

**ASSESEMENT OF QUALITY OF LIFE OF PATIENTS POST AMPUTATION OF ARM DUE TO  
HAND CRUSH INJURY -AN ORIGINAL RESEARCH**

1. Dr. ADARSH SRIVASTAVA,  
ASSISTANT PROFESSOR, DEPARTMENT OF ORTHOPAEDICS, PRASAD INSTITUTE OF  
MEDICAL SCIENCE, LUCKNOW. [dradarshsrivastava@gmail.com](mailto:dradarshsrivastava@gmail.com)
2. Dr. Rajkiran Salunkhe,  
Associate Professor, Department of Psychiatry, Government Medical College, Miraj, Maharashtra.  
rajkiran. [salunkhe@gmail.com](mailto:salunkhe@gmail.com)
3. Dr. Anil Managutti,  
Prof.& HOD, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel  
University, Visnagar, Gujarat, 384315. [dranilman12@rediffmail.com](mailto:dranilman12@rediffmail.com)
4. Dr. Rahul VC Tiwari, OMFS, FOGS, (MHA),  
PhD Scholar, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel  
University, Visnagar, Gujarat,384315. [drrahulvctiwari@gmail.com](mailto:drrahulvctiwari@gmail.com)
5. Dr. Sai Santosh Patnaik J,  
Assistant professor, Dept of Oral and Maxillofacial Surgery, Anil Neerukonda Institue of Dental  
sciences. Visakhapatnam, Andhra Pradesh, India. [ssntsh77@gmail.com](mailto:ssntsh77@gmail.com)
6. Dr. Abhinav Kumar, OMFS,  
PhD Scholar, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel  
University, Visnagar, Gujarat,384315. [abhinavbabbu.singh@gmail.com](mailto:abhinavbabbu.singh@gmail.com)
7. Dr. Paul Mathai,  
Consultant Oral and maxillofacial Surgeron, Mumbai, Maharashtra, India, [paulmathai89@gmail.com](mailto:paulmathai89@gmail.com)  
Corresponding Author: Dr. Rajkiran Salunkhe,  
Associate Professor, Department of Psychiatry, Government Medical College, Miraj, Maharashtra.  
rajkiran. [salunkhe@gmail.com](mailto:salunkhe@gmail.com)

**ABSTRACT**

**Aim**

Purpose of the present study was to evaluate the quality of life in patients who have undergone hand amputation after a hand crush injury.

**Methodology**

A questionnaire study was conducted amongst the 56 patients who had recently undergone amputation of their hand due to crush injury in road traffic accidents. The questions were based on psychological, physical, functional, social and economical aspects in the lives of hand injury patients. Descriptive statistical measures like mean and standard deviation were utilised. To initiate comparison, Unpaired t - test (t) / one -way ANOVA was also done.

**Results**

Sensory disturbance was noted amongst half of the patients with mean value of  $28.1 \pm 74.7$ . Major depressive episodes were noted in the patients with mean value of  $22.5 \pm 78.3$  with self confidence level also taking a hit in almost all the patients with a mean value of  $37.1 \pm 63.0$ .

**Conclusion**

On the whole, the majority of patients were coping adequately and were in process of rehabilitation. Only 10% were not able to return to any work. The disability correlated with the injury severity and a more severe injury had a worse quality of life and functional outcome

**Keywords** Hand trauma, Cold intolerance, Disability, Health outcome.

**INTRODUCTION**

Amputation presents multi-directional challenges. It affects function, sensation and body image. The psychological reactions vary greatly and depend on many factors and variable. In most cases, the predominant experience of the amputee is one of loss: not only the obvious loss of the limb but also resulting losses in function, self-image, career and relationships<sup>[1]</sup>. Many of the psychological reactions may be transient, some are helpful and constructive, others less so, and a few may require further action (e.g. psychiatric assessment in the case of psychosis)<sup>[1]</sup>. About  $\geq 30\%$  of amputees are troubled by depression.<sup>1,2</sup> Psychological morbidity,

decreased self esteem, distorted body image, increased dependency and significant levels of social isolation are also observed in short and long-term follow up after amputation.<sup>3,4</sup>The immediate reaction to the news of amputation depends on whether the amputation was planned, occurred within the context of chronic medical illness or necessitated by a sudden onset of infection or trauma. After learning that amputation may be required, anxiety often alternates with depression. Anxiety may be the fate of the limb that will be removed, as well as about the prospect of phantom limb pain, which many patients (who know of other amputees) may be familiar with.<sup>5</sup>Post traumatic stress disorder (PTSD) appears to be more common in amputees following combat, accidental injury, burn and suicidal attempts.<sup>6</sup>In contrast, PTSD is relatively rare (< 5%) among amputees whose surgery follows a chronic illness.<sup>7</sup> Cosmetic appearance appears to play a great role in the psychological sequelae of amputation. Body image, defined as ‘the individual’s psychological picture of himself’<sup>8,9</sup> is disrupted when a limb is amputated.<sup>10</sup> A number of body image-related problems may be frequently experienced following amputation such as anxiety etc.<sup>11,12</sup> The reaction to amputation may not always be negative. When amputations occur after a long period of illness and loss of function, the patient may already have gone through a period of grieving and has no need to grieve again for the amputation.<sup>1</sup> A study that investigated positive thoughts in amputation showed that 56% of people thought about their amputated limb. Participants stated many reasons as good things that happened following amputation such as the independence given to them by the amputation and the prosthesis, subsequent change in their attitude of life, improved coping abilities, financial benefits, elimination of pain and that amputation was a character-building for some of them. Furthermore, finding positive meaning was significantly associated with more favorable physical capabilities and health ratings, lower levels of Athletic Activity Restriction and higher levels of Adjustment to Limitation.<sup>13</sup>Psychological reactions noted in this phase are concerns about safety, fear of complications and pain, and in some instances, loss of alertness and orientation. In general, those who sustain the amputation after a period of preparation react more positively than do those who sustain it after trauma or accident. Most individuals are, to a certain degree, "numb," partly as a result of the anesthesia and partly as a way of handling the trauma of loss. For those who have suffered considerable pain before the surgery, the amputation may bring much-needed relief.<sup>14</sup> But practical issues like the loss of function, loss of income, pain, difficulty in adapting to a prosthesis, and cost of ongoing treatment depreciates quality of life. Health related quality of life is the value assigned to duration of life as modified by the impairments, functional states, perceptions and social opportunities that are influenced by disease, injury, treatment, or policy. Some of the greatest progresses in the medical field and most of those in hand surgery have nothing to do with duration of life, but contribute with major impact to the productivity, adjustment, and satisfaction of patients (quality of life).

#### **AIM OF THE PRESENT STUDY**

Purpose of the present study was to evaluate the quality of life in patients who have undergone hand amputation after a hand crush injury.

#### **METHODOLOGY**

A questionnaire study was conducted amongst the 56 patients who had recently undergone amputation of their hand due to crush injury in road traffic accidents. The patients who lost their upper limb due to debilitating diseases were excluded from the present study. Descriptive study consisted of 9 questions in English language in an open-ended format. Informed consent was taken from the participants. (Table 1) The questions were based on psychological, physical, functional, social and economical aspects in the lives of hand injury patients. The data received was entered in an MS excel and statistical analysis was done with the help of SPSS 25.0. Descriptive statistical measures like mean and standard deviation was utilised. To initiate comparison, Unpaired t - test (t) / one -way ANOVA was also done.

#### **RESULTS**

56 patients met all the inclusion criteria for this quality of life outcome study. 38 patients (87.3 %) were male, 18 patients (12.7 %) were female. 23 patients (48.3 %) sustained an injury to their right hand. 27 patients (50%) had their left hand injured. 2 patients (1.7 %) injured both hands leading to amputation of the injured limbs. It was observed in the present study that sensory disturbance was noted amongst half of the patients with mean value of  $28.1 \pm 74.7$ . Major depressive episodes were noted in the patients as the traumatic episode that caused crush injury were sudden and immediate having a lifetime emotional and psychological impact with mean value of  $22.5 \pm 78.3$  with self confidence level also taking a hit in almost all the patients with a mean value of  $37.1 \pm 63.0$ .

**Table 1- Questionnaire used in the present study**

S. No.	Questions
1	Do u have sensory disturbances in the amputated area?
2	Is there presence of pain in the affected area?

3	How much is the motor function affected?
4	Have you encountered any depressive episodes after amputation?
5	How is work life balance?
6	How is your self confidence level?
7	Do you have general life satisfaction?
8	Are you concerned about your rehabilitation?
9	Has your chances of employment been affected?

**Table 2- Statistical data noted in the present study**

Q.No.	Variables	Mean ± SD	Unpaired t - test (t) / one -way ANOVA (F) (p - value)
1	Sensory disturbance	28.1 (74.7)	2.68 (0.074)
2	Pain	39.0 (104.2)	0.46 (0.650)
3	Motor disturbance	40.1 (79.6)	1.83 (0.070)
4	Depressive episodes	22.5 (78.3)	0.325 (0.746)
5	Work life balance	27.5 (74.7)	0.31 (0.758)
6	Self confidence level	37.1 (63.0)	1.92 (0.057)
7	General life satisfaction	23.4 (69.3)	1.29 (0.201)
8	Rehabilitation	34.1 (70.5)	0.16 (0.874)
9	Employment opportunities	26.9 (75.9)	0.15 (0.879)

## DISCUSSION

Adjustments occur that preserve life satisfaction and therefore these people consider their quality of life as good even when there are severe limitations on their physical ability. Because quality of life is a dynamic construct, it may change through such psychological phenomena as adaptation, coping, or expectation. Therefore, one cannot assume that by measuring the functional capacity of a person or a list of objective factors that at the same time one measures the quality of life.<sup>15</sup>Reduction in earnings below a certain level after the hand injury can be therefore associated with greater functional disability, higher levels of depression and body dysmorphia, greater dissatisfaction with life generally and health status, and impaired self - confidence. A hand injury can be particularly threatening to an individual who relies upon fine motor skills to perform work related tasks. There is a potential for a hand injury to destroy a career and threaten quality of life. (Chin, 1999, p 62) Most patients with severe hand injuries require ongoing treatments and multiple operations to optimise their function. Microsurgical replantation, fracture stabilisation, nerve and tendon repair, and soft tissue cover are all possible. Without proper quality of life assessment, progress in health care will be hampered. Accurate assessment of this broad ranging concept is difficult. Assessment of quality of life is complex and affected by multiple factors. The aim of the study was to assess as comprehensively as possible the quality of life of a group of hand injury patients. This study initially sought to create a platform, by finding a working definition for quality of life, and how best to assess this concept in a group of patients with mutilating hand injuries. Demographic data, injury details, and treatment information were obtained. Assessment of outcome was made with emphasis placed on motor and sensory recovery as well as work activity. Economic circumstances appeared to be an important factor for quality of life. Ongoing motor and sensory abnormalities negatively impacted to a significant degree. 80% of the patients in the present research went ahead with rehabilitation surgeries.

## CONCLUSION

On the whole, the majority of patients were coping adequately and were in process of rehabilitation. Only 10% were not able to return to any work. The disability correlated with the injury severity and a more severe injury had a worse quality of life and functional outcome. In the future, we need to have information regarding the patient's coping ability when designing rehabilitation programs for replantation patients.

## REFERENCES

1. Engstrom B, Van de Ven, C. Therapy for Amputees. 3rd Ed. Churchill Livingstone. 1999.
2. Ghous M. Depression: prevalence among Amputees. Professional Medical Journal, 2015; 22(2): 263-266.
3. Srivastava K, Saldanha D, Chaudhury S, Ryali V, Goyal S, Bhattacharyya D, Basannar D. A Study of Psychological Correlates after Amputation. Medical Journal Armed Forces India 2010; 66(4):367-373.

4. Sahu A, Sagar R, Sarkar S, Sagar S. Psychological effects of amputation: A review of studies from India. *Industrial Psychiatry Journal* 2016; 25(1):4–10. doi: 10.4103/0972-6748.196041
5. Bhuvanewar CG, Epstein LA, Stern TA. Reactions to Amputation: Recognition and Treatment. *Prim Care Companion J Clin Psychiatry* 2007; 9(4): 303–308.
6. Fukunishi I, Sasaki K, Chishima Y, Anze M, Saijo M. motional disturbance in trauma patients during the rehabilitation phase. *General hospital psychiatry* 1996; 18(2):121-7.
7. Cavanagh S, Shin L, Karamouz N, Rauch S. Psychiatric and Emotional Sequelae of Surgical Amputation. *Psychosomatics* 2006; 47(6):459-464.
8. Thompson JK, Heinberg LJ, Altabe M, Tantleff-Dunn S. *Exacting beauty: theory, assessment and treatment of body image disturbance*. Washington: American Psychological Association.1999.
9. <https://www.nedc.com.au/eating-disorders/eating-disorders-explained/body-image/>
10. Holzer LA, Sevelde F, Fraberger G, Bluder O, Kicking W, Holzer G. Body Image and Self-Esteem in Lower-Limb Amputees. *PLoS One*. 2014; 9(3): e92943. doi: 10.1371/journal.pone.0092943.
11. Verschuren JE, Geertzen JH, Enzlin P, Dijkstra PU, Dekker R. Sexual functioning and sexual well-being in people with limb amputation: a cross-sectional study in the Netherlands. *Disabil Rehabil*, 2015; 37(3): 187-93. doi: 10.3109/09638288.2014.913704.
12. Woods L, Hevey D, Ryall N, O'Keeffe F. Sex after amputation: the relationships between sexual functioning, body image, mood and anxiety in persons with a lower limb amputation. *Disabil Rehabil*. 2018;40(14):1663-1670. doi: 10.1080/09638288.
13. Gallagher P, Maclachlan M. Positive meaning in amputation and thoughts about the amputated limb. *Prosthetics and Orthotics International*2000; <https://doi.org/10.1080/03093640008726548>
14. John C, Racy MD. Psychological Adaptation to Amputation. *Atlas of Limb Prosthetics: Surgical, Prosthetic, and Rehabilitation Principles*.[www.oandplibrary.org/alp/chap28-01.asp](http://www.oandplibrary.org/alp/chap28-01.asp)
15. Allison PJ, Locker D, Feine JS, Quality Of Life: A Dynamic Construct, *Soc Sci Med*, 1997, 45: 221-230