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Original Research Article

Quality of Life in Transtibial Amputees: An Exploratory Study Using TAPES-R Questionnaire

Ezhil Mathi[1], Disha Savla[2], Sreeraj S R[3], Swagatika Mishra[4]

[1]Associate Professor, [2]Final Year Student, [3]Professor, [4]Lecturer,
MGM College of Physiotherapy, Navi Mumbai, India.

Corresponding Author: Sreeraj S R

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ABSTRACT

Background: The Quality of Life (QoL) of individuals with amputation in developed countries have been investigated and reported in literature, but there is a paucity of information on the QoL of people living with amputation in developing countries like India. This study therefore designed to investigate the QoL of subjects with transtibial amputation among Indian population
Methods: Thirty subjects aged between 25-60 years (46.43±12.49) were selected for the study. The objectives of the study were to find out psychological adjustments, activity restriction, satisfaction with the prosthesis and stump pain and phantom limb pain in transtibial amputees by using TAPES-R questionnaire.
Results: The results for Psychological scale shows that adjustment to limitation is most affected with a score of 11.3 followed by social adjustment 14.53 and general adjustment 14.67. Activity restriction results shows that running for bus is affected with a score of 1.8 followed by vigorous activity and sports 1.7 are majorly affected. Satisfaction with prosthesis results shows that the only affected component is weight of the prosthesis giving a score of 2.1. Experience of stump pain, phantom limb pain shows that 43.33% and 10% respectively complained of stump pain.The overall result shows that the activity restriction 76.78% is majorly affected , followed by psychological adjustments 67.60% and Satisfaction with the prosthesis is least affected 93.87%
Conclusion: The amputee individuals are coping psychologically with the event but are restricting themselves from more demanding activities. Stump pain and weight of the prosthesis are preventing the subjects from achieving better independent quality of life.

Keywords: Quality of Life, QoL, Transtibial, Amputation, TAPES-R Questionnaire

INTRODUCTION

Amputation is the surgical removal of a part or whole of a limb, is an acquired condition that results in the loss of a limb or part thereof usually from injury, disease or surgery. [1,2] Globally, 200-500 million amputations are performed annually, with approximately 70,000 of these in the United

States and the incidence of lower limb amputation is also higher than that of the upper limb. [2,3] There is meagre data regarding the overall incidence and etiological background of lower limb amputation in India. [4] It can be postulated that traumatic road accidents would be a significant cause of lower limb amputation. A cross-sectional study reported vehicle accidents as the major cause of amputation [5] and it should be noted that in developing countries, traumatic accidents are the major cause of amputation. [6] Following traumatic accidents, diabetes mellitus is the second major cause of lower limb amputation in India. As per the estimates of the World Diabetes Foundation, about 40,000 lower limb amputations are performed each year in India due to diabetic complications. [7]

Although amputation can be beneficial from a medical point of view, the loss of a limb may have a considerable impact on the patient's health-related quality of life. [8] Amputation leads to a permanent disability and brings a dramatic change in the life and function of the individual. This changed situation is experienced more by the lower limb amputees than by the upper limb amputees. [9] People with lower limb amputation experience multiple challenges which can range from learning how to care for their amputated limb, how to walk, and how to adjust and cope with their limb loss. It seems plausible that given the associated challenges and adjustment that they may experience a change in their quality of life (QoL). [10] The amputation has a significant and drastic change in a person's life; the amputee goes through a cascade of events post amputation from a stage of shock, to acknowledgement, and finally adjustment. [11] Amputation is referred to as triple insult, as it brings loss of function, loss of sensation, and loss or change of body image. [12] This dramatic change has an effect on the QoL of the individual due to the physical activity limitations immediately after amputation as well as has longer-term implications in varied facets of life. It also affects the individuals at psycho-social level, and can have long-term economic implications on the life and opportunities for employment. [13]

A variety of psychometric instruments have been developed to assess psychosocial outcomes specifically associated with lower limb amputation. These include the Trinity Amputation and Prosthesis Experience Scale (TAPES), the Prosthesis Evaluation Questionnaire (PEQ), the Orthotics and Prosthetics Users Survey (OPUS) and the Questionnaire for Persons with a Trans femoral Amputation (Q-TFA). [14] Each of these questionnaires assesses a range of psychosocial, social and physical functioning outcomes. A recent review recommends that all of the instruments undergo further testing and use and suggest that 'the TAPES seems especially useful for assessing psychological adjustments'. [15] The revised TAPES (TAPES-R) incorporated a Rasch analysis across several data sets to further strengthen its psychometric properties. (It is freely available to download: www.tcd.ie/psychoprosthetics). [16] The use of TAPES-R in people with amputation provides reasonably broad assessment of psychosocial, body image and affective function. These self report measures which are relatively quickly and easily administered can be valuable in complimenting routine clinical interviews and in monitoring adaptations and the impact of interventions. [14]

The QoL of individuals with amputation in developed countries have been investigated and reported in literature, but there is a paucity of information on the QoL of people living with amputation in developing countries like India. This study therefore designed to investigate the QoL of

subjects with lower limb amputation among Indian population.

MATERIALS AND METHODS

Thirty subjects aged between 25-60 years (46.43±12.49) from Mumbai and Raigad District of Maharashtra state were selected for the study; out of this 23 were males and 7 females. Subjects who underwent unilateral transtibial amputation using prosthesis for at least 6 months were included for the study. All subjects agreed to participate in this study through a written informed consent. The objectives of the study were to find out psychological adjustments, activity restriction, satisfaction with the prosthesis and stump pain and phantom limb pain in Transtibial amputees. A TAPES-R questionnaire, which has 4 components such as psychological level, activity restriction, satisfaction with prosthesis and experience of stump pain and phantom limb pain was used. Participants' scores for each domain of the TAPES-R questionnaire were obtained and recorded.

Statistical Methods

The data were analysed using Microsoft Excel 2007 version. The TAPES-R scores for each domain were summarised using descriptive statistics of mean, standard deviation, and percentages as appropriate

RESULTS

Average usage hours of prosthesis in them was 9.81 (SD 2.9). The results for Psychological scale shows that (Figure 1) adjustment to limitation is most affected with a score of 11.3 followed by social adjustment at 14.53 and general adjustment at 14.67. Activity restriction results shows that (Figure 2) running for bus with a score of 1.8 followed by vigorous activity and sports with a score of 1.7 each are majorly affected. The least affected activities are hobbies and walking for 100 meters. Satisfaction with prosthesis results shows that (Figure 3) the only affected component is weight of the prosthesis giving a score of 2.1.Experience of stump pain, phantom limb pain shows that (Figure 4) 43.33% complained of stump pain and 10% complained of phantom limb pain with no affection to ADLs.The overall results shows (Figure 5) that the activity restriction with a score of 76.78% is majorly affected , followed by psychological adjustments at 67.60%and Satisfaction with the prosthesis is least affected with 93.87%.

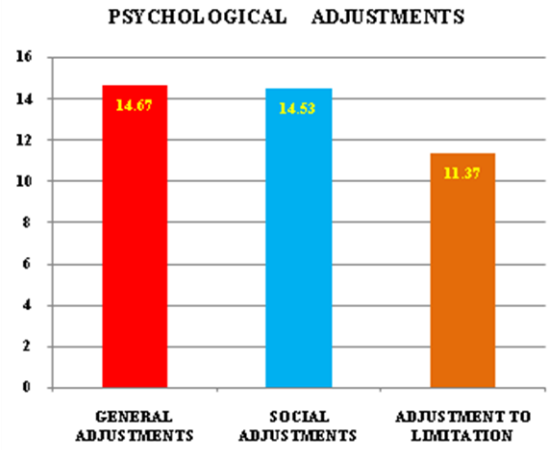

Figure1. The results for Psychological scale shows that adjustment to limitation is most affected with a score of 11.37 followed by social adjustment 14.53 and general adjustment 14.67.

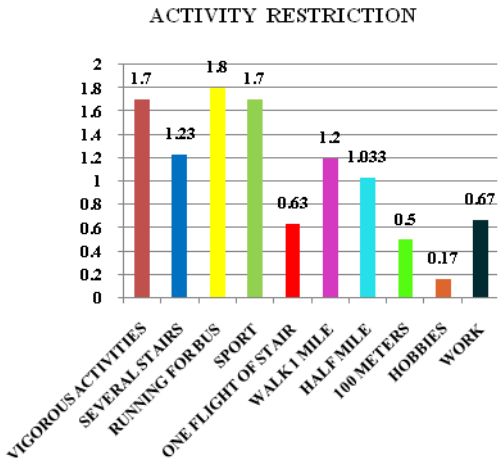

Figure 2. Activity Restriction results shows that running for bus with a score of 1.8 followed by vigorous activity and sports with 1.7 each are majorly affected. The least affected activities are hobbies and walking for 100 meters.

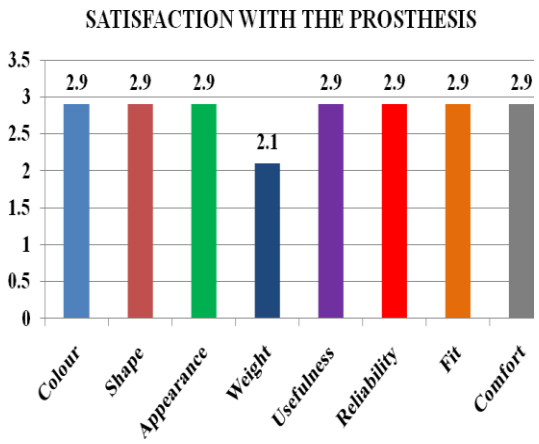

Figure 3. Satisfaction with prosthesis results shows that the only affected component is weight of the prosthesis giving a score of 2.1.

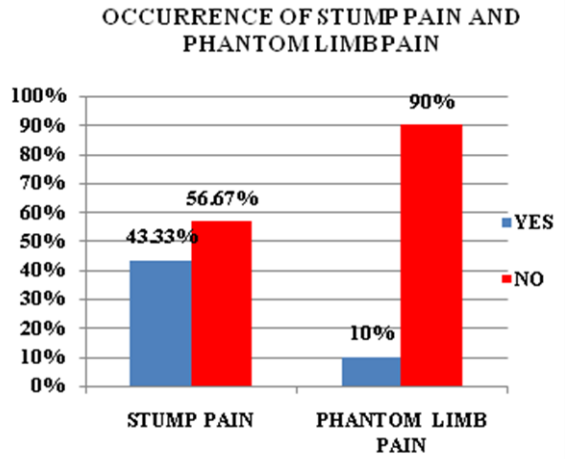

Figure 4. Experience of stump pain, phantom limb pain shows that 43.33% complained of stump pain against 10% complained of phantom limb pain.

DISCUSSION

The Psychological scale shows that adjustment to limitation is most affected followed by social adjustment and general adjustment. Limb amputation can lead to significant psychological and social dysfunction among some individuals, while many others adjust and function well. [17,18] Amputated victims often see themselves as unfit for the society anymore after amputation and people in the society also see them as members of stigmatized group. The reason is that, body image not only provides a sense of ''self'', our body image also affects how we think, act and relate to others. [19] Losing a limb has been found to dramatically change a person's sense of body image and consequently self-image, which has, in turn, been associated with a person's satisfaction with life. [20]

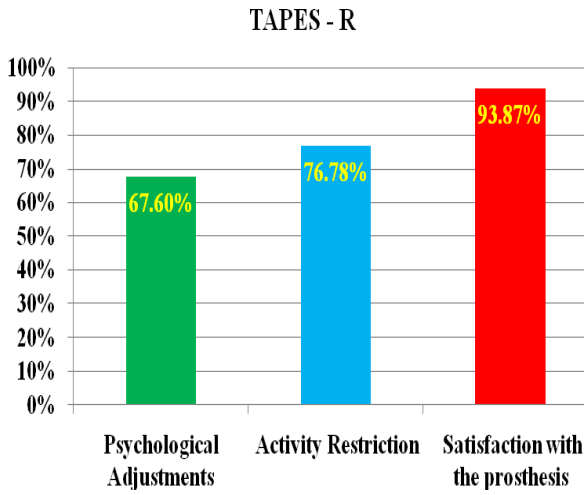

Figure 5. The overall results shows that at 76.78%, activity restriction is majorly affected followed by psychological adjustments at 67.60% and Satisfaction with the prosthesis is least affected with 93.87%.

While most people said that they were independent, they also reported that they had some limitations in doing one or more activities. Most of the respondents show more physically demanding activity like running for bus as most restricted activity and the least affected activities are hobbies and walking for 100 meters. Syme ankle disarticulates and transtibial amputees do have the ability to achieve the same running biomechanics as able-bodied runners. For most amputees, the inability to run is the single most common factor limiting participation in recreational activities, but many amputees do not have a strong desire to run. [21]

There is overall satisfaction with prosthesis results and the only affected component is weight of the prosthesis.It should be noted here that prostheses may be considered "intimate extensions of the

body" and prosthesis users often have a wide range of personal requirements, expectations and priorities. [22,23] Recent advances in prosthetic technology have resulted in prosthetic limbs that weight substantially less than those previously used by amputees. Many researchers have shown that light weight transtibial prosthesis has reduced the energy consumption but also indicated the deviations in the gait parameters of the amputees. [24] It was investigated that there was no need to further decrease the prosthesis mass; on the contrary, heavier prosthesis may result in better gait symmetry. [25,26] But an experimental study done to investigate the effect of a prosthesis mass on metabolic cost and gait performance during level walking suggests that transtibial amputees have a much symmetrical gait pattern and more proficient gait with the added mass to prosthesis. [24] Literature and evidence base supporting on weight of transtibial prosthesis are still lacking. [24]

There were more experience of stump pain than phantom limb pain but there was no affection to ADLs.Stump pain is due to a damaged nerve in the stump region which may eventually form abnormally sensitive and painful regions, called neuromas. For most patients, both the phantom sensations and pain gradually resolve with time compared to stump pain. [27] The result of this study coincide with earlier investigations reported stump pain more than phantom limb in lower limb amputees and the authors concluded that use of prosthesis, comorbidities, phantom limb pain and residual stump pain were found to be other important factors affecting QoL[4]and results of earlier studies suggest that phantom pain has a small impact on health-related quality of life. [8, 28-30]

The overall results shows that Quality of life affected in transtibial amputees majorly is in the domain of activity restriction followed by psychological adjustments and satisfaction with the prosthesis is least affected.The participant group restricted to light activities instead of more demanding activities like runing. The results shows that they are more content with basic ADLs like walking to work, being with hobbies they like etc. Deans et al 2008 suggested that amputee individuals place higher importance on social standing and friendships with family and friends than on physical ability, accomplishing and maintaining social integration is valued much more highly than being physically active or even personal psychological wellbeing. [31]

One component which might restrict them from being more active is stump pain and weight of the prosthesis as reported earlier. The most important amputation specific determinants of health related quality of life in lower limb amputees were 'walking distance' and 'stump pain'. [8]

The concluding suggestion is that apart from incorporating post-operative rehabilitative phase with programmes such as physiotherapy and personalised physical activities measures should be taken to improve perception of body image, self-esteem, sense of control, controlling stump pain and better prosthesis and its usage

CONCLUSION

The result of this study concludes that the amputee individuals are coping psychologically with the event but are restricting themselves from more demanding activities which show lack of motivation as well as stump pain and weight of the prosthesis are preventing the subjects from achieving better independent quality of life.

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REFERENCES

1. Davis WA, Kingston DR, Fyling CP, Gena F. Amputation prevention in an independently reviewed at-risk population. American Journal of Surgery 2003; 160: 454-460.
2. Walter S, Burgess EM, Romemo RC, Zettle JH. The management of lower extremity amputations. Veterans Administration Report 106. 2003. Government Printing Press, New York, USA.
3. Kathryn Ziegler-Graham, Ellen J. MacKenzie, Patti L. Ephraim, Travison TG, Brookmeyer R. Estimating the prevalence of limb loss in the United States: 2005 to 2050. Arch Phys Med Rehabil 2008; 89:422-9.
4. R Sinha, WJA van den Heuvel, P Arokiasamy. Factors affecting quality of life in lower limb amputees. Prosthetics Orthotics International, 2011; 35:4-5.
5. Mansoor I, Margoob MA, Masoodi N, Mushtaq H, Younis T, Hussain A et al. Prevalence of psychiatric comorbidities in traumatic amputees-A cross sectional study from Kashmir (Indian part). Br J Med Pract 2010;3(4):347
6. Esquenazi A. Amputation rehabilitation and prosthetic restoration. From surgery to community reintegration. DisabilRehabil 2004; 26:831-6.
7. Diabetes foot care: step-by-step. Available from: URL: http://www.worlddiabetesfoundation.org /projects/IndiaTanzania-WDF03-056.
8. Van der Schans CP, Geertzen JHB, Schoppen T, Pieter U. Dijkstr PU. Phantom Pain and Health-Related Quality of Life in Lower Limb Amputees. Journal of Pain and Symptom Management 2002;24: 429-433
9. Demet K, Martinet N, Guillemin F, Paysant J, Andre J-M. Health related quality of life and related factors in 539 persons with amputation of upper and lower limb. DisabilRehabil 2003; 25:480-6.
10. Weiss GN, Gorton A, Read RC, Neal LA. Outcomes of lower extremity amputations. JAGS 1990; 38:877–883.
11. Seymour R. Prosthetics and orthotics: lower limb and spinal. Philadelphia: Lippincott Williams & Wilkins; 2002.
12. Horne CE, Neil JA. Quality of life in patients with prosthetic legs: ancomparison study. J ProsthetOrthot 2009;21: 154-9.
13. Gallagher P, O'Donovan M-A, Doyle A, Desmond D. Environmental barriers, activity limitations and participation restrictions experienced by people with major limb amputation. ProsthetOrthotInt 2011;35: 278-84.
14. Kennedy P. The oxford handbook of Rehabilitation Psychology. Oxford University Press. 2012: 358
15. Wolfe DL, Hebert JS, Miller WC, Deathe AB, Devlin M, Pallaveshi L. (2008). Psychological Adjustment to Lower Limb Amputation: An Evaluation of Outcome Measurement Tools. In P. Gallagher, D. M. Desmond & M. MacLachlan (Eds.), Psychoprosthetics 2008; 67-90.
16. Gallagher, P., Franchignoni, F., Giordano, A., &MacLachlan, M. (2010). Trinity Amputation and Prosthesis Experience Scales: A Psychometric Assessment Using Classical Test Theory and Rasch Analysis. American Journal of Physical Medicine & Rehabilitation 2010; 89:487-496.
17. Desmond DM.,MacLachlan M. Affective Distress and Amputation-Related Pain Among Older Men with Long-Term, Traumatic Limb Amputations. Journal of Pain and Symptom Management 2006; 31:362-368.
18. Pezzin L, Dillingham T, MacKenzie E. Rehabilitation and the long-term outcomes of persons with trauma-related amputations. Archives of Physical Medicine and Rehabilitation 2000; 81: 292-300.
19. Jaye W, Rosemarie A.Psychological Factors in Work-Related Amputation:

Considerations for Rehabilitation Counselors. The Journal of Rehabilitation 2004;70: 6-15
20. Saradjian A, Thompson RA, Dipak D. The experience of men using an upper limb prosthesis following amputation: Positive coping and minimizing feeling different. Journal of Disability and Rehabilitation 2008;30:871-883.
21. GaileyJr RS, Clark CR. Atlas of Limb Prosthetics: Surgical, Prosthetic, and Rehabilitation Principles. Chapter 23Physical Therapy Management of Adult Lower-Limb Amputees. . O&P Virtual Library. Available from: http://www.oandplibrary.org/alp/chap23-01.asp
22. Biddiss EA, Chau T. Upper-Limb Prosthetics: Critical Factors in Device Abandonment. American Journal of Physical Medicine & Rehabilitation 2007; 86: 977-987.
23. Smith G, Plettenburg DH. Efficiency of voluntary closing hand and hook prostheses. Prosthetics and Orthotics International 2010; 34:411-427.
24. Lenka P, Biswas D, Kumar S. Impact of Added Prosthetic Mass on Metabolic Cost and Gait in Persons with Unilateral Transtibial Amputation. Indian Journal of Biomechanics2014; 4: 63-69
25. Lehmann JF, Price R, Okumura R, Questad K, deLateur BJ, Negretot A. Mass and Mass-Distribution of Below-Knee Prostheses - Effect on Gait Efficacy and Self-Selected Walking Speed. Arch physMedRehab 1998; 79: 162-168.
26. Selles RW, Johannes BJ, Bussmann, Robert C, Wagenaar H, Stam J. Effects of prosthetic mass and mass distribution on kinematics and energetics of prosthetic gait: A systematic review. Arch phys Med Rehab 1999; 80: 1593-1599.
27. Phantom and stump pain. [Internet] 2000-2011 Continuum Health Partners, Inc.Available from: http://www.stoppain.org/pain_medicine/content/chronicpain/phantom.asp
28. Kooijman CM, Dijkstra PU, Geertzen JHB, et al. Phantom pain and phantom sensations in upper limb amputees. An epidemiological study. Pain 2000; 87:33–41.
29. McCartney CJL, Charles DHM, Cooper GG, et al. Pain and disability following lower limb amputation: a quantitative and qualitative study. Pain Clinic 1999; 11: 293–300.
30. Lerner RK, Esterhai-JL J, Polomano RC, et al. Quality of life assessment of patients with posttraumatic fracture nonunion, chronic refractory osteomyelitis, and lower-extremity amputation. ClinOrthop 1993; 295: 28–36.
31. Deans SA, McFadyen AK, Rowe PJ. Physical activity and quality of life: A study of a lower-limb amputee population. Prosthetics and Orthotics International 2008; 32: 186 – 200.

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