

Health Related Quality of Life for Patients with Diabetic Foot Amputation

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ABSTRACT

Background: In the latter stages of many illnesses, such as diabetes mellitus, limb amputation is a life-altering treatment that has social, psychological, and functional repercussions that lower the patient's quality of life.

Objective: The current study aimed to assess the health-related quality of life for patients with diabetic foot amputation.

Patients and methods: A descriptive exploratory study was conducted at the Outpatient Clinic affiliated to Beni-Suef University Hospital. A total of 70 diabetic patients, 3 to 18 after amputation operation for follow up, were recruited using a purposive sample. Data of participants were collected using two tools; (I): Structured interviewing questionnaire, it included three parts; socio-demographic characteristics of patients, medical history of patients and knowledge assessment questionnaire. (II) World Health Organization quality of life SF36 questionnaire.

Results: About 51.4% of studied patients were in the age group 50 - <60 years, 58.6% of them had unsatisfactory total knowledge level regarding diabetic foot and amputation, and 60% of them had unhealthy or poor quality of life. There was no statistically significant correlation between total knowledge and total quality of life regarding diabetic foot amputation. **Conclusion:** Developing and implementing an educational programme for patients with diabetic foot amputation for improvement of their quality of life is strongly and urgently needed.

Keywords: Amputation, Diabetic foot, Quality of life.

INTRODUCTION

The prevalence of diabetes mellitus (DM), a chronic illness, is rising globally. A collection of metabolic illnesses known collectively as diabetes are defined by the presence of hyperglycemia. The diverse pathophysiology includes problems in the metabolism of carbohydrates, fats, and proteins as well as impairments in insulin production, insulin action, or both. Retinopathy, nephropathy, and neuropathy are among the long-term particular consequences of diabetes ⁽¹⁾.

Diabetes-related hospitalizations are most frequently brought on by diabetic foot problems, which account for 50% of all diabetes admissions and 24% of total medical expenses. The most frequent reason for non-traumatic lower extremity amputations is diabetic foot problems. Patients with diabetes have a 15-46 times increased risk of lower limb amputation than people without diabetes ^(2,3).

The phrase "health-related quality of life" (HRQOL) has been defined in a variety of ways, but the most popular definition centers on the patient's capacity for self-determination, independence, and control over the illness processes. The idea also assesses the person's feeling of psychological, bodily, and social well-being, as well as their judgement of their own level of life satisfaction. Amputations cause significant alterations in one's everyday functioning and quality of life. Amputation-related limitations on the body's structures and functions have an impact on a person's level of activity and social engagement ⁽⁴⁾.

Patients who have had a lower limb amputated (LLA) deal with difficulties and restrictions in daily mobility. Because walking with prosthesis entails independence and community involvement, it is a key factor in determining quality of life. Poorer walking ability, worse functional ability, and a higher risk of

cardiovascular illnesses are linked to lower levels of prosthesis use and physical activity. Thus, in this exposed group, maintaining an adequate amount of physical exercise is crucial for community involvement and general health ⁽⁵⁾.

The quality of life of people who have diabetic foot is impacted and is associated with significant morbidity and death. Foot ulcers affect 15% to 20% of diabetic people throughout the course of their lifetime, and the number of foot ulcers is rising at a rate of 2% each year. Patients with a history of amputation, deformity, or foot ulcer, however, are more likely to rise by 17% to 60%. Patients with diabetic foot have lower limb amputation mortality rates that are around 22% at 30 days, 44% at 1 year, and 77% at 5 years ⁽⁶⁾.

Following an amputation, quality of life suffers along with decreased mobility and discomfort. Patients can have psychological and social effects, and psychological issues might include sadness, anxiety, and in very extreme situations, suicide.

There is a correlation between mobility, use of a prosthesis, and perceived HRQOL among patients with amputation ^(4, 6). Mobility is one of the most significant variables for excellent HRQOL since low functional status reduces the patient's ability to live independently.

The current study aimed to assess the health related quality of life for patients with diabetic foot amputation.

PATIENTS AND METHODS

A descriptive exploratory study was conducted at the Outpatient Clinic affiliated to Beni-Suef University Hospital. The clinic has one room, with one bed for receiving one patient which is located at the ground floor.

A total of 70 diabetic patients, 3 to 18 after amputation operation for follow up, were recruited using a purposive sample.

Data were collected using the following two tools:

Tool I: Patients Structured interviewing questionnaire. This tool was developed by the investigator in simple Arabic language based on reviewing the related literatures ^(8,9). It included three parts:

A) Socio-demographic characteristics of patients: It was used to assess the patient's demographic characteristics including age, gender, marital status, education level, occupation status, monthly income and residence; **B) Medical history of patients:** It was used to assess patient's medical and family history including the following: duration of disease, type of DM, type of diabetic medication, period of hospitalization, main cause of current hospitalization admission, amputation site, complication at amputation site, history of chronic diseases, previous amputation surgery, family history of DM and amputation;

C) Knowledge assessment questionnaire: This tool was adapted from *Zubair et al.* ⁽¹⁰⁾ to assess the knowledge of patients regarding diabetes mellitus (7 items), diabetic foot care (21 items), and diabetic foot amputation (13 items).

Scoring system of knowledge assessment questionnaire:

This part included 41 items, the score 1 for the correct answer, score zero for incorrect answer. These scores were summed and were converted into a percent score. The total knowledge scores ranged from 0- 41 and were classified as: Satisfactory if the score $\geq 60\%$ of the total score, and Unsatisfactory if the score $< 60\%$ of total scores.

Tool II. World Health Organization Quality of Life SF36 questionnaire (WHOQOL-SF36). It was adopted from *Ware et al.* ⁽¹¹⁾, and translated into Arabic language. It used to assess QOL of patients with diabetic foot amputation, which included 8 parts were classified as: General health (2 items), Limitations of activities (10 items), Physical health problems (4 items), Emotional health problems (3 items), Social activities (2 items), Pain (2 items), Energy and emotions (9 items) and General health (4 items).

Scoring system of world health organization quality of life SF36 questionnaire: It included 36 items; in part 1, 5, 6, 7, 8 responses were measured on fifth point Likert scale.

Part 1: was rated as question 1 (excellent= 5, very good= 4, good= 3, fair= 2 and poor= 1) and question 2 (Much better now than one year ago= 5, somewhat better now than one year ago= 4, about the same= 3, somewhat worse now than one year ago= 2 and much worse than one year ago= 1). (Total score= 10 scores).

Part 5: was rated as (not limited= 5, limited a little= 4, limited sometimes= 3, limited most of time= 2 and limited all the time= 1). (Total score= 10 scores).

Part 6: question 1 was rated as (none= 5, mild= 4, moderate= 3, sever= 2, very sever= 1) and question 2 was rated as (not at all= 5, a little bit= 4, moderately= 3, quite a bit= 2 and extremely= 1). (Total score= 10 scores).

Part 7: questions 1, 4, 5, 8 was rated as (all of the time= 5, most of the time= 4, some of the time= 3, a little bit of the time= 2 and none of the time= 1) but questions 2, 3, 6, 7, 9 was rated as (all of the time= 1, most of the time= 2, some of the time= 3, a little bit of the time= 4 and none of the time= 5). (Total score = 45 score).

Part 8: question 1, 3 was rated as (definitely true= 1, mostly true= 2, don't know= 3, mostly false= 4 and definitely false= 5) but question 2, 4 was rated as (definitely true= 5, mostly true= 4, don't know= 3, mostly false= 2 and definitely false= 1). (Total score = 20 score).

Part 2: was measured on three likert scale which rated as (no, not limited at all= 3, yes, limited a little= 2 and yes, limited a lot= 1). (Total score = 30 score).

Part 3 and 4: was measured on two likert scale which rated as (no= 2 and yes= 1). (Total score for part 3= 8 score) and (Total score for part 4= 6).

Total score of SF 36 questionnaire was 139. The mean score for each component was calculated by adding up the statement scores for each component, converting the total to a percent score, and dividing the result by the number of items.

- ❖ $\leq 50\%$ Unhealthy/ poor QOL (≤ 69.5 score).
- ❖ $\leq 70\%$ Good/ mild QOL ($>69.5 < 97.3$ score).
- ❖ $< 95\%$ Very good/Moderate QOL ($\geq 97.3 < 132$ score).
- ❖ $\geq 95\%$ Excellent/ healthy QOL (≥ 132 score).

Preparatory phase:

In order to construct techniques for data collection, it involved analysing past and current local and worldwide of linked literatures and theoretical understanding of the many components of the research utilizing books, papers, the internet, journals, and magazines.

Validity:

Validity tests were conducted on the research instruments (face and content validity). A jury of 5 medical surgical nursing professionals from Helwan University and Beni-Suef University's nursing department evaluated it. The tool was examined by professionals for clarity, relevance, correctness, thoroughness, simplicity, and application; minor changes were made.

Reliability: The tools that were modified were evaluated for internal reliability using Cronbach's Alpha. Higher values (greater than 0.7) signify satisfactory reliability. Cronbach's alpha reliability coefficient typically falls between 0 and 1, with a usual range of 0 to 1. The tool's reliability score for the knowledge assessment questionnaire was (0.787), which was satisfactory.

Pilot study: To assess the clarity and usefulness of the research instruments, a pilot study including 10% of the study subjects (7 patients) was undertaken. Minor alterations were made, however subjects from the pilot research were not eliminated from the study population.

Field work:

- Data were collected within 6 months in the period from the beginning of October (2021) to the end of March (2022).
- The investigator visited the outpatient clinic two days per week during the morning shifts (9:00 am to 1:00 pm). The patients were selected according to inclusion criteria.
- Data were collected through interviewing patients to fill data collection tools by the investigator.
- At the beginning of the interview, the study's objective was presented to the patients.
- The investigator obtained the patients' consent for participating in the study and every patient was informed that confidentiality was assured.
- The study tools were completed and filled in by the investigator within an average time of 60-90 minutes as following: structured interview questionnaire for collecting data regarding socio demographic characteristics of patients and as well medical history of patients; it took 10-15 minutes. The knowledge assessment questionnaire; it took about 20-35 minutes. Lastly, World Health Organization quality of life SF36 questionnaire (WHOQOL-SF36) took about 30-40 minutes.

Administrative item: The hospital director of Beni-suef University Hospital provided the required authority for the study to be carried out. After outlining the purpose of the study and requesting approval for the data collection, the dean of the nursing faculty wrote an official letter to the organization. Patients were asked to verbally consent to taking part in the research procedure.

Ethical Considerations:

The Nursing Faculty at Helwan University's Scientific Ethics Committee gave its permission. Before any data was collected, the researcher made sure that the patients understood the study's goals and objectives. The patient has the right to leave

the research at any moment, and the investigator guaranteed that anonymity and confidentiality of the patient's data will be maintained. Respect was shown for morals, values, culture, and beliefs. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

Statistical item:

The collected data were introduced and statistically analyzed by utilizing the Statistical Package for Social Sciences (SPSS) version 24 for windows. Qualitative data were defined as numbers and percentages. Chi-Square test and Fisher's exact test were used for comparison between categorical variables as appropriate. Quantitative data were tested for normality by Kolmogorov-Smirnov test. Normal distribution of variables was described as mean and standard deviation (SD), and independent sample t-test was used for comparison between groups. The correlation matrix was completed using Pearson's correlation coefficient test (r). P value ≤ 0.05 was considered to be statistically significant.

RESULTS

Table 1 summarizes the sociodemographic data of the studied diabetic patients.

Table (1): Frequency distribution of sociodemographic characteristics of the studied patients (n=70).

Variable	No.	%
Age		
40 < 50 year	7	10.0
50 < 60 years	36	51.4
≥ 60 year	27	38.6
Mean \pm SD	59.65 \pm 7.30	
Gender		
Male	41	58.6
Female	29	41.4
Marital status		
Married	58	80.9
Divorced	2	2.9
Widow	10	14.3
Educational level		
Not read and write	30	42.9
Read and write	34	48.6
Intermediate education	6	8.6
Occupational status		
Employee	8	11.4
free business	23	32.9
House wife	28	40.0
Retired	11	15.7

Table 2 summarizes the clinical characteristics of the studied diabetic patients.

Table (2): Frequency distribution of current medical history of the studied patients (n=70).

Variable	No.	%
Duration of DM		
< 1 year	32	45.7
1 year < 5 years	8	11.4
≥ 5 years	30	42.9
Type of DM		
Insulin dependent diabetes mellitus	41	58.6
Non-insulin dependent diabetes mellitus	29	41.4
DM medication		
Insulin	43	61.4
Oral hypoglycemia	27	38.6
Amputation site		
Right leg	60	85.7
Left leg	10	14.3
Amputation level (n=60)		
Part of foot	53	88.3
Below the knee	17	11.7
Complication at amputation site		
No	15	21.4
Yes	55	78.6
Type of complication (n= 55)		
Infection	47	85.4
Ulcer	8	14.6
Problems in un affected foot		
No	59	84.3
Yes	11	15.7

Figure 1 illustrates that, 41.4% of the studied patients had satisfactory total knowledge level, while 58.6% of them had unsatisfactory total knowledge level regarding diabetic foot and amputation.

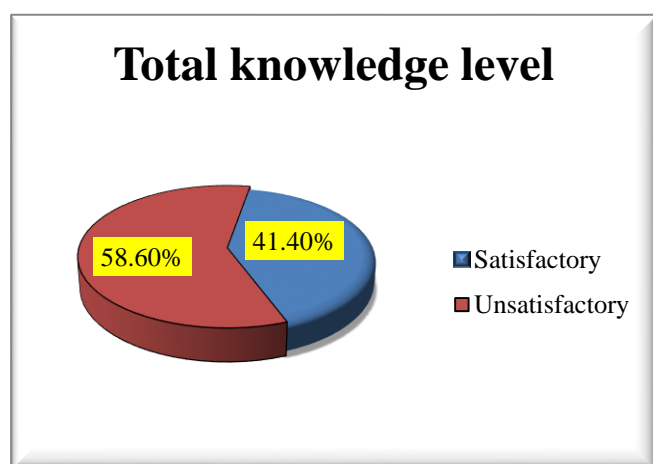


Figure (1): Frequency distribution of the studied patients' regarding their total knowledge level regarding diabetic foot and amputation (n= 70).

Figure 2 illustrates that 60% of the studied patients had unhealthy or poor QOL, while 0.0% of them had excellent or healthy QOL.

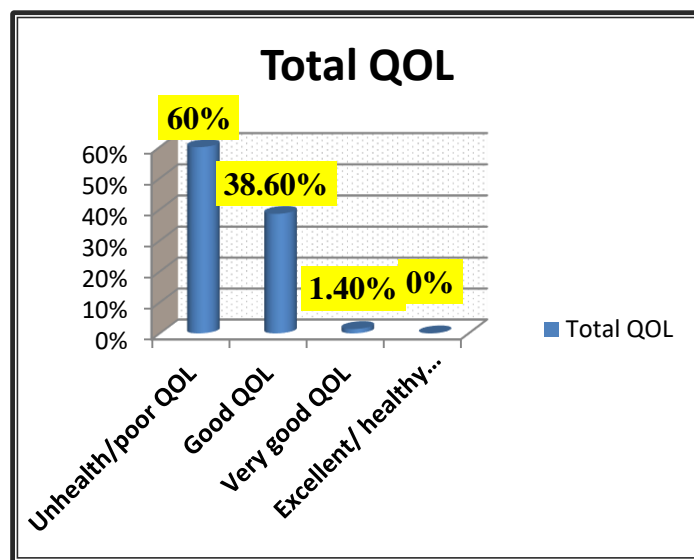


Figure (2): Frequency distribution of the studied patients regarding their total quality of life (n= 70).

Table 3 reveals that there was no statistically significant correlation between total knowledge and total QOL regarding diabetic foot amputation.

Table (3): Correlation between total knowledge and total QOL regarding diabetic foot amputation.

Variable		Total knowledge
Total knowledge	r	1
	P-value	---
Total QOL	r	0.171
	P-value	0.158

r Pearson Correlation, * Statistically significant at $P \leq 0.05$.

DISCUSSION

In relation to sociodemographic characteristics of the studied patients, in terms of the sociodemographic features of the researched patients, the current study showed that, with a mean age of 59.65 (SD 7.3) years, more than half of the patients were in the age range of 50 to 60 years. This finding is consistent with that of *AlSadrah* ⁽⁸⁾, who discovered that the mean age of the investigated patients was 56.8 (SD 12.4), with more than half of them being between the ages of 40 and 60.

According to the current study, the majority of the patients were married and more than half were men. This may be because more than half of them were in the 50 to 60 age range. *Sekhar et al.* ⁽¹²⁾ statement that 75% of the patients in the research were guys lends credibility to this study.

According to the results of the current study, more than one-third of the patients looked at had DM for less than a year. This conclusion differs with that of *Sari et al.* ⁽¹³⁾, who noted that polydipsia and polyuria were the symptoms that led to the diagnosis of the condition and that the majority of the investigated

patients had been diagnosed with DM for more than 5 years.

The results of the current investigation showed that more than half of the patients underwent type 1 diabetes therapy and used insulin. This result is comparable to that of **Hsu et al.** ⁽¹⁴⁾, who showed that 75% of the patients under study had type 1 diabetes mellitus and were using insulin.

The majority of the studied patients were hospitalized for days on end, with infection at the site of the amputation being the primary reason for their current hospitalization. This may be related to the patients' lack of knowledge regarding diabetic foot care as a result of their educational background. This outcome is consistent with **Ugwu et al.** ⁽¹⁵⁾ finding that more than 4/5 of the patients in the study spent days in the hospital as a result of wound infection.

The majority of the patients in the current research had their right legs amputated, and 75% of them also had portions of their feet amputated. This study supports the findings of **Sothornwit, et al.** ⁽¹⁶⁾, who reported that 2/3 of the patients had amputees of the foot.

According to the results of the present study, more than 75% of the patients experienced complications at the site of their amputation, more than 2/3 of them had infections, and the majority of them had no issues with their unaffected feet. This finding is consistent with that of **Almohammadi et al.** ⁽¹⁷⁾, who discovered that more than half of the patients under study experienced an infection in their amputation incision.

Concerning history of the studied patients, according to this study, the majority of the patients was healthy and had no prior amputation surgeries or other chronic illnesses. This study supports **Wukich and Raspovic** ⁽¹⁸⁾ assertion that more than half of the patients had no prior amputation history.

Concerning total knowledge of the studied patients, more than half of the patients in the research had insufficient overall knowledge of diabetic foot and amputation; this might be connected to their educational background. This finding is consistent with **Hanley et al.** ⁽¹⁹⁾ finding that more than two thirds of patients had low levels of knowledge.

Concerning total QOL, the results showed that more than half of the study subjects reported poor or unhealthy QOL. While none of them had a good or healthy QOL overall, this may be attributed to their age, expertise, and educational background. This result is consistent with that of **Sarroca et al.** ⁽⁷⁾, who noted that more than half of the patients in the study had low QOL.

Regarding correlation between total knowledge and total QOL, according to the results of the current study, there was no statistically significant relationship between overall knowledge and overall QOL. This finding conflicts with that of **Chunteng et al.** ⁽²⁰⁾, who noted a statistically significant relationship between overall QOL and patients' knowledge.

CONCLUSION

The present study revealed that less than half of studied patients had satisfactory total knowledge level regarding diabetic foot amputation. More than half of them had unhealthy or poor QOL, while, none of them had excellent or healthy QOL. Also it was presented that, there was no statistically correlation between total knowledge and total QOL regarding diabetic foot amputation

RECOMMENDATIONS

- Develop and implement an educational programme for patients with diabetic foot amputation for improvement of their QOL.
- Developing further researches about the factors that affect quality of life for patients with diabetic foot amputation on a large probability sample in a various settings in order to generalize the results.

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Conflict of interest: Nil.

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