

Knowledge and Awareness of Oral Health Care for Diabetes Mellitus Patients among BDS Undergraduates in Bhubaneswar

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Abstract

An estimated 11.1% of adult population (ages 20-79) i.e., 1 in every 10 individuals approximately suffering from a chronic metabolic disorder Diabetes Mellitus (DM). Studies indicate 0.94% diabetic in school aged children and 0.56% in adolescents, where as 15% -16% of children are pre-diabetic. Increased glucose levels in Diabetes mellitus lowers the immune response, contribute to various types of diseases related to oral cavity such as gingivitis, periodontitis, dental caries, oral candidiasis, delayed wound healing, trigeminal neuropathy, halitosis, taste and neurosensory disorders, peri-implantitis, tooth loss and tongue abnormalities. In this article we will discuss about various oral manifestations associated with diabetes mellitus. It includes outcome of a structured inquiry to determine the basic as well as depth knowledge & awareness of oral health linked to diabetes mellitus patients among BDS undergraduates at Institute of dental sciences, Bhubaneswar. From November 2025 to March 2026. Where Total 161 individuals participated in the study. Findings and results are discussed in the articles.

Keywords: Metabolic disorder, Diabetes Mellitus (DM), Blood glucose level, Gingivitis, Periodontitis

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Introduction

A chronic metabolic disorder which impacts millions of individual globally is Diabetes mellitus (DM) [1]. Diabetes mellitus is characterized by elevated blood glucose levels due to either partial or complete deficiency of insulin [2]. This increase in blood glucose results in osmotic diuresis, which leads to common symptoms such as thirst, polyuria, nocturia, fatigue and weight loss [3]. The prevalence of diabetes is rising in both poor and rich countries. In rich countries, the majority of young individuals or children are diagnosed with type 1 diabetes mellitus. Diabetes mellitus can lead to various medical complications such as kidney disease, eye damage, nerve damage, peripheral vascular disease and heart disease [4]. Oral diseases associated with diabetes include periodontitis, tooth loss, gingivitis, oral candidiasis, dental caries, delayed wound healing, lichen planus, salivary dysfunction, halitosis, tongue anomalies, fungal infections, oral soft tissue pathologies, etc [5]. In 1993 Loe proposed that periodontal disease is considered as the 6th complication of diabetes mellitus [6]. In a 2008 review, Taylor and Borgnakke highlighted periodontitis as a potential risk factor for poor metabolic control in individuals with

diabetes mellitus [7]. Periodontal disease and diabetes mellitus are correlate to each other. The periodontal health of type 2 diabetes mellitus patients has been closely associated with “attachment loss and bone loss.” [8] Periodontitis in those with type1 diabetes has not been observed because these patients are generally younger and have benefited from recent advancements in glycaemic control. The impact of periodontal disease is not only a crucial factor for the quality of life in diabetic patients, but it may also influence their overall health by hindering their ability to maintain a nutritious diet and leading to poor glycaemic management [9]. Recent studies have thoroughly examined the connection between oral infections and diabetes, concluding that oral health and general health are inseparable. Many individuals with diabetes lack adequate understanding of oral health implications of their condition and the importance of oral hygiene. Consequently, they should be educated about these issues, encouraged to practice good oral care and regularly visit both their diabetes care providers and dentists.

Survey is conducted to evaluate the Knowledge and Awareness of Oral Health related to Diabetes Mellitus

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Patients among BDS Undergraduates in Institute of Dental Sciences, Bhubaneswar. This study also aimed to assess oral hygiene maintenance practices and attitude towards oral health in diabetes patients and oral health care practitioners' awareness and education regarding oral manifestations of diabetes among public to reduce the risk of oral diseases.

Methods

A structured inquiry was conducted to ascertain the knowledge and awareness of oral health related to diabetes mellitus patients among BDS undergraduates at Institute of dental sciences, Bhubaneswar from November 2025 to March 2026. Total 161 individuals participated in the study including 1st year, 2nd year, 3rd year, 4th year, Interns and some other dental hygienists. A questionnaire was prepared of 5 sections including Demographic details, Knowledge about diabetes mellitus, Awareness of oral health care practices, Attitude and practice, Source of information and Overall awareness from which information was collected. This questionnaire includes total of 19 questions from second to sixth section.

The objective of this study to ascertain the knowledge, awareness, effects of diabetes mellitus on oral health, oral health education and promotion among undergraduate students.

Questions in the questionnaire were selected from different national and international surveys [10-12] Questionnaire was circulated among all undergraduate students out of which 161 students responded to the questionnaire. Out of 161, total male participants are 57.8% and female participants are 42.2%. The age group of participants is between 17 to 30 years which includes undergraduate students from 1st year to Interns. Rest others are above 30 years which includes dental hygienists, nurses and dental attenders. From total participants 50.3% participants are interns, 14.9% participants are 4th year, 9.3% participants are 3rd year, 8.1% participants are 2nd year, 10.6% participants are 1st year and rest others are 6.8%. The questionnaire survey was filled by the undergraduate students. Data filed to spreadsheet and imported to SPSS for statistical analysis.

QUESTIONNAIRE

1. Demographic Details

- Age
- Gender
- Year of study

2. Knowledge about Diabetes Mellitus

- Diabetes mellitus is a
 - Metabolic disorder
 - Infectious disease
 - Autoimmune disease
 - Don't know
- Does diabetes affect oral health?
 - Agree
 - Disagree
 - Don't know
- Which of the following oral conditions are commonly seen in diabetic patients?
 - Periodontitis

- Xerostomia
 - Dental caries
 - Delayed wound healing
 - Oral candidiasis
 - Burning sensation
- Diabetes increases the risk of periodontal disease
 - Agree
 - Disagree
 - Don't know
 - Are you aware of the link between high blood sugar and dry mouth?
 - Yes
 - No
 - Don't know

3. Awareness of oral health care practices

- Do you think regular dental checkup are important for diabetic patients?
 - Yes
 - No
- Is it important for diabetic patients to maintain proper oral hygiene?
 - Yes
 - No
 - Don't know
- Healthy gums can be maintained by controlled Diabetes
 - Yes
 - No
 - Don't know
- Glycaemic control influences periodontal treatment outcome
 - Agree
 - Disagree
- Diabetic patients should be educated about oral hygiene maintenance
 - Disagree
 - Neutral
 - Agree
 - Strongly agree
- Frequency of dental visits recommended for diabetic patients is
 - Every 3 months
 - Every 6 months
 - Once a year
 - Only when pain occurs
- How many times a diabetic patient should brush their teeth?
 - Once daily
 - Twice daily
 - More than 2 times
 - Occasionally
- Is it recommended to use any other supplemental cleaning aids (mouthwash, dental floss, etc) in diabetic patients?
 - Yes
 - No

4. Attitude and Practice

- Have you examined diabetic patients during your clinical postings?
 - Yes
 - No

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2. Do you take medical history related to diabetes before dental treatment?

- a. Always
- b. Sometimes
- c. Never

3. Do you feel comfortable managing oral health problems in diabetic patients?

- a. Yes
- b. No
- c. Needs more training

4. Would you need more clinical training or workshop for managing diabetic patients?

- a. Yes
- b. No

5. Source of information

From which source you know about oral health and diabetes?

- a. Undergraduate curriculum
- b. Clinical postings
- c. Workshops / Seminar
- d. Social media
- e. Others

6. Overall awareness

How do you rate your knowledge about oral health care in diabetic patients

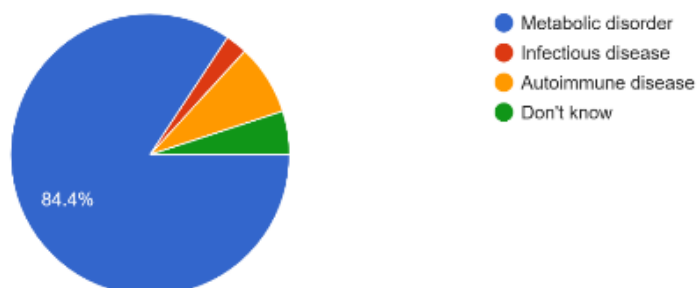
- a. Excellent
- b. Good
- c. Average
- d. Poor

Results and Discussion

This study assessed the knowledge and awareness regarding oral health care in diabetes mellitus patients among undergraduate students. The finding revealed that 84.5% of respondents correctly identified diabetes mellitus as a metabolic disorder, 2.4% considered it an infectious disease, 8.1% identified it as an autoimmune disease and 5% reported that they were unaware.

Diabetes Mellitus is a

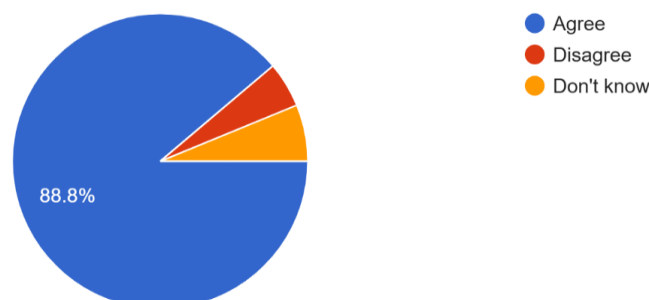
160 responses



Out of 161 students 88.8% agreed that diabetes affects oral health, whereas 5% disagreed and 6.2% students stated that they did not know.

Does Diabetes affect oral health ?

161 responses

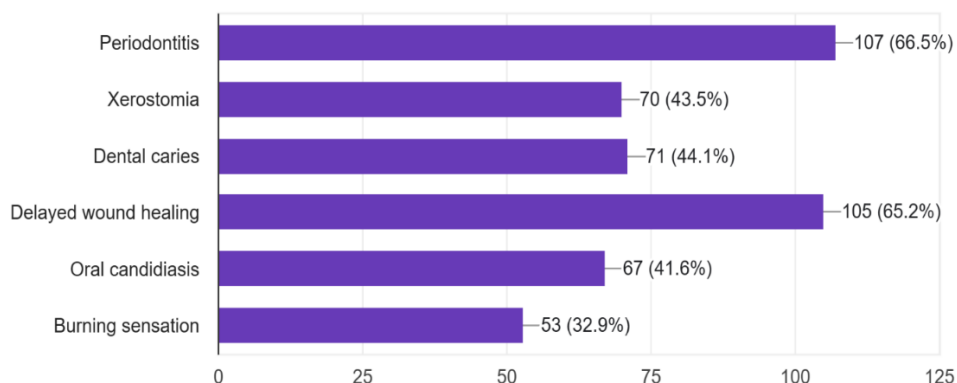


Regarding oral manifestations of diabetes many students recognized its association with periodontitis (66.5%), delayed wound healing (65.2%), xerostomia (43.5%), dental caries (44.1%), oral candidiasis (41.6%), and burning sensation (32.9%).

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Which of the following oral conditions are commonly seen in diabetic patients

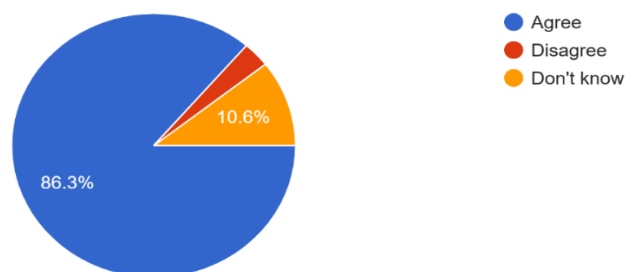
161 responses



Furthermore, 86.3 % students agreed that diabetes increases the risk of periodontal disease while 3.1% disagreed and 10.6% were uncertain.

Diabetes increases the risk of periodontal disease

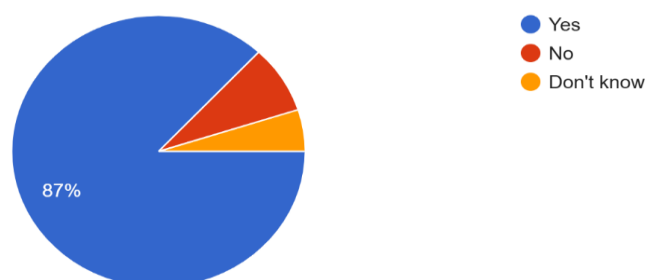
161 responses



This study showed that 87% respondents were aware that there is a link between high blood sugar and dry mouth, 8.1% respondents believed that there is no association between high blood sugar and dry mouth and rest 5% were unaware.

Are you aware of the link between high blood sugar and dry mouth

161 responses

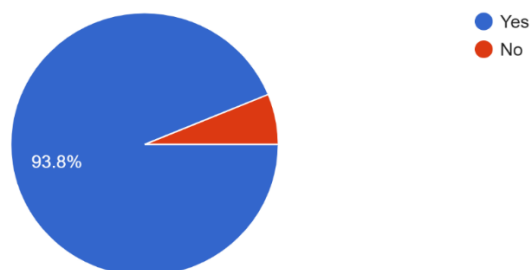


Coming to awareness of oral health care practices, 93.8% believed that regular dental check-ups are important for diabetic patients whereas 6.2% considered them unimportant.

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Do you think regular dental checkup are important for diabetic patients

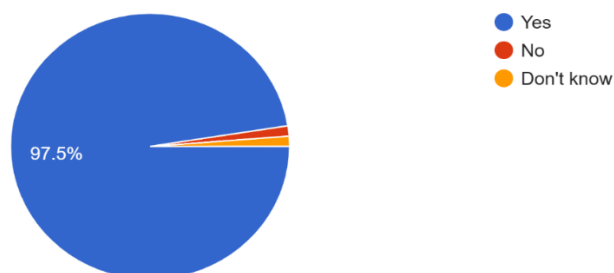
161 responses



Regarding the maintenance of proper oral hygiene, 97.5% agreed that it is highly important for diabetes patients whereas 3.5% disagreed.

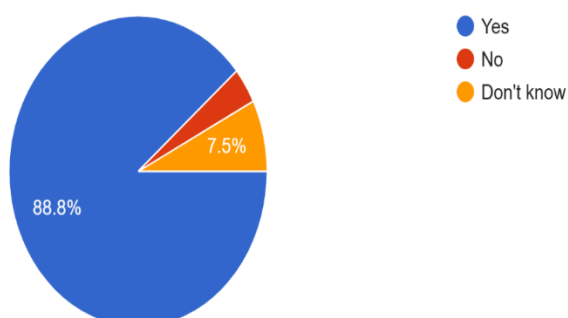
Is it important for diabetic patients to maintain proper oral hygiene

161 responses



Healthy gums can be maintained by controlled Diabetes

161 responses

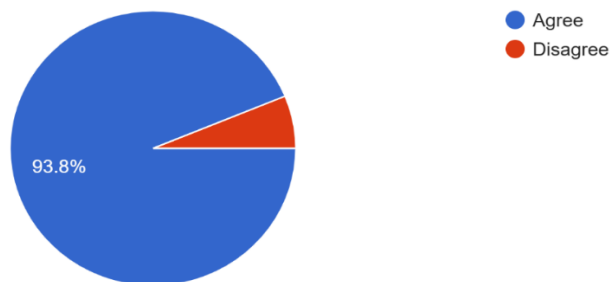


When asked about healthy gums can be maintained by controlled diabetes 88.8% agreed while 7.5% were uncertain and 3.7% disagreed. Approximately 93.8% participants reported that glycaemic control influences periodontal treatment outcomes however 6.2% denied any association between glycaemic control and periodontal therapy.

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Glycemic control influences periodontal treatment outcome

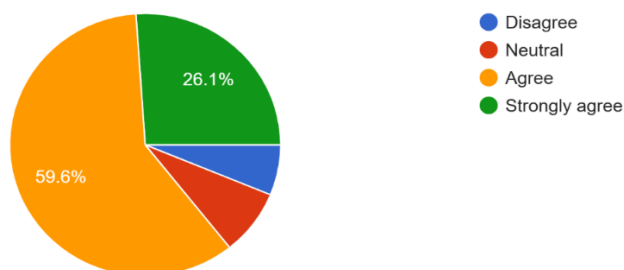
161 responses



All respondents expressed that it is essential to educate diabetes patients about the effects of diabetes mellitus on oral health and emphasize on good oral hygiene maintenance. 59.6% individuals agreed in favour of educating diabetic patients, 26% strongly agreed, 85 neutral and 6.2% are uncertain.

Diabetic patients should be educated about oral hygiene maintenance

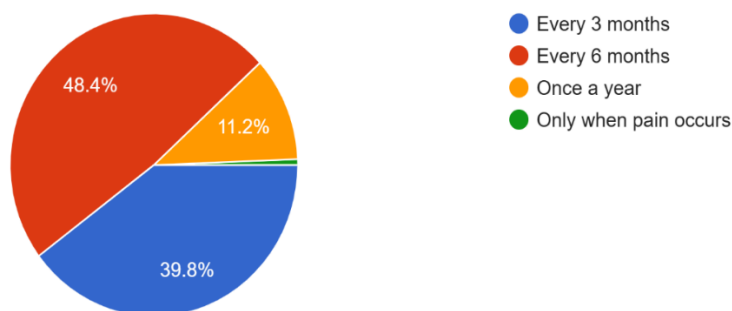
161 responses



Concerning the frequency of dental visits recommended for diabetes patients, 39.9% suggested visits every three months, 48.4% suggested visits every six months, 11.2% suggested once a year visit and a small proportion 0.6% suggested to visit only when pain occurs.

Frequency of dental visits recommended for diabetic patients is

161 responses

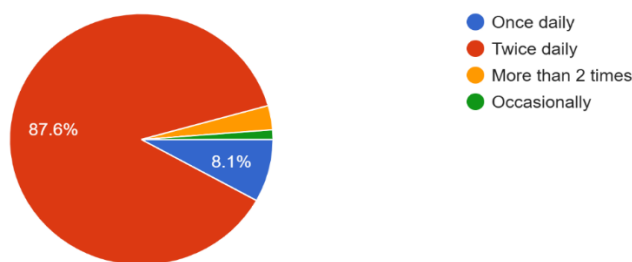


Regarding the frequency of toothbrushing among diabetes patients 87.6% respondents believed that diabetic patients should brush twice daily, 8.1 % recommended once daily and 4.3% suggested more than two times daily.

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How many times a diabetic patients should brush their teeth

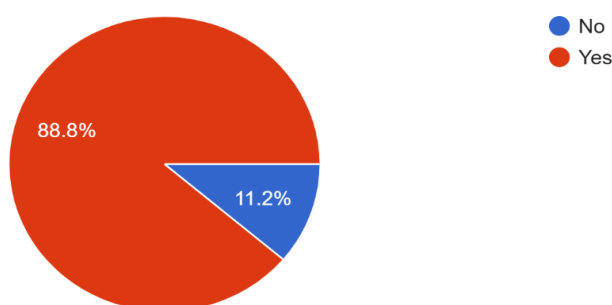
161 responses



A majority of students 88.8% recommended the use of adjunctive oral hygiene aids such as mouthwash, dental floss, etc. for diabetic patients whereas 11.2% did not consider these aids to be mandatory.

Is it recommended to use any other oral supplemental cleaning aids (mouthwash, dental floss, etc) in diabetic patients

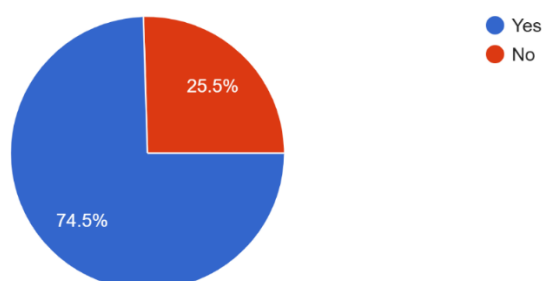
161 responses



In this study we get to know that 74.5% of students had examined diabetic patients during their clinical postings, while 25.5% had not encountered any diabetic patients during their clinical postings. The participants included students from the first year through internship.

Have you examined diabetic patients during your clinical postings

161 responses

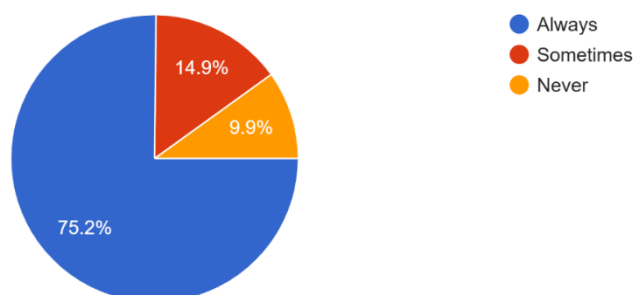


Among all undergraduate students 75.2% consistently obtained a medical history related to diabetes prior to initiating dental treatment. In contrast, 14.9% reported taking medical history only sometimes and 9.9% admitted that never recorded medical history before performing dental procedures.

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Do you take medical history related to diabetes before dental treatment

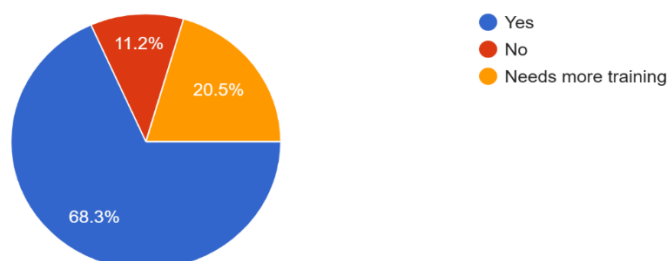
161 responses



This study reflects that 68.3% of students felt confident in managing oral health problems in diabetes patients however 20.5% expressed the need for additional training and 11.2% reported a lack of confidence in managing such cases.

Do you feel confident managing oral health problems in diabetic patients

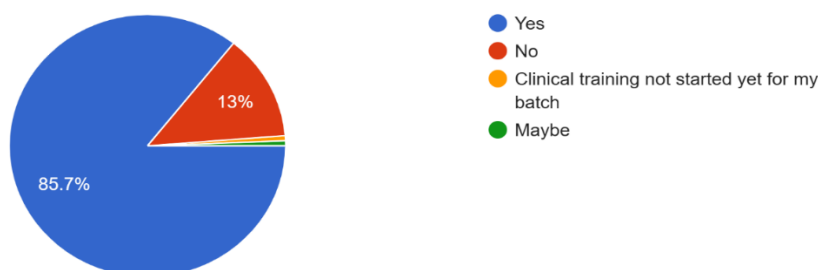
161 responses



Regarding the need for further skill development, 85.7% of undergraduate students emphasized the for additional clinical training or workshops focused on the management of diabetic patients. Meanwhile 13% students believed they were sufficiently confident and rest 1.3% had not yet begun their clinical training.

Would you need more clinical training or workshop for managing diabetic patients

161 responses



Study illustrates the various sources from which undergraduate students gained knowledge regarding the association between oral health and diabetes mellitus. The majority of participants (40.4%) reported that their understanding was derived from undergraduate curriculum additionally 31.7% acquired knowledge

through clinical postings, while 14.9% cited social media as their source of information. A smaller proportion of students obtained knowledge from workshops and seminars (4.5%) and other sources (5.6%). Furthermore, the present study assessed the students self-evaluated knowledge regarding oral health

care for diabetic patients. Among them 36.6% rated their knowledge excellent, 46% as good, 12.4 % as average and 5% as poor.

Good oral health is a reflection of Overall general health of an individual [13]. Oral health is intensively connected to general and overall health of an individual. Continuous exposure to infectious agents in the oral cavity may contribute to the progression of systemic diseases. Therefore, it is essential to have adequate knowledge and awareness regarding systemic conditions and their impact on oral health, as well as their appropriate management. Those individuals with diabetes mellitus exhibit greater chances of periodontal disease when compared to non-diabetic individuals. The prime reason for this is the oral education through various means such as advertisements, hospital-based programs, pamphlets, health magazines and counselling provided by the dental professionals.

In this questionnaire - based study, many respondents demonstrated the awareness of the correlation between oral health and systemic health. Previous studies have reported that in maximum cases diabetes patients are more susceptible to conditions such as periodontitis, tooth loss, dental caries, delayed wound healing, xerostomia, halitosis, oral candidiasis, burning sensation and other common oral lesions. Although several participants were aware of these complications, overall awareness regarding oral health maintenance remains insufficient.

Common dental treatment modalities

Morning appointments are mostly preferred in diabetes patients, as endogenous cortisol levels are typically higher during the early hours of the day. Patients should be advised to take their regular medications and insulin dosages as prescribed, along with a proper breakfast, prior to attending dental appointments. The dental clinic should be equipped with a glucometer for monitoring blood glucose levels and also readily available with oral glucose and injectable glucose to manage potential hypoglycaemic episodes. Adequate blood glucose level of the patient should be assured at the time of appointment. A comprehensive medical history should be obtained before initiating any dental procedure so that it can provide detailed information regarding the patient's lifestyle, diabetes status, possible triggers, risk factors for hypoglycaemia as well as guidance for appropriate management.

Conclusion

The findings of the current study reveal that more than 80% of the respondents possess adequate knowledge and awareness regarding oral health and its association with diabetes mellitus. Good knowledge contributes to the development of a positive attitude. Healthcare professionals including dentists, general physicians as well as endocrinologists should undertake special initiatives to increase public awareness about the oral

manifestations and complications associated with diabetes mellitus. Such efforts can help minimize the risk of oral diseases and promote a healthier life.

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