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Original Research Article.

Awareness and Practice of Diabetic Foot Care among Diabetic Patients Attending to Family Medicine Department in PMMH

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ABSTRACT

Aims: The current research aimed at identifying deficits at diabetic patients practice and awareness regarding their foot care.

Methodology: A descriptive cross-sectional survey design was conducted including 207 diabetic patients attended the PMMH during the period between November 2016 and April 2017 in PMMH, Taif, Saudi Arabia. A direct interview questionnaire was used for data collection and then data was analyzed using SPSS version 22.

Results: The study was conducted on 207 diabetic patients who completed the questionnaire with age ranged from 20-75 years and 57.5% were females. All of the included patients complained of one or more foot problems such as feeling of heaviness, tightness pain or numbness. Generally, 30% of the patients did healthy practices and 19.8% of the patients had satisfactory level of awareness regarding their foot care. Patients who have no familiar couple (unmarried) were more aware and recorded better practice than others.

Conclusions and Recommendations: The current survey covers that despite the variety at duration of diabetes among the studied patients as more than half of the patients with diabetes for more than 10 years and all of them have one or more foot problems but they recorded very poor practice and awareness regarding foot care. Health education sessions and posters and may be educational videos are required to improve patients practice and awareness.

Key terms: Diabetic Foot, Diabetic Patients, Awareness, Practice.

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INTRODUCTION

Diabetes mellitus is a chronic metabolic noncommunicable diseases (NCD) that has epidemic proportions all over the word.[1] it consists of a group of metabolic disorders characterized by hyperglycemia which is a result of defects in insulin action, insulin secretion, or both.[2] Diabetes' chronic hyperglycemia is associated with long-term destruction, dysfunction, and failure of many organs, especially blood vessels, kidneys, heart, nerves, eyes and diabetic foot complications.[2,3]

Diabetic foot diseases (DFD) are one of the most prevalent and stressful complications that affects diabetic patients.[4,5] DFD include a constellation of neurological and vascular pathologic changes that caused directly by DM which cause local tissue damage by sensory neuropathy and comprising the vascular system of the affected lower limb in diabetic patients.[6,7] More than 10% of diabetic patients suffers from these contributory factors at the time of diagnosis.[5,7] DFD are one the major challenges that face the healthcare systems in both high and low-income countries with probable economic consequences for the patients, their families, and the society as all.[4,5] DFD repeatedly lead to chronic disabilities, lower limb amputation, loss of income or even death.[8] It is estimated that 20% of patients with DM (type 1 or 2) has a 15 % probability of having a foot infection in a year, and 5% of patients with DFD will ultimately undergo amputation.[9] In spite of various interventions, DFD are still a common and significant problem affecting quality of both life and care that disrupts physical and psychosocial state of diabetic patients and has a negative impact on their overall perception of the disease.[10-12] DFD leads to functional disabilities and physical limitations.[12]

Although, the patient is the first line foot care, it is important to reduce the incidence of foot disease among patients with DM.

They should have a good awareness of the risk factors that predispose and worsen DFD, as well as being aware of the good foot care practice.[4,7,13,14] Generally, DFD develops in areas where the foot is exposed to continuous pressure, repetitive trauma and friction. Harmful footwear such as those with narrow foreparts, unergonomic interiors and high heels, is one of the major contributing causes in the progression to DFD and even lead to amputation. Additionally, inappropriate footwears are sometimes considered 'enemies of the diabetic patients' foot".[15,16] Evidence shows that improving knowledge is associated with better practices of foot care, and consequently increases the clinical benefit.[17-19.] More studies need to be performed to assess and identify the level of awareness and foot care practice among diabetic patients.

DFD were prevalent among 3.3% of diabetic patients in Saudi Arabia as reported by Al-Rubeaan et al.[20] Additionally, DFD were reported to be significantly associated with male gender, age more than 40 years, type 2 diabetes, smoking, illiteracy, longer duration of diabetes as well earlier onset.[21,22] Furthermore, when a diabetic foot care education program was implemented at King Abdulaziz Medical City in Riyadh, Saudi Arabia, rates of lower limb imputation was decreased by 8.1% as well there were a reduction in toe and below-knee amputation rates.[23]

Globally, Diabetic foot problems is the most common cause for hospital admissions than any other long-term complications of DM and are responsible for nearly 50% of all hospitalization days among diabetic patients[5] and the perfect intervention for stopping diabetic lower limb complications is prevention. Till now, the only intervention that can limit all types of diabetes-related complications is strict control of blood glucose level, as reported in The Diabetes Control and Complications Trial.[24,25] It was reported that controlling of glucose level and management of other cardiovascular risk factors as hypertension, hyperlipidemia and smoking cessation prevent the development and progression of DFD.[26] Also, Patient education is an important factor in preventing DFD specially diabetic foot ulcers. Recently, Cochrane review concluded that there is insufficient evidence that patient education alone is effective in reaching clinically relevant decrease in ulcer and amputation rates.[27] On other hand, prevention through the daily self-inspection of feet is just one of several means of trying to decrease risks.[28-30]

METHODOLOGY

A descriptive cross-sectional survey design which was conducted in Taif city, at the western part of Kingdom of Saudi Arabia.

Study Population and Sampling

This study targeting diabetic patients attending to family medicine department in PMMH who can read and write. The study included 207diabetic patients attended the PMMH during the period between November 2016 and April 2017 in PMMH, Taif, Saudi Arabia. The respondents were purposively and consecutively included according to their availability during their routine visit to the selected centers.

Data Collection Method

Based on thorough review of relevant literature, a direct interview questionnaire has been constructed by the researcher. The questionnaire included data for sample socio-demographic characteristics, Diabetes and medical history, foot problems, foot care behavior and foot care awareness. After having the necessary approvals, the researcher directly interviewed the survey sample with a after explaining the purpose of the study and confirming confidentiality of participants' data to and requesting participant's consent to participate in the study.

Statistical Analysis

After data were collected it was revised, coded and fed to statistical software IBM SPSS version 22. The given graphs were constructed using Microsoft excel software.

All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant.

Regarding scoring system, each correct answer of awareness or healthy practice item was given a score of one point otherwise zero was given. The items discrete scores for both awareness and practice were summed after reversing scores for negative statements and total score was calculated by summing the scores given for its responses. All scores were transformed into score % as follow:

Score % = (the observed score / the maximum score) x 100. Then score % for perception at different domains was transferred into categories according to the different scales as

Unhealthy practice / Unsatisfactory awareness: If Score % < 60%%

Healthy practice/ satisfactory awareness: If Score % ≥60% for

Descriptive statistics: frequencies and percent were used to describe the frequency of each category for categorical data. Mean with standard deviation was used to describe scale data. Chi square test / Mont Carlo exact test and Fishers exact test were used to test for association between practice / awareness level and sample characteristics if there were many small expected values. Multiple logistic regression analysis was used to identify which of the studied factors can determine the participant level of awareness and practice on adjusting all other factors.

RESULTS

The study was conducted on 207 diabetic patients who completed the questionnaire. Most of the study sample aged above 50 years (74.4%) and 57.5% were females. About 60% of the patients were jobless and 24.6% were at retirement age. As for education, 43% were illiterate and 6.3% were graduated from university. About 83% of the sample were married and 43.5% recorded good glycemic control. Considering duration of diabetes mellitus, 29.5% of the patients were diabetic for four years or less and 25.6% for 5-9 years while only 7.2% had diabetes for 20 years or more. Regarding associated comorbidities, 54.6% of the patients had elevated cholesterol level, 37.7% were hypertensive and 16.9% were free of any other chronic health problem. Only 5.8% of the included patients were smokers (Table 1).

With consideration to the foot problems recorded among the patients, numbness, tingling pain was the most recorded (27.5%) followed with tightness heaviness pain (23.7%) while foot ulcers or toe amputation were recorded among 2.4% of the patients (Figure 1).

Table 2 and figure 2 demonstrates the practice of the sampled patients regarding foot care. About 91% of the included patients wash their feet daily, 75.4% examine their feet daily, 67.6% of them dry well between toes 570% wear healthy shoes and 55.1% use moisturizing cream while 41.1% test water temperature before putting your feet. Regarding unhealthy practices, 56.0% wear

shoes without wearing any socks and 53.6% walk around in your bare feet. With consideration to patients' awareness regarding diabetic foot care, 75.4 % of the patients received medical advice by their doctors while only 18.8% read handouts for foot care practice and 13.5% attended health education sessions (Figure 3).

Table 1: Bio-Demographic characteristics of diabetic patients attending family medicine department in PMMH, Taif 2017

Bio-Demographic data		No	%
Age in years	**21-29**	4	1.9%
	30-39	12	5.8%
	40-49	37	17.9%
	50-59	64	30.9%
	60-69	53	25.6%
	70+	37	17.9%
Gender	**Female**	119	57.5%
	Male	88	42.5%
Occupation	**Jobless**	120	58.0%
	Military employee	28	13.5%
	Civilian employee	8	3.9%
	Retired	51	24.6%
Level of education	**Illiterate**	89	43.0%
	Primary school	61	29.5%
	High school	44	21.3%
	University	13	6.3%
Marital status	**Single**	10	4.8%
	Married	171	82.6%
	Widow/ divorced	26	12.6%
Blood glucose control on average?	**Good**	90	43.5%
	Moderate	69	33.3%
	Poor	48	23.2%
Duration of DM	**0-4**	61	29.5%
	5-9	53	25.6%
	10-15	50	24.2%
	16-20	28	13.5%
	21-25	12	5.8%
	>30 years	3	1.4%
Comorbidities	**None**	35	16.9%
	Cardiac disease	16	7.7%
	HTN	78	37.7%
	High cholesterol	113	54.6%
	Depression	6	2.9%
	Renal disease	3	1.4%
	Hepatic disease	3	1.4%
	Pulmonary disease	3	1.4%
	Others	24	11.6%
Smoking	**Yes**	12	5.8%
	No	195	94.2%

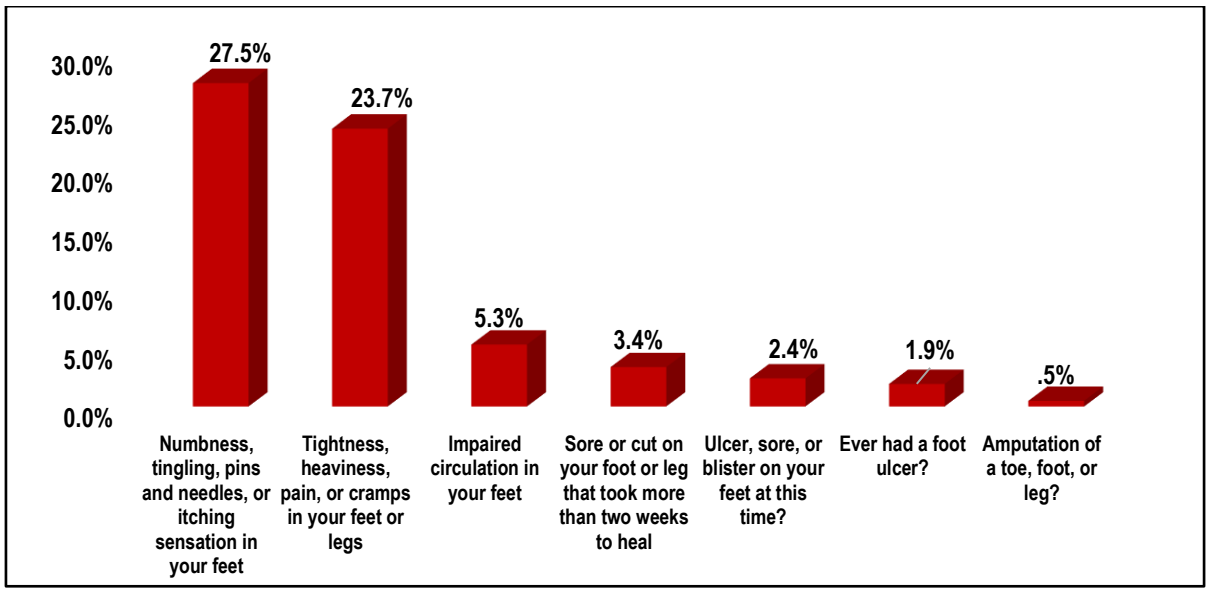

Fig 1: Foot problems among diabetic patients attending family medicine department in PMMH, Taif 2017

Table 2: Distribution o of foot care practice for diabetic patients attending family medicine department in PMMH, Taif 2017

FOOT CARE	No	%
Do you wash your feet every day?	188	90.8%
Do you examine your feet?	156	75.4%
Do you dry well between the toes?	140	67.6%
Do you use a moisturizing cream on your feet?	114	55.1%
Do you cut your own toenails?	149	72.0%
Do you ever soak your feet?	95	45.9%
Do you always test water temperature before putting your feet	85	41.1%
Do you ever walk around in your bare feet? #	111	53.6%
Do you ever wear shoes without wearing any socks? #	116	56.0%
Do you always inspect your shoes for foreign objects	138	66.7%
Do you sit with your legs crossed? #	77	37.2%
Wearing healthy shoes	118	57.0%

Unhealthy practice

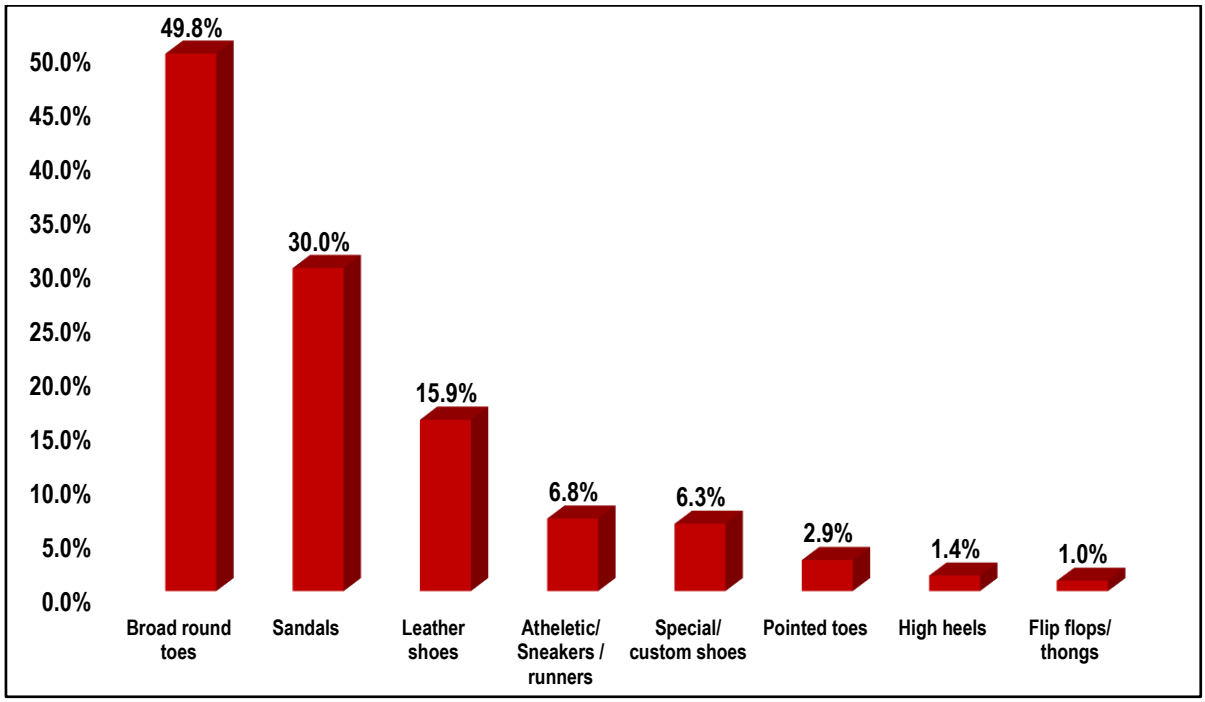

Fig 2: Type of shoes used by diabetic patients attending family medicine department in PMMH, Taif 2017

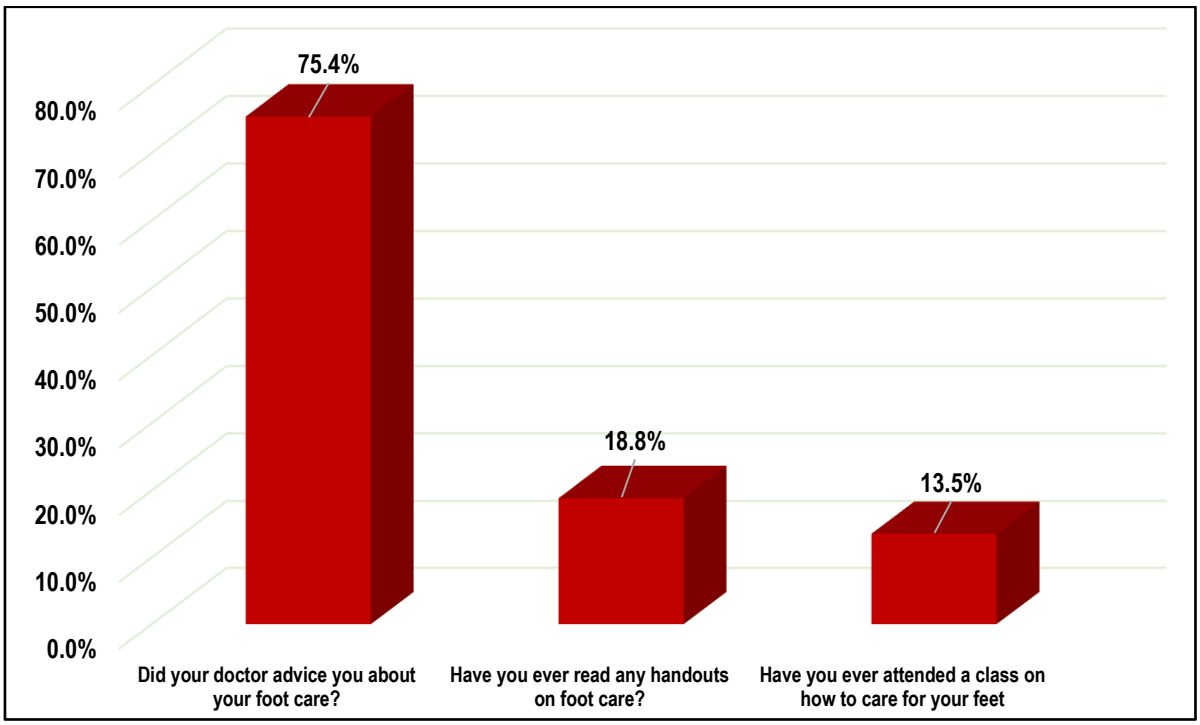

Fig 3: Awareness regarding diabetic foot care of diabetic patients attending family medicine department

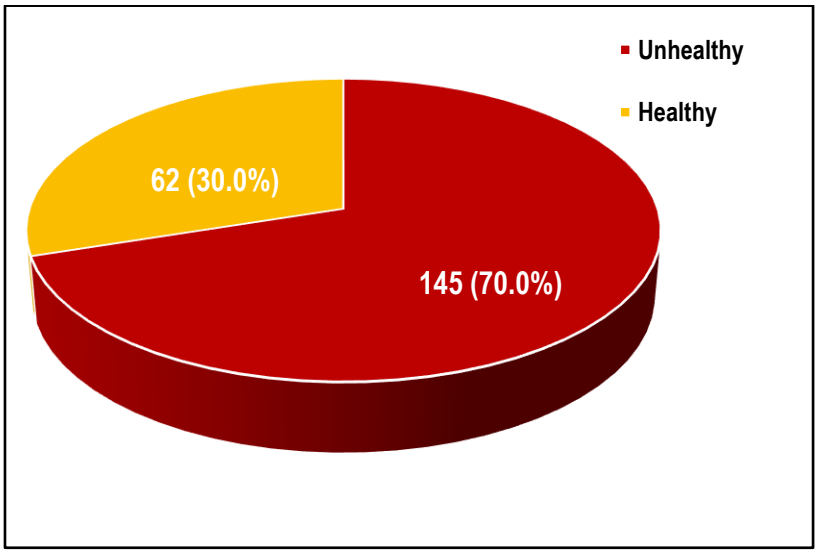

Fig 4: Level of diabetic foot care practice among diabetic patients

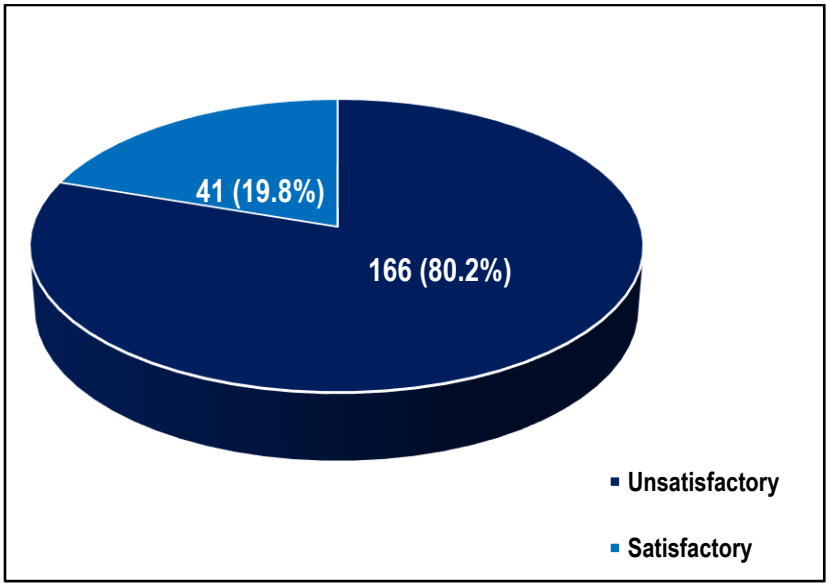

Fig 5: Level of diabetic foot care awareness among diabetic patients

Generally, 30% of the patients did healthy practices (figure 4) specially those who were widowed or divorced as 50% of them did foot care practice correctly while 30% of the unmarried did (P=0.046). Also, those who had foot tightness and heaviness sensation were significantly of higher practice level than who did not (32.9% versus 20.4%) (P=0.050). Females were insignificantly of better foot care practice than males (31.9% and 27.3%) while patients with higher education also recorded slightly insignificant better practice regarding foot care (38.5% for university graduated patients compared to 29.2% for illiterate). Patient age, glycemic control, duration of diabetes mellitus, having other health problem and any other foot problems were not of important role in detecting level of foot care practice (Table 3).

Regarding foot care awareness, 19.8% of the patients had satisfactory level of awareness regarding their foot care (figure 5). About 31% of the males had satisfactory awareness compared to 11.8% of females (P=0.001) and also working and retired patients were significantly of higher awareness level than others (89.2% versus 10.8%). Regarding education, 46.2% of patients with university level of education were of satisfactory awareness regarding foot care compared to only 6.7% of illiterate diabetic patients (P=0.001). Also, diabetic patients with foot problems specially who had history of toe amputation, numbness, tingling, pins and needles, or itching sensation or tightness, heaviness, pain, or cramps were of significantly higher awareness level (P<0.05). Patient's age, marital status and glycemic control were of no role in detecting patient awareness level (Table 4).

Regarding effect of patients awareness on their behavior (practice), table (5) studied this relation and it was clear that there was a significant association between the awareness items and patients practice as 50% of those who attended a class on how to care for your feet were of healthy practice compared to 26.8% of those who did not (P=0.013). Also 56.4% of patients who ever read any handouts on foot care had healthy practice compared to 23.8% of others (P=0.001) and 34% of the sampled patients who had advice from their doctors recorded healthy behavior compared to 17.6% of those who didn't.

Table (6) shows the most important predictors of patients practice with adjusted effect. Among all studied factors, Age, gender, marital status and having foot problem were the most important significant predictors for patients' foot care practice. Those with older age had 43% lower level of practice score than younger patients (OR=0.74, 95% CI 0.57-0.97). Also, female patients had 30% higher level of satisfactory practice than males (OR=1.3;

95% CI 1.07-3.25). Regarding marital status, married patients recorded 70% better practice score than unmarried (OR=1.7; 95% CI 1.1-2.6) while diabetic patients who experienced any of the foot problems had doubled level of satisfactory practice more than others who did not (OR=2.1; 95% CI 1.07-6.1) keeping all other factors constant.

Table (7) for predictors of diabetic patients' awareness regarding their foot care revealed that among all studied factors, Educational level, Duration of DM and Having foot problems were the most important keeping all other factors constant. The higher educational level mean nearly having tripled level of wariness more than others (OR=2.5; 95% CI 1.6-3.6) while increased duration of being diabetic also increases the level of awareness by about two folds (OR=2.2; 95% CI 1.6-3.08). Patients who experienced any foot problem had five folds more awareness level about foot care than others who did not (OR=4.9; 95% CI 2.8-7.1).

Table 3: Distribution o of foot care practice for diabetic patients attending family medicine department in PMMH by their bio-demographic characteristics and foot problems history, Taif 2017

Characteristics		Practice level				P
		Unhealthy		Healthy		
		No	%	No	%	
Age in years	**21-29**	3	75.0%	1	25.0%	0.529
	30-39	7	58.3%	5	41.7%	
	40-49	26	70.3%	11	29.7%	
	50-59	41	64.1%	23	35.9%	
	60-69	38	71.7%	15	28.3%	
	70+	30	81.1%	7	18.9%	
Gender	**Female**	81	68.1%	38	31.9%	0.469
	Male	64	72.7%	24	27.3%	
Occupation	**Jobless**	83	69.2%	37	30.8%	0.734
	Military employee	22	78.6%	6	21.4%	
	Civilian employee	5	62.5%	3	37.5%	
	Retired	35	68.6%	16	31.4%	
Level of education	**Illiterate**	63	70.8%	26	29.2%	0.324
	Primary school	47	77.0%	14	23.0%	
	High school	27	61.4%	17	38.6%	
	University	8	61.5%	5	38.5%	
Marital status	**Single**	7	70.0%	3	30.0%	0.046*
	Married	125	73.1%	46	26.9%	
	Widow/ divorced	13	50.0%	13	50.0%	
Blood glucose control on average?	**Good**	66	73.3%	24	26.7%	0.378
	Moderate	44	63.8%	25	36.2%	
	Poor	35	72.9%	13	27.1%	
Duration of DM	**0-4**	47	77.0%	14	23.0%	0.226
	5-9	32	60.4%	21	39.6%	
	10-15	34	68.0%	16	32.0%	
	16-20	22	78.6%	6	21.4%	
	21-25	7	58.3%	5	41.7%	
	>30 years	3	100.0%	0	0.0%	
Co-Morbidities	**No**	27	77.1%	8	22.9%	0.315
	Yes	118	68.6%	54	31.4%	
Have an impaired circulation in your feet	**No**	137	69.9%	59	30.1%	
	Yes	8	72.7%	3	27.3%	
Have you ever had a sore or cut on your foot or leg that took more than two weeks to heal?	**No**	141	70.5%	59	29.5%	0.842
	Yes	4	57.1%	3	42.9%	
Have you ever had a foot ulcer?	**No**	142	70.0%	61	30.0%	0.448
	Yes	3	75.0%	1	25.0%	
Have you ever had an amputation of a toe, foot, or leg?	**No**	145	70.4%	61	29.6%	0.827
	Yes	0	0.0%	1	100.0%	
Do you have an ulcer, sore, or blister on your feet at this time?	**No**	141	69.8%	61	30.2%	0.125
	Yes	4	80.0%	1	20.0%	
Do you have any numbness, tingling, pins and needles, or itching sensation in your feet	**No**	104	69.3%	46	30.7%	0.716
	Yes	41	71.9%	16	28.1%	
Do you have any tightness, heaviness, pain, or cramps in your feet or legs?	**No**	106	67.1%	52	32.9%	0.050*
	Yes	39	79.6%	10	20.4%	

* P < 0.05 (significant)

Table 4: Distribution o of foot care awareness for diabetic patients attending family medicine department in PMMH by their bio-demographic characteristics and foot problems history, Taif 2017

Characteristics		Awareness level				P
		Unsatisfactory		Satisfactory		
		No	%	No	%	
Age in years	21-29	4	100.0%	0	0.0%	0.150
	30-39	8	66.7%	4	33.3%	
	40-49	28	75.7%	9	24.3%	
	50-59	50	78.1%	14	21.9%	
	60-69	41	77.4%	12	22.6%	
	70+	35	94.6%	2	5.4%	
Gender	Female	105	88.2%	14	11.8%	0.001*
	Male	61	69.3%	27	30.7%	
Occupation	Jobless	107	89.2%	13	10.8%	0.001*
	Military employee	21	75.0%	7	25.0%	
	Civilian employee	3	37.5%	5	62.5%	
	Retired	35	68.6%	16	31.4%	
Level of education	Illiterate	83	93.3%	6	6.7%	0.001*
	Primary school	49	80.3%	12	19.7%	
	High school	27	61.4%	17	38.6%	
	University	7	53.8%	6	46.2%	
Marital status	Single	9	90.0%	1	10.0%	0.353
	Married	134	78.4%	37	21.6%	
	Widow/ divorced	23	88.5%	3	11.5%	
Blood glucose control on average?	Good	71	78.9%	19	21.1%	0.817
	Moderate	55	79.7%	14	20.3%	
	Poor	40	83.3%	8	16.7%	
Duration of DM	0-4	47	77.0%	14	23.0%	0.552
	5-9	40	75.5%	13	24.5%	
	10-15	42	84.0%	8	16.0%	
	16-20	25	89.3%	3	10.7%	
	21-25	9	75.0%	3	25.0%	
	>30 years	3	100.0%	0	0.0%	
Co-Morbidities	No	29	82.9%	6	17.1%	0.664
	Yes	137	79.7%	35	20.3%	
Have an impaired circulation in your feet	No	156	79.6%	40	20.4%	0.359
	Yes	10	90.9%	1	9.1%	
Have you ever had a sore or cut on your foot or leg that took more than two weeks to heal?	No	160	80.0%	40	20.0%	0.709
	Yes	6	85.7%	1	14.3%	
Have you ever had a foot ulcer?	No	162	79.8%	41	20.2%	0.316
	Yes	4	100.0%	0	0.0%	
Have you ever had an amputation of a toe, foot, or leg?	No	166	80.6%	40	19.4%	0.044*
	Yes	0	0.0%	1	100.0%	
Do you have an ulcer, sore, or blister on your feet at this time?	No	162	80.2%	40	19.8%	0.991
	Yes	4	80.0%	1	20.0%	
Do you have any numbness, tingling, pins and needles, or itching sensation in your feet	No	113	75.3%	37	24.7%	0.004*
	Yes	53	93.0%	4	7.0%	
Do you have any tightness, heaviness, pain, or cramps in your feet or legs?	No	119	75.3%	39	24.7%	0.002*
	Yes	47	95.9%	2	4.1%	

* P < 0.05 (significant)

Table 5: Association between patients' awareness items and their practice level among diabetic patients

Awareness item		Practice level				P
		Unhealthy		Healthy		
		No	%	No	%	
Have you ever attended a class on how to care for your feet	No	131	73.2%	48	26.8%	0.013*
	Yes	14	50.0%	14	50.0%	
Have you ever read any handouts on foot care?	No	128	76.2%	40	23.8%	0.001*
	Yes	17	43.6%	22	56.4%	
Did your doctor advice you about your foot care?	No	42	82.4%	9	17.6%	0.027*
	Yes	103	66.0%	53	34.0%	

* P < 0.05 (significant)

Table 6: Results of multiple stepwise logistic regression for determinants of foot care practice level among diabetic patients

Factor	B	S.E.	Sig.	OR	95% C.I for OR	
					Lower	Upper
Age	-.289	.136	.034	.749	.574	.978
Female	.268	.145	.044	1.300	1.070	3.254
Married	.533	.223	.017	1.704	1.100	2.639
Have foot problems	.745	.234	.048	2.130	1.074	6.240
Constant	-.003	.984	.998	-		
Model significance (X^2; P)				11.7; 0.007*		
Model classification accuracy				70.3%		

B: Regression co-efficient; SE: Standard error; OR: Odds Ratio; CI: Confidence interval.

Table 7: Results of multiple stepwise logistic regression for determinants of foot care awareness level among diabetic patients

Factor	B	S.E.	Sig.	OR	95% C.I for OR	
					Lower	Upper
Educational level	.892	.205	.001	2.50	1.61	3.64
Duration of DM	.798	.115	.001	2.22	1.63	3.08
Have foot problems	1.60	.196	.007	4.95	2.84	7.13
Constant	-3.04	.516	.001	-		
Model significance (X^2; P)				33.8; 0.001*		
Model classification accuracy				83.8%		

B: Regression co-efficient; SE: Standard error; OR: Odds Ratio; CI: Confidence interval.

DISCUSSION

Despite the reference period method used for sampling, both genders were not equally represented, female participants were 119 and male participants were 88 in the study which also were reported by anther Saudi study.[22] Although DM prevalence is unequal between genders all over the world as well in Saudi Arabia, with more males having DM than females. We also found that the increase of foot care practice level among diabetic patients has a positive relation between being female, being married, educational level, duration of DM and having a foot problem. Although, there was a negative relation with age. Additionally, all the predictors were statistically significant (table 5,6). Also, Nongmaithem et al reported the same results.[31]

In 2013, there were about 350 million people all over the world suffered from diabetes mellitus (DM), and some reports say that about 592 million are expected to suffer from the disease by 2035. World health organization (WHO) reported that Most of those people are between 40 and 59 years of age which was also reported by this study. There are strong evidences that modifications of lifestyle such as physical activity, smoking cessation, losing weight and following healthy nutritional guidelines provide benefits in the prevention of other co-morbidities associated with DM including diabetic food diseases and may decrease diabetes itself. [32]

In this study, the majority of participants were affected by cardiovascular diseases as High cholesterol, hypertension and other cardiac diseases. However, only 5.8% of participants were smokers. In diabetic patients. Smoking is a major factor that accounts for more than half of the risks contributing in the development of peripheral artery disease as well diabetic foot diseases.[33] In general, knowledge affects strongly behaviors, which is one of the reasons that a large proportion of participants were not smokers.[34] Improving knowledge through smoking cessation campaigns among diabetic patients may be a good health strategy in decreasing the risks of diabetic foot diseases.[34] In this study, most patients practice unhealthy foot care and unsatisfactory level of awareness. Although, 57.0% of Footwear usage was appropriate, as 49.8% of them claimed to wear broad rounded toes shoes which would protect them from trauma and infection. Some Studies have reported that there were a decreased rates of diabetic foot diseases in patients when there are several intervention programs, including footwear awareness.[15,35] Seeking for Counselling on the appropriate footwear to use is easy to be done in family medicine department in PMMH, with the only problem being non-obedience with the prescribed footwear due to personal socio-economic slandered or preference**.** Programs of diabetic foot should include screening, diagnostic tests, examination, referrals, follow-up, footwear recommendation and patient education. education is an essential item in diabetic foot programs[35] as reported also in this study (table 6). When a diabetic foot care education program was carried out, there were 8.1% reduction in amputation rates among Saudi diabetic patients.[23] Additionally, a randomized controlled study[36] on foot care education showed a statistically significant increase in patients' self-efficacy in foot care practice for their feet. The study also compared between both individuals and groups counselling, neither of both training methods was preferred to the other in the prevention of DFD. Also, both methods demonstrated the same positive effect.[36] Applying structured educational programs has a positive impact on improving both knowledge and practices of DM patients about DFD. [5,36] However, two other studies showed a greater improvement in both knowledge and practices when using individual counselling than group education, particularly in people with long-duration diabetes mellitus as it was due to their impaired cognition as a result of to their long-standing illness.[35] Awareness of the prefect foot care is a must among diabetic patients and health care officers to decrease the rates of foot diseases, and this would include**:**

- Preventing and managing foot infection and/or trauma.
- Dealing with abnormal pressure points
- Improving poor glycemic control
- Preventing and managing vascular damage and/or peripheral neuropathy
- Controlling associated cardiovascular diseases
- Increasing self-practice and awareness of foot care.

Awareness includes the ability to know, understand and avoid those factors that will further increase and dictates attitudes and practices toward responsibility, and success.

The key strength point of this study is that it discusses the awareness between diabetic patients in one of Saudi Arabia cities where there is a lack of such studies and need more improvement in education programs among diabetic patients. Also, we faced some limitation as lack of fund and human resources that prevent us from applying this survey to all diabetic patients in Saudi Arabia

CONCLUSIONS AND RECOMMENDATIONS

The current survey covers that despite the variety at duration of diabetes among the studied patients as more than half of the patients with diabetes for more than 10 years and all of them have one or more foot problems but they recorded very poor practice and awareness regarding foot care and also indifference of attending health education sessions with unavailability of educational notes or posters. So, it is advised to focus more on providing health care educational sessions which should be achievable by the help of the community and printing posters with pictures for illiterate patients. Also advising patients for being compliant of periodic checkup and providing medical advices for them will be and effective method in improving practice and awareness. Educational films for methods of foot care may also use as one of the most effective and practical methods for all patients which may be at available at homes.

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