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DENTAL STUDENTS' ATTITUDES TOWARD DIABETES COUNSELLING, MONITORING, AND SCREENING- A CROSS SECTIONAL SURVEY

Dental Science

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ABSTRACT

Diabetes mellitus is a chronic metabolic disease that cause complications during dental treatments. For dental students a proper knowledge of diabetes' mellitus is required for various levels of treatment because of its by directional relationship with dental diseases. . To date, there is no data on the attitude of dental students regarding the counselling for diabetes, its monitoring, screening and glucometer use. A survey was planned with an aim to assess attitude of the final year dental students and interns towards counselling for diabetes, its monitoring, screening and glucometer use in Davangere city. A questionnaire based cross sectional survey was used for data collection consisting of 16 closed ended questions having a five-point Likert scale. Statistical analysis was done using descriptive statistics chi-square test. The mean score ±standard deviation of the participant for the scope and responsibility domain was 3.34±0.52. For the barriers experienced mean score (standard deviation) was at 2.24±0.81 and for the glucometer use the mean score (standard deviation) was at 2.69(0.83). No statistically significant difference was found between the mean score and the with respect to their academic year or their gender for the scope and responsibility score. Similarly, there was no statistically significant difference found for the barrier item score and for the glucometer use items score for gender as well as the academic year. There was good level of agreement for all the items in the scope and responsibility items. The endorsement of the barrier score items was less uniform.

KEYWORDS

dental education, dental students, diabetes mellitus, glucose monitoring

INTRODUCTION:

Among the endocrine disorders Diabetes mellitus is found to have the highest prevalence worldwide. Diabetes mellitus is a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both[1]. The cardinal feature of this condition is increased blood glucose level, resulting from decreased production of insulin, insulin dysfunction or lack of insulin receptor responsiveness at target organs, such as the skeletal muscles and liver. [2]The prevalence of diabetes is not easy to determine because many diabetes remain undiagnosed. Half of affected individuals remain unaware of their disease status.[3] The dentist can be pivotal in the diagnosis of diabetes by recognizing some of the clinical features of gingivitis and periodontitis that are consistent with diabetes-related conditioning of periodontal responses to plaque. Dentists should be suspicious of patients presenting with multiple periodontal abscesses, unusual gingival reddening or abnormal responses to plaque that persist after tooth debridement and plaque control.[4]

Diabetes is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease. India (31.7 million) topped the world with the highest number of people with diabetes mellitus in the present millennium.[3] According to Wild et al. the prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India.[2] It is predicted that by 2030 diabetes mellitus may afflict up to 79.4 million individuals in India.[3] India currently faces an uncertain future in relation to the potential burden that diabetes may impose upon the country. The aetiology of diabetes is multifactorial and includes genetic and environmental influences such as obesity associated with rising living standards. Also, steady urban migration, and lifestyle changes.

With a great number of undiagnosed cases present the dentist can play a vital role in diagnosis. Diabetes is a condition of particular concern to dentistry because of its bidirectional relationship with oral disease.[5] It has gained attention as a common disorder with oral manifestation that impacts dental care, and there is concern about the ability of oral manifestations to profoundly affect metabolic control of the diabetes state.

When it comes to dental curriculum in the first-year includes glucose metabolism and introduction of the concept of treating dental patients with diabetes. In the second year, clinical implications of diabetes are presented, and diabetes management including use of a glucometer is discussed. In the third year, specifics of diabetes side effects are taught, and glucometer use is reinforced. In the fourth year, students discuss diabetes in a case-based course. And usually interns monitor diabetes in both field and clinical setting.[6] However, knowledge and skill, while necessary for the performance of a behaviour, are not sufficient in most cases. Intention to perform a behaviour is influenced by attitudes as well as subjective norms of social pressure.[7] Changes to the nature of dental practice begin with changes in dental education. Majority of patients were found to be willing to give consent to the dentist to conduct screening for systemic diseases such as diabetes irrespective of the health care setting.[8] Our literature search found a scarcity of studies assessing the attitude of dental students towards diabetes counselling, monitoring, screening and glucometer use. So a study was planned to assess the dental students' attitudes toward diabetes counselling, monitoring, screening and glucometer use among the final year dental students and interns.

MATERIAL AND METHODS:

Study Population: This cross-sectional study was carried out in July 2016 and included a study population of all (whole sample was taken using purposive sampling method) final year undergraduate students and interns enrolled in two Dental Colleges of Davangere city.

Eligibility Criteria: Students who are agreed to participate by signing the written voluntary informed consent and were present on the day of questionnaire distribution were included in the study.

INSTRUMENT FOR ASSESSMENT: Data was collected using a proforma containing 2 sections.

Section 1: Demographic details (name, age, gender, year of study).

Section 2: A total of sixteen items were present in the questionnaire.[8] The questionnaire collected data regarding attitudes toward diabetes counselling, monitoring, and screening as well as perceived barriers to success for diabetes counselling in a dental setting. There were seven questions in the 'scope and responsibility' and 'barrier' domain and three in the 'glucometer use domain'. Testing of the questionnaire had shown the instrument having good reliability and validity. The content validity index score of the questionnaire was found to be good CVI=0.96. The reliability score of the questionnaire was at r =0.85.

Each item consisted of a statement and a five-point Likert-type response scale, ranging from 1=strongly agree to 5=strongly disagree. The psychometric properties of the instrument were established during a previous study that examined attitudes of dental students[9]

ETHICAL FORMALITIES:
The study was performed in accordance with the *Declaration of Helsinki.* The ethical approval was obtained from the Institutional Review Board of Bapuji Dental College and Hospital, Davangere(Ref. no: BDC/Exam/165/2015-16). Permission was obtained from the principals of institutions to collect the list of students and to collect the relevant information from the study participants in respective college premises. Voluntary written informed consent was obtained from every participant after describing them the purpose of the study. Assurance was given to the participants regarding the confidentiality of the study.

DATA COLLECTION:
Questionnaire was self-administered to participants on prescheduled dates in their respective colleges. They were made to assemble in a class room, where the investigator appraised them regarding the purpose of the study and taken their consent to participate. Thirty minutes are given to answer the questionnaire and collected back on the same day. Precautions were taken to prevent the discussion regarding the questionnaire to ensure truthful and accurate result. A non-responder was defined as a student who failed to return the survey sheet or those who is absent on the date of conducting the survey.

STATISTICAL ANALYSIS:
Data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 21 (IBM Corp., Chicago, Illinois, USA). Pearson's Chi-squared test was used for group frequency comparisons. P value which is ≤0.05 was considered as s Statistically significant.

RESULTS
A total of 283 (response rate of 95%) students participated in the study of which majority were females (74.6%), and males were in the minority (25.4%). 149 interns and 134 final year students participated in the study (Table: 1). Age group ranged from twenty one years to twenty six years. The mean score (standard deviation) of the participant for the scope and responsibility domain was 3.34(0.52) 6(Table: 2). For the barriers experienced mean score (standard deviation) was at 2.24(0.81) and for the glucometer use the mean score (standard deviation) was at 2.69(0.83).

No statistically significant difference was found between the mean score and the with respect to their academic year (p=0.94) or their gender (p=0.84) for the scope and responsibility score. Similarly there was no statistically significant difference found for the barrier item score and for the glucometer use items score for gender as well as the academic year. (Table: 3)

There was good level of agreement for all the items in the scope and responsibility items (Table: 4). The least endorsed item was regarding educating patients about the risks of diabetes to oral health. It showed a neutral score of about 40.3%. The endorsement of the barrier score(Table :5) items were less uniform. With 'time required to obtain and discuss patients glucose level' endorsed as the strongest barrier with a combined weightage of 63.2% (strongly agree + agree), followed by the 'lack of payment for the time required to discuss patients' blood glucose level'.

The scope of glucometer use had the good degree of endorsement among the participating students. Greatest percentage of agreement was found for the 'Take a diabetic patient's blood glucose reading using a glucometer'.

Table 1: The demographic details of the participants

Demographics	Age	n (%)
Age	21-23 years	146 (51.6%)
	24-26 years	137 (48.4%)
Gender	Males	72 (25.4%)
	Females	211(74.6%)
Academic year	Final years	134 (47.3%)
	Interns	149 (52.7%)
Total number of participants		**283(100%)**

Table 2: Mean score and SD of the participants for each domain.

Domain	Mean Score	Std. Deviation
Scope and responsibility(7)	3.34	0.52
Barrier(7)	2.24	0.81
Glucometer use(3)	2.69	0.83

Table 3: Comparison of the scope and responsibility score, barrier score and glucometer use score with respect to academic year and gender.

	SCOPE AND RESPONSIBILITY(7)	T	p value	BARRIER(7)	T	p value	GLUCOMETER USE(3)	T	p value
Final	3.65(0.38)	0.06	0.94	2.41(0.57)	0.49	0.84	2.10(0.80)	0.19	0.84
Interns	3.68(0.66)			2.65(0.67)			2.14(0.55)		
Males	3.25(0.47)	0.08	0.95	2.41(0.47)	0.49	0.94	2.40(0.80)	0.18	0.64
Females	3.58(0.57)			2.65(0.57)			2.34(0.85)		

Table 3: Responses to the individual questions for the Scope and responsibility items

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
SCOPE AND RESPONSIBILITY (7)					
It is the dental professional's responsibility to: 1. Educate patients about the risks of diabetes to overall health and well-being.	50.5(%)	44.5(%)	3.9(%)	4.2(%)	0.4(%)
It is the dental professional's responsibility to: 2. Educate patients about the risks of diabetes to oral health	0.4(%)	55.8(%)	40.3(%)	3.2(%)	0.4(%)
It is within the scope of dental practice to: 3. Ask patients if they have diabetes.	66.1(%)	26.9(%)	5.3(%)	0.7(%)	0.4(%)
It is within the scope of dental practice to: 4. Advise diabetic patients to monitor their own blood glucose using a glucometer.	31.1(%)	48.1(%)	17.3(%)	1.4(%)	0.7(%)
It is within the scope of dental practice to: 5. Discuss benefits of controlling diabetes.	43.1(%)	45.9(%)	9.5(%)	0.7(%)	0.7(%)
It is within the scope of dental practice to: 6. Discuss specific strategies for controlling diabetes.	32.5(%)	49.8(%)	14.1(%)	2.8(%)	0.7(%)
It is within the scope of dental practice to: 7. Refer a patient for medical evaluation if the patient's blood glucose is too high.	64.7(%)	25.1(%)	7.8(%)	2.1(%)	0.4(%)

Table 4: Responses to the individual questions for the Barrier items

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
BARRIER (7 ITEMS)					
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 1. Amount of time required to obtain and discuss a patient's glucose levels.	14.1(%)	49.1(%)	30.7(%)	4.2(%)	1.8(%)
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 2. Lack of payment for the time taken to obtain and discuss a patient's blood glucose levels	11.3(%)	39.2(%)	35.3(%)	11.3(%)	2.8(%)
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 3. Lack of confidence in my ability to obtain and discuss a patient's blood glucose.	8.8(%)	28.6(%)	31.8(%)	24.7(%)	3.9(%)
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 4. Patient resistance to having a blood glucose taken in the dental office.	12.4(%)	36.4(%)	35.7(%)	14.5(%)	0.7(%)
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 5. Lack of adequate referral knowledge.	7.8(%)	29(%)	34.6(%)	25.8(%)	1.8(%)
How strong a barrier to evaluation and counselling regarding elevated blood glucose is: 6. Lack of payment for services	12(%)	32.5(%)	43.1(%)	10.2(%)	2.1(%)

Table 5: Responses to the individual questions for the Glucometer use items

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
GLUCOMETER USE (3 ITEMS)					
14. It is within the scope of dental practice to: Take a diabetic patient's blood glucose reading using a glucometer.	23.3(%)	54.1(%)	18. (%)	4.2(%)	0.4(%)
15. It is within the scope of dental practice to: Screen for diabetes using a glucometer on patients who are not diagnosed with diabetes.	18(%)	48.8(%)	22.3(%)	10.2(%)	0.7(%)
16. Monitoring blood glucose in a dental office can have an impact on controlling a patient's diabetes.	34.6(%)	44.5(%)	16.6(%)	4.2(%)	0(%)

DISCUSSION

The study found an overall good positive attitude of the dental students assessed towards treatment counselling and monitoring of the diabetic patients. The present study found no significant differences in attitude by gender or level of education.

The instrument used in the present study for this investigation was developed form assessment tools used to examine attitudes and perceived barriers to tobacco cessation counselling among dental students. This was validated by multiple previous studies.[8,9]Items related to glucose were constructed to parallel the tobacco items. The diabetic instrument was tested in a verity of dental setting out side India.[8,9] To check for validity In Indian setting the instrument was given to five examiners for validation and the instrument was modified.

The average domain scores of the three groups were similar to the scores of the previous studies conducted by Andres etal.[8,9]There was a big gap in the male to female ratio in the study setting which is similar to what is happing in all dental colleges in India were females out number male students.. The overall score of the students in the present study was similar to the previous studies done on the United States of America even with the difference in the setting. The studies also showed that there was a lack of predictability about the student's attitude regarding the gender or the academic year.[8,9]The lack of influence of the dental students' academic year on the study results shows that the results maybe more dependent on the culture and attitude rather than the curriculum of the students.

The barrier scores found to have good agreement with time to obtain and discuss glucose level being the biggest barrier. This result should be viewed with great caution as the time required to do this routine check maybe undermined if the patient is diabetes leading to complications which may cause unacceptable consciences for the patient and the dentist.[14]Educational intervention should be given to the students change the students' attitude on diabetes counselling in the clinical setting. It was also found that many of the students lacked confidence in their ablity to check for diabetes. Similar finding were found in the previous studies.[13] The same problem found in studies which was done to determine patients' attitudes toward screening for medical conditions in a dental setting[15]. Patient resistance to having a blood glucose taken in the dental office and lack of adequate referral knowledge was found to a barrier among one third of the population that participated in the study. It should be noted that even when the students found the referral was in the scope of dental practice there was a lack of referral knowledge among the participants. This is an area which should be improved in the dental curriculum. All he glucometer items scored very high percentage in the present study which was similar to the previous studies.[8,9]

The present study has poor generalizability due to the sampling technique used. Longitudinal studies can be conducted to find out the change in attitude of the students as they enter and exit different academic levels as well as through their clinical experience. As focus shifts from disease treatment and prevention to health promotion. With new models variously described as integrated medical/ dental health care, and common risk approach for health promotion and disease prevention. Oral and systemic complications of diabetes are directly related to the level of glycemic control. Students' positive attitude towards diabetic screening and monitoring will optimize the health of the patient. Dental practitioners are in a unique position of being able to provide diabetes education and counselling and may serve an important role in helping Diabetes self-management education (DSME).

CONCLUSIONS

The present study has shown that dental students have a positive attitudes toward activities related to diabetes counselling, monitoring, and screening. The students endorsed monitoring of blood glucose level in patients diagnosed with diabetes more strongly than screening for diabetes in patients who have not been diagnosed. Patients who are not willing and students' lack of knowledge about glucometer use were found to be barrier.

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