Research Article

Cross-sectional study on knowledge, attitude and practice about diabetes mellitus among diabetic patients with type II; Asmara, Eritrea

Abstract

Introduction: Diabetes mellitus (DM) type II is one of the most common chronic disease conditions in human history and now it is emerging as an epidemic of the 21st century. Besides the global epidemicity, DM is increasing and becoming a priority disease especially in countries undergoing socio-economic transformation. It has been recommended that self-care, Knowledge, Attitude and Practice (KAP) about the disease is the cornerstone for proper management. Therefore, this study was conducted to evaluate the levels of Knowledge, Attitude, and practice of patients with Diabetes mellitus Type II in Asmara, Eritrea.

Methods: Cross-sectional study on Knowledge, Attitude and Practices of diabetic patients was conducted starting from May 1st to July 1st, 2018, at Halibet and Haz-Haz hospital diabetic clinics, Asmara. The study participants included were from two hospitals based and selected by systematic random sampling. Data collection was done using a structured questionnaire and data were analyzed using SPSS version 25 software. Statistical analyses included correlation tests, ANOVA and t-test.

Results: Three hundred seventy adult diabetic patients, 45.9% males and 54.1% females were enrolled participated in the study. The majority (97%) was greater than 40 years of age and 54% had a family history of Type II diabetes. The levels of diabetic patients' knowledge attitude, and practice were 51.9%, 40.9 % and 42.6 %, respectively. There was a significant correlation between age, sex (male), educational level, family history, duration of diabetes mellitus and use of oral hypoglycemic agents in combination to Insulin with KAP level.

Conclusions: The results of this study showed that KAP regarding diabetes mellitus to be low. The presences of complications were found to be significantly associated with attitude. The study results were also found to have a significant association and positive correlation with duration of DM. Therefore, the study results recommend continuous education about DM and its complications mainly to a newly diagnosed patient's in order to create early awareness and good knowledge.

Keyword: knowledge, attitude, practice, diabetes mellitus, type II

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Abbreviations: DM, diabetes mellitus; IDF, international diabetes federation; SD, standard deviation; KAP knowledge, attitude and practices; SPSS, statistical package for social sciences; Type I DM, type one diabetes mellitus; Type II DM, type two diabetes mellitus; WHO, world health organization

Introduction

Diabetes mellitus (DM) is a metabolic disorder that results from defects in insulin secretion or action of insulin or both. Diabetes mellitus is classified into two types namely; Type I Diabetes mellitus (Type I DM) and Type II Diabetes mellitus (Type II DM). Type I DM is characterized by lack of insulin production while Type II DM is characterized by inadequate insulin secretion or improper insulin utilization.[1,2] Diabetes mellitus (DM) is one of the most common chronic disease conditions in human history and now it is emerging as an epidemic of the 21st century which threatens to overwhelm the health care system in the near future.[3] Besides the global epidemicity, DM is increasing and becoming a priority disease especially in countries undergoing socio-economic transformation.[4] According to International Diabetes Federation (IDF) (2012), report, currently, more than 80% of diabetic patients live in low and middle-income countries with an estimation of 366 million in 2011 and projection to 552 million by 2030, with the African region expected to experience the highest increase in coming years. There are other projections by the World Health Organization (WHO) that estimates the prevalence of diabetes mellitus in 2030 to be 300 million.[5,6] DM affects patients' general health and well-being and is a major public health problem.[7] In most cases the progression of Type II diabetes mellitus results to chronic complications, which lowers patients' quality of life and increases the morbidity, disability and mortality rates.[8,9]

Inadequate knowledge and practice about the prognosis, complications and treatment of DM results to poor glycemic control which in turn leads to increase in morbidity, disability and premature mortality. The management of DM depends mainly on a patients' ability to provide self-care, which is usually acquired through patient education and is considered as an essential element of DM management. Different studies have consistently reported that improved glycemic control reduces the rate of complications and evidences suggest that patients, who are knowledgeable about DM self-care, have better long term glycemic control. Moreover, for the improvement of glycemic control, diabetic patients need to increase their knowledge about the disease. This could affect their attitude,

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which in turn lead to decreased morbidity and mortality related to diabetes, and improve their overall quality of life. Knowledge is the greatest weapon in the fight against diabetic complications; therefore, information can help people to assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to change their attitude towards disease.[10] It is crucial to educate diabetic patients in order to raise their knowledge, attitudes and practices for the reduction of early complications, disability and mortality related to DM.[11–14] However, there are limited studies that address knowledge, attitude and practices (KAP) among diabetic patients. Therefore, this study was conducted to evaluate the levels of Knowledge, Attitude and Practice of Diabetes mellitus Type II among diabetic patients who are on follow-up at Asmara, Eritrea.

Methods and materials

Study design and area

A cross-sectional study on Knowledge, Attitude and Practices of diabetic patients was conducted starting from May 1st to July 1st, 2018, at Halibet and Haz-Haz hospital diabetic clinics. These two hospitals are situated in the capital city of Eritrea, Asmara; about 90% of the diabetic patients in the country get service from these hospitals.

Study participants

The study included diabetic patients who were under follow-up in the two hospitals and they were selected by systematic random sampling every 7th patient during the follow-up days.

Data collection

Data collection was done using structured questionnaire to determine KAP of the diabetic patients. The questioner was developed by the research team and pretested before the actual data collection in a community hospital that provides limited follow-up services for few diabetic patients around a very small subzoba.

Data analysis

Data was entered in to excel software and exported to SPSS version 25 for analysis. Statistical tests were done using 0.05 as the level of significance for looking a significant association of the variables. One-way ANOVA and t-test were used f correlation between variables was assessed using Pearson and Spearman's correlation coefficients.

Ethical clearance

The study has got an ethical approval from ethical committee of the Ministry of Health, and a written consent was obtained from the study participants.

Results

The study included a total of 370 adult diabetic patients who undergo regular follow-up at Halibet and Haz-Haz hospital diabetic clinics. The study findings indicated that the number of males and female participants were almost equal about 46%and 54%; with the majority (97%) greater than 40 years of age. Around 76% of the study participants were married, with 13.5%, 5.1%, 4.1%, 1.4% and 0.3% reporting being widowed, single, divorced, and separated or cohabitating, respectively. The study participants had an educational level of college and above (13.0%), secondary (30.0%), junior (20.3%) and, elementary (17.8%) school, whereas the remaining 18.9% were illiterate. The study finding indicated that 39.2% were housewives followed by government employee (21.4%), trader or merchant (9.5%) military/national service (5.4%) Table 1.

Table 1 Socio-demographic characteristics of study participants (N= 370)

Variable		Number (N)	Percent (%)
Gender			
	Male	170	45.90%
	Female	200	54.10%
Age			
	20-29 Years	2	0.50%
	30–39 Years	9	2.40%
	40-49 Years	49	13.20%
	5059 Years	119	32.20%
	60-69 Years	111	30.00%
	70-79 Years	66	17.80%
	≥80 Years	14	3.80%
Marital status			
	Married	280	75.70%
	Widowed	50	13.50%
	Living Together	1	0.30%
	Separated	5	1.40%
	Divorced	15	4.10%
	Single/Never Married	19	5.10%

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Table Continued...

Variable		Number (N)	Percent (%)
Educational or Professional level			
	Illiterate	70	18.90%
	Elementary	66	17.80%
	Junior	75	20.30%
	Secondary	111	30.00%
	College and above	48	13.00%
Current Occupation			
	Housewife	145	39.20%
	Farmer	11	3.00%
	Civil servant	9	2.40%
	Trader/merchant	35	9.50%
	Retired	13	3.50%
	Military/national service	20	5.40%
	Government employee	79	21.40%
	Self employed	30	8.10%
	Unemployed	28	7.60%
	Total	370	100%

Family history, duration and drug regimen of type II diabetes

More than half (54%) of the study participants had a family history of Type II diabetes, with a history of different years of duration with the disease; -under 1 year (7.3%), 1-4years (25.1%),5-9 years (25.4%),10-14years (19.7%),15-19 years (12.4%) and ≥20years (10.0%). About 45 %were tested for Hg A1C and the majorities (71.4%) were using oral hypoglycemic medications. The main comorbidity between diabetes and hypertension was in 45.4% of the patients Table 2.

Table 2 Clinical Characteristics of study participants (N=370)

Variable		Frequency (N)	Percent (%)
Family History			
	Present	199	53.80%
	No Family History	167	45.10%
	I Don't Know	4	1.10%
Duration of Diabetes in Years			
	< 1 year	27	7.30%
	01-Apr	93	25.10%
	05-Sep	94	25.40%
	10-14	73	19.70%
	15-19	46	12.40%
	≥20	37	10.00%
Have you done Hg A1C with in the year 2017			
	Yes	166	44.90%
	No	204	55.10%

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Table Continued...

Variable		Frequency (N)	Percent (%)
Regimen			
	Oral hypoglycemic agent	264	71.40%
	Insulin	93	25.10%
	Oral hypoglycemic agents and insulin	13	3.50%
Presence or absence of Hypertension			
	Yes	168	-45.40%
	No	202	-54.60%
	Total	370	100%

Knowledge on type II diabetes mellitus among the study participants (diabetic patients)

The diabetic patients' total level of knowledge was found to be 51.9 (SD±15.7) Table 3.

Attitude on type II diabetes mellitus among the study participants (diabetic patients)

The total level of attitude among the diabetic patients' was 40.9 (SD±6.8) Table 4.

Table 3 Description of patients' knowledge score in detail. Each question belongs to 0–1 and 0–4 scores, based on the numbers of correct choices

Code	Knowledge	Mean score (SD)
K1	What are diabetes symptoms? (0-4)	2.29 (1.021)
K2	What is necessary for controlling diabetes? (0-4)	2.36 (0.805)
K3	Which one could cause type 2 diabetes? (0-4)	1.57 (1.068)
K4	What is the effect of diabetes on eyes? (0-4)	1.43 (0.688)
K5	Does exercise have effect on glucose controlling? (0-1)	0.98 (0.126)
K6	Is dietary intervention necessary in controlling glucose? (0-1)	0.99 (0.090)
K7	What is suitable blood pressure for a Diabetic Patient? (0-1)	0.10 (0.304)
K8	Which index is suitable for awareness about diabetes control in past months? (0-1)	0.29 (0.454)
K9	What is the normal fasting blood glucose in a healthy person? (0-1)	0.55 (0.498)
K10	Which one is the correct foot care in a diabetic person? (0-2)	1.38 (0.661)
	Total knowledge percentage (0-100)	51.9 (15.7)

Table 4 Description of patients' attitude in detail; each item belongs -2 to +2 Likert-like (strongly agree, agree, no idea, disagree, and strongly disagree) scores

Code	Attitude	Mean score (SD)
A1	Is diabetes mellitus treatable?	0.41(1.14)
A2	Does DM treatable with dietary and exercise.	0.30(1.17)
A3	Do you think that medication can be discontinued in case of increasing blood glucose and symptoms release.	0.93(0.70)
A4	Diabetes reduces life expectancy.	0.58(0.86)
A5	Do you believe that herbal medications have less complication than physicians' medications?	1.00(0.63)
A6	Lipid and blood pressure control is necessary in diabetic patients.	1.09(0.50)
A7	Regular exercise helps controlling diabetes.	1.19(0.51)
A8	Do you consider initiating insulin exacerbates diabetes and its complications?	0.38(0.85)
A9	Proper diabetes treatment could block renal failure and blindness.	1.14(0.55)
A10	Smoking exacerbates vascular complications due to diabetes.	1.16(0.55)
	Total Attitude Percentage (0-100)	40.9(16.8)

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Practice on type II diabetes mellitus among the study participants (diabetic patients)

The diabetic patients had a total level 42.6 (SD±8.6) Table 5.

Association between knowledge, attitude and practice between knowledge, attitude and practice with, age, sex, educational level, family history and duration of type II DM, drug regimen, presence of complication, and hypertension

There was a significant correlation between age, knowledge(r=-0.312; P=0.0001) and attitude(r=-0.189; P=0.0001), with older age having a negative impact on high knowledge and good attitude. Being male was also found to have a significant association with knowledge (P-value=0.0001), attitude (P-value=0.011) and practice (P-value=0.004) towards DM. The present study documented a significant association between educational level, and knowledge (P-value=0.0001), attitude (P-value= 0.0001) and practice (P-value=0.001). Family history was also found to have a significant association with knowledge (P-value=0.0001), attitude (P-value=0.042) and practice(P-value=0.0001).The present study showed a significant correlation between duration of diabetes mellitus, knowledge(r=0.257 ; P-value=0.0001), attitude (r=0.213 ; P-value=0.0001) and practice (r=0.132 ; P-value=0.011), as the duration with the diseases increases it had a positive impact or there is an increases in knowledge, attitude and practice among the diabetic patients about the diseases. A significant association was reported between the use of oral hypoglycemic agents in combination to Insulin and KAP (P-value=0.0001) about DM, and between insulin alone and attitude (P-value=0.0001). The current study also indicted that the presence of complication had association with the attitude (P-value=0.001) towards diabetes mellitus Table 6.

Table 5 Description of patients' practice score in detail; each item belongs 0 and 1 scores for bad practice and good practice respectively

Code	Practice	Mean score (SD)
P1	Have you ever done ophthalmologic examination? (0-1)	0.19(0.40)
P2	Have you ever used herbal medication for controlling diabetes? (0-1)	0.92(0.27)
P3	Have you asked Nutritional advice from an expert? (0-1)	0.23(0.42)
P4	How many times a week do you examine your feet? (0-1)	0.00(0.00)
P5	Do you have glucometer? (0-1)	0.51(0.50)
P6	When is proper time to check blood glucose by glucometer? (0-1)	0.92(0.27)
P7	How many days a week do you exercise? (0-1)	0.00(0.00)
P8	How many main meals do you have daily? (0-1)	0.00(0.00)
P9	Last year how many times do you visit the follow-up clinic? (0-1)	0.20(0.40)
P10	Do you smoke? (0-1)	0.93(0.26)
P11	Have you ever participated in a diabetic education? (0-1)	0.98(0.15)
	Total Practice Percentage (0-100)	42.6(8.6)

Table 6 Association between KAP with, age, sex, educational level, family history and duration of Type II DM, drug regimen, presence of complication, and hypertension

Variable		Knowledge (%) (SD)	Attitude (%) (SD)	Practice (%) (SD)
Total score (0-100)		51.9(15.7)	40.9(16.8)	42.6 (8.6)
Age1		r=-0.312 ; P=0.0001	r=-0.189; P=0.0001	r=-0.028; P=0.588
Sex2		P=0.0001	P=0.011	P=0.004
	Male	55.2(15.7)	43.3(16.3)	41.2(8.2)
	Female	49.2(15.2)	38.9(16.9)	43.8(8.8)
Educational level3		P =0.0001	P=0.0001	P=0.001
	Illiterate	41.6(15.8)	31.5(18.0)	46.4(8.9)
	Elementary	43.3(13.9)	38.6(16.7)	42.3(9.0)
	Junior	51.5(13.4)	41.3(13.2)	40.1(8.7)
	Secondary	59.2(11.4)	45.6(15.6)	42.4(8.3)
	College and above	62.9(14.5)	46.5(16.8)	41.9(5.9)

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Table Continued...

Variable	Knowledge (%) (SD)	Attitude (%) (SD)	Practice (%) (SD)
Family history of diabetes2	P=0.0001	P=0.042	P=0.0001
Yes	57.9(14.1)	42.6(15.0)	41.0(8.2)
No	44.4(14.1)	39.0(18.3)	44.5(8.8)
Duration of diabetes (Yrs.)4	r=0.257 ; P=0.0001	r=0.213 ; P=0.0001	r=0.132 ; P=0.011
Done Hgb A1C in 20172	P=0.0001	P=0.083	P=0.736
Yes	57.1(16.3)	42.6(14.9)	42.8(8.3)
No	47.7(13.9)	39.6(18.1)	42.5(8.8)
Drug regimen3	P=0.0001	P=0.0001	P=0.0001
Oral hypoglycemic agent	48.8(15.3)	38.2(17.2)	43.8(8.8)
Insulin only	59.4(13.7)	48.4(12.7)	40.1(7.1)
Oral hypoglycemic agents and insulin	62.5(15.4)	41.9(17.0)	36.4(6.4)
Presence of complication/s2	P= 0.396	P=0.001	P=0.608
Yes	52.3(15.3)	42.3(16.4)	42.5(8.6)
No	50.4(17.5)	34.8(17.2)	43.1(8.5)
Presence of Hypertension2	P=0.364	P=0.386	P=0.238
Yes	51.1(15.4)	40.1(16.4)	43.2(8.8)
No	52.6(15.9)	41.6(17.1)	42.1(8.4)

[1]Pearson correlation (r); [2]t-test; [3]One way ANOVA; [4]Spearman's correlation (r_s)

Discussion

Out of the 370 adult diabetic patients, 45.9% (n=170) were males and 54.1% (n=200) females. The study participants were under regular follow-up at Halibet and Haz-Haz hospital diabetic clinics. The majority (97%) of the participants were greater than 40 years of age and 54% had a family history of Type II diabetes with different durations; under 1 year (7.3%), 1-4 years (25.1%), 5-9 years (25.4%), 10-14 years (19.7%), 15-19 years (12.4%) and ≥20 years (10.0%). Greater than 71% of the diabetic patients were using oral hypoglycemic agents (Glibenclimide and/or metformin). In this study drug adherence was good. Similar to this study, many previous studies documented a significant association between good drug adherence and high prevalence of diabetic complications.[4,15–19] The results of this study indicated good drug adherence to oral hypoglycemic medication which is similar to a study in Ethiopia.[15] The present study showed comorbidity between hypertension and diabetes mellitus (45.4%), which is similar to a study in Lahore and Nepal.[4,19] The present study showed a significant correlation between age, knowledge and attitude, with older age having a negative impact on high knowledge and good attitude. Furthermore, results were found to be similar to a study in the United Arab Emirates (UAE) that showed a significant association between age and knowledge. However, the results were inconsistent with the study in Iran that showed a significant association between age and practice, with older age having a negative impact on good practice.[16,17] Being male was also found to have a significant association with positive knowledge, attitude and practice towards DM which is similar to a study in UAE.[16] The study findings were found inconsistent with other studies that didn't reported any association between sex and Knowledge Attitude and Practice (KAP) about DM.[17] The present study documented a significant association between educational level and KAP of diabetes mellitus.

A study in United Arab Emirates, Iran, Turkey and Egypt documented similar results of association between educational level and KAP.[16–19] Family history was found to have association with knowledge, attitude and practice, to a similar study in UAE, Iran and Egypt documented a significant association between family history and, knowledge and KAP of DM.[16,17,19] The present study showed a significant association and positive correlation between duration of diabetes mellitus and KAP similar to the study of UAE, Iran and Egypt.[16,17,19] These results might be due to the duration of the diseases, because as the patient stays with the disease for years awareness about the disease increases. Therefore, it had a positive impact or there is increased awareness in knowledge, attitude and practice among the diabetic patients about the diseases with time. A significant association was reported between patients who use of oral hypoglycemic agents in combination to Insulin and KAP of the patents. The present study results were found to have similar results with the study reports from UAE but inconsistent with a study from Iran.[16,17] The current study also indicted that the presence of complication had association with the attitude towards DM. In general, the present study showed a total level of 51.9 (SD±5.7), 40.9 (SD±6.8) and 42.6 (SD±8.6) of the diabetic patients' knowledge, attitude and practice, respectively. The present study findings of knowledge were found to be similar with a study in Pakistan,[19] but the overall knowledge, attitude and practice were found to be low as compared to studies in Iran, Turkey and Nepal.[17,18,20] The study results showed a better knowledge, attitude and practice than a study that was conducted in western Nepal that documented very poor knowledge (4.9%), attitude (2.03%) and practice (0.84%).[21]

Conclusion

The results of this study showed that KAP regarding diabetes mellitus to be low. The presence of complications were found to be significantly associated with attitude and, significantly associated and

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positively correlated with duration of DM. Therefore, the study results recommend continuous education about DM and its complications to a newly diagnosed patient's in order to be aware early and have a good knowledge, attitude and practice about the diseases.

Authors contribution

ETA, prepared the proposal of the study, contributed in data entry and analysis, interpreted, wrote the report and reviewed the final manuscript; AG, MS, KG and DF lead and participated in data collection, ZA participated in data analysis and interpretation of the data. Final manuscript was approved by all the authors.

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Conflicts of interest

All authors have no conflict of interests.

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