

A Prospective Study of Post-Operative Health Related Quality of Life in Orthopaedic Trauma Patients.

Rajendra Kumar Dhamania¹, Rohan Patil², Pramod P Neema³, Vinay Tantuway¹, Murtuza Rassiwal²

¹Consultant, Department of Orthopaedic Surgeon, Arthros Clinic, Sahj Hospitals, Indore.

²Resident, Department of Orthopaedics, Unique Super Speciality Centre, Indore, Madhya Pradesh.

³HOD, Department of Orthopaedics, Unique Super Speciality Centre, Indore, Madhya Pradesh.

Received: October 2018

Accepted: October 2018

Copyright: © the author(s), publisher. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Trauma is one of the leading public health problems and the most common avoidable cause of death among children and adults up to age 45 years. For every trauma, several thousand injured people seek medical attention. Survivors incur temporary or permanent impairments and disabilities resulting in human suffering, major social consequences and economic costs for the individual, families and society. Measuring outcome after the Orthopaedic surgery is important for many reasons, particularly its one measure of effectiveness of surgical treatment and support that has been offered and standard of care taken. As trauma care has improved substantially during recent decades and has led to higher survival rates there has also been an increasing focus on the patient's perceived Health-Related Quality Of Life (HRQOL) as an outcome after trauma. **Methods:** A prospective cohort study of hospitalized trauma patients who were operated at our centre for different levels of injury was performed during March 2016 to June 2017. We included 200 patients on the basis of inclusion criteria who were enrolled at the outpatient department (OPD), ward & casualty. Informed consent was taken from all patients and clearance from ethical committee was taken. Preoperative evaluation of HRQOL was done with 36 Item Short Form Health Survey (SF36) questionnaire. Same questionnaire was filled up at the time of follow up after 1 month, 3 months and 6 months. At home interviews were done in selected patients who because of some reasons were unable to come for follow up. **Results:** Out of 200 patients, lower limb was operated in 133 patients and 67 cases were operated for upper limb trauma; the most commonly performed surgery being proximal femoral nailing (22 cases). The SF-36 mean score of 200 patients pre operatively was 20.50 which postoperatively at six months improved to 83.59. The highest percentage improvement was recorded for role limitation due to emotional problem. Highest percentage of improvement in SF-36 mean score was seen in 18 to 33 year age group patients (78.77%) while lowest percentage improvement was seen in 50 to 65 year age group (72.74%). Males have shown better improvement in Mean scores as compared to females. There was no significant difference in pre operative mean scores in upper limb trauma patients (20.16) and lower limb trauma patients (20.29). Patients operated with closed reduction internal fixation or external fixation had higher pre operative mean score (21.24) & post operative mean score (85.39) than those who were operated with open reduction internal fixation (19.47 and 83.99 respectively); but the percentage improvement was slightly better in open reduction cases (76.81%) than closed reduction cases (75.13%). **Conclusion:** The study was conducted to determine whether the patient was satisfied or not after surgery done for Orthopaedic traumatic conditions. It was noted in the study that young age group patients showed better improvement in all aspects of Health. Both physical and mental scale improvement was more in 18 to 33 year age group patients; which decreased in second age group 34 to 50 year age group and was lowest in 50 to 65 year age group patients. The study indicated better and fast improvement in male patients as compared to females. Upper limb trauma patients showed better scores and healing than lower limb trauma patients in post operative period. Patients operated with closed reduction internal fixation or external fixation had higher pre operative mean score & post operative mean score than those who were operated with open reduction internal fixation but the percentage improvement was slightly better in open reduction cases than closed reduction cases. Good functional outcome after Orthopaedic Surgery measured in the form of SF-36 is related to many variables such as Proper surgical procedure, aseptic environment and good choice of implant, timing of surgery, post operative rehabilitation program, proper psychological counseling and regular follow ups. When all the above mentioned variables are managed and planned accordingly, the surgical intervention leads to tremendous improvement in both physical and mental health of the patients which can be measured and recorded in the form of SF-36 Health survey. The study supports the requirement of proper surgical intervention against conservative treatments for the limb injuries involving major Orthopaedic trauma to achieve better long term functional outcomes.

Keywords: HRQOL, SF-36, Trauma.

INTRODUCTION

Trauma is one of the leading public health problems and the most common avoidable cause of death among children and adults up to age 45 years. The World Health Organization reports that more than 5 million people die from injury every year, accounting for 9% of global mortality. Over 100 million people visit annually emergency departments in the India, with about 36% of the visits to trauma centers.^[1,2]

Survivors incur temporary or permanent impairments and disabilities resulting in human suffering, major social consequences and economic costs for the individual, families and society. Health Related Quality Of Life is defined as the level of well being and satisfaction associated with person's life and how it is affected by disease, accident and treatment. It is a multidimensional concept including aspects of life that are not generally considered as Health, such as income, freedom and quality of environment.^[3] Measuring outcome after the Orthopaedic surgery is important for many reasons, as it is a measure of effectiveness of the surgical treatment and support that has been offered and standard of care taken.

There are growing evidences that trauma patients have impaired HRQOL after trauma compared with reported pre-injury levels and with HRQOL in general populations but there are limited studies that compared the HRQOL between Upper and Lower limb injuries.^[4-6] A number of questionnaires have been developed to evaluate HRQOL and the 36-item Short Form Health Survey (SF-36) is the most commonly used one.^[7] Originally developed as a multipurpose health survey instrument, SF36 has been translated in more than 50 countries as part of international quality of life assessment project and has become the most extensively validated and used generic instrument for measuring quality of life. SF-36 has been proven useful in monitoring population health, estimating the burdens of different diseases and injury, monitoring outcome in clinical practice, and evaluating medical treatment effects.

Although many studies have made a contribution to the understanding of health-related quality of life, most of these studies that focus on the relationship between quality of life and health, concentrate primarily on objective indicators, such as sickness, income levels and social status.

Although patients with minor injuries contribute to a large part of the health burden among adults,^[8]

there is less documentation regarding the impact of minor injuries on HRQOL and in particular, few studies have been performed in populations with the whole range of injury severity. Studying a mixed trauma population with different levels of injury severity provides an opportunity to investigate the impact of the relative contribution of physical and mental factors to HRQOL. Also, increased knowledge of HRQOL predictors after trauma may enable us to optimize and individually tailor interventions at an early stage in treatment and rehabilitation.

The predictors of good HRQOL after trauma previously reported include lower age male gender absence of pre-existing disease lower ISS lower number of injuries absence of hip/lower extremity fracture or spine injury short hospital stay not having been admitted to an ICU and absence of head injury.^[11-18]

To assess the relative contribution of physical and mental factors after trauma to HRQOL, it is also important to investigate the impact of psychological distress in these patients. There is also a need for more information about the consequences of injury in order to give sufficient prognostic information to patients, their families, insurance companies, and government agencies.

This study was designed to eliminate some of the deficiencies in our knowledge about the consequences of trauma. In this study, we aimed to appraise the HRQOL of trauma patients and identify the factors affecting the HRQOL among them with Upper limb and Lower limb injuries.

MATERIALS AND METHODS

A prospective cohort study of hospitalized trauma patients who were operated at Unique Super speciality Centre, Indore for different levels of injury was performed during March 2016 to June 2017. We included 200 patients during this period of time for the study who were enrolled at the outpatient department (OPD), ward & casualty. After screening, the patients were assessed and enrolled for the study. An informed consent was taken from all the patients included in the study.

Inclusion Criteria

- Adult patients from 18 to 65 year with upper & lower limb fractures.
- Adult of both the sexes are included in the study.
- Patients fit for surgery.
- Patients who were admitted for minimum 2 days in Hospital.
- Patients who were operated with Closed or Open reduction at the institute.
- Patients with follow up of minimum 6 months.

Exclusion Criteria

- Patients less than 18 years of age and more than 65 years of age.

Name & Address of Corresponding Author

Dr. Murtuza Rassiwala
Resident, Department of Orthopaedics,
Unique Super Speciality Centre,
Indore,
Madhya Pradesh.

- b) Patients with fracture involving more than one limb.
- c) Patients who were operated for replacement surgeries.
- d) Patients not willing for surgery.
- e) Patients medically unfit or denying for surgery.
- f) Patients with fractures involving small bones & Vertebrae.
- g) Patients with severe psychiatric disorders.
- h) Patients with severe head injury causing cognitive impairment influencing the ability to answer the questionnaire.

Preoperative evaluation of HRQOL was done with 36 Item Short Form Health Survey (SF36) questionnaire. SF-36 is a generic 36 item questionnaire which measures following 8 dimensions:-

- 1) Physical functioning
- 2) Social functioning
- 3) Role limitations because of physical problems
- 4) Role limitation because of emotional problems
- 5) Bodily pain
- 6) General health perceptions
- 7) Vitality
- 8) General mental health

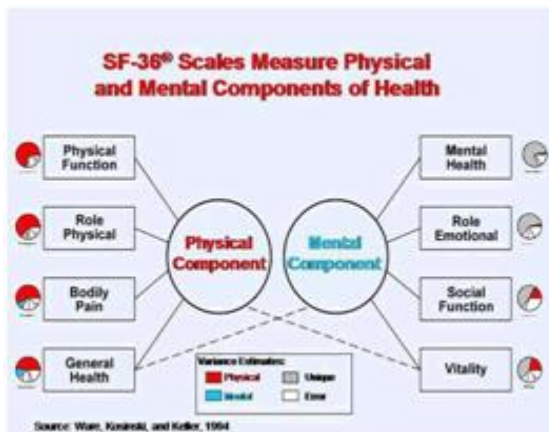


Figure 1: SF36 Scale

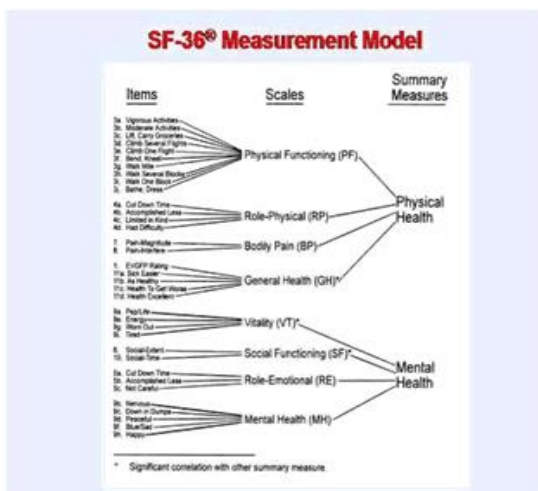


Figure 2: SF36 Measurement Model

SF-36 items are scored in the following steps:

- 1) Item recoding
- 2) Computing scale scores by summing across items in the same scale (raw scale scores)
- 3) Transforming raw scale scores to a 0-100 scale (transformed scale scores)

We followed the recommendation that at least 50 percent of the items in a given scale must be present for calculation of the scale score. At baseline i.e. on the day before surgery, the first SF36 questionnaire was given to the patient at the ward.

Before discharging the patient from the hospital the eligible patients were given with the information regarding the study & were requested to participate in the study.

Follow up Data Collection

Same questionnaire was filled up from the patients at the time of follow up after 1 month, 3 months and 6 months of surgery. At home interviews were done in selected patients who because of some reasons were unable to come for follow up. Clinical evaluation was done using SF-36 Health Survey.

Data collection and Statistical analysis

Using the SF 36 Score and the score was graded as follows:

The SF-36 consists of eight scaled scores, which are the weighted sums of the questions in their section. Each scale is directly transformed into a 0-100 scale on the assumption that each question carries equal weight. The lower the score more is the disability. The higher the score the less disability i.e., a score of zero is equivalent to maximum disability and a score of 100 is equivalent to no disability.

Descriptive statistics were obtained for mean, standard deviation and other relevant parameters. Mean co-relation between scores at preoperative and postoperative levels were evaluated using student's t-test. Inter-correlation between preoperative and postoperative scores at six months level was evaluated to test the efficacy of the surgery.

Study End-point: 6 months follow up.

RESULTS

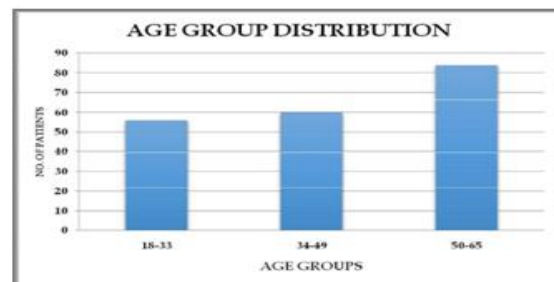


Figure 3: Graphical Representation of Frequency Age distribution in Study group

1. **Frequency distribution of age group in the study:-**

Most of the patients were of 50 to 65 year age group. (42%) The highest frequency for age was 65 year with 8% incidence followed by age 18 and 40 year with 6.5% incidence. Mean age was 43.79 year with standard deviation of 14.90.

2. **Sex Distribution:-**

Male sex had predominance in the study group. Out of 200 patients 144 were male (72%) and 56 were females (28%)

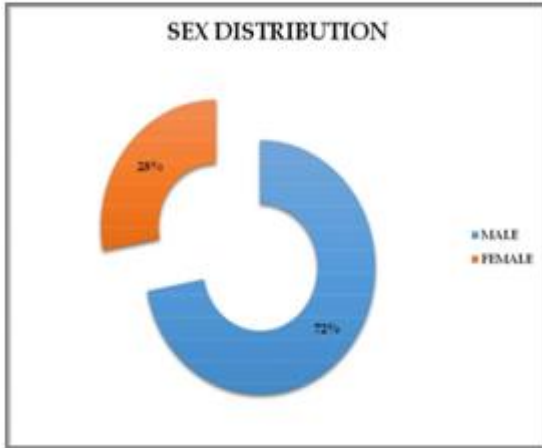


Figure 4 Sex Distribution in study group

3. **Limb Operated:-**

In this study it is found that, lower limb trauma and surgeries were much higher in occurrence than those of upper limb surgeries. Out of 200 operated patients, 133 cases were operated for lower limb trauma (66.5%) and 67 patients were operated for upper limb trauma (33.5%)

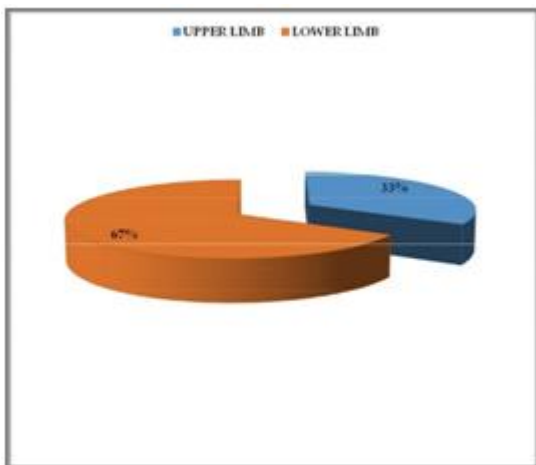


Figure 5: Limb Operated

4. **Type of Surgery:-**

Proximal Femoral Nail was most commonly performed operation (22 cases) followed by condylar plating, tibia fibula interlocking nail and radius ulna plating.

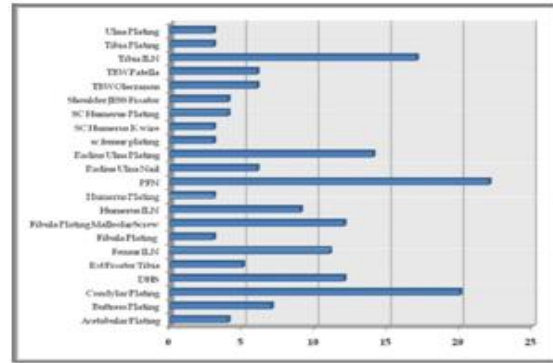


Figure 6: Frequency of Various Types of Operations

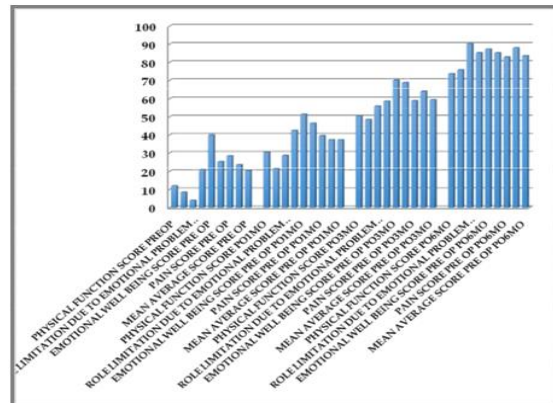


Figure 7 Graphical Representation of Serial Follow Up SF36 Mean Scores

[Figure 7] shows the graphical representation of Mean SF-36 score (serial follow-up mean scores) in postoperative follow up. The scores showed a regular upward improvement from preoperative to postoperative levels. The mean SF-36 score at preoperative level was 20.50, which improved to 37.28, 59.44 and 83.59 at one month, three months and six months stages respectively.

Table 1: Serial Mean Average SF36 Scores

	N	Mean	Std Dev
SF36 Pre Op	200	20.50	4.68
SF36 Po1Mo	200	37.28	3.76
SF36 Po3Mo	200	59.44	3.39
SF36 Po6Mo	200	83.59	6.84

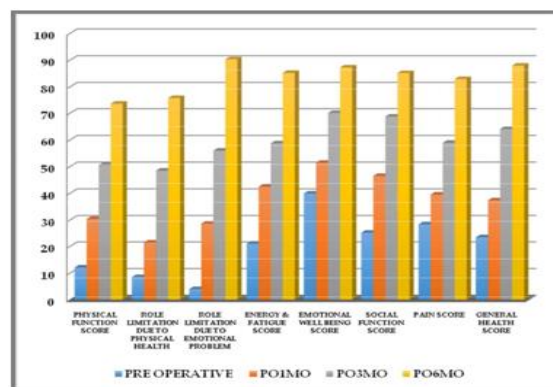


Figure 9: Graphical Representation of SF36 Component Scores at Pre op, 1 month, 3 month & 6 month Post operative

Table 2: Descriptive Statistics of SF-36

	N	Range	Minimum	Maximum	Mean	Deviation Std	Variance	Skewness	Kurtosis
Mean Average Score Pre Op	200	20.49	11.20	31.69	20.56	4.80	22.583	0.214	-0.403
Mean Average Score PO1MO	200	16	27.54	43.54	37.28	3.76	14.091	-0.847	0.138
Mean Average Score PO3MO	200	20.60	47.52	68.12	59.44	3.39	11.413	-0.642	2.028
Mean Average Score PO6MO	200	33.17	62.25	95.42	83.59	6.84	46.817	-0.638	0.008

The [Table 2] shows the descriptive parameters for the various parameters evaluated in SF-36 survey. The analysis includes the number of cases, range, range minimum, range maximum, mean, standard deviation, variance, skewness and kurtosis of the data obtained.

The total mean score for 200 patients at preoperative level was 20.50 which postoperatively at six months improved to 83.59

Statistical Data

Table 3 Statistical Data for Paired t Test Calculation

Group	Post Op 6 Month	Pre Op
Mean	83.5912	20.5244
Std Deviation	6.8594	4.6867
Standard Error Of Mean	0.4850	0.3314
Sample Size	200	200

Table 4: Paired Samples Test

	Paired Differences				T	Df	Sig (2 tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pai SF364-1 SF361	63.0668	5.860	0.618	61.8490	64.2845	107.3586	199	.0001

The highest percentage improvement was recorded for role limitation due to emotional problems (95.58%) followed by role limitation due to physical health, physical function, energy and fatigue, general health score, social function score, pain score and emotional well being score.

Paired sample t-test was performed to compare the mean differences of various pairs of data i.e. preoperative analysis with post-operative scores at six month stage. The Mean difference was found to be 63.0668 with a standard deviation of 5.860. The difference was significant at 95% level of confidence (p<0.0001). Lower limit of Confidence Interval is 61.8490 and upper limit is 64.2845. Standard error of mean was found to be 0.618.

years and 50 to 65 years was found to be 19.24, 20.93 & 21.07 respectively; which improved to 90.63, 85.8 & 77.31 post operatively after 6 months.

18 to 33 year group showed 78.77% improvement which was highest; while lowest percentage improvement was seen in 50 to 65 year age group. (72.74%)

6. Sex wise comparison of Pre op & Post op mean scores:-

In males, the pre operative mean score improved from 19.8 to 85.38 post operatively at 6 months (76.8% improvement); while in females the same improved from 20.83 pre operatively to 78.98 at 6 month post operative follow up (73.63% improvement)

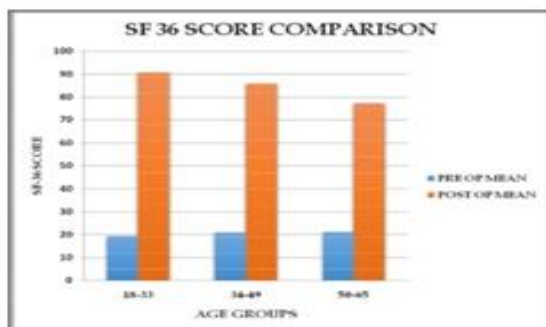


Figure 10: Age Group wise Comparison of Pre op & Post op Mean SF-36 Scores

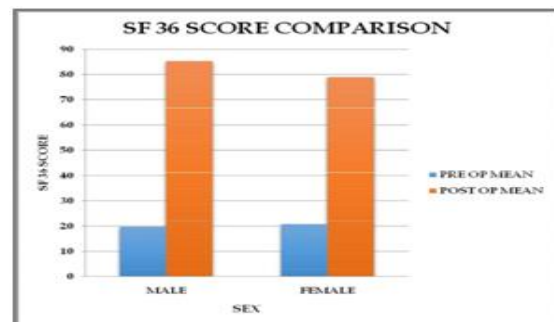


Figure 11: Sex wise Comparison of Pre op & Post op Mean SF-36 Scores

5. Age Group Comparison of Pre op & Post op mean Scores:-

In this study; with serial follow ups, Pre op Mean SF-36 scores for age group 18 to 33 years, 34 to 49

7. Comparison of mean scores according to the surgery performed:-

As shown in figure 12 & table 5, highest pre operative SF-36 mean score was found in case of

tibia fractures requiring External fixator (24.13) and lowest score was 15.92 for Supra condylar humerus fractures which went for plating. Post operatively at 6 months, the highest score was found in patients who underwent Closed Reduction Internal Fixation with K Wire in Supracondylar Humerus Fracture (94.72) and the lowest score was found in operated patients of tibia plating (75.51)

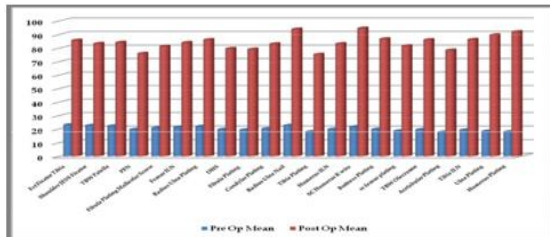


Figure 12:

It was found in the study that, highest percentage of improvement in SF-36 score was seen in cases of Supracondylar humerus plating (80.94%) followed by Humerus plating, Ulna plating, Tibia Nailing, Acetabulum plating, Tension band wiring olecranon. Lowest percentage of improvement was seen in cases of External Fixator application for Compound Tibia Fractures. (71.92%)

Pre operative SF 36 mean score for the patients operated for upper limb trauma improved from 20.16 to 88.1 and for lower limb trauma the score improved from 20.29 to 81.41 post operatively.

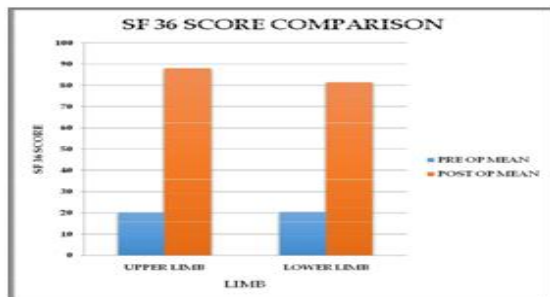


Figure 13 Limb Surgery wise Comparison of Pre op & Post op Mean SF-36 Scores

8. Comparison of mean score according to reduction method used:-

In the patients who underwent open reduction & internal fixation, mean score improved from 19.47 to 83.99 at 6 months post operatively showing 76.81 percent improvement. While in patients who were operated closed reduction internal fixation or external fixation, the mean score improved from 21.24 to 85.39 with 75.13 percentage improvement.

Result

In present study our aim was to evaluate patient satisfaction after Orthopaedic Surgery; whether the patients are satisfied or not after surgery.

Our study included 200 patients with mean age of 43.79 years; Most of the patients in this study

format belong to 50-65 age groups. The highest frequency for age was 65 year with 8% incidence. Male had predominance in the study group. Out of 200 patients 144 were male (72%) and 56 were female (28%).

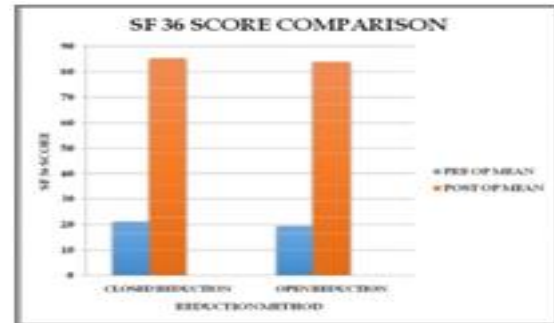


Figure 14 Comparison of SF-36 Mean Pre op & Post op Scores on basis of Reduction Methods

Out of 200 patients lower limb was operated in 133 patients and 67 cases were operated for upper limb trauma. As per type of surgery classification, the most commonly performed surgery was Proximal Femoral Nailing for proximal femur fractures (22 cases) followed by condylar plating (20 cases each). Range of motion in affected limb improved significantly post operatively.

For clinical evaluation the SF-36 Health Survey Questionnaire was used.

The SF-36 mean score of 200 patients pre operatively was 20.50 which postoperatively at six months improved to 83.59. The highest percentage improvement was recorded for role limitation due to emotional problem.

Highest percentage of improvement in SF-36 mean score was seen in 18 to 33 year age group patients (78.77%) while lowest percentage improvement was seen in 50 to 65 year age group. (72.74%)

Males have shown better improvement in Mean scores as compared to females. In males, pre operative score improved from 19.8 to 85.38 (76.8% improvement) post operatively at 6 months. Females showed 73.63% improvement where pre operative score was 20.83 and improved to 78.98 after 6 months.

There was no significant difference in pre operative mean scores in upper limb trauma patients (20.16) and lower limb trauma patients (20.29). Patients operated for upper limb trauma showed more post operative mean scores (88.1) than lower limb trauma patients. (81.41)

Patients operated with closed reduction internal fixation or external fixation had higher pre operative mean score (21.24) & post operative mean score (85.39) than those who were operated with open reduction internal fixation(19.47 and 83.99 respectively); but the percentage improvement was slightly better in open reduction cases (76.81%) than closed reduction cases (75.13%)

SF-36 appears to be most suited to evaluate the patient satisfaction level, still we feel it is important to use at-least two scoring systems in synergy to obtain a more comprehensive follow-up result evaluation, thus keeping both the patient's perspective as well as healthcare provider's perspective.

DISCUSSION

Traditionally a marker for healthcare performance and certainly a tool of previous decades, survival has been the primary outcome when assessing providers of care for orthopaedic trauma. Compared to the number of fatalities, the number of survivors of major trauma with serious or permanent injury is doubled. Hence, in recent years, there has been a shift toward a more comprehensive assessment of delivery of trauma care to encompass the overall quality of life of trauma patients rather than just their survival. Individuals with traumas have to adapt to several losses and changes to their lifestyle, social interactions, and identity.^[19] Therefore, the current study aims to assess HRQOL and to determine the factors affecting HRQOL of patients with Upper Limb and Lower Limb trauma. Since the risks of a low response rate and poor quality information are well documented in the literature when dealing with distrustful old persons and rural population,^[20-22] we have put a special effort in establishing a privileged access to the eligible subjects and in setting the answering session of the follow up questionnaire at their home in trauma patients who were unable to come to hospital because of some reasons. This has resulted in a 100% participation rate to our study.

Numerous instruments are available for measuring the HRQOL in children and adults after trauma. It has been recommended that, in particular, three features should be considered. First, HRQOL instrument need to be multidimensional, a feature that distinguishes them from other health outcome measures. Second, the instruments need to measure aspects of life that are meaningful to adult trauma patients and to pediatric trauma patients and their families. Finally, HRQOL instruments need to take the patient's perspective when measuring the impact of injury on physical, emotional, and social well-being.

In this study the SF-36 Health Survey was used as HRQOL measures. The instrument covers the essential domains of HRQOL and is suitable for long-term follow-up measurement of HRQOL in adult trauma patients. Apart from achieving the scientific goals, the SF-36 questionnaire also has a high level of validity.

Our study results are compared with the results of the studies considered in the review of literature.

Holbrook et al (2001) in a study of 1048 trauma patients suggested that women are at risk for

markedly worse functional and psychological outcomes after major trauma than men, independent of injury severity and mechanism. The findings were consistent with our study. We also found better improvement in quality of life in men as compared to women.^[12]

Crichlow et al (2006) assessed the prevalence and severity of depression in Orthopaedic trauma patients using several self reported outcome measures including subset of SF-36. They concluded that global disability is strongly correlated with depression and the presence of an open fracture may also increase the risk of depression. Similar to our study where open fractures of tibia treated with external fixator showed least improvement (71.96%) in SF 36 scores post operatively.^[23]

Harris et al (2008) in a study performed on 731 major trauma surviving patients concluded that the General Health after major physical trauma is strongly associated with factors relating to compensation than with the severity of injury. In comparison to this study, we have not studied compensation factors.^[11]

Bilen et al (2010) studied the impact of trauma mechanism on the outcome by doing a follow up study on HRQOL in patients after major Orthopaedic trauma. We; in our study have not taken trauma mechanism in our consideration.^[24]

Andrew et al (2012) reported large reduction in physical health and reduced function 12 months after hospitalization for sport and active recreation related Orthopaedic injury using SF 36 scale. In contrast, in our study physical component of health has improved significantly after follow up of 6 months after surgery.^[25]

Cutillas et al (2015) performed a pilot study in patients with tibial plafond fracture. They used SF 36 Health Survey for the measurement and concluded that tibial plafond fracture have a significant negative impact on General HRQOL regardless of the operative treatment used. In our study group pre op score of 20.37 improved to 83.31 in cases of tibial plafond fractures treated with condylar plating.^[26]

Zwingmann et al (2016) retrospectively studied data of 147 poly-traumatized patients using SF 36 Score. Their results reveal that poly-traumatized patients suffer from persistent pain and functional disabilities after more than 5 years. In our study occurrence of persistent pain after 6 months of follow up is much less (10%) with less percentage of functional disabilities.^[27]

Very few studies have commented on the effect age, sex, limb involved, type of implant, type of surgery and reduction method have on outcome of surgery. We in our study have included each of the above mentioned variables and have compared mean scores pre and post operatively.

Infection, post traumatic arthritis, persistent pains, decreased range of motion, joint stiffness, neurological injury are some of the most commonly encountered complications after Orthopaedic trauma or fractures.

In our study group, one patient had post operative Infection which was treated conservatively, however due to failure of infection remission, implant removal was done, and then after complete eradication of infection revision surgery was done.

Twenty cases of study group showed consistent pain post surgery which was managed conservatively with chronic medication as even after intense investigation no static reason for pain was found out.

In rare cases, neurological injury was seen which was treated with functional bracing and physiotherapy in form of Ultra Sonic therapy and TENS therapy respectively.

Most commonly encountered complication after surgery was decreased range of motion and joint stiffness in the affected limb which was managed cautiously with physiotherapy rehabilitation at our institute only.

It is recommended that the patients receive a structured rehabilitation program which is appropriate to the specific needs of people with limb traumas in order to be able to find out its impact on their functional status and HRQOL. Rehabilitation is an important link for patients with significant disabilities. In our study almost 80 percent patients received rehabilitation in the form of physiotherapist, psychologist and social workers; which at the end of study reflected in form of highly improved HRQOL in most of the patients.^[28]

Important technical progresses have already been made in almost every surgical procedure at present time, so future progress in this field might not significantly impact patient satisfaction. An emerging area of research lies in the identification of determinants of patient satisfaction, which may offer new improvement perspective in quality care and helps in increment in patient satisfaction level.

The SF-36 mean score of 200 patients pre operatively was 20.50 which postoperatively at six months improved to 83.59.

The highest percentage improvement was recorded for role limitation due to emotional problems (95.58%) followed by role limitation due to physical health, physical function, energy and fatigue, general health score, social function score, pain score and emotional well being score.

Demet et al,^[29] study reports that Upper Limb injury had high HRQOL (compared to lower limb amputees) is primarily related to their responses pertaining to physical disability, pain, and energy level. In our study also, the HRQOL was more in upper and lower limb trauma patients.

The strengths of our study are; its prospective character, the size of the cohort (n=200) and the length of follow up (6 months). Only a few prospective studies reporting on factors associated with the course of HRQOL after fracture are known.^[30-32] Two studies had a relatively short follow-up: one (n = 402) up until discharge the other (n = 1273) 4 months.^[31,32] The study with the longest follow-up (2 years) was small study (n = 61).^[30]

CONCLUSION

The study was conducted to determine whether the patient was satisfied or not after surgery done for Orthopaedic traumatic conditions.

It was noted in the study that young age group patients showed better improvement in all aspects of Health. Both physical and mental score improvement was more in 18 to 33 year age group patients; which decreased in second age group 34 to 50 year age group and was lowest in 50 to 65 year age group patients. The study indicated better and fast improvement in male patients as compared to females. Pre operative findings and scores were almost same in both the sexes. Post operative scores are higher in males than in females. Upper limb trauma patients showed better scores and healing than lower limb trauma patients in post operative period.

Patients operated with closed reduction internal fixation or external fixation had higher pre operative mean score & post operative mean score than those who were operated with open reduction internal fixation but the percentage improvement was slightly better in open reduction cases than closed reduction cases. Good functional outcome after Orthopaedic Surgery measured in the form of SF-36 is related to many variables such as Proper surgical procedure, aseptic environment and good choice of implant, timing of surgery, post operative rehabilitation program, proper psychological counseling and regular follow ups. When all the above mentioned variables are managed and planned accordingly, the surgical intervention leads to tremendous improvement in both physical and mental health of the patients which can be measured and recorded in the form of SF-36 Health survey. The study supports the requirement of proper surgical intervention against conservative treatments for the limb injuries involving major Orthopaedic trauma to achieve better long term functional outcomes.

In the end, writing about the favorable factors for High SF-36 scores and better HRQOL; following variables are associated with favorable outcomes according to our study:-

- Younger age.
- Male Sex.
- Upper Limb trauma.
- Open Reduction Cases.

REFERENCES

1. World Health Organization. Global burden of disease. 2004 Update. Available at http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004_update_full.pdf
2. World Health Organization. World report on child injury prevention. 2008 update. Available at <http://whqlibdoc.who.int/publications/2008/eng.pdf>
3. Guyuatt G. the philosophy of health related quality of life translation. Quality of life research. 1993; 2: 461-65.
4. Michaels AJ, Michaels CE, Smith JS, Moon CH, Peterson C, Long WB. Outcome after injury: general health, work status and satisfaction 12 months after trauma. J Trauma. 2000; 48: 841-848.
5. Hotslag HR, Van Beeck EF, Lindeman E, Leenen LP. Determinants of long term functional consequences after major trauma. J Trauma. 2007; 62: 919-927.
6. Aitken LM, Davey TM, Ambrose J, Conelly LB, Swanson C, Bellamy N. Health outcome of adults 3 months after injury. Injury. 2007; 38: 19-26.
7. Tarlov AR, Ware JE Jr, Greenfield S, Nelson EC, Perrin E, Zubkoff M. The medical outcomes study: An application of methods for monitoring the results of medical care. JAMA. 1989; 262: 925-930.
8. McKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL et al. a National evaluation of the effect of trauma centre care on mortality. N Engl J Med. 2006; 354: 366-378.
9. Holbrook TL, Anderson JP, Sieber WJ, Browner D, Hoyt DB. Outcome after major trauma: 12 month and 18 month follow up results from the trauma recovery project. J Trauma. 1999; 46: 765-771.
10. Steel J, Youssef M, Pfeifer R, Ramirez JM, Probst C, Sellei R et al. Health related quality of life in patients with multiple injuries and traumatic brain injury 10 years post injury. J Trauma. 2010; 69: 523-530.
11. Harris IA, Young JM, Rae H, Jalaludin BB, Solomon MJ. Predictors of general health after major trauma. J Trauma. 2008; 64: 969-974.
12. Holbrook TL, Hoyt DB, Anderson JP. The importance of gender on outcome after major trauma: functional and psychological outcomes in women versus men. J Trauma. 2001; 50: 270-273.
13. Vles WJ, Steyerberg EW, Essink-Bot ML, Van Beeck EF, Meeuwis JD, Leenen LPH. Prevalence and determinants of disabilities and return to work after major trauma. J Trauma. 2005; 58: 126-135.
14. Ringdal M, Plos K, Lundberg D, Johansson L, Bergbom I. outcome after injury: memory, health related quality of life, anxiety and symptoms of depression after intensive care. J Trauma. 2009; 66: 1226-1233.
15. Dimopoulou I, Anthi A, Mastora Z, Theodorakopoulou M, Konstandinidis A, Evangelou E et al. Health related quality of life and disability in survivors of multiple trauma one year after intensive care unit discharge. AM J Phys Med Rehabil. 2004; 83:171-176.
16. Vazquez MG, Rivera FR, Perez AA, Gonzalez CA, Fernandez ME, Navarrete NP. Analysis of quality of life in polytraumatized patients two years after discharge from intensive care unit. J Trauma. 1996; 41: 326-332.
17. Ulvik A, Kvale R, Wentzel-Larsen T, Flatten H. Quality of life 2-7 years after major trauma. Acta Anaesthesiol Scand. 2008; 52: 195-201.
18. Meerding WJ, Looman CWN, Essink-Bot ML, Toet H, Mulder S, Van Beeck EF. Distribution and Determinants of health and work status in a comprehensive population of injury patients. J Trauma. 2004; 56: 150-161.
19. Horgan O, MacLachlan M. Psychological adjustment to lower limb amputation: a review. Disab Rehabil. 2004; 26: 837-850.
20. Desmond D, Gallagher P. Quality of life in people with lower limb amputation. Handbook of Disease burdens and quality of life measures. VR Preedy and RR Watson Eds. 2010; 3785-3796.
21. Zeigler-Graham K, MacKenzie EJ, Ephraim PL, Trivison TG, Brookmeyer R. Estimating the prevalence of limb loss in United States:2005 to 2050. Arch Phys Med Rehabil. 2008; 89: 422-429.
22. Tseng CL, Helmer D, Rajan M. Evaluation of regional variation in total, major and minor amputation rates in a National Health care system. Int J Qual Health Care. 2007; 19:6: 368-376.
23. Crichlow RJ, Andres PL, Morrison SM, Haley SM, Vrahas MS. Depression in Orthopaedic trauma patients: Prevalence and severity. J Bone Joint Surg Am. 2006; 88: 1927-1933.
24. Bilen K, Ponzer S, Castren M, Pettersson H, Ottosson C. The impact of trauma mechanism on outcome: a follow up study on health related quality of life after major trauma. Eur J Trauma Emerg Surg. 2010; 36: 449-455.
25. Andrew NE, Wolfe R, Cameron P, Richardson M, Page R et al. Return to pre injury health status and function 12 months after hospitalization for sport and active recreation related orthopaedic injury. Inj Prev. 2012; 18: 377-384.
26. Cutillas MB, Lizaur A, Lopez FA. Prognostic factors of health related quality of life in patients with tibial plafond fracture: A pilot study. Injury. 2015; 46: 2253-2257.
27. Zwingmann J, Hagelschuler P, Langenmair E, Bode G, Herget G, Hammer T et al. Lower health related quality of life in polytrauma patients: long term follow up after over 5 years. Medicine (Baltimore) 2016; 95(19):e3515.
28. Khan F, Amatya B, Hoffman K. Systematic review of multidisciplinary rehabilitation in patients with multiple trauma. British Journal of Surgery. 2012; 99: 88-96.
29. Demet K, Martinet N, Guillemin F, Paysant J, Andre JM. Health related quality of life and related factors in 539 persons with amputation of upper and lower limb. Disabil Rehabil. 2003; 25:9: 480-486.
30. Rohde G, Haugeberg G, Mengshoel AM et al. Two year change in quality of life in elderly patients with low energy hip fractures: a case control study. BMC Musculoskelet Disord. 2010; 11:226.
31. Borgstro MF, Lekander I, Iverga M et al. The International cost and utilities related to osteoporotic fractures study (ICUORS) : Quality of life during the first 4 months after fracture. Osteoporos Int. 2013; 24: 811-823.
32. Beucking B, Struwer J, Waldermann A et al. What determines health related quality of life in hip fracture patients at the end of acute care? A prospective observational study. Osteoporos Int. 2014; 25: 475-484.

How to cite this article: Dhamania RK, Patil R, Neema PP, Tantuway V, Rassiwal M. A Prospective Study of Post Operative Health Related Quality of Life in Orthopaedic Trauma Patients. Ann. Int. Med. Den. Res. 2018; 4(6):OR16-OR24.

Source of Support: Nil, **Conflict of Interest:** None declared