between systemic health and periodontium which involves the acceleration of the destructive inflammatory process [21]. Globally periodontitis has a prevalence of 20-50% in adults of both developed and developing countries which increases drastically in the population over 65 years of age [22, 23].

Young dentists can play a pivotal role in patient counseling and education regarding oral and systemic health relations. Therefore, for better patient management it is extremely important to have knowledge regarding this relationship and inculcate it in the early years of practice via patient counseling. This will help build a foundation for a better practice that revolves around good patient care.

The study aimed to assess the awareness regarding the relationship between periodontitis and systemic health among young dental practitioners in twin cities of Pakistan. This will help in identifying the gaps in knowledge and a tailor-made reinforcement can be incorporated in the future during the training of house officers in the periodontology department to ensure proper management and counseling of compromised patients.

## Materials and Methods

A cross-sectional, questionnaire-based, study was conducted on 190 house officers in 6 dental hospitals in Islamabad and Rawalpindi. After attaining approval from the institutional review board, dental section IM&DC (letter no. IMDC/DS/IRB/143), due permission was sought from all the concerned dental hospitals which included Islamabad Dental

Hospital, Riphah Dental Hospital, Margalla Dental Hospital, Armed Forces Institute of Dentistry, Rawal Dental Hospital and Pakistan Institute of Medical Sciences. The sample size of 186 house officers was calculated which was raised to 190 using the WHO sample size calculator with an anticipated proportion (p) of 0.78 [20], level of confidence of 90%, and margin of error(e) of 0.05. The data was collected for 1 year from January 2020 to December 2020 using the convenience sampling technique. The personalized questionnaire was constructed, and face validity was assessed by five panelists including 2 medical educationists and three senior consultants. After some minor changes, the questionnaire was then piloted on n=30 participants. The reliability of the questionnaire was checked through Cronbach's alpha which was 0.72. The questionnaire was distributed in the clinical departments of the respective teaching hospitals and written consent was taken from all the participants and the study was explained to them. It included 8 questions assessing awareness regarding the relationship between periodontitis and systemic disease. There were questions of basic knowledge regarding periodontium, the relation of diabetes with periodontitis, the relation of atherosclerosis with periodontitis, and the effect of smoking on the periodontium. The average time taken to fill out the questionnaire was 8-10 minutes. The score ranged from 0-8 with a score of 1 assigned to each correct answer. The level of awareness was categorized as (0-3) poor, (4-6) fair, and (7-8) excellent. The data was encoded and entered in SPSS version 23.0 and the results were analyzed in the form of percentages for all the individual correct answers and the level of awareness. Quantitative data like age was calculated as mean  $\pm$ SD.

## Results and Discussion

The cross-sectional study included 190 house officers with a mean age of  $24.03 \pm 0.3$ , having n=64(33.6%) males and n=126(66.3%) females. Regarding the relation of systemic health with periodontitis poor awareness was observed for n=61(32.1%) of house officers, fair awareness for n=109(57.4%), and excellent awareness for 20(10.5%). The percentage of awareness for some questions is shown in (Table 1).

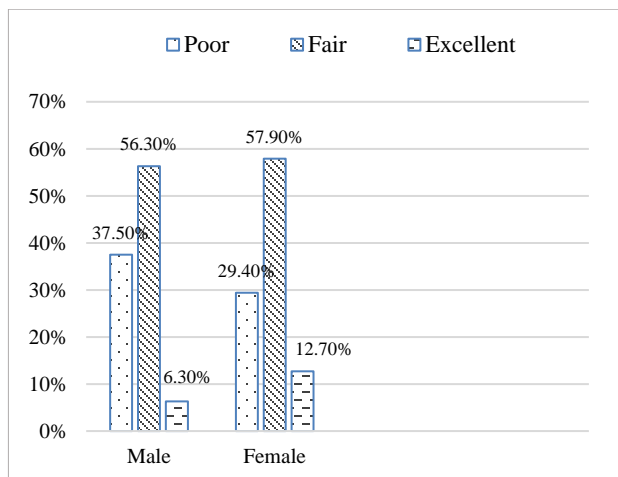
**Table 1.** Percentage of Responses for each Question

Sr.#	Question	Correct (n)	Incorrect (n)	Correct %
1	Basic Knowledge of Periodontium	106	84	55.8
2	Atherosclerosis linked with periodontitis	50	140	26.3
3	Bidirectional relationship between Diabetes	146	44	76.8
4	Effect of smoking on gingival inflammation	149	41	78.4
5	Risk of atherosclerosis in periodontitis	44	146	23.2

6	Effect of periodontal treatment on Glycemic control	109	81	57.4
7	Mechanism linking systemic influence and periodontium	135	55	71.1
8	Prescription of antibiotics in diabetic patients	45	145	23.7

No difference was observed in the percentage of males n=36(56.3%) and females n=73(57.9%) for fair awareness, whereas more females n=16(12.7%) possessed excellent awareness as compared to males n=16(6.3%) house officers. The percentage of awareness levels in males and females is shown in (Figure 1). A total of n=160(84%) of house officers claimed to counsel their patients regarding systemic health.

Mention all the tables and figures in the text as follows:



**Figure 1.** Percentage of Awareness Level Among Gender

Having a high prevalence of systemic diseases like diabetes and cardiovascular disease in Pakistan [22, 23], it becomes imperative for young dentists to have sound knowledge and educate the patients regarding the reciprocal relationship between systemic health and periodontitis. The present study aims to assess the level of awareness regarding this relationship so that areas of required improvement are identified.

The results of the present study showed that the majority (>75%) of young dentists had awareness regarding the bidirectional relationship between periodontitis with diabetes and the effect of smoking on the periodontium. According to several studies awareness among general dental practitioners is reported to range from 83% to 88% for a bidirectional relationship between periodontitis and diabetes and 68% to 71% agreed that there is a positive impact of periodontal treatment in improving glycemic control. The majority of practitioners also educate their

patients regarding the relation of periodontitis with diabetes [10-12, 24].

Although results revealed that more than half the participants had fair awareness, the in-depth analysis revealed that very few (<27%) participants were aware of the mechanism linking periodontitis with systemic health and its relationship with atherosclerosis. Some studies assess the knowledge of medical practitioners and cardiologists for cardiovascular disease linked with periodontitis but dental practitioners' knowledge has been assessed quite rarely [25, 26]. One of such studies reports a higher prevalence of dental practitioners being aware of the relation between periodontitis and cardiovascular diseases but their study population included experienced dental practitioners whereas the present study assessed awareness of fresh graduates working as residents [27]. As there are shared genetic and lifestyle risk factors like smoking, obesity, and poor diet for periodontitis and atherosclerosis it is recommended for dental practitioners to be aware and impart awareness about the relationship and the cardiovascular complications. Patients with periodontitis should be informed that they are at higher risk for developing cardiovascular disease. According to a study recently 1 in 4 middle-aged adults in Pakistan are suffering from CAD [28]. Dental regimes of prevention, treatment, and maintenance should be recommended for patients who have a family history or previous history of cardiovascular disease and periodontitis [29].

It was also concerning to note that only n= 45(23.7%) young dentists were aware of when to prescribe antibiotics in diabetic patients during non-surgical periodontal treatment. Overprescription of antibiotics is very common in regions where there are no national guidelines available. Due to a lack of knowledge and experience young practitioners are prone to prescribing antibiotics where it is not required [30]. Further analysis of the present data revealed that 100% of the participants possessing excellent knowledge had awareness regarding the bidirectional relation between diabetes and periodontitis, the effect of smoking, and mechanism linking systemic health and periodontium. On the contrary among the participants having poor knowledge, n=28(45.9%) of them were not aware of the bidirectional relationship between periodontitis and diabetes, n=36(59%), were not aware of how smoking affects periodontium, 41(67%) were not aware of the relation of periodontitis with atherosclerosis. Awareness regarding the relation of cardiovascular disease with periodontitis is significantly lacking.

This study highlights the gap in awareness of young dental practitioners regarding some aspects of the relation between non-communicable diseases like diabetes and atherosclerosis with periodontitis. However, the questionnaire was not extensive and did not address the awareness of systemic conditions like pregnancy, metabolic syndrome, etc. Due to the increase in the global prevalence

of non-communicable diseases and periodontitis, it is required that an elaborated questionnaire is structured to assess the awareness of general dental practitioners in Pakistan as well. This will highlight the importance of continuing education programs for the management of periodontitis as well as other oral diseases influenced by systemic involvement.

### Conclusion

The majority of house officers possessed a fair level of awareness regarding the relation of periodontitis to systemic disease. However, the in-depth analysis revealed that most of them were not aware of the relation between atherosclerosis with periodontitis and the prescription of antibiotics for the treatment of periodontitis in diabetic patients. Maximum of the house officers counseled their patients regarding periodontal and systemic health.

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**Conflict of interest:** None

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