

# DENTIST'S ATTITUDES AND PRACTICES RELATED TO DIABETES IN DENTAL SETTINGS IN HUBLI-DHARWAD CITY

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## ABSTRACT:

**Purpose:** Diabetes mellitus is one of the major public health problems with high prevalence having oral complications and affecting the quality of life. As many undiagnosed diabetes patients visit dentists, dentists are well positioned to identify these cases. Hence the study was conducted to determine general dentist's attitudes and practices related to patients with diabetes and to assess the factors influencing the dentist's attitude and practice towards diabetes mellitus in Hubli- Dharwad city.

**Methods:** A cross sectional survey was conducted among practicing dentists of Hubli-Dharwad city, India in 2011, with 71.3% response rate. A closed ended questionnaire with 18 items was used to assess the attitude and practice of dentists.

**Results:** 97% of respondents believed that addressing diabetes was important to their role as a dentist. 95% reported they knew how to assess for diabetes, 93% felt well prepared to intervene with patients with diabetes. 91% felt that receiving formal training for diabetic assessment and management is important.

**Conclusions:** Attitude and practice toward patients with diabetes was found better among dentists with higher qualification and those who had received formal training. Formal training and importance of their role were significant factors related to dentist's attitude and practices.

**Key words:** diabetes, BGM, attitude, practice, dentists



## INTRODUCTION:

Diabetes mellitus (DM) is one of the highly prevalent non communicable diseases of the modern era. DM is one of the major public health problems, as many studies report worse quality of life for people with

diabetes compared to the general population, especially regarding physical functioning and well-being [1]. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and projected to be 4.4% by 2030 [2]. With more than 135 million people

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affected worldwide [3], India has 33 million diabetic subjects, most of them belonging to urban areas as compared to rural areas [4]. The Indian population faces a high risk for diabetes and its associated complications as they have a *genetic phenotype* characterized by low BMI, high upper body adiposity, high body fat and high level of insulin resistance and body fat percentage, as well as higher susceptibility to *environmental insults* [4].

The *World Oral Health Report* (2003) stated clearly that there is an evidence to prove the relationship between oral health and general health. Oral health and general health are related in four major ways: 1. Poor oral health is significantly associated with major chronic diseases. 2. Poor oral health causes disability. 3. Oral health issues and major diseases share common risk factors. 4. General health problems may cause or worsen oral health conditions [5]. Most of the DM cases are associated with frequent oral manifestations like periodontitis, abscess, delayed healing, frequent infections and failure of treatment procedures [6]. Also, periodontal signs and symptoms are considered as the '*sixth complication*' of diabetes [7]. Emerging evidences suggest that periodontal disease predicts the development of end-stage kidney disease in diabetic patients; also one Korean study has identified a relationship between total tooth loss from any cause and diabetes [8].

Literature review shows that, majority of general dentists surveyed lacked knowledge about diabetes, and believed that activities related to management of

patients with diabetes in the dental setting are peripheral to their role and that their patients and colleagues did not expect them to perform those activities [9]. It is estimated that approximately 5% of all patients seen in dental offices have diabetes [10]. And the prevalence of diabetes may be as high as 20% to 25% among patients aged 60-74 years [11]. Considering that a large number of patients with undiagnosed diabetes visit the dentists, dentists are well positioned to detect undiagnosed patients with diabetes early by recognizing oral manifestations of DM and referring suspected undiagnosed patients to a physician for further diagnostic workup. This demands the need to evaluate practitioner's attitude and practice towards patients with DM.

In India, majority of the dental treatment is provided by the general dental practitioners who are mostly the Under Graduates (BDS) and not specialty practitioners i.e., Graduates or Masters (MDS). It is observed that the general practitioners' attendance to the continuing dental education programmes is very less hence; their update of knowledge is also deficient. Moreover, there are no studies conducted in this regard of assessing the knowledge, attitude and practice of dental practitioners towards diabetic patients in India. Hence, the aim of the present study was to assess the attitude and practice of the general dental practitioners towards the patients with DM in Hubli-Dharwad city, India.

## MATERIAL AND METHODS:

**Study Population and Design:** A cross sectional survey was conducted among practicing dentists of Hubli-Dharwad city, Karnataka, India, during the month of August 2011. Out of 185 practicing dentists in this region, 132 practitioners gave consent to participate in the study with a 71.3% response rate.

A closed ended multiple choice questionnaire was framed according to the objectives of the study to assess the attitude and practice of dental practitioners regarding patients with DM. Also the data on demographics like, age, gender, educational qualification, and dentist's diabetic status, type of practice, formal training and practice of blood glucose measurement in their clinics was obtained.

A questionnaire was framed having a total of 18 questions, including 8 questions pertaining to the attitude and 10 questions regarding the practices of the dental practitioners. The questions on attitude included the dental practitioners' attitudes regarding intervening patients with DM as part of their role, if they know to assess DM patients and how to assess DM patients, feeling about their preparation to intervene patients with DM, if they were effective to intervene DM patients, how knowledgeable they were about the DM therapeutic drugs and the importance of receiving formal training for diabetic assessment and management. Whereas the questions regarding the practices included if they have received formal training for diabetic assessment and management, and what

type of training, if they take history, how frequently they take history, if they document diabetic condition of the patients, if they inform the patients about risk of DM on oral health, if they give any written material for the same, if they perform BGM in their clinic, the barriers to perform BGM in their clinics if they consult a physician for evaluation prior to treatment and if they provide treatment to DM patients.

Out of the total 18 questions asked, 15 questions were rated on a 5 point Likert scale having the values on the scale ranging from 1 to 5, with score 5 for the most favorable answer and score 1 for the most unfavorable answer. The responses on the Likert ranged from definitely yes to definitely no. Rest of the 3 questions had multiple choice options. The framed questionnaire was tested for face validity as well as content validity. The questionnaire was pretested by conducting a pilot test prior to the start of the study on 50 dental practitioners, and the reliability values of the questionnaire were found to be, *Cronbach's alpha value of 0.7962* and *Split half reliability of 0.85*.

The list of all the dental practitioners in Hubli-Dharwad city was obtained by the IDA (Indian Dental Association) branch, and those who were not there in the list were identified by the peer enquiry. By this, a total of 185 dental practitioners were listed and were approached, of which only 137 dentists agreed to participate in the study, making it to a response rate of 71.3%. The questionnaire was distributed to the participants after having brief communication about the

purpose of the study and consent was obtained. The participants completed the questionnaire in the presence of investigator anticipating any queries regarding the questionnaire. Ethical clearance for the study was obtained by the institutional review board.

**Data analysis:** Data was computed and cross tabulation was done using SPSS version 10.0. Bi-variate logistic regression analysis was performed to check the association between dependent and independent variables. Multi-variate regression analysis was done to identify the factors predictive of providing services for patients with DM, Correlation was made using Karl Pearson's correlation coefficient test. The significance was level was set at  $p \leq 0.05$ .

## RESULTS:

Table 1 shows the socio-demographic and practice characteristics. The mean age of the study subjects was 32.95 years. Out of 132 participants, 75 (57%) were females and 57 (43%) were males. Only 1.5% of the practitioners were diabetic themselves. Among 132 dentists, 30.5% had formal training related to diabetes and only 27.2% of them were practicing Blood Glucose Measurement (BGM) in their practice.

Chart 1 describes the frequency of self reported attitudes of dentists related to diabetes assessment and intervention. More than 90% of the dentists felt that they were prepared to intervene with patients with diabetes; they were knowledgeable to assess patients with

diabetes and felt that intervening with patients with diabetes is a part of their role. Around 72% of the dentists felt that they were effective in intervening with patients with diabetes. About 78% of the participants felt that they were knowledgeable about diabetes related therapeutic products.

Even though 91% of the practicing dentists felt that receiving formal training for diabetic assessment and management was important, only 40% of them had actually received formal training. Out of these 40%, 65% of them had received formal training through dental course and 35% of them through Lectures/CDE programmes.

Table 2 reveals that less than 1% of the practitioners document the diabetic condition of their patients, even-though 91% of the practitioners take history of diabetic condition of their patients. About 89% of the dentists consult with a physician for evaluation prior to treatment and only 11.36% of the dentists advise patients with diabetes about periodontal risks and provide written educational material about diabetes and periodontitis to patients with diabetes.

Table 3 shows a statistically significant favorable attitude ( $p = 0.0084$ ) and practice ( $p = 0.0079$ ) scores with MDS degree holders as compared to those with BDS degree. Whereas, gender and type of practice did not show any statistically significant differences.

Table 4 shows the regression analysis performed to identify the predictor of

advising patients with diabetes about oral health in dental settings. Multivariate regression analysis showed that, formal training and belief in the importance of their role were significantly associated with attitude and practice towards diabetes and oral health. Bi-variate logistic regression results showed formal training as a significant predictor of dentist's perceptions related to diabetes assessment of intervention.

Chart 2 shows dentist's perceived barriers to perform BGM. About 54% of the dentists felt that there is no barrier to perform BGM in their clinic. Around 28% of the practitioners felt that lack of time as the main barrier and 11% felt that patient's resistance for BGM, 3% of them forget to do BGM and 6% of them are not interested to do BGM in their clinic.

A statistically significant positive correlation was observed between Attitude and Practice ( $r=0.5605$ ) of dentists.

## DISCUSSION:

The incidence and prevalence of diabetes mellitus are increasing with time and despite greater knowledge of the disease, one-third of people with the disease are undiagnosed [3]. Poorly controlled diabetes is an important risk factor for periodontitis, and gingivitis and periodontitis is sometimes the first sign that a patient has diabetes [12]. As already discussed, many undiagnosed diabetic patients visit dentists; hence, dentists play an important role in exploring the submerged portion of the iceberg of

disease, by identifying these undiagnosed cases for the early management of these systemic conditions. This necessitates the assessment of attitude and practice of general practitioners' attitude and practice related to diabetic patients.

Over 95% of the dentists reported that intervening with patients with diabetes was important to their role as a dentist in the present study. This finding is encouraging in that the motivation to participate in addressing this important health issue in the dental setting appears to exist. It was also found that belief about importance of diabetes management to the dentists' role was an independent predictor of providing diabetes related advice about periodontal risks and of providing diabetes related services analogous to the findings of a study by Esmeli T, Ellison J and Walsh MM [6]. The finding in this study related to dentists' perceptions of the importance of diabetes management to their role as dentists differ from that reported in 2005 for northeastern states by Kunzel et al [9], who reports that the majority of general dentists surveyed believed that activities related to management of patients with diabetes in the dental settings were peripheral to their role. This apparent inconsistency between our study and other studies could be because of the increasing translation of evidence related to the connection between oral health and general health, and specifically, with regard to diabetes and periodontal disease. In 2008 however, Kunzel et al. reported that low socioeconomic status (SES) general practice dentists took a

more proactive role in managing their patients with diabetes than middle/higher SES general practice dentists. Moreover, they concluded that this finding was important as lower SES general practice dentists see more patients with undiagnosed diabetes in their practice settings<sup>[13]</sup>. In our study the practitioners were not willing to disclose their income; hence it was not possible to collect information regarding the SES of the study subjects, therefore this parameter was not considered for analysis.

73% of the dentists in our study felt that they were effective in addressing diabetes with their patients, and 95% believed that they had enough knowledge to assess and intervene with patients with diabetes in the dental setting. These findings are in contrast to the study by Esmeili T et al,<sup>[6]</sup> who found that only a third of dentists felt effective in addressing diabetes with their patients, and less than half believed that they had enough knowledge to assess and intervene with patients with diabetes in the dental setting. This difference in attitude among studies could be due to the varied medical curriculum in dental schools in different countries. Whereas, Kamel NM in his study found that a majority of diabetic patients (90.0%) had poor knowledge about the disease<sup>[14]</sup> hence it becomes even more a responsibility of the dental practitioners to identify these cases at the earliest.

Study by Esmeili T et al. 2009, showed that dentists' report of formal training related to diabetes assessment and management was associated with feeling

effective to intervene with patients with diabetes<sup>[6]</sup>. But this was not the case in our study. Having had formal training also was a significant predictor of both advising patients about diabetes and its periodontal implications. These findings support the premise that formal training helps in developing confidence and feelings of effectiveness.

It was observed that only few dentists (11%) reported that they advise patients with diabetes about periodontal risks, and provide written educational material about diabetes and periodontitis to patients with diabetes in their dental clinics. In contrast, Esmeili T et al.<sup>[6]</sup>, has reported that majority of the dentists (86%) reported that they often or almost always advise their patients with diabetes about the interrelationship between diabetes and periodontitis. Kamel NM has reported that 83.7% of diabetic patients had poor knowledge about the complications associated with diabetes and 96.3% had poor awareness of how to control the disease<sup>[14]</sup>. Whereas, Mirza K M has revealed in his study that only 35.4% of the patients had knowledge about the oral complications of diabetes, 57% did not know that diabetes predisposed them to oral disease, and 7.6% denied any existence of a link between diabetes and oral health<sup>[15]</sup>. In this regard, it may be useful for patients to receive written education material as well as hear the dentists' advice regarding the oral health complications of diabetes, which could be made possible if the dentist spends some time discussing the issue.

There was a positive correlation between attitude and practice among the practitioners. This seems to be of importance to improve the attitude of the dentists in order to improve the practice of the dentists towards diabetic patients.

Even though most of the practitioners reported that there is no barrier to perform BGM, only 27% of them practice BGM in their clinics. Lack of time and patient's resistance were other major barriers to perform in clinic BGM. This finding could be due to the easy accessibility of the physicians for checking BGM and lesser cost involved in doing so. Forbes K has reported that almost one-third of dentists were unwilling to screen for diabetes using a finger-stick test, and only 2.6% overall had ever done so in his study [16].

It is mentioned in a document adopted by the 60th World Health Assembly 2007 entitled *Oral health: action plan for promotion and integrated disease prevention*, which acknowledges "the intrinsic link between oral health, general health and quality of life [17].

As almost all individuals with periodontitis would require diabetes screening, and many at-risk persons with periodontal disease frequently visit dentist, it is suggested that the dental visit provides an important potential venue for screening [18, 19]. Thus, dental care providers should assess the diabetes status of their patients using clinical guidelines which includes the following predictors: waist circumference, age, self-reported oral health, self-reported weight and self-reported race or

ethnicity, as well as any additional information on periodontal status and family history of diabetes.

This clinical guidelines along with screening could help dentists identify patients with undiagnosed diabetes, resulting in the early identification of dental patients who require treatment for diabetes and, thus, reduce morbidity as well as health care costs [20].

Further, there is also an emphasis on "the need to incorporate programmes for promotion of oral health and prevention of oral diseases into programmes for the integrated prevention and treatment of chronic diseases" [17].

One approach in achieving this is through common risk factor approach, targeting the risk factors which are common to both oral diseases and non communicable diseases. For this approach to be effective, oral health professionals need to develop a range of net-working and communication skills to enable them to work collaboratively with other agencies and professionals [21]. This can be made possible by increasing the knowledge among dental practitioners about the association between periodontal diseases and DM to effectively prevent, manage, and control diabetes and periodontal diseases. [22]

## CONCLUSIONS:

Attitude and practice toward patients with diabetes was found better among the dentists with higher educational qualification and those who had received formal training. Formal training and

importance of their role were significant factors related to dentist's attitude and practices.

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**TABLES:**

**Table 1: Dentist’s socio-demographic and practice characteristics:**

Characteristics of practitioners	Total no = 132 n (%)
Mean Age	32.95 yrs
Gender	Female – 75 (56.82%) Male – 57 (43.18%)
Educational qualification	BDS – 87 (65.91%) MDS – 45 (34.09%)
Dentists who are diabetic	2 (1.5%)
Dentists who had formal training related to diabetes	40 (30.5%)
Dentists who practice BGM in their practice	36 (27.2%)

**Table 2: Frequency of dentist’s self reported practice related to diabetes assessment and intervention**

Practices	% (n)
Documenting the diabetic condition	0.75 (1)
Performing in office BGM on patients with diabetes	27.2 (36)
Consulting with a physician for evaluation prior to treatment	89 (118)
Advising patients with diabetes about periodontal risks	11.36 (15)
Providing written educational material about diabetes and periodontitis to patients with diabetes	11.36 (15)

**Table 3: Comparison of attitudes and practices among dental graduates and post graduates**

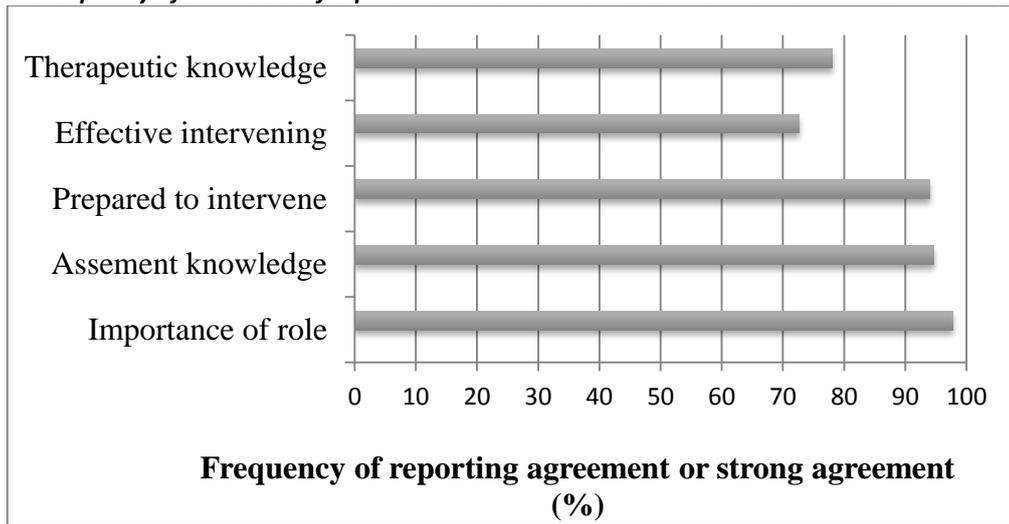
Variable	Group	Mean	SD	t-value	p-value
Attitude	BDS	30.3563	2.6147	-2.6777	<b>0.0084</b>
	MDS	31.6444	2.6299		
Behaviour	BDS	32.1839	3.7835	-2.6991	<b>0.0079</b>
	MDS	34.0889	3.9590		

p<0.05

**Table 4: Multivariate-Regression-Model, Results showing significant predictors of advising patients with diabetes about oral health in dental settings.**

Predictor variables	Outcome variables	Odds ratio	SE of O.R	Z- value	Confidence interval
Importance of dentist’s role	Advising patients about oral health	1.0492	0.8771	0.06	(0.2038-5.4001)
Formal training	Advising patients about oral health	0.7705	0.2993	-0.67	(0.3598-1.6498)

**Chart 1: Frequency of dentist's self reported attitudes related to diabetes assessment and intervention**



**Chart 2: Dentist's perceived barriers to perform BGM**

