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Research Article

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Oral Health Awareness and Self-Care Practice among Diabetic Patients Attending Diabetic Clinic of Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia

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Abstract

Background: *Good oral health awareness and self-care practice play a vital role in the early diagnosis and management of diabetes-related complications including oral disease. However, the status of oral health awareness and self-care practice among diabetic patients has never been reported in Ethiopia. Therefore, this study aimed to assess the level of oral health awareness, and self-care practices among diabetic patients attending the diabetic clinic of Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia.*

Methods: *A facility-based cross-sectional study and systematic random sampling method were used to recruit diabetic patients in this study from March to May 2020. Collected data were entered, and edited, using Epi data version 3.1 statistical packages and analyzed using STATA version 14. Descriptive statistics were used to describe the level of oral health awareness and self-care practice among the study participants.*

Results: *The study found lesser number (39.25%) of the study participants know the relationship between diabetes and oral health. Further, our finding revealed that only (43.55) of the study participants knew their diagnosis (the type of DM). About 31.72% of the study participants had received information regarding oral health care. Further, the study found about 39.78 % of the participants clean their teeth once a day, and (40.13%) of them had a history of dental care visits within five years.*

Conclusion: *The study concludes level of oral health awareness and self-care practice among diabetic patients was low in the study area. Therefore, healthcare providers and stakeholders should invest efforts in improving the patient's oral care awareness and self-care practice.*

Keywords: Oral health, Awareness, Self-Care Practice, Diabetes Mellitus

1. Introduction

Diabetes Mellitus (DM) remains a worldwide public health problem and is currently one of the primary causes of morbidity and mortality in both developed and developing countries [1]. According to the International Federation of Diabetes (IDF), approximately half a billion people live with diabetes mellitus, and about (80%) of the diabetes burden was estimated from low and middle-income countries [1,2]. In Africa, oral health diseases are a major public health problem [3]. This can significantly affect patients 'quality of life and dramatically increase healthcare costs.

The study has shown that the lifetime prevalence rate of oral disease among diabetic patients was estimated to be more than seventy [4]. Additionally, a systematic review conducted in Saudi Arabia revealed that more than (90%) of diabetic patients were found to have oral complications [2]. Hence, having a good awareness of oral health is a major part of diabetes care [5,6]. This means people with well-controlled diabetes and having a good awareness of self-management are not at an increased risk of oral disease like periodontitis [6]. However, evidence suggests that oral health awareness among diabetes patients is considerably low. For instance, a study done in Saudi Arabia revealed that only (21.8%) of participants knew the challenge of gum disease to control blood sugar [7]. Further, a survey study from India indicated that only (49.8%) of diabetic patients had good knowledge of oral disease[6]. Similarly, a literature review conducted in Australia reported that approximately (73%) of patients with DM did not know the link between diabetes and oral health[8]. Conversely,

a study conducted among health professionals has reported that about (92%) of participants were aware of a relationship between DM and oral disease [9].

Although a good mouth-care practice is vital for the management of diabetes-related complications, most of the studies indicated that the level of oral care practice among diabetes mellitus was low. According to a study reported by Eldarrat, A., (83%) of the participants didn't brush their teeth twice daily and (67%) of the participants had no regular dental check-ups [10]. Another study done in Saudi Arabia revealed that only (22.2%) of DM patients brush their teeth twice a day [7]. Poor oral care increases the risk of oral infection, bad taste, tooth loss, pain, and discomfort, and may prevent the patient from chewing food properly, causing poor nutrition and poor quality of life [11-13].

Prevention of oral health problems is of paramount importance to reduce diabetic-related economic and health problems [2]. For effective prevention and management, a diabetic patient needs health information from all healthcare providers [14]. However, many diabetic patients didn't receive adequate information from their healthcare providers [15]. A survey study conducted in Saudi Arabia revealed that (94.8%) of diabetic patients didn't receive oral health information from healthcare providers [7]. Additionally, Al Habashneh, R., et al reported that (50%) of participants preferred to use media as the main source of information [15]. On another hand, diabetes patients preferred to use their friends or relatives as a source of oral health information [7]. Hence, healthcare providers should provide health information about the prevention, early detection, and treatment of oral disease.

Even though several studies have been conducted to assess oral health awareness and self-care practice among diabetic patients in several countries [5-7]. The status of oral health awareness and self-care practice among diabetic patients has never been reported in Ethiopia. Therefore, this study aimed to assess oral health awareness and self-care practices among diabetic patients' follow-up at the diabetic -center of Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia.

2. Methods and Materials

2.1 Study Design, Setting, and Study Period

A facility-based descriptive cross-sectional study was conducted in the diabetic center of Tikur Anbessa Specialized Hospital (TASH) from March to May 2020. TASH is the largest referral hospital in the nation at the tertiary level. It serves as a teaching hospital for undergraduate, postgraduate, residency, and sub-specialty training in various health professions. The hospital had 800 beds with 470 doctors and 996 nurses. The hospital provides care in almost all specialties including diabetes. The diabetic care unit of TASH is the most organized center and until recently, the only referral clinic for diabetic care in the country. The center serves about 853 diabetic patients who come from urban and rural districts of the country. It is the only public institution that provides retinal screening and lather therapy for diabetic patients. It has regular patient follow-up schedules where it conducts patient education, and glycemic control check-up medication refills.

3. Populations

The source population of this study was all adult diabetic patients who were receiving diabetic care at TASH diabetic center whereas, those DM patients who were attending their follow-up care at TASH during the data collection period and their medical record number got sampled were the study populations

4. Inclusion and Exclusion Criteria

All diabetic patients (with type 1 and type 2 diabetes) aged 18 years or above with a regular follow-up for at least 6 months were included in the study. whereas, patients who were severely ill and those who are not volunteered to participate were excluded from this study.

5. Sample Size Determination

In calculating the sample size, a single population proportion formula with a 95% confidence interval at a precision of 0.05% was used. Since there is no study conducted in the study area, we used a proportion of 50%. Hence, the sample size was calculated as follows

Since the total number of the study population is less than ten thousand, we used an adjustment for finite population correction formula (Nc =n/ (1+n/N) Where, n= sample size calculated, Nc= sample size after use of correction formula, and N= number of the source population. Then, (Nc=. 384/ (1+ 384/853). Assuming a 5% nonresponse rate. Finally, 278 was estimated for this study. Using systematic random sampling techniques, every third patient who fulfills the inclusion criteria was invited to participate in the study.

6. Data Collection Instruments

The data collection tool was developed based on previous similar studies[6, 10, 16]. Before data collection, the instrument was developed in the English language. To ensure consistency, the questionnaire was translated from the English version to the Amharic language (a federal language in Ethiopia) by a multilingual translator and then back-translated to English by another multilingual translator. A pre-test was conducted in St. Paul's Millennium Medical College Hospital. Then, some amendment was made based on pretest feedback. Based on the result of the pretest, ambiguous questions were modified for clarity and consistency. Then, the questionnaire was categorized into socio-demographic characteristics of participants; awareness of diabetic-related clinical data, sources of information on oral health, and oral self-care practice.

7. Sampling Technique and Quality Assurance

Three nurses with BSc degrees and two nurses with MSc were recruited for data collection and supervision respectively. The data collectors were provided with one day of intensive training about the data collection procedure, (how to administer the self-administered questionnaire, informed consent, keep confidentiality,

and respect the right of the participants). The completeness and consistency of the collected data were checked daily and closely supervised by the principal investigator. Since data were collected during the COVID-19 pandemic, the World Health Organization (WHO) Safety guidelines and protocols were strictly followed at all times. Data were collected using face-to-face interviews with trained Nurses who work at the diabetic unit of TASH.

8. Operational Definition

Oral health awareness: Is defined as the capacity needed by individuals to understand the factors associated with good as well as poor oral health [17]. Hence, in this study, participants were considered as having:

Poor oral health awareness: Participants who scored below the mean score of questionnaires related to oral health information/ knowledge Good oral health awareness: Participants who scored above the mean score of questionnaires related to oral health information/knowledge Oral self-care practice: Is defined as the process of learning and adopting positive oral self-care behaviors such as frequent brushing, flossing, and regular dental checkups. In this study, a good oral self-care practice was considered if the participants clean their teeth more than once a day [17]. In this study, those who clean their teeth only once a day or at a lesser frequency were taken as having poor oral self-care practice.

9. Statistical Analysis

Collected data were entered, edited, and cleaned using Epi data version 3.1 statistical package and analyzed using STATA version 14. Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe the level of oral health awareness and self-care practice among the study participants. The results were presented in a table and the figures.

10. Results

11. 1 Demographic Characteristics of the Study Participants

A total of 186 diabetic patients were participated in the study. The mean age of participants was 47.16 years. The majority 58.6% and 90.86% of the study participants were females and reside in urban areas respectively. The majority 75.27% and 59.68% of the study participants were Orthodox Christian followers in their religion and married in their marital status respectively. The majority of the study participants were married (59.68%) followed by singles (18.82%) (Table 1).

Variables	Frequency(N)	Percentage (%)
Age (in years)		
18 – 30	31	16.67
31 – 45	57	30.65
46 – 60	62	33.33
> 61	36	19.35
Sex		
Female	109	58.60
Male	77	41.40
Residence		
Urban	169	90.86
Rural	17	9.14
Religion		
Orthodox	165	88.71
Muslim	21	11.29
Marital status		
Married	111	59.68
Unmarried	75	40.32
Educational status		
No formal education	23	12.37
Primary school	32	17.20
Secondary school	71	38.17
Tertiary education	60	32.26
Employment		
Unemployed	108	58.1
Employed	78	41.9
62 Income		
Below 1000 EB	31	19.14
Between 1000-2000 EB	33	20.37
Above 2000 EB	89	54.94
Don't disclose	9	5.56
Key: EB = Ethiopian Birr		

Table 1: Socio-Demographic Characteristics of the Study Participants (n= 186)

12. Level of Oral Health Awareness among the Study Participants

The study found only (39.25%) of the study participants knew the relationship between diabetes and oral health. Further, the findings of our study revealed that less than half (43.55%) of the study participants know their type of DM and nearly half (49.46%) of them know the complications of DM. Only (31.72%) of the study participants had ever received information regarding oral health. A small number of participants have received information from dental professionals (40.68%), doctors (23.73%), nurses (20.34%), mass media (10.17%), and However, the remaining (5.08 %) of participants have received from other sources (table 2).

Variable	Frequency(N)	Percentage (%)
Diabetes Mellitus and oral disease have a relation		
Yes	73	39.25
Do you know the complications of Diabetes Mellitus?		
Yes	92	49.46
Complications of Diabetes Mellitus mentioned		
Eye disease	12	6.45
Kidney disease	7	3.76
Heart disease	13	6.99
Oral disease	22	11.83
Foot ulcer	18	9.68
Others (such as Nerve paralysis, neurologic disturbance (confusion), nausea, and vomiting)	20	10.75
Do you know the preventive methods for diabetes mellitus?		
Yes	81	43.55
Ever received oral health information		
Yes	59	31.72
Sources of oral health information		
Nurses	12	20.34
Doctors	14	23.73
Dental professionals	24	40.68
Mass media	6	10.17
Others (such as friends, family, and the Internet)	3	5.08
Information understandability		
Yes	156	93.33

Table 2: Oral Health Awareness and Source of Information (N= 186)

13. Self-Reported Oral Care Practice among Study Participants

Regarding the participant's oral health self-care practice (29.57%) of the participants brushed their teeth once a day while (38.71%) cleaned twice a day. The remaining (29.03%) and (2.69%) did a self-care practice less than once a day and only once a week respectively (Table 3).

Variables	Frequency(N)	Percentage (%)
Self-Care Practice		
Clean once a day	72	38.71
Clean twice a day	55	29.57
Clean < one a day	54	29.03
Clean once a week	5	2.69
Ever referred to dental care		
Yes	28	15.05
Dental care visit		
< 1 year ago	29	15.59
1-2 years ago	14	7.53
3-5 years ago	18	9.68
More than 5 years	37	19.89
Don't know	88	47.31

Table 3: Self-Reported Oral-Care Practice among Study Participants (n= 186)

14. Discussion

Given that currently, at least (3.9%) of the Ethiopian population suffer from diabetes mellites DM [18]. And (42.2%) of people have encountered oral disease [19]. With such a high prevalence, it is well expected that many Ethiopian people are encountered in both cases. Hence, good oral health awareness plays a vital role in the early diagnosis and management of diabetes-related complications including oral disease. However, the level of oral health awareness and self-care practice among diabetic patients has never been reported in Ethiopia. Therefore, this study aimed to assess oral health awareness and self-care practices among diabetic patients attending the diabetic -center of Tikur Anbessa Specialized Hospital Addis Ababa, Ethiopia.

In the present study, only (39.25%) of the study participants knew the bidirectional relation between diabetes and oral health problem, which is lower when compared to a study done in India, and Saudi Arabia, which reported that (60%) and (85%) of the study participants were aware of the interrelationship between diabetes Mellites and oral disease respectively [20,21]. The difference might be due to variations in the level of education among the study population, and the level of understanding and intervention from healthcare providers because the awareness of the bidirectional relationship between DM and oral disease is not easy for patients [8].

Awareness of various complications of DM is important for the prevention and management of the disease. In our study, less than half (49.46%) of participants had an awareness of DM complications. Moreover, awareness about oral complications was limited (11.83%). This finding is lower when compared to the study done in Australia [22]. Which reported that about (29%) of the patient had an awareness of oral complications. This could be the difference in socioeconomic status, study population, and healthcare system. On another hand, the finding of this study revealed that only (43.55%) of study participants knew the preventive method of DM. The finding is in line with a study done in Gambia [23]. which reported that 50% were not aware of the methods of prevention. These findings suggest that patient education on the prevention of DM seems not to be optimal in developing countries. Therefore, the need to educate patients on prevention and control methods may encourage them to adopt appropriate measures that may be vital in managing the disease.

The effectiveness of diabetic prevention and management largely depends on the information and advice received from healthcare providers [24]. In this study, the results of data analysis showed that only, (31.72%) of the study participants had received information about oral health, which is consistent with the results of a previous study conducted in the UK [5]. Which revealed that only (30.9%) of the DM patients had received oral health information. This finding indicates that still there is a gap in knowledge and information among diabetic patients regarding self-care practice.

Furthermore, our finding was higher when compared to a study done in Saudi Arabia, which revealed that (5.2%) of diabetic patients had received oral health information [7]. This might be due to differences in the study population, for instance, in a study reported by Bahammam MA, all participants were health professionals so they are expected to have more information about the management of diabetes-related disease. But in our study, most of the participants (38.17 %) attended only secondary school. So, they need health-related information on the prevention and control of DM complications including oral disease from healthcare providers. Since the majority of our study population does not have formal education, this information should be delivered in the local language via radio and television, newspapers, mobile phones, and the Internet.

Regarding oral health self-care practice, the present study found only (38.71%) of the study participants clean their teeth once a day. This finding is significantly lower when compared to a study

conducted in, the UK [5]. In addition, Australia, in which (67.2%), and (84.2%) of the study participants clean their teeth twice a daily respectively. The variation might be due to the study population, socio-economic status, variability in educational level, study area, and policy in the health care delivery system. Furthermore, patients' ability to practice self-care in their daily lives is vital for preventing and managing diabetes mellites [25,2]. However, this is better when the patient is informed regarding the importance of self-care practices like oral health. Therefore, informing the methods of preventive practice is an essential element of diabetes management.

Unlike the study conducted in Saudi Arabia, in which (80.2%) of participants visited a dental clinic in one year, the results of the current study showed that only (15.59 %) of the patients visited a dental clinic less than 1 year ago. This indicates that patients who visited their diabetic clinic regularly had a better understanding of self-care practice than those who didn't frequently visit diabetes clinics. On another hand, our data analysis shows that about (76.9%) of participants didn't refer to dental care [7]. The finding is in line with the study reported from India [6], in which more than half (54%) of diabetic patients didn't refer to visit dental care. This signifies that many diabetic patients didn't refer to visit a dental care center. Therefore, all healthcare providers including nurses need to create awareness and advice for diabetic patients about the importance of visiting a dental care center.

15. Strength and Limitations

This study has some limitations. First, this study was conducted at the diabetic center of Tikur Anbessa Specialized Hospital in Ethiopia, so the conclusions may not be representative of other low-level hospitals. Secondly, since participation in the study was not mandatory, our findings may have been influenced by non-response, and selection biases. Thirdly, the nature of the cross-sectional study itself limited us to estimating the cause–effect relationship.

This study has considerable strengths. The study was conducted at a diabetic center of Tikur Anbessa Specialized Hospital, which is the largest referral hospital in the country. Second, this was the first study conducted in Ethiopia, so, the results of this study provide preliminary important information to inform future research.

16. Conclusion and Recommendations

Our study shows that the level of oral health awareness and self-care practice among diabetic patients was low. Lack of adequate knowledge regarding the relationship between DM and oral disease, inadequate sources of information, infrequent dental care/or brush, and lack of awareness towards visiting dental clinics were some of the identified factors among diabetes patients. A serious effort towards improving the level of awareness through health education and promotion was needed from healthcare workers and the general population, as part of strategies to prevent, manage and control DM. Additionally, further studies combining multiple methods should investigate the barriers of DM patients that prevent them from practicing oral care.

17. Declarations

17.1 Ethical Approval and Consent to Participations

Before data collection, ethical approval was obtained from the Addis Ababa University Institutional Review Board (AAU-IRB, With protocol number: 037/20/SNM), College of Health Science. The study was performed by the Declaration of Helsinki. The study protocol was fully explained to each eligible patient and their family. Informed consent was obtained from study participants. Participants' privacy and confidentiality were secured by applying a coded serial number for identification. Moreover, since data were collected during the coronavirus pandemic, all data collectors, supervisors, and study participants were encouraged to wear face masks at all times during the data collection.

18. Acknowledgments

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19. Author Contributions

All authors made a significant contribution to the work reported, in the conception, study design, execution, acquisition of data, analysis, and interpretation, or all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

20. Conflict of Interests

The authors declared no potential conflicts of interest.

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