

Effect of an Educational Program on Caregivers' Knowledge about Diabetic Foot Care at Elderly Home in Damanhur - Egypt

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Abstract: Background: Diabetic foot care of elderly people constitutes a growing and costly public health concern in developed nations. Educating caregivers about diabetic foot and increasing their knowledge will give significant impact on reducing the rate of amputation. This study **aimed to** determine the effect of an educational program on caregiver's knowledge about diabetic foot care at elderly home in Damanhur governorate. **Method:** An experimental research design was adopted. A convenience sample of 32 caregivers was recruited. An educational program was implemented with pre-post test and after four months. Tools included: socio-demographic characteristics and knowledge regarding diabetic foot care was assessed using the validated Diabetes Care Program of NOVA SCOTIA, DCPNS. **Results:** The mean \pm SD of age was 34.8 ± 5.9 and 53.1% were females. There were statistical significant differences in the general knowledge of the diabetic foot problems of the "numbness, picking pain, sharp pain at foot, for the favor of immediately after the program, with $p=0.019$ " and the "tightness, heaviness, aching or cramps in the feet or legs pose a problem, with $p =0.039$ ". The knowledge of the caregivers was improved immediately after the educational intervention for foot hygiene items, type of shoes, socks and foot safety management, without significant differences of some studied items. The majority of the participants preferred posters and needed health education for diabetic foot care. **Conclusion:** The program has increased the knowledge of caregiver's, but the statistically significant impact will need long-term educational interventions. Caregiver's education can help in prevention and control of foot complications and lower-extremity amputations. This study **recommended** that: increasing the knowledge of caregivers in elderly homes about diabetic foot care through posters and repetitive short- term practical training interventions.

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1. Introduction:

The prevalence of diabetes mellitus is increasing, consequently it influences and it appears to affect a disproportionate number of older adults. ⁽¹⁾ It stands to reason that as the prevalence of diabetes continues to increase, there is significant risk that diabetic complications, including foot problems, will also increase. ⁽²⁾ The underlying lesions that often result in chronic ulceration and amputation have been termed the diabetic foot. This is defined as infection, ulceration and destruction of deep tissues, associated with neurological abnormalities (loss of pain sensation) and various degrees of peripheral vascular disease in the lower limb. ⁽³⁾ The risk of such complications increases in the elder population, as older diabetic are more likely to have multiple chronic diseases and comorbidities. ⁽⁴⁾

The burden of care is higher among institutionalized older adults, as these individuals are often managing a wide range of physical and cognitive disorders. ⁽⁵⁾ The contributory factors for diabetic foot ulcers among older adults include: peripheral arterial disease, sensory neuropathy, and joint malformations. ⁽⁶⁾

Accordingly, preventive care of foot problems among older adults is challenging, particularly considering the range of multiple diseases, numerous medications, and sometimes limited caregiver support in the long-term care (LTC) population. ⁽⁷⁾

In developing countries, the percentage of the population with diabetes is rapidly out-pacing than in the developed world. ⁽⁸⁾ A number of Middle Eastern countries, including Bahrain, Kuwait, Saudi Arabia and the United Arab Emirates, dominate the world top-ten league table for the highest percentage of diabetes in the population. ⁽⁹⁾

Egypt will have at least 8.6 million adults with diabetes and will be the tenth largest population of diabetics in the world. ⁽¹⁰⁾ The eleventh most important cause of premature mortality in Egypt is diabetes mellitus. It's responsible for 2.4% of all years of life lost. Also, diabetes is the six most important cause of disability burden in Egypt. ⁽¹¹⁾ It is associated with impaired quality of life. ⁽¹²⁾ A study in Beni Suif hospital, Egypt from 2010-2012 reported that fifth of cases had high risk for development of diabetic foot

ulcers, where peripheral arterial disease (PAD) was the major cause.⁽¹³⁾

Proper daily foot care is an essential, low cost and effective part of diabetic foot ulcer (DFU) prevention. Performing daily foot care routines enables diabetic patients to detect foot abnormalities and injuries earlier, hence reduce or even prevent the risk of foot ulceration effectively.⁽¹⁴⁾ However, many diabetic patients do not perform daily foot care appropriately, for instance, failing to conduct a daily foot self-inspection, walking barefoot or wearing improper footwear, improperly trimming their toenails, or using unsafe water for washing their feet.⁽¹⁵⁾ Management and preventive care of diabetic-related foot complications are also essential to reduce the risk of lower-extremity amputations, an increasing problem among individuals with diabetes.⁽¹⁶⁾ Proponents of diabetic foot management suggest a nationwide educational campaign to encourage healthcare providers to conduct routine foot examinations for diabetic person and periodic follow-ups for individuals at risk of developing foot complications.⁽¹⁷⁾

The lack of podiatry services in many countries limits, or prohibits, some diabetic patients from accessing foot care of a high standard. Until such time as the shortage of podiatrists is resolved, those treating diabetic foot disease (that is not trained in the field) need access to the educational programs that will enhance their skills and ensure the best possible outcomes for those receiving treatment. Yet just over one dozen podiatrists are employed in the Middle East. So few podiatrists do not constitute a service, only individuals providing the best care they can.⁽⁸⁾ However, there are, some notable exceptions and some developing countries are offering successful diabetic foot care courses. Notably, India, Tanzania, Egypt and Pakistan have all become involved in the Step-by-Step program, which aims to improve diabetes foot care in the developing world by providing education for people with diabetes and healthcare providers in the prevention and treatment of diabetic foot problems.⁽¹⁸⁾ Educating health care providers and patients about diabetic foot complications and increasing their knowledge will no doubt have a significant impact on reducing the rate of amputation. However; it requires commitment and patience to achieve the required results, especially in communities where education is still growing, as in developing countries.⁽¹⁹⁾

Lack of knowledge regarding diabetic foot problems, inappropriate footwear and the high prevalence of skin and nail pathology in Egypt could explain this paradox. It is suggested that regional differences in the risk factors for DFU should be considered when preventative strategies are planned.⁽²⁰⁾ To overcome the knowledge gap among healthcare professionals in the area of diabetes foot care, the

researcher designed an evidence-based program (EBP) that targets diabetes foot care knowledge among nurses practicing in LTC environments. The study hypothesized that nurses who participate in the program on diabetes foot care would improved caregivers knowledge of different components of foot examinations, including foot inspection and pedal pulse assessments, appropriate foot care practices, and patient education.⁽⁷⁾ However, a Step by Step Foot Project in Tanzania was initiated to train healthcare personnel in diabetic foot management, facilitate transfer of knowledge and expertise, and improves patient education. The project comprised a 3-day basic course with an interim period 1-year of for screening, followed by an advanced course and evaluation of activities. This program is an effective model for improving outcomes in other less-developed countries.⁽²¹⁾

Aim of the study:

This study aimed to determine the effect of an educational program on caregiver's knowledge about diabetic foot care at elderly home in Al Behaira governorate, Damanhur, Egypt.

Hypothesis:

Care givers who attend the educational program exhibit higher knowledge about diabetic foot care than those who do not attend it.

2. Subjects and Methods:

Design: Quasi - experimental research design.

Setting:

The study was conducted at Dar Al-Mogama of elderly home in Damanhur, El-Behaira Governorate, Egypt.

Subjects:

Total of 32 caregivers from the previously mentioned setting had constituted the study sample (males and females). They were conveniently choose according to the following criteria: being healthy and without history of neuropsychiatric illness.

Tools:

A structured interview pre-coded sheet was used to collect the data. The researcher carried out face-to-face interviews, with an average duration of 20 minutes. The tool was developed by the researcher and it divided into two parts:

Part 1: Socio-demographic characteristics including: age, gender and educational level...etc.

Part 2: Caregivers Knowledge about diabetic foot care. A questionnaire with 28 items about (foot problems, foot care, foot wear, safety and prevention, and foot care education), 24 items 'yes/no response' questions and 4 items multiple questions with each having one point with a total score was 28 points. Each subjects knowledge level was determined according to the following scoring system: from 0 – 14 was considered

poor knowledge (less than 50% of the answers are correct), from 15 – 21 was considered fair knowledge (50 – <75% of the answers are correct) and from 22 –28 was considered satisfactory (>75% of the answers are correct). The caregiver knowledge regarding diabetic foot care was assessed using the validated Diabetes Care Program of NOVA SCOTIA, DCPNS -September 2009. ⁽²²⁾

Methods:

During the practical classes of academic year 2013-2014 in elderly home, the researcher observed the increasing in the number of diabetic elderly with lack of knowledge among caregivers and encouraged them to express own needs for health educational programs especially on foot care. Planning for the education program was based on results revealed by the analysis of the pre-test where the educational needs were determined. The baseline data for the evaluation of knowledge of the caregivers were obtained by pre-test for those who previously worked in homes with different aspects of diabetic foot care.

The program was put in specific teaching strategies: group sessions in a classroom, using educational lectures, and the addressed themes were: foot care and special situations. The lectures involved stages for warm-up, development, and finalization. The contents of the intervention were developed after thorough review of literatures. The intervention included two sessions the duration of each session ranged from 45 to 60 minutes. The first session was educational and the second session was special situations session. Teaching methods included lectures, role playing, demonstration re-demonstration, pictures, discussion and others educational material used included: video of step-by-step program ⁽¹⁸⁾, with slide projector, posters; the selected content was organized in topics for better visualization. Booklet, in Arabic language, about (foot problems, foot care, foot wear, safety and prevention, and foot care education) was given to each caregiver to guide and enrich his/her memory about activities performed in each session. Before the start of second session, caregivers were asked questions related to the topics discussed in the previous session to identify their understanding; misses or unclear points were re-emphasized by the researchers. Along with all sessions, the researchers used simple, brief and clear words. At the end of each session, a brief summary was given emphasizing the most important points. By the end of the intervention reassessment (post-test) was done immediately and after four months to the caregivers to assess the effectiveness of the health education program on the knowledge related to preventive measures of foot problems. Three diabetes specialists reviewed this questionnaire, and suggested changes regarding the questions, sequence, and content while the suggested

changes were made. All participants were provided with standardized explanations of the procedures before initiating the study and asked to complete a pre-, post-test and after four months of the program. Inclusion Criteria: the caregiver must be sharing the dwelling and spend six to eight hours with the elderly daily and those accept to participate. Exclusion Criteria: the caregiver with history of neuropsychiatric illness or abuse.

The answers were registered directly in the questionnaire, during the interviews. This questionnaire and intervention were administered at the end of the program.

The study accomplished as follow:

- An official permission was obtained from the manager of the elderly home and the authorities of the setting, after explanation of the nature and objectives of the study.

- After obtaining an informed consent, the caregiver is handed over the questionnaire to mark his responses, any clarification or difficulties in interpreting these questions will be provided to him.

- A pilot study was carried out with three caregivers for a final adjustment and assess the tools for their clarity and validity, this are not included in the study.

Statistical analysis:

The collected data were processed using the statistical analysis (SPSS) version 19 software. The data were presented as absolute percentages, mean SD, range and absolute frequency distributions. Mc-Nemar test was performed for testing between the difference in proportion between caregivers, knowledge before and after implementing the program. Test of Marginal Homogeneity used for multiple sub items. Each correct answer received score 1 and, thus, the total score for each topic in the questionnaire was obtained before and after implementing the foot care Education Program. P value based on Fisher exact probabilities (FEP) significance ($p < 0.05$).

3. Results:

Table 1: Shows the distribution of the study sample according to their socio-demographic characteristics, where more than one-third (34.4%) of the participants were illiterates, with a mean age of 34.8 ± 5.9 years and a range of (24-41 years). More than half of them were females (53.1%).

Table 2: Explains the distribution of the study sample, according to their general knowledge about diabetic foot problems before, immediately after and after four months of the educational program. From the table it is clear that there was improvement in the general knowledge of the caregivers about the diabetic foot problems, immediately after the educational program, concerning ulcer of foot infection is a problematic, but

without statistically significant difference. There were statistical significant differences in the general knowledge of the diabetic foot problems of the "numbness, picking pain, sharp pain at foot, for the favor of immediately after the program, where 93.8% versus 71.9% & 65.5% for before and after four months of the program, respectively with $p=0.019$ " and the "tightness, heaviness, aching or cramps in the feet or legs pose a problem, where 90.6% for immediately after the program versus 81.3% & 75.0% for the before and after four months, respectively with $p=0.039$ ". It is clearly noticed that the general knowledge of the caregivers was increased immediately after than both before and after four months of the educational program, where the later being the least.

Table 1: Distribution of the study sample according to the socio-demographic characteristics (No =32)

Socio-demographic data	No.	%
Education		
▪ Illiterate	11	34.4
▪ Read & write	6	18.8
▪ Primary level	9	28.1
▪ Secondary level	6	18.8
Age		
▪ <35	13	40.6
▪ >35	19	59.4
Mean SD:(range)	34.8 ± 5.9; (24-41)	
Gender		
▪ Male	15	46.9
▪ Female	17	53.1

Table 2: Distribution of the study sample according to their general knowledge about diabetic foot problems before, immediately after and four months after of the educational program (no=32)

General knowledge Items	Educational Program Phases						Q _P
	before		after		After 4 months		
	No	%	No	%	No	%	
Wound needs more than 2 weeks for healing	30	93.8	30	93.8	29	90.6	0.857
Ulcer of infection at diabetic foot is problematic	28	87.5	32	100.0	28	87.5	0.113
Blood secretion on patient socks is problematic	29	90.6	28	87.5	28	87.5	0.902
Numbness, picking pain, sharp pain at foot is problematic	23	71.9	30	93.8	21	65.6	0.019*
Tightness, heaviness, aching, or cramps in the feet or legs pose a problem	26	81.3	29	90.6	24	75.0	0.039*

^QP: Cochran Q test * $P < 0.05$ (significant)

Table 3: Shows the distribution of the study sample according to their knowledge about diabetic foot care items before, immediately after and four months after of the education program. It is clear that the percentages of diabetic foot care knowledge of caregiver's increased significantly immediately after and after four months intervention, for the foot care items of " It is possible for the diabetic to see his foot",

"The daily washing of foot", " Dry between fingers "and " Using moistening cream", ((84.4% and 90.6%, respectively with $p=0.001$), (87.5% and 84.4%, respectively with $p =0.002$), (87.5% and 78.1%, respectively with $p =0.001$) and (71.9% for each with $p =0.047$), all respectively). Whereas no statistical differences were obtained for the other studied foot care items.

Table 3: Distribution of the study sample according to their knowledge about diabetic foot care items before, immediately after and four months after of the education program (no=32)

Foot care items knowledge	Educational Program Phase						P
	Pre		Post		After 4 months		
	No	%	No	%	No	%	
Is it possible for diabetics to arrive and see his foot	17	53.1	29	84.4	27	90.6	0.001*
No. of diabetic checkup							0.639
No	8	25.0	3	9.4	5	15.6	
Daily	19	59.4	26	81.3	19	59.4	
2-6 times/wk	1	3.1	0	0.0	3	9.4	
Once /wk	3	9.4	3	9.4	4	12.5	
With problems	1	3.1	0	0.0	1	3.1	
Daily washing of foot	16	50.0	28	87.5	27	84.4	0.002*
Dry between fingers	13	40.6	28	87.5	25	78.1	0.001*
Use moistening cream	15	46.9	23	71.9	23	71.9	0.047*
Nail cutting							0.376
Can cut his nails by self	13	40.6	22	68.8	20	62.5	
Family member	9	28.1	4	12.5	6	18.8	
Health care provider	8	25.0	4	12.5	4	12.5	
Nurse	2	6.3	2	6.3	2	6.3	

P: P value of Friedman test * $P < 0.05$ (significant)

Table 4: Illustrates the distribution of the study sample according to their knowledge about diabetic foot wears items before, immediately after and after four months of the educational program. Although there was improved knowledge post and after four months of intervention for using special and modified shoes (37.5%) for special shoes post intervention versus 34.4% before the intervention) and (for modified shoes, 9.4% & 18.8% for post & after four months,

respectively versus 3.1% before the educational program), but no statistical differences were observed regarding the knowledge of caregivers about the types of shoes ($p = 0.945$). Concerning the types of socks, there was a significant difference between the knowledge of caregivers before and both post & after four months of the program for using special socks, (31.3% and 56.3% & 46.9%, respectively with $p = 0.05$).

Table 4: Distribution of the study sample according to their knowledge about diabetic foot wears items before, immediately after and four months after of the education program (no=32)

Foot wear	Educational Program Phase						P
	Pre		Post		After 4 months		
	No	%	No	%	No	%	
Types of shoes							0.945
▪ Sharp shoes	4	12.5	2	6.3	2	6.3	
▪ Shoes sewn of the front	2	6.3	2	6.3	2	6.3	
▪ Sports shoes	2	6.3	2	6.3	2	6.3	
▪ Shoes made of leather	3	9.4	2	6.3	2	6.3	
▪ Special shoes	11	34.4	12	37.5	10	31.3	
▪ Modifiable shoes	1	3.1	3	9.4	6	18.8	
▪ Rounded wide shoes	9	28.1	9	28.1	8	25.0	
Types of socks							0.050*
▪ Cotton	19	59.4	13	40.6	14	43.8	
▪ Acrylic	3	9.4	1	3.1	3	9.4	
▪ Special socks	10	31.3	18	56.3	15	46.9	

P: P value of Friedman test * $P < 0.05$ (significant)

Table 5: Shows the distribution of the study sample, according to their knowledge about the diabetic foot safety. It is observed from the table that most of the diabetic foot safety knowledge were improved post and after four months of the program with statistically significant differences of the items of "using moistening creams between fingers, 75.0% for post and 59.4% for after four months versus 37.5% for before the program, with $p = 0.010$), "importance of checking shoes for foreign bodies, 87.5% for post and 84.4% for after four months versus 59.4% for before the educational program with $p = 0.014$) and the item of

"using hot foment for foot, 62.5% and 65.6% for post and after four months, respectively versus 25% for before the program, with $p = 0.001$).

Table 6: Shows the distribution of the study sample by their need of attendance of health education programs. It was noticed that all the participants (100%) agreed for attending health education programs in the future. The majority (96%) of them mentioned that they need HE for diabetic foot caring .So, nearly two-thirds (62.5%) of the caregivers preferred reading posters for diabetic foot care.

Table 5: Distribution of the study sample according to their knowledge about diabetic foot safety items before, immediately after and four months after of the education program (no=32)

Diabetic Foot safety knowledge	Phase						Q _P
	Pre		Post		After 4 months		
	No	%	No	%	No	%	
Diabetic patient can wet his foot	15	46.9	15	46.9	15	46.9	1.000
Water temperature should be adjusted	28	87.5	30	93.8	28	87.5	0.640
use pharmaceutical products for the treatment of pimples	28	87.5	24	75.0	23	71.9	0.278
Moistening creams between fingers	12	37.5	24	75.0	19	59.4	0.010*
Walk barred foot	10	31.3	4	12.5	6	18.8	0.171
Wear shoes without socks	8	25.0	2	6.3	3	9.4	0.050*
Checking shoes important for foreign bodies	19	59.4	28	87.5	27	84.4	0.014*
Use hot foment for foot	8	25.0	20	62.5	21	65.6	0.001*
Setting with crossing legs	26	81.3	16	50.0	17	53.1	0.018*
Smoking	13	40.6	6	18.8	6	18.8	0.071

^QP: Cochran Q test * $P < 0.05$ (significant)

Table 6: Distribution of the study sample by their need of attendance of health education programs

Health education (HE) regarding diabetic foot care	No	%
Attending HE program for diabetic foot care		
▪ Yes	32	100.0
▪ No	0	0.0
Read posters for diabetic foot care		
▪ Yes	20	62.5
▪ No	12	37.5
Need HE for diabetic foot caring		
▪ Yes	30	96
▪ No	2	6.25

4. Discussion

Diabetic foot care has been neglected in health-care research and planning, and clinical practice is based more on opinion than scientific fact. Furthermore, the pathological processes are poorly understood and poorly taught and communication between the many specialties involved is disjointed and insensitive to the needs of patients.⁽²³⁾ Foot ulcers are more likely to be of neuropathic origin, and therefore eminently preventable, in developing countries, which will experience the greatest rise in the prevalence of type 2 diabetes in the next 20 years. People at greatest risk of ulceration can easily be identified by careful clinical examination of the feet: education and frequent follow-up is indicated for these patients. An integrated care approach with regular screening and education of patients at risk requires low expenditure and has the potential to reduce the cost of health care.⁽²⁴⁾ In developing countries, it has been estimated that diabetic foot problems may consume as much as 40% of available healthcare resources for diabetes. This means that programs aimed at early intervention and prevention are of paramount importance for people living with diabetes.⁽²⁵⁾ For instance, type 2 diabetes mellitus in sub-Saharan Africa demonstrated a ten-fold increase in prevalence in the last two decades⁽²⁶⁾. Similarly, diabetes is a major emergency clinical and public health problem in Egypt.⁽²⁷⁾

The present study revealed that the mean \pm SD of the participants' age was 34.8 ± 5.9 years, where more than half of them were females and more than one-third of them were illiterate. In consistence to these findings, age above 55 was found to be significant independent predictor of risk to diabetic foot.⁽¹⁵⁾ However, age plays an important role in healing and mortality but site of osteomyelitis has a predictive role in amputations. Modifying the risk factors May help in reducing amputations and also more intensive management of the elderly patients might result in better outcomes in this age group.⁽²⁸⁾ In contrast, another study found that percentage of foot ulcers decreases with increases in age.⁽²⁹⁾ Other factors that

are unique to our part of the world no doubt represent an important contribution to the delay in obtaining the required results of the education program, included education (because there is a high percentage of illiterate people in the community), and the media (which pays less attention to medical problems).⁽¹⁹⁾

The study also, revealed that there was improvement in the general knowledge concerning the items related to the diabetic foot problems immediately post and after four months of the educational program assessment but unexpectedly there was decrease in general knowledge of some diabetic foot problems. In agreement to the present study results of diabetic foot care program implemented at King Abdul Aziz Medical City in Riyadh, Saudi Arabia, in 2010, showed that there was 8.1% reduction in amputation rate after implementation of the program directed at health care staff and patients to increase their awareness about diabetic foot care and prevention of complications, but no statistically significant differences were obtained between the two studied groups.⁽¹⁹⁾ The literature is replete with studies demonstrating the major impact of increasing patients' and health care providers' awareness about foot care and changing their behaviors and practices regarding the prevention of ulcers. Studies from several countries have shown that increasing awareness of diabetic foot care, as well as its prevention and proper management, resulted in a 50% reduction in major amputation rates.⁽³⁰⁾ An evident-based program (EBP) study carried in three late-term care (LTC) facilities (Broward County, Florida, between November 2011 and March 2013), indicated that no significant knowledge improvement after the training, was between facilities LTC 1 and LTC 3.⁽⁷⁾

The study findings of the caregivers' knowledge post intervention regarding foot hygiene (possibility for diabetics to arrive and see their feet, daily washing of foot, dry between fingers, and use of moistening cream) were improved significantly both post and after four months of the intervention program. The study revealed that there were no significant

differences in the knowledge of the caregivers regarding types of shoes. On the other hand there was a significant difference for use of special socks for diabetic foot ulcers, was detected between the pre, post, and after four months of intervention concerning this issue. In the context of the present findings, an Indian study reported that an important component of the foot ulcer practices is selection of appropriate footwear. This study data showed a very poor choice of footwear made both by the diabetics and controls subjects. As it also reinforced the scope for improving foot care and footwear practices in the diabetic managements and argued the ignorance in foot care knowledge and practices, which contributes heavily to the susceptibility of the diabetic foot for injury and infection. The study also signified that if the foot practices are not checked in time, this may culminate into serious consequences like amputation of the affected foot.⁽³¹⁾ The evaluation done by many studies brought out forward the poor educational status of diabetic foot.⁽³²⁻³⁴⁾ On the other side American Diabetes Association emphasized on the education of the diabetic patients at risk for foot lesions, about risk factors and the importance of foot care, including the need for self-inspection and surveillance, monitoring foot temperature, appropriate daily foot hygiene, use of proper footwear, good diabetes control, and prompt recognition and professional treatment of newly discovered lesions.⁽³⁵⁾ When especially combined with a comprehensive approach to preventive foot care, education that can reduce the frequency and morbidity of limb threatening diabetic foot lesions.⁽³⁶⁾

The present study noted that the caregivers knowledge regarding the diabetic foot safety management items were improved immediately after and after four months of the intervention for the following items: moistening creams between fingers, wear shoes without socks, use hot foment for foot, and setting with crossing legs. The majority of the study participants preferred posters and needed health education for diabetic foot care. These findings are consistent with previous studies reported from West Java, Indonesia, where foot care safety of self-management(SM) support programs have been effective with evident that the five-week diabetic foot care program was effective in improving diabetic foot care behavior (DFCB) of the experimental group of patients with DM. All these studies reported an improvement in DFCB when the subjects participated in studies lasting 6 and 12 weeks, 6 months, 12 months and 14 months⁽³⁷⁻⁴²⁾. However, the present study noted improved foot safety management after only two hours intervention period, where no significant differences between the pre and post and after four months of intervention results referred to the caregivers may be listening to our knowledge through

the health classes of the final year students of our nursing college in elderly home during the academic year and the short period of our intervention. As well as, the heavy load of daily duties that exerts heavy stress on the caregivers of the elderly home.

Conclusion:

There was significant difference between the before and immediately after the education program results with regard to general knowledge items related to diabetic foot problems and the after four months knowledge was the least. Although, the knowledge of the caregivers was improved immediately education intervention for foot hygiene items, type of shoes & socks and foot safety management, but no statistically significant differences were observed. The majority of the participants preferred posters and needed health education for diabetic foot care.

Recommendations: this study recommended that:

1. Provide health caregivers with the clinical training they need to prevent the diabetic foot problems.
2. Increase the knowledge and awareness of caregivers in elderly homes with diabetic foot lesions through posters, brochures and practical training.
3. Introduce repetitive short- term educational interventions about diabetic foot care.

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