

## ABSTRACT

Ethnic conflict in Sri Lanka has left behind a legacy of thousands of lower limb amputee soldiers. They represent a significant number who continue to need services to make them useful and effective members of society.

Aim of this study was to describe: details of injury leading to lower limb amputation, the management; the functional outcome of lower limb amputee soldiers in terms of use of prostheses, vocational status, self assessed general health, mental health and factors affecting them; and opinions, expectations and experience of amputee soldiers and general public regarding 'rehabilitation'. In order to achieve these objectives, a community based study comprising a cross sectional survey with a comparison group and a qualitative study was conducted in the districts of Anuradhapura and Kurunegala of Sri Lanka.

Strict standardization of methodology to ensure quality was ensured throughout the study. Univariate, bivariate and multivariate analyses were performed to describe the relationships between outcomes and exposure variables and to determine the associations.

The descriptive cross sectional component included all eligible lower limb amputee soldiers resident in the two districts (n=470). An equal number of age and marital status matched employed males were included as comparisons in the comparative cross sectional component of the study.

Using a pre-tested interviewer administered questionnaire socio-demographic details, details of injury and its management, employment and prosthetic use were gathered. Self assessed general health status was assessed using the self-administered Short Form health survey-36. The SF-36 was validated for use in Sri Lanka among amputee soldiers, as a part of this study. General Health Questionnaire -30 and Bradfords Somatic Inventory assessed the mental health. Both these tools are validated for use in Sri Lanka and were used as self-administered questionnaires.

Amputees were young with a mean age of 30.2 ( $\pm$  4.6) years and nearly 80% were married. The study had a preponderance of unilateral below knee amputees (88.5%). Unilateral above knee amputees comprised 10.2% of the sample while bilateral amputees were only 1.3%. Nearly 80% injuries had been due to land mines. Surgical and post surgical management had been in military as well as non-military hospitals

and was found to be inconsistent. All were admitted to 'Ranaviru Sevena' for prosthetic fitting and prosthetic training and all subjects had completed the training.

Only 70% amputees were engaged in gainful employment. Of the employed amputees, 70% were serving the Army. This figure may not reflect a successful employment outcome as there were indications in the qualitative study that they may continue to serve only till period of service required to be eligible for pension is completed. Self employment in the fields of small scale business (30.8%) and three wheeler driving (32.1%) seems to be popular. Of the unemployed, 77% had received vocational training. This training did not seem to be employment-oriented as highlighted with the qualitative data. Difficulty in traveling (73.8%) and working (62.8%) due to disability were given as the reasons for unemployment while multivariate analysis revealed higher education ( $\beta=0.388$ ) as a predictor of unemployment.

Prosthetic use was found to be satisfactory with 98.7% using prosthesis for walking and of these 81.7% used them for more than half of their mobilizations outdoors. Factors affecting the extent of use of prostheses were studied using the theoretical model predisposing, reinforcing and enabling factors in educational diagnosis and evaluation (PRECEDE) as the framework.

Some of the important predisposing factors shown to be associated with less use of prostheses both indoors and outdoors were: higher level of amputation (indoor  $p=0.000$ ; outdoor  $p=0.005$ ); presence of constant pain in the stump (indoor  $p<0.05$ ; outdoor  $p<0.001$ ); and problems of the unaffected leg (cramps: indoor  $p<0.001$ ; outdoor  $p<0.05$  and wounds/ sores: indoor  $p<0.05$ ; outdoor  $p<0.001$ ). In addition to these, relatively older age (30-44 years) ( $\beta= 0.522$ ) was shown to be a significant predictor of less prosthetic use in multivariate analysis.

Of the enabling factors, ability to put on the prosthesis alone (indoors  $p=0.000$ ; outdoors  $p=0.000$ ) and better ability at basic and advanced locomotor activities (indoors  $p<0.001$ ; outdoors  $p<0.001$ ) were significantly associated with higher use of prosthesis. Presence of obstacles to reach the toilet (indoors  $p=0.000$ ; outdoors  $p=0.003$ ) significantly limited use of prosthesis.

Satisfaction with comfort (indoor  $p=0.003$ ; outdoor  $p=0.002$ ) and appearance (indoor  $p=0.03$ ; outdoor  $p=0.04$ ) of prostheses reinforced its use. Pain (indoor

$p < 0.05$ ; outdoor  $p < 0.001$ ) and excessive perspiration (indoor  $p < 0.05$ ; outdoor  $p < 0.001$ ) in the stump due to wearing of the prostheses and mechanical problems (loose socket: indoor  $p < 0.05$ ; outdoor  $p < 0.001$ ) were shown to limit use of prostheses significantly. Social interactions such as participation in outdoor sports (indoor  $p = 0.000$ ; outdoor  $p = 0.000$ ) and indoor sports (indoor  $p = 0.002$ ; outdoor  $p = 0.000$ ) and exercising regularly (indoor  $p = 0.000$ ; outdoor  $p = 0.000$ ) reinforced higher the use of prostheses both indoors and outdoors.

Assessment of physical ( $p < 0.001$ ) and mental ( $p < 0.001$ ) health of amputee soldiers was worse compared to comparison subjects. Physical health was assessed much worse than mental health. Higher level of amputation was shown to be associated with poor physical ( $p = 0.00$ ) and mental ( $p = 0.01$ ) health.

The present study found significantly higher percentage of psychological distress characterized by psychological symptoms (amputees-36.2%; comparisons-9.4%;  $p = 0.001$ ) as assessed using GHQ-30 and somatic symptoms (amputees-14%; comparisons-3.6%;  $p = 0.000$ ) using BSI, among amputee soldiers. Having either attempted or considered suicides (amputees-11.9%; comparisons-6.9%;  $p < 0.05$ ) and being referred to a psychiatrist (amputees-5.5%; comparisons-2.6%;  $p < 0.05$ ) were the other indicators of worse mental health among amputees. Having experienced traumatic situations were significantly ( $p < 0.05$ ) associated with psychological distress among amputee soldiers. Alcohol consumption ( $p = 0.000$ ) and drug dependency ( $p = 0.05$ ) were also found more among amputee soldiers when compared to age matched males.

This study concludes that, in general, overall functional outcome of amputee soldiers was not satisfactory with room for improvement to make them more productive within the context of their physical limitations and thereby relieve the burden to the family, society and to the country to some extent. Several primary and secondary strategies for this purpose are recommended.