Original Article

Knowledge, Practice and Barriers of Foot Self-Care among Diabetic Patients

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Abstract

Background and objectives: Diabetic foot problems are one of the most common chronic complications of diabetes that has a tremendous economic and social impact on individuals, families and on health system as a whole in developing and developed countries. Diabetic foot problems can be prevented through well-coordinated foot care services. Patient education is an important and essential element of any health program for diabetic foot prevention and control patients at Sohag University Hospital.

Methods: The study included 200 diabetic patients aged 30-70 years old, attending the endocrine outpatient clinic at Sohag University Hospital.

Results: a total of 200 people participated in present study among which data of 200 participants (Male: n = 108, 54%; females: n = 92, 46%) with mean age ±SD 54. ±15 years. ranged from 30 to 70. They were mainly from rural 127 (63.5. %) and to less extent from urban 73 (36.5%), Marital status result showed there were 134(67%) married and 36 (18%) single ones. Education level result showed that majority of respondents were of middle and primary education while 40(20.0%) were high educated and 45(22.5%) were primary and 63(31.5%) were illiterate. The occupation result showed that majority 88(44 %) were having no job followed by 49(24.5%) were having private job, only16 (8%) patients were having Government job, and 47(23.5%) were self-employers. The monthly income result showed that majority of respondents had monthly income less than 5,000 pound that's not sufficient. Also we found that the most prominent barrier is the cost that represents 51.5% of the participants' barrier, also two thirds of participants had poor practice levels and that more than half of participants had poor knowledge levels. Upon analyzing sociodemographic data in relation to diabetic foot care knowledge and practice our results show that males had statistically significant lower mean knowledge score than females. Also the educational level had statistically significant importance in both knowledge and practice score Multivariate regression analysis showed significant associations between scores of practice score with demographic characteristics of participants as with (Level of education) (p= 005-.001). and with (Marital status) (p = .013-.004). and multivariate regression analysis showed significant associations between scores of knowledge score with demographic characteristics of participants as with gender (female) (p = <0.0001-<0.0001), and income (p= <0.0001-<0.0001). residence (p = <0.0001- o33). Spearman correlation shows that there was no correlation between the scores of knowledge and practice and age.

Conclusion: This study has brought attention to the knowledge and practice gaps in DM patients' foot care

Key words: Knowledge, Practice, Barriers, Foot Self-Care, Diabetes

Introduction

It is well known that ,one of the most prevalent long-term problems of diabetes, diabetic foot issues have a significant financial and social impact on people, families, and also the global health system in both poor and industrialized nations.[1] Coordinated foot care services can help prevent diabetic foot issues. A key component of any good health program for the prevention and control of diabetic foot is patient education [2] One significant DM complication is diabetic foot problems, which are a growing public health concern as they are a major factor in hospitalization, amputation, and death rate in diabetic patients [3] Education is the most important factor in managing diabetes well because it empowers people to take an active part in their own care. Daily foot care practices help diabetics identify irregularities and damage to their feet earlier, which lowers or even eliminates the chance of developing foot ulcers. [4] The most frequent consequence of type 2 diabetes mellitus, diabetic peripheral neuritis (DPN), necessitates regular referral for medical or surgical therapy .[5]

There is no study on knowledge, practice and barriers of foot care in diabetic patients in Sohag. We aimed at conducting a research in an important tertiary hospital in Sohag to determine the level of knowledge and practice of foot care in diabetic patients visiting Sohag University Hospital.

Methods

Study settings

This was A cross-sectional, descriptive question-naire based study conducted over 1 year from June 2022 to July 2023 at Sohag University Hospital, Sohag, Egypt.

The sample size

Total coverage of all diabetic patients who met the inclusion criteria attending the endocrinal outpatient clinic at Sohag University Hospital during one year.

Inclusion and exclusion criteria

The study included diabetic patients aged 30 to 70 years old who were attending Sohag university hospital. We excluded Patients in the emergency room, patients refused to participate in the study, Patients with active foot ulcers and People who

suffer from cognitive impairment. Two-hundred diabetic patients were included in our study.

Data collection

Data were collected through personal interview with the study participants using:

Medical data collection sheet

a. Patient sociodemographic information, including age, gender, place of residence, level of education, marital status, income, and type of work..

b. Knowledge questions include -DM patients should take their medication because they liable to get DM complications &Do you know foot ulcer is a common complication in DM, do you have any idea that dry and scaly skin is common symptom of foot ulcer? Do you know wounds may not heal quickly in DM patients, Do you know infections may not recover-quickly in DM,,,do you know smoking causes poor circulation affecting the feet,,do you think you should inspect the inside of footwear for objects or torn lining?

c. Practice questions include: Do you inspect your feet daily?, Do you wash your feet two times in a day?, Do you wash your feet with warm water?, Do you trim toe nails straight across?,do you measure your feet size when last you bought footwear?, Do you use talcum powder for keeping interdigital space dry?,did you ever inspect inside of footwear?,do you regularly walk barefoot?, Do you clean nails with sharp instrument?, Do you add antiseptic to water before feet cleaning?, Do you wear elasticated hosiery (to prevent edema and thrombosis)?, Do you feel heal ache?

d. Barriers questions include: poor vision among respondents ,inability to reach their feet , cannot afford the recommended shoes , don't think it is important to do foot self-care , don't know how to do foot self-care, poor communication between the health care provider and the patient, lack of family support, walking bare foot questionnaire comprising questions about patients' understanding of disease, patients' self-care routines, and questions about barriers to the practice of foot care. The Cut off level was ≤ 4 and total knowledge questions were 7 and the scoring (knowledge) less than or equal to 4 was considered as poor kno-

wledge and scoring (knowledge) greater than 4 was considered as adequate knowledge. The Cut off level was ≤ 6 and total practice questions were 12 and the scoring (practice) less than or equal to 6 is considered as poor practice and scoring (practice) greater than 6 is considered as adequate practice according to study from which we took the questionnaire. [6]

The questionnaire was filled in about 10 minutes duration from eligible persons at the study place. The researcher was able to speak with 8 to 10 patients per day. Two times every week, the outpatient clinic was visited, filling the medical chart then the questionnaire from the patients.

Statistical analysis
SPSS version 21 was used for data analysis and tabulation. Quantitative factors such as mean, median, standard deviation, and range were subjected to descriptive tests. Number and percentage formats were used to show qualitative data. The chi-squared test was utilized to compare the frequency distribution of the groups. Testing statistics for data that are non-parametric or not normally distributed using the Shapiro–Wilk normality tests All data were not normally distrbuted .

Age-related mean scores for knowledge and practice were correlated using the Spearman correlation coefficient. A P-value of 0.05 was considered significant. Whitney Mann When comparing two groups with quantitative variables that do not have a normal distribution. When comparing more than two independent samples with non-parametric data, the Kruskal Wallis test is used. A P value is considered significant if it is less than 0.05. The independent variables that were related to the patient's scores were identified using univariate regression analyses.

The association between the knowledge and practice scores and variables that were linked in the univariate regression analyses or supported by practice observations was then assessed using multivariate regression analysis. Statistical significance was determined by the adjusted p value being less than 0.05.

Ethical considerations
The study protocol was approved by Sohag Faculty of Medicine Research Ethics Committee. Written informed consents were obtained from all the study participants. Confidentiality of the data of the study participants was ensured.

Result

Table (1): Socio-demographic data of study Participants.   .

Variable	Frequency	Percent
Age (year)		
Mean ±SD	54±15	
Median	55	
Min.-Max.	(30-70)	
Gender		
Male	108	(54.0%)
Female	92	(46.0%)
Residence		
Rural	127	(63.5%)
Urban	73	(36.5%)
Marital status		
single	36	(18.0%)
married	134	(67.0%)
Widowed	24	(12.0%)
Separated	6	(3.0%)
Level of education		
Illiterate	63	(31.5%)
Primary	45	(22.5%)
Middle	52	(26.0 %)
High education	40	(20.0%)
4-**Occupations**		
Jobless	88	(44.0%)
Government servant	16	(8.0%)
Private servant	49	(24.5%)
Free worker	47	(23.5%)
Income		
No income	83	(41.5%)
<5000	60	(30.0%)
5000-10000	44	(22.0%)
11000-15000	13	(6.5%)
>15000	0	(0%)

Table (1): shows a total of 200 people participated in present study among which data of 200 participants (Male: n = 108, 54%; females: n = 92, 46%) with mean age was about 54 years and ranged from 30 to 70.

As regards the residence of participants, they were mainly from rural 127 (63.5. %) and to less extent from urban 73 (36.5%), Marital status result showed that there were 134 (67%) married and 36 (18%) were single. Education level result showed that the majority of respondents were of middle and primary education while 40 (20.0%) were high educated and 45(22.5%) were primary and 63 (31.5%) were illiterate. The occupation result showed that the majority 88 (44 %) were having no job followed by 49 (24.5%) were having private job, only16 (8%) patients were having Government job, and 47(23.5%) were self-employers. The monthly income result showed that the majority of respondents had monthly income less than 5,000 pounds.

Table (2) Distribution of knowledge level and practice level among the study participant.

	Knowledge level NO Percentage	Practice level NO Percentage
Adequate	71 (35.5%)	64 (32.0%)
Poor	129 (64.5%)	136 (68.0%)
P –value	0.03	

Table (2) demonstrates that two thirds of participants had poor practice levels and that more than half of participants had poor knowledge level.

Table (3) Comparison between scores of that both knowledge and practice of study population according to gender and educational level

	Mean ±SD Median (Range)	P-Value	Mean ±SD Median (Range)	P-Value
1-Gender Male	2.2±1.9 3.0 (0-6)	<0.0001*	5.7±2.4 6 (0-12)	0.61*
Female	3.6±1.8 3.0 (0-6)		6.3±3.2 6 (0-12)	
2-Educational level Illiterate	3.7±1.7 3 (0-6)	0.001**	7.0±2.6 6 (4-12)	0.002**
Primary	3.2±2.4 3 (0-6)		6.6±2.7 6 (3-12)	
Middle	2.2±1.9 2.5 (0-6)		4.7±2.6 5 (0-12)	
High education	2.6±1.5 3 (0-5)		6.1±2.7 6 (0-12)	

* Mann-Whitney test
**Kruskal-Wallis test

Table (3) shows that males had statistically significant lower mean knowledge score than females. Also the educational level had statistically significant importance in both knowledge and practice score

Table (4) shows that the income had statistically significant importance in both knowledge and practice score while residence had no statistically significant importance in both knowledge and practice score .

|		B (95% C.I)	P-Value	B (95% C.I)	P-Value
-Age	-	-0.01(-0.04:0.02)	0.47	0.003(-0.02:0.03)	0.77
Gender (male)	Female	0.63(-0.46:1.72)	0.26	-0.61(-1.302: 0.094)	0.09
Marital status (single) **Married** **Widow**	Separated	-0.96(-3.29:1.36) -0.89(-2.89:1.20) -3.93(-6.28:-1.59)	0.42 0.41 0.001	-0.79(-.47:0.89) -0.65(-2.15:0.84) -1.02(-2.72:0.69)	0.36 0.39 0.24
Level of education **Illiterate** **Primary** **Middle**	High education	1.71(0.40:3.02) 1.31(0.02:2.62) -1.88(-2.66:-0.34)	0.01 0.05 0.01	0.95(-0.002:1.91) 0.39(-0.54:1.32) 0.12(-0.73;0.97)	- 0.05 0.40 0.78
Income		-0.90(-1.58:0.23)	0.01	-0.57(-1.06;-0.08)	0.02
Locality (Rural)	Urban	-0.48(-1.56:0.60)	0.38	0.24(-1.03:0.56)	0.56
Occupation **Jobless** **Government servant** **Private servant**	Free worker	1.20(-0.16:2.55) -0.15(-1.88:1.58) 1.88(0.63:3.13)	0.08 0.86 0.003	1.17(0.23:2.1) 2.3(0.13:3.45) 0.77(-0.10:1.7)	0.01 <0.0001 0.08

Table (4) shows multivariate regression analysis showed significant associations between mean scores of practice with demographic characteristics of participants as with (Level of education ; illiterate and middle education) (p= 0.01). and with (Marital status, widow) (p value =0.001), with income (p value=0.01) and with occupation ; private servant (p value= 0.003). Multivariate regression analysis showed significant associations between mean scores of knowledge with demographic characteristics of participants as with income (p= 0.02) and occupation ; jobless and government servant (p = 0.01,< 0.0001).

Table (5) Correlation of Knowledge score and Practice score with age

Age		Knowledge score	Practice score
	Correlation Coefficient	0.045	-.097
	P-Value	0.53	0.17

Spearman correlation

Table (5) shows correlation between mean scores of knowledge and practice with age. There was no correlation between the scores of knowledge and practice and age.
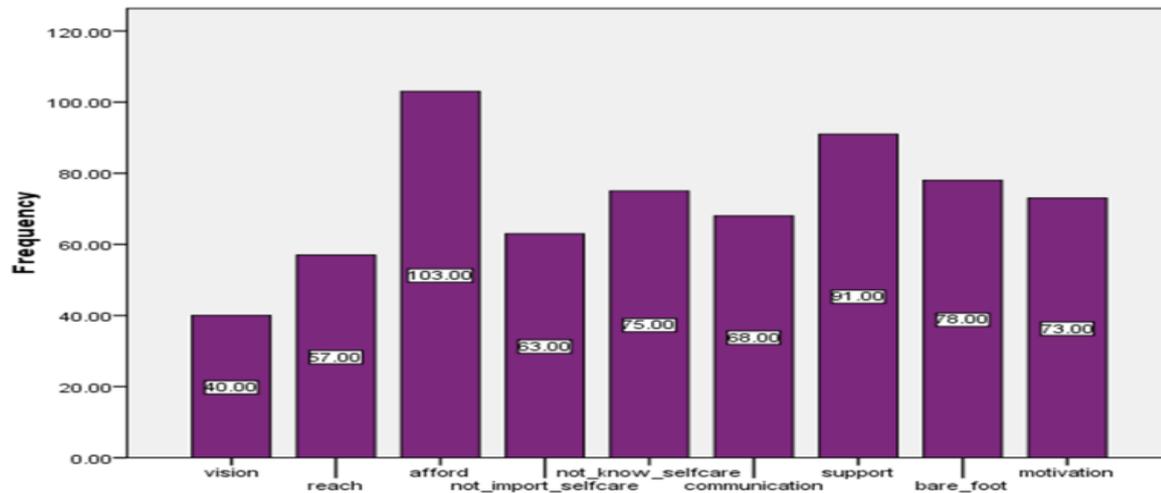
Figure(1): Frequency
distribution of the patients towards foot self-care practices barrier
Figure 1 shows that the most prominant barrier is the cost that represent's51.5% of the participants'barrier, more than third of the participants don't know how to do foot self-care and reported "poor communication" between patients and health care provider

Discussion

Our research aimed to raise awareness among primary care practitioners including a diabetic foot examination or screening tool in their routine care. Our findings, which were consistent with those of Muhammad Lutfi, Kim, and studies on young Saudi females with diabetes who also reported low KAP scores, showed that the majority of patients had lower knowledge and practice scores regarding foot care. The mean knowledge score was also lower than the mean practice score. However, other studies have found that people with diabetes are highly knowledgeable about the disease. [7]

The variations in diabetes care training provided by healthcare professionals in these studies' populations, as well as the variations in income levels and mean ages of the research populations, may account for the variations in knowledge scores about foot care among diabetes patients among studies. These discrepancies could be attributed to the low illiteracy rate, which allowed them to read and comprehend instructional materials .However, the mean practice score was

statistically insignificant higher among females than males in the current study. Female gender was found to have a statistically significant association with higher mean knowledge scores of foot care. These findings are consistent with findings from studies conducted in the UK by Pollock et al., which found that female patients had significantly higher mean knowledge scores. However, they are at odds with findings from studies conducted in Nigeria by Desalu et al. [8], which found a statistically significant association between male gender and higher knowledge of foot care. Since women in the UK and Egypt may have more opportunities than women in Nigeria, where men were found to have a statistically significant connection with higher knowledge, this discrepancy could be explained from a cultural standpoint .[8] Married participants had higher practice score due to cultural prejudice towards married people in developing nations, particularly in rural regions, which makes up two thirds of the sample population in the current study. [9] With

higher education and more exposure to instructional materials it has been linked to enhanced diabetes knowledge .[10] In our study, occupation, education, and knowledge are strongly correlated, although the mean knowledge score is greater for illiterate and unemployed patients, which can be explained by the fact that these groups made up the majority of the sample. Occupation has also been noted as a category that influences effective practice. We speculate that this may have been caused by their greater independence in accessing healthcare as well as better access to products and services. Rich folks, on the other hand, displayed a lesser level of practice. The cause requires investigation. According to this study, there are a number of theories for why nutrition is such an important component of every diabetic treatment regimen. It is typically impossible to obtain good metabolic control without an effective dietary intervention. Diet-related problems are complex, necessitating the consideration of behavioral, functional, cognitive, and socioeconomic factors .[11] The use of medicine is the cornerstone of diabetes mellitus therapy. High out-of-pocket drug expenses, which are higher among diabetes patients with other chronic conditions, may be the cause of unfair or bad treatment practices. As a result, adherence to prescribed medication regimens is significantly hampered .[11] According to the study's findings, patients performed worse on tests pertaining to the practice of diabetic foot self-care. Poor foot care practices are reported in reports from numerous nations. [6]

In spite of having inadequate knowledge and income, there are more good practices in our study than there are among people who had adequate knowledge of foot care, according to a study from Pakistan by Hasnains et al. This was explained by the fact that participants in the present study bathed their feet more frequently as a result of religious customs, which are required for Muslims. "Wudhu," a religious ritual that includes foot washing five times a day, offers a good opportunity for foot inspection, enabling for the fast discovery of any foot ulcerations. Participants in this study nevertheless received inadequate findings because many of them walk barefoot indoors and don't routinely check their feet and inside of their shoes, even though practice mean scores from the current study were higher than those from past studies. Additionally, it was shown that individuals frequently clip their toenails improperly and dry their feet improperly after bathing. The incidence of diabetic foot issues is known to rise as a result of these unethical actions, which can also directly cause the occurrence of foot ulcers. [9] In our study the total of 200 respondents who had encountered barriers, 68 (34%) reported "poor communication" between patients and health care providers 75 (37.5%) cited "I did not know what to do. This comes in accordance with seid A et al.[12] and Abu-elenin M et al. [13] study as there is insufficient communication between healthcare providers. and patients due to limited time devoted to educate patients as a result of busy clinic schedule this is the main cause of inappropriate patient education Therefore, healthcare providers are crucial in improving the knowledge and practices of patients. In a study from Italy, more than 50% of the patients reported that they did not have their feet examined by their physician and 28% stated that they had not received training for foot self-care. Ensuring that patients' knowledge and practices are strongly related to physicians' attitudes .[14] In our study (45.5%) of participants reported that they lack family support and motivation. These results are in line with the findings of Nguyen's study, as family involvement in healthcare decisions extends beyond just making decisions about food and financial support for medical expenses, which may create barriers to patients' participation in health education programs. As a result, patients need ongoing support from family members and the community in order to change their lifestyles and behaviors and achieve effective continuous changes in or additionally, in order to effectively control diabetes mellitus at the community level, information regarding the disease and its risk factors should be distributed through the media[15].

Conclusion

This study has brought attention to the knowledge and practice gaps in DM patients' foot care, underscoring the need for an educational program to prevent diabetic foot complications, which were linked to poor socioeconomic status and illiteracy. Along with ongoing assistance and reinforcement from doctors**.**

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