

Original article

Impact of Postoperative Pain Management Strategies on Patient Satisfaction Following Abdominal Procedures: A Descriptive Cross-Sectional Study

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ABSTRACT

Background: Postoperative pain remains common after abdominal surgery and may impair recovery. Patient satisfaction reflects pain relief as well as communication, information and involvement in care. Evidence describing these dimensions in Pakistani surgical settings is limited. **Objective:** To describe postoperative pain-management strategies, pain intensity, communication, participation in treatment decisions and satisfaction among adults following abdominal procedures. **Methods:** This single-center descriptive cross-sectional study included 120 adults aged 18–50 years recovering from abdominal surgery at Life Hospital, Bahria Town, Lahore. Participants were recruited purposively during a four-month period completed before December 2024. A structured questionnaire recorded demographic and clinical characteristics, the reported primary pain-management strategy, postoperative pain intensity on a visual analogue scale, communication, participation in decisions and overall satisfaction. Data were summarized using frequencies, percentages, mean and standard deviation; 95% confidence intervals (CIs) were calculated for key proportions and the mean pain score. **Results:** Of 120 participants, 83 (69.2%) were men, 99 (82.5%) underwent elective surgery and 77 (64.2%) reported no previous surgery. Opioids were the most frequently reported primary strategy (73/120, 60.8%), followed by non-steroidal anti-inflammatory drugs (30/120, 25.0%), multimodal analgesia (12/120, 10.0%) and non-pharmacological management (5/120, 4.2%). Mean postoperative pain was 5.7 ± 1.9 (95% CI 5.36–6.04). Pain-management options were explained to 104 participants (86.7%; 95% CI 79.4–91.6), 107 (89.2%; 95% CI 82.4–93.6) reported involvement in decisions and 97 (80.8%; 95% CI 72.9–86.9) were satisfied. Marginal totals did not permit patient-level tests of association. **Conclusion:** Satisfaction and reported communication were high, although the mean pain score indicated a clinically relevant residual pain burden. These descriptive findings support routine pain assessment and patient-centered communication but do not establish comparative effectiveness or causality. Analytical multicenter studies using validated satisfaction measures are warranted. **Keywords:** Postoperative pain, Pain management, Patient satisfaction, Abdominal surgery, Analgesia, Cross-sectional study

EDITORIAL INFORMATION

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INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage (1). Acute postoperative pain develops through interacting nociceptive, inflammatory and neuropathic mechanisms, with its intensity and duration influenced by the procedure and individual patient characteristics (2,3). Given the worldwide volume of surgery, inadequately controlled postoperative pain remains an important quality-of-care problem (4). National surveys have consistently shown that many surgical patients experience moderate-to-severe pain despite receiving analgesic treatment (5,6). Poor pain control may restrict breathing, coughing, sleep and mobilization, delay functional recovery and increase the risk of persistent postsurgical pain (2,3,7).

The postoperative pain experience is dynamic rather than a single event. Surgical tissue injury initiates peripheral sensitization and sustained nociceptive input, while central sensitization may amplify pain beyond the immediate operative site (2,3). Pain is also modified by preoperative pain, anxiety, expectations, previous experiences, age, comorbidity and the nature of surgery. Consequently, patients

undergoing similar procedures and receiving comparable analgesic prescriptions may report substantially different experiences. Pain should therefore be assessed repeatedly and interpreted in relation to movement, functional interference, adverse effects and response to treatment rather than relying on a single resting pain score recorded at an unspecified time (8,9).

Abdominal surgery includes open and minimally invasive procedures, upper- and lower-abdominal incisions, and elective and emergency operations with different expected pain trajectories. Pain during movement may be especially important because it can interfere with turning, walking, deep breathing, coughing and physiotherapy. Procedure-specific assessment is therefore necessary, as an intervention appropriate for one abdominal operation may provide inadequate benefit or disproportionate risk in another (8,9). Enhanced Recovery After Surgery pathways address these differences by combining procedure-specific analgesia with early mobilization, nutrition and coordinated perioperative care (10,11).

Contemporary postoperative pain guidance recommends individualized multimodal analgesia, in which compatible interventions with different mechanisms are combined to improve pain relief and reduce excessive dependence on a single drug class (8,12,13). Depending on the patient and procedure, multimodal care may include acetaminophen, non-steroidal anti-inflammatory drugs, local or regional techniques, carefully titrated opioids, patient education and selected non-pharmacological measures (8,13,16). Opioids remain important for moderate-to-severe acute pain but require monitoring for nausea, vomiting, sedation, respiratory depression, ileus and other dose-related harms (14,15). The objective is not necessarily the complete elimination of postoperative sensation, but acceptable relief that supports breathing, mobility and recovery while minimizing treatment-related harm.

Despite advances in anesthesia and analgesic delivery, persistent gaps between the availability of treatment and patients' reported relief demonstrate that prescribing an analgesic does not ensure adequate pain control (5,6). Delayed administration, insufficient reassessment, inconsistent documentation, fear of adverse effects and failure to tailor treatment to the patient or procedure may weaken care. Evaluation should therefore consider the treatment provided, residual pain, functional interference, adverse effects and the patient's experience of communication. This broader approach is particularly relevant in resource-constrained hospitals, where staffing, medicine availability and monitoring capacity may affect protocol implementation.

Patient satisfaction is not a direct substitute for pain intensity. It is a multidimensional judgement influenced by pain relief, expectations, timeliness of treatment, information, staff responsiveness and participation in decisions (17–19). Patients may report considerable pain while remaining satisfied with care, producing a recognized paradox that makes a single binary satisfaction question difficult to interpret (20). A favorable satisfaction rating may reflect respectful staff behavior, reassurance or low expectations rather than optimal analgesia. Satisfaction should therefore complement, rather than replace, measurement of pain intensity, interference, relief and adverse effects.

Validated instruments such as the revised American Pain Society Patient Outcome Questionnaire assess pain severity and functional interference alongside adverse effects, information, participation and non-pharmacological care (17). Multidimensional assessment can distinguish satisfaction with analgesic treatment from satisfaction with communication and staff responsiveness, allowing quality-improvement teams to identify specific deficiencies. When detailed validated instruments are unavailable, individual indicators should be reported separately, and causal language should be avoided. Accordingly, the present study treats pain intensity, explanation of treatment options, participation in decision-making and overall satisfaction as analytically distinct descriptive domains.

International studies demonstrate substantial variation in postoperative pain and analgesic practice across procedures and institutions (21,22). However, local evidence describing analgesic strategies together with residual pain, communication, participation and satisfaction remains limited. Findings from well-resourced health systems may not transfer directly to hospitals in Pakistan because differences in medicine availability, staffing, monitoring resources, health literacy, patient expectations and clinician–patient communication can affect both treatment delivery and reported satisfaction. Although a single-hospital study cannot provide a national estimate, it can establish an institutional baseline, identify areas for quality improvement and generate hypotheses for multicenter analytical research.

Accordingly, this study described the primary postoperative pain-management strategies, residual pain intensity, explanation of available treatment options, perceived participation in decisions and overall satisfaction among adults following abdominal procedures at Life Hospital, Bahria Town, Lahore. These outcomes were examined as separate descriptive indicators because the cross-sectional design and available aggregate data could not establish whether communication, participation or a particular analgesic strategy caused greater satisfaction.

MATERIALS AND METHODS

A single-centre descriptive cross-sectional study was conducted in the general surgical wards of Life Hospital, Bahria Town, Lahore, Pakistan. Data collection covered four months and was completed before the December 2024 publication period; institutional ethical approval and hospital permission were obtained before recruitment. Adults aged 18–50 years who had undergone an abdominal procedure, were receiving postoperative pain management, were conscious and able to communicate, and provided written informed consent were recruited purposively. Outpatients, minor procedures, critically ill patients, people with severe cognitive or communication difficulty, and those declining participation were excluded. The achieved sample comprised 120 eligible participants available during the study period.

A structured self-administered questionnaire, reviewed for relevance and clarity by academic and clinical experts, recorded demographic and clinical characteristics; the reported primary postoperative pain-management strategy; pain intensity using a visual analogue scale; information about pain-management options; participation in decisions; and overall satisfaction. Assistance was limited to clarification when requested. The primary outcome was overall satisfaction, classified from the questionnaire as satisfied or dissatisfied. Secondary outcomes were the reported primary strategy, pain score, communication and participation. Responses were collected confidentially during the postoperative admission and de-identified before analysis.

Data were analysed using IBM SPSS Statistics version 26.0. Categorical variables are reported as *n* (%), and the available continuous pain score as mean $\pm$ standard deviation. Wilson 95% CIs were calculated for principal proportions, and the 95% CI for the mean pain score used the standard error derived from the reported standard deviation. Because only marginal aggregate counts were available for revision, no patient-level association or adjusted analysis was introduced. Ethical approval was granted by the Ethical Review Committee of the University of Lahore before data collection (Ref. No.: DRC/DHPT004/02/24). Written informed consent was obtained, participation was voluntary and confidentiality was maintained. Reporting was aligned with the STROBE guidance for cross-sectional studies (23).

RESULTS

All 120 included participants contributed to the reported summaries. Men comprised 83 (69.2%) of the sample. The largest age group was 41–50 years (62/120, 51.7%), and 99 (82.5%) procedures were elective. Seventy-seven participants (64.2%) reported no previous surgery. Diabetes mellitus was reported in 23.3% of participants; complete counts for the other comorbidity categories were not available in the source results and were therefore not reconstructed (Table 1).

Table 1. Demographic and clinical characteristics

Characteristic	Category	n (%)
Sex	Male	83 (69.2)
	Female	37 (30.8)
Age, years	18–30	20 (16.7)
	31–40	38 (31.7)
	41–50	62 (51.7)
Previous surgery	Yes	43 (35.8)
	No	77 (64.2)
Procedure urgency	Elective	99 (82.5)
	Emergency	21 (17.5)

Opioids were reported as the primary management strategy for 73 participants (60.8%), whereas 30 (25.0%) received NSAIDs, 12 (10.0%) were classified as receiving multimodal analgesia and 5 (4.2%) reported non-pharmacological management. These categories reproduce the mutually exclusive coding

in the source results and describe utilization, not comparative effectiveness. Mean postoperative pain was 5.7 ± 1.9 ; based on $N = 120$, the derived 95% CI for the mean was 5.36–6.04 (Table 2).

Table 2. Postoperative pain-management strategy and pain intensity

Outcome	Result	95% CI
Primary strategy: opioids	73 (60.8%)	51.9–69.1
Primary strategy: NSAIDs	30 (25.0%)	18.1–33.4
Primary strategy: multimodal analgesia	12 (10.0%)	5.8–16.7
Primary strategy: non-pharmacological	5 (4.2%)	1.8–9.3
Postoperative pain score	5.7 ± 1.9	5.36–6.04

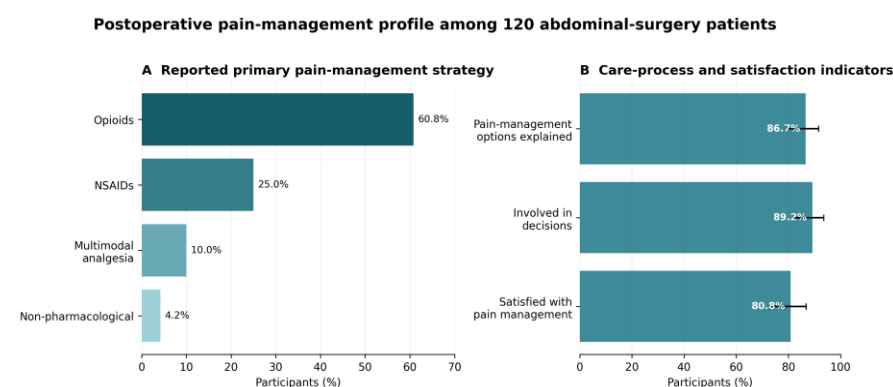
Pain-management options were reported as adequately explained by 104 participants (86.7%; 95% CI 79.4–91.6), and 107 (89.2%; 95% CI 82.4–93.6) reported participation in treatment decisions. Overall, 97 participants (80.8%; 95% CI 72.9–86.9) were satisfied and 23 (19.2%; 95% CI 13.1–27.1) were dissatisfied (Table 3 and Figure 1). These marginal proportions cannot determine whether communication or participation was associated with satisfaction in the same individuals.

Table 3. Communication, participation and satisfaction

Indicator	Yes/Satisfied n (%)	No/Dissatisfied n (%)	95% CI for Yes/Satisfied
Options adequately explained	104 (86.7)	16 (13.3)	79.4–91.6
Involved in decisions	107 (89.2)	13 (10.8)	82.4–93.6
Overall satisfaction	97 (80.8)	23 (19.2)	72.9–86.9

Indicator	Yes/Satisfied n (%)	No/Dissatisfied n (%)	95% CI for Yes/Satisfied
Options adequately explained	104 (86.7)	16 (13.3)	79.4–91.6

Figure 1. Aggregate postoperative pain-management profile



Panel A shows the mutually exclusive primary strategies reported in the source data. Panel B shows care-process and satisfaction indicators with Wilson 95% confidence intervals. The figure presents marginal distributions and does not imply patient-level associations.

DISCUSSION

In this single-center sample, opioids were the most frequently reported primary postoperative pain-management strategy, while only one in ten participants was classified as receiving multimodal analgesia. Approximately four in five participants reported satisfaction, and large majorities reported that options were explained and that they participated in decisions. At the same time, the mean pain score of 5.7 indicates a meaningful residual pain burden. The coexistence of appreciable pain and high satisfaction is the most clinically informative pattern in these data.

The predominance of opioid-based management is consistent with the continuing role of opioids in acute postoperative care, but current guidance recommends tailoring treatment to the procedure and

patient and combining compatible modalities when appropriate (8,12,13). Multimodal regimens can reduce opioid exposure, although effectiveness and safety depend on the operation, contraindications and implementation (13,16,24). Because treatment categories in this study were recorded as a single primary strategy, the results cannot establish whether patients in the opioid group also received adjuncts or whether the small multimodal group achieved better pain control. Utilization should therefore not be interpreted as comparative efficacy.

The mean pain score is broadly compatible with international evidence that moderate-to-severe postoperative pain remains common despite analgesic availability (5,6,21,22). Pain intensity varies substantially by procedure, time after surgery and assessment at rest or movement (9,21). Those details were not available here, so comparison with procedure-specific benchmarks is limited. The finding nevertheless supports repeated standardized assessment and timely treatment review, especially because acute pain and its functional interference may influence recovery and the risk of persistent postsurgical pain (3,7,25,26).

Satisfaction was higher than might be expected from the mean pain score, but this is not necessarily contradictory. Satisfaction encompasses expectations, staff attention, access to information, perceived improvement and involvement in care (17–20). Prior work has shown that patients may report high satisfaction despite substantial pain, illustrating why satisfaction should be interpreted alongside pain relief, interference and treatment adverse effects rather than used as a stand-alone quality metric (18–20). The high marginal frequencies of explanation and participation in this study are compatible with patient-centered care, but they cannot be linked statistically to satisfaction without individual cross-tabulations.

The study offers a concise local snapshot across multiple patient-experience domains and retains complete denominators for the principal outcomes. Its limitations are substantial. Purposive recruitment at one hospital restricts representativeness and may introduce selection bias. The restricted age range excludes older surgical patients. The achieved sample was based on feasibility rather than a formal precision calculation. Surgical procedure, approach, anesthetic technique, drug dose, timing of assessment, functional interference and adverse effects were not reported. The questionnaire's scoring and psychometric properties were not established, and responses obtained during admission may be affected by courtesy bias. The mutually exclusive treatment classification oversimplifies multimodal care. Finally, the cross-sectional descriptive design and available marginal counts preclude temporal, causal, comparative or adjusted conclusions.

Future work should use consecutive or probability-based multicenter recruitment, validated multidimensional outcome instruments, standardized postoperative assessment times and procedure-specific clinical data. Participant-level analysis could then examine satisfaction and pain outcomes across strategies while adjusting for operation, analgesic exposure, comorbidity and other relevant factors. Within the present setting, the data justify auditing pain intensity together with communication, participation, functional recovery and adverse effects, rather than assuming that high satisfaction alone indicates optimal analgesia.

CONCLUSION

Among 120 adults following abdominal procedures, opioids were the most frequently reported primary pain-management strategy, and most participants reported adequate explanation, participation in decisions and satisfaction with care. Nevertheless, the mean postoperative pain score showed an important residual pain burden. These findings describe local practice and patient experience; they do not establish that a particular strategy, communication or participation caused greater satisfaction. Standardized multidimensional assessment and stronger multicenter analytical studies are needed to guide comparative improvement of postoperative pain care.

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