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# Awareness of Oral Health in Adult Diabetic Patients in South Chennai – A Questionnaire Study

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**Abstract:** *Aim and Objectives:* To assess the attitude and awareness of oral health among adult diabetic patients in south Chennai, India. *Materials and Methods:* The study participants comprised of 150 adult diabetic patients in south Chennai. The information was collected from each participant through structured questionnaire regarding attitude and awareness towards oral health. Pearson correlation coefficient test was used to assess the validity and reliability of questionnaire and any  $P \leq 0.05$  was considered as statistically significant. *Results:* The study revealed limited dental care practices among the participants, with a significant 42.7% visiting a dentist only once a year and 11.3% never visited dentist. Daily oral care routines were suboptimal, with low knowledge of proper dental care practices. Most concerning 69.3% participants were unaware of the link between diabetes and oral health, leading to 68.7% of participants with lack of confidence in managing oral health while dealing with diabetes. Lifestyle factors, including tobacco and alcohol use, were prevalent and could exacerbate oral health issues. *Conclusion:* This study highlights the need for improved education, access to dental care, and better oral hygiene practices among individuals with diabetes in Chennai. Comprehensive oral health education programs tailored to their unique challenges are essential to enhance their overall well-being and quality of life.

**Keywords:** diabetes, oral health, awareness, dental care, lifestyle factors, education, quality of life.

## I. INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels, affecting millions of people worldwide. The escalating prevalence of diabetes has not only raised concerns about its direct health consequences but has also highlighted the multifaceted nature of its associated complications.<sup>1</sup> Among these complications, one that has gained increasing recognition is the impact of diabetes on oral health.<sup>2</sup>

Diabetes can significantly compromise oral health, leading to conditions such as periodontal disease, dental caries, and a range of other oral problems. Periodontal disease, which involves the loss of tooth-supporting tissue, is the sixth most common complication of diabetes.<sup>3</sup> Poorly controlled blood sugar levels are associated with gum problems, tooth loss, and bone loss around the teeth due to various factors like altered immune response, changes in oral microorganisms, and genetic predisposition. Diabetes and periodontal disease have a mutual relationship influenced by inflammatory processes. Diabetes increases the risk of cavities on tooth roots compared to the visible part of the teeth, and local and systemic factors in diabetes patients can make them more susceptible to infections like candidiasis.<sup>4</sup>

Dry mouth and reduced saliva production are common in diabetic individuals, along with other sensory issues like burning mouth syndrome, taste disturbances, and difficulty swallowing. Oral health, as an integral component of overall well-being, plays a pivotal role in an individual's quality of life. Poor oral health not only hampers one's ability to chew and digest food but also has broader implications on an individual's social interactions and self-esteem. For diabetic patients, the relationship between diabetes and oral health is particularly significant.<sup>5</sup> Elevated blood sugar levels can lead to impaired saliva production, altered immune responses, and a greater susceptibility to oral infections. Conversely, oral infections and inflammation can affect glycemic control, potentially exacerbating diabetes-related complications. Chennai, the capital of Tamil Nadu in South India, is home to a diverse population, and the prevalence of diabetes in the region has been on the rise.<sup>6</sup> The management of diabetes necessitates a holistic approach, encompassing not only glycemic control but also the prevention and management of associated complications, including those affecting oral health. However, awareness about the interplay between diabetes and oral health is still relatively limited, both among diabetic patients and healthcare providers in Chennai.<sup>7</sup> This study seeks to address this knowledge gap by investigating the level of awareness regarding oral health in diabetic patients residing in Chennai.

## II. MATERIALS AND METHODS

A questionnaire study was carried out among 150 adult diabetic patients in south Chennai. A specially prepared structured questionnaire was used to assess the attitude and awareness of oral health among adult diabetic patients in south Chennai. Ethical clearance for the survey was obtained from the university research committee. The questionnaires could be returned by mail or in-person. The patients were informed about the anonymous processing of the questionnaires. A total of 15 questions were included. Statistical analysis was performed using Pearson correlation coefficient test to know the validity of the questionnaire and any  $P \leq 0.05$  was considered statistically significant.

## III. RESULTS

Of all the 150 adult diabetic patients enrolled in the study, the age range of the participants spanned from 35 to 68 years, with an average age of 47. Among the participants, 52.7% were females, and 47.3% were males. In terms of oral health history 42.7% visited dentist for regular checkups and cleaning once a year, 26% of them visited 6 months once and 11.3% had never visited dentist (figure 1). When questioned about their oral health, 53.3% of individuals reported experiencing cavities, while 44.7% indicated gum disease, 37.3% mentioned tooth sensitivity, and 43.3% reported toothache (Figure 2). Regarding symptoms majority, 56.7% reported experiencing dry mouth, 58.7% noted changes in their taste or persistent bad breath. Additionally 56.7% of participants reported experiencing burning or tingling sensations in their mouth (Figure 3). A significant proportion of the participants in the study reported various oral health issues. Notably, 71.3% experienced gum bleeding during their oral hygiene routines, while 54.7% observed redness, swelling, or tenderness in their gums. Gum recession, where the gums pull away from the teeth, was noted by 58.7% of the participants (Figure 4). Alarmingly, a large majority, 78%, were not aware of different tooth-brushing techniques and 55.3% admitted to never practicing dental flossing. Additionally, 46% did not use mouthwash, Furthermore 61.3% reported they do not use tobacco products and 39.3% of the participants reported using and consuming alcohol (Figure 5). Majority 69.3% of individuals had not received any information or education about the connection between diabetes and oral health, 68.7% lacked confidence in their knowledge of how to effectively care for their oral health while managing diabetes (Figure 6).

## IV. DISCUSSION

The study revealed several significant findings related to the awareness and dental care practices of the participants. One notable aspect was the lack of consistent dental care practices among them. A considerable 42.7% visited a dentist for regular check-ups and cleanings once a year, suggesting room for improvement in dental care for individuals with diabetes. Equally concerning, 11.3% had never visited a dentist, indicating a potential gap in awareness and access to dental care. It's worth noting that our study reported a higher percentage of individuals visiting the dentist once a year (42.7%) compared to the study conducted by Bowyer et al. (25.6%) [8]. regarding daily oral care routines, our study showed a higher percentage of participants brushing their teeth two or more times a day (78.4% in our study compared to 67.2% in the Bowyer study) [8]. Interestingly, both studies found that only a relatively small percentage of individuals flossed at least once a day (40.7% in our study and 15.3% in the Bowyer study) [8]. The most significant difference was related to receiving advice on oral hygiene in the context of diabetes. Our study found that a vast majority (69.9%) of participants had not received such advice, which aligns with the findings in the study by Bower et al. (69.3%) [8]. Over half of them experienced dry mouth (xerostomia), and a significant majority noticed changes in taste or persistent bad breath (halitosis). These symptoms can significantly affect their quality of life and overall oral health. Gum health was another area of concern, with a substantial proportion reporting issues. Gum bleeding during oral hygiene routines was observed by 71.3% of participants, and over half noticed redness, swelling, or tenderness in their gums. In a study by Orlando et al. [9] in the USA, plaque or tartar buildup was a problem for 33%. Furthermore, a concerning 58.7% reported gum recession. These findings highlight the need for increased awareness and education regarding gum health, particularly among individuals with diabetes, who are more susceptible to gum problems. A study by Shreenivas S et al. [10] found that 78% had a good understanding that controlling diabetes is essential for maintaining healthy gums. The study also revealed a lack of knowledge about proper dental care practices. A significant majority (78%) were unaware of various tooth-brushing techniques, and over half (55.3%) did not engage in dental flossing, a crucial practice for maintaining oral health. Additionally, a notable portion (46%) did not use mouthwash, which could be an additional element in their oral hygiene routine. Notably, the study uncovered lifestyle factors that can impact oral health, with 38.7% of participants using tobacco products and 39.3% consuming alcohol Indrapriyadharshini k et al [11]. These behaviours can exacerbate oral health issues, and their prevalence among diabetic individuals underscores the need to address these risk factors. Research by Oyapero et al. [12] yielded similar findings regarding the negative effects of smoking and alcohol usage on oral micro flora and their association with periodontal disease.



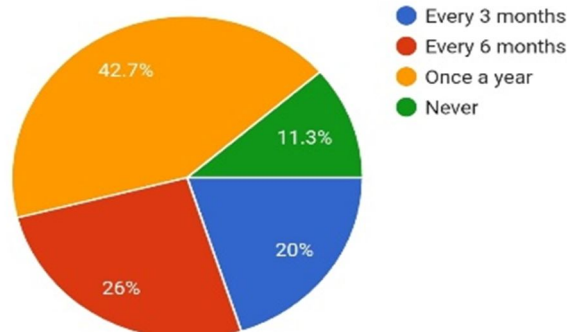
Perhaps the most striking finding was the lack of information and education regarding the connection between diabetes and oral health, with 69.9% of participants reporting that they had not received any such guidance. This knowledge gap also translated into a lack of confidence among 68.7% of participants in managing their oral health while dealing with diabetes. Karikoski et al. [13] have been reported to implement more healthcare programs for better control, regular check-ups, and treatment of dental problems, as well as monitoring and managing the underlying factors of diabetes.

## V. CONCLUSION

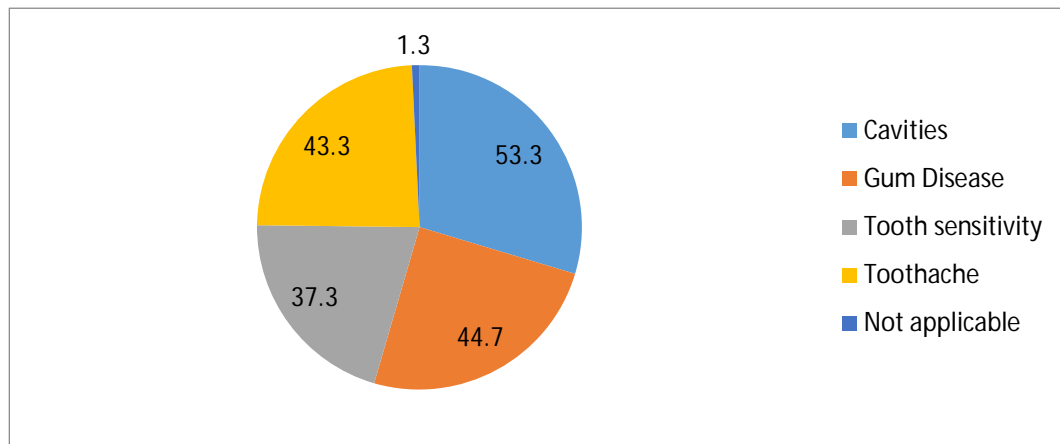
In summary, the study highlights a lack of awareness and inconsistent dental care practices among individuals with diabetes in Chennai. It underscores the need for improved education, access to dental care, and a focus on better oral hygiene practices to enhance the overall well-being of this population. The study also emphasizes the importance of addressing lifestyle factors, such as tobacco and alcohol use, and the need for comprehensive oral health education programs tailored to the unique challenges faced by individuals with diabetes in the region. By addressing these challenges, we can significantly enhance the overall well-being and quality of life for individuals living with diabetes in the region.

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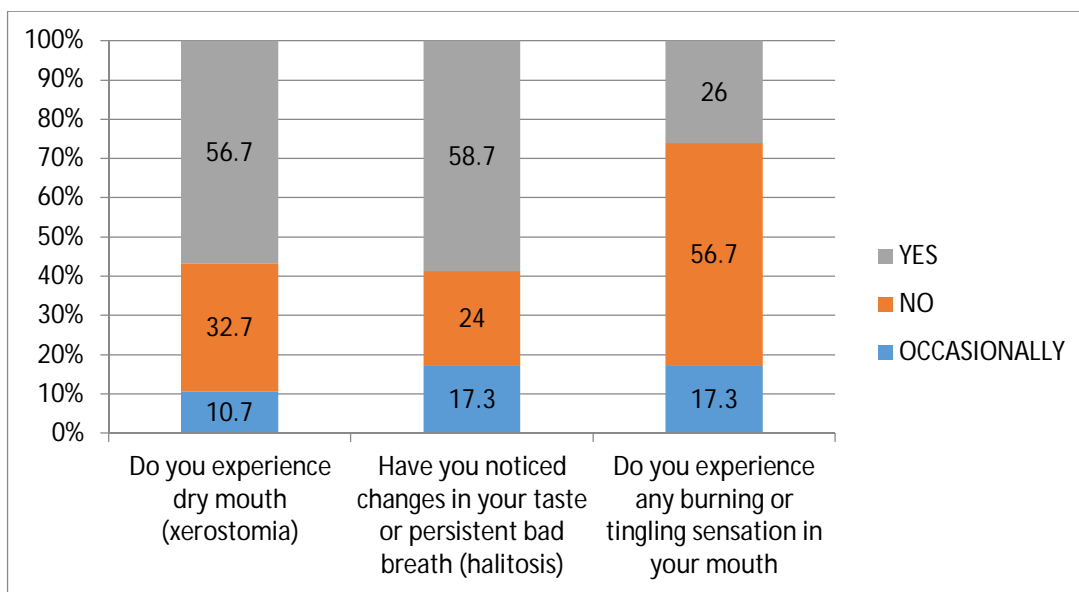
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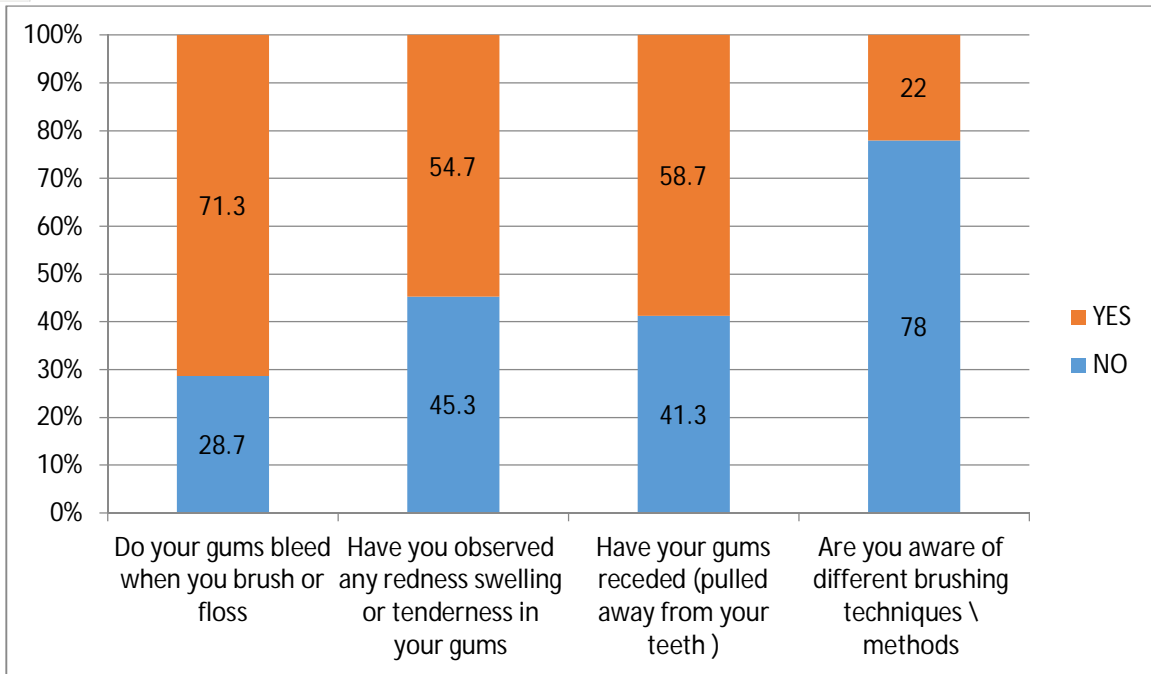
(FIGURE 1)



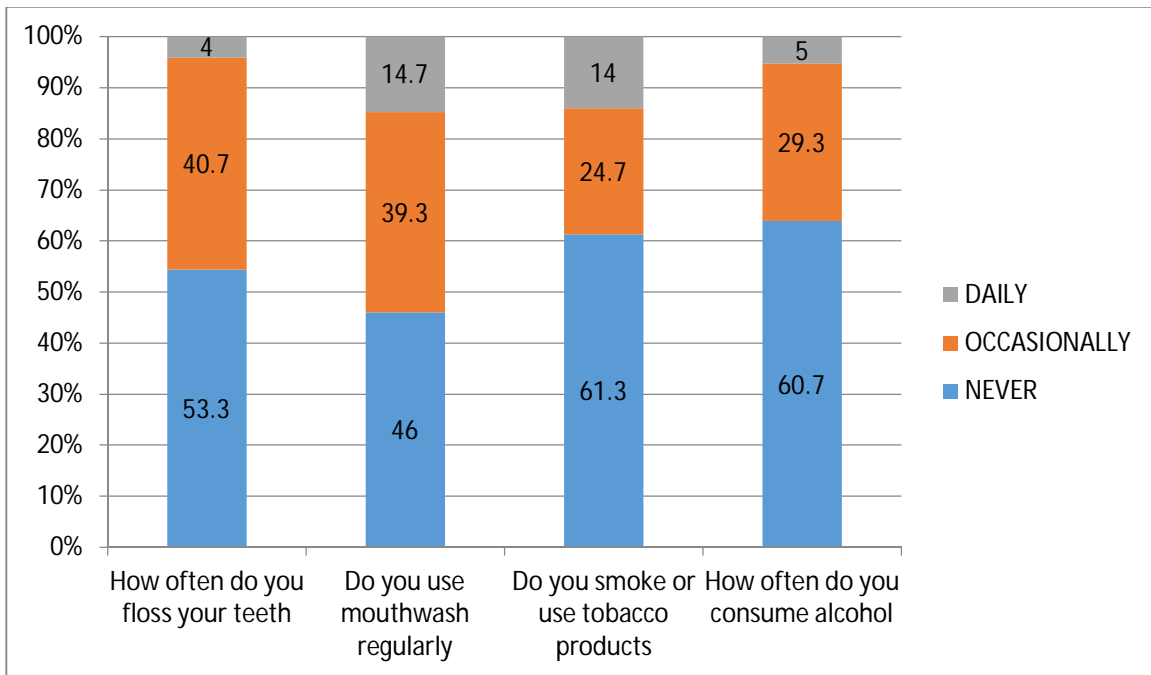
(FIGURE 2)



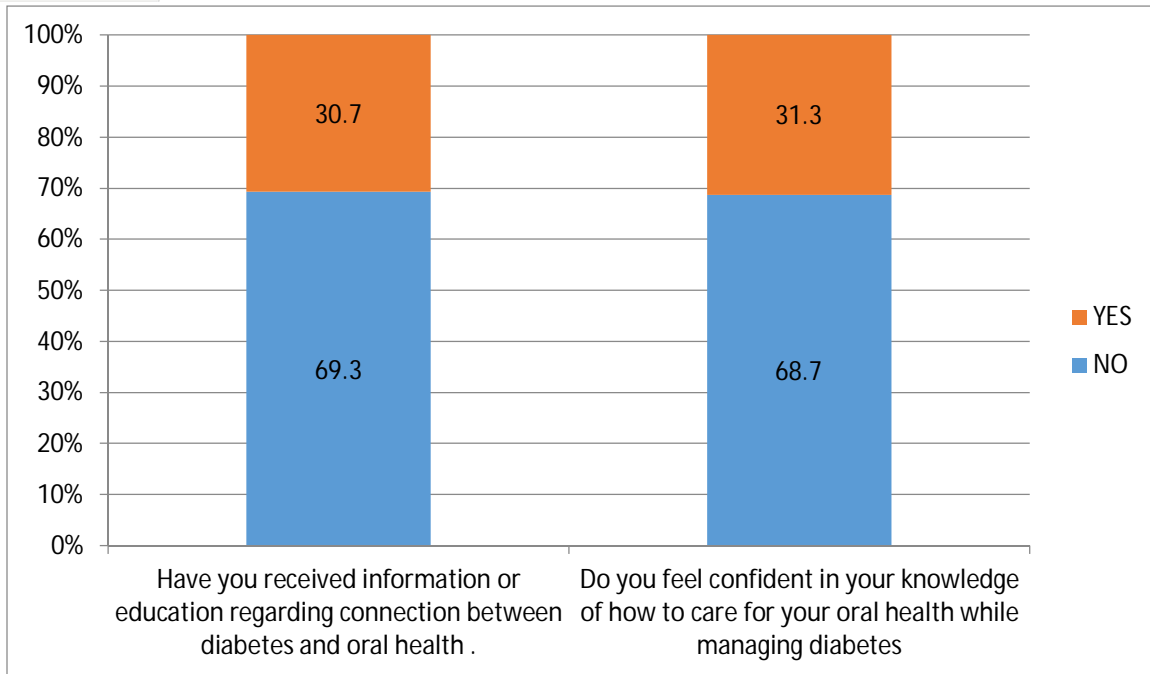
(FIGURE 3)



(FIGURE 4)



(FIGURE 5)



(FIGURE 6)



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