Effectiveness of health education intervention on foot self-care practice among diabetics at Zagazig university hospitals

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Abstract

Background: Diabetic patients are at risk for developing diabetic foot problems as infection, ulcer and gangrene which are the most common cause of hospitalization among diabetics. Proper foot care is very necessary for preventing these problems and improving quality of life of these patients.   **Aim** the aim of this study was to assess the effectiveness of health education intervention on self-care knowledge and foot care practice among diabetic patients.   **Methods:** an intervention field trial was conducted on 76 diabetic patients attending Zagazig University Hospital outpatient clinics using structured questionnaire for self-care knowledge assessment and structured questionnaire guided by American diabetes association guidelines for foot care practice assessment. The International Working Group on the Diabetic Foot (IWGDF) –Risk Classification System was used for risk classification of the studied diabetic patients.   **Results** 31.5 % of studied patients had high risk for diabetic foot. There was significant improvement in the total knowledge score from 8.17 ± 2.4 to 16.16 ± 2.3 after application of the intervention. Also there was significant improvement in the total practice score (p value <0.001). **Recommendation**: Targeted health education programs regarding foot care strategies for diabetic patients are needed to reduce diabetic foot complications and ultimately amputation.

Key words: *Diabetics, foot practice, Self-care, Knowledge, Health education.*

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Introduction

Diabetes is a chronic complex disease that requires continuous care, proper control and multifactorial strategies for risk reduction[1].   Diabetes can cause number of severe complications that increase morbidity, mortality and health care cost[2].

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[3]. Improper foot care in diabetic patients can lead to many complications such as infection, ulcerations, gangrene and amputations[4]. The prevalence of diabetic foot ulcers has been found to be high in Egypt, it is estimated from a recent study conducted among diabetics in Egypt, that (29.3%) of diabetics had foot ulcer disease; (63.3%) had vascular complications, and neuropathy was reported in (88.0%) of them[5]. Diabetic foot complications were attributed to the lack of knowledge about foot care among diabetic patients and the   feet improper wear[6.]   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[3,7]. When patients have sufficient knowledge about their

disease, they are more likely to adhere to their treatment regimen. Foot care knowledge and behavior of patients are influenced positively by their information about their medical condition[8-10].

The practice of diabetic foot care includes daily foot examination, use of appropriate footwear to prevent foot ulcers development, Check of water temperature before bath and seek professional help for any problem[10].

Since studies showed that more than 90% of the people having diabetes in Egypt do not receive education on diabetic foot problems and care[6], we aimed in this study to improve the quality of life of diabetic patients attending outpatient clinic at Zagazig University Hospitals through improving their foot self-care practices.

The aim of the present study is to identify risk of having diabetic foot among the studied patients, to assess the current foot self-care knowledge level foot care practice among diabetic patients, to implement health education intervention and to evaluate the effectiveness of intervention regarding foot self-care knowledge and foot care practice among our participants.

Methods

Study design and setting: An interventional field trial in the diabetic foot outpatient clinic at Zagazig University Hospitals was conducted over a period of 10 months (from January 2015 till October 2015) through three phases:

Assessment phase was conducted over a period of two months to assess the self-care knowledge and foot care practice. Also the risk of developing diabetic foot was assessed.

Implementation phase was conducted over a period of three months in which educational sessions and small group discussions were held based on the

American diabetes association guidelines regarding foot care practice.

Evaluation phase was conducted over a period of two months to evaluate the measurable outcome through reassessment of self-care knowledge and foot care practice. This phase was started three months after the implementation phase.

Sample size and sampling: Sample size was calculated to be 76 participants using Epi software version 6 after conduction of a pilot study which revealed improvement in knowledge after health education by 32% (from 28% to 60%) at confidence interval 95%. Our participants were selected by systematic random sample from follow up records of diabetic foot outpatient clinic.

Data collection tools: A structured questionnaire to assess the foot self-care knowledge of the participants. It was used as pre and post tests. It is divided into three parts. The 1st part included personal data. The 2nd part included diabetic history. The 3rd part included 18 multiple choice questions assessing foot self-care knowledge. In the knowledge section, each correct answer took 1 degree and incorrect answer took zero. Total score was 18 degrees. Knowledge was considered poor if (≤50%) of total score and good if (>50%) of total score. A structured questionnaire to assess the foot care Practice of the participants guided by the guidelines of American diabetes association for foot care practice [11]. It was filled before and after intervention. It included 12 items; feet inspection, shoes inspection before putting on, washing feet with warm water, drying feet after washing, using emollients for dry skin, cutting toenails properly, walking bare foot, wearing shoes without socks, check between toes, drying between toes, check of water temperature before bath and seek professional help for any problem. Answers were presented as (yes, no) with scores (zero. one respectively except in 2

items (walking bare foot, wearing shoes without socks) the scoring was reversed. Total score was 12 degrees. Practice was considered poor if (≤50%) of total score and Good if (>50%) of total score. A Comprehensive foot examination was done to cover Key components of the diabetic foot exam (dermatological, musculoskeletal, neurological and vascular assessment .The International Working Group on the Diabetic Foot (IWGDF) –Risk Classification System was used for risk classification of the studied diabetic patients. Once the patient had been assessed clinically, he or she was assigned to a foot risk category. (0 Normal– no neuropathy, 1 Loss of protective sensation (LOPS), 2a LOPS and deformity, 2b Peripheral arterial disease, 3a Previous history of ulceration, 3b Previous history of amputation) .These categories were designed to direct referral and subsequent therapy by the specialty clinician or team and frequency of follow-up by the generalist or specialist. Increased category is associated with an increased risk for ulceration, hospitalization, and amputation .Patients in risk category 0 generally do not need referral and should receive general foot care education and undergo comprehensive foot examination annually. Patients in foot risk category 1 may be managed by a generalist or specialist every 3–6 months. Consideration should be given to an initial specialist referral to assess the need for specialized treatment and follow-up. Those in categories 2 and 3 should be referred to a foot care specialist or specialty clinic and seen every 1–3 months[12].

Experimental tools: Colored brochures, booklets, Videos and power point presentations about care of diabetic feet were used in the health education sessions (4 sessions, each session last for one hour) to improve the awareness and behavior of the participants.

Statistical management:

After data collection, data were coded, entered and analyzed using SPSS (Statistical Package for Social Science) version 19. Chi-square and McNemar test was used for comparing descriptive data and paired t test and Wilcoxon Signed Rank Test was used for comparing quantitative data. P value (≤ 0.05) was considered significant difference and P value (≤ 0.01) was considered highly significant difference.

Ethical aspect and administrative approach: Before carrying out the study, the necessary official permission was taken from the head of Internal Medicine department and the head of Zagazig University Hospitals. An informed verbal consent was obtained from patients and they were reassured about the confidentiality of any obtained information and that the results would be used for the purpose of research.

Results

Table 1 shows that the mean age of participants was 55.0 ± 10.1. Male: female ratio was nearly 1:1. Most of participant were residents of rural areas and only 15.7% of them were of higher education. More than half of them were not working, but most of them had sufficient income (income satisfy needs).

Table 2 shows that majority of participant are suffering from type 2 diabetes with median duration 10 years, More than half of them receive oral hypoglycemic therapy . Only 7.0 % of them had a history of foot ulcer and no history of amputation. More than half of them had eye and neurological complications. Most of participants regularly monitor their blood sugar level every month (known from records). 36.8% of them said that they had advice on foot care from their physicians and 28.9 % of them reported that they care for their foot.

Table 3 show that 31.5 % of studied patients had high risk for diabetic foot (Loss of protective sensation and

deformity, peripheral arterial disease and past history of ulceration), while 39.5% of them were normal with no peripheral neuropathy (low risk).

Table 4 shows that there was significant improvement of all items of knowledge with a significant improvement in the knowledge total score of the studied sample from 8.17±2.4 in the pretest to 16.16±2.3 in the post test.

Table 5 shows that there is significant improvement of self-care practice items except for drying between toes with significant improvement in the practice total score (p value <0.001).

Table 6 shows that sex, residence and education had significant effect on knowledge of the participants as males, and residents of urban areas and highly educated participants had good knowledge. Also practice was significantly better among females and residents of urban areas, while occupation and education had no significant effect on knowledge and practice of participants.

Discussion:

People with diabetes are prone to develop foot ulcer, amputation and other lower extremity clinical abnormalities if they do not have good knowledge of foot care practice[13]. Our study was an intervention field trial conducted upon 76 diabetic patients to improve their knowledge about diabetic foot and their foot care practice.

This study showed that 7.9% of studied diabetics had previous history of foot ulcers This finding with in accordance with studies conducted by Ogbera et al[14] and Prompers et al[15] that stated that the prevalence of foot ulcers is approximately 4–20% in diabetes patients in their reports. However in Ren et al[16] , 15.7% of diabetes patients at high risk of diabetic foot had a foot ulceration history, this percentage was lower than that percentage reported in our study which was (25.0%) of diabetes

patients at high risk (6 out of 24 high risk patients)

Foot care knowledge: Our results showed that the baseline knowledge of the majority of our participants was unsatisfactory; this finding was in accordance with studies conducted in Malaysia[17] and Nigeria[13] which reported poor knowledge among their studied sample. Also we found that being a females of low education had a significant effect on the level of knowledge, which was contrary to another study reported that there was no significant association between patients' demographics with the level of knowledge diabetic foot care[13].

Our findings were in accordance with a study conducted in Pakistan[18] and Desalu et al[13] who stated the significance association of low level of education and poor knowledge about diabetic foot practice. Our findings were confirmed by the fact that 97% of females above forty in rural Egypt are illiterate[19] and that Education improves an individual's cognitive skills, including reading and information processing[20]. Consequently, the higher educated are more likely to use health information resources[21,22].

Our results revealed significant improvement in the knowledge of our participants after application of the health education intervention and this was in accordance with other studies conducted in Washington[23] and Tanzania[24] where the latest recommended provision of continuous foot care education to patients and health care providers through coordinated foot care services within the diabetic clinic.

Diabetic Foot care Practice: Our findings revealed poor baseline practice in the majority of our studied group which was confirmed by the results of other Malaysian study[17]. Also, our results showed that low level of education had a significant effect on the baseline practice which was in line with a similar study

reported the significance effect of education on the level of practice[13].

Our results revealed that being a female had significant effect on the level of practice which was contrary to another study conducted in Lahore which reported no significant association between sex and diabetic foot practice[25]. Our findings were contrary to the culture of rural Egyptian women as Egyptian women's behaviors were known to be strongly influenced by their husbands and mothers-in-law after marriage[26,27] which may be a cause that they put their health of low priority due to increased daily family duties. After health education intervention most items of foot care practice was significantly improved and this was in accordance with a study conducted in a primary care center which reported improvement of foot care practice after their education[28]. We attributed our finding that the content of the educational program and the group discussions of the participants with the

researchers helped to increase the self-efficacy of the participants which had a great effect on the practice. We attributed our finding that the content of the educational program and the group discussions of the participants with the researchers helped to increase the self-efficacy of the participants which had a great effect on the practice.

Conclusion and Recommendation

This study showed poor diabetic foot care knowledge and practice. Health education intervention succeeded in improving them which suggest the need of targeted training programs for health care providers at the primary level about the importance of regular foot examination, risk assessment and foot education are needed to decrease the burden of complication and increase the wellbeing of diabetic patients.

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Table (1): Frequency distribution of socio-demographic characteristics of the studied patients (n = 76)

Socio-demographic characteristics	No. (n=76)	%
Age:		
Range	26– 70	
Mean ± SD	55.0 ± 10.1	
Gender:		
- Male	20	26.3
- Female	56	73.7
Residence		
Rural	40	52.6
Urban	36	47.4
Education		
- Illiterate	20	26.3
-read and write	4	5.3
- primary education	24	31.6
- Secondary	16	21.1
- higher education	12	15.7
Occupation:		
- Not working	44	57.9
- Working	32	42.1
Income:		
- Insufficient	24	31.6
- Sufficient	48	63.2
- Sufficient and saving	4	5.2

Table (2): Frequency distribution of diabetic history of the studied patients (n = 76)

History	No. (N=76)	%
Type of diabetes:		
- type 1	20	26.3
- type 2	56	73.7
Duration (years)		
Range	1-22	
Median	10	
Treatment :		
-Insulin	20	26.3
-Oral hypoglycemic	44	57.9
- Both	12	15.8
Foot ulcer		
-Yes	6	7.0
Foot amputation		
-Yes	0	0.0
Complication		
-No	36	47.4
-Neurological	28	36.8
-eye complication	12	15.8
Comorbidity		
-No	16	21.1
-Hypertension	28	36.8
-Cardiac	16	21.1
-Renal	4	5.3
- Liver	12	15.7
Regularly monitor blood glucose (every month)	48	63.2
Have advice to foot care	28	36.8
Care of foot	22	28.9

Table (3): Risk classification of the studied group by International Working Group on the Diabetic Foot (IWGDF) –Risk Classification System

	N=76	%
0-Normal – no neuropathy	30	39.5
1-Loss of protective sensation	22	28.9
2a-LOPS and deformity	9	11.8
2b-Peripheral arterial disease	9	11.8
3a-Previous history of ulceration	6	7.9
3b-Previous history of amputation	0	0.0

Table (4): Knowledge of the studied group before and after education intervention.

Correct Answer	Pre intervention %	Post intervention %	P value*
1-For prevention of diabetic foot we should control blood sugar	60 (78.9)	72 (94.7)	<0.001
2-For controlling blood sugar what must you do?	40 (52.6)	64 (84.2)	<0.001
3-Why diabetic patients should care for their feet	16 (21.1)	64 (84.2)	<0.001
4-How often you should inspect your feet	32 (42.1)	76 (100)	<0.001
5-On inspection of your feet you should:	24 (31.6)	72 (94.7)	<0.001
6-On washing your feet you should:	12 (15.8)	60 (78.9)	<0.001
7-For dry skin you should:	48 (63.2)	76 (100)	<0.001
8-For excessive sweating you should :	44 (57.9)	67(88.1)	<0.001
9-How to cut nails:	8 (10.5)	68(89.5)	<0.001
10-How to deal with toenails:	28 (36.8)	72 (94.7)	<0.001
11-Type of socks should be worn :	16 (21.1)	60 (78.9)	<0.001
12-On wearing socks you should:	44(57.9)	72 (94.7)	<0.001
13-How often you should inspect your shoes:	52 (68.4)	72 (94.7)	<0.001
14-On using new shoes you should:	16(21.1)	52 (68.4)	<0.001
15-On sitting you should :	32 (42.1)	68 (89.5)	<0.001
16-Symptoms of foot problem:	32(42.1)	68(89.5)	<0.001
17-For improving circulation :	32(42.1)	72(94.7)	<0.001
18-In presence of redness or blood between toes you should;	56 (73.7)	72(94.7)	<0.001
Total knowledge Good Mean±SD	36 (47.4) 8.17±2.4	68(89.5) 16.16±2.3	<0.001

*McNmar test, **Paired t

Table (5): Foot self-care practice of the studied sample before and after intervention

	Pre intervention No. (%)	Post intervention No. (%)	P value*
Inspect foot daily	40(52.6)	55(72.4)	0.001
Inspect Shoes Before Putting Them On	44(57.9)	54(71.1)	0.006
Wash Feet	20(26.3)	49(64.5)	0.000
Dry Feet Well After Washing	32(42.1)	46(60.5)	0.02
Use Emollients For Dry Skin	36(47.4)	49(65.5)	0.002
Cut Toenails Properly	44(57.9)	58(76.3)	0.003
Walk Bare Foot	24(31.6)	41(53.9)	<0.001
Wear Shoes Without Socks	20(26.3)	35(46.1)	0.004
Check Between Toe	48(63.2)	63(82.9)	0.008
Dry Between The Toes	36(47.4)	49(64.5)	0.06
Check of Water Temperature Before Bath	28(36.8)	47(61.8)	0.001
Seek Professional Help For any Problem	12(15.8)	37(48.7)	<0.001
Total practice Good Median Range	28 (36.8) 5 1-11	69 (90.8) 8 4-11	<0.001

*McNemar test used, ** Wilcoxon Signed Rank Test

Table (6): Impact of demographic factors on the baseline knowledge and practice of participants

	Good Knowledge (N=36) (%)	Poor Knowledge (N=40) (%)	P value	Good practice (N=28)	Poor Practice (N=48)	P value*
Sex						
-Male (20)	16 (80.0)	4 (20.0)	0.001	0 (0.0)	20 (100.0)	0.00
-female (56)	20 (35.7)	36 (64.3)		28 (50)	28 (50.0)	
Residence						
Rural (40)	12(30.0)	28 (70.0)	0.001	8 (20.0)	32 (80.0)	0.001
Urban (36)	24(66.7)	12 (33.3)		20 (55.6)	16(44.4)	
Education						
Elementary(48)	15 (31.3)	33(68.7)		16 (33.3)	32(66.6)	0.47
Secondary (16)	12 (75.0)	4 (25.0)	0.001	8 (50.0)	8 (50.0)	
High (12)	9 (75.0)	3 (25.0)		4 (33.3)	8 (66.7)	
Occupation						
Not working (44)	20 (45.5)	24 (54.5)	0.69	16 (36.4)	28 (63.6)	0.92
Working (32)	16 (50.0)	16 (50.0)		12 (37.5)	20 (62.5)	

 *Chi-square test