J Nepal Health Res Counc 2023 Jan-Mar;21(58): 76-80

# Short and Long Term Impact on Oral Health Related Quality of Life After Maxillofacial Trauma

Arun Kumar Mahat,[1] Niranjan Panta,[2] Mukesh Kumar Shrewastwa,[3] Reecha Puri,[4] Lila Bahadur Basnet[5]

[1]Department of Dentistry, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal, [2]Eye, ENT and Oral Health Section, Curative Service Division, Department of Health Services, [3]Department of Biochemistry, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Nepal, [4]Trishuli Plus Community Action Group, Kathmandu, [5]Nepalese Society of Community Medicine, Kathmandu.

## ABSTRACT

**Background:** Maxillofacial fracture cases require detailed diagnosis, planning and timely restoration of the proper function and aesthetics of the traumatized tissues, as well as appropriate physical, psychological and social rehabilitation to achieve the best possible treatment outcome. Oral health related quality of life allows oral healthcare professionals to evaluate the efficacy of treatment protocols from patients' perspectives and allows clinician to address and measure the clinically meaningful changes.

**Methods:** The study was carried out in 86 patients with fracture of any one facial bone from September 2020 to March 2022 in Department of Dental Surgery, Nepalgunj Medical College Teaching Hospital, Kohalpur, Nepal. The quality of life was assessed by using Nepali version of Oral Health Impact Profile (OHIP-14) questionnaire, modified to address maxillofacial injury/treatment.

**Results:** A total of 86 patients (male: Female ratio=40:3) were included in the study with mean age of 30.69±11.88 years. Patient with fracture of mandible and midface showed complete recovery on OHIP-14 Scale after 6 months whereas, in patient with panfacial fracture some residual effect in quality of life (0.13±0.50) was seen in two domains psychological discomfort (0.06±0.25) and social disability (0.06±0.25) even after 6 months.

**Conclusions:** Impact of maxillofacial fracture on quality of life is long lasting and huge on patients. Referral to a psychiatrist or psychologist might be beneficial in addition to open reduction and internal fixation of maxillofacial fractures as early as possible to achieve better quality of life in maxillofacial fracture cases.

**Keywords:** Maxillofacial fractures; OHIP-14; quality of life

## INTRODUCTION

Maxillofacial trauma is a constantly present public health problem causing disabilities which requires detailed diagnosis, planning, treatment, and appropriate physical, psychological and social rehabilitation to achieve best possible outcome.[1-3] Quality of life (QoL) studies are accepted method for evaluating effects of treatment on patient's health, lifestyle and disposition from patients' perception rather than the clinician's point of view.[4,5] OHIP-14 an effective tool for measuring Oral health related quality of life (OHRQoL) allows surgeons to evaluate the efficacy of treatment from patient's perspectives and to address and measure the clinically meaningful changes.[6,7]

Lack of adequate amount of literature on OHRQOL in Nepalese population has led to less focus of Nepalese maxillofacial surgeon towards quality of life during treatment.

This study aims to access the impact of maxillofacial fracture on OHRQoL so that an evidence-based pre-treatment counseling can be done to improve the post-operative quality of life of patient.

## METHODS

A hospital based prospective observational study was carried out in patients from September 2020 to March 2022 in the Department of Dental Surgery, Nepalgunj

Correspondence: Arun Kumar Mahat, Department of Dentistry, Nepalgunj Medical College Teaching Hospital, Kohalpur, Banke, Lumbini state, Nepal. Email: dr.arunmahat@gmail.com, Phone: +9779842172055.

Medical College Teaching Hospital, Kohalpur, Nepal. The study population consisted of 86 subjects who met the inclusion criteria- with fracture of any one craniofacial bone, gave consent to participate in the study and the one who can maintain good verbal-logical contact were purposively chosen for the study. Patients with psychiatric disease, previous surgery for facial fracture, diagnosed malignancy and loss of follow-up were excluded from the study. Ethical clearance for the study was taken from Nepalgunj Medical College Teaching Hospital- Institutional Review Committee. Ref. no:106/077-078. The quality of life was assessed by using the Nepali version of Oral Health Impact Profile (OHIP-14) questionnaire used by the studies done earlier in Nepal & has been validated,[8] adopted to assess quality of life in maxillofacial injury/treatment, originally developed by Slade and Spencer. The questionnaire contains 14 questions, 2 in each of the 7 domains, defined by the authors as: functional limitation, physical pain, psychological discomfort, physical, psychological, and social disability, and handicap. Responses was assessed on a 4-point Likert scale, where 0 means "never", 1 - "hardly ever'" 2 - "occasionally", 3 - "fairly often" and 4 - "very often". Patients' score were in the range from 0 to 56 points, and the highest number of points reflects the poorest oral health and well-being.[9] The survey was conducted in five stages. The first survey was performed before surgery, second at the day of discharge, third, fourth and fifth at 6-week, 3 month and 6 months respectively. The results acquired were subjected to statistical analyses. Patient demographic characteristics were expressed in frequency and percentage. OHIP-14 scores in each domain were expressed in mean/standard deviation.

## RESULTS

Table1 presents the socio-demographic and clinical profile of study subjects. Out of 98 patients who approached during the period of study, a total of 86 patients were included of which 80 (93%) were males and 6 (7%) were females. The age of the patients ranged from 15 to 65 years with mean age of 30.70±11.90 years. Most of the patient (64%) were married and had completed secondary or higher level of education (86.10%) and most of the participants were private jobs holder. The distribution of patient according to the facial bone fracture who were included in the study are: 52.60%, of the patient had fracture of mandible, 29.10% had fracture of Maxilla, Zygomatic bone, Nasal bone and18.60% had Panfacial fractures.

Table1. Socio-demographic and clinical profile of study subjects.

| Characteristics | n(%) |
|---|---|
| **Gender** | |
| Male | 80 (93) |
| Female | 6 (7) |
| **Age (years)** | 30.70 (11.90) |
| <30 years | 54(62.80) |
| 31 to 45 years | 22(25.60) |
| >=45 years | 10(11.60) |
| **Education** | |
| Primary level or less | 12(13.90) |
| Secondary | 44 (51.20) |
| Higher Secondary or above | 30(34.90) |
| **Marital Status** | |
| Married | 55 (64) |
| Unmarried | 31(36) |
| **Occupation** | |
| Student | 12 (14) |
| Housewife | 5(5.80) |
| Farmer | 17 (19.80) |
| Government Job | 4(4.70) |
| Private job | 31(36) |
| Business | 11(12.80) |
| Unemployed | 6 (7) |
| **Alcohol or Smoking** | |
| Absent | 27(31.40) |
| Present | 59(68.60) |
| **Mechanism of injury** | |
| Road Traffic Accident (RTA) | 55(64) |
| Other (Fall, Physical assault, Occupational injury, Animal attack) | 31(36) |
| **Facial bone fracture** | |
| Fracture of Mandible | 45(52.30) |
| Fracture of Maxilla, Zygomatic bone, Nasal bone | 25(29.10) |
| Panfacial fracture | 16(18.60) |

*n=frequency; %: percent*

As depicted in Figure 1, the total OHIP-14 scores continuously decrease from the time of first assessment of the patients before surgery. Upon subsequent assessment at the day of discharge and thereafter on 6th week postoperatively, 3 month postoperatively and 6th month postoperatively the OHIP scores gradually decrease indicating better quality of life.

The table 2 shows that all seven domains in OHIP-14 score improved after treatment and with passage of time. However, cases with fracture of mandible and midface showed complete recovery on 6th month whereas, cases with panfacial fracture showed some residual effect in quality of life (0.13±0.50). Psychological Discomfort (0.06±0.25) and Social Disability (0.06±0.25) was the two domains that have impact on quality of life of patients with panfacial fractures even after 6 months of treatment.

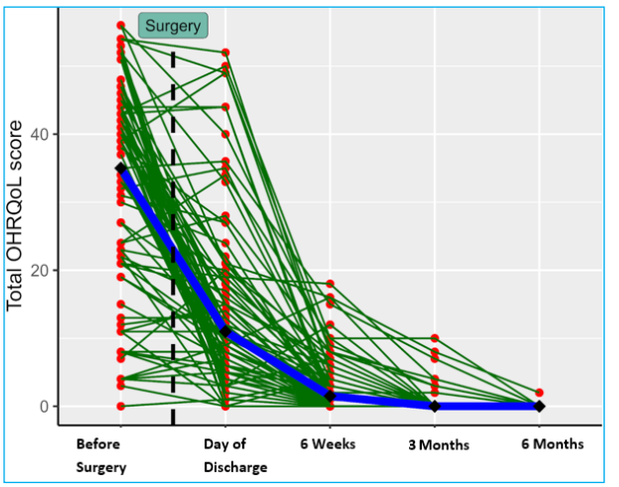


Figure 1.Change in total OHRQoL score from first assessment (before surgery) to last follow up(6 month).

Table 2. Mean and standard deviation of OHIP-14 score of respective domains in relation to type of facial bone fracture during different time of study.

| Domains | Facial bones | After Trauma | Day of Discharge | 6 week post-operatively | 3 month post-operatively | 6 month post-operatively |
|---|---|---|---|---|---|---|
| Functional Limitation | Fracture of Mandible | 3.49±2.45 | 1.56±2.04 | 0.31±0.63 | 0.07±0.33 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 3.16±2.92 | 1.20±2.08 | 0.32±0.80 | 0.00 | 0.00 |
| | Panfacial fracture | 5.00±3.05 | 1.56±1.71 | 0.31±0.60 | 0.06±0.25 | 0.00 |
| Physical Pain | Fracture of Mandible | 5.80±2.18 | 2.82±2.25 | 0.78±0.99 | 0.04±0.21 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 5.04±2.75 | 3.08±2.51 | .32±0.63 | 0.04±0.20 | 0.00 |
| | Panfacial fracture | 6.38±2.12 | 3.94±2.46 | 1.00±1.51 | 0.13±0.34 | 0.00 |
| Psychological Discomfort | Fracture of Mandible | 4.13±2.73 | 2.31±2.53 | 0.56±0.97 | 0.07±0.33 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 4.72±2.84 | 2.68±2.65 | 0.52±0.87 | 0.08±0.28 | 0.00 |
| | Panfacial fracture | 4.56±2.80 | 1.75±1.77 | 0.94±1.24 | 0.25±0.77 | 0.06±0.25 |
| Physical Disability | Fracture of Mandible | 5.49±2.69 | 2.13±2.33 | 0.38±0.65 | 0.02±0.15 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 4.76±2.82 | 1.68±2.48 | 0.12±0.33 | 0.04±0.20 | 0.00 |
| | Panfacial fracture | 5.69±2.65 | 2.56±2.25 | 0.19±0.40 | 0.25±0.68 | 0.00 |
| Psychological Disability | Fracture of Mandible | 3.93±2.79 | 1.67±2.27 | 0.38±1.03 | 0.09±0.36 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 4.28±3.30 | 2.28±2.44 | 0.20±0.64 | 0.04±0.20 | 0.00 |
| | Panfacial fracture | 3.87±2.65 | 1.50±1.86 | 0.69±1.08 | 0.00 | 0.00 |
| Social Disability | Fracture of Mandible | 4.07±2.48 | 2.16±2.22 | 0.38±0.72 | 0.00 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 3.92±2.60 | 2.04±2.51 | 0.28±0.54 | 0.08±0.28 | 0.00 |
| | Panfacial fracture | 3.75±2.70 | 1.88±1.82 | 0.69±1.25 | 0.25±0.68 | 0.06±0.25 |
| Handicap | Fracture of Mandible | 4.64±2.95 | 2.22±2.35 | 0.29±0.92 | 0.02±0.15 | 0.00 |
| | Fracture of Maxilla, Zygomatic, Nasal bone | 4.96±2.91 | 2.20±2.78 | 0.24±0.60 | 0.08±0.40 | 0.00 |
| | Panfacial fracture | 4.75±2.95 | 2.44±2.31 | 0.69±1.01 | 0.19±0.54 | 0.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Fracture of Mandible | 31.60±14.29 | 14.82±13.09 | 3.07±4.18 | 0.31±1.26 | 0.00 |
| Total | Fracture of Maxilla, Zygomatic bone, Nasal bone | 30.84±17.21 | 15.16±15.07 | 2.00±2.84 | 0.36±1.04 | 0.00 |
| | Panfacial fracture | 34.00±13.99 | 15.62±11.47 | 4.50±5.54 | 1.13±3.10 | 0.13±0.50 |

## DISCUSSION

The mean age of patient included in the study was 30.69±11.88 years with male: female ratio of 40:3. This is slightly higher than the previous study done in same clinical scenario and institution[10] which could be because of the fact that younger patient lacked ability to maintain good verbal-logical contact. Most of the patients were married (64%), had completed secondary and above level of education (86.10%), were private jobs holder and had habits of smoking and alcohol (68.60%). The study shows that RTA remains the most common etiology of maxillofacial injury and mandible is the most common fractured bone which is similar to the findings of other studies conducted in this institution and other parts of our country.[10-13] Oral Health Impact Profile (OHIP-14) questionnaires consists of 14 questions which assess patient health and well-being in 7 domains: functional limitation, physical pain, psychological discomfort, physical, psychological and social disability, and handicap. The study observes the patient well-being in these domains following different type of facial bone fractures in short and long period of time. Maxillofacial injuries with bone fractures lead to various health-related consequences, such as difficulty in breathing, articulation, mastication, swallowing of food, as well as altered sense of taste which may lead to significant discomfort in patients, especially during the short post-trauma period.[14] Chalya et al.(2011) has recommended that maxillofacial fractures should be managed by open reduction and internal fixation as early as possible in order to reduce the morbidity resulting from these injuries.[15] Studies conducted around the world have shown that maxillofacial fractures had a major impact on quality of life of patients soon after the injury.[1,14,16] All the cases in our studies were managed by open reduction and internal fixation which is a gold standard treatment for maxillofacial fractures.[15] Our study has shown that patients with panfacial fracture has lower quality of life than patients with fracture of mandible and fracture of maxilla, zygomatic bone and nasal bone on all the periods following injury and on follow-ups. Fracture of mandible is associated with decrease in quality of life observed even on 6$^{th}$ week postoperative period, unlike fracture of maxilla, zygomatic bone, nasal bone. Whereas when assessed on day of discharge and 3 months postoperatively, the quality of life is found low in patient with fracture of maxilla, zygomatic bone, nasal bone than those with mandibular fracture. This could be explained by the fact that mandible being a mobile bone of lower third of face causes more mobility of fracture fragment deteriorating the quality of life immediately after trauma whereas, maxilla fracture requires more intervention through both intraoral and extraoral approaches than the mandible leading to more decrease in quality of life at the day of discharge and 3 months postoperatively.

This study also shows that with treatment and passage of time there is improvement in Oral health related quality of life (OHRQoL) in patients with all types of maxillofacial fractures. The patient recovered significantly in all domains postoperatively and during follow-up visits at 6 week, 3 months, and 6 months period. Patients with panfacial fracture showed complete recovery in five domains except psychological discomfort and social disability. This is similar to the findings of the study done by Mayowa Solomon Somoye et.al which shows that clinicians should be aware of possible residual psychological and social relationship issues that can accompany the posttraumatic period of maxillofacial fracture.[17] Maxillofacial injury challenges the self-image and confidence of the individuals. Stress-inducing life event before the occurrence of trauma, increased levels of stress and delayed recovery are prevalent among patients who have injuries on the key areas of the face. Thus the psycho-social impact of the injury can be profound and have long lasting impact in socioeconomically disadvantaged individuals, unmarried female, and individuals with acquired facial deformities.[18,19] Our study does not adequately measure the role of social determinants on quality of life which is the limitation of this study. We recommend that, additional referral to a psychiatrist or psychologist should be done in patients with maxillofacial fractures to improve the quality of life in long term.

## CONCLUSIONS

Impact of maxillofacial fracture on quality of life is long lasting and huge on patients. All the domains of quality of life remains affected on short term though recovery can be observed with passage of time. In long term most of the patient returns to normal self except in cases with severe trauma. Domains such as: psychological

discomfort and social disability still remains affected. Thus, injury prevention strategy should be used to minimize maxillofacial trauma and additional referral to a psychiatrist or psychologist might be beneficial in addition to open reduction and internal fixation in patient with maxillofacial fractures as early as possible to achieve better quality of life.


## ACKNOWLEDGEMENTS

We would like to thank all the patients and staff of the Department of Dental surgery of Nepalgunj Medical College.


## CONFLICT OF INTEREST

The authors declare no conflict of interest

## REFERENCES


1. Boljević T, Pešić Z, Pajić S, Saveljić S. Quality of life of surgically treated patients with fractures of facial bones. Acta Medica Median. 2018;57(3):13–22. [Full Text]
2. Braimah RO, Ukpong DI, Ndukwe KCAAL. Health-related Quality of Life in Nigerian Patients Following Maxillofacial and Orthopedic Injuries: A Comparative Study. J Orthop Traumatol Rehabil. 2018;10:49–53. [DOI] [Full Text]
3. Sikora M, Chlubek M, Grochans E, Jurczak A, Safranow K, Chlubek D. Analysis of factors affecting quality of life in patients treated for maxillofacial fractures. Int J Environ Res Public Health. 2020;17(1). [Pub Med] [DOI] [Full Text]
4. Emmanuelli B, Kucner ÂA, Ostapiuck M, Tomazoni F, Agostini BA, Ardenghi TM. Racial differences in oral health-related quality of life: A multilevel analysis in brazilian children. Braz Dent J. 2015;26(6):689–94. [Pub Med] [DOI] [Full Text]
5. Omeje K, Efunkoya A, Adebola A, Osunde O. Oral health-related quality of life in non-surgical treatment of mandibular fractures: A pilot study. Niger J Exp Clin Biosci. 2015;3(1):8. [Full Text]
6. Sischo L, Broder HL. Oral health-related quality of life: What, why, how, and future implications. J Dent Res. 2011;90(11):1264–70. [Pub Med] [DOI] [Full Text]
7. Caglayan F, Altun O, Miloglu O, Kaya MD, Yilmaz AB. Correlation between oral health-related quality of life (OHQoL) and oral disorders in a Turkish patient population. Med Oral Patol Oral Cir Bucal. 2009;14(11):10–5. [DOI] [Full Text]
8. Rimal J, Shrestha A. Validation of Nepalese Oral Health Impact Profile14 and Assessment of Its Impact in Patients with Oral Submucous Fibrosis in Nepal. J Nepal Health Res Counc. 2015;13(29):43–9. [Pub Med] [Full Text]
9. Slade GD, Spencer AJ. Development and evaluation of the Oral Health Impact Profile. Community Dent Heal. 1994;11(1):3-11. [Pub Med][Google Scholar]
10. Mahat A, Gurung G, Shrestha M, Chaudhary B. Epidemiology of Maxillofacial Fracture – A Hospital Based Study. 2019;17(2):23–7. [DOI][Full Text]
11. Yadav SK, Mandal BK, Karn A, Sah AK. Maxillofacial trauma with head injuries at a tertiary care hospital in Chitwan, Nepal: Clinical, medico-legal, and critical care concerns.Turkish J Med Sci. 2012;42(SUPPL.2):1505–12. [DOI][Full Text]
12. K.C. K, Shrestha JM. Maxillofacial injuries managed at Tribhuvan University Teaching Hospital, Kathmandu, Nepal: a 7 year retrospective study. J Soc Surg Nepal. 2016;19(1):4–8. [DOI][Full Text]
13. Adhikari RB , Karmacharya A MN. Pattern of mandibular fractures in western region of Nepal. Nepal J Med Sci. 2012;1(1):45–8. [DOI][Full Text]
14. Lewandowski B, Szeliga E, Czenczek-Lewandowska E, Ozga D, Kontek A, Migut M, et al. Comparison of oral-health-related quality of life in patients in the short- and long-term period following lower-facial injury and fractures – Preliminary report. Dent Med Probl. 2018;55(1):57–62. [Pub Med][DOI][Full Text]
15. Chalya PL, Mchembe M, Mabula JB, Kanumba ES, Gilyoma JM. Etiological spectrum, injury characteristics and treatment outcome of maxillofacial injuries in a Tanzanian teaching hospital. J Trauma Manag Outcomes. 2011;5(1):1–6. [Pub Med] [DOI][Full Text]
16. Oyebunmi Braimah R, Ignatius Ukpong D, Chioma Ndukwe K. Psychosocial and Health-Related Quality of Life (HRQoL) Aspect of Oral and Maxillofacial Trauma. Oral Maxillofac Surg - Pract Updat [Working Title]. 2019;(June). [Full Text]
17. Somoye MS, Adetayo AM, Adeyemo WL, Ladeinde AL, Gbotolorun MO, Adetayo AM. A comparative study of quality of life of patients with maxillofacial fracture and healthy controls at two tertiary healthcare institutions. 2021;351–9. [Pub Med][DOI][Full Text]
18. John B, Sobitha G, Sandhya K. Maxillofacial trauma and post traumatic stress disorders. Int J Recent Sci Res. 2017;8:15724–6. [Full Text]
19. Sahni V. Psychological Impact of Facial Trauma. Craniomaxillofac Trauma Reconstr. 2018;11(1):015–20. [Pub Med][DOI][Full Text]