ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

*International Journal of Dental Science and Innovative Research (IJDSIR)*

*IJDSIR : Dental Publication Service*

*Available Online at:www.ijdsir.com*

*Volume – 7, Issue – 6, December – 2024, Page No. : 120 - 130*

# Recovery Perception of Patients after Surgical Extraction of Mandibular Third Molar

[1]Dr Abira Chattopadhyay, Associate Professor, Department of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

[2]Dr Aritra Chatterjee, Assistant Professor, Department of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

[3]Dr Nayana De, Assistant Professor, Department of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

[4]Dr Soumen Mandal, Assistant Professor, Department of Oral And Maxillofacial Surgery, Burdwan Dental College and Hospital, Purba Burdwan

[5]Dr Md Arif Hossain, Dental Surgeon, Department Of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

[6]Dr Purbalee Barman, Post Graduate Trainee, Department Of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

**Corresponding Author**: Dr Abira Chattopadhyay, Associate Professor, Department of Oral and Maxillofacial Surgery, Dr R Ahmed Dental College and Hospital, Kolkata, India

**Citation of this Article:** Dr Abira Chattopadhyay, Dr Aritra Chatterjee, Dr Nayana De, Dr Soumen Mandal, Dr Md Arif Hossain, Dr Purbalee Barman,"Recovery Perception of Patients after Surgical Extraction of Mandibular Third Molar", IJDSIR- December – 2024, Volume –7, Issue - 6, P. No. 120 – 130.



**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

## Introduction

Third molar surgeries are the most common surgeries performed in the oral and maxillofacial surgery department. Surgical removal of third molar teeth is indicated in a case of chronic pericoronitis and other indications are related to orthodontic treatment and due to loss of tooth function when the antagonist tooth at the opposite arch are nor present [1-3]. Different literature suggests that retention of third molar tooth may result in development of pathologies, such as cyst, tumour, loss of alveolar bone and distal caries related to lower second molar tooth; which may even lead to root resorption and temporo-mandibular joint dysfunction [1,2,4]. The surgeries are associated with post-operative pain, swelling, limitation of social activities and others [5] which may change the post-operative quality of life in immediate post-operative period. in the age of information and technology, patients demand better

understanding of healthcare facilities available to them and the choices of treatment options they have. In country like ours, with poor socioeconomic status of the patients reported in hospitals, the limitation in social activities may refer to direct impact in their income. the decision for extraction of teeth is straightforward when symptoms of pericoronitis associated with pain, swelling are present, but, same is crucial when the teeth is asymptomatic [3,6]. Appropriate clinical knowledge about the surgical outcome and knowledge regarding patient's perception of recovery is to be assessed to take appropriate decision of surgery. various studies were performed to assess post-operative complications like pain, swelling, trismus and paresthesia, but very limited data available regarding patient's perception on recovery and post-operative sequel. The oral health related quality of life assessed is based on patient's perception of wellbeing, so it depends on psychological aspects and social dimension of patients. Various indices were fabricated to assess it, among which Oral Health Impact Profile-14 (OHIP-14) questionnaires are the most accepted one and measured in this study [7]. The aim of this study is to (i) measure the impact of oral health in quality of life, (ii)assess the patient's perception on recovery after surgical extraction of third molar surgery and (iii) identify the factors associated with quality of life in relation to oral health.

**Keywords:** Chronic Pericoronitis, Root Resorption, Third Molar Surgeries, Tumour

**Materials and Methods**

**A) Sample selection:**

A random sample of 224 patients within the age limit of 24-60 years , ASA =1 and with recent episodes of pericoronitis awaiting for third molar surgery were at the department of oral and maxillofacial surgery , Dr R Ahmed dental college and Hospital were selected for the study . The study was performed in accordance with the declaration of Helsinki and after the approval of institutional ethics committee. proper patient counselling was done, patients were explained about the study and all the patient signed the informed consent to participate in the study. The patients were advised for radiographic examination and routine blood investigations with serology for the surgery. Patients reported with any co-morbidity and other medical conditions were excluded from the study. Demographic data related to patients age, sex, education, habit were collected pre-operatively. The self-completed questionnaire related to OHIP-14 was collected pre-operatively as well. Pre-operative radiographic evaluation was done as per Winter's classification and difficulty index was measured following the Pell and Gregory classification, 1933 [8].

**B) Methodology:**

All the surgical extractions were performed by third year post-graduate trainee. Every patient was advised for 0.12% chlorhexidine gluconate mouthwash pre-operatively. Lignocaine with 1:100,000 adrenaline administered as local anesthetic agent. Buccal flaps were elevated, bone removal and tooth sectioning were done with rotary instrument as and when necessary. Socket irrigation was done with isotonic solution and sutures were placed with 3-0 black silk. An antibiotic (Amoxicillin 500mg, TDPC) and analgesic (Diclofenac 50mg, BDPC) were given for 5days. Suture removal were done on 7$^{th}$ post operative day. patients were given a "recovery log book" containing questionnaires related to OHIP-14 index, and asked to record the details for next 21days. Participants were given a telephone number of the surgeon to enquire any questions related to study and recording of data.

**C) Data collection and analysis:**

Pre-operative 14 item Oral Health Impact Profile (OHIP-14) questionnaires were recorded as a baseline data. Post-operative OHIP-14 scores were taken for first to seventh post-operative day and then up-to 21st post-operative day. OHIP-14 contains 14 questions related to seven conceptual domains containing two questions from each domain. i)Functional limitation(Q1 and Q2) , ii) Physical pain (Q3 and Q4) , iii) Psychological discomfort (Q5 and Q6), iv) Physical disability (Q7 and Q8), v) Psychological disability (Q9 and Q10 ), vi) Social disability ( Q11 and Q12 ), vii) Handicap (Q13 and Q 14) . For OHIP-14, each items were further measured as: 'never '- score 0, 'hardly ever' - score 1, 'occasionally' - score 2, 'fairly often - score 3 and 'very often' - score 4 accordingly and domain scores and global scores are calculated accordingly [7]

Postoperative pain was measured in 10 cm horizontal VAS scale. Pre-operative inter-incisal opening was recorded with a scale and to detect trismus and restriction in mouth opening, post-operative inter-incisal opening was recorded on 1st, 7th, 15th and 21st post-operative day. Presence of swelling was recorded with a flexible scale measuring the distance between corner of the moth to tragus and compared with Pre-operative scores. To assess the perception of recovery, several other parameters / questionnaire were added related to bleeding, bruising, chewing, food impaction at surgical site and limitation of social activities, bad breath/taste and these are scored. The format of questionnaire was initially considered by Shrugars et al,1996 [ 3] and validated by Shrugars 2006 [9] (ranged from 'no trouble'=0, 'little trouble'=1, 'some trouble'=2, 'quite a 'bit-trouble'=3 and 'lots of trouble'=4). Data were obtained and processed using SPSS software version 22. p value of $< 0.05$ was considered statistically significant.

**Results**

**A) Pre-operative findings**

In our study, out of 224 patients, only 201 patients reported back and four patients were excluded from the study due to missing data. So, the study consisted of 197 participants. Among them, 108 were female ( 54.82%) and 89 participants (45.17%) were male, with a mean age of 34 years and a standard deviation of 2 years and 8 months. According to age distribution, the data collected is represented in Fig 1.

Pre-operative radiographs taken for the study were IOPA radiographs in 37 cases (18.78%), OPG in 98 cases (49.74%) and CBCT in 62 cases (31.47%). Among all the patients.

The difficulty index of the lower third molar tooth was calculated from the Pell and Gregory classification. Among 197 cases, 101 participants underwent extraction of the right third molar and the left third molar was extracted in the rest 96 cases. The cases were tabulated according to difficulty index which is as follows (Table 2).

**B) Per-operative findings**

Surgical time taken was recorded as the time taken during surgery and post-operative pain, swelling and numbness were directly related to longer operation time and the correlation was statistically significant ( $p < 0.05\%$, RR: 1.7 ).

During the immediate postoperative period following surgery, quality of life due to oral health significantly decreased as compared to preoperative status during pericoronitis. There was a mean increase in OHIP-14 score which signifies the worsening of quality of life. The detailed values are explained in Table 3. According to the available data, patients faced more discomfort in the immediate postoperative period, but it resolved within 7 days and quality of life improved as well.

**C) Post-operative findings**

The intensity of other symptoms during the pre-operative period and the post-operative period on day 1(POD-1), day 7 (POD-7), day 15 (POD-15) and 21st post-operative day (POD-21) are mentioned in Table 4.

Difficulty in chewing was one of the complaints pre-operatively, which was increased after surgery, on POD-1 but gradually reduced after 3-4 days. Trismus was present in fewer patients (19%) pre-operatively but increased after surgery which continued for the 7th post-operative day and a small number of patients reported trismus even on the 15th post-op day but subsided within 21 days. The main reason for pre-operative swelling was pericoronitis (29.1%). The number increased on the 1st post-op day by 88.5 cases, but gradually subsided and only 12.5% of patients reported swelling till the 7th post-op day. Bleeding was a major concern to patients (69.7%) on the first day after surgery. Food impaction at the surgical site was seen in 70.6% of cases on the first day of surgery with a gradual resolution to 15% of cases on day 7 and completely resolved within 15 days. Post-operative complications like alveolar osteitis and..... reported in very few cases (3 cases only). Numbness of the lip, chin and tongue was associated with complaints mainly after surgery. It resolved after 5-6 days. A very small population faced similar numbness even after 15 days which then totally subsided within 21 days.

**D) Correlation analysis**

There was no significant correlation found in this study between gender and post-operative pain, swelling, bleeding, chewing, trismus, numbness and restriction in social activities (p.0.05).

No significant correlation was seen between patients' age and pre-operative, post-operative pain, facial swelling, bleeding, trismus, or numbness of lip, chin and tongue; although a significant correlation was seen between older age and limitation of social activities, psychological disabilities and diet modification.

This study does not reveal any significant relation between the habit of smoking or drinking alcohol with post-operative pain, bleeding or swelling.

Statistically significant correlation seen between increased difficulty index of tooth and post-operative pain. Facial swelling, numbness, trismus and difficulty in chewing ($p<0.05$, CI 95%, relative risk 1.76).

There was a strong correlation found between pre-operative symptoms and post-operative pain, swelling and trismus ($p<0.05$, CI 95%, relative risk 1.9).

**Discussion**

The current study aimed to identify patients' perceptions of recovery following third molar surgery. Patients reported for pericoronitis were selected for surgery. A total of 197 cases were selected for the study. The average age group was 34yrs with a standard deviation of 2 years and 8 months. A study performed by Goldberg et al and Osborn et al mentioned the mean age group as young ( < 25 years )[2,4] , in our study the older age group suffered from caries in the third molar with pulp exposure and associated periodontitis and bone loss, so pain and pre-operative symptoms were presented by older populations (>35 years). The age range from 24 years to 56 years helped to prevent selection bias and avoided the “best case scenario’ which influenced the results to be more accurate. Bruce et al showed more post-surgical complications in the older age group, which is in contrast to our study [1]. There are multiple variants (radiographic evaluation, surgical time, per-operative complications etc) involving post-surgical complications. The older age group had a direct influence on reduced social activity during immediate post-surgical days for 3-5 days.

In our study, the frequency of pericoronitis and related complaints was higher in female patients (54.82%) as compared to male patients, which is similar to the study done by Abdalla Hazza in 2009 [10].. the higher frequency of impacted third molar in females may be a consequence of their jaw that seizes to grow when the growth continues in male patients of the same age group [6].

Smoking, alcohol and a combination of these two habits have been shown to have deleterious effects on oral hygiene and are associated with postoperative complications after oral surgery [11]. Interestingly, nicotine was reported to increase the pain threshold and tolerance in men but has no effect in women [12]. The number of female smokers in our study was negligible (only 4 cases, 0.02%) and this can be an explanation of why smoking did not affect post-surgical pain.

The assessment of the difficulty index as per Pell and Gregory's classification was based on the depth of the impacted teeth and their angulation, about ramus. Bui et al reported that mesioangular impaction has more post-operative complications [13], whereas, Yusara et al found that the depth of impacted teeth and ramus space were directly associated with increased surgical time and more post-op complications [14]. This was by our study which supports that surgical difficulty and increased time are associated with impaired or delayed healing. Other studies by Aznar-Arasa et al 2014 demonstrated the direct influence of the depth of impacted teeth, length of surgical time and surgeons' experience on postoperative complications [15]. Information from OPG and CBCT may help assess the difficulty index and can help the surgeon and patient better understand the surgical procedure and its outcome.

Several studies have stated that prolonged surgical time (>30 -45 min) has a prolonged recovery period [3,16,17]. Our study also attributed to the fact, that the mean operation time was 30.8 min with a standard deviation of 8.9 min. Prolonged surgery is usually associated with the extraction of a tooth with a higher difficulty index.

This study demonstrated a statistically significant difference in oral hygiene-related quality of life when compared to the pre-operative OHIP-14 index. There was a significant decrease in the parameter of the early postoperative period for 3-5 days, but the parameter gradually improved within 7 days. The improvement in quality of life was seen in the 21st post-operative period when compared with pre-operative parameters. Therefore, it has been stated that the presence of clinical symptoms and episodes of pericoronitis must be considered as risk factors for post-surgical complications. It has important clinical implications concerning decision-making in surgical extraction of the third molar [18].

Post-operative pain is generally considered as main one of the chief concerns of the patients following surgery. Inflammatory mediators related to tissue injury usually reach at the highest level immediately after 24 hrs of surgery, which causes intense pain [19] this is by our study, where 92.89 % of patients reported intense pain on POD-1. The intensity of pain gradually decreased within 4-5 days post-surgery. Several studies reported that the average number of days before returning to work was 2-3 days [20, 21]. Studies also reported that application of platelet-rich fibrin in extraction sockets, submucosal injection of steroids, or administration of conscious sedation may improve post-operative pain following third molar surgery [22, 23]. Therefore, adequate pain management is essential, and pharmacotherapy may be considered to improve post-

operative quality of life and reduce the period of sick leave.

J Savins and J R Ogden showed that, during the immediate post-op period, the difficulty in chewing and mouth opening resulted in a shift towards soft diet and unilateral chewing. In our study, similar findings are seen, where 95.85 patients reported difficulty in chewing on POD-1 and after 7 days, 48.1% showed significant improvement and almost no complaints related to chewing [24].

In this study, very few patients reported pre-operative limitation in mouth opening (19% l reported little discomfort). A significant limitation in mouth opening was seen in immediate post-operative days (POD-1 and 2) in 91.9% of cases, with a mean inter-incisal opening of 10mm (SD 2.6mm). It required 6-7 days to return to normal/ pre-operative mouth opening. These findings are in agreement with the study done by Shawn Conrad [16] which showed that 78.5% of cases experienced trismus during the immediate post-surgical period. There may be several causes of trismus including pain, inflammation of local tissues due to surgery and injury to muscles during giving anaesthesia, or trauma to the temporomandibular joint due to prolonged surgery. In our study, difficulty in extraction was directly related to post-operative trismus and limitation in mouth opening.

Post-operative swelling was present in 88.5% of cases in POD-1 which subsequently reduced within 2-3 days. Van Gool et al [25] associated increased swelling and limitation of mouth opening with increased surgical time, which was the same as in our study.

Food impaction at the surgical site was a complaint in 70.65% of cases, but it resolved within 7 days to 15% This may be explained by the secondary healing at the surgical site, leading to chewing of food from the opposite side and diet as well. As soon as the patient returned to a normal diet, the problem was resolved.

Another significant complaint reported by the patients after surgery was numbness of the lip, chin and tongue. In our study, almost 4.9% of patients complained of lip numbness and 5.4% of patients reported numbness of the tongue.

Previous studies showed that 0-22% impairment of sensation was seen after the third molar surgery [26].

This systematic review showed an association between numbness and depth of impaction, approximation of inferior alveolar nerve with root apex, and intra-operative nerve exposure.

Bleeding (69.7%) was another major concern for the patients on the first postoperative day, but the bruising was minimally evident and the concern for bleeding was minimal in consecutive days, with evidence of some bleeding in only 5.2% of cases on POD-7. Delayed bleeding may be attributed to local inflammation, food impaction and gingivitis due to poor cleaning of the surgical site.

Our study demonstrated a decrease in quality of life due to oral health with various parameters which helped in better understanding of the outcome of impacted third molar surgery. This helped in expanding our understanding of the impact of surgery in physical, social and psychological aspects. The patient's perception of recovery is important, as sometimes “cure’ is worse than ‘disease’, in terms of quality of life. These data and outcomes can be utilized and patients may be able to make informed decisions regarding surgery.

The implication of this study's results is limited by the small sample, although the heterogeneous nature of the sample with a large range of populations of various age groups added value to the outcome, however, the study

was performed on an institutional basis, so no data can be obtained from the private practitioners.

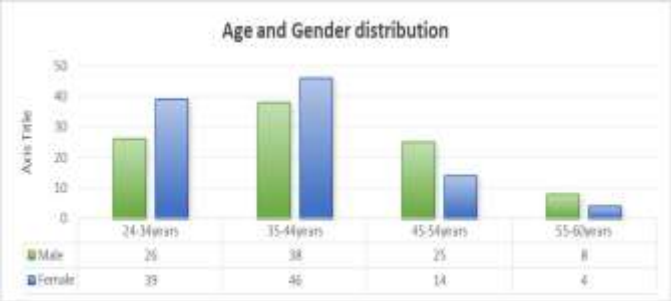


Figure 1: Showing age and gender distribution among the participants included in the study.

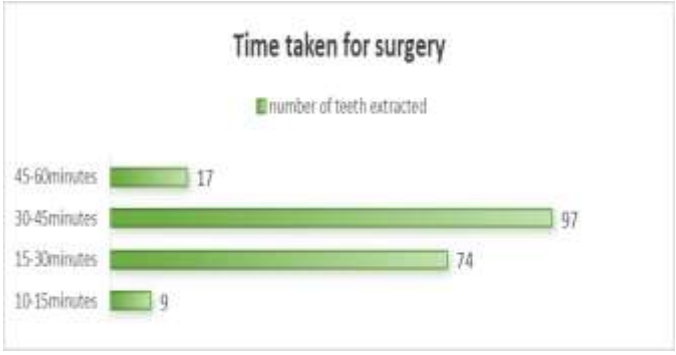


Figure 2: The total time taken for surgery was displayed in the figure 2

Table 1: Patient related demographic data

| VOLUNTARY HABIT | NUMBER OF CASES (%) |
|---|---|
| No habit | 21(61.42) |
| Habit of smoking | 76(38.57) |
| Alcohol intake | 49(24.87) |
| Smoking + Alcohol | 28(14.21) |

Table 2: cases were tabulated according to difficulty index

| | | |
|---|---|---|
| I A<br>07 | IB<br>09 | IC<br>12 |
| IIA<br>36 | IIB<br>28 | IIC<br>23 |
| IIIA<br>41 | IIIB<br>32 | IIIC<br>09 |

Table 3: Increase in oral health impact on life quality over the study period (OHIP domains adversely affected)

| Domain | Questions | Number (%) Of Subjects (PRE-OP) | Number (%) Of Subjects (POD-1) | POD-7 | POD- 15 | POD-21 |
|---|---|---|---|---|---|---|
| Functional limitation | had trouble in pronouncing words or felt taste sense worsening | 34 (17.25%) | 87 (44.16%) | 11 (05.58%) | 08 (4.06%) | 03 (01.52%) |
| physical pain | had painful aching or found it uncomfortable to eat any food | 147 (74.61%) | 183 (92.89%) | 43 (21.82%) | 29 (14.72%) | 09 (04.57%) |
| Psychologica | Have been self-conscious or | 119 | 161 | 45 | 23 | 07 |

| | | | | | | |
|---|---|---|---|---|---|---|
| l discomfort | felt tense | (60.64%) | (81.72%) | (22.84%) | (11.67%) | (03.55%) |
| Physical disability | Had an unsatisfactory diet or had to interrupt meal | 134 (68.02%) | 173 (87.81%) | 56 ( 28.42%) | 37 ( 18.78%) | 05 ( 02.53%) |
| Psychological disability | found it difficult to relax or have been a bit embarrassed | 83 (42.13%) | 112 (56.85%) | 36 (18.27%) | 12 (6.09%) | 03 (01.52%) |
| social disability | have been irritable with the people or has difficulty doing usual job | 103 (52.28%) | 152 (77.15%) | 17 (08.62%) | 11 (5.58%) | 04 (02.03%) |
| Handicap | Felt life in general was less satisfying or have been totally unable to function | 23 (11.67%) | 73 (37.05%) | 11 (5.58%) | 08 (4.06%) | 04 (02.03%) |

Table 4: Percentage of Patients Reporting Various Symptoms

| Symptoms | Pre-Operative Parameter | % of Subjects POD-1 | POD-7 (%) | POD-15 (%) | POD-21 (%) |
|---|---|---|---|---|---|
| CHEWING | | | | | |
| Lots | 15.6 | 46 | 2.1 | - | - |
| Quite a bit | 35.9 | 41.9 | 16.7 | 2.3 | - |
| Some | 10.9 | 07.9 | 33.1 | 06.5 | - |
| Little/None | 37.6 | 04.2 | 48.1 | 91.2 | 100 |
| TRISMUS | | | | | |
| Lots | - | 18.3 | - | - | - |
| Quite a bit | - | 46.3 | 11.6 | - | - |
| Some | 19 | 27.3 | 16.2 | 3.1 | - |
| Little/None | 81 | 8.1 | 72.2 | 96.9 | 100 |
| SWELLING | | | | | |
| Lots | 04.2 | 16.1 | - | - | - |
| Quite a bit | 07.4 | 37.2 | 3.2 | - | - |
| Some | 17.5 | 35.2 | 09.3 | - | - |
| Little/None | 70.9 | 11.5 | 87.5 | 100 | 100 |
| FOOD IMPACTION | | | | | |
| Lots | - | 05.3 | - | - | - |
| Quite a bit | - | 17.7 | 1.7 | - | - |
| Some | 13 | 47.6 | 13.3 | 2.2 | - |
| Little/None | 87 | 29.4 | 85 | 97.8 | 100 |

| | | | | | |
|---|---|---|---|---|---|
| BLEEDING | | | | | |
| Lots | - | 08.7 | - | - | - |
| Quite a bit | - | 26.1 | - | - | - |
| Some | 06.4 | 34.9 | 05.2 | - | - |
| Little/None | 93.6 | 30.3 | 94.8 | 100 | 100 |
| NUMBNESS | | | | | |
| Lip | - | 04.9 | 0.9 | 0.9 | - |
| Chin | - | 0.7 | - | - | - |
| Tongue | - | 05.4 | 1.1 | 0.6 | - |

**Conclusion**

With the limitation of a prospective study, it is evident that third molar extraction is associated with a decrease in the quality of life during the immediate postoperative period, which is a relatively short period of 3-5 days. The main concern of discomfort was swelling, trismus and numbness related to surgery, where pain and bleeding were transient and were controlled pharmacologically. These data can be valuable in decision-making in health policies that affect patients' access to third molar surgery and are also useful in obtaining informed consent for the surgery.

**References**


1. Lyons, C. et al. (1980) 'Age of patients and morbidity associated with mandibular third molarsurgery', The Journal of the American Dental Association, 101(2), pp. 240–245. doi:10.14219/ jada.archive.1980.0183.
2. Goldberg, M.H., Nemarich, A.N. and Marco, W.P. (1985) 'Complications after mandibular third molar surgery: A statistical analysis of 500 consecutive procedures in private practice', The Journal of the American Dental Association, 111(2), pp. 277–279. doi:10.14219/jada.archive.1985.0098.
3. Shugars, D.A. et al. (1996) 'Developing a measure of patient perceptions of short-term outcomes of third molar surgery', Journal of Oral and Maxillofacial Surgery, 54(12), pp. 1402–1408. doi:10.1016/s0278-2391(96)90253-0.
4. Osborn, T.P. et al. (1985) 'A prospective study of complications related to mandibular third molar surgery', Journal of Oral and Maxillofacial Surgery, 43(10), pp. 767–769. doi:10.1016/0278-2391(85)90331-3.
5. Sato, F.R. et al. (2009) 'Short-term outcome of postoperative patient recovery perception after surgical removal of third molars', Journal of Oral and Maxillofacial Surgery, 67(5), pp. 1083–1091. doi:10.1016/j.joms.2008.09.032.
6. Reddy, K., Jadaun, G. and Bindra, S. (2018) 'Quality of life after third molar removal in subjects with pericoronitis', Journal of Advances in Medicine and Medical Research, 26(8), pp. 1–9. doi:10. 9734/ jammr/2018/39796.
7. Pell, G.J.; Gregory, B.T. Impacted mandibular third molars: Classification and modified techniques for removal. Dent Dig. **1933**, 39, 330–338.
8. Almoznino, G. et al. (2015) 'Sleep quality in patients with dental anxiety', Journal of Psychiatric Research, 61, pp. 214–222. doi:10.1016/ j.jpsychires. 2014.11.015.
9. Gentile, M.A. (2006) 'Assessment of oral health-related quality of life before and after third molar

surgery', Journal of Oral and Maxillofacial Surgery, 64(9), p. 73. doi:10.1016/j.joms.2006.06.139.

10. Bataineh, A., Hazza'a, A. and Odat, A. (2009) 'Angulation of mandibular third molars as a predictive factor for Pericoronitis', The Journal of Contemporary Dental Practice, 10(3), pp. 51–58. doi:10.5005/jcdp-10-3-51.
11. GROSSI, S.G. et al. (1997) 'Effects of smoking and smoking cessation on healing after mechanical periodontal therapy', The Journal of the American Dental Association, 128(5), pp. 599–607. doi:10.14219/jada.archive.1997.0259.
12. Jamner, L.D. et al. (1998) 'Pain inhibition, nicotine, and gender.', Experimental and Clinical Psychopharmacology, 6(1), pp. 96–106. doi:10.1037//1064-1297.6.1.96.
13. Bui, C.H., Seldin, E.B. and Dodson, T.B. (2003) 'Types, frequencies, and risk factors for complications after third molar extraction', Journal of Oral and Maxillofacial Surgery, 61(12), pp. 1379–1389. doi:10.1016/j.joms.2003.04.001.
14. Yuasa, H., Kawai, T. and Sugiura, M. (2002) 'Classification of surgical difficulty in extracting impacted third molars', British Journal of Oral and Maxillofacial Surgery, 40(1), pp. 26–31— doi:10.1054/bjom.2001.0684.
15. Aznar-Arasa, L. et al. (2014) 'Patient anxiety and surgical difficulty in impacted lower third molar extractions: A prospective cohort study', International Journal of Oral and Maxillofacial Surgery, 43(9), pp. 1131–1136. doi:10.1016/ j.ijom.2014.04.005.
16. Conrad, S.M. et al. (1999) 'Patients' perception of recovery after third molar surgery', Journal of Oral and Maxillofacial Surgery, 57(11), pp. 1288–1294. doi:10.1016/s0278-2391(99)90861-3
17. Phillips, C. et al. (2010) 'Recovery after third-molar surgery: The effects of age and sex', American Journal of Orthodontics and Dentofacial Orthopedics, 138(6). doi:10.1016/ j.ajodo.2010. 06.013.
18. Grossi, G.B. et al. (2007) 'Assessing postoperative discomfort after third molar surgery: A prospective study', Journal of Oral and Maxillofacial Surgery, 65(5), pp. 901–917. doi:10.1016/j.joms.2005.12.046.
19. Bortoluzzi, M.C. et al. (2011) 'Pain levels after third molar surgical removal: An evaluation of predictive variables', The Journal of Contemporary Dental Practice, 12(4), pp. 239–244. doi:10.5005/jp-journals-10024-1041.
20. Colorado-Bonnin, M. et al. (2006) 'Quality of life following lower third molar removal', International Journal of Oral and Maxillofacial Surgery, 35(4), pp. 343–347. doi:10.1016/j.ijom.2005.08.008.
21. White, R.P. et al. (2003) 'Recovery after third molar surgery: Clinical and health-related quality of life outcomes', Journal of Oral and Maxillofacial Surgery, 61(5), pp. 535–544. doi:10.1053/ joms. 2003.50106.
22. Melini, M. et al. (2020) 'Conscious sedation for the management of dental anxiety in third molar extraction surgery: A systematic review', BMC Oral Health, 20(1). doi:10.1186/s12903-020-01136-0.
23. Ramos, E.U. et al. (2022) 'Do the new protocols of platelet-rich fibrin centrifugation allow better control of postoperative complications and healing after surgery of impacted lower third molar? A systematic review and meta-analysis, Journal of Oral and Maxillofacial Surgery, 80(7), pp. 1238–1253. doi:10.1016/j.joms.2022.03.011
24. Savin, J. and Ogden, G.R. (1997) 'Third molar surgery—a preliminary report on aspects affecting

the quality of life in the early postoperative period', British Journal of Oral and Maxillofacial Surgery, 35(4), pp. 246–253. doi:10.1016/s0266-4356(97)90042-5.

25. Van Gool, A.V., Ten Bosch, J.J. and Boering, G. (1977) 'Clinical consequences of complaints and complications after removal of the mandibular third molar', International Journal of Oral Surgery, 6(1), pp. 29–37. doi:10.1016/s0300-9785(77)80069-0.
26. Kang, F., Sah, M.K. and Fei, G. (2020) 'Determining the risk relationship associated with inferior alveolar nerve injury following removal of mandibular third molar teeth: A systematic review', Journal of Stomatology, Oral and Maxillofacial Surgery, 121(1), pp. 63–69. doi:10.1016/j.jormas. 2019. 06.010.