

Bio-Psychosocial Needs Of Patients With Post Diabetic Foot Amputation

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Abstract:

Diabetes is the cause for nearly 80% of the non-traumatic amputation. Amputation could be described as the removal of a body extremity by surgery. The patients post diabetic foot amputations are exposed to many physical, social and psychological problems which affect on his life. Aim of the study: to assess the bio-psychosocial needs of patients with post diabetic foot amputation. Research design: A descriptive exploratory design was utilized. Subjects: 50 patients admitted in diabetic foot clinic. Setting: outpatient clinic in Makkah hospitals, Saudi Arabia was selected for this study. Tools for data collection: Demographic data assessment tool, medical data assessment tool, patients' knowledge assessment interview questionnaire, bio psychosocial needs assessment interview questionnaire and diabetic foot reported practice checklist. Results: 56% of the studied patients had unsatisfactory of total knowledge regarding diabetes mellitus and diabetic foot amputation. 72% of the studied patients had unsatisfactory self care of non-amputated foot and 78% of them had satisfactory self care of amputated foot. While regarding physical problems, 24% of the studied patients had moderate pain and 52% of them need assistance with daily living activities regarding bathing, toileting and moving. Also, 48% of them need assistance regarding functional performance. A regard to the psychological needs, 100% of the studied ¹patients suffered psychosomatic symptoms, GIT symptoms and behaviors symptoms on speech. Furthermore, in relation to the social needs, 32% of the studied patients stated that they had mild social needs parameters as feeling financial burden about cost of treatment. Conclusion: more than half of studied patients suffered from many physical, psychological and social problems post diabetic foot amputation. Recommendation: Rehabilitation programs for patients with diabetic foot amputation must be implemented through the collaboration of various rehabilitation team members.

Key words: Diabetic foot amputation, bio-psychosocial needs.

Introduction:

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Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycemic control. Ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications. Significant evidence exists that supports a range of interventions to improve diabetes outcomes (American Diabetes Association, 2017). Diabetes is different from many other diseases, where medication alone may be all that is required to manage the illness.

Diabetes may be controlled through lifestyle modifications such as weight loss, diet and exercise, but eventually, most individuals will need oral hypoglycemic agents and/or insulin to manage their disease. Individuals diagnosed with diabetes must perform self care practices in order to effectively manage their illness. Because diabetes self-care practices are performed by patients, families, and significant others, there is an important need for diabetes self-management knowledge. Diabetes self-management education (DSME) is essential for successfully living with diabetes (Centers for disease control and prevention (CDC), 2014).

Diabetic foot ulcer is one of the severe consequences of diabetes causing large economic burden. Amputation is another severe complication of diabetes, which is preceded by a foot ulcer. According to some studies it has been proven that approximately 15% of people with diabetes develop foot ulcers eventually resulting approximately 85% of lower limb amputations. Too many ulcers fail to heal, become indolent, develop an infection and come to amputation (Alexiadou & Doupis 2012). An amputation is the removal of all or part of an extremity. Amputations are done in response to diseases such as diabetes mellitus, malignant tumors, infections and peripheral vascular disorders. Other disease conditions that require amputation include extensive osteomyelitis or congenital disorders.

An amputation may be done to save the client's life (White, Duncan & Baumle, 2013). The most frequent indication for elective lower extremity amputation is peripheral vascular disease, with over half of the amputations attributed to diabetes mellitus. The decision to perform an amputation often comes after all other options have been exhausted. It is a final decision that cannot be reversed once initiated. However, the diseased limb is often at the center of the patient's illness, leading to a compromised medical status. The removal of the diseased limb is necessary to eliminate systemic toxins and save the patient's life (Parker, Kirby, Adderson & Thompson, 2011).

The goal of care after an amputation is to ensure adequate healing of the stump to allow for the placement of a prosthesis. Many patients will experience sensation in the absent extremity. This is called phantom pain (phantom limb sensation) and it is a normal phenomenon and this will go away over time. Phantom pain may occur because the brain remembers the nerve fibers. It can take some time for the brain to accommodate the loss of all of the tissue and nerves involved (Ramont, Niedringhaus & Towle, 2012). Diabetic foot imposes a substantial burden on the economy in the form of increased medical costs and indirect costs from work-related absenteeism, reduced productivity at work and at home, reduced labor force participation from chronic disability and premature mortality. In addition to the economic burden that has been quantified, diabetes imposes high intangible costs on society in terms of reduced quality of life and pain and suffering of people with diabetes, their families, and friends (CDC, 2011).

The psychological support and care of the patients following amputation are very important. Recall the patient is adjusting to the normal body images that come with puberty. Peer interaction is important to normal psychological development at this stage. Amputation insults the patient's developing body image. Hospitalization and rehabilitation may prevent interaction with peer groups. Support system should be identified and contacted as soon as possible. The

nurse can help the patient's identify a role model who has overcome the challenges of amputation (McRobert, 2012).

The nurse creates an accepting and supportive atmosphere in which the patient and family are encouraged to express and share their feelings and work through the grief process. The support from family and friends promotes the patient's acceptance of the loss. The nurse helps the patient deal with immediate needs and become oriented to realistic rehabilitation goals and future independent functioning. (McFarl and et al., 2011). The loss of a limb confronts individuals with a wide range of extensive and evolving threats and challenges to their physical, psychological and social functioning. These may include impairments in physical functioning, the experience of amputation related pain, learning how to use a prosthesis, alterations in one's body image, sexuality and self-concept, changes in personal relationships and occupational status, limitations in carrying out every day and valued activities and restrictions in participating in the community and wider society (Desmond et al., 2012).

Aim of the study:

Assess the bio psychosocial needs of patients with post diabetic foot amputation.

Subjects and Methods Research question:

What are the bio-psychosocial needs of patients with post diabetic foot amputation?

Subject and methods

(A)-Research design: A descriptive exploratory design was followed to achieve the aim of this study.

(B)- Setting: This study was conducted in diabetic foot outpatient clinic in Makkah hospitals, Saudi Arabia.

(C) -Subjects: A purposive sample of 50 patients admitted in the previous mentioned setting at the time of data collection were recruited in this study.

(D)- Tools of data collection: Five tools were used for data collection which included:

I- Demographic data assessment tool

II- Medical data assessment tool

III- Patients' knowledge assessment interview questionnaire:

IV- Bio psychosocial needs assessment interview questionnaire V- Self-reported foot practice checklist I-Demographic data assessment tool: It was developed by the researcher and written in Arabic language. It aimed to assess the patients' demographic characteristics including age, sex, occupation, marital status, level of education, residence, cost of treatment, and sufficient of income per month from patient's point of view.

II- Medical data assessment tool: It was developed by the researcher based on related literature (Nolan, Damm & Prentki, (2011), Lancet, (2015) & WHO, (2016). It was used to assess and collect medical data about patients' history which include present, past and family health history. Present history included (type of DM, type of treatment, site, level and complications of amputation. Past history included (follow up of blood sugar level, diet, weight, examining foot regularly, previous causes, level of amputation, previous surgery and present of any other chronic disease. Family history which included (if one of the patients relatives had previous diabetic foot amputation and level of amputation).

III. Patients' knowledge assessment interview questionnaire: It was developed by the researcher based on related literature (Mcfarland et al., (2011), ADA (2011), Janice et al., (2014), Gittler (2016) & Taylor & Poka, (2016). It was written in simple Arabic language and filled by researcher at the time of interviewing patients. It was used to assess patient's knowledge related to DM and diabetic foot amputation. It contained 29 questions distributed in two parts as the following: Part I: it included (12) questions (7 MCQ and 5 true or false) to assess patient's knowledge regarding diabetes mellitus (as definition, normal value of fasting blood sugar, risk factors, causes, signs and symptom, treatment and complications of the disease). Part II: it included (17) questions (12 MCQ and 5 true or false) to assess patient's knowledge regarding diabetic foot amputation as (definition, aim, signs and symptoms, causes, risk factors, complications and self-care).

Scoring system:

The total score of knowledge was 29 grades. Each correct answer was given one grade and the incorrect answer was given zero. It was considered as follows:

* $\geq 60\%$ was satisfactory level of knowledge when the total grades were ≥ 18 grades.

* $< 60\%$ was unsatisfactory level of knowledge when the total grades were < 18 grades.

IV- Bio psychosocial needs assessment interview questionnaire:(Appendix V)

It was used to assess bio psychosocial needs of patients post diabetic foot amputation through assessing physical, psychological and social needs through the following parts.

1- Patients' physical needs:

Patients' physical needs were assessed through assessment of pain, daily living activities and functional performance.

A- Pain assessment

It included assessment of pain site, frequency and the intensity of pain. It was adopted from **Wong- baker face scale (2016)**. The scale determines the level of pain intensity ranging from no pain (scored=0), to worst (scored =10).

Scoring system

It was considered that:

- 1- Nopain \rightarrow 0
- 2- Mild \rightarrow 1-3
- 3- Moderate \rightarrow 4-6
- 4- Severe \rightarrow 7-10

B- Activities of daily living assessment (The Katz index)

It was adopted from **Shelkey & Wallance, (2012)**. The Katz index of independency in activities of daily living was used to assess functional status as a measurement of patient's ability to perform activities of daily living independency. It included eating, bathing,

dressing, toileting and transferring. The scale determines the level of functional status ranging from totally dependent (scored = 0) to full Independence (scored = 10).

Scoring system

It was considered that:

1- Totally dependent → 0-3

2- Need assistant → 4-7

3- Independence 8- 10

-Functional performance assessment

Functional performance questionnaire was adopted from **(Fortington et al., 2012)**. It used to assess any limitation in mobility as one of the most relevant disabilities regarding quality of life following lower limb amputation (LLA) and ability to restore their mobility.

Scoring system:

It included nine questions with five responses for the previous questions ranging as the following: not difficult at all (5), a little difficult (4), somewhat difficult (3), very difficult (2), couldn't do it all the time (1). It was considered as the following

1- 1→14 dependent

2- 15→30 need assistant

3- 31→45 independent

2-Psychological needs assessment

Hamilton Anxiety Rating Scale (HARS) was adapted from **Hamilton (1960)** and modification was done based on related literature, which used to assess Psychological needs of patients with post diabetic foot amputation. It elicited the patient's subjective responses and related symptoms of anxiety that collectively provide a quantitative index of anxiety, it included 14 items, which include anxiety, worries, tension, Fears, insomnia, night mare, lack of concentration, depression, somatic symptoms, psychosomatic, cardiac, respiratory, GIT and urinary tract symptoms, psychosomatic and behaviors on speech.

*** Scoring system:**

The Hamilton Anxiety Rating Scale included 14 items; each item had 4 responses ranged from 1-4 as the following:

1-None 2- Mild

3-Moderate 4- Severe

The total score of the instrument is 56.
It was graded as the following:

1 → 12 Absent of anxiety
13 → 24 Mild of anxiety
25 → 42 Moderate anxiety.
43 → 56 Severe anxiety

3- Patients' social needs assessment:

Was assessed through using social dysfunction scale it was adapted from **Matteson, Connell & Linton (1997)** and some modification was done by the researcher based on the related literature **WHO (2016)**. It was used to assess social needs. It included three main items self- confidence, internal

psychological system and performance system.

Scoring system

The social dysfunction rating scale included 22 items, four responses for each item was ranged from 1 to 4 and classified as the following:

1-None 2- Mild
3-Moderate 4- Severe

The total score of the instrument is 88; the higher score is the higher social needs. It was considered that:

1 → 22 No social dysfunction > 23 → 44 Mild social dysfunction.
> 45 → 66 Moderate social dysfunction
> 67 → 88 Severe social dysfunction.

v- Diabetic foot self care observation checklist: (Appendix VI)

It was developed by the researcher based on related literature (**Salmani & Hosseini2010, Casella 2012 and Perry,2014**) to assess foot self care for the amputated and non amputated foot.

A- Self reported practice for foot self care of non amputated foot

It was used to assess if the patient currently taking care of his non amputated foot.

Scoring system:

The total score of observational checklist for foot self care for non amputated foot was 17 grades. Each correct answer was given one grade and the incorrect answer was

given zero.

* $\geq 60\%$ was satisfactory level of foot self-care for non amputated foot when the total grades were ≥ 12 grades.

* $< 60\%$ was unsatisfactory level of foot self-care for non amputated foot when the total grades were < 12 grades.

B- Stump self care observation checklist:

It was used to assess if the patient currently taking self care of his stump

Scoring system:

The total score of Stump self care observation checklist was 14 grades. Each correct answer was given one grade and the incorrect answer was given zero.

* $\geq 60\%$ was satisfactory level of stump care when the total grades were ≥ 10 grades.

* $< 60\%$ was unsatisfactory level of stump when the total grades were < 10 grades.

* **Validity and Reliability: Testing validity** of the proposed tools by inspecting the items to determine whether the tools measure what supposed to measure. **Testing reliability** of the proposed tools was done statistically by Cronbach alpha test.

Ethical consideration:

The ethical research considerations included the following:

-The research approval was obtained from the ethical committee before starting the study.

-The researcher clarified the objectives and aim of the study to patients included in the study before starting.

-Researcher assured maintaining anonymity and confidentiality of subjects 'data of the patients included in the study.

-Subjects were informed that they were allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time

A) Pilot study:

Before performing the actual study, a pilot study was carried out for patients (10%) of the study sample with post diabetic foot amputation in diabetic foot outpatient clinic in Makkah hospital to test clarity, applicability of tools used in this study. Some modifications on tools were done based on pilot study. The patients who included in the pilot study were excluded from the main study group and replaced by other patients.

B) Field work

Data collection took about 3 months started from March 2022 until May 2022.

Statistical design:

The data were collected, tabulated and subjected to Statistical analysis. Statistical analysis is performed by SPSS in general under windows version 11.0.1 Number and percentage for qualitative variable were done, also Microsoft Office Excel is used for data handling and graphical presentation. Quantitative variable are described by the mean, standard deviation (SD), while qualitative categorical variable are described by proportions and percentages. Chi- squared test of independence is used for categorical variables. Person correlation coefficient is used for relation between quantitative variables. Test of significance was used and regarding significance of the result, the observed differences and associations were considered as follows:

* Non significant (NS) $P < 0.05$

* Significant (S) $P \leq 0.05$

* Highly significant (HS) $P \leq 0.01$.

Results:

Table (1) clarifies, the mean age of the studied patients was (60.6 ± 11.1) and 76.0% of them were males. Also 46.0% had basic education, (98.0%) of them were married and 50.0% were working.

Items	N	%
Age		
>40 years	2	4.0%
40- 60 years	20	40.0%
<60 years	28	56.0%
Mean + SD	60.6 ± 11.1	
Sex		
Male	38	76.0%
Female	12	24.0%
Educational level		
Illiterate	10	20.0%
Reads & writes	12	24.0%
Basic	23	46.0%
Bachelor degree	5	10.0%
Marital status		
Single	0	0.0%

Married	49	98.0 %
Widow\ divorced	1	2.0%

Figure (1) shows that 56% of the studied patients had unsatisfactory of total knowledge regarding diabetes mellitus and diabetic foot amputation.

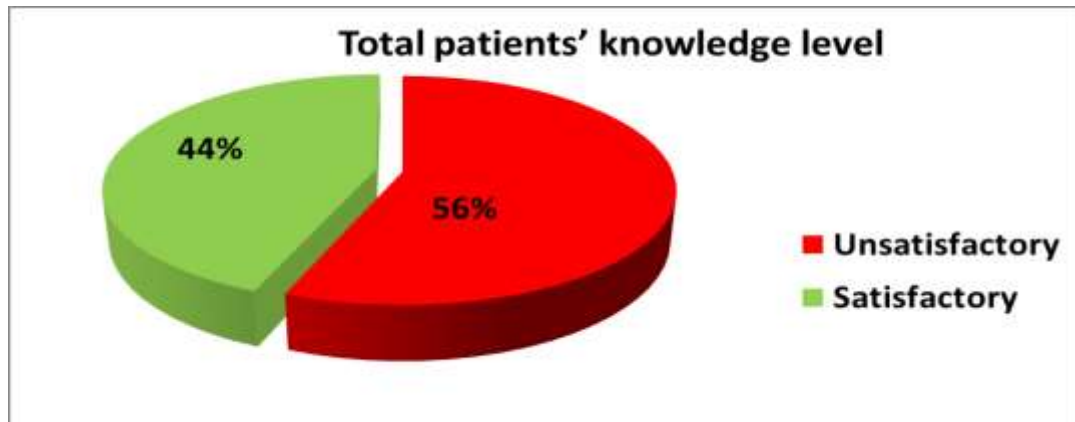


Figure (2) shows that 72% of them had unsatisfactory self care of non amputated foot totally

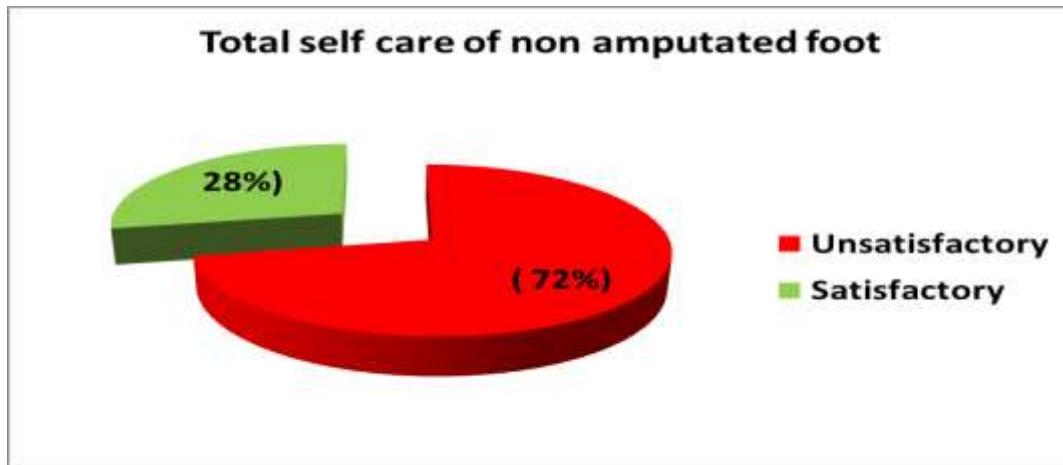
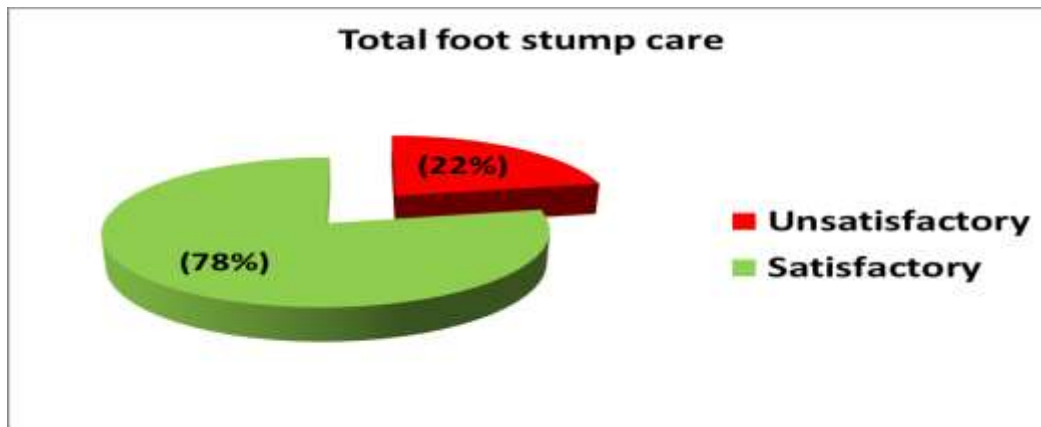


Figure (3) shows 78% of them had satisfactory self care of the foot stump.



Discussion:

Regarding the studied patients demographic characteristics, the results of the present study revealed that more than half of the studied patients were above sixth years old and about two third of them were males. This result is in accordance with Kirkman et al., (2012) who confirmed that older adults with diabetes are substantial risk for amputation. This may be due to increased risk of chronic disease related amputation such as diabetes among men at the same age group in Saudi Arabia.

Regarding to the educational level, this study result revealed that a relatively near half of patients had basic education. This finding is in accordance with that of a recent study of Soomro, Khan, Ahmed & Minhas, (2013), who assessed and determinant lower extremity amputations and found that low educational level has been a major significant predictor for limb amputation among diabetic amputees. This result may be due to lack of information about importance of foot self-care and lack of educational programs for those patients.

In the current study the result showed that the most of studied patients were married. This result is supported by El Sebae & Mohamed (2011), who assessed patients with limb amputation and reported that about three quarters of the study sample were married. This may be due to the most of the studied patients aged from forty to sixty or more years old.

Concerning patients' level of total knowledge regarding diabetes mellitus, the current study revealed that about two thirds of the studied patients had satisfactory level of total knowledge regarding diabetes mellitus. This finding is inconsistent with Funnell et al., (2008) who revealed that people with diabetes are more likely to have poorer knowledge about their diseases. This may be due to about two thirds of the studied patients were diagnosed for more than 10 years and the presence of complications encourage the patients to know about their diseases.

Regarding patients' level of knowledge about diabetic foot amputation, the present study reveals that near two thirds of them had unsatisfactory knowledge about diabetic foot amputation. This finding is according to Livingstone, Mortel & Taylor (2011), who finding in the study that the patients' reported of lack of education and knowledge deficit regarding their disease process.

While, concerning self care of amputated foot, the current results revealed that more than three quarters of the studied patients had satisfactory about self-care. This result level is in agreement with Muhammad et al., (2014) who showed that the majority of patients who were admitted for diabetic foot infections had poor knowledge and poor practice of foot care. While this result is innot according with Tembo & Tan, (2013), who revealed that many respondents likewise did not record their levels of satisfaction with the various service providers for care related to their stump care. This result may due to fear of occurrence of further complications in the amputated limb as a critical condition that need the patients to care for their stump and good communication between patients and health care provider.

Conclusion:

Based on findings of the present study, it can be concluded that:

More than half of the studied patients had unsatisfactory knowledge regarding DM and diabetic foot amputation. More than two thirds of the studied patients had unsatisfactory self care of non-amputated foot and more than three quarters of them had satisfactory self care of amputated foot. While regarding physical problems, near half of the studied patients had moderate pain and more half of them need assistance with daily living activities regarding bathing, toileting and moving. Also, near half of them need assistance regarding functional performance. A regard to psychological needs, the all of the studied patients suffered psychosomatic symptoms, GIT symptoms and behaviors symptoms on speech. Furthermore, in relation to the social needs less than half of the studied patients stated that they had mild social needs parameters as feeling financial burden about cost of treatment.

Recommendations:

Based on the results of the current research, the following recommendations are suggested:

1-Rehabilitation programs for patients with diabetic foot amputation must be implemented through the collaboration of various rehabilitation team members.

2-Health education programs about DM and diabetic foot amputation should be provided for these patients by using new methods of teaching such as computer assisted instructions.

3-Supportive care services are directed towards meeting bio-psychosocial needs should be provided.

4-Further studies about the effect of the bio-psychosocial needs on the patients' quality of life and outcomes.

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