



ASSESSMENT OF KNOWLEDGE RELATED TO DIABETES MELLITUS AMONG A SAMPLE OF DENTAL STUDENTS IN SALEM CITY-A CROSS SECTIONAL STUDY

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ABSTRACT

Diabetes mellitus is a metabolic disorder characterized by high blood glucose levels, polyuria, polydipsia and weight loss. Diabetes is the eight leading cause of deaths among both the sexes and accounts for about 1.5million diabetes deaths and 2.2million deaths from associated complications worldwide. As DM is a preventable disease, dental students being a part of the health care team can raise public awareness which plays a vital role in diabetes management and reducing economic burden especially in developing countries like India. **Aim:** To assess diabetes related knowledge among dental students of Vinayaka Mission's Sankarachariyar (VMS) Dental College in Salem, Tamilnadu, India. **Materials and Method:** A cross sectional questionnaire based study was carried out for about two days which encompassed first, second, third, fourth year dental students and interns. Knowledge of respondents regarding diabetes was measured using 15 item self-administered modified Diabetes Knowledge Questionnaire (DKQ). **Results:** When knowledge regarding diabetes was considered, more than half (65.3%) of the participants believed that sweet consumption causes diabetes. Almost half (49.9%) of the students were unaware that HbA1c is accurate test to assess blood glucose level. Furthermore, 51% respondents perceived that diabetic patient should always take insulin injection and about 38.3% dental students consider that diabetes is a curable disease. Female dental students attending clinical sessions had a better knowledge compared to males and preclinical students. **Conclusion:** Some of the misconceptions among the students need to be addressed as academic dental institutions are considered safety nets for low-income populations.

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INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder characterized by high blood glucose levels, polyuria, polydipsia and weight loss[1]. Worldwide the number of people with diabetes has considerably increased between 1980 and 2014 ranging from 108 million to 422 million [2,3]. Moreover, India already has 62 million people with diabetes and estimated prevalence rate by 2030 is 79.4 million[4]. Furthermore, diabetes is the eight leading cause of deaths among both the sexes and accounts for about 1.5million diabetes deaths and 2.2million deaths from associated complications worldwide in 2012 [5]. Several studies[6-11] reported that diabetes contributes to development of various microvascular and macrovascular complications in turn decreasing life expectancy by about 10-30%. Diabetes not only affect general health but also oral health. Epidemiological studies [12-18] revealed that uncontrolled diabetes can affect the salivary glands resulting in xerostomia, sialosis, taste impairment and increases the risk for dental caries.

Additionally, impaired leukocyte function and reduced cellular immunity in diabetes patients enhance susceptibility to periodontal diseases. Henceforth, inadequately controlled moderate to severe periodontitis increase gram negative bacterial load which eventually triggers insulin resistance through C-Reactive Proteins (CRP) thus adversely affect glycemic control [19, 20]. Thereby diabetes and periodontal disease shows bidirectional relationship.

Considerable body of evidence revealed that more than 80% of people with diabetes live in low and middle income countries [21, 22]. Various studies [23-25] conducted worldwide had shown, people lack knowledge allied to diabetes etiology, prevention and associated complications in turn leading to poor levels of self-care.

As DM is a preventable disease, dental students being a part of the health care team can raise public awareness which plays a vital role in diabetes management and reducing economic burden especially in developing countries like India, which spend only 3% Gross Domestic Product (GDP) on health & family welfare development. In the light of these findings, it is important to assess knowledge regarding diabetes among dental students for planning interventions or preventive

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programs in order to favorably influence both oral and general health. Hence the aim of this study is to assess diabetes related knowledge among dental students of VinayakaMission's Sankarachariyar (VMS) Dental College in Salem, Tamilnadu, India.

MATERIALS AND METHOD

A cross sectional questionnaire based study was carried out among undergraduate dental students of VMS Dental College in Salem, Tamilnadu. The study was conducted in the month of February 2017 for about two days which encompassed first, second, third, fourth year dental students and interns. Ethical clearance was obtained from the Institutional Research Committee VMSDC/PHD/0022/2017. The proforma was designed to collect the information which comprised of two sections. The first section gathered demographic details (age, gender and year of study) from the students. In the second section, knowledge of respondents regarding diabetes was measured using 15 item self-administered modified Diabetes Knowledge Questionnaire (DKQ) which was developed based on 24-item diabetes knowledge questionnaire developed by the Starr Country Texas, Diabetes Education Study[26]. The responses were recorded on a three point likert scale. Each "Yes" response was scored '2', '1' for "No" response and '0' for "Don't Know". The questionnaire assesses knowledge regarding etiology, symptoms, associated complications and on prevention of diabetes. Validity and reliability of the questionnaire was assessed before the start of the study, which showed good test and retest reliability of 0.7. The questionnaire was distributed to the students and only completed forms were included in the analysis. Those who scored at or above 15 point were considered as having adequate knowledge whereas those who scored below 15 point have inadequate knowledge regarding diabetes mellitus. The data was analyzed using Statistical Package for Social Sciences (SPSS) package version 20.0. Chi square test was used to associate the knowledge scores of the study population with variables. Student t-test and ANOVA were used to compare mean knowledge scores with variables. p< 0.05 was considered statistically significant.

RESULTS

Out of 400 participants, 378 undergraduate dental students completed the questionnaires which were included in the study.

The study comprised of 248 (65.6%) females and 130 (34.4%) males with a mean age of 19.2±1.6 years. The age of the respondents ranged from 17-25 years and utmost number of respondents were in 20-22 years of age group. Majority of the study participants belonged to first year (n=94,24.9%) followed by second year (n=92,24.3%), third year (n=67,17.7%), final year (n=66, 17.5%) and internship (n=59, 15.6%) respectively.

When knowledge regarding diabetes was considered, (47.6%) of the participants believed that sweet consumption causes diabetes. Around 30.9% of subjects were not aware that insulin is secreted by pancreas. Almost half (49.9%) of the students were unaware that HbA1c is accurate test to assess blood glucose level. Furthermore, 50% respondents perceived that diabetic patient should always take insulin injection and about 25.92% dental students consider that diabetes is a curable disease [Table I].

Comparison of the correct knowledge responses based on gender, revealed that females had a better knowledge compared to males and significant (P<0.05) difference was noted for questions 2,4,5,11,14 and 15. When age was considered, participants in the age group of 20-22 years had adequate knowledge scores compared to other age groups. Moreover, statistically significant (p<0.05) difference was noted for questions 2,8,10,12,13,14 and 15 with age groups. Based on the year of study, interns followed by fourth and third dental students had adequate knowledge scores with a significant (p< 0.05) difference noted for questions 2, 6,7,9,12,13 and 14[Table I, III].

The significantly (p=0.000) higher mean knowledge scores was observed among females and in 23-25 years of age group participants. Though interns followed by fourth year students dissipated higher mean knowledge scores compared to other students, this difference was not statistically significant [Table IV].

DISCUSSION

As diabetes remains to be a widespread problem all over the world, emphasis has been shifted from prevention of disease to promotion of healthy life styles. Moreover, raising the level of knowledge regarding diabetes among people in the community will ultimately reduce risk of illness. In the present study, overall 266(70.3%) of the dental students had adequate knowledge regarding diabetes which constitute considerable

Table I Participants response rate to diabetes knowledge questionnaire

S.NO	Questions	Yes N(%)	No N(%)	Don't know N(%)
1	Diabetes is a hereditary disease	353(93.4)	23(6.1)	2(0.5)
2	Consumption of sweets causes diabetes	180(47.6)	131(34.6)	67(17.7)
3	Diabetes caused by insulin hormone deficiency	369(97.6)	8(2.1)	1(0.3)
4	Insulin secreted by pancreas	261(69.0)	17(4.49)	100(26.45)
5	Frequent urination and thirst are the symptoms of diabetes	367(97.1)	7(1.9)	4(1.1)
6	Regular exercise can prevent diabetic	330(87.3)	35(9.3)	13(3.4)
7	Monthly once examination of blood glucose level is mandatory	336(88.9)	27(7.1)	15(4.0)
8	Normal level of blood glucose is 80-120 mg	289(76.45)	43(11.37)	51(13.49)
9	HbA1c Test is accurate test to assess the blood glucose level	189(50)	64(16.93)	125(33.06)
10	Before any surgical procedure, blood glucose examination is important	372(98.4)	5(1.3)	1(0.3)
11	Wound healing will be slow for diabetic patients	361(95.5)	11(2.9)	6(1.6)
12	Diabetes can damage kidneys	326(86.2)	28(7.4)	24(6.3)
13	Diabetes can affect the dental health	340(89.9)	33(8.7)	5(1.3)
14	Diabetes patient should always take insulin injection	189(50)	185(48.94)	4(1.05)
15	Diabetes is a curable disease	98(25.92)	238(62.96)	47(12.43)

Table II Comparison of study subjects based on knowledge scores according to variables

Variable	Inadequate knowledge (n)	Adequate knowledge (n)	p value
GENDER			
Males	46	84	0.050*
Females	66	182	
AGE			
17-19	80	61	0.000*
20-22	32	152	
23-25	0	53	
YEAR OF STUDY			
First year	61	33	0.000*
Second year	47	45	
Third year	3	64	
Fourth year	0	56	
Internship	1	58	

*Statistically significant (p<0.05)

Table III Questions asked for the assessment of knowledge responses among the study population stratified based on gender, age and year of study

S.No	Questions	p value		
		Gender	Age	Year of study
1	Diabetes is a hereditary disease.	0.568	0.980	0.076
2	Consumption of sweets cause diabetes.	0.057*	0.000*	0.009*
3	Diabetes caused by insulin hormone deficiency.	0.653	0.590	0.131
4	Insulin secreted by pancreas	0.000*	0.497	0.104
5	Frequent urination and thirst are the symptoms of diabetes.	0.025*	0.359	0.385
6	Regular exercise can prevent diabetic.	0.722	0.496	0.018*
7	Monthly once examination of blood glucose level is mandatory.	0.429	0.299	0.000*
8	Normal level of blood glucose is 80-120 mg	0.735	0.000*	0.083
9	HbA1c Test is accurate test to assess the blood glucose level	0.356	0.018	0.000*
10	Before any surgical procedure, blood glucose examination is important	0.075	0.000*	0.338
11	Wound healing will be slow for diabetic patients.	0.017*	0.281	0.483
12	Diabetes can damage kidneys.	0.612	0.003*	0.000*
13	Diabetes can affect the dental health	0.090	0.000*	0.020*
14	Diabetes patient should always take insulin injection.	0.009*	0.046*	0.000*
15	Diabetes is a curable disease.	0.001*	0.003*	0.064

*statistically significant at p<0.05

Table IV Comparison of Mean±SD scores of knowledge based on variables

Variables	Knowledge (Mean±SD)	p value
Gender		
Males	26.89±2.72	0.000*
Females	26.90±2.13	
AGE		
17-19 years	26.66±2.33	0.000*
20-22 years	26.97±2.35	
23-25 years	27.30±2.37	
Year of Study		
First year	26.50±2.57	0.062
Second year	27.04±2.22	
Third year	26.97±2.68	
Fourth year	27.56±1.64	
Internship	26.49±2.32	

proportion of sample. Whereas contradictory findings was observed in studies done by Saxena K *et al* [27] revealing a clear cut knowledge deficit amongst dental fraternity regarding

the manifestations and management of diabetics in dental practice.

In the existing study though good number of respondents had adequate knowledge scores, yet higher percentage (47.6%) of students has misconception that consumption of sweets cause diabetes which was in accordance with Haroon S *et al* [28] study. This finding indicates it's time to enact to address this misconception. According to the study by Saxena K *et al* [27], majority (70%) of the study participants stated HbA1c as the gold standard investigation for screening individuals for diabetes. Whereas in the present study almost half (49.9%) of the students were unaware that HbA1c is accurate test to assess blood glucose level which is comparatively more. This percentage is quite high indicating the need to educate students.

In the prevailing study females had better knowledge scores compared to males which might be due to more inquisitive nature among females leading to better knowledge scores. The mean knowledge score was high among interns followed by fourth and third year students which could be attributed to the fact that students attended medical postings (general medicine and general surgery) and thereby more aware of the diabetes. This finding was in agreement with finding of Haroon S *et al* [28] where problem based learning and case based learning of metabolic disease leads to enhanced knowledge.

CONCLUSION

In country like India with conventional medical practices and lack of equitable distribution of health care, gap related to diabetes mellitus knowledge should be abridged among the masses in order to reduce disease burden and to yield positive health outcomes in the society. The study showed significantly higher number of the students had adequate knowledge scores in regards to diabetes mellitus. Some of the misconceptions among the students that sweet consumption is the etiological factor for diabetes, diabetics should always take insulin injection and diabetes is a curable disease which necessitate to address this misconception as academic dental institutions are considered safety nets for low-income populations.

Limitations

However, we acknowledge that the study had certain limitations such as small sample size and was carried out in a single institution. Therefore, results have to be generalized with caution.

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