RESEARCH ARTICLE

LEVEL OF MOBILITY AND ITS ASSOCIATION WITH QUALITY OF LIFE IN LOWER LIMB AMPUTEES

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ABSTRACT

Objectives: The objective of the study was to explore the levels of mobility and its association with quality of life in lower limb amputees. **Methodology:** A cross-sectional correlational study was conducted at Chal foundation, Fauji Foundation Hospital and PIPOS on the sample of 230 patients for time duration of six months from January–July 2019. The lower limb amputees aged between 18-57 years, and using prosthesis from more than four months were included in the study. The level of mobility was measured through Self-reporting Prosthetic Limb User Survey of Mobility (SF-PLUS-M) questionnaire, while Prosthetic Evaluation Questionnaire (PEQ) was used to determine the Quality of Life (QOL) among prosthesis users. This data was analyzed by SPSS version 21. **Results:** The mean age of study participants was 43±14.89 years**.** The mean PLUS-M score was 39.48±14.33. The results showed a positive significant association between level of mobility and quality of life in lower limb amputees ($p<0.001$). **Conclusion:** The study concluded that in Pakistan lower limb amputees has high level of mobility that contributes in improved quality of life.

Keywords: Lower limb amputation, mobility, quality of life

INTRODUCTION

Lower Limb amputation is a noteworthy health event which has dangerous impact on the health of an individual.[1, 2] Amputation has been done since very old times and as the time passes by, the trends, techniques and technologies are evolving with better care and outcome both pre and post-operatively.[3] Globally, the incidence of amputation either one or both limbs tends to increase. In the national scenario, the 85% of the amputation effects the lower limb.[4] The prevalence of lower limb amputation in Pakistan is ranging from 21% to 48%, [5] however in the United States, approximately 150000 people went through lower limb amputation each year.[6]

The main cause of amputation in Pakistan is terrorism and earthquake also added a burden of amputees on economy of Pakistan[3]. The other causes of amputation are infection, malignancies,[7] diabetes mellitus, peripheral artery diseases, traffics accidents, electric shock, firearms, and agricultural machinery.[4] In developing countries, trauma is the leading cause of amputation, while in developed countries diabetes and vascular diseases are responsible for amputations.[4] A research done in Karachi concluded that vascular diseases were found out to be major cause of amputation which was 63%, trauma was 23.28%, and 13.69% people are effected due to tumors in a civilians[8]. However, a study on armed forces showed that 99% of amputations were due to trauma and only 1% was due to tumors[9].

The mobility level is higher in young amputees as compared to old amputees. Level of amputation also effects mobility and trans-tibial amputees have better mobility as compared to trans-femoral amputees.[10, 11] The patient with amputation had worse perception towards quality of life especially with regard to the dimension of vitality and functional capacity as compared to general population.[12] The ability to walk is considered central to the perception of quality of life,[13] and is the foremost outcome of rehabilitation,[12] as it directly impacts the ability to live independently and community participation.[13] Also, a previous study stresses the importance of maximizing mobility along with quality of life and general satisfaction, with or without prosthesis, in patients with lower limb loss.[14]

In order to be achieving high quality of life, patient must feel pleasure and fulfilment. Quality of life has also been considered closely related to financial, psychosomatic and family aspects.[15] Low self-esteem, weaknesses, social isolation and feeling of being stigmatized are associated with limb loss and results in low quality of life.[16] It is also evident from some previous studies that co-morbidities also effects the ambulation of amputees.[10] Amputees of cardiac and pulmonary patients' have diminished energy level, however prosthetic users required extra energy for ambulation.[11, 17]

Though some studies have been conducted on mobility and quality of life, but very little literature was found from Pakistan. The current study was

aimed to explore level of mobility and its association with quality of life among lower limb amputees.

METHODOLOGY

A cross-sectional correlational study was conducted at Chal Foundation, Fauji Foundation Hospital and PIPOS on the lower limb amputees for a time period of six months. The duration of study was six months after approval of synopsis. The study was initiated after taking an approval from Ethical Review Board (ERB) of Chal Foundation. Informed consent was taken from the study participants and assurance concerning the confidentiality of the data, a total of n=230 patients fulfilling the eligibility criteria were recruited through non-probability convenient sampling technique. The sample size was calculated through Rao Soft online, with 95% confidence interval and 5% margin error.

The lower limb amputees, aged between 18 years and above, and using prosthesis from more than four months were included in the study, While participants having amputation higher than femoral level, systemic and metabolic disease, and diagnosed neurological and psychiatric problem were excluded from the study.

Furthermore, level of mobility and level of amputation of participants was explored. The demographics characteristics were obtained in terms of age, gender and cause of amputation. The level of mobility was measured through Self-reporting Prosthetic Limb User Survey of Mobility (SF-PLUS-M) questionnaire, which constructed validity and reliability.[17] However, Prosthetic Evaluation Questionnaire (PEQ) was used to determine the Quality of Life (QOL) among prosthesis users which is also a valid and reliable tool.[18]

The demographics data was presented as frequency, percentages, mean±SD, while correlation between level of mobility and quality of life was determined through Pearson product-moment correlation coefficient. The level of significance was set p<0.05 and the data were analysed through SPSS 21.

RESULTS

The mean age of study participants was 43±14.89 years. Of the 230 patients, n=191 were males and n=39 were females. Also, n=152 (66%) out of total n=230 participants, had transtibial amputation, n=4(2) participants had knee amputation, n=68 (29.57%) participants had transfemoral amputation while only n=5 (2.43%) had syme amputations. The causes of amputation has been shown figure 1.

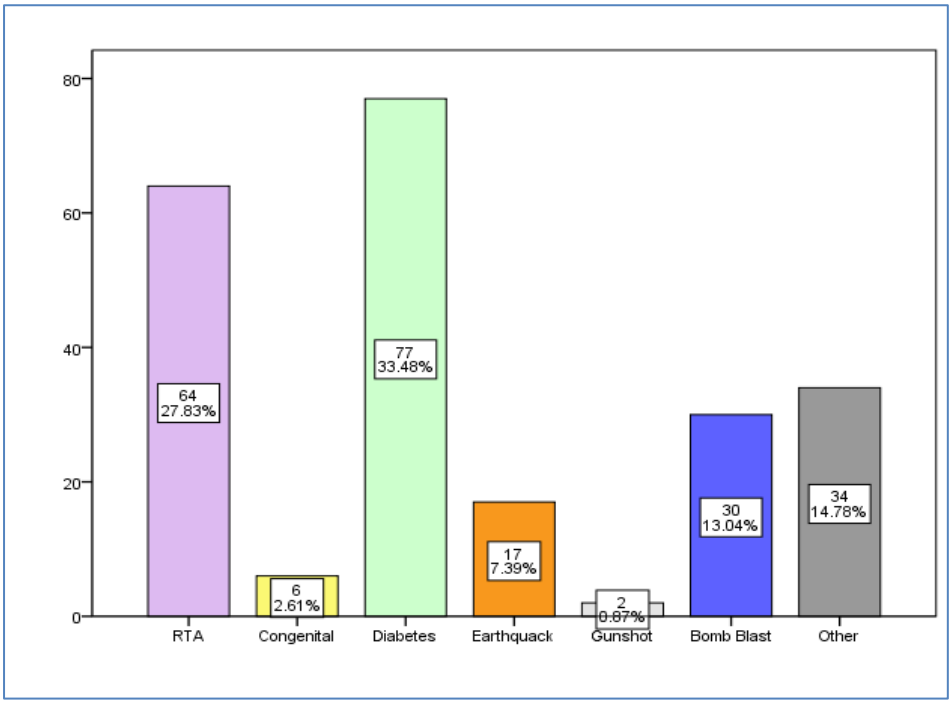

Figure 1: Causes of Amputation

The mean of Prosthetic Limb User Survey of Mobility (PLUS-M) score was 39.48±14.33, which showed that majority of amputees had little or no difficulty with mobility as shown in Figure 2

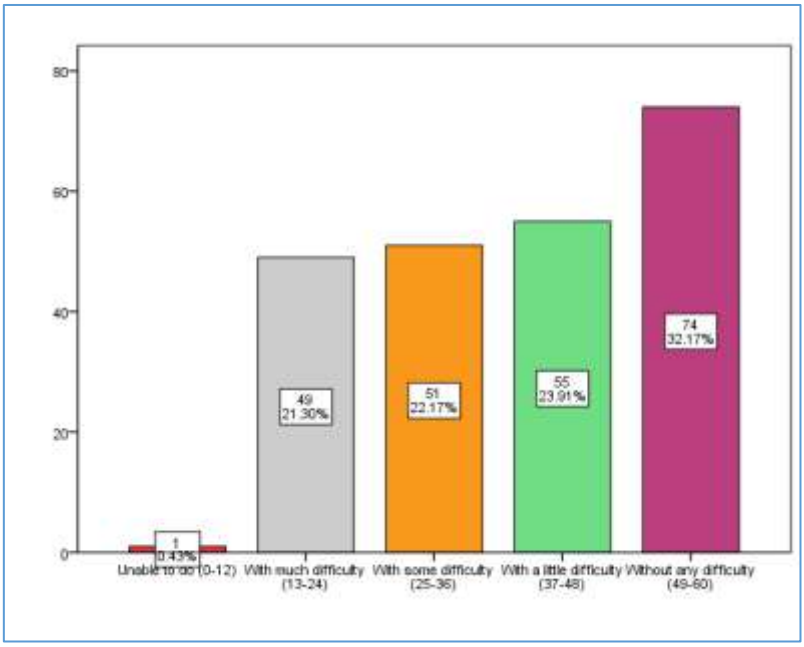

Figure 2: Prosthetic Limb User Survey of Mobility

The results showed strong significant (*p<0.001*) positive correlation between that level of mobility and ambulation (*r=0.81*), Frustration (*r=0.53*) and Social Burden (*r=0.59*). But with other domains of PEQ such as Appearance (*r=0.41*), Perceived Response (*r=0.40*), Residual Limb Health (*r=0.50*), and Sound (*r=0.42*) showed moderate correlation as shown in table 1.

Table 1: Correlation between PEQ & PLUS-M

			PLUS Mobility 39.48±14.33	
Prosthetic Evaluation Questionnaire (PEQ)	**Mean**	**SD**	***r***	***p-value***
Ambulation	59.12	24.37	.816**	*p<0.001*
Appearance	73.98	22.20	.415**	*p<0.001*
Frustration	65.91	30.07	.535**	*p<0.001*
Perceived Response	75.91	25.16	.403**	*p<0.001*
Residual Limb Health	70.36	21.80	.508**	*p<0.001*
Social Burden	65.48	26.64	.596**	*p<0.001*
Sound	73.14	28.62	.420**	*p<0.001*

Significance level: p<0.001

DISCUSSION

The main objective of the study was to explore the level of mobility and its association with quality of life in the patients with lower limb prosthesis. The results showed that majority of amputees had little or no difficulty with mobility. The level of mobility and quality of life was significantly associated to each other.

As the results showed majority of the patients with amputation had little or no difficulty with mobility which also correlates with the previous study conducted by Pereira AM et al. in which significant improvement was observed in functional independence and health related quality of life after mobility training.[20] It has been discussed that to gain the functional independence, post amputation rehabilitation should focus on the disturbance of functional mobility[21] because amputation leads to disability.[20]

Furthermore, Wurdeman SR et al. described the factors which affects the prosthetic mobility such as age, peripheral vascular disease, psychological disorders, previous history of stroke,[22] other than that health of residual skin of limb, pain and socket discomfort may cause hindrance to functional independence.[23]

Moreover, a positive correlation has been found between level of mobility and quality of life. The clinically significant association has been found in domains such as ambulation, appearance, frustration, perceived response, residual limb health, social burden, and sound of prosthetic evaluation questionnaire. In previous study, significant association has been found between mobility and quality of life, which improves satisfaction and functional capacity.[24] A study designed by Shane R Wurdeman et al. to determine the relationship between ambulation, quality of life and satisfaction. And a positive relationship between quality of life, satisfaction and mobility was found.[25] In another study it has been determined that higher the level of mobility the higher would be the quality of life.[26]

Additionally, In a study it was reported that in order to achieve high quality of life, patient must feel fulfilment and pleasures of independency and well-being**,** it has also been considered closely related to economic, psychological and family aspects.[15] A previous study reported the significant improvement in satisfaction, appearance, utility and sound after discharge and follow-up, which was mainly due to rehabilitation protocol. Another correlation was found between quality of life and walking in a confined space,[27] similar to the results of current study.

The main limitation of study is tat there no information included regarding unilateral/bilateral amputation in the study that may affect quality of life differently.

CONCLUSION

The study concluded that in Pakistan lower limb amputees has high level of mobility that contributes in improved quality of life. In future studies it is recommended to incorporate confounding variable to determine level of mobility and it association with quality of life such as age, gender, BMI, laterality, socio-economic status etc.

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