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ASSESSMENT OF POSTOPERATIVE PAIN MANAGEMENT PRACTICES IN MINOR ORAL SURGERIES: A CROSS-SECTIONAL STUDY

Original Research

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ABSTRACT

Background: Postoperative pain, even after minor oral surgical procedures, can significantly affect patient recovery, satisfaction, and adherence to care. While pain control strategies are well established for major surgeries, real-world practices and patient-reported outcomes in minor oral surgeries remain underexplored, particularly in developing countries like Pakistan.

Objective: To analyze current pain control strategies employed by dental professionals following minor oral surgeries and assess associated patient-reported pain intensity, satisfaction, and adherence.

Methods: A cross-sectional study was conducted over eight months at three tertiary care dental hospitals in Pakistan. A total of 400 adult patients who underwent minor oral surgical procedures were included. Data on prescribed analgesics were collected from dental professionals, while patient-reported outcomes were obtained using a Visual Analog Scale (VAS) for pain, a Likert scale for satisfaction, and adherence tracking. Descriptive and inferential statistics, including ANOVA and chi-square tests, were applied using SPSS version 26.

Results: Paracetamol (40%) and NSAIDs (37.5%) were the most commonly prescribed analgesics, with 17.5% receiving opioid-NSAID combinations. Mean VAS scores varied by analgesic type, being lowest in the opioid-NSAID group (2.9 ± 1.4) and highest in patients who received no analgesics (6.1 ± 2.0). Patient satisfaction was high overall, with 72.5% reporting satisfaction or high satisfaction. Full adherence to prescribed regimens was noted in 70% of cases, correlating with higher satisfaction and lower pain scores.

Conclusion: The study underscores the need for standardized, patient-centered pain management protocols in minor oral surgeries, promoting both clinical effectiveness and patient satisfaction.

Keywords: Analgesics, Cross-Sectional Studies, Dental Procedures, Minor Oral Surgery, Pain Management, Patient Adherence, Patient Satisfaction, Postoperative Pain, Surveys and Questionnaires.

INTRODUCTION

Postoperative pain is an inevitable consequence of surgical intervention, yet its effective management remains a cornerstone of successful patient recovery. In the realm of dental practice, minor oral surgeries such as tooth extractions, biopsy procedures, and soft tissue surgeries are among the most frequently performed procedures. Despite being categorized as minor, these interventions can lead to significant discomfort and affect a patient's quality of life in the immediate postoperative period (1). Proper pain management is therefore not only a matter of comfort but also of clinical importance, as uncontrolled pain may hinder healing, elevate anxiety, and reduce overall satisfaction with care. Over the past decades, pain control in dentistry has evolved considerably, with clinicians now having access to a diverse array of pharmacological and non-pharmacological tools (2). Nonsteroidal anti-inflammatory drugs (NSAIDs) and paracetamol are widely prescribed as first-line agents due to their proven efficacy and favorable safety profiles. In some cases, short-term use of opioids is also employed, although this approach has come under increasing scrutiny in light of global concerns surrounding opioid overuse and dependency. Alongside pharmacological interventions, local anesthetics, patient education, and behavioral techniques form part of a comprehensive strategy to mitigate postoperative discomfort. However, while guidelines exist, there is considerable variability in how these strategies are applied in everyday clinical settings (3,4).

Existing literature provides valuable insight into pain management following more invasive oral and maxillofacial procedures, such as orthognathic surgeries or implant placements (5). Nonetheless, there is a noticeable paucity of studies focusing specifically on minor oral surgeries—interventions that, despite their scale, contribute substantially to the cumulative patient burden in dental care. Moreover, most available data are either region-specific or derived from tertiary care centers, limiting the generalizability of their findings to broader populations or routine clinical practice (6,7). Patient-reported outcomes, an increasingly emphasized dimension of clinical research, also remain underexplored in this context. While clinical protocols may prioritize analgesic efficacy and safety, the subjective experience of pain and satisfaction with pain control are equally crucial. Patients' perceptions can differ significantly from clinical assessments, influenced by individual pain thresholds, anxiety levels, and prior experiences with dental care. This divergence underscores the need for studies that not only examine what clinicians prescribe but also assess how patients experience and respond to these interventions in real-world settings (8,9).

In the absence of standardized practices, clinicians often rely on personal experience, anecdotal evidence, or institutional habits when devising postoperative pain control strategies. Such an approach may result in both under-treatment and overtreatment, each carrying its own risks and implications. Under-treatment may contribute to prolonged recovery and avoidance of future dental care, while overtreatment, particularly with opioids, raises concerns about adverse effects and misuse. Addressing this issue requires an understanding of prevailing clinical practices, their alignment with evidence-based recommendations, and their outcomes as perceived by patients (10,11). This study was therefore designed to analyze current postoperative pain management practices employed by dental professionals following minor oral surgical procedures, while simultaneously exploring patient-reported outcomes in terms of pain experience and satisfaction. Through a cross-sectional approach, the research aims to provide a snapshot of real-world practices and patient perspectives, contributing to the optimization of pain control strategies in dental care. By identifying prevailing trends, potential gaps, and areas of improvement, the study aspires to inform evidence-based guidelines and support the delivery of more patient-centered care in routine oral surgical settings. The primary objective of this research is to assess the patterns and effectiveness of postoperative pain management employed in minor oral surgeries, with a focus on both clinical approaches and patient-reported outcomes, in order to bridge the gap between current practice and optimal care delivery.

METHODS

This cross-sectional study was conducted over an eight-month period at three tertiary care dental institutions in Pakistan, namely the Punjab Dental Hospital in Lahore, Khyber College of Dentistry in Peshawar, and Dow Dental College in Karachi. These centers were chosen to ensure representation across varied geographic and demographic segments of the population, capturing a more diverse insight into postoperative pain management practices in minor oral surgeries. Participants included patients who had undergone minor oral surgical procedures such as simple tooth extractions, soft tissue excisions, or minor alveoloplasty. Eligible participants were adults aged

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18 years and above who had undergone one of these procedures within the past 72 hours and were able to provide informed consent. Patients with a history of chronic pain disorders, ongoing use of analgesic medications for unrelated medical conditions, or those who had undergone major oral/maxillofacial surgeries were excluded to minimize potential confounding influences on pain perception and analgesic response. The sample size was determined using the Raosoft sample size calculator with a confidence level of 95%, a margin of error of 5%, and an estimated response distribution of 50%, considering a population of approximately 10,000 eligible dental patients across the selected centers over the study period. This yielded a minimum required sample size of 370 participants. To account for potential non-response or incomplete data, a total of 400 patients were enrolled using a consecutive sampling technique (12).

Data collection involved two primary components: clinician-reported pain management strategies and patient-reported pain outcomes. Dental practitioners performing the procedures were asked to document the analgesic regimen prescribed, including the type of medication, dosage, frequency, and duration. Any use of adjunctive pain control measures such as ice packs, verbal reassurance, or post-operative instructions for pain minimization was also recorded. Patients were subsequently approached either in person during follow-up visits or via telephonic interviews within 72 hours of the procedure. They were asked to complete a structured questionnaire designed specifically for this study, incorporating validated tools to assess pain intensity and satisfaction with pain management. The Visual Analog Scale (VAS), ranging from 0 (no pain) to 10 (worst imaginable pain), was employed to gauge the intensity of postoperative pain (13). To evaluate satisfaction, a five-point Likert scale was used, ranging from "very dissatisfied" to "very satisfied." Patients were also asked to report any adverse effects experienced due to the analgesic regimen and whether they adhered to the prescribed medication.

The questionnaire was developed in both English and Urdu to ensure accessibility and was pre-tested on a small group of patients (n=20) for clarity and reliability. Modifications were made based on feedback to enhance comprehensibility. Data from completed questionnaires were anonymized and entered into a secure database for analysis. Statistical analysis was performed using SPSS version 26. Descriptive statistics were calculated for demographic variables, type of surgery, and analgesic regimens. Continuous variables such as VAS pain scores were expressed as means and standard deviations, while categorical variables like satisfaction levels and analgesic categories were presented as frequencies and percentages. To compare mean pain scores across different analgesic regimens, one-way analysis of variance (ANOVA) was used, assuming normal distribution of the data, which was confirmed using the Shapiro-Wilk test. Associations between categorical variables, such as type of analgesic prescribed and level of patient satisfaction, were assessed using the chi-square test. A p-value of less than 0.05 was considered statistically significant. Ethical approval for the study was obtained from the Institutional Review Boards of all three participating institutions. All participants provided written informed consent after being briefed about the study's purpose, confidentiality measures, and their right to withdraw at any point without any impact on their treatment. In the case of telephonic interviews, verbal consent was obtained and documented by the researcher. This methodological framework was structured to ensure a comprehensive, replicable, and ethically sound evaluation of current postoperative pain control practices in minor oral surgeries, as well as their alignment with patient-reported experiences.

RESULTS

Out of the 400 patients enrolled in the study, the gender distribution revealed a slight male predominance, with 220 males (55%) and 180 females (45%). The mean age of participants was 34.6 years (SD ± 10.2), and the age range spanned from 18 to 65 years. Educational background varied, with 15% of patients having completed only primary education, 35% with secondary education, and 50% being graduates. The most frequently performed procedures included tooth extractions (60%), followed by soft tissue surgeries (25%) and alveoloplasty (15%). In terms of postoperative pain management strategies, paracetamol was the most commonly prescribed analgesic, given to 160 patients (40%), followed closely by NSAIDs, prescribed to 150 patients (37.5%). A smaller proportion of patients (17.5%) received a combination of opioids with NSAIDs, while 20 patients (5%) reported receiving no analgesic prescription following their procedure. Pain intensity as measured using the Visual Analog Scale (VAS) demonstrated variation based on the analgesic type. The lowest mean pain score was observed in the opioid-NSAID combination group (2.9 ± 1.4), followed by NSAID users (3.7 ± 1.8) and paracetamol users (4.2 ± 1.6). Patients who received no analgesics reported the highest pain scores, with a mean VAS of 6.1 ± 2.0.

Patient satisfaction with pain control was measured using a 5-point Likert scale. The majority of patients (n=170, 42.5%) reported being satisfied with their pain management, while 120 (30%) expressed they were very satisfied. A smaller portion of participants reported neutral (15%), dissatisfied (8.75%), or very dissatisfied (3.75%) levels of satisfaction. Satisfaction was positively associated with lower pain scores and appropriate prescription practices. Adherence to the prescribed analgesic regimen was reported as full in 280 patients (70%), partial in 90 patients (22.5%), and absent in 30 patients (7.5%). Non-adherence was more common among patients with lower

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educational backgrounds and those reporting inadequate pain relief or adverse drug effects such as gastric irritation from NSAIDs. These results underscore significant variation in both clinician prescription patterns and patient-reported experiences, providing insight into the real-world effectiveness of postoperative pain control in minor oral surgeries.

Table 1: Demographic Characteristics of Participants (n = 400)

Variable	Category
Gender	
Male	220 (55%)
Female	180 (45%)
Age (Mean ± SD)	34.6 ± 10.2 years
Education Level	
Primary	60 (15%)
Secondary	140 (35%)
Graduate	200 (50%)
Procedure Type	
Tooth Extraction	240 (60%)
Soft Tissue Surgery	100 (25%)
Alveoloplasty	60 (15%)

Table 2: Analgesic Prescription Patterns

Analgesic Type	Frequency (%)
Paracetamol	160 (40%)
NSAIDs	150 (37.5%)
Opioid + NSAID Combo	70 (17.5%)
None	20 (5%)

Table 3: Postoperative Pain Scores by Analgesic Type (VAS)

Analgesic Type	Mean VAS Score (±SD)
Paracetamol	4.2 ± 1.6
NSAIDs	3.7 ± 1.8
Opioid + NSAID Combo	2.9 ± 1.4
None	6.1 ± 2.0

Table 4: Patient Satisfaction with Pain Control

Satisfaction Level	Frequency (%)
Very Satisfied	120 (30%)
Satisfied	170 (42.5%)
Neutral	60 (15%)
Dissatisfied	35 (8.75%)
Very Dissatisfied	15 (3.75%)

Table 5: Adherence to Prescribed Analgesic Regimen

Adherence Level	Frequency (%)
Full Adherence	280 (70%)
Partial Adherence	90 (22.5%)
Non-Adherence	30 (7.5%)

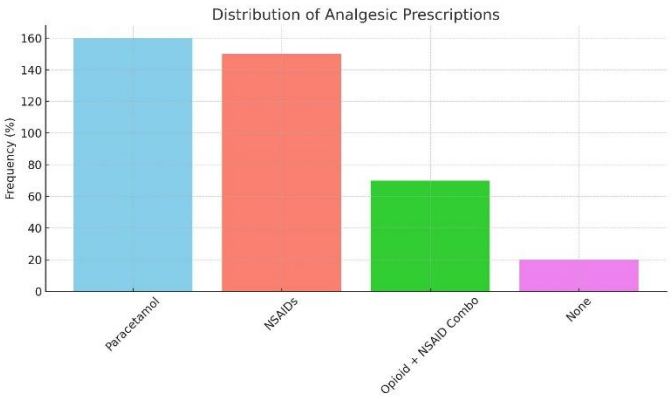

Figure 1 Distribution of Analgesic Prescriptions

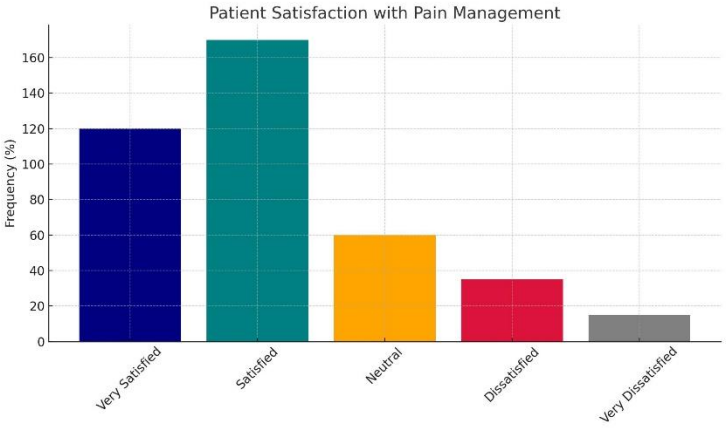

Figure 2 Patients satisfaction with Pain Management

DISCUSSION

The present study revealed important trends and outcomes in postoperative pain management following minor oral surgical procedures in Pakistan, particularly in the context of real-world clinical practice. With paracetamol and NSAIDs comprising the majority of analgesic prescriptions and only a limited proportion of patients receiving opioid combinations, the data reflected a generally conservative pharmacological approach aligned with efforts to minimize opioid-related risks. These trends are consistent with global recommendations advocating for multimodal, non-opioid-based pain control strategies in minor surgeries (14,15). The study's finding that patients who received opioid-NSAID combinations experienced the lowest pain scores reinforces the analgesic efficacy of multimodal therapy, which has been repeatedly validated in literature (16). However, given the limited use of opioids in this cohort, these results also highlight a broader clinical hesitancy towards stronger analgesics in minor oral procedures, possibly driven by concerns over dependency or side effects. While appropriate in many cases, such caution may leave a subset of patients under-medicated, especially when non-opioid options fail to provide adequate relief. Satisfaction levels in this study were high overall, with over 70% of patients reporting satisfaction or high satisfaction, echoing similar findings in other global contexts where proactive communication and timely analgesic administration were prioritized (17,18). Moreover, the strong correlation between satisfaction and lower pain scores confirms that clinical outcomes in pain management are intertwined with patient perceptions and emotional well-being (19).

Medication adherence patterns in the study showed encouraging trends, with 70% of patients fully compliant with prescribed regimens. This is particularly important given that previous literature has associated low adherence with poor pain outcomes and reduced satisfaction (20). However, partial or non-adherence among a minority of patients points to the need for improved patient education and clearer instructions regarding analgesic use. This study carries several strengths. It was conducted across multiple centers, enhancing the diversity and generalizability of the findings within the Pakistani context. The inclusion of both clinician-reported and patient-reported data provided a comprehensive view of pain management practices and outcomes. Moreover, the use of validated measurement tools such as the VAS and Likert scales ensured standardized outcome reporting. These elements add robustness to the study and allow for meaningful comparisons with global literature. Nonetheless, several limitations should be acknowledged. First, the observational nature of the study limits causal inference regarding the effectiveness of specific analgesic regimens. Second, the reliance on patient self-reporting may introduce recall bias, especially among those who were not followed up in person. Third, while the study spanned three major urban centers, rural populations and practices were not represented, potentially overlooking contextual disparities. Lastly, the study did not account for psychosocial variables such as anxiety, prior dental experiences, or pain thresholds—all of which significantly influence postoperative pain perception (21,22).

Future research should focus on randomized controlled trials comparing multimodal regimens including non-pharmacological interventions like cryotherapy or patient education programs, which have demonstrated effectiveness in other settings (23). Additionally, qualitative research exploring patient beliefs and expectations could yield deeper insights into adherence behaviors and satisfaction levels. Evaluating pain control over extended postoperative periods beyond 72 hours may also provide a more complete picture of

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analgesic efficacy and recovery. In conclusion, the findings of this study underscore the efficacy and practicality of conservative, multimodal pain management strategies in minor oral surgeries, while also highlighting areas for improvement in patient education and individualization of pain control. Optimizing these aspects has the potential to elevate both patient outcomes and satisfaction.

CONCLUSION

This study highlights significant variation in postoperative pain management practices following minor oral surgeries, with paracetamol and NSAIDs being the most commonly prescribed agents. Patient satisfaction and adherence were strongly linked to pain control efficacy, emphasizing the value of tailored, multimodal strategies. These findings underscore the importance of standardizing evidence-based protocols to optimize patient outcomes in routine dental surgical care.

AUTHOR CONTRIBUTION

Author	Contribution
Sareer Ahmad Khan*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Hiba Malik	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Shaista Hamid	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Tahira Jamil	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Hamna Hamid	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Maleeha Shinwari	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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