

## Diabetes mellitus patients' knowledge, attitude and awareness on oral hygiene at Kanpur: A cross-sectional study

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### Abstract

**Aims:** This study aimed to assess the knowledge, attitude, and awareness of patients with diabetes mellitus, and their oral hygiene practices, in Kanpur, India. **Materials and Methods:** The study was performed in 2 months and involved 244 patients diagnosed with diabetes mellitus, undergoing dental treatment to which a questionnaire was distributed. The resulting data were evaluated using statistical software and the frequency of distribution was calculated, followed by the percentage. **Results:** The knowledge of diabetics about their increased risk for oral diseases, and dryness of the mouth was significant. Regarding participants' sources of information about their oral health, the majority of the participants had received the information from their dentist (51.7%). **Conclusions:** The results of this study show decreased awareness of diabetic patients about their increased risk for oral diseases.

**Keywords:** Awareness, attitude, diabetes, knowledge, oral health.

### Introduction

"A group of metabolic diseases that consist of hyperglycemia resulting from defects in insulin secretion, insulin action, or both," is how the American Diabetes Association explains diabetes mellitus. Polyuria, polydipsia, weight loss, and occasionally polyphagia and blurred vision are signs of diabetes mellitus. These symptoms can also include growth impairment and a higher risk of contracting specific infections.<sup>1,2</sup> Long-term complications of Diabetes mellitus may include retinopathy, nephropathy, neuropathy, macrovascular disease, and altered wound healing. The most common oral complication of diabetes mellitus is periodontal disease, which has also been labelled as the "sixth" complication of diabetes mellitus.<sup>2</sup> Based on etiology, diabetes mellitus has been classified as Type 1 diabetes, Type 2 diabetes, gestational diabetes, and other specific types.<sup>3,4</sup> The number of diabetic individuals is increasing worldwide. According to the World Health Organization (WHO), the number of

diabetics worldwide is estimated to increase to at least 366 million by 2030, as compared to the previously estimated number of 30 million in 1985.<sup>5</sup> Also, a warning has been issued by the WHO that India will be the "diabetes capital of the world" as the present 30-33 million diabetics in India is estimated to increase up to 74 million by 2025.<sup>6,7</sup>

Despite diabetes mellitus's growing prevalence across the globe, little is known about diabetics' awareness of and attitudes regarding their elevated risk for oral diseases, oral hygiene habits, and awareness sources.<sup>8</sup> Hence, this study was designed to assess the knowledge, attitude, and awareness of diabetes mellitus patients about their oral health, in Kanpur, India.

## Material and methods

### Study design and study population

This institutional, cross-sectional study was performed for a two-month duration; data on 244 oral lesions of diabetes mellitus patients were collected from the Department of Oral Medicine & Radiology. The study included demographic data of all patients. The study protocol was approved by the institutional ethical board. Written informed consent was obtained from all the patients. Data were collected throughout two- months using a self-administered structured questionnaire and validated through a pilot survey.

### Inclusion and exclusion criteria

Patients aged 20–60 years of both sexes suffering from any systemic diseases other than diabetes mellitus were excluded from the study. The participants could read and write and were free from any mental disabilities.

### Statistical analysis

The data obtained were analysed using SPSS software<sup>17</sup> (SPSS Inc., Chicago, IL, USA). The frequency of distribution was calculated, followed by the percentage.

## Results

Of the 224 patients who participated in the study, 149 (61%) were males and 75 (38.9%) were females. Of the total participants, 52.2% were recently diagnosed with diabetes mellitus in less than 5 years of time period, 25.4% since 5 – 10 years. [Table-1].

Table 1: Characteristic of the diabetes patients

Characteristic	Frequency	Percentage (%)
Gender		

Male	149/224	61%
Female	75/224	33.4%
Duration of disease(years)		
<5	117/224	52.2%
5-10	57/224	25.4%
11-20	28/224	12.5%
>20	15/224	6.6%

The percentage of participants with knowledge of various oral complications associated with diabetes was dryness of mouth (25.00%), tooth decay (24.1%), gingival bleeding (16.9%), infections (13.8%), participants were aware of all the oral complications associated with diabetes.[Table -2]

Table 2: Knowledge of diabetic patients about oral complications

Oral complications	Frequency	Percentage (%)
Dryness of mouth	56	25%
Teeth caries	54	24.1%
Oral infections	31	13.8%
Oral ulcers	15	6.6%
Gingival bleeding	38	16.9%
Oral soreness	12	5.3%
All of the above	18	8%

Regarding patient attitudes, 46.8% preferred to consult a dentist for their oral problems while 45% preferred to visit a general physician for their oral problems whereas 02.01% of participants tend to treat their oral problems with homemade remedies. [Table-3]

Table 3: Attitude of diabetic patients toward oral health

Oral health problem	Frequency	Percentage (%)
Consult physician	101	45%
Consult a dentist	105	46.8%
Self-remedy	04	1.7%
No cure	14	6.25%

As far as the patient's sources of information about their oral health are concerned, 51.7% of the patients had received the information from their dentist, 10.04% from their diabetologist, 21.8% from mass media. [Table 4]

Table 4: Awareness of patients towards oral health information

Source of information	Frequency	Percentage (%)
Dentist	116	51.7%
Diabetologist	22	9.8%
Family and friends	36	16%
Mass media	49	21.8%

## Discussion

Diabetes mellitus (DM) is a multisystemic metabolic disease typified by abnormalities in the metabolism of fats, proteins, and carbohydrates. The primary biochemical characteristic of this illness is hyperglycemia, which can be brought on by alterations in insulin activity, pancreatic dysfunction, or both. The term "Diabetic complications" refers to the broad multisystem damage caused by chronic hyperglycemia. These complications include retinopathy, neuropathy, nephropathy, macrovascular disease, and delayed wound healing.<sup>8</sup>

Diabetes is an important medical issue that will likely affect 300 million people worldwide by 2025 and at least 366 million by 2030. It represents a significant global public health burden.<sup>9</sup>

Type 1 disease includes type A (immune-mediated) and type B (idiopathic) DM. Type 2 includes the most common form, which combines insulin resistance and the insulin secretory defect. Other specific forms are diabetes secondary to autoimmune endocrinopathies, infections (congenital rubella, cytomegalovirus, coxsackie virus), genetic disease, and DM induced by drugs or pregnancy.<sup>10,11</sup>

Diabetes mellitus alters the cellular microenvironment in multiple organ systems, oral cavity is not an exception. Diabetes has profound effects on oral tissues, particularly in individuals with poor glycemic control as 1st described by Seifert in 1862. The oral problems in diabetics include gingivitis, periodontitis, fungal infections, dental caries, enamel hypoplasia, tooth sensitivity, crackling of oral mucosa, angular cheilitis, xerostomia, taste dysfunction, salivary

dysfunction, neurosensory dysfunction, lichen planus, burning mouth syndrome, premalignant lesions and malignancy.<sup>11</sup>

Despite the increasing trend in the prevalence of diabetes mellitus, little information is available on the knowledge and attitude of diabetics towards their increased risk for oral diseases. This study used a questionnaire that aimed to determine the knowledge, attitude, and awareness of diabetic patients about their oral health. Surprisingly, 25% of participants in the current study were unaware of the type of diabetes they had, despite Type 2 diabetes accounting for more than half of the individuals.

The data presented in this study reveals an important finding that diabetics have more knowledge about their increased risk for systemic complications associated with diabetes than they do for oral and dental complications. The knowledge of diabetics about their increased risk for oral diseases was low, similar findings were reported by several other researchers who also demonstrated that diabetics had more knowledge about their increased risk for systemic complications than they had about their oral and dental complications, like in the study done by Swati K et al.<sup>1,12</sup>

In this study, most of the diabetics preferred visiting dentists for their oral health problems, while few of the patients still preferred to visit a general physician whereas in the study conducted by Swati K et al, 57% preferred to consult a dentist for their oral problems while 41% preferred to visit a general physician.<sup>1</sup> The findings indicate that diabetic patients need to be educated about the impact of oral health on their overall general health and vice versa. This can help in minimizing the oral complications associated with diabetes mellitus and thus can help in improving their quality of life.

### **Conclusion**

Diabetes has a significant impact on dental health. Dental care should be a part of primary healthcare for patients with diabetes, as there is growing evidence of oral complications in this population. To prevent complications, lower the burden of systemic inflammation, avoid morbidity and mortality, and ultimately enhance the quality of life for diabetic patients, it is critical to provide them with proper oral care. Given the close connection between diabetes patients' oral health and overall health, dental and medical personnel who are in charge of their care should communicate more frequently. Dental practitioners must arrange programs that can aid in education and raise public awareness of the value of maintaining good oral health. **References**

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