

PSYCHOLOGICAL EFFECTS OF ORTHOPEDIC TRAUMA

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ABSTRACT

Background: Orthopedic trauma has not only impact on physical activity of trauma patients, but it also induces the post-traumatic psychological morbidity. Despite of the mounting evidences that non-injury factors are important in recovery phase of trauma, specific factors associated with clinical outcomes are still poorly understood. Lack of knowledge further complicates the situation to improve the care of orthopedic polytrauma patient.

Objective: Objective was to evaluate psychological effects among patients with orthopedic trauma

Method: Study design was observational Cross-Sectional Study. Study Setting was in Department of orthopaedic surgery Services Hospital Lahore.: A total number of 125 patients having orthopedic trauma with age between 18-75 years were included in the study. A regression analysis was performed to determine the health-related quality of life was done in the patients under study.

Results: Out of 125 patients, 110 patients agreed to participate in the study. Among 110 patients, 90 were males while 20 were females. Patient's physical component summary score was associated with old age ($p < 0.01$), fracture location ($p = 0.03$) and positive symptoms distress ($p < 0.003$). This predicts the 25.45 % of variance in patients with physical component summary score.

Conclusion: The study concluded that orthopedic polytrauma patients, there is a significant relationship between psychological aspects, mental components and the physical components scores. The degree of distress arising from the perception of body dysfunction i.e., pain with dysfunction of musculoskeletal system is significantly associated with their physical component summary score Similarly patient mental component summary score was also associated with their interpersonal sensitivity, phobia, anxiety and emotional upsets.

Key Words: Orthopedic trauma, polytrauma, depression, anxiety.

How to cite this article: Shahid MZI, Syed MK, Khalid M, Akram MR, Hamid, Inamullah S. Psychological effects of orthopedic trauma. Pak Postgrad Med J 2023;35(2): 68-72

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DOI: <https://doi.org/10.51642/ppmj.v35i02.592>

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INTRODUCTION

As a significant increase in traffic, number of patients having road traffic accident are increasing. Orthopedic trauma exerts physical, financial and psychological stresses on the patient and family. ¹ Polytrauma patients comprise a large percentage of hospital admissions and contributes to persistent daily illness such as pain, leading to opioid

dependency, disability, anxiety, depression and post-traumatic stress disorder after musculoskeletal injury.^{1,3}

A lot of physical and technical factors are involved in the treatment of these patients. Longer duration of surgery, rehabilitation time and period of return to pre-injury status are factors which have impact on the psychical behavior of the patients.³ Serious injuries with multiple fractures and amputation are unforeseen live endangering and challenging events. The long duration of physical and mental trauma further aggravates these problems.⁴ Moreover the economic problem and financial burden of family accentuate the mental stress of trauma.

Although physical rehabilitation has provided the relief regarding the functional deficit after traumatic injury but still the psychological factors dramatically affect the emergency management, operative procedures and long term post-operative recovery of the patients.^{5,6} Patients who survive after major trauma suffer from post-traumatic -distress, anxiety, depression and have long term implications on the quality of life. Almost 50 % of the trauma survivors have long term impact of trauma even if the physical injury is treated^{9,10}.

Orthopaedics surgeons treat thousands of patients by adopting surgical or conservative means.⁷ Pain intensity and self-reported disability varies from patient to patient who underwent similar- surgical treatment. Catastrophic thinking, depression and anxiety are associated with self-reported disability and pain in multiple musculoskeletal injuries. In spite of abundant research regarding the significant psychological impacts in care of orthopaedic patients, the efficacy of psychological intervention in improving the pain and disability have not yet been incorporated in orthopaedic practice.⁸ Orthopaedic surgeon can have their role during transition phase by referring such patients to the psychologist for psychological rehabilitation. Surgeons usually discuss the patient disability, treatment of the injury but they refrain from making referral for post-traumatic stresses. The numerous psychological ramifications of trauma including disruption of social contacts with other people, with job and with no guarantee of predictable outcomes.¹¹

The barriers for referral are lack of screening, discussing the psychological problems, lack of belief regarding the psychological problems and considering that medical treatment alone is sufficient for these injuries. Most studies suggest that post traumatic psychological distress is related to the younger age, pre injury psychological illness like anxiety and depression, genetic factors, female sex, poor socioeconomic status and childhood diversities. Although the anxiety at the time of trauma are the strongest predictors of post traumatic stresses. The potential benefits of early intervention by psychologists have resulted in increasing benefits to improve the psychological wellbeing of the patient. Other important parameters are emotions and thoughts which are not only significant but are interlinked that enables the fragmentation of traumatic experience. A greater polymorphism has been suggested in development of post traumatic stresses. The promoter region of SLC 6 A4 which encodes the serolamine transporters constitute a genetic candidate region, responsible for emotional events in traumatic stress. Studies reveal that anxiety disorders as high as 38% in patients with orthopaedic trauma related phobia and severe depression ranges from 20% to 51% after acute trauma^{17,18}. Patients with younger age, unemployment, multiple injuries, unsettled compensation, claims are associated with post traumatic

distress trauma and anxiety. Studies reveal that teaching surgeons about the available resources including cognitive behavioral therapy, mindfulness, training procedures and relaxation techniques are excellent treatment modalities for post traumatic psychological disorders. However, patients who have continuous sign of anxiety, distress and somatization in poly trauma patients have difficulties in rehabilitation in pain control issues with emotional upsets, should be referred to the mental health professionals^{19,20}.

METHODS

After permission from the Hospital Ethical Review Board, 140 patients who received orthopedic trauma were enrolled for the study. After written consent from each patient, psychological symptoms check list with filling the Performa SCL-90-R and SF-36 for health-related quality of life.

Demographic data including age, sex, education level, smoking and alcohol intake was obtained from each patient. Detailed history of injury, location whether single, multiple and open or closed fractures and time elapsed from the injury. Impact of trauma on current status and quality of life of the patient was obtained from the attending surgeon.

SCL-90-R was used to measure the present psychological symptoms status. Nine symptoms like anxiety, hostility, phobia, paranoid behavior, depression emotional upset, inter personal sensitivity, obsessive behavior and somatization were assessed. Global indicators i.e. global severity index, positive symptoms distress index and total positive symptoms also assessed. SCL-90-R is easy to apply and considerable data supports its reliability and validity in orthopedic trauma patient.

For Health-related quality of life regarding the medical outcome we used the SF-36 i.e. self-administered 36 items questionnaire that measure the quality of life after the injury in terms of physical performance-limitations related to the injury and due to emotional upset, pain, general health status, mental health problems, social stability and role of vitality.

All data were assessed with SPSS version 10 chicago 3. Baseline variables were summarized as standard variation. Psychological assessment was assessed with T-score. The SF-36 domains mean score was calculated. An association between independent variables (physical and mental components i.e. score of SF-36) was conducted as univariate regression analysis.

RESULTS

Total 110 patients those fulfilling the inclusion criteria were assessed for psychological aspects, Mean age was 35.8 years +18.2. with range of 18-75 years. 90 patients were males and 20 females. 38 patients belong to poor class, 50 lower middle class and 20 to middle class. Psychological assessment was done after 06 weeks to 1

and half year after the injury. Lower extremity was involved in 56 patients while 24 patients had upper extremity involvement. Operative intervention was successful in 90 patients while in 20 patients with poly trauma it was unsuccessful. Out of these 20 patients, 8 patients had fracture of spine and presented with paraplegia at the time of injury. 6 patients had Gustilo type III fractures and 4 patients had amputation because of uncontrolled infection and gas gangrene.

In current study, 28 patients were diagnosed for psychological distress. These patients were assessed for SCL-90- A. All these 28 patients showed higher level of psychological distress in all primary characteristics of SCL-90-R (63-88 percentile) when compared with normal population

Phobia was 87th percentile when compared with age and sex matched population in the control subjects.

In terms of expression of emotional upsets as physical symptoms, these 28 patients were ranked as 79th percentile (somatization).

Positive symptoms distress was 75th percentile. Patients who were followed for 1 and half year (22 patients), did not show any difference in overall distress compared to those who were followed for less than 1 and half years.

The quality of life related to health measured by SF-36, showed decreased physical component summary score when compared to US-norms i.e: 36.2 Vs 52 (P=0.02) metal component summary score was 46.0 Vs 50 (P=0.01)

Table No.1: Distribution of psychological symptoms among patients

SCL-90-R	T-Score (0-100) Mean+-SD	Normative population percentile	% Meeting Criteria for Diagnosis
Primary Dimensions			
Emotional Upsets	58.1 (9.92)	79	21
Obsessive Dis Order	54.1 (9.92)	63	19
Depression	58.2 (8.8)	79	22
Hostile attitude	55.8 (8.6)	71	25
Anxiety	55.8 (8.5)	70	19
Phobia	63.2 (5.8)	87	19
Paranoid Behaviour	58.1 (9.0)	77	51

The four variables associated with physical component SF-36 identified. These were old age (P=0.01), poor socioeconomic status (P=0.03), fracture location and unsuccessful treatment (P=0.03) and positive distress index (P=0.004) That is 22 percent variability in patients. The physical component summary score was higher in upper limb fracture (40.1 SD 9.9 Vs 34.1 SD 10.8 P= 0.04) than in lower limb fracture. Similarly open and infected fractures had high physical component summary score (P=0.07) similarly Mental component score was significantly associated with the degree inter person sensitivity (P=0.03), phobia P=0.006 and emotional upsets (P=0.02)

Table no.2: Demographic data of patients.

VARIABLES n= 110	Frequency	Percentage
Mean age	35.8 + 18.2	
Gender		
Males	90	81.8
Females	20	18.2
Profession		
Private job	40	36.4
Student	20	18.2
Govt. job	50	45.4
Socioeconomic status		
Poor class	38	34.5
Lower middle class	50	45.4
Middle class	22	20.1
Fractures		
Pelvis	20	18.2
Spine	10	9.1
Lower extremity	56	50.9
Upper extremity	24	21.8
Type of Fracture		
Polytrauma	90	81.8
Single bone fracture	20	18.2
Follow up		
<4 months	50	45.4
>1 year	60	44.6
Surgical Procedure Success		
Successful	90	81.8
Unsuccessful	20	18.2
Smoking		
Yes	52	47.3
No	58	52.7
Alcohol users		
Yes	20	18.2
No	90	81.8

DISCUSSION

In the present study patients had higher than normal level of psychological distress in all primary characteristics of SCL-90-R specially phobia and emotional upsets as a dependent variable. We used mental component summary score i.e., SF-36 was significantly associated with socioeconomic status, litigation, fracture location and severity of psychological symptoms^{10,11,12}. Our study reveals that 25.45 % of the patients with orthopaedic trauma have psychological illness which is consistent with lot of other studies^{2,7,8,9}.

In a study conducted by K-Kang et al. for psychological effects of musculoskeletal trauma, they came to the conclusion that post-traumatic stress disorder and depression are greater than general adult Cohort. It contributes to daily pain as an Illness, disability & complications of increased depression, anxiety, opioid dependency & post-traumatic distress. Improving the resilience social rehabilitation, positive cognitive behavioral therapy, Self-efficacy & mindfulness training has important role in improving the health-related quality of life.¹ Similar results were detected in our study.

In opinion of Heather K et al. Long term pain psychological factors such as post-traumatic stress, distress, anxiety, catastrophic thinking and depression are associated with orthopaedic trauma. Options for distress

reduction or patient counselling, coping skills for pain, mindfulness, and group discussion with information about trauma and recovery process can help the patients to come out of these stresses³.

In a cross-sectional study at Dilla university hospital Ethiopia, A. Henok et al came to the conclusion that psychological distress in orthopaedic patients was high in females, patients with poor economic social status, poor social support and in patients with poor sleep quality⁶.

In view of B. Waseem et al. 1/3rd of patients with severe lower limb injury developed post-traumatic stress disorders. Younger patients are more prone to develop psychological symptoms. Psychological support to overcome their distress is recommended⁴.

In a study conducted by S. Ambrish et al. in 2016 regarding his study on depressive and anxiety symptoms with orthopaedic patients, they came to the conclusion that anxiety symptoms are found pre dominantly in early phase of trauma while depressive symptoms are detected in the later phase of acute orthopaedic trauma. It is recommended that anxiety and depression should be detected earlier to institute psychotherapy or psychiatric medication to improve the mental and physical recovery⁵. Results of this study are consistent with our study.

All these studies suggest that Polytrauma patients with pain and disability both mental and physical result in significant psycho social dysfunction and loss of productivity. They should be treated with psychological support, early psychological evaluation with early psychological rehabilitation to improve the associated morbidity^{13,14,15,16}. This suggests that even moderate reduction in pain, psychological and physical impairment result in socio-economic benefits including reduction of opioids for chronic pain^{17,18,19,20}.

CONCLUSION

It was concluded from the study that in orthopaedic Polytrauma patients, there is a continuous relation between psychological aspects, mental components and the physical components scores according to SCL-90-R and SF-36. Mental component score was significantly associated with the degree inter person sensitivity, phobia, and emotional upsets. Psychosocial factors, poor socio-economic status, female sex, litigation, location of fractures, and psychosocial morbidity were associated with reduced health related quality of life. The physical component summary score was higher in upper limb than lower limb.

ETHICAL APPROVAL

Ethical approval for this study was obtained from ethical review board services hospital Lahore.

LIMITATIONS OF THE STUDY

In our study we used the patiently predictable variables and outcomes at the same time. Further our study did not mention the complications, time for fracture healing and re-admission of patient as possible variables affecting the outcomes and psychological disorders. No data was collected for pre-injury psychological illness. A prospective study with multiple follow ups for psychological assessment is needed to resolve the issue.

ACKNOWLEDGMENT

We are highly obliged to department of orthopaedic surgery services hospital Lahore who provided us access to data of patients.

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AUTHOR'S CONTRIBUTIONS

MZIS: Conceptualization of the Project

MKS: Data collection

MK: Literature research

MRA: Statistical analysis

MSH: Drafting, revision

SI: Manuscript writing