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Original Article

Quality of life among Syrian patients with war-related lower limb amputation at the Military Hospital in Lattakia

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ABSTRACT

Purpose: To describe the quality of life(QOL) of Syrian people with lower limb amputation after the war. **Methods:** A cross-sectional study conducted at the Military Hospital in Lattakia, from May to August 2019. A convenience sample of 65 adult males who had previously undergone amputation of a lower limb was included in this study. Participants' data were collected including age, marital status, employment, time since amputation, level of amputation, type of amputation and the use of assistive devices. The QOL was measured using the World Health Organization Quality of Life Brief Version (WHO QOL-BREF). Data analysis was done by using SPSS version 20.

Results: Forty (61.5%) of subjects were between age of 40–60. Below knee and unilateral lower-limb amputees formed the highest number 52 (80.0%) and 51 (78.5%) respectively. The mean scores of environment, physical health, psychological, and social relationships domains of QOL were 15.86, 15.18, 14.66, and 6.64, respectively. There were statistically significant differences in various domains of QOL between groups with different status of employment, financial support, amputated lower limb, duration since amputation, and cause of amputation ($P < 0.05$).

Conclusion: There is a need to pay attention to experiences and the quality of life among Syrian patients with war-related amputation.

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What is known?

- Lower limb amputation is a surgical procedure that can affect a patient's lifelong quality of life as it has important functional, psychological, and social side effects.

What is new?

- This study can contribute to a better understanding of the dimensions of quality of life in patients with amputation, a topic addressed in previous literature studies in multiple countries, that has not been studied in-depth in cases of war and disasters, especially in Syria, so to improve the quality of life of these patients, we still need more theoretical and applied studies.

1. Introduction

Lower limb amputation is a major event in an individual's life and remains a major problem worldwide. Globally, 200–500 million amputations are performed annually. In the USA, 1.6 million people were estimated to be living with limb amputation in 2005, and 65% among them had lower extremity amputation (LEA). It is estimated that these statistics might double in 2050 [1]. The incidence of lower limb amputation varies significantly across the globe, ranging from 5.8 to 31 per 100,000 [2]. In England, a 3-year study recorded 34,109 amputations [3]. In Pakistan, a total of 1,115 patients underwent amputations between 2007 and 2012, 47.4% of which were of the lower limb [4]. According to WHO, there are 30,000 injuries in Syria every month through more than 6 years during the war and 1.5 million are living with permanent disabilities, including 86,000 people whose injuries have led to amputations [5]. The total cost of all aspects of health care regarding amputation was estimated to be US\$ 52,126,496 [6].

In the study by Pooja and Sangeeta, out of 155 amputation cases, 109 patients (70.3%) were victims of trauma, making this the most common cause of amputation [7].

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Lower limb amputations are the most affecting amputees because they directly affect the walking ability of an individual [8], and it causes many physical and psychosocial disorders such as mobility, occupational or non-occupational activities, self-care activities and body image [9,10]. One of the significant considerations for war-injured patients is the influence on psychological health and physical during combat exposure [11].

A study by Esfandiari to document long-term symptoms and functions after war-related lower limb amputation revealed that patients with lower limb amputation experienced a significant clinical and functional disorders [12] such as back pain, joint pain, osteoarthritis, and phantom limb pain [13]. Several sources mentioned that amputation cases were linked to psychological problems such as depression 10.4%–63%, posttraumatic stress disorder (PTSD) 3.3%–56.3%, and phantom limb phenomenon 14%–92% [14]. There are several factors responsible for depression for amputees such as self-stigma, feelings of loss, and difficulty dealing with physical weakness [15]. At the same, Holzer et al. found that lower-limb amputation significantly affected patients' body image and quality of life (QOL) [16]. QOL is defined as individuals' perception of their position in life in the context of the culture and value in which they live and regarding to their goals, expectations, concerns, and standards [17]. The difficulty to assess the QOL of our patients comes from the fact that it is not universal because each person has his own understanding of satisfaction and benefit, which includes a whole series of features that describe the individual perception of quality life [18]. At the same time, the literature showed that the QOL is a wide concept and contains many dimensions: physiological, mental, social health, financial independence of an individual [19,20].

There are several studies examining the impact of extremity amputation, which causes loss of the physical functions, on body image and QOL [21,22], but cultural and socio-economic aspects may vary in perception and assessment of QOL by studied population. However, this was the first study on QOL of amputees following the war in Syria, and this locally available data will help to improve the quality of our services in the direction to meet the patients' needs and satisfaction which in turn leads to the betterment of their QOL. The purpose of this study was to evaluate the QOL among patients with war-related lower limb amputation.

2. Materials and methods

2.1. Study design

This study is a descriptive cross-sectional study performed at the Military Hospital in Lattakia, Syria from May to August 2019.

2.2. Sample

A convenience sample of 65 males at the Military Hospital in Lattakia, Syria was included in this study. The sample size was not calculated because of the unavailability of accurate statistics of the population. The patients that met the required criteria were adult male and diagnosed with lower limb amputation following to war injuries, ability to speak the Arabic language, who had unilateral or bilateral lower limb amputation at the level of foot, lower leg, or upper, at least 3 months after limb amputation and were aged between 20 and 60 years. Those who had open wounds and amputations caused by neurological or vascular problems such as diabetes were excluded from the study to avoid bias.

2.3. Data collection

Face-to-face interviews among amputees were performed by

the researcher. Self-administered questionnaires were used to collect the data about the patients' subjective data, amputation characteristics, and to assess QOL. Demographic data include age, marital status, employment, income, educational level, whereas, health status characteristics related to amputation include: amputated lower limb, amputation level, use of assistive devices, duration since amputation, cause of amputation. Quantitative variables such as age, duration since amputation were converted to categorical variables, and income measured by an ordinal scale. The World Health Organization Quality of Life Brief Version (WHOQOL-BREF) is a questionnaire consists of 26 - items, which is a short version of the WHOQOL-100 scale [23]. The permission for using the questionnaire was obtained from WHO. The answers range from 1 (very dissatisfied/very poor) to 5 (very satisfied/very good), a high score reflects a better QOL. The questionnaire has four domains, namely, physical health (seven items), psychological health (six items), social relationships (three items) and environment (eight items), and this study was based on this model. The final score is the sum of the 26 items, ranging from 26 to 130 in this scale, which does not have a cut-off point. According to each domain, the mean score indicates the participants' perception of their satisfaction with each aspect of their life, relating it with QOL. The Arabic translation of the WHOQOL-BREF has adequate validity and reliability indices, and it represents the same constructs across cultures [24,25].

2.4. Ethical consideration

Before starting the study, the researcher obtained approval to conduct the study from Al-Andalus university research ethics committee (REC), and permission to conduct the proposed study was obtained from the Military Hospital. Before embarking the interview with the participants, the researcher introduced himself to patients with full explanation of the purpose and nature of the study and then written consent forms were filled by participants who accepted to participate in the study and to answer the self-administered questionnaire. The researcher explained to patients that participation will entirely voluntary and withdrawal from this study is permitted and the data will be treated anonymously and confidentiality and it will be used just for research purposes.

2.5. Data analysis

Data were analyzed by using SPSS version 20. A descriptive analysis was performed on study variables. The QOL was considered the dependent variable, and the sociodemographic and health data were considered the independent variables. Frequency and percentage were used to describe the characteristics of the sample. P -value < 0.05 was considered a significant value.

3. Results

3.1. Sample characteristics

A total of 65 patients met the inclusion criteria and completed the 26 items in the questionnaire. Four subjects uncompleted the questionnaire. Descriptive statistics of the demographic data and amputation characteristics are presented in Table 1. More than half of the 65 persons (61.5%) with lower limb amputation admitted to the Hospital during the study period were in age group ranged from 40 to 60 years and one-third of them were from 20 to 39. Regarding their educational status less than half of them (38.5%) had only a preparatory degree. In addition, most were unemployed (67.5%), married (69.2), and have no financial support (70.8%), respectively. Total individuals with below-knee amputation were 52 (80.0%)

Table 1
Descriptive of the sample characteristics ($n = 65$).

| Variables | | <i>n</i> | % |
|-----------------------------------|------------------------------|----------|------|
| Age | 20–39 | 25 | 38.5 |
| | 40–60 | 40 | 61.5 |
| Marital Status | Married | 45 | 69.2 |
| | Unmarried | 19 | 29.2 |
| | Divorced | 1 | 1.5 |
| Employment | Employed | 18 | 27.7 |
| | Unemployed | 40 | 61.5 |
| | Retired | 7 | 10.8 |
| Income | Low | 20 | 30.8 |
| | Middle | 45 | 69.2 |
| | High | 0 | 0 |
| Education | Primary | 6 | 9.2 |
| | Preparatory | 25 | 38.5 |
| | Secondary | 19 | 29.2 |
| | College | 15 | 23.1 |
| Financial Support | Yes | 19 | 29.2 |
| | No | 46 | 70.8 |
| Type of amputation | Unilateral | 51 | 78.5 |
| | Bilateral | 14 | 21.5 |
| Level of Amputation | Below knee | 52 | 80.0 |
| | Above knee | 13 | 20.0 |
| Use of assistive devices | Prosthesis | 11 | 16.9 |
| | Wheelchair | 19 | 29.3 |
| | Crutches | 35 | 53.8 |
| Duration since amputation (years) | <2 | 39 | 60.0 |
| | 2–4 | 15 | 23.1 |
| | >4 | 11 | 16.9 |
| Cause of amputation | Injury during war | 49 | 75.4 |
| | Infection followed by injury | 16 | 24.6 |

Table 2
Scores of QOL domains ($n = 65$).

| Domains | Mean \pm SD |
|----------------------------|------------------|
| Environment domain | 15.86 \pm 4.87 |
| Physiological domain | 15.18 \pm 4.86 |
| Psychological domain | 14.66 \pm 4.27 |
| Social relationship domain | 6.64 \pm 2.65 |

Note: QOL, quality of life.

followed by above-knee amputation 13 (20.0%). Most of the participants were with unilateral amputation 51 (78.5%) compared to those with bilateral amputation 14 (21.5%). Assistive devices such as crutches were almost used by half of the amputees (53.8%) and lower limb amputation due to injury during the war was constituted common cause 49 (75.4%).

3.2. Ranking of QOL domains

Results of data analysis indicate that the environment domain obtaining the highest score with a mean of 15.86, while the social relationships domain had the least score among all the domains with a mean score of 6.64 (Table 2).

3.3. Comparison between QOL domains and variables in the demographic details

Table 3 illustrates comparisons of domains of the QOL among patients with various demographic details. There were statistical differences in the social relationships domain of QOL between different age groups ($P = 0.035$). For employment and duration since amputation, there was a significant difference in the psychological domain; patients employed and those with duration >4 years of amputation had higher mean scores than the others with P -value 0.026, 0.027, respectively. The patients with financial

support had higher scores in the physical health domain ($P = 0.001$), psychological domain ($P = 0.001$), and environment domain ($P < 0.001$) than the others. There was a significant difference in the physical health domain between unilateral and bilateral lower limb groups ($P = 0.016$). Scores of the physical health and social relationships domains of amputated regarding infection after injury were higher than those of amputated regarding injury after war ($P = 0.033, 0.031$). Regarding education level, marital status, income, use of assistive devices, and level of amputation, no significant difference was found in any of the QOL domains.

4. Discussion

Lower limb amputation is a major event in an individual's life having challenges and an adverse effect on overall health day-to-day life. The results of this study showed that more than half of the subjects were between 40 and 60 years of age. Research explained that 40 (61.5%) individuals were unemployed, and all of the individuals belonged to the middle class and down, this shows that amputation has a major impact on the possibility of employment, and vocational rehabilitation programs must find effective and useful solutions. The most frequent cause of amputation was injuries during the war (75.4%) and the most common level of amputation was below the knee (80.0%). Numerous studies place trauma as a leading cause of lower limb amputation [26,27] second only to complicated diabetes [28]. In addition to literature shows that the trauma (65.49%) followed by infection (25.16%) as the most common indication of amputation [29] and the lower extremity injuries contribute to over half of all war injuries, resulting in permanent disability [30]. The results of our study can be explained by the fact that the majority of the individuals, were soldiers injured in combat. Although using of prosthesis will enhance the mobility of an individual with lower limb amputation, results of this study revealed that more than half of the amputees (53.8%) were using crutches as assistive devices for mobility, in contrast of

Table 3
Comparison of QOL domains with the variables in the demographic data (Mean \pm SD).

| Variables | | Physiological | Psychological | Social | Environment |
|-----------------------------------|------------------------------|------------------|------------------|-----------------|------------------|
| Age | 20–39 | 16.16 \pm 3.11 | 15.96 \pm 3.62 | 7.52 \pm 1.43 | 16.84 \pm 3.53 |
| | 40–60 | 14.58 \pm 3.23 | 13.85 \pm 3.32 | 6.10 \pm 1.12 | 15.25 \pm 3.44 |
| | <i>t</i> | 1.73 | 3.65 | 4.78 | 1.73 |
| | <i>P</i> | 0.204 | 0.052 | 0.035 | 0.203 |
| Marital Status | Married | 15.89 \pm 3.22 | 15.33 \pm 3.44 | 7.04 \pm 1.46 | 16.49 \pm 3.01 |
| | Unmarried | 13.74 \pm 3.15 | 13.21 \pm 3.42 | 5.79 \pm 1.22 | 14.53 \pm 3.78 |
| | Divorced | 11 \pm 2.69 | 12 \pm 2.08 | 5 \pm 1.09 | 13 \pm 3.53 |
| | <i>F</i> | 1.79 | 1.87 | 1.79 | 1.52 |
| | <i>P</i> | 0.188 | 0.159 | 0.186 | 0.289 |
| Employment | Employed | 16.28 \pm 3.57 | 16.72 \pm 3.78 | 7.44 \pm 1.56 | 16.33 \pm 3.22 |
| | Unemployed | 14.47 \pm 3.49 | 13.58 \pm 3.45 | 6.38 \pm 1.37 | 15.25 \pm 3.43 |
| | Retired | 16.43 \pm 3.39 | 15.57 \pm 3.28 | 6.14 \pm 1.86 | 18.14 \pm 3.23 |
| | <i>F</i> | 1.23 | 7.65 | 1.28 | 1.34 |
| | <i>P</i> | 0.335 | 0.026 | 0.322 | 0.317 |
| Income | Low | 14.65 \pm 3.65 | 15 \pm 3.22 | 7.20 \pm 1.45 | 14.45 \pm 3.29 |
| | Middle | 15.42 \pm 3.43 | 14.51 \pm 3.37 | 6.40 \pm 1.23 | 16.48 \pm 3.83 |
| | High | 15.18 \pm 3.25 | 14.66 \pm 3.28 | 6.64 \pm 3.83 | 15.86 \pm 3.28 |
| | <i>F</i> | 0.72 | 0.59 | 1.46 | 2.08 |
| | <i>P</i> | 0.559 | 0.674 | 0.265 | 0.121 |
| Education | Primary | 13.50 \pm 3.75 | 12.83 \pm 2.63 | 6.66 \pm 1.65 | 15 \pm 3.44 |
| | Preparatory | 14.80 \pm 3.07 | 14.56 \pm 3.22 | 6.86 \pm 1.11 | 15.52 \pm 3.12 |
| | Secondary | 14.78 \pm 3.48 | 14.42 \pm 3.93 | 6.15 \pm 1.32 | 15.42 \pm 3.81 |
| | College | 17 \pm 4.89 | 15.86 \pm 3.86 | 7.20 \pm 1.43 | 17.33 \pm 4.22 |
| | <i>F</i> | 0.98 | 0.76 | 0.51 | 0.65 |
| | <i>P</i> | 0.385 | 0.510 | 0.738 | 0.618 |
| Financial Support | Yes | 18.31 \pm 4.60 | 17.42 \pm 4.55 | 7.26 \pm 3.02 | 19.78 \pm 4.01 |
| | No | 13.89 \pm 3.76 | 13.52 \pm 2.16 | 6.39 \pm 2.11 | 14.23 \pm 3.32 |
| | <i>t</i> | 9.69 | 8.80 | 1.28 | 10.09 |
| | <i>P</i> | 0.001 | 0.001 | 0.321 | <0.001 |
| Type of amputation | Unilateral | 15.94 \pm 4.22 | 15.15 \pm 3.76 | 6.82 \pm 1.12 | 16.21 \pm 3.85 |
| | Bilateral | 12.42 \pm 3.12 | 12.85 \pm 3.88 | 6.00 \pm 1.56 | 14.57 \pm 3.33 |
| | <i>t</i> | 7.72 | 2.82 | 1.39 | 1.46 |
| | <i>P</i> | 0.016 | 0.074 | 0.307 | 0.267 |
| level of Amputation | Below knee | 15.11 \pm 3.21 | 14.65 \pm 3.05 | 6.50 \pm 1.98 | 15.53 \pm 3.11 |
| | Above knee | 15.46 \pm 3.11 | 14.69 \pm 3.42 | 7.23 \pm 1.45 | 17.15 \pm 4.43 |
| | <i>t</i> | 0.32 | 0.12 | 1.12 | 1.58 |
| | <i>P</i> | 0.821 | 0.977 | 0.379 | 0.289 |
| Use of assistive devices | Prosthesis | 15.18 \pm 3.44 | 14.90 \pm 3.12 | 5.81 \pm 1.10 | 16.36 \pm 3.53 |
| | Wheelchair | 13.52 \pm 3.53 | 12.89 \pm 2.34 | 6.00 \pm 1.09 | 14.36 \pm 3.73 |
| | Crutches | 16.08 \pm 3.11 | 15.54 \pm 3.87 | 7.25 \pm 1.56 | 16.51 \pm 3.55 |
| | <i>F</i> | 1.79 | 2.51 | 1.95 | 1.52 |
| | <i>P</i> | 0.184 | 0.091 | 0.132 | 0.287 |
| Duration since amputation (years) | <2 | 15.85 \pm 3.96 | 14.58 \pm 3.06 | 6.94 \pm 1.78 | 15.89 \pm 3.18 |
| | 2–4 | 13.33 \pm 3.86 | 12.86 \pm 2.12 | 5.73 \pm 1.69 | 14.40 \pm 3.56 |
| | >4 | 16.27 \pm 3.54 | 17.36 \pm 4.21 | 6.81 \pm 1.35 | 17.72 \pm 4.43 |
| | <i>F</i> | 1.68 | 7.65 | 1.34 | 1.63 |
| | <i>P</i> | 0.227 | 0.027 | 0.317 | 0.230 |
| Cause of amputation | Injury during war | 14.55 \pm 3.66 | 14.02 \pm 3.34 | 6.51 \pm 1.98 | 15.12 \pm 3.21 |
| | Infection followed by injury | 17.12 \pm 4.34 | 16.62 \pm 3.22 | 7.06 \pm 1.95 | 18.12 \pm 4.56 |
| | <i>t</i> | 3.14 | 4.81 | 0.81 | 4.83 |
| | <i>P</i> | 0.066 | 0.033 | 0.474 | 0.031 |

subjects were using prostheses(83%) in the study conducted by Adegok to determine the QOL of Nigerians with lower limb amputation [31], this result can be explained by the fact that crutches are available and always distributed to war wounding by private and government support institutions in Syria, while the prosthesis is an expensive procedure and not available for all. The result of this study shows that 46.42% of patients experienced moderate QOL. Dajpratham et al. (2011) reported that 5% and 8.3% of the participants having poor and good QOL respectively, and 86.7% had moderate QOL [32]. Results of our study revealed that there is a significant difference between QOL domains and each of the variables: employment, financial support, amputated lower limb, duration since amputation and cause of amputation, in contrast, level of amputation and use of assistive devices had not influenced the domains of QOL in the study. Incongruent study about QOL among Egyptian patients with amputation found that no statistically significant differences are detected among dimensions

of QOL and causes of amputation [33]. Another incongruent study carried out in Malaysia revealed, according to the level of amputation, physical health is better among patients with a through knee amputation compared to those with above-knee amputation [33]. However, similar findings of our study by Htwe in Malaysia had explained that none existing significant differences in the QOL according to the level of amputation [34] and subjects who were presently working showed much better health experiences [35]. Our study showed that married participants had lower QOL, although the literature had offered data opposite of these results, this may be explained to the social support offered by family [32]. In another hand, participants in this study who had no financial support scored had lower QOL. The financial support is considered one of the factors that help the patient's with satisfaction and comfort after lower limb amputation. The environment domain scored the highest, which played the most prominent role in supporting the QOL, followed by the physical health domain and

psychological domain, and the social relationships domain scored the lowest. Nonetheless, This result incongruent with a study by Abdul Razak et al., which found that the psychological domain scored the highest followed by the social relationships, then environment and physical health domain [36]. While that, among the amputees in the study by Hisam, the physical components of health were more severely affected than the mental components (38.7 and 44.8, respectively) [27]. Mathi et al. in another study found that QOL affected among amputees is in the aspects of activity restriction, psychological adjustments while satisfaction with the prosthesis is least affected [37].

5. Conclusion

Amputation adversely affects health-related QOL in multiple ways. This study was designed to describe the QOL of Syrian patients with lower limb amputation after the war. Results revealed that the QOL was moderate. Employment, financial support, amputated lower limb, duration since amputation, and cause of amputation appeared to be the factors that influenced the participants' QOL, these findings may be essential to create new strategies in rehabilitation programs to enhance QOL of patients with lower limb amputation. Nursing and healthcare staff are urged to take responsibility for the care of those patients, and encouragement the necessary collaboration between the health care team to develop interventions and early rehabilitation programs. There is a need for more qualitative studies about experiences of Syrian patients with war-related amputation. Further studies recommended determining physical and psychosocial burdens of lower and upper amputation among Syrian patients. Clinicians and nursing should identify, through researches, barriers, and difficulties in the use of assistive devices such as prosthesis by patients to improve their QOL. However, the primary limitation observed in the current research is the small sample size and the data collection from one hospital in Syria, so the sample comprised essentially from one geographic unit thus other data lies unexplored in this regard. For enhancing generalization, it is suggested to collect data from much more widely diverse geographical locations for sampling.

Declaration of competing interest

The author declared that no conflict of interest exists.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2020.05.001>.

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