

Knowledge, Attitude and Practice Behaviors Regarding Relationship between Diabetes Mellitus & Periodontitis among General Dental and Medical Practitioners

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Abstract

Background and Aim: There is a strong link between diabetes mellitus (DM) and an increased risk of periodontal disease. In fact, periodontitis is often considered as the sixth complication of DM. This study aimed to evaluate the understanding, perspectives, and behaviours of medical practitioners who treat diabetes towards diabetes and periodontal disease. Additionally, it explored their willingness to recommend dental treatment to their patients.

Material and Methods: A survey was conducted to gather information on the awareness, attitude, and practice of general dental and medical practitioners in Bhuj Town, Gujarat, India, regarding the relationship between Diabetes Mellitus and Periodontitis. The survey utilised a self-administered, structured questionnaire to collect data. Participants were questioned regarding specific periodontal complications, their understanding, and their perspective on the reciprocal connection between diabetes and periodontal disease.

Results: In the study, 100 general practitioners took part, with 50 being physicians and the other 50 dentists. Dentists demonstrated a higher level of awareness about the impact of diabetes complications on periodontal health compared to physicians, with a statistically significant difference. Most dentists preferred to refer their patients to physicians for medical evaluation, unlike physicians. They were particularly interested in understanding the connection between diabetes mellitus and periodontal health. Healthcare professionals in the dental field tend to stay informed about the connection between Diabetes Mellitus and Periodontal Health by attending conferences or continuing dental education programmes. On the other hand, medical practitioners tend to rely on professional journals as their primary source of information.

Conclusion: Dentists demonstrated a greater understanding and application of the bidirectional relationship between diabetes and periodontitis compared to physicians.

Keywords: Awareness, Dentist, Knowledge, Physicians.

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Introduction

It's crucial to prioritise oral health as it directly impacts overall well-being. Unfortunately, many people mistakenly believe that oral diseases only fall under the domain of dental professionals. There is a lack of collaboration between dentists and other health-care professionals in academic, research, and professional fields. [1] It is crucial to address the issue of poor oral health, as it is a clear reflection of social inequalities. [2]

Therefore, it is imperative that both developed and underdeveloped countries prioritise the prevention of oral diseases. There is a strong body of evidence

that connects periodontal disease with various systemic conditions that are of great medical interest. These conditions include diabetes, pregnancy complications, cardiovascular disease, respiratory diseases, osteoporosis, rheumatoid arthritis, and cancer. [3,4]

Oral complications related to diabetes, such as gingivitis, periodontitis, xerostomia, opportunistic infections, plaque buildup, slow wound healing, oral paresthesia, and candidiasis, are increasingly becoming concerns in the field of dental health. These issues have significant effects on both the

social and economic aspects of the country. [5] In India, the diabetes epidemic is particularly severe. According to reports from the World Health Organisation (WHO), the number of people with diabetes reached 32 million in the year 2000. [6] According to the International Diabetes Federation, the number of individuals with diabetes in India is projected to increase from 40.9 million to 69.9 million by 2025. [7] India has the potential to become the global hub for diabetes. [7]

Periodontal disease is an inflammatory condition that affects the supporting structures of the teeth. It is caused by specific bacteria and can lead to periodic loss of attachment. A staggering 90% of the Indian population is affected by gingival and periodontal diseases. Approximately 40-45% of the population is affected by advanced periodontal disease, which involves pocket formation and bone loss, ultimately resulting in tooth loss. [8,9]

There is a well-established connection between diabetes and periodontitis, indicating that individuals with uncontrolled diabetes are more likely to develop periodontitis, and vice versa. It is important for individuals with diabetes to be mindful of this potential connection in order to prevent oral and periodontal issues. [10] Research has shown that diabetic patients have a lower level of awareness regarding oral and periodontal problems compared to other systemic diseases. According to recent reports, it has been found that a mere 10.8% of individuals with diabetes have sought dental Checkups on a regular basis. Many people have gone more than two years without visiting a dentist due to a lack of awareness (29.7%) and a dismissive attitude towards the importance of dental Checkups. [11]

Many people are unaware of this issue, which may be attributed to a lack of information provided by healthcare providers. Individuals who struggle to maintain healthy blood sugar levels may experience greater attachment loss and may not respond as well to periodontal treatment. Multiple studies have indicated that managing periodontal infection through a combination of mechanical therapy and systemic antibiotics can enhance glycemic control, resulting in a decreased need for insulin in individuals with Insulin Dependent Diabetes Mellitus (IDDM). [12-14]

It is important to priorities preventive measures such as regular brushing, flossing, and dental check-ups. These practices not only help prevent complications related to diabetes, but also reduce the associated health risks. There is significant evidence indicating that periodontal disease and diabetes mellitus have a negative impact on each other. It is crucial for dental practitioners and medical practitioners to collaborate in order to minimise the negative impact of diabetes mellitus

on the periodontium, and vice versa. [15] It is important to recognize the growing evidence of a connection between diabetes and periodontal disease. Incorporating oral health management into diabetes care is crucial. However, research has shown that many medical practitioners are unaware of this relationship and rarely refer their diabetic patients to dental professionals for guidance. [8,9] India's high prevalence of diabetes has prompted an investigation into the knowledge, attitude, and practice behaviours of medical practitioners who treat diabetes. The study aimed to determine their willingness to advise patients to seek dental treatment for diabetes-related periodontal disease.

Material and Methods

A survey was conducted to gather information on the awareness, attitude, and practice of general dental and medical practitioners in Bhuj Town, Gujarat, India, regarding the relationship between Diabetes Mellitus and Periodontitis. The practitioners were asked to complete a structured questionnaire. The questionnaire was created and then sent out by the principal investigator and co-investigators.

Once the purpose of the study was clarified, all participants were given the opportunity to provide verbal informed consent. Respondents had to provide a response by selecting either "Yes" or "No". Participants were individually approached and given a questionnaire. They were kindly asked to return the questionnaire by the end of the working day or the following day. After one week, we reached out to the practitioners who had not responded. A randomised scheme was employed to gather a combined total of 50 Dental & Medical Practitioners (50 dental & 50 medical) from the city. The study population was divided into two main categories: dental practitioners and medical practitioners. Data was collected from various clinical settings, including Primary Health Centres, Private Medical and Dental Clinics, District Hospitals, and Dental & Medical colleges, over a span of 3 months.

Factors related to individuals' social and demographic backgrounds, Understanding the impact of diabetes on periodontal health, Understanding the connection between diabetes and periodontal health, incorporating this knowledge into daily practice, and exploring ways to learn more about the bidirectional relationship between diabetes and periodontitis. A set of questions were asked to establish a connection between Diabetes and Periodontitis, focusing on the criteria of Knowledge, Attitude, and Practice (KAP) study. Respondents had to provide a response by selecting either "Yes" or "No". Participants were individually approached and given a questionnaire to complete. They were

kindly asked to return the questionnaire by the end of the workday or the following day. Another attempt was made to reach out to the practitioners who had not responded, one week after the initial contact.

Statistical analysis: The survey responses were inputted into an electronic database and subsequently analysed using statistical software. The data was compiled and entered into a spreadsheet computer programme before being exported to the data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). Quantitative variables were reported using measures such as means and standard deviations or median and interquartile range, depending on their distribution. The presentation of qualitative variables was in the form of counts and percentages. Confidence level and level of significance were set at 95% and 5% respectively for all tests.

Results

100 dental and medical practitioners, consisting of 50 dentists and 50 physicians, participated in the survey. Here is a breakdown of the socio-demographic characteristics in Table 1.

A significant number of dentists and physicians are well-informed about the common dental issues that often occur in diabetic patients, such as periodontal abscess, gingival bleeding, and tooth mobility. A significant number of dentists and physicians are aware of the correlation between tooth loss and diabetes, according to recent data. Specifically, 82% of dentists and 48% of physicians have knowledge of this connection. A significant difference was observed between the two categories ($P < 0.05$). Table 2 displays a comparison between different groups in terms of their knowledge and awareness of the bidirectional relationship between diabetes and periodontal disease. Most of the study participants were well-informed about the reciprocal connection between Diabetes Mellitus and Periodontal Disease, with

each condition exacerbating the other. A significant number of dental and medical practitioners have expressed their intention to include oral examinations for diabetic patients as part of their routine practice. According to a recent study, 94% of dental practitioners and 66% of medical practitioners reported that they will actively check for oral manifestations in diabetic patients. The findings indicate a statistically significant difference, highlighting the importance of oral health in diabetes management.

A significant number of dental practitioners recommend that their patients with periodontitis undergo general blood glucose check-ups, while a large percentage of medical practitioners suggest that their poorly controlled diabetes patients have regular dental check-ups. It was found that dentists had a significantly higher level of awareness regarding the significance of regular dental maintenance and scaling for patients with poorly controlled diabetes, compared to physicians ($P < 0.05$). Table 3.

A significant number of dental and medical practitioners have participated in continuing education programmes that focus on the connection between periodontitis and diabetes mellitus. The majority of dental practitioners (96%) and medical practitioners (84%) believe that it is important to include an oral health component in diabetes continuing education programmes. Additionally, a significant number of dental practitioners (94%) and medical practitioners (86%) express interest in furthering their knowledge about diabetes mellitus and its effects on oral health.

Healthcare professionals have shown a keen interest in understanding the relationship between diabetes mellitus and oral health. Medical practitioners tend to rely on professional journals for this information, while dental practitioners prefer to attend conferences and continuing education events.

Table 1: Sociodemographic Characteristics of Study Participants

Variables		Designation						P value
		Dental		Medical		Total		
		N (50)	%	N(50)	%	N(100)	%	
Age	Less than 30 Years	18	36%	19	38%	37	37	0.10
	More than 30 Years	32	64%	31	62%	63	63	
Gender	Male	26	52	42	84	68	684	0.01*
	Female	24	48	8	16	32	32	
Practice	Practice	19	38	32	64	51	51	0.002*
	Practice & Academics	31	62%	18	36	49	49	
Experience	Less than 5 Years	28	56	27	54	55	55	0.23
	5 years & More	22	44%	23	46	45	45	

* Indicate statistically significance at $p \leq 0.05$

Table 2: Inter-Group Comparison regarding Knowledge & Awareness about association between Diabetes & Periodontal Disease

Knowledge & Awareness		Designation		Total 100	P value
		Dental 50	Medical 50		
A] Is any co-relation between diabetes mellitus and gum disease	Yes	49 (98%)	42(84%)	91	0.02*
	No	1 (2%)	8(16%)	9	
B] Diabetes and gum disease/ periodontal disease make each other worse	Yes	48 (96%)	43(86%)	91	0.03*
	No	2 (4%)	7(14)	9	
C] Patient with diabetes mellitus comes to you, do you notice or check for any oral manifestations.	Yes	47 (94%)	33 (66%)	80	0.01*
	No	3 (6%)	17 (34%)	20	

* Indicate statistically significance at $p \leq 0.05$

Table 3: Inter-group Comparison about Dental & Medical Care Recommendations for Patients with Periodontitis and Diabetes

Dental & Medical Care Recommendations		Designation		Total100	P value
		Dental 50	Medical 50		
Patient with poorly controlled diabetes mellitus should have frequent dental Checkups	Yes	0	40 (80%)	40	0.001*
	No	0	10 (20%)	10	
Have you referred your diabetic patients to dentist/Ever referred your gum disease patient who is diagnosed withdiabetes for general blood glucose check ups	Yes	45 (90%)	26 (52%)	71	0.02*
	No	5 (10%)	24(48)	29	
Patient with diabetes mellitus comes to you, do you notice or check for any oral manifestations.	Yes	46 (92%)	30 (60%)	76	0.001*
	No	4 (8%)	20 (40%)	24	

* Indicate statistically significance at $p \leq 0.05$

Discussion

Recognising the importance of evidence-based care, it is crucial for both dental and medical professionals to adopt a holistic approach, understanding the need for interdisciplinary referrals. Oral health is crucial for overall well-being, according to the World Health Organization. During the 101st FDI Annual World Dental Congress in 2013, a declaration was formally released titled "Oral health and general health: A call for collaborative approach." [8] It is important for all healthcare providers to understand the connection between oral diseases and overall health. They have a crucial role to play in diagnosing and referring patients to dentists.

Despite the wealth of research demonstrating the connection between diabetes and periodontitis, it is evident from this study that there is a significant gap in understanding this relationship. The findings highlight a disconnect between the scientific evidence and how it is applied in practice.

Research has revealed that individuals diagnosed with diabetes are more likely to experience periodontal complications such as gingival inflammation, gingival bleeding, tooth mobility, periodontal abscess, and tooth loss, as demonstrated in controlled clinical trials. According to our study, a significant majority of practitioners, about 84%, were well-informed about the common occurrence of periodontal abscess,

gingival bleeding, and tooth mobility in diabetic patients. Interestingly, dentists demonstrated a higher level of awareness compared to physicians, with a statistically significant difference between the two.

In a study conducted by Al-Khabbaz et al (2011) [16], it was found that 64% of the participants had knowledge about the periodontal complications in diabetic patients. Interestingly, dentists were found to be more aware of these complications compared to physicians.

The impact of periodontal diseases and tooth loss extends beyond just quality of life. These conditions can have a significant effect on overall health, making it difficult for individuals to maintain a healthy diet and proper glycemic control. A majority of respondents, 70% to be exact, reported a strong correlation between tooth loss caused by periodontal disease and diabetes. However, it is worth noting that only 48% of physicians acknowledged the correlation between tooth loss and diabetes in patients, which is significantly different from the perspective of dentists. In a study conducted by Al-Khabbaz et al (2011) [16], it was found that a significant number of respondents and physicians acknowledged the correlation between tooth loss and diabetes. Based on the studies mentioned, it appears that there is a widespread lack of understanding among physicians worldwide regarding the impact of diabetes on periodontal health. However, the

physicians in our study demonstrated slightly better knowledge in this area compared to others. Periodontal diseases and the subsequent loss of teeth can significantly impact an individual's quality of life and overall health. Many dentists have acknowledged the link between periodontitis and diabetes, noting that tooth loss can be a consequence of this condition. According to a recent survey, it was found that a significant number of respondents and physicians believe that tooth loss is a common occurrence among individuals with diabetes. Based on the studies mentioned, it seems that there is a lack of understanding among physicians worldwide about how diabetes can impact periodontal health. However, the physicians in our study performed slightly better than others. [16]

Individuals diagnosed with diabetes are at a higher risk for experiencing severe forms of periodontal breakdown. Research suggests that severe periodontitis can potentially impact glycemic control. Treating periodontal infections may play a role in managing glycemic control, according to scientific evidence. [17,18] Based on our study, it was found that a significant number of participants were well-informed about the mutual impact of Diabetes and Periodontal disease. They acknowledged that these two conditions exacerbate each other. When comparing different groups, it was found that dentists had a higher level of awareness compared to physicians, and this difference was statistically significant. A significant disparity exists between the rates at which physicians and dentists check for oral manifestations in diabetic patients. According to recent data, only 66% of physicians conduct these checks, while a much higher percentage of dentists, 96%, prioritize this aspect of patient care. According to Rebecca Smith (2007) [19], it appears that many individuals are not advised by their endocrinologists to schedule routine dental Checkups. It is evident from other studies [20,21] that a small number of patients diagnosed with diabetes regularly visit the dentist, and many are not aware of the impact of diabetes on oral health. This lack of information may be attributed to the limited knowledge of their physicians. According to a study conducted by Srinidhi et al (2011) [22], medical practitioners and interns in Chennai, India demonstrated a strong understanding of dentistry. This can be attributed to the fact that dental health is incorporated into the medical education curriculum in Chennai, with the aim of enhancing the knowledge and attitude of medical students towards dental health. Similarly, various medical colleges in different Indian states adhere to the syllabus recommended by the Medical Council of India (MCI). Due to the incorporation of dental syllabus into the medical curriculum, our study

yielded a notably more positive response from physicians compared to previous research.

According to the study, a significant number of medical practitioners believe that patients with poorly controlled diabetes should have regular dental Checkups and scaling. However, it was found that a smaller percentage of physicians actually referred their diabetic patients to dentists. It is interesting to note that a significant majority of dentists, 89.6%, recommended that their patients with periodontitis and diabetes should visit physicians regularly. Additionally, an overwhelming 92% of dentists believed that diabetic patients should undergo frequent dental scaling. According to Sreenivas Nagarkanti (2013) [21], screening and referral by healthcare professionals can be beneficial for patients as it improves their access to dental care. It is crucial for doctors to stay updated on the heightened susceptibility to periodontal issues and the significance of regular dental examinations.

There was a notable difference between dentists and physicians in their level of interest in the bidirectional relationship between diabetes mellitus and periodontal health. Unfortunately, the attendance of dentists and physicians at continuing dental/medical education programmes was quite low. Assessing the expertise of dental and medical professionals is crucial for ensuring the delivery of suitable Continuing Dental Education Programmes. According to a study conducted by Mary H Lopes (2012) [23] on the knowledge of certified diabetes educators regarding the connection between diabetes and periodontitis, a significant number of participants highlighted that inadequate glycemic control can contribute to the growth of oral bacteria. Additionally, it was observed that periodontal disease may further worsen glycemic control. These findings suggest that certified diabetes educators possess a better understanding of the bidirectional relationship between diabetes and periodontitis. They credited the addition of oral health to their curriculum and expressed excitement about incorporating an oral health component into their diabetes continuing education programmes.

A significant number of dental and medical practitioners expressed interest in expanding their knowledge about diabetes mellitus and its effects on oral health. While 36% of dental practitioners preferred to learn through professional journals, 64% of their counterparts preferred to gain knowledge through conferences. A significant difference ($p < 0.05$) was observed. According to a study conducted by Koerber et al (2006) [24], nurses and nutritionists are most likely to benefit from receiving information about periodontal disease through guidelines and protocols in their workplaces, as well as professional journals.

Physicians have the opportunity to reach a larger population and offer dental counselling, as children and adults visit them more often than dentists. [25] In our study on Periodontal Disease and Diabetes Mellitus, the dentist's Knowledge, Attitude, and Practice (KAP) outperformed that of physicians in all aspects. It is the responsibility of dentists to raise awareness among medical practitioners about periodontal health. In our study, medical practitioners outperformed similar studies reported in the literature in all aspects.

Conclusion

Health care professionals can help their patients by improving access to dental care through screening and referral. It is crucial to provide doctors with education on oral health and its connection to overall well-being. It is crucial for doctors to be aware of the heightened susceptibility to periodontal issues and the significance of regular dental examinations. The sampling frames consisted of both registered dental and medical practitioners. Regular follow-up ensured maximum response rates, with dentists achieving a 100% response rate and physicians achieving an 87.6% response rate. We need to shift the way we view dentists and dental hygienists as the sole guardians of oral health in our society.

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