

Research Article

Quality of Life and Depression among Lower Limb Amputees

Anna Zaheer¹, Faiza Sharif², Zeeshan Khan³, Sana Batool⁴, Hussain Iqbal⁵

¹Lecturer, University Institute of Physical Therapy, University of Lahore; ²Assistant Professor, University Institute of Physical Therapy, University of Lahore; ³Medical Officer, Chaudhry Pervaiz Elahi Institute of Cardiology(CPEIC) Multan; ⁴Assistant Professor, University Institute of Physical Therapy, University of Lahore; ⁵Demonstrator, University Institute of Physical Therapy, University of Lahore

Abstract

Background: Amputation is the surgical excision of all or part of extremity. After amputation patient may suffer various physical and psychological consequences. These symptoms may be due to adaptive responses to the emotional experiences of this serious impairment. Amputation certainly results in massive change in life situations of a person; therefore, it is important to assess psychological status as well as quality of their life (QOL) of amputation surgery survivors.

Objective: To measure quality of life and level of depression among lower limb amputees having transtibial or transfemoral amputation. Moreover, to find the correlation between QOL and depression scores of amputees.

Methods: In this study 70 both female and male lower limb amputees participated. To assess QOL of amputees WHOQOL-BREF questionnaire and for assessing status of depression PHQ-9 questionnaire was used.

Results: Mean scores of all domains of QOL questionnaire were: physical (53.44), psychological (56.41), social (60.29) and environmental (54.10). Among all amputees, 55 participants reported to have mild - severe depression. Moreover, strong negative correlation was analyzed between QOL score and depression score of responders (-0.615, p=0.000). Social domain of QOL was strongly correlated with overall QOL score of amputees (0.808, p=0.000).

Conclusions: Amputees participated in this study encountered significant life changes after amputation which adversely effected their quality of life. Many of participants suffered moderate depression. Depression and QOL scores of amputees were negatively correlated (p<0.05).

Corresponding Author | Anna Zaheer: Lecturer, University Institute of Physical Therapy, University of Lahore.

E-mail: annazaheer@yahoo.com

Keywords | Depression, quality of life and amputation.

Introduction

Amputation surgery is the excision of whole extremity or limb or its part i.e. a leg, arm, finger, toe, hand and foot. Trauma is prime reason of leg amputation in developed countries and it's second main prevalent reason of amputation in growing

countries, leading to peripheral artery disease. There are countless causes of amputation which could be vascular such as peripheral artery disease, diabetes, vasculitis or non-vascular conditions i.e. neoplasm, trauma or other pathologies associated with infections.^{1,2} Peripheral neuropathy related diabetic ulceration in foot is chief reason of amputation in

Pakistan while below and above knee amputations are most frequently used.³ Assessing QOL of survivors of amputation surgery is very important indicator as amputation definitely results in a remarkable transformation of the life situations for the person involved. The World Health Organization defines QOL as "Individual's perception of his/her position in routine life in the context of system of principles and culture as well as in relation with common standards and personal goals".⁴ According to a systematic review conducted by Fiona Davie-Smith et. al, QOL is an important outcome in amputees and there are many factors that influences it, some of which are patient's ability to walk with prosthesis, living situation, psychological status, co-morbid diseases, living situation and social life.⁵ While measuring QOL, person may undervalue physical aspect and discomfort, instead more importance may be given to psychological induced problems, these necessities psychological assessment.⁶ Worldwide, depression is the second most important reason of life days spent with disability, and the third leading reason of disability-adjusted life- years caused by adaptive responses of emotional experiences due to impairment.^{7,8} Depression refers to a broad variety of psychological troubles characterized by the deficiency of optimistic approach (a loss of satisfaction and pleasure in everyday experiences), continuous low mood and a variety of related physical, cognitive, psychological symptoms.⁹ A study was conducted on effects of traumatic limb amputation on the mental health of amputees in which researchers concluded that amputees have various psychosocial issues that need to be consider to deliver a better QOL and holistic care. In order to achieve the holistic care, best knowledge about amputees mental and physical condition should be available.¹⁰

According to researcher's best knowledge, most previous studies were cross-sectional and mainly focused only on QOL or psychological assessment and limited evidence is present about association of psychological status of amputees with their overall well-being. Therefore, this study not only assess QOL and depression score but also correlated different aspects of QOL of amputees with their depression status, as distinct attention on mental evaluation and psychological or emotional counselling of amputees is required for improving their self-esteem and moti-

vating them towards better QOL. Due to the high frequency of amputation in Pakistan, there is need to sensitize the community and patient's family about psychological concerns and other domains of QOL of amputees in order to improve rehabilitation of this challenging condition.

Methods

It was a cross-sectional research in which convenient sampling procedure was used to gather responders. Before starting research, permission was taken from higher authorities /ethical committee of institutions and basic knowledge and instructions was given to study population. Patient Health Questionnaire-9 (PHQ-9) and World Health Organization Quality of Life Questionnaires (WHOQOL- BREF) were used to gather data on depression and quality of life. Ethical considerations were taken in account. Participants were given comfortable environment and proper consent form was given to each responder containing detail information about study and researcher's contact detail. Confidentiality of information was maintained and participants were included on the basis of informed consent. Sample size of 86 lower limb amputees was calculated by formula.¹¹ Confidence level was set at 95% and margin of error at 5%. Sample size could not be completed because of limited sources. Total 76 participants fulfilling the study criteria, due to uncomplete data 6 participant's questionnaires were not included, so total lower limb amputation (LLA) participants included was 70. Study was conducted in 6 months after the acceptance of Research proposal. Participants were recruited from orthopedic and surgical units of three government hospitals and two private rehabilitations hospitals of Lahore. Inclusion criteria of study included both genders with more than 18 years of age with either trans-femoral or trans-tibial lower extremity removal surgery. Exclusion criteria of study was infectious stump, pregnancy, lower motor disease, upper motor disease, malignancy and participants having other disabilities. At start questions related demographic information of participants and physiotherapy rehabilitation were included. WHOQOL-BREF was used to measure QOL of the participants. WHOQOL-BREF is multidimensional tool which is very useful to measure quality of life.¹² This tool includes 4 areas of life i.e. psychological, physical health, environmental and social domain and comprised of 26 questions relevant to their perception of all

domains of QOL. It is self-administrated tool but interviewer gave assistance to participants who were not able to read questionnaire. Frequency and level of depression was measured by PHQ-9, which contains 9 questions. It is a valid tool in detecting presence and severity of depression. Each responder can score from 0-27. Depression level (PHQ-9) scoring was categorized as: 0-4 scores = no depressing symptoms, 5-9 scores=mild depressing symptoms, 10-14scores = moderate depressing symptoms, 15-19scores= moderately Severe and 20-27 scores =severe depressing symptoms. Cut-off greater or equal to 10 gives most precision in identifying depression. In total, questionnaire used in this study had 44 questions.

Descriptive statistics of demographic data of participants, domains of WHOQOL-BREF questionnaire, level of depression and correlation statistics was calculated using version 22.0 of SPSS. For quality of life assessment first raw scores were calculated for each individual included in the study, then it was transformed according to QOL-BREF questionnaire transforming score into 100 rules. Means and standard deviations were calculated of all four quality of life domains separately as well as collective overall QOL score. Overall depression score of each participant was calculated. Both values of variable are quantitative, so Pearson correlation was used with p value of 0.05 and CI was 95% to measure correlation between results of different domains of QOL questionnaire and depression statistics.

Results

In this study 70 amputees were required, having either trans-femoral or trans-tibial lower limb amputation. Among all participants 17(24.3%) were females and 53(75.7%) were male. Mean and standard deviation of ages of male and female participants are 37.92, 19.103 and 38.88, 16.603 respectively. From 70 participants 55 participants had depression, among those 2(2.9%) responders had severe depression, 12(17.1%) moderately severe, 20 (28.6%) moderate and 21 (30%) participants reported to have mild depression. Frequency of depression level among male and female participants is given in figure 1. Mean of psychological, physical, environmental and social relationships domains of WHOQOL-BREF are 56.41, 53.44, 54.1 and 60.29 respectively. Mean of overall total quality of life score by adding together scores of all 4 domains is 224.24 and standard

deviation is 59.748. (Table I). Study showed strong negative correlation between depression and the QOL scores. Coefficient of correlation between depression statistics of participants with psychology, physical, environmental and social domains of QOL questionnaire are as follows: -0.454(p 0.000), -0.566 (p0.000), -0.389(p=0.001) and -0.406 (p=0.000) respectively. Negative significant correlation was also seen in depression and scores of physical aspects of QOL that is - 0.566(p 0.00). Results of all areas of QOL and overall QOL scores were correlated with depression score and negative correlation between these measures was observed. Social domain of QOL was seen significantly correlated with Total quality of life score that is 0.808 (p=0.000).

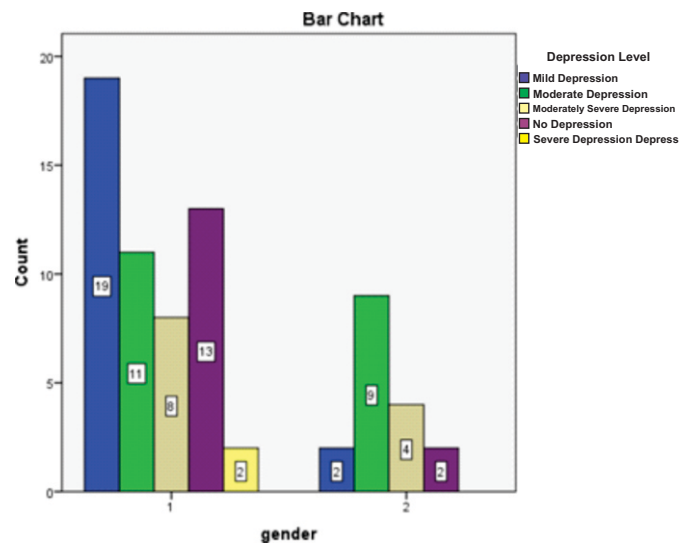


Figure 1: Frequency of Depression Level Among Male and Female Participants

1= male 2 = female

Table 1: Statistics of all Domains of QOL.

WHOQOL- BREF Domains	Number of participants	Range	Min	Max	Mean	SD
Physical domain	70	68	13	81	53.44	18.358
Psychological domain	70	75	25	100	56.41	17.260
Social Domair	70	100	0	100	60.29	28.264
Environmental domain	70	75	19	94	54.10	18.090
Total quality of life score	70	224	132	356	224.24	59.748

Table 2: Correlation of Scores of Domains of Quality of Life and Depression Score

	Depression score (PHQ-9)	Total quality of life Score
Physical domain of WHOQOL - BREF	-0.566 * (p 0.000)	0.670* (p 0.000)
Psychological domain of WHOQOL - BREF	-0.454* (p 0.000)	0.716* (p 0.000)
Social domain of WHOQOL - BREF	-0.406* (p 0.000)	0.808* (p 0.000)
Environmental domain of WHOQOL - BREF	-0.389* (p 0.000)	0.676* (p 0.000)

*Correlation is significant at the 0.01 (2-tailed)

Discussion

In current study QOL and frequency of depression was estimate in 70 amputees having either above or below knee amputation. This study concluded that QOL of the participants was weakened specifically in terms of physical participation in activities mainly due to numerous physical limitations they deal. Fortington et al., studied the change in health related QOL in first 18 months after lower limb amputation. They conducted a prospective longitudinal study comparing the quality of life of amputees with Dutch population normal standards of life, they concluded that QOL improved in 5 out of 7 domains under consideration with time within 6 months but the physical fitness remain low than the population normal norms.¹³

Recent study suggested there is link of psychosocial and physical domains of quality of life. Anxiety is positively correlated with postoperative pain and physical discomfort and residual or phantom limb pain. Katherine A. Raichle et al., also suggested that acutely greater postoperative pain was seen in people having higher level of anxiety prior to operation. Thus preventing phantom limb pain soon after operation can prevent chronic phantom limb pain.¹⁴

In this study most people were suffering from mild depression and were not severely depress, this may be due to the fact that as the time passes people start excepting their bodies, they start adapting their life with the fact that they had lost a limb and depressing thoughts decreases. As a result, as the time passes anxiety and stress related diseases may decrease. It was also investigated in a study performed in India by Sahu E at al.¹⁵ Ghous, Misbah et al., performed a

cross-sectional descriptive study in different hospitals of Rawalpindi and Islamabad. They also found that amputees have mild level of depression.¹⁶ Moreover, those it was seen that people who had good approach to health-related facilities, had fewer negative concepts about their situation with lesser hopeless thoughts.

A cross sectional study was conducted by Mohamad Iqbal M et al. on 196 LLA, this study showed a correlation between QOL and depression measures that multiple factors of QOL such as a good social support, lesser part of limb removed, optimistic personality and lower level of stump pain effects positively on person's positive psychological adjustment of amputation.¹⁷ In current study there was similar significant negative correlation, and there was a report between depression and quality of life score as those who are more stronger physically, having minimal functional limitation, good focusing capacity, more indulged in for recreational activities, having enough information regarding their condition, having plenty of money suffers less from depression.

There was strong positive correlation between social area score and entire QOL score of amputees. This is due to the reason that people having good social life and satisfied with the relationships with their and spouse, family and friends had mental harmony, because they enjoy assistance from family and society in form of emotional support, financial and social support, this reduces depressive thoughts, this depression is negatively correlated with physical aspect of QOL, therefore upgrading overall QOL scores. This is also shown in study conducted by Juszczak M et al., they reported people having social assistance had better QOL, they also had dignity and better activity status.¹⁸ So, in order to achieve holistic care of amputees, knowledge about both mental and physical condition is required.

However, this study included all aspects of QOL and results of all four items of QOL were correlated with total QOL as well as with depression scores. However, small sample size and no follow-up can produce inappropriate results. Moreover, difference among trans-tibial and trans-femoral amputation as well as comparison between people with prosthesis and non-prosthesis users in terms of quality of life and depression was not assessed.

According to researcher's knowledge, most of the studies were cross-sectional and no good prospective data correlating quality of life, anxiety and depression is present, thus this is needed to be address in future studies. Strong negative association between depression and QOL score of amputees represents that specific concentration on psychological evaluation and mental counselling of lower limb amputees is required. This will uplift their self-esteem which may improve their QOL. Moreover, social abolition or absence of social assistance can aggravate this negative situation, therefore rehabilitation team's knowledge about the importance of the amputee's involvement into social life is crucial and should never be ignored.

Conclusion

Amputees participated in this study encountered significant life changes which adversely effected all areas of their quality of life. Participants suffered from mild to moderate depression. QOL and depression scores of amputees were negatively correlated ($p < 0.05$) i.e., those who had high score in depression had low quality of life score and vice versa.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest

Funding Source: None

References

1. Padovani MT, Martins MRI, Venâncio A, Forni JEN. Anxiety, depression and quality of life in individuals with phantom limb pain. *Acta ortop. Bras.* 2015; 23(2):107-110.
2. Ramanaiah J, Pavani M, Reddy NDK, Subrahmanyam S. Limb Salvage In Diabetic Foot Infection. *JEBMH* 2017;4(12):686-689.
3. Assaad-Khalil S, Zaki A, Rehim AA, Megallaa M, Gaber N, Gamal H, et al. Prevalence of diabetic foot disorders and related risk factors among Egyptian subjects with diabetes. *Prim. Care Diabetes.* 2015; 9(4): 297-303.
4. Hye RJ, Mackey A, Hill MD, Voeks JH, Cohen DJ, Wang K, et al. Incidence, outcomes, and effect on quality of life of cranial nerve injury in the Carotid Revascularization Endarterectomy versus Stenting Trial. *JVS.* 2015;61(5):1208-1215.
5. Davie-Smith F, Coulter E, Kennon B, Wyke S, Paul L. Factors influencing quality of life following lower limb amputation for peripheral arterial occlusive disease: a systematic review of the literature. *Prosthet orthot int.* 2017;41(6):537-547.
6. Lam T-wJ, Tang L-cL, Chau W-w, Law S-w, Chan K-m. The Effect of Age, Gender and Socioeconomic Status on Self-esteem, Body Image and Quality of Life of Amputees: An Evaluation Seven Years after the 2008 Sichuan Earthquake. *DCID.* 2018;29(3):32-47.
7. Pedras S, Vilhena E, Carvalho R, Pereira MG. Psychosocial adjustment to a lower limb amputation ten months after surgery. *Rehabil. Psychol.* 2018; 63(3): 418.
8. Kassebaum NJ, Arora M, Barber RM, Bhutta ZA, Brown J, Carter A, et al. Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The Lancet.* 2016;388(10053):1603-1658.
9. Derry HM, Padin AC, Kuo JL, Hughes S, Kiecolt-Glaser JK. Sex differences in depression: does inflammation play a role? *Current psychiatry reports.* 2015;17(10):78.
10. Bhutani S, Bhutani J, Chhabra A, Uppal R. Living with amputation: anxiety and depression correlates. *JCDR.* 2016;10(9):RC09.
11. Hisam A, Ashraf F, Rana MN, Waqar Y, Karim S, Irfan F. Health related quality of life in patients with single lower limb amputation. *JCPSP.* 2016; 26(10): 851-854.
12. Uddin MN, Islam FMA. Psychometric evaluation of an interview-administered version of the WHOQOL-BREF questionnaire for use in a cross-sectional study of a rural district in Bangladesh: an application of Rasch analysis. *BMC Health Serv. Res.* 2019; 19(1): 216.
13. Amtmann D, Morgan SJ, Kim J, Hafner BJ. Health-related profiles of people with lower limb loss. *Arch. Phys. Med. Rehabil.* 2015;96(8):1474-1483.
14. Raichle KA, Osborne TL, Jensen MP, Ehde DM, Smith DG, Robinson LR. Preoperative state anxiety, acute postoperative pain, and analgesic use in persons undergoing lower limb amputation. *Clin J Pain.* 2015; 31(8):699.
15. Sahu A, Sagar R, Sarkar S, Sagar S. Psychological effects of amputation: A review of studies from India. *Ind. Psychiatry J.* 2016;25(1):4.
16. Ghous M, Gul S, Siddiqi FA, Pervaiz S, Bano S. Depression; Prevalence among amputees. *TPMJ.* 2015;22(2):263-266.
17. Iqbal M, Mohamed S, Mohamad M. Depression and Its Associated Factors among Lower Limb Amputees at Hospital Kuala Lumpur and Hospital Sultanah Bahiyah: A Cross Sectional Study. *J Depress Anxiety.* 2019;8(338):2.
18. Juszczak M, Beattie A, Smith M, Nelson L, Maikos J, Bushnik T. The Influence of Social Support on Functional Outcomes and Quality of Life in Lower Limb Amputees. *Arch. Phys. Med. Rehabil.* 2016; 97(10):e61.