

# Quality of Life Following Major Limb Amputations in a Rural Community in Cameroon

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## Abstract

**Background:** Limb amputation is considered the last resort when the limb is no longer salvageable or when the limb is dead or dying, viable but nonfunctional or endangering the patient's life. It is associated with profound economic, social, and psychological effects on the patients. The aim of this study is to evaluate the quality of life of major limb amputees in a rural setting in western Cameroon. **Methods:** This was a cross-sectional descriptive and analytical study carried out at the BATSENGLA-DSCHANG community in the West Region of Cameroon. Participants were interviewed and data collected using a pre-defined accredited questionnaire of the WHOQOL-BREF to assess the quality of life. **Results:** There were 63 participants, and a majority (60.32%) reported trauma as the cause of amputation. Participants with prostheses had a better quality of life. **Conclusion:** The age range of the study participants was 18 to 85 years with a mean of  $46.73 \pm 18.31$  years. The majority were males (74.6%). Most of them (41.27%) had attained at least a secondary level of education, a majority (80.95%) were unemployed and more than half (55.56%) have less than the guaranteed inter-professional minimum wage. Major limb amputations were mostly due to traumatic causes (72%) and involved the lower limbs. Only a few (12.70%) used prostheses. Almost all of them (90.48%) had symptoms consistent with a phantom limb. The quality of life after major limb amputation in this study was generally fair according to the WHO quality of life tool.

## Keywords

Amputation, Limbs, Phantom Limb, Prosthesis, Quality of Life

## 1. Introduction

Major limb amputations are defined as any levels of amputation above the hand and foot [1]. Amputation of the limbs has been reported to be a significantly stressful event for an individual [2] [3]. Loss of a limb has been typically equated with the loss of a spouse [4], the loss of one's perception of wholeness [5], symbolic castration, and even death [6] [7]. Amputation may cause the patient to be severely affected emotionally and result in poor quality of life [8] [9].

Limb amputation is considered the last resort when limb salvage is impossible or when the limb is dead or dying, viable but nonfunctional or endangering the patient's life [10]. The typical indications of amputation include trauma, infections, and neoplasms. Sometimes trauma inflicted during an accident or blast may result in partial amputation which needs to be surgically revised to avoid complications [11].

In developing countries, the knowledge, acceptance and use of prosthesis after limb amputation are poor, moreover, most amputees can scarcely afford prosthetic fittings and therefore, it causes problems of social rehabilitation, which have reasons enough to cause medical, psychological, economic and familial stress [12] [13]. Some of the amputees can be thus left permanently disabled or relying on their families for moral, emotional and physical support [13] [14]. Because of these factors, the promotion of autonomy and quality of life of the amputees constitute a major challenge.

This study aims at evaluating the quality of life of amputees living in a rural setting in the West Region of Cameroon with the expectation that our findings will aid in ameliorating their rehabilitation and reinsertion in society.

## 2. Patients and Methods

### 2.1. Study Design

This was a cross-sectional descriptive and analytical study carried out at the BATSENGLA-DSCHANG community in the West Region of Cameroon. This study was conducted for a period of 3 months (February 2020-May 2020).

### 2.2. Study Setting

Batsengla is a rural community with approximately 45,000 habitants, located near the town of Dschang in the West region of Cameroon. Subsistence farming is the main activity of the inhabitants of this community. The NOTRE DAME DE LA SANTE HOSPITAL is the main hospital found in the Batsengla community and it is managed by the Catholic mission. This hospital has an electronic medical record of all patients, including contact details and clinical information.

### 2.3. Study Population

This study involved patients who reside in Batsengla and who had a major limb amputation in the NOTRE DAME DE LA SANTE HOSPITAL.

Included in this study were:

- 1) Patients who had a major limb amputation at NOTRE DAME DE LA SANTE HOSPITAL between September, 2015 and December, 2019;
- 2) Patients who had a traumatic amputation and were surgically revised at this health facility;
- 3) Patients who gave their consent to participate in the study;

Excluded in the study were:

- 1) Patients previously amputated in other institution but required stump revision;
- 2) Patients not permanently living in Batsengla;
- 3) Amputees less than 18 years old.

#### **2.4. Sampling**

Our target subjects were patients above 18 years old that had a major limb amputation at the NOTRE DAME DE LA SANTE HOSPITAL and residing in Batsengla. Consecutive sampling method was used.

#### **2.5. Ethical Issues**

Ethical clearance was obtained from the Institutional Review Board (IRB) of Faculty of Health Sciences, University of Buea, Cameroon. After which Administrative approvals were obtained from the Faculty of Health Sciences of the University of Buea, NOTRE DAME DE LA SANTE HOSPITAL Batsengla, and the Regional delegation of public health of the West region Cameroon.

#### **2.6. Study Procedure**

Following ethical and administrative approval, the telephone contacts of the amputees were obtained from the hospital records. The aim and study process was explained to them and their consent sought. A home visit was then planned based on their availability. Those who could read and who consented signed the consent form. Those who couldn't read and who consented required a witness who co-signed the consent form.

The WHO pre-defined accredited questionnaire to assess quality of life was used. A data collection tool was used to collect socio-demographic data, clinical history, aspects on quality of life by the means of the WHOQOL-BREF which gives a quality of life profile. The WHOQOLBREF questionnaire contains two items from the Overall QOL and General Health and 24 items that are divided into four domains: Physical health with 7 items (DOM1), psychological health with 6 items (DOM2), social relationships with 3 items (DOM3) and environmental health with 8 items (DOM4). To ensure confidentiality and safety, information was coded and data obtained was stored and securely.

#### **2.7. Data Analysis**

Data was analyzed using Microsoft Excel 2016 and SPSS version 23. Association

between overall quality of life scores categories and dependent variables were evaluated using the Chi-squared test or Fisher exact test for categorical variables and ANOVA or Kruskal Wallis test for continuous variables.

### 3. Results

A total of 84 patients had complete records, amongst which 17 were not reachable by phone calls despite multiple attempts. Four patients didn't provide their consent. A total of 63 patients were finally included in the study.

#### 3.1. Socio-Demographic and Clinical Characteristics

The age range of the study participants was 18 to 85 years with a mean of  $46.73 \pm 18.31$  years. The majority were males (74.6%). Most of them (41.27%) had attained at least a secondary level of education, majority (80.95%) were unemployed and more than half (55.56%) have less than the guaranteed inter-professional minimum wage. Major limb amputations were mostly due to traumatic causes (72%) and involved the lower limbs. Only few (12.70%) used prosthesis. Almost all of them (90.48%) had symptoms consistent with phantom limb.

#### 3.2. Assessment of the Overall Quality of Life of the Amputees

The overall quality of life of the amputees was evaluated to be poor in 25 participants (39.68%), faire in 19 (30.16%), and good in 19 (30.16%). Neither age group, sex, marital status, level of education, occupation nor monthly income significantly influenced participant's overall quality of life (**Table 1**).

Participants with prosthesis had relatively good quality of life compared to those without prosthesis ( $p = 0.020$ ). Majority (72.0%) of those with poor quality of life had trauma as the cause of their amputation. Participants did not differ significantly in their overall quality of life scores with respect to their comorbidities, cause of amputation, level of amputation nor sensation of phantom limb (**Table 2** and **Table 3**).

#### 3.3. Assessment of Quality of Life Domains in the Study Population

The 4 quality of life domains assessed were: physical health, psychological health, social relationship and environmental health. The score was mostly fair in all four domains (**Table 4**)

Highest scores in physical health ( $23.25 \pm 4.94$ ), psychological health ( $20.25 \pm 3.33$ ) and environmental health ( $23.25 \pm 3.31$ ) domains were seen in patients aged between 50 - 59-year-old, meanwhile the same age ranges had the lowest score in social and relationship domains ( $9.50 \pm 1.98$ ). There was a significant statistical difference between ages and physical health psychological health and social relationship ( $p = 0.044$ ,  $p = 0.019$ ,  $p = 0.031$ ) respectively. Extreme age range had the lowest scores in these domains. Sex and level of education did not significantly influence the different domains of quality of life. Profession affect the psychological health significantly ( $p = 0.011$ ) (**Table 4**).

**Table 1.** Assessment of the overall quality of life of the amputees.

Variables	Overall QOL			
	Poor n (%)	Fair n (%)	Good n (%)	P
<b>Age (mean ± SD)</b>	42.96 (18.10)	52.58 (16.62)	45.84 (4.5)	0.221
<b>Sex</b>				
Male	21 (44.70)	13 (27.65)	13 (27.65)	0.46
Female	4 (25.00)	6 (37.50)	6 (37.50)	
<b>Marital status</b>				
Single	9 (50.00)	3 (16.66)	6 (33.33)	0.300
Widowed	0 (0.00)	1 (33.33)	2 (66.66)	
Married	16 (38.09)	15 (35.71)	11 (26.19)	
<b>Level of education</b>				
None	0 (0.00)	1 (50.00)	1 (50.00)	0.580
Primary	8 (55.33)	3 (20.00)	4 (26.67)	
Secondary	8 (30.76)	8 (30.76)	10 (38.48)	
High	9 (45.00)	7 (35.00)	4 (20.00)	
<b>Occupation</b>				
Unemployed	19 (37.25)	16 (31.37)	16 (31.37)	0.810
Private	4 (57.14)	2 (28.57)	1 (14.28)	
Public	2 (40.00)	1 (20.00)	2 (40.00)	
<b>Estimate income (×10<sup>3</sup> FCFA), med (IQR)</b>	50 (40 - 100)	70 (30 - 100)	70 (20 - 200)	0.900

**Table 2.** Assessment of the quality of life of the amputees with respect to co-morbidities and cause of amputation.

Variables	Overall QOL			
	Poor (%)	Fair (%)	Good (%)	p
<b>Comorbidities</b>				
Diabetes	5 (20.00)	9 (47.40)	6 (31.60)	0.410
Hypertension	3 (12.00)	4 (21.10)	3 (15.80)	
Malignancy	3 (12.00)	0 (0.00)	0 (0.00)	
Others	1 (4.00)	0 (0.00)	1 (5.30)	
No comorbidity	14 (56.00)	7 (36.80)	11 (57.90)	
<b>Cause of amputation</b>				
Diabetes	3 (12.00)	4 (21.10)	5 (26.30)	0.190
Trauma	18 (72.00)	11 (57.90)	9 (47.40)	
Others	4 (16.00)	4 (21.10)	5 (28.30)	

**Table 3.** Assessment of life of the amputees with respect to their clinical conditions.

Variables	Overall QOL			P
	Poor n = 25 (39.69%)	Fair n = 19 (30.16%)	Good n = 19 (30.16%)	
<b>Level of amputation</b>				<b>0.750</b>
Below knee	9 (36.00)	11 (57.90)	6 (31.6)	
Above knee	11 (44.00)	6 (31.6)	9 (47.4)	
Below elbow	3 (12.00)	1 (5.3)	2 (10.5)	
Above elbow	2 (8.00)	1 (5.3)	2 (10.5)	
<b>Limb replacement</b>				<b>0.020</b>
None	6 (31.57)	2 (8.0)	4 (21.1)	
Orthosis	13 (68.42)	20 (80.0)	10 (52.6)	
Prosthesis	0 (0.0)	3 (12.0)	5 (26.3)	
<b>Phantom limb</b>				<b>0.410</b>
Yes	24 (96.0)	17 (89.5)	16 (84.2)	
No	1 (4.0)	2 (10.5)	3 (15.8)	
<b>Nuisance by phantom limb</b>				<b>0.350</b>
None	1 (4.0)	2 (10.5)	3 (15.8)	
Little	5 (20.0)	7 (36.8)	8 (42.1)	
Moderate	12 (48.0)	5 (26.3)	6 (31.6)	
Much	7 (28.0)	5 (26.3)	2 (10.5)	
<b>Knowledge on prosthesis</b>				
Yes	22 (88.0)	15 (78.9)	18 (94.7)	0.260
No	37 (12.0)	4 (21.1)	1 (5.3)	
<b>Affordability of prosthesis</b>				
Yes	0 (0.0)	4 (26.7)	13 (33.3)	<b>0.030</b>
No	22 (100.0)	11 (73.3)	6 (66.7)	
<b>Reason if unable to afford prosthesis</b>				
Non availability	3 (13.6)	7 (46.7)	6 (33.3)	0.840
Expensive	19 (86.4)	8 (53.3)	12 (66.7)	
<b>Knowledge on rehabilitation center</b>				
Yes	8 (32.0)	7 (36.8)	11 (42.1)	0.540
No	17 (68.0)	12 (63.2)	8 (57.9)	

**Table 4.** Analysis of the quality of life domains in the study population.

Variables	Quality of life domains			
	Physical health mean (SD)	Psychological mean (SD)	Social relationship mean (SD)	Environmental mean (SD)
<b>Age (years)</b>				
18 - 40	21.54 (5.50)	18.15 (3.57)	10.08 (1.55)	22.38 (4.45)
40 - 49	22.83 (2.64)	18.17 (2.64)	10.00 (1.26)	22.50 (3.62)
50 - 59	23.25 (4.94)	20.25 (3.33)	9.50 (1.98)	23.25 (3.31)
59+	20.79 (4.76)	17.84 (4.48)	10.05 (1.47)	22.74 (4.37)
P-value	<b>0.044</b>	<b>0.019</b>	<b>0.031</b>	0.529
<b>Marital status</b>				
Single	22.72 (4.44)	18.94 (2.53)	10.33 (1.68)	23.61 (3.07)
Widowed	24.67 (7.57)	18.00 (8.66)	9.67 (1.53)	25.67 (1.53)
Married	21.14 (4.97)	18.29 (3.89)	9.81 (1.53)	22.05 (4.44)
P-value	0.311	0.770	0.478	0.170
<b>Sex</b>				
Male	21.72 (4.91)	18.57 (3.64)	10.13 (1.55)	22.51 (4.39)
Female	21.88 (5.21)	18.13 (4.25)	9.44 (1.54)	23.13 (3.03)
P-value	0.826	0.925	0.635	0.671
<b>Level of education</b>				
None	22.00 (8.49)	15.50 (10.61)	9.00 (1.41)	25.00 (1.41)
Primary	22.40 (3.98)	18.53 (3.25)	10.33 (1.63)	22.13 (3.50)
Secondary	22.46 (4.69)	18.88 (3.31)	9.58 (1.68)	23.42 (3.24)
High	20.35 (5.90)	18.15 (4.15)	10.25 (1.33)	21.85 (5.39)
P-value	0.503	0.921	0.285	0.466
<b>Monthly income</b>				
0 - 36,000	22.29 (4.48)	18.29 (3.30)	10.06 (1.47)	23.26 (2.62)
36,000+	21.11 (5.50)	18.68 (4.36)	9.82 (1.70)	21.93 (5.35)
P-value	0.352	0.685	0.558	0.236
<b>Occupation</b>				
Unemployed	22.55 (4.37)	18.86 (3.39)	9.98 (1.63)	23.31 (3.23)
Private	16.43 (6.83)	14.57 (5.13)	9.86 (0.69)	17.43 (5.26)
Public	21.20 (3.63)	19.80 (2.77)	9.80 (2.05)	23.40 (5.68)
P-value	0.136	<b>0.011</b>	0.935	0.077

## 4. Discussion

Limb amputation is one of the most ancient of all surgical procedures with a history of more than 2500 years dating back to the time of Hippocrates [15]. Major limb amputations are essentially disfiguring operations that carry a fairly high perioperative mortality and morbidity and persons who have undergone amputations are often viewed as incomplete individuals [16]. This study was undertaken to evaluate quality of life following major limb amputations in a rural community in the west region of Cameroon. It was found that there is a gross modification in all domains of quality of life after major limb amputation.

### 4.1. Sociodemographic Characteristics of the Amputees

A majority of the participants (74.6%) were males. This high male predominance is similar to findings obtained in previous studies carried out in Cameroon [12] and Nigeria [17]. The mean age of the participants was  $46.73 \pm 18.31$  years, which is similar to those reported by other authors [18] [19]. The most affected age group was 18 - 39 years (41.27%) similar to results of studies in other developing countries [17] [20], and the main reason for amputation in this age group was trauma. This suggests that amputation occurs mainly in the active age group in developing countries probably as a result of the type of occupation and unsafe means of transportation. More than half of the amputees (80.95%) were unemployed at the time of the study, whereas, most of them reported being employed prior to amputation. This makes unemployment a probable direct consequence of amputation, suggesting that amputation has a significant impact on employability of amputees and their income. About half (55.56%) of the participants on a salary, were paid less than conventional inter-professional minimal wage (36,000 Francs CFA).

### 4.2. Factors that Influenced the Overall Quality of Life of the Amputees

Using the WHOQOL-BREF tool, the overall quality of life of the amputees was evaluated to be poor in 25 participants (39.68%), fair in 19 (30.16%), and good in 19 (30.16%). These findings are similar to those of other authors who reported that people living with amputations have significantly poor quality of life [19] [20] [21]. In this study, neither age group, gender, marital status, level of education, occupation nor monthly income significantly influenced participant's overall quality of life. The unemployed participants had a poorer quality of life than the employed ( $p = 0.011$ ). Unemployment may be distressing for the amputee and potentially affect his quality of life. Other authors have reported a direct impact of unemployment status on the quality of life of amputees [19] [20] [21] [22]. Only 12% of the participants used prosthesis. The reasons for not having prosthesis were financial constraints, ignorance, inadequate knowledge and lack of proper education [12] [13]. The participants with prosthetic replacements of their amputated limbs had relatively good quality of life compared to those without prosthesis ( $p = 0.020$ ).

Prosthetic replacement has been found to help amputees develop hope for the future and determination to regain a sense of agency and self-worth [22]. Prosthesis is also viewed by amputees as a valuable tool and/or a part of the body which apart from being a functional element, can also facilitate a psychological continuity, or link with the former self-representation, thereby easing the transition and integration of a new self-representation as described by Lundberg *et al.* [23]. This study revealed no statistical difference between the level of amputation and the quality of life of the amputees. Similar findings were seen in other studies [13] [17]. Some studies have however found that people with upper limb amputations had a better quality of life than those with lower limb amputations [24] [25] [26]. Majority (72.0%) with poor quality of life had trauma as the cause of their amputation. Participants did not differ significantly in their overall quality of life scores with respect to their comorbidities, cause of amputation, level of amputation nor sensation of phantom limb. Conversely, trauma as cause of amputation and phantom limbs symptoms have been found by other authors to significantly affect quality of life of amputees [27] [28].

#### **4.3. Assessment of the Quality of Life Domains of the Amputees**

The 4 quality of life domains assessed included physical health, psychological health, social relationship and environmental health. The scores were mostly fair in all four domains. These low scores can be explained by the fact that over three-quarters of the amputees in this study are mature individuals who are physically strong, who probably suddenly lost a limb at the prime of their lives, and consequently lost their job and family cohesion. Moreover, having suddenly found themselves in a state of dependency and helplessness may have stirred up deep feelings of embarrassment and low self-esteem, thereby affected the quality of life domains [21] [22]. Some of them consider their state as humiliating, and may prefer to isolate themselves whenever possible, from friends and family members [29]. Amputees equally express a lot of anxiety about the uncertainty of the future, losing a spouse, losing their jobs and/or means of existence which can be manifested as a sense of threat, of imminent danger that compels vigilance and thus may cause insomnia, negative cognitions, rumination, stress, and irritability [22]. The use of prosthesis and adequate continual supportive psychosocial support is unquestionably helpful to improve the physical health, psychological health, social relationship and environmental health of amputees [21] [22] [30] [31].

### **5. Conclusion**

The overall quality of life following major limb amputation in rural Cameroon is poor. Amputees should be encouraged to maintain positive self-esteem with the help of measures such as the provision of a prosthesis, re-employment, reintegration, and psycho-social support from immediate family members, friends in the community.

## Limitation

This study included only amputees from a single community around DSCHANG, so this is not a significant representation of the true picture in Cameroon.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] Carmona, G.A., Lacraz, A., Hoffmeyer, P. and Assal, M. (2014) Incidence de l'amputation majeure des membres inférieurs à Genève: Vingt-et-un ans d'observation. *Revue Médicale Suisse*, **10**, 1997-2001.
- [2] Horgan, O. and MacLachlan, M. (2004) Psychosocial Adjustment to Lower-Limb Amputation: A Review. *Disability and Rehabilitation*, **26**, 837-850. <https://doi.org/10.1080/09638280410001708869>
- [3] Solgajová, A., Sollár, T. and Vörösová, G. (2015) Gender, Age and Proactive Coping as Predictors of Coping in Patients with Limb Amputation. *Kontakt*, **17**, e67-e72. <https://doi.org/10.1016/j.kontakt.2015.01.005>
- [4] Parkes, C.M. (1972) Components of the Reaction to Loss of a Lamb, Spouse or Home. *Journal of Psychosomatic Research*, **16**, 343-349. [https://doi.org/10.1016/0022-3999\(72\)90087-6](https://doi.org/10.1016/0022-3999(72)90087-6)
- [5] Kingdon, D. and Pearce, T. (1982) Psychological Assessment and Management of Amputee. In: Banarjee, S., Ed., *Rehabilitation of Management of the Amputees*, Williams Wilkins, Baltimore, 350-371.
- [6] Block, W.E. and Ventur, P.A. (1963) A Study of the Psychoanalytic Concept of Castration Anxiety in Symbolically Castrated Amputees. *Psychiatric Quarterly*, **37**, 518-526. <https://doi.org/10.1007/BF01617750>
- [7] Goldberg, R.T. (1984) New Trends in the Rehabilitation of Lower Extremity Amputees. *Rehabilitation Literature*, **45**, 2-11.
- [8] Melcer, T., Walker, J., Bhatnagar, V., Richard, E., Sechrist II, V.F. and Galarneau, M.A. (2017) Comparison of Four-Year Health Outcomes Following Combat Amputation and Limb Salvage. *PLoS One*, **12**, e0170569. <https://doi.org/10.1371/journal.pone.0170569>
- [9] Sinha, R., van den Heuvel, W.J. and Arokiasamy, P. (2011) Factors Affecting Quality of Life in Lower Limb Amputees. *Prosthetics and Orthotics International*, **35**, 90-96. <https://doi.org/10.1177/0309364610397087>
- [10] Paudel, B., Shrestha, B.K. and Banskota, A.K. (2005) Two Faces of Major Lower Limb Amputations. *Kathmandu University Medical Journal*, **3**, 212-216.
- [11] Tintle, S.M., Keeling, J.J., Shawen, S.B., Forsberg, J.A. and Potter, B.K. (2010) Traumatic and Trauma-Related Amputations: Part I: General Principles and Lower-Extremity Amputations. *The Journal of Bone and Joint Surgery. American Volume*, **92**, 2852-2868. <https://doi.org/10.2106/JBJS.J.00257>
- [12] Pisoh-Tangnyin, C., Farikou, I., Nonga, B.N., Guifo, M., Mbah, S., Ngowe, M.N., Takongmo, S. and Sosso, M. (2013) Epidemiology of Extremity Amputations in Yaounde-Cameroon. *Health Science and Disease*, **11**. <https://www.hsd-fmsb.org/index.php/hsd/article/view/65>
- [13] Ndukwu, C. and Muoneme, C. (2015) Prevalence and Pattern of Major Extremity Amputation in a Tertiary Hospital in Nnewi, South East Nigeria. *Tropical Journal of Medical Research*, **18**, 104-108. <https://doi.org/10.4103/1119-0388.158405>

- [14] Verla, T.G. (2011) Diabetes Related Amputations in the North West Region of Cameroon. Carolina Digital Repository.
- [15] Van der Meij, W.K.N. (1995) No Leg to Stand on Historical Relation between Amputations. *Surgery and Prostheseology*, **1**, 1-256.
- [16] Masood, J., Irfan, A. and Ghulam, M. (2008) Current Indications for Major Lower Limb Amputation. *Pakistan Journal of Surgery*, **24**, 228-231.
- [17] Adegoke, B.A.O., Kehinde, A.O., Akosile, C.O. and Oyeyemi, A.L. (2012) Quality of Life of Nigerians with Unilateral Lower Limb Amputation. *Disability CRB and Inclusive Development Journal*, **23**, 76-89. <https://doi.org/10.5463/dcid.v23i4.192>
- [18] Chalya, P.L., Mabula, J.B., Dass, R.M., Ngayomela, I.H., Chandika, A.B., Mbelenge, N., *et al.* (2012) Major Limb Amputations: A Tertiary Hospital Experience in North-western Tanzania. *Journal of Orthopedic Surgery and Research*, **7**, 18. <https://doi.org/10.1186/1749-799X-7-18>
- [19] Mohammed, S.A. and Shebl, A.M. (2014) Quality of Life among Egyptian Patients with Upper and Lower Limb Amputation: Sex Differences. Hindawi Publishing Corporation, London, 1-8. <https://doi.org/10.1155/2014/674323>
- [20] Pooja, G.D. and Sangeeta, L. (2013) Prevalence and Etiology of Amputation in Kolkata, India: A Retrospective Analysis. *Hong Kong Physiotherapy Journal*, **31**, 36-40. <https://doi.org/10.1016/j.hkpj.2012.12.002>
- [21] Sarroca, N., Valero, J., Deus, J., Casanova, J., Luesma, M.J. and Lahoz, M. (2021) Quality of Life, Body Image and Self-Esteem in Patients with Unilateral Transtibial Amputations. *Scientific Reports*, **11**, Article No. 12559. <https://doi.org/10.1038/s41598-021-91954-1>
- [22] Cătălina, R.A., Constantin, B.C., Vlad, B. and Alexandru, M. (2021) Psychological Consequences in Patients with Amputation of a Limb: An Interpretative-Phenomenological Analysis. *Frontiers in Psychology*, **12**, Article No. 1410. <https://doi.org/10.3389/fpsyg.2021.537493>
- [23] Lundberg, M., Hagberg, K. and Bullington, J. (2011) My Prosthesis as a Part of Me: A Qualitative Analysis of Living with an Osseointegrated Prosthetic Limb. *Prosthetics and Orthotics International*, **35**, 207-214. <https://doi.org/10.1177/0309364611409795>
- [24] Demet, K., Martinet, N., Guillemin, F. and Andre, J.M. (2003) Health Related Quality of Life and Related Factors in 539 Persons with Amputation of Upper and Lower Limb. *Disability and Rehabilitation Journal*, **25**, 480-486. <https://doi.org/10.1080/0963828031000090434>
- [25] Dunn, D.S. (1996) Well-Being Following Amputation: Salutary Effects of Positive Meaning, Optimism, and Control. *Rehabilitation Psychology*, **41**, 285-301. <https://doi.org/10.1037/0090-5550.41.4.285>
- [26] Mireille, N.N. and Nadège, N. (2019) Social Resilience and Self-Esteem among Amputees: A Case Study of Amputees with Positive Self-Esteem. *Journal of Medicine and Clinical Research & Review*, **3**, 1-7. <https://doi.org/10.33425/2639-944X.1088>
- [27] Ali, S., Kaniz, S. and Haider, F. (2017) Psychological Adjustment to Amputation: Variations on the Bases of Sex, Age and Cause of Limb Loss. *Journal of Ayub Medical College Abbottabad*, **29**, 303-307.
- [28] Senra, H., Oliveira, R.A., Leal, I. and Vieira, C. (2012) Beyond the Body Image: A Qualitative Study on How Adults Experience Lower Limb Amputation. *Clinical Rehabilitation*, **26**, 180-190. <https://doi.org/10.1177/0269215511410731>
- [29] Khan, M.J., Dogar, S.F. and Masroor, U. (2018) Family Relations, Quality of Life and

Post-Traumatic Stress among Amputees and Prosthetics. *Pakistan Armed Forces Medical Journal*, **68**, 125-130.

- [30] Zhu, X., Goh, L.J., Chew, E., Lee, M., Bartlam, B. and Dong, L. (2020) Struggling for Normality: Experiences of Patients with Diabetic Lower Extremity Amputations and Post Amputation Wounds in Primary Care. *Primary Health Care Research & Development*, **21**, e63. <https://doi.org/10.1017/S146342362000064X>
- [31] Simsek, N., Ozturk, G.K. and Nahya, Z.N. (2017) Psychosocial Problems and Care of Patients with Amputation. *Eurasian Journal of Medicine and Investigation*, **1**, 6-9. <https://doi.org/10.14744/ejmi.2017.22931>

## Appendix

### The World Health Organization Quality of Life (WHOQOL)-BREF

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#### WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

	Very poor	Poor	Neither poor nor good	Good	Very good
1. How would you rate your quality of life?	1	2	3	4	5
	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2. How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

	Not at all	A little	A moderate amount	Very much	An extreme amount
3. To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4. How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5. How much do you enjoy life?	1	2	3	4	5
6. To what extent do you feel your life to be meaningful?	1	2	3	4	5

	Not at all	A little	A moderate amount	Very much	Extremely
7. How well are you able to concentrate?	1	2	3	4	5
8. How safe do you feel in your daily life?	1	2	3	4	5
9. How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

	Not at all	A little	Moderately	Mostly	Completely
10. Do you have enough energy for everyday life?	1	2	3	4	5
11. Are you able to accept your bodily appearance?	1	2	3	4	5
12. Have you enough money to meet your needs?	1	2	3	4	5
13. How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14. To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

  

	Very poor	Poor	Neither poor nor good	Good	Very good
15. How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

	Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?				
	5	4	3	2	1

**Do you have any comments about the assessment?**

**[The following table should be completed after the interview is finished]**

		Equations for computing domain scores	Raw score	Transformed scores*	
				4 - 20	0 - 100
27.	<b>Domain 1</b>	$(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18$ $\square + \square + \square + \square + \square + \square + \square$	a. =	b:	c:

**Continued**

28.	<b>Domain 2</b>	$Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26)$ $\square + \square + \square + \square + \square + \square$	a. =	b:	c:
29.	<b>Domain 3</b>	$Q20 + Q21 + Q22$ $\square + \square + \square$	a. =	b:	c:
30.	<b>Domain 4</b>	$Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25$ $\square + \square + \square + \square + \square + \square + \square + \square$	a. =	b:	c: