IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e- ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 2 Ver. V (Mar-Apr .2018), PP 10-23
www.iosrjournals.org

Barriers of Foot Care Practice among Older Adults with Diabetes in Alexandria, Egypt

عوائق ممارسة العناية بالقدم بين كبارالسن المصابين بداء السكرى فى الأسكندرية, مصر

Abeer Abd El-Rahman Mohamed [(1)],Abeer Abd El-Galeel Abd El-Moneam [(2)] &Nancy Mahmoud El-Sahky [(3)]

(1), (2) & (3) Lecturers-Gerontological Nursing- Faculty of Nursing- Alexandria University
Corresponding Author:Abeer Abd El-Rahman Mohamed

Abstract

Background: *Diabetes has a multiple complications such as foot ulcers and amputations, which has devastating drawbackson the older adults and the community. Although this complication can be prevented by prompt foot care, there are multifactorial barriers to practice foot care among them. These barriers should be identified to develop effective strategies to overcome them.* ***Aim of the study****: was to identify barriers of foot care practice among older adults with diabetesin Alexandria, Egypt.* ***Materials and Method:*** *A descriptive correlational research design was selected.* ***Setting:*** *Smouha, El Zaher, El Farana diabetic outpatient clinics,which are affiliated to the General Authority of Health Insurance in Alexandria.* ***Subjects****: 300 ofolder adults with diabetes who were selected conveniently from the previous settings.* ***Tools of data collection:*** *I- Older Adults' with Diabetes Socio-demographic and Health Profile Structured Interview Schedule, II-Older Adults' with DiabetesKnowledge Structured Interview Schedule, III- Nottingham Assessment of Functional Foot Care (NAFF) & IV- Foot Care Confidence Scale (FCCS).* ***Results****: There are a significant relation of foot care practice of older adults and their socio demographic characteristics except their age. Also, there are a significant relation between their practice and their health profile such as having musculoskeletal diseases, physical disability, vision problems and feeling of pain. It was found that61.0% of older adults who had unsatisfactory level of knowledge reported poor practice for their foot care andthere is a statistically significant difference X: 39.55 P: <0.000. Also, 69.9% of them who reported poor foot confidence had poor practice for their foot, and the difference is a statistically significant X: 63.29 P: <0.000.* ***Conclusion:*** *there are multiple barriers facing the older adults with diabetes when performing foot care practice as sex, marital status, education, occupation before retirement, income, living arrangement, presence of comorbidities, physical disability, having pain, lack of receiving foot care education,poor knowledge &poor foot care confidence.* ***Recommendations****: The gerontological nurses should plan for continuous patient's assessment, follow up and education about foot care. Also, providing in-service training program to the health care personnel working in the diabetic outpatient clinic for identifyingwho are at riskto develop foot complications.*

Key word: *Barriers, Foot care practice, Older adults, Diabetes Mellitus*

Date of Submission: 16-03-2018 Date of acceptance: 31-03-2018

I. Introduction

Diabetes mellitus (DM), particularly type 2 DM, will be getting to be a serious public health issue, WHO marks 14 November 2017 as a World Diabetes Day 2017. [(1)]Demographic progressions and social transition, alongside with aging in developing countries, have transformed diabetes as a worldwide epidemic. [(1,2)] Diabetes presently influences about 422 million people all over the world; 1.6 million deaths are directly attributed to diabetes every year. [(1)] It has been estimated that by the year of 2030, people with diabetes will accounted 6.8 million in Egypt, putting the country into the tenth largest population of diabetes in the world. [(3)]Studies have determined that diabetes mellitus is unrecognized by more than half of diabetic patients, (according to World Health Organization Criteria), particularly the elderly. [(1, 4, 5)] DM may be presented among older adults atypically with low rate of diagnosis and early detection; a lot of cases stay undiagnosed. [(6, 7)] DM influences up to 20% to 25% of the elderly population over 65 years in the United States. [(8)]

Diabetic patients may undergo a number of complications, including retinopathy, nephropathy, neuropathy, coronary artery disease, cerebro and peripheral vascular diseases. [(1, 6)]Beside macrovascular and microvascular complications, lower limb amputations are prominent cause of morbidity and mortality among diabetic patients. [(1, 9)] DM is accepted as the cause of more than half of non-traumatic amputations and the risk of amputation is increased 12- 15 folds in diabetic patients. [(10)] The incidence of lower limb amputation is

eighttimes higher in diabetic patients than in non-diabetic. [11]Most of the individuals with diabetes, around 75% live in the developing countries with low- and middle income, with greatest burden of diabetes with lower limb amputations; these resulted in serious consequencesfor individuals, caregivers, and care receiver as for psychosocial, physical, functional and financial consequences. [13, 15]

Foot ulceration occurs likewise after the effect of trauma (usually unremarked) which accompanied with neuropathy and/or peripheral vascular diseases. Foot ulcers are prevalentin elderly patients with diabetes; they had twice the risk of developing foot ulcer than the young adults. [16] Diabetic foot ulcer (DFU) considered full – thickness wound infiltrating through the dermis (the profound vascular and collagenous inner layer of the skin) occurred in the lower limbs of diabetic patients. Foot ulcer becomes infected if dose not treated and healed. [17, 18] DFU might have been found with influence 10- 15% of diabetics. It might occur as a result of numerous incorporate many risk factors include advancing age, poor metabolic control, diabetes long duration, foot deformities, peripheral vasculopathy, poor diabetic knowledge and poor self-care foot practice. [19]

Generally, unfriendly impacts of DFU are the high financial burden, foot amputation, physical disability, hospitalization, low quality of life particularly in elderly population and higher mortality rate. Difficult long term treatment and recurrent foot ulcer unfortunately occur. [6, 18, 20] Diabetic foot complications, which affect more often the older adults, could be prevented through the application of comprehensive programs. These programs concentrated on foot care, including feet daily inspection, professional treatment, hygiene, and proper well-fitting footwear which have been revealed incredibly diminish amputation rates. [19, 21, 22]

Regardless of those accessible health awareness guided to diabetic foot problems, there may be poor outcomes of foot complications in the developing countries. There would a number of different barriers for reaching these health services include, absence of awareness of patients and health providers, restricted or inadequate podiatry services, delay looking for appropriate medical care, decreased access to health facilities which provide care, absence of team work approach, poor referral to specialist treatment by health care providers, due to lack of training program for them and deficiency of quality assurance programs. [18, 20, 23, 24]

The gerontological nurse play a basic role in instructing their diabetic elderly patients about increase risk of lower extremity complications and refer those patients to routine schedule of foot care. Promptly preventive foot care should be performed as early as possible in order to cut down number of lower limbs infectionsand future amputations. [6, 81, 25, 26]

II. Aim of the study

The present study aimed to identify barriers of foot care practice among older adults with diabetes in Alexandria, Egypt.

III. Research Questions

What are the barriers of foot care practice among older adults with diabetes?

IV. Materials and Method

Materials:

Design:

A descriptive correlational research design was followed in this study.

Setting:

This study was carried out at Smouha, El Zaher, El Farana diabetic outpatient clinics. These clinics are affiliated to the General Authority of Health Insurance in Alexandria, which includes nine zones. The study settings were selected randomly from these zones. The working hours of these clinics are from 8 am to 2 pm six days per week. These clinics serve all health insured adults and older adults diabetic patients in Alexandria governorate.

Subjects:

The study subjects comprised 300older adults with diabeteswho were selected conveniently from the previous settings and fulfilled the following criteria: - aged 60 years and above, diagnosed with diabetes mellitus, able to communicate and accepted to participate in the study. The program Epi info 7 was used to estimate the sample size according to the following parameters; population size 275 older adults, 5% acceptable error and the confidence co-efficient 95%.

Tools:-

The following tools were used for data collection:-

Tool I: Older Adults' with DiabetesSocio-demographic and Health Profile Structured Interview Schedule: -

This tool was developed by the researchers based on review of the relevant literatures,it includes two parts:

Part1: **Socio-demographiccharacteristics of the older adults with diabetes**: This part consists of questions related to the patient's age, sex, marital status, level of education, income, living arrangement, and level of social support.

Part 2: Health profile of the older adults with diabetes: This part consists of questions related to patient's medical history, family history, duration of the disease, past or present history of diabetic complications e.g. foot problems, type of medication used, resources available for foot care, type of footwear used, seeking medical advice, receiving health educational program for foot care, periodic foot check- up, level of self- care activity and barriers that limit elderly from performing proper foot care.

Tool II: Older Adults' with DiabetesKnowledge Structured Interview Schedule:

This tool was developed by the researchers after a thorough review of a relevant literature. [19, 27- 30] It includes two parts:

Part 1: **Knowledge of olderadults about DM and its complications**: This part consists of 7 questions such as; the meaning, predisposing factors, sign and symptoms,diagnostic measures, medical managements, and the complication of the DM.

Part 2: **Knowledge of older adults with diabetes about foot self-care practices:**

This part consists of 13 questions such as; the frequency of foot and nail care, the need for special shoes and periodic checkup for their foot.

In order to calculate the total score of the diabetic geriatric patients' knowledge,the answers were scored the following; a score of 1 was given to correct and complete answer while 0 score was given to wrong answer or don't know. The total knowledge scores ranged from 0 to 20 point. Elders who had knowledge percent score below fifty percent was categorized as having unsatisfactory knowledge level, while those who had knowledge percent score $\geq 50\%$ was categorized as having satisfactory knowledge level.The tool was tested for reliability using Cronbach's alpha test (r = 0.801).

Tool III: Nottingham Assessment of Functional Foot Care (NAFF):

The NAFF scale was developed by Lincoln NB (2007) [31]. It was translated into Arabic language and approved to be valid and reliable by the study researchers. It comprises29 questions to evaluate the diabetic patient's foot care behaviors. Each of the 29 items was ranked on a 4-point Likert scale ranged from ''never or once per week'' (0) to ''more than one time daily'' (3). The total possible scores ranged from 0-87,the higher the scores the more frequentuse of self-care practices. Good foot care practice, this includes a total practice score of $\geq 50\%$ of maximum score. Poor foot care practice, this includes a total practice score of $< 50\%$ of maximum score. The scale was tested for reliability using Cronbach's alpha test (r = 0.889).

Tool IV: Foot Care Confidence Scale (FCCS):-

The FCCS scale is a practical, valid and reliable instrument developed by Sloan H in (1997). [32]It was designed to measure the confidencein practicing foot self-careof diabetic patients. Itcomprisestwelve statements, each of the 12 items was rated on a 5-point Likert scaleranged from ''stronglyunconfident'' (1) to ''stronglyconfident'' (5). The Total possible scores ranged from 12-60 the higher the scores the more confidence in foot care practices. Participants scoring less than 50% of the possible score were categorized as ''poor'' foot care confidence. Those equal to or more than 50% were categorized as ''good" foot care confidence.The tool was translated into Arabic language by the researchers and tested for reliability using Cronbach's alpha test (r = 0.830).

V. Method

- Permissions to carry out the study from the responsible authorities from the Faculty of Nursing Alexandria University and the General Authority of Health Insurance in Alexandria governoratewere obtained after explanation of the purpose of the study, date and time of data collection.

- **Tool I** and **Tool II**were developed by the researchers after a thorough review of relevant literature.**Tool III**and **Tool IV** were translated into Arabic language by the researchers and tested for content validity by seven experts in the related fields such as Gerontological Nursing and Medical Surgical Nursing. The required changes were done consequently.

- **Tool II, tool III, and tool VI** were tested for reliability on ten older adults with diabetes mellitus selected from one of the ministry of health diabetic clinics in Alexandria governorate namely; Farouk diabetic outpatient clinic using Cronbach's coefficient alpha reliability method.

- A pilot study was conducted on 30 geriatric patients diagnosed with DM selected from the outpatient clinics of the Alexandria main university hospitals to determine the clarity and applicability of the study tools. The requiredadjustments were done accordingly and the tools were set into their final form.

- Each researcher of the study used to conduct the interview at 8 in the morning and those who meet the inclusion criteria were included conveniently in the study.

- Face to face interview was conducted for each older adult with DM in the waiting areas with ensuring patients' comfort and ease.

- Data collection started from the first of July 2017 till the end of September 2017.

Ethical considerations:-

An informed written consent was acquired from every older adult with DMinvolved in the study after providing appropriate explanations about the purpose of the study. The privacy and anonymityof the participantsand confidentiality of the collected data were maintained.

Statistical Analysis:

The collected data were coded and analyzed using PC with the Statistical Package for Social Sciences (SPSS version 20) and tabulated frequency and percentages were calculated. Descriptive statistics as frequency, distribution, mean, and standard deviation were used to describe different characteristics. The Chi-square test was used for testing relationship between categorical variables. Univariate analyses, including: t-test was used to test the significance of results of quantitative variables and tocompare the means between two unrelated groups on the same continuous, dependent variable. The level of significance selected for this study was p value equal to or less than 0.05.

VI. Results

The results of the present study were divided into two parts:

Part I: Description of the study subjects

Table (1) illustrates that the highest percent 91.3% of the study subjects aged between 60 to less 75 years old withthe mean of 66.01 ± 5.86 years old. Male elderly patients were more prevalent than female patients with percent of 61.7%. The majority of the study subjects 71.0 % were married. 42.3% of them were illiterate / read and write and the least percent 16.0 % completed their basic education. 45.3% of them worked in the professional works before retirement compared to only 11.0 % joined to skilled works. Not enough incomewas reported by 72.0% of them and 87.0% of them reported living with their family, children and relatives.

Figure (1) shows the total score of the foot care practice, knowledge, and foot care confidence of the study subjects, it was noted that 60.3% of the study subjects have satisfactory level of knowledge, 59.0 % of them have good foot care practice and 57.3% reported good foot care confidence.

Part II: Barriers of foot care practice

(A) Personal related barriers

Table (2) clarifies that foot care practice of the older adults with diabetes does not significantly affected by their age. Males reported good foot practice than females with 70.6% and the difference is a statistically significant X: 14.64 P: <0.000. Good foot care practice was observed among 77.4% of the married elders with least and same percent 0.6% observed among divorced and single groups and the difference is a statistically significant X:8.807 P: 0.005. foot care practice of the study subjects also affected by their level of education, 56.9% of illiterate / read and write elderly patients reported poor foot care practice, there is a statistically

significant difference X:21.73 P: <0.000. Study subjects with professional type of work before retirement showed good foot care practice with 56.5 % and the difference is a statistically significant X: 27.82 P: <0.000. 77.2% of the study subjects who reported not enough income showed poor foot care practice, there is a statistically significant difference X:2.83 P: 0.025. Elders who live with their families reported good foot care practice by 90.4% than those living alone with a statistically significant difference X: 4.40 P: 0.016.

(B) Health related barriers

Table (3) shows the relation between foot care practice of the study subjects and their health profile, it was noted that there is a statistically significant difference between having musculoskeletal, gastrointestinal, and respiratory diseases and their foot care practice X: 2.98 P: 0.024 X: 4.002 P: 0.018 and X: 3.21 P: 0.037 respectively. It was observed that diabetic elders with vision problems 66.7% had good foot practice while 64.2% of them who reported feeling of pain during performing foot care showed poor foot care practice, there is a statistically significant difference X: 15.37 P:< 0.000 and X: 12.48 P:< 0.000 respectively. Regarding self-care ability to perform foot care practice, it was noted that 66.1% of independent study subjects showed good foot care practice, and the difference is a statistically significant X: 25.05 P: 0.002. A statistically significant relation was found between use of assistive devices as cane and crutches of the study subjects and their foot care practice X: 1.51 P: 0.048, only 26.0 % of them had good foot care practice.

Table (4) identifies that the study subjects who reported their foot problems as poor circulation, toe nails problems and foot ulcer showed higher level of poor foot care practice by 78.9 %, 39.0 % and 12.2% respectively. A statistically significant relation was found X: 8.34 P: 0.001 X: 3.83 P: 0.015 and X: 3.27 P: 0.033 respectively. 79.7% of the study subjects who reported no previous foot injury had good foot care practice and the difference is a statistically significant X: 10.63 P: 0.001.

(C) Foot care resources related barriers

Table (5) illuminated that while there is no a relation was found between availability of foot care resources, diabetic shoes and foot care practice of elders, there is a statistically significant relation was found between use of unsuitable footwear and their foot care practice. 75.5% of the study subjects who reported using of unsuitable footwear such as slippers and sandals showed poor foot care practice.

(D)Help seeking behaviors related barriers

Table (6) illustrates that there is no significant relation was detected between receiving foot care education and foot care practice among the study subjects. 97.7% of them who reported seeking foot care advice whether from the health care team, family, friends &/or through mass media showed good foot care practice and the difference is a statistically significant X: 4.477 P: 0.026. There is no statistically significant relation between foot periodic check-up and foot practice of the study subjects. Regarding the relation between causes of not receiving periodic check-up among the study subjects and their foot care practice, 32.2%, 9.9%, 23.1%, 6.6% and 10.7% reported that the scarce /no professional foot care appointments, physical limitation/ difficult transportation, fear from discovering any serious problems, absence of physician specialized in foot problems (podiatrists), and overcrowded clinic are the causes respectively. There is a statistically significant difference was found X: 6.935 P: 0.003, X: 3.198 P: 0.039, X: 2.306 P: 038, X: 6.505 P: 0.011 and X: 4.079 P: 0.025 respectively.

(E)Knowledge related barriers:

Figure (2) demonstrates the relation between foot care practice of the study subjects and their level of knowledge. It was observed that older adults who had satisfactory level of knowledge reported good practice for their foot care with percent of 75.1% while 61.0% of them who had unsatisfactory level of knowledge reported poor practice for their foot care. There is a statistically significant difference X: 39.55 P: <0.000.

(F) Confidence related barriers

Figure (3) indicates the relation between foot care practice of the study subjects and their foot care confidence. It was noted that 76.3 % of elders who reported high foot care confidence showed good practice for their foot care, while 69.9% of them who reported poor foot confidence had poor practice for their foot, and the difference is a statistically significant X: 63.29P: <0.000.

VII. Discussion

Foot ulcer considered one of the chronic complications of DM, and is responsible for considerable morbidity, disability and mortality among geriatric patients with diabetes. It can be prevented and controlled by appropriate foot care. [19, 28] Identifying the barriers to foot care practice is a critical step in achieving optimal

health outcomes in those patients. Therefore this study aimed to identify barriers of foot care practice of the older adults with diabetes.

Sociodemographic characteristics were associated with problems in foot care practice among older adults with diabetes. Regarding the age, the present study revealed that there is no significant relation between age of the study subjects and their foot care practice (table 2). A study done by Kurnia A et al. 2017 in Indonesia supported the finding of the present study and revealed that the age of the participant is not a strong predictor of the diabetes self-care especially foot care practice. [33] Also, the same finding was found in Bell R, et al. study 2005 (USA)[21] and Seid A 2015 (Ethiopia) [19], which found no correlation between participants' age and their foot care practice score. In contrast, many studies contradicted the present finding and discovered that, young diabetics recorded significant higher scores in their foot care practice. [30, 34, 35] The finding of the current study can be justified as the majority (91.3%) of the study subjects were in the younger age group ranged from 60 to less than 75 years and older group with least percent. Older group may be unable to visit health insurance clinic and their family/ children come instead of them to bring their diabetic medications.

The current study discovered a significant relation between gender and foot care practice. Males had higher scoring than female in their performance of good foot care practice (table 2). An American study done by Wendling S et al. 2015 supported the present finding and illustrated that a significant relation was found between foot self-care behaviors and gender of the participant using the same study tools of the present study NAFF and FCCS. [36] Also, Al-Busaidi I. 2013 in Oman [30] and Schoeberg N et al. 2001 in USA [37] came in the line of the present study. The females in the current study exhibited poorer foot care practice than males may be because of they are not only live with the diabetes significantly longer than their male counter parts, they also tend to operate with more co-morbidities, disabilities and fewer economic resources.

Married elders showed good foot care practice in the existing study with a statistically significant difference (table 2). Also, older adults who live with their family/ relatives showed better foot care practice than those who living alone with a significant relation (table 2). Two studies done by Chin Y et al. 2012 in Taiwan and Matriccian L et al. 2015 in Australia congruent with the current study and explained that elements of social integration and support were important enablers of foot self-care practice such as marriage and living with children/ family which reported a significant association. [35, 38] A study done by Al-Busaidi I. opposed the current study and displayed that there is no a relation between marital status of the participants and practicing their foot care. [35] Also, Bell R. et al. contradicted the present finding and found that receiving support was inversely concomitant with foot care index score. [21] The present findings can be justified as the married elders and living with family, children and relatives having better foot care practice because they may receive support, care, guidance and obtained diabetes related foot care information through communication with family members and relatives.

Better foot self-care practices were associated with education. As seen from the current study, that there is a significant relation between the foot care practice of the study subjects and their level of education (table 2). A study done by Seid A. et al. in Ethiopia is consistent with the present finding and revealed that the participant who's had higher educational status is more likely to practice foot care comparing with illiterates. [19] Also, other studies conducted by Al-Busaidi I. and El-Khawaga G. found the same finding and informed that there is a significant association between foot self-care score and level of education. [30, 39] While, a study conducted by Kurnia A. et al. did not confirm the present finding and illustrated that there is no a significant relation between foot self-care management and the participants' level of education. [33]

The study subjects whose occupation before retirement was professional work are more likely to practice foot care as compared to skilled and unskilled work (table 2). The same finding was observed in Seid A. et al. study. [19] Al-Busaidi I. reversed the present finding and revealed that there is no a statistically association between foot self-care and employment status. [30] The current study found that the elders with enough income practice foot care with higher rate than those without enough income with a significant relation (table 2). Two studies came in accordance with the present and assured that the participants with less income reported increased barriers to foot self-care. [37, 39] Multiple studies did not confirm the present finding and explained that there is no a significant relation between income of the participants and their foot care practice. [19, 30, 33] The present finding can be justified as access to a highly specialized foot care team can sometimes be limited especially in the diabetic health insurance outpatient clinic; where there is no physician specialized in foot examination. So, the elders with limited income need to see a private clinic/ physician which seem to be impossible.

As regard the relation between health profile of the study subjects and their foot care practice, good foot care practices were observed with a greater percent for elders with DM duration of ≥ 10 years compared to those with less DM duration without a significant relation (table 3). Many studies came in a harmony with the present finding and explicated that there is no association between foot care practice of the participants and their duration of DM. [19, 21, 30, 33]In contrast, an Egyptian study of El-Khawaga G. et al. did not support the present finding and clarified that the diabetic patients' compliance with practicing foot care was a statistically significant among recently diagnosed diabetic patients < 1 year. [39]

The subjects of the current study who reported co-morbidities other than DM such as musculoskeletal, gastrointestinal, and respiratory diseases showed poorer foot care practices than others, as well for the use of an assistive device, with a statistically significant difference (table3). Pollock R. et al. 2004 in UK approved the present finding and elucidated that the barriers to the practice of foot care were mainly due to co-morbidities that hindering diabetic patients to perform recommended foot care practice such as problems in joints affecting the mobility. [28]Rahman Ks. et al. also agreed with the present finding and illuminated that the majority of the diabetic patients with co-morbidities such as respiratory illnesses reported poor foot care practice score, and disagreed with the existing study in other results such as the presence of significant relation between poor foot care practice and cardiovascular diseases. [40]

Many studies clarified that physical and visual limitations were reported as the main barriers of foot self-care practice. [28, 35, 37, 38] The result of the existing study illuminated that diabetic older adults who is independent in self-care reported good foot care practice than the dependent group with a statistically significant difference. Also, the geriatric patients with pain and discomfort during performing foot care reported poor foot care practice, while patients with visual problems showed good foot care practice with a statistically significant difference (table 3). These results are congruent with the previous study of Schoenberg N. et al. which illustrated that pain, discomfort and physical limitations inhibit optimal foot self-care practice. [37] While it contradicted the current study in the association between visual problems of the study subjects and their foot care performance as they said "they have given up on checking their feet because they just cannot see it". In addition to a study done by Pollock R. et al. 2004 which confirmed that the physical limitations and pain affect foot care practices and controverted the current study in the relation between of visual decline and the foot care practice. [35] Most of the previous findings refuted the existing study in the issue of the relation between decline visual acuity and the poor foot care practice; this may be because of the majority of the present subjects did not live alone and had someone else, including family and children, to care with. The study subjects with visual impairment fear from cutting their toes nails for example and they seek help for it from their family. So, they reported good foot care practices.

The present finding showedthat the study subjects without experience of foot problems had good foot care practices while, the patients with poor circulation, toes nail problems, foot ulcer and previous foot injuries reported poor foot care practice with a statistically significant difference (table 4). Pollock R. et al. confirmed the present finding and reported that geriatric patients with toes nails problems such as thick and misshapen nails had difficulty in the toenail trimming which could be one barrier facing older adults in performing foot care practice. [28] Other studies reversed the present finding and reported better foot self-care practices among participants with high risk of foot complications such as poor circulation and foot ulcers. [30, 35, 38] The present findings can be justified as the elders are unaware of their increasing risk of foot complication, so that they did not perform recommended foot care practice. In addition to their foot problems as ulcers can be occur as a result of their poor foot care practice.

The current study discovered a statistical significant relation between use of suitable footwear and foot care practice, the patient who used to wear suitable footwear had better foot care practice than those who wearing unsuitable footwear (table 5). The similar result was reported in Seid A. study which revealed that poor foot care practice is found among diabetic patients who wearing sandals. [19]

Foot care behaviors can be modified by foot care education, through motivating and empowering diabetic patients to participate actively in practicing their foot care and is considered a measure of primary prevention. [38] The result of the existing study explicated that the older adults who receive education on foot care (42.7%) had better foot care practice than those who did not receive any education (57.3%), without significant difference found (table 6). Al-Busaidi I reinforced the present finding and concluded that less than half of the diabetic patients reported receiving foot care education by health care professionals and no statistical significant relation was found. [30] In contrast to the present finding, a study of Wendling S. et al. found that minimal education on diabetes and its related foot care is a positive predictor of foot care performance. [36] Another study also against the present finding which explored that attendance of educational diabetic foot care classes was significantly associated with level of foot care behaviors. [21] The current study did not revealed a significant relation between receiving foot care education and foot care practice because this issue is poorly addressed in the Egyptian health care system, and educating diabetic patients is not a part of routine diabetic care.

Also, the older adults who seek advice for their foot problems from health care providers e.g. physicians and nurses had better foot care practices than those who did not seek any advice with a statistical significant difference (table 6). Pollock R. confirmed the present finding as regard seeking advice for foot problems and demonstrated that diabetic patients who seek health advice on foot care showed a significantly higher foot care practice score than those who did not. [28]

The preventive foot care health services in the developing countries are far away from acceptable level because this concept is neither adopted nor implemented. The clinics specialized in diabetic foot are scarce, the majority of the diabetic patients did not be familiar with itand they are not accessible to them. [41] The majority

of the current study subjects (96.3%) informed that they did not follow periodic foot check-up without a statistically relation with their foot care practices because a small percent of them who already follow foot periodic examination (table 6). The barriers of not performing foot periodic check-up as reported by the participants are lack of information, poor communication with health care providers, they did not pay enough attention to screen patients' feet, no professional foot care appointments, increased cost, physical limitations, difficult transportation, fatalism, fear from discovering any serious problem, absence of podiatric physician and overcrowded clinics. Some factors showed a significant relation with foot care practice of the elders and some are not (table 6). A study done by Wendling S. et al. agreed with the present finding and revealed that there is no a relation was observed between foot care behaviors and frequency of visits with health care providers. [(36)] Many studies confirmed the present findings regarding the barriers of not performing foot periodic examination as mentioned before. [(24, 30, 37, 41-44)] Bell R. et al. gainsaid the present finding and concluded that there is a higher percent of diabetic patients who had seen a podiatric physician for their foot problems with a statistically significant relation. [(21)]

Inadequate knowledge on diabetes and foot care was reported as a barrier of foot care practice in many studies. [(33, 37, 38)] The result of the current study clarified that more than half of the study subjects (60.3%) had satisfactory level of knowledge concerning DM and foot care practice (figure1). A statistically significant association was found between practicing foot care of the participants and their knowledge, good foot care practice associated with satisfactory level of knowledge (figure 2). The same finding was observed in many studies and indicatedthat the participants who had good level of knowledge on DM and foot care were practicing foot care with higher rate as compared to participants with poor knowledge. [(19, 33, 37, 42, 44, 45)] An Egyptian study of El-Khawaga et al. did not confirm the present finding and explained that there is a negative significant correlation between theknowledge and practice of foot care; knowledge did not translated into action to modify foot self-care behaviors. [(39)] Also. Chin Y. et al. study refuted the present finding and displayed that there was no association between foot care knowledge and daily foot care practice. [(35)]

The current study added to the gerontological nursing studies by verifying the effect of foot care confidence of the older adults with diabetes and their foot care practice. More than half of the older adults (57.3%) reported good foot care confidence (figure 1). A statistical significant relation was found.The higher foot care confidence the higher foot care practice (figure 3). A study of Wendling S. et al. supported the present finding and clarified that the diabetic patients who performed their own foot care had a higher self-efficacy. [(36)] Another study came in line with the present finding and identified that the participant who make daily foot care had more self-efficacy than others. [(35)]In contrast a study conducted by Perrin et al. 2009 in Australia did not confirm the present finding and revealed that there is a little positive correlation between foot care confidence scale scores and foot care practice. [(46)]

VIII. Conclusion

The findings of the current study highlight that there aremany barriers of foot care practice as reported by the older adults with DM. Being a female, with low education, being unmarried, with lowlevel of occupation before retirement, living alone and with low income were found to be important barriers to practice foot care. Having co-morbidities such as musculoskeletal and respiratory diseases, experiencing some foot problems such as toes nail problems are associated with poor foot care practice. Inability to care for self, vision problems having pain and discomfort whileperforming foot care practice were also other barriers, in addition to neither receiving foot care education nor seeking advice for foot problems. Also, poor knowledge and poor confidence in foot care were found to be barriers to practice foot care

Recommendations

- Education programs on foot care practices to be prepared by the gerontological nurses and presented to the older adults with diabetes who attend the outpatient clinics in order to raiseawareness of foot care practice.
- The gerontological nurses in the outpatientclinics should provide posters, leaflets, booklets and videos showing foot care steps and its importance to be available for older adults with low education.
- The gerontological nurses plan for continuous in-service training programs to the health care personnel working in the diabetic outpatient clinic and inpatient. The program should include skills neededfor identification of the older adults with DM who are at risk for foot problems and complications.
- Sending a letter of recommendations by the researchers to the responsible authority of the Egyptian health insurance stick holders for providing professional specialists in foot care and examination such as podiatric physician and nurses in each diabetic health insurance clinic.
- A professional foot examination and educationshould be encouraged by the gerontological nurse to be routinely as integral part of diabetic patient care to the older adults attendingthe outpatient clinics, and it should be scheduled with proper appointment.

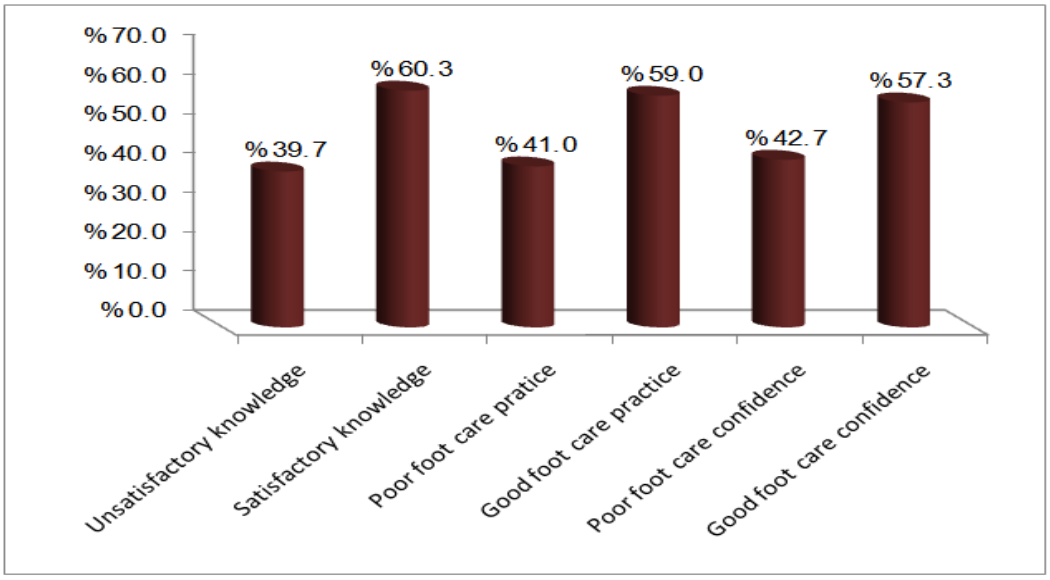
Future research:
Assess the motivating factors that influence on older adult's decision to participate in foot care behaviors.

Part I: Description of the study subjects

Table (1) Sociodemographic characteristics of the study subjects

Items	Categories	No (300)	%
Age	60 to less than75	274	91.3
	75 to less than 85	22	7.3
	85 and more	4	1.4
Mean ± SD	66.01 ± 5.86 years		
Sex	Male	185	61.7
	Female	115	38.3
Marital status	Married	213	71.0
	Widow	82	27.3
	Divorced	3	1.0
	Single	2	0.7
Level of Education	Illiterate/ Read and write	127	42.3
	Basic education	48	16.0
	Secondary level	63	21.0
	University/ Post graduate	62	20.7
Occupation before retirement	Professional work	136	45.3
	House wife	74	24.7
	Unskilled worker	57	19.0
	Skilled worker	33	11.0
Income	Not enough	216	72.0
	Enough	84	28
Mean ± SD	1370.00±823.66 LE		
Living arrangement	Living with family/ relatives	261	87.0
	Living alone	39	13.0

Figure (1) Foot care practice, total score of knowledge and foot care confidence of the study subjects



Part II: Barriers of foot care practice

(A) Personal related barriers

Table (2) Relation between foot care practice of the study subjects and their socio-demographic characteristics

Items	Categories	Poor foot care practice n (123)		Good foot care practice n (177)		Total n (300)		Test of significance
		No	%	No	%	No	%	
Sociodemographic characteristics								
Age	60 to less than75	112	91.1	162	91.5	274	91.3	X:0.136 P:0.480
	75 to less than 85	9	7.3	13	7.3	22	7.3	
	85 and more	2	1.6	2	1.1	4	1.4	
Sex	Male	60	48.8	125	70.6	185	61.7	X:14.64
	Female	63	51.2	52	29.4	115	38.3	*P: <0.000
Marital status	Married	76	61.8	137	77.4	213	71.0	X:8.807
	Widow	44	35.8	38	21.4	82	27.3	*P:0.005
	Divorced	2	1.6	1	0.6	3	1.0	
	Single	1	0.8	1	0.6	2	0.7	
Level of Education	Illiterate/ Read and write	70	56.9	57	32.2	127	42.3	X: 21.73
	Basic education	20	16.3	28	15.8	48	16.0	*P: <0.000
	Secondary level	18	14.6	45	25.4	63	21.0	
	University/ Post graduate	15	12.2	47	26.6	62	20.7	
Occupation before retirement	Professional work	36	29.3	100	56.5	136	45.3	X: 27.82
	House wife	43	35.0	31	17.5	74	24.7	*P: <0.000
	Unskilled worker	21	17.1	12	6.8	33	11.0	
	Skilled worker	23	18.6	34	19.2	57	19.0	
Income	Not enough	95	77.2	121	68.4	216	72.0	X: 2.83
	Enough	28	22.8	56	31.6	84	28.0	*P:0.025
Living arrangement	Living with family/ relatives	101	82.1	160	90.4	261	87.0	X: 4.40
	Living alone	22	17.9	17	9.6	39	13.0	*P:0.016

* Significance P ≤0.05

(B) Health related barriers:

Table (3) Relation between foot care practice of the study subjects and their health profile

Items	Categories	Poor foot care practice n (123)		Good foot care practice n (177)		Total n (300)		Test of significance
		No	%	No	%	No	%	
Health profile								
Duration of diagnosis with DM	Less than one year	8	6.5	12	6.8	20	6.7	X: 2.89
	1 <5 years	23	18.7	22	12.4	45	15.0	P:0.134
	5 < 10 years	35	28.5	47	26.6	82	27.3	
	≥ 10	57	46.3	96	54.2	153	51.0	
Presence of co-morbidities other than diabetes #	No	13	10.6	26	14.7	39	13.0	X:1.08 P:0.082
	Hypertension	63	51.2	99	55.9	162	54.0	X:0.649 P:0.068
	Cardiovascular diseases	44	35.8	52	29.4	96	32.0	X:1.36 P:0.051
	Musculoskeletal diseases	38	30.9	39	22.0	77	25.7	X:2.98 *P:0.024
	Gastrointestinal diseases	25	20.3	21	11.9	46	15.3	X:4.002 *P:0.018
	Respiratory diseases	13	10.6	9	5.1	22	7.3	X:3.21 *P:0.037
	Others	8	6.5	17	9.6	25	8.3	X:.913 P:0.110
Symptoms related barriers								
Vision problems	Yes	54	43.9	118	66.7	172	57.3	X:15.37

	No	69	56.1	59	33.3	128	42.7	*P: <0.000
Feeling of pain	Yes	79	64.2	77	43.5	156	52.0	X:12.48
	No	44	35.8	100	56.5	144	48.0	*P: <0.000
Functional related barriers								
Foot self-care ability	Independent	49	39.8	117	66.1	166	55.3	X:25.05 *P:0.002
	Need assistant	66	53.7	45	25.4	111	37.0	
	Totally dependent	8	6.5	15	8.5	23	7.7	
Assistive device use	No	83	67.5	131	74.0	214	71.3	X:1.51 *P:0.048
	Yes	40	32.5	46	26.0	86	28.7	

* Significance P ≤0.05# Multiple responses

Table (4) Relation between foot care practice of the study subjects and their self-reported foot problems

Items	Categories	Poor foot care practice n (123)		Good foot care practice n (177)		Total n (300)		Test of significance
		No	%	No	%	No	%	
Self-reported foot problems								
Experience of previous foot problems after the diagnosis of Diabetes#	No	17	13.8	52	29.4	69	23.0	X:9.91 *P:0.001
	Numbness	4	3.3	3	1.7	7	2.3	X:0.772 P:0.204
	Poor circulation	97	78.9	112	63.3	209	69.7	X:8.34 *P:0.001
	Toes nail problems	48	39.0	50	28.2	98	32.7	X:3.83 *P:0.015
	Callus & warts	6	4.9	5	2.8	11	3.7	X:0.866 P:0.158
	Amputation	28	22.8	34	19.2	62	20.7	X:0.559 P:0.087
	Foot ulcer	15	12.2	11	6.2	26	8.7	X:3.27 *P:0.033
	Charco feet	6	4.9	9	5.1	15	5.0	X:0.007 P:0.211
Previous foot injuries	No	77	62.6	141	79.7	218	72.7	X:10.63 *P:0.001
	Yes	46	37.4	36	20.3	82	27.3	

Multiple responses

(C) Foot careresources related barriers:

Table (5) Relation between foot care practice of the study subjects and the availability of foot care resources

Items	Categories	Poor foot care practice n (123)		Good foot care practice n (177)		Total n (300)		Test of significance
		No	%	No	%	No	%	
Foot care resources								
Foot care supplies	Yes	4	3.3	13	7.3	17	5.7	X:2.274 P:0.068
	No	119	96.7	264	92.7	283	94.3	
Types of footwear	Unsuitable footwear	93	75.6	61	34.5	154	51.3	X:49.180 *P: <0.000
	Suitable footwear	30	24.4	116	65.5	146	48.7	
Presence of medical diabetic shoes	No	116	94.3	160	90.4	276	92.0	X:1.51 P: 0.084
	Yes	7	5.7	17	9.6	24	8.0	

* Significance P ≤0.05

(D) Help seeking behaviors related barriers:

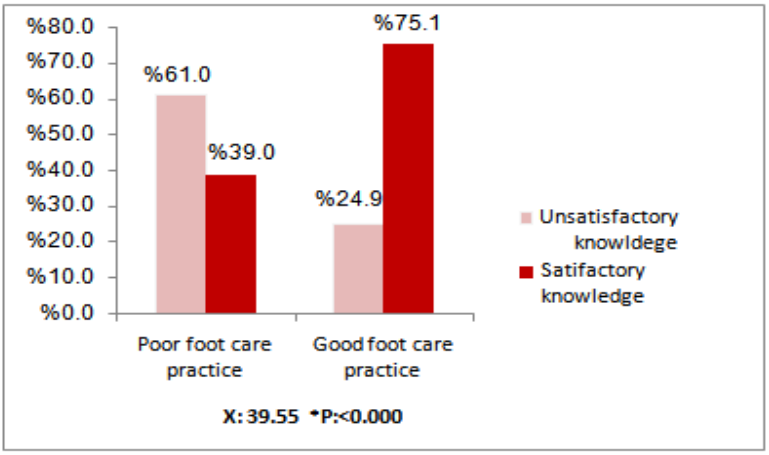
Table (6) Relation between foot care practice of the study subjects, having foot care education and foot periodic check up

Items	Categories	Poor foot care practice n (123)		Good foot care practice n (177)		Total n (300)		Test of significance
		No	%	No	%	No	%	
Receiving foot care health education and seeking advice for foot problems								
Receiving education	No	73	59.3	99	55.9	172	57.3	X:0.346
	Yes	50	40.7	78	44.1	128	42.7	P: 0.080
Seeking advice	No	9	7.3	4	2.3	13	4.3	X:4.477
	Yes	114	92.7	173	97.7	287	95.7	*P: 0.026
Foot periodic check up								
Periodic check up	No	121	98.4	168	94.9	289	96.3	X: 2.45
	Yes	2	1.6	9	5.1	11	3.7	P: 0.063
		n (121)		n (168)		n (289)		
Causes of not receiving periodical foot check- up no (289)#	Do not know	110	90.9	166	98.8	276	95.5	X:1.870 P: 0.068
	Poor communication with health care providers / they do not pay enough attention to screen my feet	85	70.2	119	70.8	204	70.6	X:.117 P: .095
	Scarce/ no professional foot care appointments	39	32.2	83	49.4	122	42.2	X:6.935 *P: 0.003
	I cannot afford it/ costly	2	1.7	3	1.8	5	1.7	X:0.002 P: .0348
	Physical limitation/ difficult transportation	12	9.9	8	4.8	20	6.9	X:3.198 *P: .039
	Do not need it/ no apparent foot problems	7	5.8	6	3.6	13	4.5	X:.927 P: .142
	Fatalism/ laziness	12	9.9	11	6.5	23	7.9	X:1.286 P: 0.091
	Lack of social support	5	4.1	5	2.9	10	3.5	X: 0.346 P: 0.211
	Fear from discovering any serious problem leading to amputation	28	23.1	28	16.7	56	19.3	X: 2.306 *P: 0.038
	Absence of podiatric physician	8	6.6	2	1.2	10	3.5	X: 6.505 *P: 0.011
	Overcrowded clinic	13	10.7	8	4.8	21	7.3	X: 4.079 *P: 0.025

* Significance P ≤0.05# Multiple responses

(E) Knowledge related barriers:

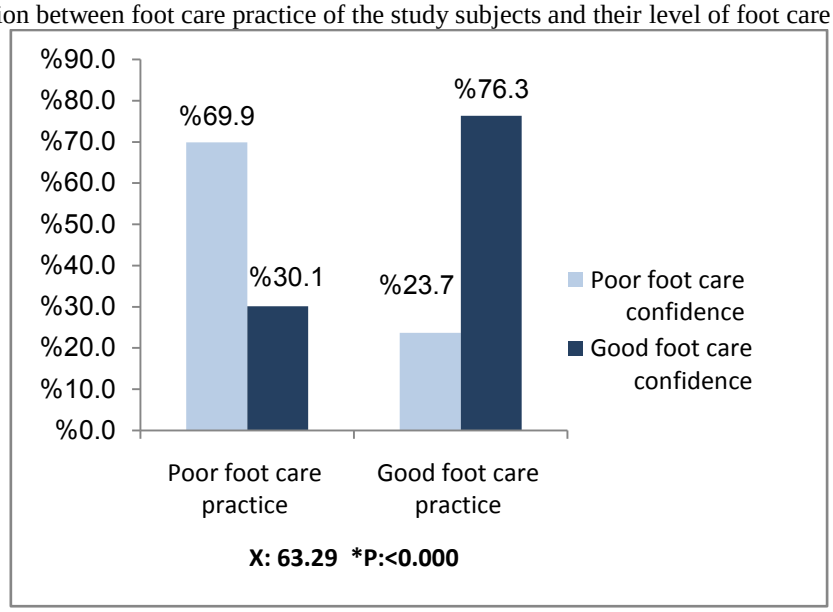
Figure (2) Relation between foot care practice of the study subjects and their level of knowledge



* Significance P ≤0.05

(F) Confidence related barriers:

Figure (3) Relation between foot care practice of the study subjects and their level of foot care confidence



* Significance P ≤0.05

References

[1] World Diabetes Day 2017: Global report on diabetes, Facts & Figures about diabetes. Available at: http://www.who.int/diabetes/en/. Accessed November 2017.
[2] Ramezankhan A, Soori H, Allhani F &Goudarzi A. Design and Development of a Scale of Perceived Barriers to Self-care in Patients with Type 2 Diabetes Mellitus: an Exploratory Factor Analysis. Electronic Physician 2015; 7(7): 1486-1493.
[3] Moustafa S. Highlights on Diabetes Mellitus in Older Adults. Egyptian Journal of Geriatrics and Gerontology 2014; 1(1): 16-18.
[4] Akter S, Rahman M, Abe S & Sultana P. Prevalence of Diabetes and Prediabetes and their Risk Factors among Bangladeshi Adults: a Nationwide Survey. Bulletin of the World Health Organization 2014; 92: 204-213A.
[5] Alavi A, Sanjari M, Haghdoost A &Sibbald RG. Common Foot Examination Features of 247 Iranian Patients with Diabetes. Int Wound J 2009; 6: 117-122.
[6] Touhy T & Jett K. Ebersole& Hess' Toward Healthy Aging: Human Needs & Nursing Response. 9th ed. USA; Elsevier, 2016, 309-315.
[7] Sinclair A, Morley J, Manas L, Paolisso G, Bayer T, Zeyfang A, Marchasson B, Vischer U, Woo J, Chapman I, Dunning T, Meneilly G, Saldana J, Robledo L, Yaffe T, Gadsby R, Schernthaner G &Lorig K. Diabetes Mellitus in Older People: Position Statements on Behalf of the International Association of Gerontology and Geriatrics (IAGG), the European Diabetes Working Party for Older People (EDWPOP), and the International Task Force of Experts in Diabetes. JAMDA 2012; 13: 497-502.
[8] Fact Sheet of USA available at https://www.cdc.gov/diabetes/data/index.html.
[9] Seker A, Kara A, Camur S, Malkoc M &Sonmez M. Comparison of Mortality Rates and Functional Results After Transtibial and Transfemoral Amputation due to Diabetes in Elderly Patients a Retrospective Study. Int J Surg 2016; 33: 78-82.
[10] Bates B, Stineman M, Reker D, Kurichi J &Kwong P. Risk Factors Associated with Mortality in a Veteran Population Following Transtibial or Transfemoral Amputation. J Rehabil Res Dev 2006; 43(7): 917-928.
[11] Johannesson A, Larsson G, Ramstrand N, Turkiewicz A, Wirehn A &Atrosh I. Incidence of Lower-limb Amputation in the Diabetic and Nondiabetic General Population. Diabetes Care 2009; 32: 275-280.
[12] IDF Diabetes Atlas- 8thedition 2017. Available at https://www.idf.org/eibrary/epidemiology.

[13] Ogurtsova K, Fernandes J D, Huang Y, Linnenkamp U, Guariguata L, Cho N H, Cavan D, Shaw J E &Makaroff L E. IDF Diabetes Atlas: Global Estimates for the Prevalence of Diabetes for 2015 and 2040. Diabetes Res ClinPract 2017; 128: 40-50.

[14] Pagano E, Rosa M, Rossi E, Cinconze E, Marchesini G, Miccoli R, Vaccaro O &Bonora E. The Relative Burden of Diabetes Complications on Health Care Costs: the Population-based ARNO Diabetes Observatory, Italy. NutrMetabCardiovasc Dis 2016; xx: 1-7.

[15] Bonner T, Foster M &Lanoix E. Type 2 Diabetes-related Foot Care Knowledge and Foot Self-care Practice Interventions in the United States: a Systemic Review of the Literature. Foot Ankle Int 2016; 7: 1-8.

[16] Evans SL, Nixon BP, Lee I, Yee D &Mooradian AD. The Prevalence and Nature of Podiatric Problems in Elderly Diabetic Patients. J Am GeriatrSoc 1991; 39(3):241-245.

[17] Alavi A, Sibbald G, Mayer D, Goodman L, Botros M, Armstrong D, Woo K, Boeni T, Ayello E &Kirsner R. Diabetic Foot Ulcers. J Am AcadDermatol 2014; 70(1): 1.e1-1.e18.

[18] Meiner S. Gerontologic Nursing. 5thed. USA; Elsevier Mosby, 2015, 458-467.

[19] Seid A &Tsige Y. Knowledge, Practice, and Barriers of Foot Care Among Diabetic Patients Attending FelegeHiwot Referral Hospital, Bahir Dar, Northwast Ethiopia. Advanced in Nursing 2015; volum 2015: 1-9.

[20] Miller C. Nursing Wellness in Older Adults. 7thed. Philadelphia;WoltersKluwe, 2015, 573-574.

[21] Bell R, Arcury T, Snievy B, Smith S, Stafford J, Dohanish R &Quandt S. Diabetes Foot Self-care Practices in a Rural, Trienthnic Population. Diabetes Edu 2005; 31(1): 75-83.

[22] Otene CI, Odatuwa-Omagbemi DO, Enemudo RE, Elachi IC, Anizor Co, Egwuterai JE, Omoraka F &Odonmeta BA. Attitude and knowledge of Foot Care Amongst Diabetic Patients Attending Clinics in Two Hospitals in Delta State of Nigeria. JDMS 2015; 14(12): 31-37.

[23] Mirmiran R, Page J, Armstrong J & Killian R. Barriers to Podiatric Care among Diabetic Patients in the San Francisco Bay Area. J Foot Ankle Sur 2000; 39(5): 301-304.

[24] Guell C &Unwin N. Barriers to Diabetic Foot Care in a Developing Country with a High Incidence of diabetes Related Amputations: An Exploratory Qualitative Interview Study. BMC Health Serv Res 2015; 15(377): 1-7.

[25] Mohamed H A, Elsaher H E, Aref M S &Fouad N. The Effect of Diabetic Foot Care Training Program on Elderly Adults' Outcome. JNHS 2015; 4(4): 14-20.

[26] Dixit S, Maiya A, Khetrapal H, Agrawal B, Vidyasagar S &Umakanth S. A Questionnaire Based Survey on Awareness of Diabetic Foot Care Indian Population with Diabetes: a Cross-sectional Multicenter Study. Indian J Med Sci 2015; 65(10): 411- 423.

[27] The American College of Foot and Ankle Surgeons and the Diabetes (American Diabetes Association), 1998 available at http://ankleandfootcareonline.com

[28] Pollock R, Unwin N & Connolly V. Knowledge and Practice of Foot Care in People with Diabetes. Diabetes Res ClinPrac 2004; 64: 117-122.

[29] Seid A. Assessment of Self-Reported Knowledge, Practice, and Barriers of Diabetic Foot Self-care among Patients Attending FelegeHiwotReferrlal Hospital, Bahir Dar, Amhara Regional State, North West Ethiopia. Thesis, PHD. Ethiopia: Addis Ababa University, School of Allied Health Science, 2014.

[30] Al-Busaidi I. Quality of Diabetic Foot Care in Muscat, Oman. Thesis, BMS. New Zealand: University of Otago, Dunedin School of Medicine, 2013.

[31] Lincoln NB, Jeffcoate WJ, Ince P, Smith M & Radford KA. Validation of a New Measure of Protective Foot Care Behaviors: the Nottingham Assessment of Functional Foot Care (NAFF). PractDiabInt 2007; 24(4): 207 – 211.

[32] Sloan H. Developing and Testing the Foot Care Confidence Scale to Measure Self-efficacy in Foot Care. Thesis, PHD. New Orleans, Louisiana: Louisiana State University Medical Center, School of Nursing, 1997.

[33] Kurnia A, Amatayakul A &Karuncharernpanit S. Predictors of Diabetes Self-management among Type 2 Diabetes in Indonesia: Application Theory of the Health Promotion Model. Int J NursSci 2017; 4: 260 – 265.

[34] Eweda S, Kamel F &Abd-Elwahed M. Relationship BetweenKnowledge of Diabetes Patients, their Perception About the Disease and Self-care Management, in Two Different Age Groups. J Egypt Sc Met &Diab 1994; 26(1): 106 – 126.

[35] Chin Y, Huang T & Hsu B. Impact of Action Cues, Self-efficacy and Perceived Barriers on Daily Foot Exam Practice in Type 2 Diabetes Mellitus with Peripheral Neuropathy. JCN 2012; 22: 61 – 68.

[36] Wendling S & Beadle V. The Relationship Between Self-efficacy and Diabetic Foot Self-care. J Clini& Trans Endo 2015; 2: 37 – 41.

[37] Schoenberg N &Drungle S. Barriers to Non-Insulin Dependent Diabetes Mellitus (NIDDM) Self-care Practices among Older Women. J Aging & Health 2001; 13(4): 443 – 466.

[38] Matricciani L & Jones S. Who Cares About Foot Care? Barriers and Enablers of Foot Self-care Practices among Non-Institutionalized Older Adults Diagnosed with Diabetes. Diabetes Educ 2014; 41(1): 106 – 117.

[39] El-Khawaga G & Abdel-Wahab F. Knowledge, Attitudes, Practices and Compliance of Diabetic Patients in Dakahlia, Egypt. European J Research in Medical Sciences 2015; 3(1): 40 – 53.

[40] Rahaman KS, Majdzadeh R, Naieni KH &Raza O. Comorbidities and Care Practices of Diabetic Patients. Austin J Public Health Epidemiol 2017; 4(2): 01-06.

[41] Abu-Qamar M & Wilson A. Foot Care within the Jordanian Health Care system: a Qualitative Inquiry of patient's Perspectives. Australian J Advanced Nurs 2012; 29(1): 28 – 36.

[42] Aggarwal S, Bhardwaj V, Singh A, Haroon Khan M, Goel S, Krishna J &Surana A. Self-reported Perceptions Towards Diabetic Foot Care among Patients Seeking Care at a Tertiary Care Teaching Hospital in Rural Haryana. Indian J Sci Res 2015; 6(2): 49-54.

[43] Walker R, Smalls B, Hernandez-Tejada M, Campbell J, Davis K &Egede L. Effect of Diabetes Fatalism on Medication Adherence and Self-care Behaviors in Adults with Diabetes. Gen Hosp Psychiatry 2012; 34(6): 598-603.

[44] Hjelm K &Beebwa E. The Influence of Beliefs about Health and Illness on Foot Care in Ugandan Persons with Diabetic Foot Ulcers. Open Nurs J 2013; 7: 123-132.

[45] Onwudiwe N, Mullins D, Winston R, Shaya F, Pradel F, Laird A & Saunders E. Barriers to Self-Management of Diabetes: A Qualitative Study Among Low-Income Minority Diabetics. Ethnicity & Disease 2011; 21: 27 – 32.

[46] Perrin B, Swerissen H & Payne C. The Association Between Foot Care self- efficacy Beliefs and Actual Foot Care Behavior in People with Peripheral Neuropathy: A Cross-sectional Study. J Foot Ankle Res 2009; 2(3): 1 – 8.

Abeerabd El-Rahman Mohamed "Barriers of Foot Care Practice among Older Adults with Diabetes in Alexandria, EgyptI .OSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.2 , 2018, pp. 10-23.