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ORAL HEALTH KNOWLEDGE, ATTITUDE, AND PRACTICES AMONG TYPE-2 DIABETICS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Diabetes mellitus represents a growing global health crisis, with its incidence rising rapidly worldwide. It is characterized by the body's impaired ability to effectively utilize insulin, often associated with lifestyle factors such as obesity and sedentary behaviour. Despite the significant risks, many individuals with diabetes remain unaware of the oral health challenges related to their condition and the importance of preventive care. This study underscores the urgent need to enhance awareness and understanding of oral health among diabetic patients. Maintaining good oral hygiene is crucial in preventing and managing gingival and periodontal infections, which tend to be more severe in individuals with diabetes.

Aims & Objectives: The primary aim of this study is to assess the oral health status of individuals diagnosed with Type 2 diabetes mellitus and evaluate their knowledge, attitudes, and practices concerning oral health.

Methodology: A cross-sectional study design was employed to investigate the oral health status and survey the knowledge, attitudes, and practices of individuals with Type 2 diabetes mellitus. The World Health Organization's Oral Health Assessment form was utilized, complemented by a self-developed, close-ended, pre-validated questionnaire. Statistical analysis was conducted to interpret the collected data.

Results: The results indicate a significant deficiency in knowledge among diabetic patients regarding the oral health complications associated with their condition, as well as the importance of proper preventive care. This highlights the critical need for educational initiatives aimed at improving the understanding and attitudes of diabetic patients towards the oral health risks linked to diabetes. **Conclusion:** Overall, individuals with diabetes exhibit limited awareness and inadequate practices concerning oral health. It is essential to educate diabetic patients about their heightened risk for oral health issues, encourage better oral health practices, and ensure they have access to appropriate dental care.

KEYWORDS: Attitude, Dental health-care, Diabetes, Knowledge, Oral health, Practices.

INTRODUCTION

Diabetes mellitus (DM) is increasingly becoming a global health issue, with its prevalence rising at an alarming rate. Between 1985 and 1995, the number of people with DM surged from 30 million to 135 million, and it is projected to reach 366 million by 2030. This growing concern is particularly pronounced in the Indian subcontinent, where the World Diabetes Atlas reports that approximately 51 million people are currently living with DM. The escalating rates of DM have drawn significant attention from healthcare professionals, including both general practitioners and dentistry[1]. People with diabetes experience a range of oral health issues, including changes in salivary gland function, neural functions, periodontal tissues, and the oral mucosa. Women with pre-existing diabetes or gestational DM also face hormonal changes that can severely impact periodontal health[2]. DM is a recognized risk factor for gingivitis and periodontitis, both of which are highly prevalent and severe among diabetics. Poor glycemic control in individuals with DM can lead to increased gingival inflammation in response to bacterial plaque, a condition less severe in well-controlled diabetics or those without DM. Additionally, hyperglycaemia raises glucose levels in the gingival crevicular fluid, which can significantly affect the healing of periodontal wounds by altering cell-matrix interactions within the periodontium[3].

Given these risks, it is vital for people with diabetes to understand their heightened susceptibility to periodontal diseases (PD) and dry mouth, as well as the importance of preventing these complications through effective management strategies. Academic research highlights that improving oral health knowledge (OHK) is a critical step in fostering proper oral self-care behaviours[4]. However, simply having knowledge and a positive attitude toward oral hygiene and diabetes management does not necessarily translate into daily practice[5,6]. This disconnect is particularly concerning in India, where many people with diabetes fail to apply their knowledge and attitudes to their oral health routines, despite being aware of its importance. The objective of this study is to assess the levels of OHK and identify factors associated with adequate oral health knowledge in adults with DM. A cross-sectional study design was utilized to explore these factors and their implementation in practice.

AIM AND OBJECTIVES

1.To assess the oral health status and knowledge, attitude and practice among patient with type-2 diabetes mellitus patients.

2. To evaluate the oral health related practices with regard to diabetes-related factors.

MATERIALS AND METHODS

Source of Data: A cross-sectional study was conducted to evaluate oral health status, knowledge, attitude, and practices (KAP) among patients with Type 2 Diabetes Mellitus (T2DM) who are 35 years of age or older. This study was carried out in the outpatient Department of Oral Medicine & Radiology at Shree Bankey Bihari Dental College and Research Centre, located along Mansuri Canal in Ghaziabad, Uttar Pradesh, India.

Data Collection: The data collection process involved screening diabetic patients aged 35 greater than or equal to it and above who visited the OPD clinic for dental consultations. Participants for the study were selected using a combination of Simple Random Sampling, Purposive Sampling, or

Convenience Sampling, depending on the specific needs of the research. The final sample consisted of 96 participants, with the sample size determined based on a study by Rais N et al. (2021), which focused on the prevalence of Type 2 Diabetes Mellitus in Uttar Pradesh. Inclusion criteria required participants to be 35 years or older, diagnosed with Type 2 Diabetes Mellitus, and have at least one tooth present in the oral cavity. Exclusion criteria included patients with other systemic diseases, those who smoked or used tobacco, and individuals with intellectual impairments or difficulties with reading. Informed written consent was obtained from all participants, and the study received ethical approval from the Institutional Review Board.

Tools designed for study -

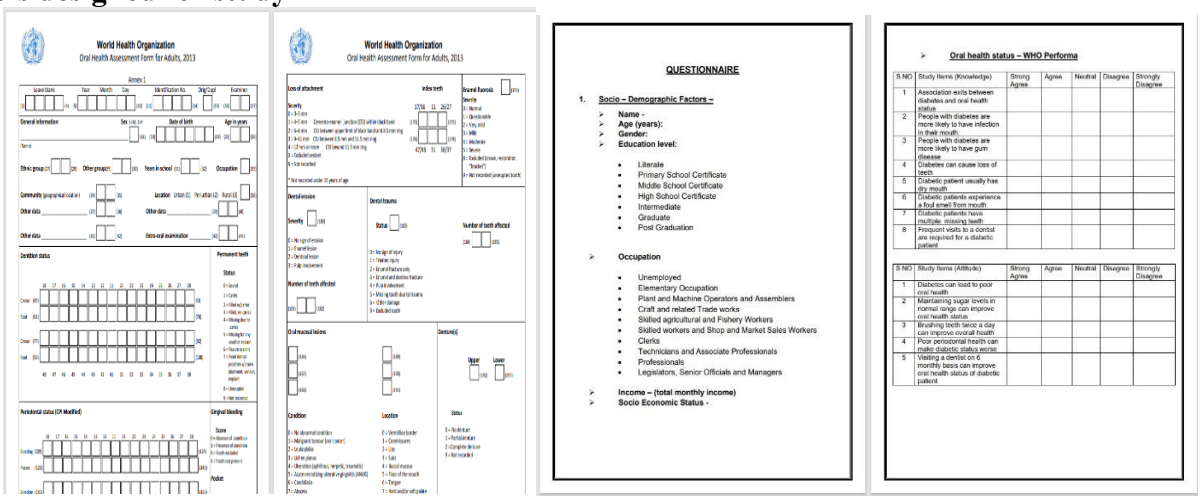


Fig. 1. Oral Health Assessment form for adults, 2013

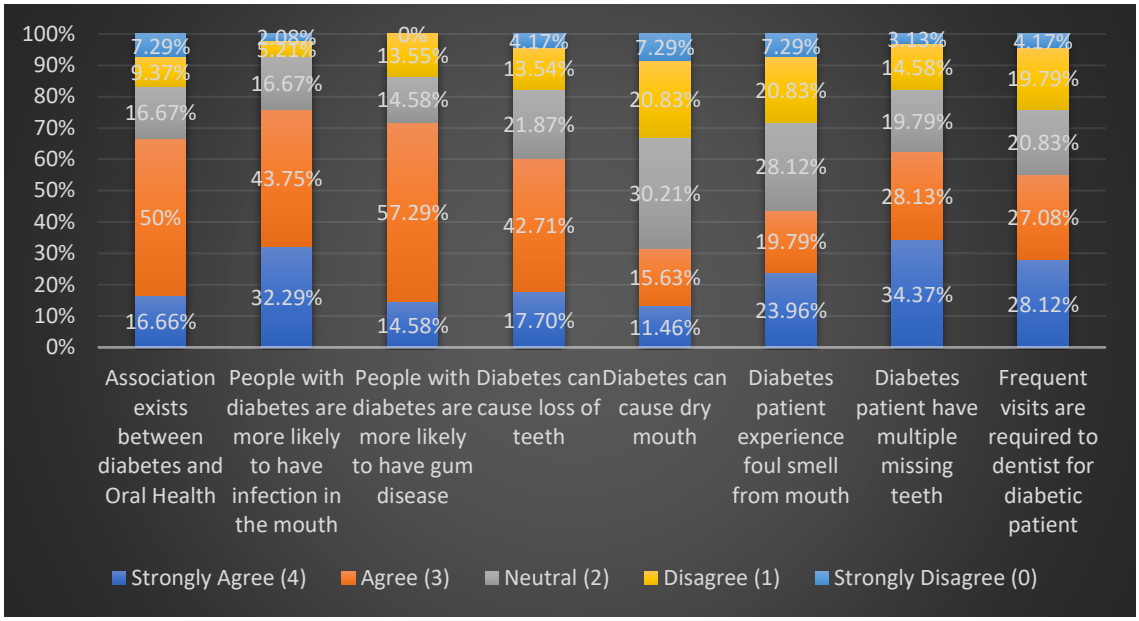
S.NO	Study Items (Practice)	Frequently	Often	Neutral	Sometimes	Never
1	Tooth Brushing twice daily					
2	Use of Fluoridated tooth paste					
3	Rinsing after every meal					
4	Use of any intra oral cleaning aid					
5	Flossing once a day					
6	Visit to a dentist every 6 month					
7	Professional scaling of teeth every 6 months					
8	Tobacco Use					
9	Alcohol Use					

Fig.2: Format of questionnaire.

A self- designed, close ended and pre valeted questionnaire for study participants (socio demographic factors (Knowledge, Attitude, Practice) based on KAP surveys.

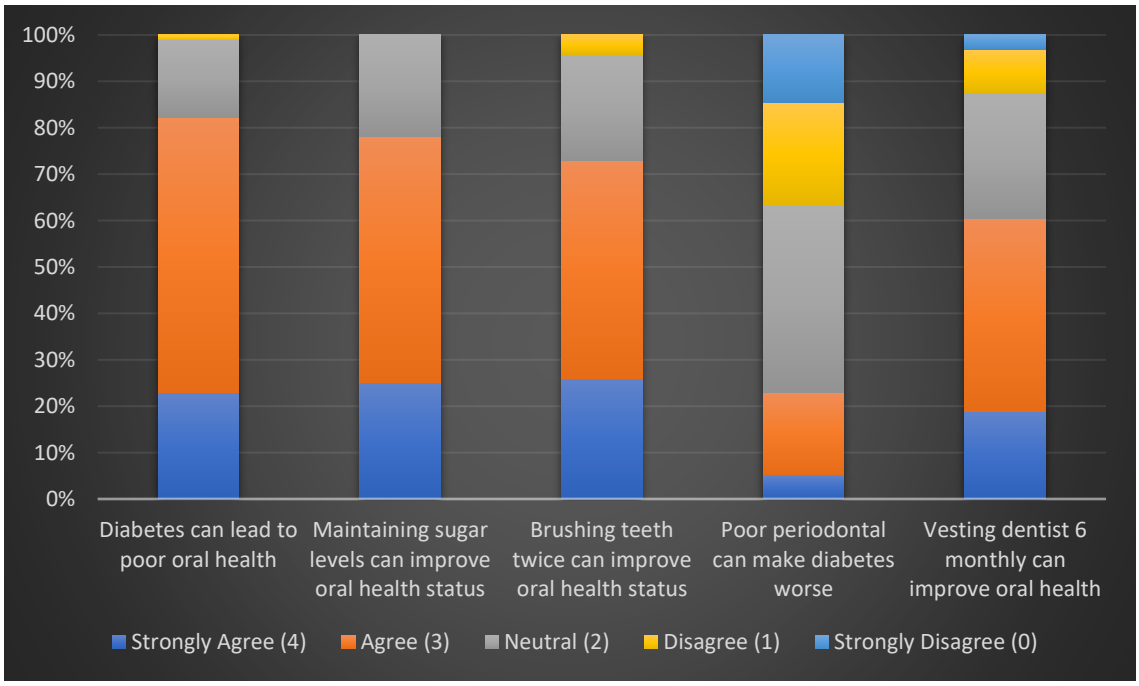
STATISTICAL ANALYSIS- The data for the present study was entered in the Microsoft Excel 2007 and analysed using the SPSS statistical software 23.0 Version. The descriptive statistics included frequency and percentage. The level of the significance for the present study was fixed at 5%. The intergroup comparison of the ordinal variable was done using Chi Square test.

RESULTS



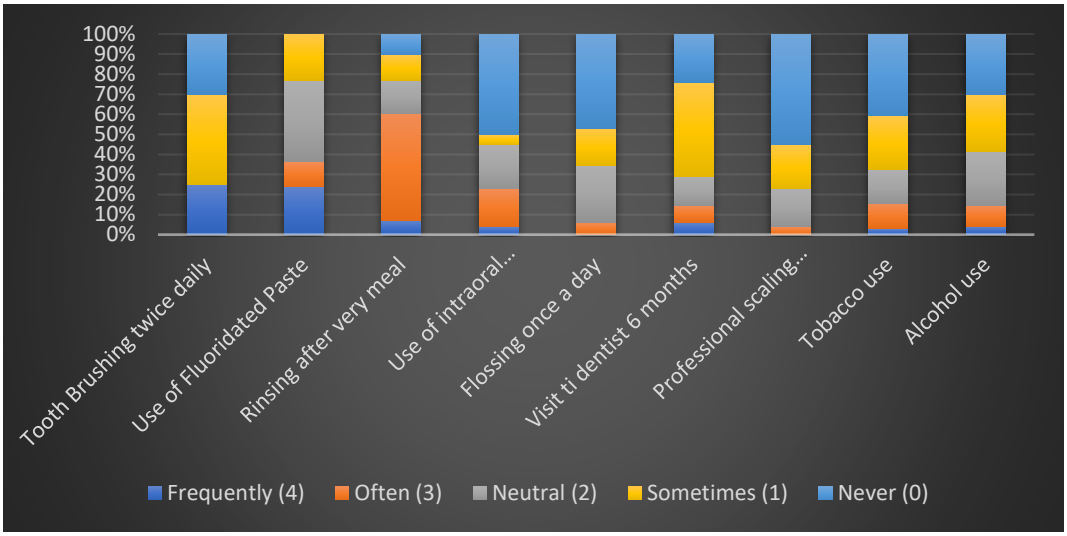
Graph.1- Oral Health Knowledge in Diabetes

In the analysis of the correlation between **Oral health (OH) knowledge and diabetes mellitus** (DM) among the 96 participants, the results were as follows- Knowledge of OH and DM: 16 participants strongly agreed, 3 agreed, 2 were neutral, 9 disagreed and 8 strongly disagreed. Awareness of the connection between DM and oral infections: 31 participants strongly agreed, 42 agreed, 16 were neutral, 5 disagreed and 2 strongly disagreed. Understanding of the link between DM and gum disease: 14 participants strongly agreed, 55 agreed, 14 were neutral,13 disagreed. Awareness of the association between DM and tooth loss: 17 participants strongly agreed, 41 agreed, 21 were neutral, 13 disagreed, 4 strongly disagreed. Understanding of the link between DM and dry mouth: 11 participants strongly agreed, 15 agreed, 29 were neutral, 20 disagreed and 7 strongly disagreed.



Graph 2 - Oral Health Attitude in Diabetes

In our detailed study of 96 participants, the findings revealed the following insights- Impact of DM on Oral Health: 22 participants strongly agreed that diabetes can negatively affect oral health. 57 agreed,16 were neutral and 1 disagreed. Role of Blood Sugar Control in Oral Health: 24 participants strongly believed that maintaining blood sugar levels can improve oral health. 51 agreed, 21 held a neutral stance. Effectiveness of Brushing Twice Daily: 25 participants strongly affirmed that brushing teeth twice daily enhances oral health. 45 agreed, 22 were neutral and 4 disagreed. Connection Between Periodontal Health and Diabetes: 5 participants strongly agreed that poor periodontal health can exacerbate diabetes. 17 agreed, 39 were neutral, 21 disagreed and 14 strongly disagreed. Importance of Regular Dental Visits: 18 participants strongly supported the idea that visiting the dentist every six months can improve oral health. 40 agreed, 26 were neutral, 9 disagreed and 3 strongly disagreed.



Graph 3- Oral Health Practice in Diabetics

In this study oral health practices of 96 subjects shown that 24 individuals are committed to the practice of brushing their teeth twice daily, while 43 do so occasionally, and 29 have never adopted this routine. Seven patients rinse after every meal frequently, 51 often do, 16 were neutral about its use, 12 practice it sometimes, and 10 have never done it. Four patients frequently use intraoral cleansing aids, 18 often do, 21 are neutral about its use, and 5 practice it sometimes, while 48 have never done it. Six patients often floss once a day, 27 are neutral about it, 18 practice it sometimes, and 45 have never done it. Six patients frequently visit the dentist every 6 months, 8 often do visits, 14 are neutral about it, 45 do so sometimes, and 23 have never visited. Four patients often go for professional scaling once every 6 months, 18 are neutral about it, 21 have gone for it sometimes, and 53 have never gone.

DISCUSSION

The current study utilized a Knowledge, Attitudes, and Practices (KAP) survey, a commonly employed questionnaire-based method in international health practices as noted in Nichter's study (2008)[7] This survey incorporates various options for treatment and prevention, along with hypotheses. Despite the prevalent use of KAP surveys for planning activities aimed at behaviour change, it is important to recognize that the assumption of a direct relationship between knowledge and behaviour may be misleading. Balshem (1993)[8] Farmer (1997)[9] and Launiala and Honkasalo (2007)[10] have demonstrated through their studies that one of the many variables impacting treatment-seeking behaviours is knowledge. To effectively alter behaviour, health programs must address multiple factors, including environmental, socio-cultural, structural, and economic aspects. Launiala A (2009)[11] affirmed in his study that KAP surveys are not only easy to conduct but also cost-effective, even on a nationwide scale.

In this study, we have evaluated the connections between various aspects of **Oral Health and Knowledge** levels of the research population, as presented in Graph-1. In our study the educational background of our participants were 8 individuals (8.33%) had limited literacy, 7 (7.29%) had completed primary school, 10 (10.42%) had passed middle school, 37 (38.54%) had finished high school and 34 (35.42%) were graduated. This aligns with a 2018 study by Baskaradoass JK (2018)[12], which similarly established a correlation between literacy and OH status. Our results on correlation between knowledge of OH and DM (Graph.1) indicated that a majority of participants affirmed this correlation, while a smaller group expressed disagreement. Concerning awareness of connection between DM and oral infections, majority of participants acknowledged it, with only a few indicating a lack of awareness. More than 80 percent of participants agreed on the link between gum diseases and diabetes, while only 15 percent disagreed. These findings align with previous studies by Allen et al.[13] and Eldarrat A (2011)[14] where DM patients' knowledge of periodontal and gingival disease risk, their attitude towards OH, and their quality of life connected to oral health were evaluated. More than thirty-three percent of the subjects in those studies knew they had a higher risk of developing PD. Eldarrat A[14] also noted that diabetes patients were highly aware of the higher risk of oral disease.

Oral Health Attitudes: In this study, the research focused on examining the attitudes of individuals with diabetes toward OH, specifically exploring the correlation between diabetes and various factors such as overall health, sugar level management, periodontal health and dental appointments. The assessment of attitudes involved participants expressing their views on perceived OH status through agreement or disagreement. The findings of the current study underscore the significance of OH care among individuals with diabetes (Graph-2), aligning with previous research conducted by Orlando VA et al[15] Their study indicated that over half of the participants (52%) recognized the importance of OH care on par with their overall health, while only a third (33%) identified plaque or tartar buildup as a concern. Additionally, other studies, such as those by Mirza KM[16] reported instances where participants denied any perceived connection between diabetes and OH.

Oral Health Care Practices: This study examined OHP, including the frequency of brushing, use of fluoridated paste, flossing, rinsing, oral hygiene habits, and dental visits among participants. The findings indicated that just under half of the participants with diabetes brushed twice a day, a result consistent with previous studies conducted by Orlando VA et al[15] Moffet HH et al[17] and OH J[18] Regarding regular flossing, use of interdental cleaning aids, and rinsing twice per day (≥1/day), only a quarter of the subjects adhered to these practices, with a majority overlooking them a trend observed in studies by Goldsmith MR, Moffet HH et [a17] and Orlando VA et al[15]. The current study data also revealed low rates of regular dental visits and professional cleaning among individuals with diabetes, aligning with earlier research conducted by Kejriwal SR, Goldsmith MR and Moffet HH[17] Dental consultation and services were notably infrequent, with a mean of 34.6% and a range of 10% to 75.60% among diabetic populations.

The outcomes of the present study on the correlation between gingival and periodontal status and DM using parameters of knowledge, attitudes, and practices, indicated that individuals with high knowledge levels, positive attitudes and consistent adherence to good oral hygiene practices exhibit a less prevalence of gingival bleeding. A parallel study conducted by Giovanni E. Salvi[19] revealed that, particularly on days 7 and 21, individuals with DM exhibited significantly lesser proportions of sites with gingival index scores of 1 and bleeding sites in comparison to those without diabetes.

CONCLUSION

The study's findings among the Uttar Pradesh population highlight significant gaps in oral health (OH) knowledge, attitudes, and practices among individuals with diabetes mellitus (DM). While some participants reported practicing basic oral hygiene, such as toothbrushing and regular dental visits, there is a clear need for improvement. The study underscores the importance of enhancing OH awareness through education and calls for targeted interventions to address the challenges of limited accessibility and high costs associated with dental care. To bridge the knowledge and practice gaps,

the study advocates for the development and implementation of an integrated approach to OH care. This approach would involve collaboration with non-dental healthcare providers to promote oral health among diabetic patients, ensuring a more comprehensive and effective strategy.

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