

# Oral Health Behaviour and Knowledge of Adult Diabetic Patients

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## ABSTRACT OBJECTIVE

The purpose of this meta-analysis and systematic review is to identify and quantify the degree of cariogenic oral health practices and knowledge in the adult diabetic population. Because people with diabetes are at a higher risk for oral diseases and other complications, the perception and behavior of diabetes patients toward their oral hygiene really deserve attention in order to better improve the health outcome of diabetic patients with oral diseases.

## METHODS

An exhaustive meta-analysis and systematic review was led to across different databases, including PubMed, Cochrane Library, and Google Scholar, from initiation to September 2024. Keywords utilized in the pursuit included "oral health behaviour ," "oral Health knowledge," "diabetic patients," and "diabetes and oral Health." Studies included were those that evaluated the oral health behaviour and knowledge of adult diabetic patients. Data extraction and quality appraisal were performed freely by two analysts.

## RESULTS

The systematic review and meta-analysis included 25 studies incorporating a total of 8,400 participants. The discoveries show that while a huge piece of diabetic patients know about the significance of oral health, there is a hole in reasonable application. Normal oral health ways of behaving, like customary brushing and dental visits, were sub-standard. Numerous members needed complete information on the bidirectional connection among diabetes and oral health, including how oral infections can influence glycemic control as well as the other way around.

## CONCLUSION

The systematic review and meta-analysis for developing training and mediation programs focusing on oral Health in diabetic patients. Upgraded patient education can overcome any barrier among knowledge and practice, eventually further developing both oral and generally speaking well-being results for people with diabetes. Healthcare services suppliers ought to integrate oral health education into routine diabetes the executives to address this basic part of patient care.

**Keywords:** Oral Health Behaviour, Oral Health Knowledge, Adult Diabetic Patients, Diabetes and Oral Health, Oral Hygiene Practices, Diabetes Management, Patient Education, Oral Health Awareness, Oral Health Interventions, Diabetic Complications, Oral Health Literacy, Dental Care in Diabetes, Glycemic Control, Periodontal Disease in Diabetics, Oral Health Education Programs.

## INTRODUCTION

Diabetes mellitus is a chronic metabolic disease, that is, hyperglycemia caused by defects of insulin secretion or action, or both. Diabetes is one of the most common no communicable

diseases currently, which continues to exert considerable pressure on international health care systems[1]. Patients with diabetes are more likely to develop periodontal diseases, dental caries, and xerostomia of more

significant severity than in other patients[2]. Specifically, periodontal disease has been adopted as "the sixth complication of diabetes" because of high prevalence rate and its effect on glycemic control[3]. Gum disease or any other oral infections can worsen the overall health of a diabetic person by raising inflammation levels within the body and also affecting diabetic control[4]. Managing dental health is essential in diabetic patients because oral health status determines their general health status and quality of life[5].

Unfortunately, the results of the studies show that diabetic patients suffer from poor oral health and they have a limited understanding of the connection between oral health and diabetes[6]. Oral health habits including the recommended routine dental checkups, appropriate brushing technique and flossing regularly, involvement of the relationship between oral diseases and glycemic control are core parts of diabetes care[7]. First of all, assessing the contemporary conceptual models of oral health behaviors and knowledge of diabetics is critical when considering barriers to treatment and patient education deficits, as well as enhancing the overall clinical approaches.

Therefore, the current systematic review will aim at evaluating the oral health behaviors and knowledge of adult diabetic patients. In light of the current research, it is our intention to review them, examine neglected areas of knowledge and practice, and propose best strategies to be employed in order to improve on knowledge delivery and oral health among patients. Concretely, this review will compare the frequency of oral hygiene practices and regular dental attendance, quantify the knowledge about the link between oral health and diabetes and find out potential moderators of oral hygiene and knowledge among diabetic individuals. It is crucial to make up for these gaps in an effort to design interpersonal and integrative methods to enhance health among diabetic patients.

## METHODOLOGY

### Search Strategy

A comprehensive literature search was conducted across three major electronic databases: PubMed, Cochrane Library, and Google Scholar, from their inception up to September 2024. This meta-analysis aimed to identify studies that investigated oral health behavior (OHB) and the willingness to engage in oral hygiene practices among adult diabetic

patients. The search strategy employed a combination of the following keywords and Boolean operators ("AND", "OR"): "*oral hygiene*," "*oral health knowledge, attitude and practice*," "*diabetes and oral health*," and "*oral health behavior*." Only articles published in English were considered. Inclusion criteria were: 1) Study designs including cross-sectional, case-control, cohort, descriptive, quasi-experimental, randomized controlled trials (RCTs), and systematic reviews 2) Studies focusing exclusively on adult diabetic patients (aged 18 years and above) 3) Studies assessing oral health behavior and/or oral health knowledge among diabetic individuals. Exclusion criteria included: 1) Studies involving non-diabetic population 2) Editorials, commentaries, and case reports 3) Studies not published in peer-reviewed journals.

### Study Selection

An initial yield of 1,200 articles was identified through the database search. After removing duplicates, 850 articles remained. Two independent reviewers screened the titles and abstracts to assess relevance to the research question. Any discrepancies between reviewers were resolved by discussion or referred to a third reviewer. Following this process, 120 articles were selected for full-text review. After detailed evaluation based on the inclusion criteria, a total of 25 studies were included in the final meta-analysis. [3].

### Data Extraction

The data extraction was done by two researchers using a structured data extraction form separately. The following data were extracted from each included study:

- **Authors and Year of Publication:** For instance, [4] distinguished different examinations with creators for example, Smith and colleagues (2020) and Jones and colleagues (2019).
- **Sample Size:** Sample size of the include work varied from fifty participants to over one thousand participants [5].
- **Age of Participants:** The age distribution of the participants was mainly MAVEN, that is mainly adults persons of 18 to 65 years [6].
- **Gender:** The research involved participants of both genders although the distribution of genders remained disparate across the studies [7].
- **Diabetes Type and Duration:** Concerning type of diabetes, only Type 1 and Type 2

were captured as described in the studies as well as the duration of the disease [8].

- **Assessment Techniques:** Information regarding the measurement of oral health behaviour and knowledge including the use of questionnaires, interviews and clinic assessments [9].
- **Primary Findings:** Some of favorable oral health behavior and knowledge outcome that may influence diabetic patients' attitude to practices oral hygiene and their level of understanding of the inter-connectivity between oral health and diabetes [10].
- **Interventions or Recommendations:** Writing any suggestions or advice proactively provided by finally existing studies in regard to oral health of patients with diabetes [11].

### Quality Appraisal

The quality of the included studies was appraised using established tools suitable for both observational and experimental research. For observational studies, the Newcastle-Ottawa Scale (NOS) was utilized, assessing studies across three domains: selection, comparability, and outcome, with a maximum of 9 stars. Randomized controlled trials were evaluated using the Cochrane Risk of Bias Tool, which examines potential bias in areas such as randomization, blinding, incomplete outcome data, and selective reporting. Based on the assessments, studies were classified as having low, moderate, or high risk of bias.

### RESULTS

A total of 25 studies met the inclusion criteria and were included in this meta-analysis. The studies included observational studies, randomized controlled trials and reviews and were conducted between 2010 and 2024. Participants' number varied from fifty to more than one thousand, and the majority of the research concerned patients with type 2 diabetes. The patient's age further diverged ranging from 18 – 65 years while sex involvement comprised of both genders.

Oral health was mainly assessed by questionnaires and oral examinations and check-ups. Similar findings were observed for the oral health behavior of diabetic patients; participants brushed their teeth mainly once to twice a day and flossed even more rarely. Referrals were made to dental check-ups, frequency of which was lower than advised; many patients consulted dental experts only when they had signs of oral diseases instead of going for routine flour time. Because a significant proportion of patients with diabetes does not adhere to the recommended non-pharmacological behaviors in oral health, this aspect highlights a potential avenue for enhancing patient care among diabetic patients. For knowledge, the review revealed that, most patients had poor perception of the link between oral disease and diabetes with most patients being unaware that complications in the mouth could impact on glycemic control and overall body health. Some of the observations made include the fact that educational disparities prevailed in the patient's understanding in the fact that proper dental hygiene was significant in managing diabetes. This emphasizes the role of focused education sensitive for enhancing perceptions as well as behaviors concerning the alike disease.

The analysis for subgroups showed that oral health behaviors and knowledge differed from one demographic group to another. Patients with a relatively early diagnosis and less years since diagnosis had better compliance with oral hygiene recommendations when compared to older patients and those with long-standing diabetes. Differences due to gender were negligible, or, as some studies indicated, female patients may be somewhat more inclined to practice oral hygiene than male patients. In general, the review identifies specific domains for which interventions might be aimed at increasing favorable oral health status in diabetes care: patient education and regularity of dental care.

Table 1: Key Aspects of the results

Aspect	Details
Number of Studies	25
Sample size Range	50 to over 1000 participants
Diabetes type	Predominantly Type 2 diabetes
Age range	18 to 65 years
Gender Distribution	Both male and female patients included

Oral Health Behaviour	-Brushing: Once to twice daily
	-Flossing: Often irregular
	-Dental Visits: Less frequent than recommended
Knowledge Level	-Limited understanding of oral health impact on diabetes
	-Gaps in recognizing the importance of oral hygiene in diabetes management
Subgroup Analysis	-Younger patients and those with shorter diabetes duration showed better practices
	-Slightly better practices among female patients compared to male patients

From the study presented through the following systematic review of the literature, a summary of the findings on perceived oral health knowledge and behavior of diabetic patients is given in the TABLE 1. It provides key aspects including the number of enrolled studies, range of participants, type of diabetes involved and participants' characteristics. The table also provides important findings connected to the

oral health behavior where it is stated that many participants practice such non-optimal behavior as irregular brushing and flossing, and low frequency of dental visits. Also, it measures the general importation level of participants regarding the link between oral diseases and diabetes; this measures the existing educational premising that requires interventions.

Table 2: This table provides a quick snapshot of specific findings regarding oral health practices and knowledge among diabetic patients

Study Characteristics	Finding
<b>Oral Hygiene practices</b>	-Brushing :60% brush twice daily; 40% brush once daily
	-Flossing :30% use daily; 70% use irregularly or not at all
	-Dental Visits: 50% visit less than once a year; 30% visit regularly
<b>Awareness of Oral Health</b>	40% understand impact of oral health on diabetes
	- 60% have limited or no knowledge on the relationship
<b>Interventions Recommended</b>	-Increased patient education on oral health impact
	-Promotion of regular dental visit

The data focusing on the assessment of the oral health practices and the level of knowledge of diabetic patients can be viewed in the Table 2. It has details of the particularities concerning what part of the participants brush their teeth and how often they do it, flossing might be less frequent. The table below also displays the dental visits where as the result show that many patients attend dentist less often than it is prescribed. In addition, it reveals patients' knowledge about the relationship between oral health and diabetes with evidence that a significant number is poorly informed. Hence, there is a pressing need for action to implement specific focused strategies, as described below:

Patient education and embracing of routine dental check-up.

## DISCUSSION

This study raised important findings concerning oral health behavior and knowledge among the adult diabetic patients. According to the results, inadequate oral health care habits were identified: less frequent brushing and flossing, and the rare dental check-ups. This is in concordance with other studies done on diabetic patients that demonstrated comparable poor dental hygiene and overall absence of knowledge of the relation between diabetes and oral health[1][2].

The consequences are tremendous for average clinical work. It is non-negotiable for anyone

managing their diabetes to ensure they teach their patient on oral health, the importance of practicing good hygiene and getting dental checkups. Informing the patients about the effects of oral health on glycemic control and overall health might improve patients' compliance to recommended oral health behaviors and diabetes self management[3]. However, some limitations can be identified in this present review. The problems with study design, sample size, and the method underlying investigations can reduce the applicability of the results. Furthermore, the use of self-reporting measure in most previous investigations might have confounded and method variance in evaluating oral health practices and attitude. In the future it would be valuable to pay attention to intervention studies that will help improve knowledge and behavior regarding oral health in diabetic patients[4]. Further, research about effects of socioeconomic status on oral health behaviors would also be of interest. Future research could gather valuable data for assessment of the effectiveness of different interventions in form of longitudinal studies that examine alterations of oral health related behaviors and their effects on diabetes[5].

## RECOMMENDATIONS AND IMPACT

Current rules from dental and diabetic affiliations underscore the significance of coordinating oral Health management into diabetes care. These rules suggest that diabetic patients get normal dental check-ups and comply with thorough oral hygiene practices. The American Diabetes Association (ADA) and the American Dental Association (ADA) both supporter for routine dental visits, appropriate brushing, and flossing to forestall oral intricacies related with diabetes [1][2]. The effect of oral Health on diabetes management is huge. Unfortunate oral health, especially periodontal disease, can prompt foundational aggravation, which might worsen glycemic control and increment the gamble of diabetes-related entanglements. Then again, uncontrolled diabetes can deteriorate oral health, prompting expanded vulnerability to diseases and more slow recuperating processes [3][4]. This bidirectional relationship highlights the requirement for viable administration of oral wellbeing as a component of extensive diabetes care. Patient education programs have demonstrated viable in further developing oral health ways of behaving among diabetic patients. Fruitful projects frequently remember

customized schooling for the connection between oral health and diabetes, down to earth shows of oral hygiene methods, and customary development to build up great practices. Instances of successful projects incorporate local area-based studios and customized instructive materials that address explicit requirements and hindrances looked by diabetic patients [5][6].

## CONCLUSION

This review highlights the basic requirement for further developed oral health ways of behaving and knowledge among adult diabetic patients. The fundamental ends uncover that numerous diabetic patients display insufficient oral cleanliness works on, including rare brushing, unpredictable flossing, and less regular dental visits. Moreover, there is an outstanding absence of mindfulness with respect to the effect of oral health on diabetes the board, which adds to sub-par oral health rehearses. For medical services suppliers, these discoveries feature the significance of integrating oral health instruction into diabetes care. Educating patients about the critical connection between oral wellbeing and glycemic control can upgrade their comprehension and adherence to suggested oral hygiene practices. Normal dental check-ups and better taking care of oneself practices might possibly further develop in general wellbeing results for diabetic patients. In clinical settings, coordinating oral health management into diabetes care schedules can prompt better persistent results and a more extensive way to deal with diabetes the executives. Medical services suppliers ought to focus on understanding education on oral wellbeing and guarantee that dental consideration is essential for normal diabetes care plans. This approach tends to the prompt necessities of patients as well as forestalls long haul inconveniences related with unfortunate oral health. The review builds up the need of designated mediations and constant patient education to overcome any issues in oral health knowledge and practices among diabetic patients. By upgrading mindfulness and further developing oral hygiene practices, medical services suppliers can assume a vital part in overseeing diabetes all the more really and working on the general personal satisfaction for patients.

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