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Association Between Dental Clinic In Oral Health Knowledge, Attitudes And Practices Of Dietitians In Of Patients With Diabetes In The Primary Health Care At Saudi Arabia 2023

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Abstract:

Background*:*
Dietitians are a well-placed profession to be providing pre-emptive oral health promotion. Despite recommendations that oral health promotion should be routinely part of dietetic practice, there is limited data informing the current practices of clinical dietitians in this area across Saudi Arabia . Hence, the aim of this study was to assessment the association between dental clinic in Oral health knowledge, attitudes and practices of dietitians in of patients with diabetes in the Primary health care at Saudi Arabia. Increased understanding of the association between many diseases and functional foods has reinforced the need for dietitians and grown the profession globally. There exists a lacuna regarding the understanding, behavior, and perception of diabetic patients toward oral health. Despite the worldwide recognition of the dangers of diabetes mellitus, diabetic patients' awareness of and attitudes toward their heightened risk for oral diseases has not been fully addressed ***. Aim of the study****: To assessment the association between dental clinic in Oral health knowledge, attitudes and practices of [1]dietitians in of patients with diabetes in the Primary health care at Saudi Arabia 2023 .* ***Method:*** *cross sectional study conducted at outpatient dental clinics in primary health care center at Saudi Arabia in Sample population consists of Saudi out patients aged 20 <50 years attending. Our total participants were (300).* ***Results:****. Show the age majority of the study groups from the 40-50 years were (38.0%), gender many of the respondents were female (59.0 %), regarding the perceived Oral Health status the majority of the respondents appears Poor were (45.0%), nationality the most of the participants answer Saudi were (85.0%).****Conclusion****: Dietitians have acknowledged that oral health promotion should be incorporated into their practice. However, they are challenged by a lack of resources and training to support this in clinical practice, and capacity building dietitians to promote oral health allows opportunity for improvement in the oral health, nutritional status and quality of life of priority population groups. Overall, people with diabetes have limited oral health knowledge and poor oral health behaviors. It is therefore essential to educate patients about their increased risk for oral health problems, motivate them for good oral health behaviors and facilitate access to dental care,*

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on the other hand, inflammation caused by gingivitis and periodontitis makes it harder to control blood sugar levels.

Keywords: *Assessment, association, dental, diabetic, patient's, knowledge, attitude, practice, oral, health, Primary health care, Saudi Arabia*

Introduction

Background

The role of dietitians has grown in the last few decades as the burden of chronic illness continues to worsen, and public health interest turns towards dietetic interventions to promote health and prevent diseases.[1] In addition to non-clinical roles, dietetics has become an integral part of the allied health team working alongside medical and nursing staff to translate the impact of good nutrition and a healthy diet on biochemistry, physiology and genetics.[2] Although a well-informed relationship between nutrition and oral health exists, several barriers can impede an individual from seeking dental services with affordability being one of the most cited barriers among the general population.[3] As reported in a Canadian-based population study, individuals without private health insurance and lower socioeconomic status were four times more likely to avoid going to see the dentist.[4] One in five of the surveyed participants reported cost as a barrier to engaging with dental services.[5]

In addition to affordability, a rapid review of barriers to oral health care in vulnerable population groups concluded that difficulty accessing appropriate care and limited access to specialized dental services were other challenges faced by vulnerable populations.[6] Although utilization of private dental services outweighs that of the public dental system, individuals who are unable to afford the cost of dental services have limited choice but to engage with the public system and endure the extensive waiting lists for treatments.[7,8]

DM is an established risk factor for periodontal disease, and periodontal disease is one of the leading causes of tooth loss among adults. Dental patients with poorly controlled DM experience far greater periodontal problems and poorer treatment outcomes compared to those who keep their blood glucose within normal limits.[9] With this close link between DM and periodontal disease, the dental practice offers a good setting for the opportunistic screening of patients' medical problems as Oral Health Professionals (OHPs) are extremely likely to encounter asymptomatic patients with undiagnosed DM and pre-DM.[10] A total of 537 million individuals (20-79 years old) worldwide had diabetes in 2010. By 2030, there will be 643 million diabetics worldwide, and by 2045, there will be 783 million. In South East Asia, the number of adults with diabetes is expected to increase by 68% by 2045 [11]. Dry mouth (Xerostomia), tooth decay (including root caries), periodical lesions, gingivitis, periodontal disease, oral candidiasis, burning mouth (especially glossodynia), altered taste, geographic tongue, coated and fissured tongue, Oral Lichen Planus (OLP), recurrent pathos stomatitis, increased tendency to infections, and poor wound healing are oral manifestations and complications associated with Type 2 diabetes mellitus (T2DM).[12] Complex metabolic and hemodynamic abnormalities, including hyperglycemia, insulin resistance, dyslipidemia, hypertension, and immunological dysfunction, are involved in the pathogenesis of these complications.[13]

Review of literatures

Diabetes has a negative impact on the patient's health due to its many complications. Diabetic patients develop complications due to lack of awareness of the disease There is increasing amount of evidence that patient education is the most effective way to lessen the complications of diabetes.[14]

Shamugakappa et al. [15] reported that only 34% of diabetics were aware of the association between diabetes and periodontal disease, which is low when compared to the 47.7% identified in the study by Maia et al. [16] of Jordanians a total of 612 patients were

enrolled into study. Female patients were more in number than females and the maximum number of patients were in the age-group of more than 55 years. This is similar to the study carried out in western nepal by Subedi et al.[17]

A survey among the United States' (U.S) dentists identified that an overwhelming majority (68−85%) were willing to undertake chair side screening of a medical condition. [18] However, only 56% of the respondents were comfortable drawing blood with a finger stick for blood glucose measurement.[19] Some of the important barriers identified in screening for medical conditions in the dental setting include lack of training, knowledge, fear of being judge mental or fear of offending the patient.[20]

Study in American found that nearly two third of (64% aged 18–64) and Australian (60.3% aged 15 and over) visited dentist in the past year [21]. This delay to seek dental care among people with diabetes is a significant concern considering periodontal disease can negatively impact on diabetes control and worsen diabetes complications [22]

Furthermore, Vaz et al and colleagues in 2023 identified that many dental practitioners regarded blood glucose investigation as outside their scope of practice, and only a few dental offices owned and use a glucometer.[21]

In Australia, little is known about the OHP knowledge, attitudes and practice (KAP) around identification of patients with diagnosed and undiagnosed DM. To explore OHPs' knowledge on DM, referral, and pathway of care, an understanding of risk factors for DM, opinions about and perceived barriers to screening is important.[23]

Among the knowledge variable, only 12% of the OHPs identified osteoporosis as a significant complication of DM. This may be due to the fact that evidence relating T2DM and Bone Mineral Density (BMD) is inconsistent and equivocal.[24] Having said that, several studies have demonstrated higher incidence of fracture among T2DM being linked to glycaemia control, retinopathy, peripheral neuralgia and stroke, thus increasing the risk of fall.[25] When we compared our results with a similar survey on U.S general dentists24 and dental hygienists on selected (DM risk factors) knowledge items with the same wording, we observed Victorian OHPs with 7–8% higher knowledge scores. However, the number of survey respondents in our study was small and may not be representative of the entire Victorian OHPs. As such, results need to be interpreted with caution.[26]

Poudel et al. [27] did a scoping review in which it was found that the overall awareness of the Asian population about the relationship between diabetes and periodontitis to be of low in the range of 11-64%, and they also had low knowledge scores. This shows that diabetic patients do not have satisfactory oral health due to a lack of awareness of the relationship between oral health and diabetes mellitus and do not value regular dental examinations [28].

Rationale

That people with diabetes have inadequate oral health knowledge, poor oral health attitude, and lower compliance of recommended oral hygiene behaviours and dental visits. They are also not receiving adequate oral health information and care advice from diabetes care providers. It is important that people with diabetes are educated about their increased risk of oral health complications and encouraged to seek regular dental checkups. A multidisciplinary approach involving oral health professionals is needed to capacity build diabetes care providers to promote oral health and encourage their patients to seek dental care along with the establishment of appropriate and affordable dental referral pathways. Addressing knowledge gaps, negative attitudes, and perceptions towards oral health care are important in promoting good oral health among diabetic patients.

Aim of the study

To assessment the association between dental clinic in Oral health knowledge, attitudes and practices of dietitians in of patients with diabetes in the Primary health care at Saudi Arabia 2023.

Specific objective

To assessment the association between dental clinic in Oral health knowledge, attitudes and practices of dietitians in of patients with diabetes in the Primary health care at Saudi Arabia 2023

Methodology

Study setting:
This study has been conducted among diabetic patient's knowledge, attitude, and practice toward oral health attending in the Primary health care at Saudi Arabia 2023

Study Population
The study population consists of diabetic patient's knowledge, attitude, and practice toward oral health attending in the Primary health care at Saudi Arabia 20 - ≥50 years attending to outpatient attending health care center Saudi Arabia

Study Design
Cross-sectional, analytic study , systematic random sampling technique

Inclusion criteria:
Diabetic patient's attending PHC aged 20->50 years
Able and willing to participate in the study .
Participants suffer from dental caries.

Exclusion Criteria
Out patients less than 20 years
Not able and refuses to participate in the study.

Sample size:
Using EPI info version 24, the study sample size has been determined based on the following assumptions :
Knowingly, sample sizes obtained from source population sizes above are not significantly different). Accordingly, a sample size (n) would be 200. In order to account for non-response and achieve more generalizable results, the investigator has be increase the sample size up to 300.

Sampling Technique:
Regarding health care center selection, by using simple random sample technique (by using randomizer.org), regarding patients' selection, the total number visiting is 2700 per month and the sample size is 300. The data collection period is 30 days (four weeks minus weekends). Every day there are nearly 90 patients attending in PHC in both sections (male and female sections). To collect data from sample size, the researcher needs nearly 20 patients per day to collect desired sample size. The researcher has been selecting every 4th patient to cover the sample size during data collection period .The study period extended from the month of February 2023 to March 2023.

Sampling method:
The total number of diabetic patient's patients attending primary health care center in one month is 2700. Based on this information sample size was calculated using a website (raosoft.com). The resulted estimated sample size is 300 diabetic patient's. The confidence interval is 95% and margin of error is 5%. The estimated prevalence used is 50% to calculate maximum sample size.

Data collection method:

Self-administered questionnaire has been given to all participants. Those who have trouble reading or writing the questionnaire, has be filled by the interviewer

Questionnaire:

An Arabic self-administered questionnaire has been used. It consisted of three sections. The first section is on the socio-demographic and presence of chronic disease, and present medication history (e.g., age and education level). The second sections cover ddistribution of basic characteristics of dental caries. The third section addresses of knowledge of respondents relating in diabetic patients and oral health, management and responses of participants to oral health management

Data Collection Technique

The researcher has visit the health care center The researcher has filled the questionnaires through the interview with patients who are attending diabetic patients attending health care center met the inclusion criteria after taking their verbal consent. After obtaining necessary approvals, the researcher and one trained nurse used a since all centers work on walk-in basis, i.e., using "systematic random sampling" technique .

Data Entry and Analysis

Data has been collected and coded and then entered to a MS program with adequate backup. Descriptive statistics, e.g., number, proportions, cumulative proportions, mean and standard deviation, etc. has been displayed, as appropriate. Analytically, a parametric technique, e.g., t-test and ANOVA, has been attempted, as applicable, especially analyzing normally distributed variables. Otherwise, a non-parametric alternative, e.g., Man Whitney U test and ANOVA or χ^2 test of independence, has been used, as necessary. The Statistical Package for Social Sciences (SPSS) software for MS- version-24 will be used for the analysis. All tests has been conducted at level of significance a=0.05; results with p-values<0.05 has been considered "statistically significant ".

Pilot Study

A pilot study has been done on 10 Saudi patients who meet the study's eligibility criteria. The pilot study has been mainly help examine both the instrument's content validity and construct validity issues, alongside with other needed information.

Ethical Considerations

Necessary approval has been the Research Ethics Committee of the PHC, shall be obtained prior to the study .

A written consent has been obtained both from PHC administration. The aim of the study has been explained to them. Feedback about the results has been sent to these organizations .Data has been treated confidentially and has been used only for the purpose of research .

Budget : Self-funded.

Result

Table 1. Distribution of the demographic characteristics of about (n=300)

	N	**%**
Age		
20-30 years	69	23
30-40	60	20
40-50	114	38
≥50	57	19
Sex		
Female	177	59

Male	123	41
Perceived Oral Health status		
Appears Poor	135	45
Neither good nor poor	105	35
Appears good	36	12
Perceived Oral Health status	24	8
Duration of diabetes		
less than 1	84	28
1 – 5 years	93	31
5-10 years	60	20
More than 10 years	63	21
Nationality		
Saudi	255	85
non-Saudi	45	15
Under regular medication		
Yes	117	39
No	183	61
Recent dental visit		
Never visited	93	31
Before 6 years	84	28
Before 1-5 years	102	34
Within a year	21	7
Educational level		
Illiterate	90	30
Low	63	21
Medium	60	20
High	87	29
Income		
Low	84	28
Medium	90	30
Medium-high	75	25
High	51	17
Smoking status		
Yes	135	45
No	114	38

Regarding the distribution of the socio-demographic details among the oral health patients regarding age majority of the study groups from the 40-50 years were (38.0%) followed by 20 to30 years were (23.0%) but 30-40 years were (20.0%) , regarding the gender many of the respondents were female (59.0 %) while male were (41.0%), regarding the perceived Oral Health status the majority of the respondents appears Poor were (45.0%) while neither good nor poor were (35.0%) but appears good were (12.0%), regarding the duration of diabetes the most of the participants 1–5 years were (31.0%) while less than1were(28.0%) while more than 10 years were (21.0%), regarding nationality the most of the participants answer Saudi were (85.0%) while non-Saudi were(15.0%), regarding the under regular medication the majority of the respondents answer No were (61.0%) but Yes were (39.0%), regarding the Recent dental visit the majority of the respondents before 1-5 years were (34.0%) but never visited were (31.0%) while before 6 years were (28.0%), regarding the education status the majority of the respondents illiterate were (30.0%) but high were (29.0%) while low and high were (20.0%), regarding the income the majority of them had medium were (30.0%) while low were (28.0%) but medium-high were (25.0%), regarding the you smoke the most of participant answer Yes were (45.0%) while No were (38.0%)

Table 2 Distribution of knowledge about effect of diabetes mellitus on the oral health .

	Yes		No		Do not know		Chi-square	
	N	%	N	%	N	%	X^2	P-value
Diabetics are more prone to oral diseases	177	59	36	12	87	29	101.940	0.000
Diabetes mellitus cause dental caries	180	60	69	23	51	17	97.620	0.000
Diabetes mellitus affect gingiva	231	77	45	15	24	8	259.620	0.000
Diabetes causes oral fungal infection	207	69	39	13	54	18	172.860	0.000
Is smoking is more injurious to the gum of diabetics more than non-diabetics	228	76	24	8	48	16	248.640	0.000

Regarding distribution of knowledge about effect of diabetes mellitus on the oral health regarding diabetics are more prone to oral diseases a statistical significant relation were P=value 0.001 and X^2 101.940, the majority of the Participants answer Yes were (59.0%) followed by I don't know were (29.0%) while No were (12.0%), regarding diabetes mellitus cause dental caries a statistical significant relation were P=value 0.000 and X^2 97.620, the majority of the Participants answer Yes were (60.0%) followed by I don't know were (17.0%) while No were (23.0%), regarding diabetes mellitus affect gingiva a statistical significant relation were P=value 0.000 and X^2 259.620, the majority of the Participants answer Yes were (77.0%) followed by No were (15.0%) while I don't know were (8.0%), regarding diabetes causes oral fungal infection a statistical significant relation were P=value 0.000 and X^2 172.860, the majority of the Participants answer Yes were (69.0%) while I don't know were (18.0%) followed by No were (13.0%), regarding is smoking is more injurious to the gum of diabetics more than non-diabetics a statistical significant relation were P=value 0.000 and X^2 248.640, the majority of the Participants answer Yes were (76.0%) followed by I don't know were (16.0%) while No were (8.0%),

Table 3 Distribution of Knowledge about the signs of gingival diseases and complication of diabetes on body systems

	Yes		No		Do not know		Chi-square	
	N	%	N	%	N	%	X^2	P-value
Bleeding during brushing	195	65	57	**19**	**48**	**16**	135.780	0.000
Swollen red colored gingival	177	59	36	**12**	**87**	**29**	101.940	0.000
Soreness of gingival	201	67	42	**14**	**57**	**19**	154.140	0.000
complication of diabetes on body systems								
Effect of D.M on the eyes	189	63	45	**15**	**66**	**22**	121.020	0.000
Effect of D.M on the kidneys	192	64	33	**11**	**75**	**25**	135.780	0.000
Effect of D.M on the nerves	204	68	48	**16**	**48**	**16**	162.240	0.000

Effect of D.M on the oral health	198	66	54	**18**	**48**	**16**	144.240	0.000
Effect of D.M on the heart	219	73	27	**9**	**54**	**18**	216.060	0.000
Diabetic foot	195	65	24	**8**	**81**	**27**	151.620	0.000

Regarding distribution Knowledge about the signs of gingival diseases and complication of diabetes on body systems regarding bleeding during brushing a statistical significant relation were P=value 0.000 and X^2 135.780, the majority of the Participants answer Yes were (65.0%) followed by I don't know were (16.0%) while No were (19.0%), regarding Swollen red colored gingival a statistical significant relation were P=value 0.000 and X^2 101.940, the majority of the Participants answer Yes were (59.0%) followed by I don't know were (29.0%) while No were (12.0%), regarding Soreness of gingival a statistical significant relation were P=value 0.000 and X^2 154.140, the majority of the Participants answer Yes were (67.0%) followed by No were (14.0%) while I don't know were (19.0%).

Regarding the complication of diabetes on body systems

Regarding effect of D.M on the eyes a statistical significant relation were P=value 0.000 and X^2 121.020, the majority of the Participants answer Yes were (63.0%) while I don't know were (22.0%) followed by No were (15.0%), regarding effect of D.M on the kidneys a statistical significant relation were P=value 0.000 and X^2 135.780, the majority of the Participants answer Yes were (64.0%) followed by I don't know were (25.0%) while No were (11.0%), regarding effect of D.M on the nerves a statistical significant relation were P=value 0.000 and X^2 162.240, the majority of the Participants answer Yes were (68.0%) followed by I don't know were (16.0%) while No were (16.0%), regarding effect of D.M on the oral health a statistical significant relation were P=value 0.000 and X^2 144.240, the majority of the Participants answer Yes were (66.0%) followed by I don't know were (16.0%) while No were (18.0%), regarding effect of D.M on the heart a statistical significant relation were P=value 0.000 and X^2 216.060, the majority of the Participants answer Yes were (73.0%) followed by No were (9.0%) while I don't know were (18.0%), regarding diabetic foot a statistical significant relation were P=value 0.000 and X^2 151.620, the majority of the Participants answer Yes were (65.0%) followed by No were (8.0%) while I don't know were (27.0%).

Table (4): Distribution of Attitude and practice of diabetic patients towards oral health

	N	**%**
If you have an oral problem, what should be done?		
Consult a physician	45	15
Consult a dentist	102	34
Self -remedy	66	22
Ignore it	87	29
Do you brush your teeth?		
Yes	156	52
No	144	48
The frequency of teeth brushing		
After every meal	102	34
Twice daily	126	42
Once daily	60	20
Occasionally or nill	12	4

How often do you visit the dentist?		
Every 3 months	75	25
Every 6 months	90	30
Once a year	57	19
More than 1 year	30	10
No visits	48	16
Do you want to get education about effect of diabetes on oral health?		
Yes	60	20
No	240	80

Regarding the distribution of attitude and practice of diabetic patients towards oral health regarding if you have an oral problem, what should be done majority of participant answer consult a dentist were (34.0%) followed by ignore it were (29.0%) but self-remedy were (22.0%) while consult a physician were (15.0%), regarding you brush your teeth most the respondents were answer Yes (52.0 %) while No were (48.0%), regarding the frequency of teeth brushing the majority of the respondents twice daily were (42.0%) while after every meal were (34.0%) but once daily were (20.0%) while the occasionally or nill were (4.0%) , regarding often do you visit the dentist majority of participant answer every 6 months were (30.0%) followed by every 3 months were (25.0%) but once a year were (19.0%) while no visits were (16.0%), regarding you want to get education about effect of diabetes on oral health most the respondents were answer Yes (52.0 %) while No were (48.0%), regarding the frequency of teeth brushing the majority of the respondents twice daily were (42.0%) while after every meal were (34.0%) but once daily were (20.0%) while the occasionally or nill were (4.0%) , regarding the duration of diabetes the most of the participants answer No were (80.0%) while Yes were(20.0%) .

Table (5) Distribution of Knowledge of participant toward oral health .

Knowledge		N	%
Yes		201	67
No		99	33
Total		300	100
Chi-square	**X^2**	34.003	
	P-value	<0.001*	

Table 5 show distribution of Knowledge of participant toward oral health the most of participants answer Yes were (67.0%) followed by No were (33.0%) but total were (100.0%) while heave a significant relation were P-value <0.001 and X^2 34.003

Figure (1) Distribution of Knowledge of participant toward oral health

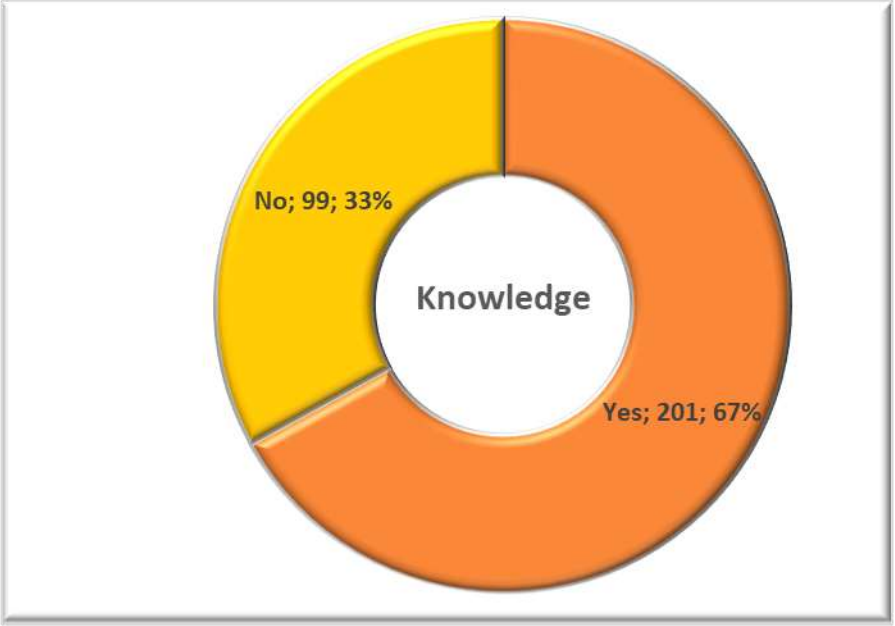
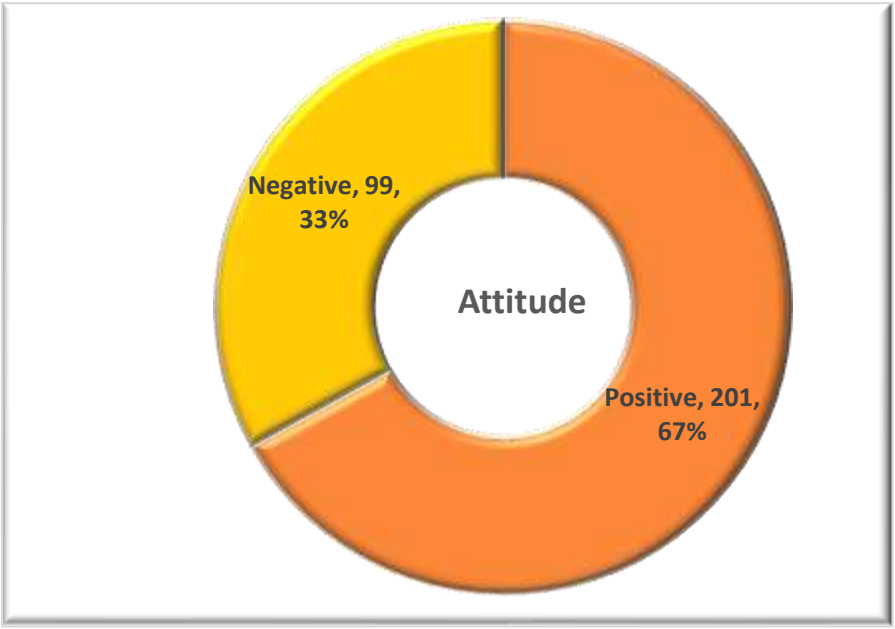


Table (6) Distribution of attitude of participant toward oral health

Attitude		**N**	**%**
Positive		225	75
Negative		75	25
Total		300	100
Chi-square	**X^2**	74.003	
	P-value	<0.001*	

Table 6 show distribution of attitude of participant toward oral health the most of participants positive were (75.0%) followed by negative were (25.0%) but total were (100.0%) while heave a significant relation were P-value <0.001 and X^2 74.003 .

Figure (2) Distribution of attitude of participant toward oral health



Discussion

Diabetes has a negative impact on the patient's health due to its many complications. Diabetic patients develop complications due to lack of awareness of the disease[22]. There is increasing amount of evidence that patient education is the most effective way to lessen the complications of diabetes.[20]

A total of 300 patients were enrolled into this study, age majority of the study groups from the 40-50 years were (38.0%), the gender many of the respondents were female (59.0 %), the perceived Oral Health status the majority of the respondents appears Poor were (45.0%), the duration of diabetes the most of the participants 1–5 years were (31.0%), nationality the most of the participants answer Saudi were (85.0%). This is similar to the study carried out in western Nepal . [29] (See table 1)

This study showed that there is diabetic patient's knowledge about the relationship of diabetes with oral health complications, and some of the participants did not have adequate oral health knowledge related to diabetes. The results are consistent with studies conducted in Saudi Arabia and worldwide [30] This may indicate lack of oral health counseling on the part of physicians and illiteracy In the another study, it was found that less than a fourth of the respondents were aware of, (signs of gingival diseases like bleeding during brushing, swollen red colored gingiva and soreness of gingival. These results are in accordance with previous studies [23]

our study regarding the knowledge about effect of diabetes mellitus on the oral health regarding diabetics are more prone to oral diseases a statistical significant relation were P=value 0.001 and X2 101.940, the majority of the Participants answer Yes were (59.0%), regarding diabetes mellitus affect gingiva a statistical significant relation were P=value 0.000 and X2 259.620, the majority of the Participants answer Yes were (77.0%) (See table2)

This study revealed that most diabetic patients knew about various medical complications of diabetes and the effect of DM on the body systems like the eyes (retinopathy), kidneys (nephropathy), nerves (neuropathy), the heart and diabetic foot because their physicians had laid emphasis on these topics. This may indicate lack of oral health counseling on the part of physicians, as evidenced by other studies [31].(See table 3)

About the attitude and practice of the diabetic patients towards oral health, the overall oral hygiene measures in diabetic patients were found to be good in this study. Most of the included patients consult the dentist, brush their teeth at least 0nce daily and regularly visit the dentist at least once a year for check up [20]

in our study regarding if you have an oral problem, what should be done majority of participant answer consult a dentist were (34.0%) , regarding you brush your teeth most the respondents were answer Yes (52.0 %), regarding often do you visit the dentist majority of participant answer every 6 months were (30.0%) (See table 4)

These findings are in agreement with studies [20]. On the other hand these findings are in disagreement with study in pakistan [21] who found that overall oral hygiene measures in diabetic patients were deficient , this may be due to lack of health education about oral hygiene

Nearly 67.0% of diabetic patients have good knowledge about the complications of diabetics towards oral health which is similar to that of Siddiqi et al.[33] study (51.2%) whereas in it was 9.73%. According to Ismaeil et al. [29] study, 96.7% of diabetic patients are comfortable talking to dental professionals, and 71.2% believe there is no need to discuss diabetes during dental appointments whereas in the current study, 67.0% answer Yes about knowledge oral health .

Show distribution of Knowledge of participant toward oral health the most of participants answer Yes were (67.0%) followed by No were (33.0%) but total were (100.0%) while heave a significant relation were P-value <0.001 and X2 34.003 (See table 5)

Also regarding distribution of attitude of participant toward oral health the most of participants positive were (75.0%) followed by negative were (25.0%) but total were (100.0%) while heave a significant relation were P-value <0.001 and X2 74.003 .(See table 6). Comparable to the 5.1% observed in the Ismaeil et al. [29] study, 11.6% of the participants in the current study demonstrated positive attitudes towards oral health which is in contrast to the present study (62%). However, 74.5% of the study subjects only used toothbrushes, compared to 83.2% in the study by Ismaiel FMR et al. [29].

Conclusion

The level of awareness and dental health knowledge in diabetic patients was good. Most diabetic patients knew about various medical complications of diabetes and the effect of DM on the body systems. About the attitude and practice of the diabetic patients towards oral health, the overall oral hygiene measures in diabetic patients were found to be good. Overall, knowledge, attitude and practice towards DM was positive. There is increasing interest towards medical screening in the dental setting, to implement T2DM screening in the dental setting, it is important for OHPs to appreciate the value, willingness to screen and compliance of the patient, as Diabetes Mellitus is emerging as a global epidemic, there lies a huge responsibility on the hands of both dentists and physicians in educating and creating awareness among the diabetic population to reduce the oral complications and morbidity rate respectively.

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