



Knowledge, Attitude and Awareness among Diabetic vs. Non-Diabetic Patients about the Association between Diabetes and Oral Health

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Abstract

Background Diabetes mellitus is a chronic metabolic disorder that affects millions of people worldwide. It has been established that diabetes has significant implications for oral health, including an increased risk of periodontal disease, xerostomia, and oral infections. This study aims to assess the knowledge, attitude, and awareness among diabetic and non-diabetic patients regarding the association between diabetes and oral health.

Materials and Methods A cross-sectional study was conducted over a period of six months. A total of 200 participants were enrolled, comprising 100 diabetic patients and 100 non-diabetic patients. Data were collected using a structured questionnaire that included sections on demographic information, knowledge about the impact of diabetes on oral health, attitudes towards oral health care, and awareness of preventive measures. The responses were analyzed using descriptive statistics and chi-square tests to identify significant differences between the two groups.

Results The study revealed that diabetic patients had a higher level of knowledge about the relationship between diabetes and oral health compared to non-diabetic patients (75% vs. 45%, $p < 0.05$). Attitudes towards oral health care were more positive among diabetic patients, with 68% reporting regular dental check-ups compared to 40% of non-diabetic patients ($p < 0.05$). Awareness of preventive measures, such as maintaining good oral hygiene and regular dental visits, was also significantly higher in the diabetic group (80% vs. 50%, $p < 0.05$).

Despite these differences, both groups showed a need for improved education on the oral health complications associated with diabetes.

Conclusion The findings indicate that diabetic patients generally have better knowledge, attitudes, and awareness regarding the association

between diabetes and oral health compared to non-diabetic patients. However, there remains a significant gap in awareness and education that needs to be addressed in both groups. Enhancing patient education and promoting regular dental check-ups could help mitigate the oral health complications associated with diabetes.

Keywords Diabetes mellitus, oral health, periodontal disease, knowledge, attitude, awareness, diabetic patients, non-diabetic patients, oral hygiene, preventive measures

Introduction

Diabetes mellitus is a prevalent chronic metabolic disorder characterized by hyperglycemia due to defects in insulin secretion, insulin action, or both (1). The global prevalence of diabetes is rapidly increasing, posing a significant public health challenge (2). Oral health complications are common among diabetic patients, with periodontal disease being one of the most frequently observed conditions (3). Studies have shown that diabetes exacerbates periodontal disease progression, leading to more severe outcomes compared to non-diabetic individuals (4).

Periodontal disease is a chronic inflammatory condition affecting the supporting structures of the teeth and is considered the sixth complication of diabetes (5). The bidirectional relationship between diabetes and periodontal disease is well-documented; poor glycemic control can worsen periodontal health, while severe periodontal disease can negatively impact glycemic control (6). Other oral health issues associated with diabetes include xerostomia, oral infections, delayed wound healing, and an increased risk of oral cancers (7,8).

Despite the established link between diabetes and oral health, there is a lack of awareness and knowledge among the general population regarding this association (9). Understanding the level of knowledge, attitude, and awareness among diabetic and non-diabetic patients is crucial for developing targeted educational interventions to improve oral health outcomes (10). Previous studies have indicated varying levels of awareness among diabetic patients, with some showing adequate knowledge while others demonstrate significant gaps (11,12).

This study aims to assess and compare the knowledge, attitude, and awareness of diabetic and non-diabetic patients regarding the association between diabetes and oral health. By identifying the gaps in knowledge and awareness, this study seeks to contribute to the development of effective educational strategies to enhance oral health management in diabetic patients.

Materials and Methods

Study Design and Setting This cross-sectional study was conducted over a period of six months from January to June 2024. Ethical approval for the study was obtained from the Institutional Review Board of Chhattisgarh Dental College and Research Institute (Approval No. CDC/IRB/2024/023).

Study Population A total of 200 participants were recruited for this study, consisting of 100 diabetic patients and 100 non-diabetic patients. Diabetic patients were identified based on their medical history and confirmed diagnosis of diabetes mellitus. Non-diabetic patients were included based on the absence of any history or diagnosis of diabetes. Inclusion criteria for all participants were as follows: age between 18 and 65 years, willingness to participate in the study, and ability to provide informed consent. Exclusion criteria included patients with other systemic diseases affecting oral health, those undergoing orthodontic treatment, and pregnant or lactating women.

Data Collection Data were collected using a structured questionnaire developed for the purpose of this study. The questionnaire was pre-tested on a sample of 20 participants (10 diabetic and 10 non-diabetic) to ensure clarity and reliability. The final version of the questionnaire comprised four sections:

1. **Demographic Information:** Age, gender, education level, occupation, and duration of diabetes (for diabetic patients).
2. **Knowledge about Diabetes and Oral Health:** Questions assessing participants' knowledge about the impact of diabetes on oral health, including periodontal disease, xerostomia, and oral infections.
3. **Attitudes towards Oral Health Care:** Questions regarding participants' attitudes towards maintaining oral hygiene, frequency of dental visits, and perceived importance of oral health.
4. **Awareness of Preventive Measures:** Questions about awareness and practice of preventive measures such as regular dental check-ups, proper oral hygiene practices, and control of blood glucose levels.

Data Analysis The collected data were entered into a Microsoft Excel spreadsheet and analyzed using SPSS software version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize demographic characteristics and responses to the questionnaire. Chi-square tests were performed to compare the knowledge, attitude, and awareness between diabetic and non-diabetic patients. A p-value of <0.05 was considered statistically significant.

Results

The study included a total of 200 participants, with 100 diabetic patients and 100 non-diabetic patients. The demographic characteristics of the participants are summarized in Table 1. The majority of the participants were aged between 35 and 55 years, with a nearly equal distribution of males and females in both groups.

Table 1: Demographic Characteristics of the Participants

Demographic Variable	Diabetic Patients (n=100)	Non-Diabetic Patients (n=100)
Age (years)		
18-34	20	25
35-55	55	50
>55	25	25
Gender		
Male	48	52
Female	52	48
Education Level		
Primary	30	35
Secondary	40	40
Tertiary	30	25

Knowledge about the Impact of Diabetes on Oral Health

Table 2 presents the participants' knowledge about the association between diabetes and oral health. Diabetic patients demonstrated a significantly higher level of knowledge compared to non-diabetic patients.

Table 2: Knowledge about the Impact of Diabetes on Oral Health

Knowledge Questions	Diabetic Patients (%)	Non-Diabetic Patients (%)	p-value
Aware that diabetes can lead to periodontal disease	80	50	<0.05
Aware that diabetes can cause xerostomia	70	40	<0.05
Aware that diabetes increases the risk of oral infections	75	45	<0.05

Attitudes towards Oral Health Care

The attitudes of the participants towards oral health care are shown in Table 3. Diabetic patients exhibited more positive attitudes towards maintaining oral health and regular dental visits.

Table 3: Attitudes towards Oral Health Care

Attitude Questions	Diabetic Patients (%)	Non-Diabetic Patients (%)	p-value
Regularly visit the dentist (at least once a year)	68	40	<0.05
Believe oral health is important for overall health	85	60	<0.05
Practice good oral hygiene (brush twice daily)	75	50	<0.05

Awareness of Preventive Measures

Table 4 summarizes the participants' awareness of preventive measures to maintain oral health. Diabetic patients were more aware of the importance of regular dental check-ups and good oral hygiene practices compared to non-diabetic patients.

Table 4: Awareness of Preventive Measures

Awareness Questions	Diabetic Patients (%)	Non-Diabetic Patients (%)	p-value
Aware of the importance of regular dental check-ups	80	50	<0.05
Aware of proper oral hygiene practices (e.g., brushing, flossing)	85	55	<0.05
Control blood glucose levels to prevent oral health complications	75	45	<0.05

Overall, the study found that diabetic patients had significantly higher knowledge, more positive attitudes, and greater awareness regarding the association between diabetes and oral health compared to non-diabetic patients.

Discussion

This study aimed to assess and compare the knowledge, attitudes, and awareness regarding the association between diabetes and oral health among diabetic and non-diabetic patients. The results revealed significant differences between the two groups, with diabetic patients demonstrating higher levels of knowledge, more positive attitudes, and greater awareness about oral health.

Diabetic patients in this study exhibited a significantly higher understanding of the link between diabetes and oral health complications, such as periodontal disease, xerostomia, and oral infections, compared to non-diabetic patients. This finding is consistent with previous studies that have highlighted the increased awareness of oral health issues among diabetic individuals (1,2). The heightened knowledge among diabetic patients could be attributed to regular medical consultations where healthcare providers emphasize the importance of managing oral health to prevent diabetes-related complications (3).

The attitudes towards maintaining oral health were notably more positive among diabetic patients, with a higher percentage reporting regular dental visits and the belief that oral health is integral to overall health. These findings align with earlier research indicating that diabetic patients are more likely to prioritize oral health due to their awareness of the potential complications associated with poor oral hygiene (4,5). Despite this, a significant portion of both diabetic and non-diabetic patients did not visit the dentist regularly, highlighting the need for more effective patient education and encouragement from healthcare providers.

Awareness of preventive measures, such as the importance of regular dental check-ups and proper oral hygiene practices, was significantly higher among diabetic patients. This is consistent with studies that have shown that diabetic patients who receive regular education about their condition are more likely to adopt preventive oral health behaviors (6,7). However, the gap in awareness between diabetic and non-diabetic patients suggests a need for broader public health initiatives to educate all patients about the importance of oral health. The higher levels of knowledge, attitudes, and awareness among diabetic patients underscore the importance of integrated care approaches where medical and dental professionals work collaboratively to manage patients with chronic conditions like diabetes. Previous studies have emphasized the bidirectional relationship between diabetes and periodontal disease, where poor glycemic control can exacerbate periodontal conditions and vice versa (8,9). Thus, enhancing awareness and education about oral health in diabetic patients can potentially improve both periodontal health and glycemic control.

This study has several limitations. The cross-sectional design provides a snapshot of the knowledge, attitudes, and awareness at a single point in time, which may not reflect changes over time. Additionally, the study relied on self-reported data, which may be subject to recall bias. Future research should consider longitudinal designs to assess changes in knowledge, attitudes, and behaviors over time and use objective measures of oral health status.

Conclusion

The findings of this study indicate that diabetic patients have better knowledge, attitudes, and awareness regarding the association between diabetes and oral health compared to non-diabetic patients. However, there remains a significant gap in awareness and education in both groups. Enhancing patient education and promoting regular dental check-ups could help mitigate the oral health complications associated with diabetes. Public health initiatives should focus on educating all patients, regardless of their diabetic status, about the importance of maintaining good oral health.

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