

KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT DIABETIC FOOT CARE AMONG DIABETIC PATIENT ATTENDING ENDOCRINE CLINIC IN BAGHDAD TEACHING HOSPITAL/MEDICAL CITY

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ABSTRACT

Background of the study: Diabetic foot represents a serious complication and results in a significant burden on the health of the community and the healthcare system. Moreover, diabetic foot ulcer is a highly recurrent problem, once it occurs, even if treated properly. But fortunately, the majority of problems for diabetic foot can be prevented by relatively easier and lower-cost measures through proper patient education, early identification by healthcare practitioners, and appropriate care measures by a multidisciplinary team. **Aim of the study:** To assess the knowledge, attitude, and practice about diabetic foot care among Diabetic patient, and to determine the association between socio-demographic data with their knowledge, attitude, and practices. **Patients & Methods:** A cross-sectional study used a pre-structured questionnaire adopted from a previous literature. Using convenient sampling, 319 participants were recruited from the diabetic patients visiting a tertiary endocrine clinic in Baghdad hospital /medical city, from the 1st of February 2024 to the 30 May 2024. The data collected using a questionnaire which consist of 4 parts, the first part about sociodemographic information, the second part measure patient knowledge, the third part about attitude about diabetic foot care and the last part was about foot care practice. The study included type 1 and 2 diabetic patients diagnosed for at least one year, excluding those with gestational diabetes, active or past diabetic foot ulcers, non- diabetic foot issues, late-stage complications, or those on chemotherapy/immunosuppressants. **Results:** In this study the result showed that in 208 (65.2%) was fair level of knowledge, 56 (17.6%) were poor knowledge & 55(17.2%) had good knowledge, regarding attitude score 148 (64.4%) were neutral attitude, 67(21%) had negative attitude and 104(32.6%) with positive attitude. Regarding practice score, 219 (68.7%) had a fair level of practice, 55(17.2%) had poor practice, and 45 (14.1%) had good practice. A Positive significant association was found only between educational level and both attitude and practice level. **Conclusions:** Two thirds of the patients had fair knowledge level about diabetic foot care, regarding attitude part of the study near half of participants were neutral attitude, two third of the participants had fair practice, more than half of the participants, their source of information about diabetic foot was from their family and friends and only one third was from medical staff, there was a significant association between educational level and the fair practice level and also educational level associated with positive attitude level toward diabetic foot.

KEYWORDS: Diabetic foot care, Knowledge, Attitude, Practice.

1. INTRODUCTION

Diabetes is a chronic metabolic disease marked by high blood sugar levels, leading to serious organ damage over time.^[1]

It poses a major global health challenge. In Iraq, the adult prevalence is 10.7%, and according to world health organization (WHO) it was the fifth leading cause of death in 2019.^[2,3]

Diabetic foot results from nerve and artery damage, and is defined as any necrosis, gangrene, or full-thickness skin defect below the ankle in diabetic patients.^[4]

Diabetic foot is a serious complication with a 15% lifetime risk. It accounts for 50% of diabetes-related hospitalizations and 70% of non-traumatic amputations.^[5]

Each year, 2.5% of diabetics develop foot problems. The global prevalence is 6.3%, varying by region (3%–13%).^[6] In Iraq, a 2021 study reported a 51.1% prevalence among 92 diabetic patients.^[7]

Diabetic foot ulcers are highly recurrent; even after proper treatment, they are often seen as being in remission rather than fully healed, with a high risk of relapse.^[8] Diabetic foot leads to frequent hospital visits and, in severe cases, long admissions and antibiotic use, placing a high economic burden on both patients and the healthcare system.^[9]

Diabetic foot significantly increases healthcare costs by 50% to 200%^[10] and is among the top five most costly conditions, with an estimated \$43 billion annual cost in the USA.^[11]

Fortunately, up to 85% of cases are preventable with simple, low-cost measures.^[12] Through proper patient education, early identification by healthcare practitioners, and appropriate care measures by a multidisciplinary team, many of the diabetic foot risk factors can be managed, and most of the complications can be prevented.^[13] The first step of prevention starts from the patient himself/herself, when the patient gets enough knowledge about the diabetic foot problem, how it develops, what are the predisposing risk factors, what are the daily practices that s/he needs to follow to reduce the risk of a foot injury and when s/he needs to consult his/her doctor are the most important part of prevention. Educating the patient about all this stuff is the responsibility of the healthcare practitioners and should start as early as possible when the patient is diagnosed with diabetes and starts the journey.^[14]

2. Aims of study

- 1- To assess the knowledge, attitude, and practice about diabetic foot care among diabetic patients.
- 2- To determine the association between socio-demographic data with their knowledge, attitudes, and practices.

3. PATIENTS AND METHODS

3.1 Study design

Cross-sectional, descriptive study with some analytic measurement.

3.2 Study setting

This study was done by recruiting diabetic patients visiting the tertiary endocrine clinic in Baghdad teaching hospital /Medical City, Iraq. Data was collected over 4 months, from the 1st of February 2024 to the 30th of May 2024.

3.3 Study Population and Sample size

The study was targeting diabetic patients who had been diagnosed with type 1& 2 diabetes mellitus for

more than one year.

Using a convenient sampling method, the Inclusion criteria will be:

Adult patients (male and female) > 18 years with type 1 and type 2 diabetes mellitus.

- 1- Diagnosed with diabetes for at least one year.

Exclusion criteria

- 1- Gestational diabetes.
- 2- Currently have active diabetic foot ulcer.
- 3- Previous history of diabetic foot ulcer or amputation.
- 4- Any foot problem due to trauma or other causes other than diabetes.
- 5- Patients have one or more of the late-stage complication of diabetes like nephropathy or retinopathy.
- 6- Severely ill patients treated with chemotherapy and/or immunosuppressants.

3.4 Data collection method

Data were collected through direct interviews using a structured questionnaire covering four parts: socio-demographics, knowledge (14 questions), attitude (5 statements), and foot care practices (13 questions). The tool was adapted from previous studies, reviewed by a supervisor, and professionally translated into Arabic.^[5, 15, 16]

Approval was obtained from the Arabic Board for Health Specialization. Patients were selected via convenience sampling, and the study's purpose, privacy, and the right to withdraw were explained. Informed verbal consent was obtained before starting the interviews.

3.5 Statistical analysis

Data were analyzed using Microsoft Excel and SPSS. The knowledge, attitude, and practice (KAP) scores were calculated separately. Responses of “yes” or “agree” were scored as 2, “no” or “disagree” as 0, and neutral responses (e.g., “I don’t know”, “sometimes”) as 1. To reduce acquiescence bias, some questions were reverse-worded, and their scoring was reversed accordingly. The maximum scores were: 28 for knowledge, 26 for practice, and 10 for attitude.

Chi-square analysis and Fisher's exact test will be used to evaluate the relationship between knowledge, practice, and attitude level and categorical socio-demographic variables. For the significance level in this study, a p-value of less than 0.05 will be considered significant.

4. ANALYSIS AND RESULT

4.1 Knowledge level about diabetic foot problem

The highest percentage of the sample had fair level of knowledge (65.2%) about diabetic foot problem, with 17.6% had poor knowledge and 17.2% had good knowledge (Figure 4.1).

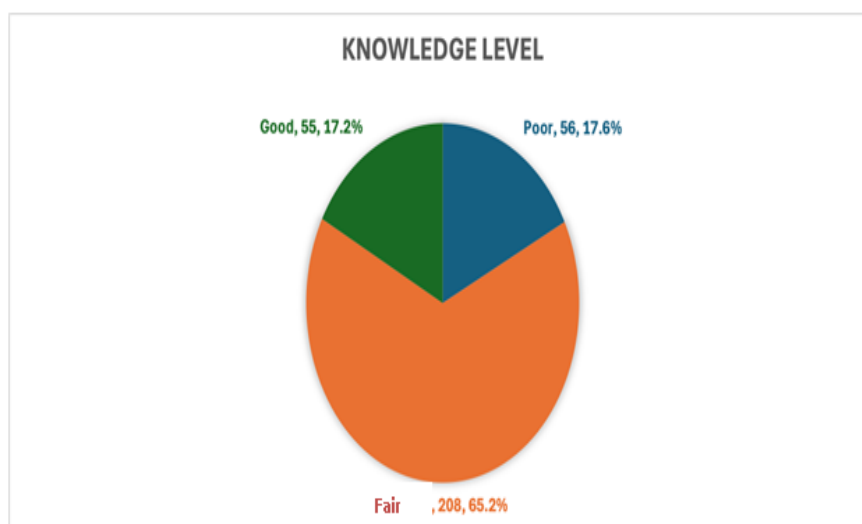


Figure 4.1: Knowledge level distribution among participants.

Regarding the relationship between knowledge level of the participants and their socio- demographic characteristics, we used the Chi-square test to test for the significance of the relationship and the Fisher exact test for variables that include expected frequencies

less than 5. There was no statistically significant relationship between knowledge level and gender, age, marital status, educational level, occupation, family history of diabetes, or the duration of diabetes (Table 4.1).

Table 4.1: Association of Knowledge score with Socio-Demographic and Disease-related information.

Patient characteristics		Knowledge Score				P-value
		Poor no. 56	Fair no. 208	Good no. 55	Total no. (%) N=319	
Gender	Male	16 (17.0)	56 (59.6)	22 (23.4)	94 (29.5)	0.167
	Female	40 (17.8)	152 (67.5)	33 (14.7)	225 (70.5)	
Age Group	18-24	1 (14.3)	5 (71.4)	1 (14.3)	7 (2.2)	0.420
	25-34	5 (33.3)	8 (53.4)	2 (13.3)	15 (4.7)	
	35-44	2 (6.5)	20 (64.5)	9 (29.0)	31 (9.7)	
	45-55	23 (19.7)	75 (64.1)	19 (16.2)	117 (36.7)	
	Older than 55	25 (16.8)	100 (67.1)	24 (16.1)	149 (46.7)	
Marital Status	Single	1 (10.0)	6 (60.0)	3 (30.0)	10 (3.1)	0.538
	Married	47 (17.1)	178 (65.0)	49 (17.9)	274 (85.9)	
	Divorced	1 (20.0)	3 (60.0)	1 (20.0)	5 (1.6)	
	Widow	7 (23.3)	21 (70.0)	2 (6.7)	30 (9.4)	
Education level	illiterate	14 (18.9)	56 (75.7)	4 (5.4)	74 (23.2)	0.125
	Primary school	22 (17.7)	77 (62.1)	25 (20.2)	124 (38.9)	
	High school	16 (17.4)	57 (62.0)	19 (20.6)	92 (28.8)	
	University Degree or higher	4 (13.8)	18 (62.1)	7 (24.1)	29 (9.1)	
Occupation	Unemployed	6 (17.6)	21 (61.8)	7 (20.6)	34 (10.6)	0.337
	Government Employee	2 (6.5)	20 (64.5)	9 (29)	31 (9.7)	
	Private Employee	4 (21.1)	10 (52.6)	5 (26.3)	19 (6.0)	
	Retired	6 (21.4)	17 (60.7)	5 (17.9)	28 (8.8)	
	Housewife	38 (18.4)	140 (67.6)	29 (14.0)	207 (64.9)	
Duration Of the disease	< 5 years	20 (16.8)	78 (65.5)	21 (17.7)	119 (37.3)	0.357
	5-10 years	22 (19.5)	67 (59.3)	24 (21.2)	113 (35.4)	
	> 10 years	14 (16.1)	63 (72.4)	10 (11.5)	87 (27.3)	
Family Hx of DM	Yes	37 (16.7)	145 (65.3)	40 (18.0)	222 (69.6)	0.729
	No	19 (19.6)	63 (64.9)	15 (15.5)	97 (30.4)	

Those who reported their source of information about diabetic foot, 58.4% were taking their information from other family members and/or their friends, 37.3% were depending on the doctors and other medical practitioners as a source of information, and 4.3% were depending on the internet.

4.2 Attitude of participants toward diabetic foot

From the 319 participants in this study, 67 (21%) had with negative attitude, 148 (46.4%) had with neutral attitude, and 104 (32.6%) had with positive attitude as shown in Figure 4.2.

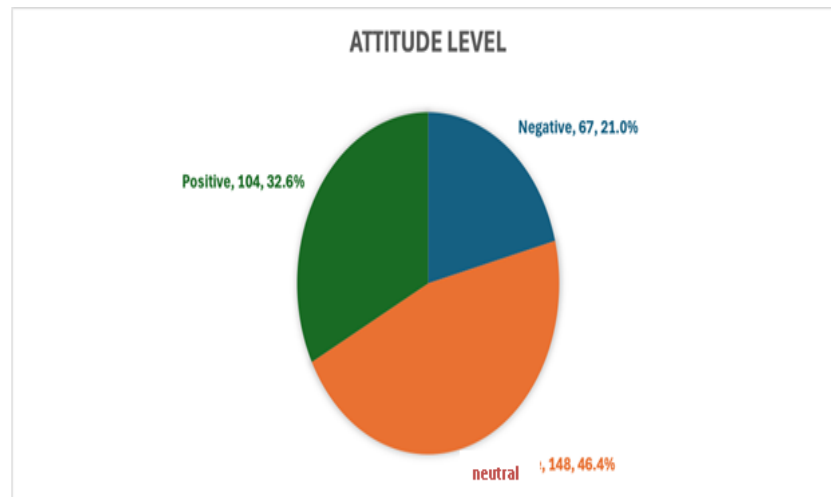


Figure 4.2: Attitude level distribution among participants.

From all the socio-demographic factors, only the educational level of the participant was significantly associated with their attitude toward diabetic foot, with a p-value of 0.007. The highest percentage (65.5%) of those with a university degree or higher was in the positive attitude category, followed by 32.6% of those

with high school, 29%, and 25.7% of those with primary school and illiterate, respectively, had a positive attitude (Table 4.2). Other socio-demographic factors like gender, age, marital status, and occupation, in addition to the duration of the disease and the family history of diabetes, showed no significant association.

Table 4.2: Association of attitude score with socio-demographic and disease-related information.

Patient characteristics		Attitude Score			Total no. (%) n=319	P-value
		Negative no. (%) n=67	Neutral no. (%) n=148	Positive no. (%) n=104		
Gender	Male	17 (18.1)	39 (41.5)	38 (40.4)	94 (29.5)	0.153
	Female	50 (22.2)	109 (48.5)	66 (29.3)	225 (70.5)	
Age group	18-24	3 (42.9)	3 (42.9)	1 (14.2)	7 (2.2)	0.313
	25-34	0 (0.0)	7 (46.7)	8 (53.3)	15 (4.7)	
	35-44	6 (19.4)	16 (51.6)	9 (29.0)	31 (9.7)	
	45-55	28 (23.9)	50 (42.7)	39 (33.3)	117 (36.7)	
	Older than 55	30 (20.1)	72 (48.3)	47 (31.5)	149 (46.7)	
Marital Status	Single	2 (20.0)	5 (50.0)	3 (30.0)	10 (3.1)	0.919
	Married	55 (20.1)	128 (46.7)	91 (33.2)	274 (85.9)	
	Divorced	1 (20.0)	2 (40.0)	2 (40.0)	5 (1.6)	
	Widow	9 (30.3)	13 (43.3)	8 (26.7)	30 (9.4)	
Education level	illiterate	15 (20.3)	40 (54.0)	19 (25.7)	74 (23.2)	0.007
	Primary School	27 (21.8)	61 (49.2)	36 (29.0)	124 (38.9)	
	High School	21 (22.8)	41 (44.6)	30 (32.6)	92 (28.8)	
	University degree or higher	4 (13.8)	6 (20.7)	19 (65.5)	29 (9.1)	
Occupation	Unemployed	4 (11.8)	17 (50.0)	13 (38.2)	34 (10.6)	0.126
	Government Employee	11 (35.4)	10 (32.3)	10 (32.3)	31 (9.7)	
	Private Employee	3 (15.8)	8 (42.1)	8 (42.1)	19 (6.0)	
	Retired	4 (14.3)	10 (35.7)	14 (50.0)	28 (8.8)	

	Housewife	45 (21.7)	103 (49.8)	59 (28.5)	207 (64.9)	
Duration of the disease	< 5 years	29 (24.4)	56 (47.0)	34 (28.6)	119 (37.3)	0.490
	5-10 years	24 (21.2)	48 (42.5)	41 (36.6)	113 (35.4)	
	> 10 years	14 (16.1)	44 (50.6)	29 (33.3)	87 (27.3)	
Family Hx of DM	Yes	51 (23.0)	101 (45.5)	70 (31.5)	222 (69.6)	0.420
	No	16 (16.5)	47 (48.5)	34 (35.1)	97 (30.4)	

4.3 The Practice part of participants about diabetic foot

In this study, we find 55 (17.2%) participants had poor

foot care practice, 219 (68.7%) had a fair level of practice, and 45 (14.1%) had good practice (Figure 4.3).

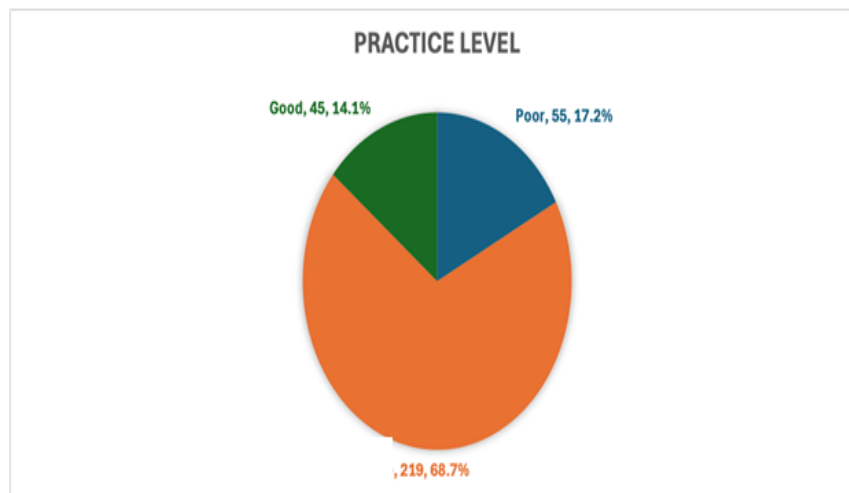


Figure 4.3: Practice level distributions among participants.

Again, here, only educational level was found to be significantly associated with practice level, with a p-value of 0.012. although the majority of each educational level were in the moderate practice category, but we can see from (Table 4.3) that those with the high school and university degree or higher and good practice score were higher in percentage than those with the same

educational but had poor practice score, while in the illiterate and primary school level the opposite situation.

All other socio-demographic factors, including the duration of the disease and family history of diabetes, didn't show any statistically significant association.

Table 4.3: Association of practice score with socio-demographic and disease-related information.

		Practice Score			Total no (%) n=319	P-value
Patient characteristics		Poor no. n=55	Fair no (%) n=219	Good no. (%) n=45		
Gender	Male	13 (13.8)	67 (71.3)	14 (14.9)	94 (29.5)	0.587
	Female	42 (18.7)	152 (67.6)	31 (13.8)	225 (70.5)	
Age Group	18-24	0 (0.0)	6 (85.7)	1 (14.3)	7 (2.2)	0.774
	25-34	4 (26.7)	9 (60.0)	2 (13.3)	15 (4.7)	
	35-44	4 (12.9)	21 (67.7)	6 (19.4)	31 (9.7)	
	45-55	21 (17.9)	77 (65.8)	19 (16.2)	117 (36.7)	0.649
	Older than 55	26 (17.5)	106 (71.1)	17 (11.4)	149 (46.7)	
Marital Status	Single	0 (0.0)	9 (90.0)	1 (10.0)	10 (3.1)	
	Married	48 (17.5)	186 (67.9)	40 (14.6)	274 (85.9)	0.012
	Divorced	0 (0.0)	4 (80.0)	1 (20.0)	5 (1.6)	
	Widow	7 (23.3)	20 (66.7)	3 (10.0)	30 (9.4)	
Education level	illiterate	10 (13.5)	60 (81.1)	4 (5.4)	74 (23.2)	0.431
	Primary School	26 (21.0)	83 (66.9)	15 (12.1)	124 (38.9)	
	High School	16 (17.4)	54 (58.7)	22 (23.9)	92 (28.8)	
	University degree or higher	3 (10.3)	22 (75.9)	4 (13.8)	29 (9.1)	
Occupation	Unemployed	5 (14.7)	26 (76.5)	3 (8.8)	34 (10.6)	

	Government Employee	3 (9.7)	24 (77.4)	4 (12.9)	31 (9.7)	
	Private Employee	6 (31.6)	9 (47.4)	4 (21.0)	19 (6.0)	
	Retired	4 (14.3)	18 (64.3)	6 (21.4)	28 (8.8)	
	Housewife	37 (17.9)	142 (68.6)	28 (13.5)	207 (64.9)	
Duration of the disease	< 5 years	20 (16.8)	87 (73.1)	12 (10.1)	119 (37.3)	0.349
	5-10 years	17 (15.0)	75 (66.4)	21 (18.6)	113 (35.4)	
	> 10 years	18 (20.7)	57 (65.5)	12 (13.8)	87 (27.3)	
Family Hx of DM	Yes	39 (17.6)	156 (70.3)	27 (12.1)	222 (69.6)	0.337
	No	16 (16.5)	63 (64.9)	18 (18.6)	97 (30.4)	

5. DISCUSSION

5.1 Overview

Diabetic foot is a major health problem with high burden and significant impact on healthcare system, diabetic patients, and the overall community, according to American Diabetes Association in 2022, the lifetime risk for diabetic patient to develop diabetic foot problem between 12%-25%, annual incidence among diabetic that range from 0.2% to 11% and prevalence of 6.3%, these high numbers had provoked the attention of academics and practitioner in the field of diabetes for the need of thorough investigation of this problem and well-designed awareness, interventional, and management program.^[11]

The outcomes of Knowledge, Attitude, and Practices (KAP) studies are used to design effective educational, awareness, preventive, or management programs targeted to the present knowledge gaps, and with a tailored message that can promote positive behavioral changes that ultimately lead to more prevention and better management of health problems. In addition, this outcome will represent the baseline point used to assess the effectiveness of such programs in the future.^[17]

5.2 Knowledge part

This part of the study consists of 14 questions about diabetic foot care. Two-thirds of the participants in this study were at a fair knowledge level, with a low proportion of the sample population (17.2%) having good knowledge, and 17.6% had poor knowledge.

Total score of knowledge in current study reveal higher level than those reported by study of saber HT and Daoud AS study, Erbil, 2018^[18] Mousa T *et al.* in Kuala Lumpur, 2014^[16] Mehmood MK *et.al.* study in United Arab Emirates, 2019^[19] due to their lack of education and lack of time to attend classes on diabetic foot care; also, because of participants residence, it was discovered that only urban residents scored highly on knowledge tests.

Regarding overall score of knowledge, the study of Awwad KA and Abu-Khader IR, Palestine, 2022 was somewhat similar to the current study, the majority was in the fair level 68.7%, while 28% in the poor level and the good level only 3.3%^[20] While in study done by Alshammari ZJ.*et, al* study in Riyadh, Saudi Arabia 2019,^[21] Al-Hariri MT *et, al* study in Saudi Arabia,

2017^[5] and the study of Moh'd R *et, al.* Jordan, 2016^[22] the majority of patients had a higher level of good knowledge score due to a good educational level about diabetic foot care.

In the current study, there was no association between knowledge score and these variables, gender, educational level, marital state, duration of DM, which was similar to the study of Mousa *et al.* in Kuala Lumpur, 2014.^[16] The study of Albalawi, MA, and Sheikh WA in Saudi Arabia, 2022, found a good knowledge score associated significantly with occupation and duration of DM.^[23]

In the study of Pourkazemi A *et.al*, Iran, 2020^[24] and Al-Jasim *et al.* study in Iraq, 2020^[25] there was a significant association between knowledge score and variables like gender, educational level and duration of diabetes mellitus, and occupation level.

5.3 The attitude part

In this part of the study, participants answered 5 questions about their attitude towards diabetic foot care. In current study, nearly half of the participants were neutral level of attitude in concordance with Al-Jasim A *et, al.* study in Iraq, 2020.^[25] and in the study of Awwad KA and Abu-Khader IR, Palestine, 2022, as the majority of participants had unfavorable attitude with 38.3% had a favorable attitude, this was due to Lack of awareness, unavailability of information.^[20]

In the study of Al Amri AM *et al.* in Saudi Arabia, 2021^[15] and the study by Metwally AS *et al.* in Saudi Arabia, 2023^[26] the majority of participants had good level of attitude than the current study, because the majority had periodic visits to diabetic clinic and good awareness about problems about diabetic foot. Regarding to the study done by Jia H *et al.* in China, 2022^[12] And the study reported by Albalawi MA and Sheikh WA, Saudi Arabia, 2022^[23] the proportion of the participants in the positive attitude group was higher than in the recent study, and this may be because they classified the patients into two groups only, positive and negative. Only educational level was positively associated with the attitude level of the participants, and those with a higher educational level had a higher percentage of positive attitude than those with lower education. And this association was also reported by Albalawi MA and SheikhWA, Saudi Arabia, 2022^[23] Other

sociodemographic factors like age, gender, marital status, and occupation, and disease related factor like duration and family history of diabetes were not significantly associated with attitude level, and this agree with the findings of Albalawi MA and Sheikh WA.^[23]

5.4 Foot care practice

This part of study consists of 13 questions about the care of diabetic foot, with half of the participants with a neutral level of practice, the other two parts had good and poor practice.

Total score of practice score in the current study was somewhat close to the distribution reported by Awwad AK and Abu-Khader IR, Palestine, 2022^[20] the study reported by Moh'd R et al. in Jorden, 2016^[22] and study of Verma M *et al.* in India, 202.^[14] The studies in Iraq, Saber HJ and Daoud AS study, 2018,^[18] pourkazemi A et al study, Iran, 2020,^[24] the study done by Mehmood MK et al, Dubia, 2019^[19] the study of Jia H et al, China, 2022^[12] and the study reported by Mousa T *et al.* in Kuala Lumpur, 2014^[16] showed higher percentage of poor practice compared to the current study, due to lack of proper communication between patients and medical team and inadequate education, people living in rural area had high level of poor practice compare to Urban areas. The only significant association of practice score was with the educational level, people with higher education tend to be more caring about their feet, and this similar to what was is reported by Albalawi MA and Sheikh WA^[23] Awwad KA and Abu- Khader IR^[20] and Verma M *et al.* in India, 2021.^[14]

While of Jia H et al, China, 2022, there is significant association of practice score and duration of DM, patient with longer duration performed better foot care practice.^[12]

6. CONCLUSIONS

- 1- Two-thirds of the patients with fair knowledge level about diabetic foot care, while the remaining one third equally divided between poor and good knowledge.
- 2- In the attitude part of the study near half of participant was neutral and the rest had either positive or negative attitude.
- 3- Two third of participant had fair practice and only small proportion had good practice about diabetic foot.
- 4- More than half of participant, their source of information about diabetic foot from their family and friends and only one third from medical staff.
- 5- There was significantly association between education level with the fair practice level and also educational level associated with positive attitude category toward diabetic foot.

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