Int. J. Curr. Res. Med. Sci. (2026). 12(2): 21-27

International Journal of Current Research in Medical Sciences

ISSN: 3107-3743 (Print), ISSN: 2454-5716 (Online)
(A Peer Reviewed, Indexed and Open Access Journal)
www.ijcrims.com

Original Research Article

Volume 12, Issue 2 -2026

DOI: http://dx.doi.org/10.22192/ijcrms.2026.12.02.003

Drug Utilization Pattern Of Analgesics In Post-Surgical Patients At A Secondary Care Hospital: A Prospective Observational Study.

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Abstract

Background: Postoperative pain is a common problem that can delay recovery if not properly managed. Analgesics play a major role in controlling pain after surgery, and understanding their utilization pattern helps promote rational drug use.

Objectives: To assess the drug utilization pattern of analgesics in post-surgical patients and to evaluate pain severity using the Visual Analogue Scale (VAS).

Methods: A prospective observational study was conducted among 124 post-surgical patients in a secondary care hospital. Demographic details, type of surgery, analgesic prescriptions, and pain scores were recorded. Pain intensity was assessed daily for seven postoperative days using the VAS scale. Data were analyzed using descriptive statistics.

Results: NSAIDs were the most frequently prescribed analgesics, with diclofenac used in 36.29% of patients, followed by tramadol (28.23%). Combination therapy was used in 15.31% of cases. Severe pain was common during the first two postoperative days but gradually decreased over time. By Day 7, most patients (84.68%) reported only mild pain. Mean VAS scores showed a consistent decline across all analgesic regimens.

Conclusion: The study highlights effective postoperative pain control through rational analgesic prescribing and regular pain assessment. NSAID-based and multimodal therapies provided satisfactory pain relief while limiting opioid use, supporting rational pain management practices in secondary care settings.

Keywords: Postoperative pain; Drug utilization pattern; Analgesics; NSAIDs; Visual Analogue Scale; Multimodal analgesia.

Introduction

Post-surgical pain represents a widespread issue which hospital patients encounter. All surgical patients will experience some degree of post-operative pain which requires proper pain management for their recovery process.[1] The inability to control pain effectively results in multiple negative outcomes for patients because it causes them distress and prevents them from moving and it extends their hospital stay and it decreases their treatment satisfaction. Patients who receive effective pain relief solutions experience improved breathing ability and they achieve earlier mobility and their healing process becomes faster. The management of post-surgical pain needs equal importance to surgical procedures because it serves as essential patient care element which needs to be handled with equal treatment.[2]

Post-operative pain occurs due to tissue damage which occurs during surgery and activates the body's pain pathways. The body produces chemicals that create inflammation and pain at the site of surgery.[3] To control this pain, doctors prescribe medicines called analgesics. These comprise paracetamol together with non-steroidal anti-inflammatory drugs (NSAIDs) and opioids. Each of these medicines operates through their own unique mechanism to provide pain relief. The selection of an appropriate analgesic together with its correct dosage and proper drug combination needs to occur so doctors can deliver effective pain relief while preventing side effects.[4]

At secondary-care hospitals and other medical facilities doctors implement different methods to manage patient pain. Some patients may receive only one pain-relieving drug, while others may receive a combination of medicines.[5] The way doctors prescribe analgesics depends on three factors which include the surgical procedure and the patient's medical state and the doctor's personal choice. The incorrect application of analgesic medications results in ineffective pain management and the emergence of extra medication-related complications. The research examines actual medication usage in hospitals to determine if the treatment methods used are sensible and successful.[6]

Drug utilization studies help understand prescribing habits while establishing safe and effective medicine usage. Healthcare professionals use analgesic usage data and pain control effectiveness data to create better treatment methods. Doctors use simple pain

assessment tools such as the Visual Analogue Scale to track their patients' development.[7] The study investigated how patients used analgesics after surgery while assessing their pain outcomes to develop better pain management solutions for secondary-care hospital environments.[8]

Materials and Methods

Study Design and Setting **:** A prospective observational study was conducted in the post-surgical wards of a Sankalp Speciality Healthcare Hospital, Mumbai Naka, Nashik over a period of six months (October 2024 – April 2025).

Study Population **:** A total of 124 post-surgical patients were included in the study.

Inclusion Criteria

- Patients aged ≥18 years
- Patients undergoing surgical procedures
- Patients willing to provide informed consent

Exclusion Criteria

- Exclusion <18 years of age.
- Non-Surgical Patients
- Chronic pain management (Patients who are on long-term analgesic therapy to reduce the error in the result)

Data Collection

Data were collected using a structured data collection form, which included:

- Demographic details (age, gender)
- Type of surgery
- Analgesic drug prescribed (drug name, dose, frequency, route)
- Pain intensity assessed using the Visual Analogue Scale (VAS)

Pain scores were recorded daily from Day 1 to Day 7 post-surgery.

Assessment Tool

Pain intensity was measured using the Visual Analogue Scale (VAS), ranging from 0 (no pain) to 10 (worst imaginable pain), and categorized as:

- Mild pain (1–3)
- Moderate pain (4–6)
- Severe pain (7–10)

Statistical Analysis: Data were analyzed using descriptive statistics. Results were expressed as frequencies, percentages, mean, and standard deviation.

Results

Table 1. Demographic and Clinical Characteristics of Study Participants (n = 124)

Variable	Category	Number of Patients	Percentage (%)
Gender	Male	74	59.67
	Female	50	40.33
Age Group (years)	18–40	72	58.06
	41–60	37	29.84
	61–80	15	12.10
Type of Surgery	General Surgery	68	54.84
	Orthopedic Surgery	43	34.68
	ENT Surgery	8	6.45
	Gynecological Surgery	5	4.03

Table 1 describes the demographic and clinical characteristics of 124 post-surgical patients.

Males formed the majority (59.67%) compared to females (40.33%). Most patients belonged to the 18–40 year age group (58.06%), followed by 41–60 years (29.84%). General surgeries were most common (54.84%), followed by orthopedic surgeries (34.68%), while ENT and gynecological surgeries accounted for a smaller proportion.

Table 2. Distribution of Analgesic Drugs Prescribed Among Post-Surgical Patients

Analgesic Drug	Number of Patients	Percentage (%)
Diclofenac	45	36.29
Tramadol	35	28.23
Aceclofenac	18	14.52
Paracetamol (PCM)	6	4.84
Pregabalin	1	0.81
Aceclofenac + PCM	8	6.45
Diclofenac + PCM	8	6.45
Tramadol + Diclofenac	3	2.41
Total	**124**	**100**

Table 2 shows the pattern of analgesic drug use among post-surgical patients.

Diclofenac was the most commonly prescribed analgesic (36.29%), followed by tramadol (28.23%). Aceclofenac was used in 14.52% of patients. Combination therapies such as diclofenac with paracetamol and aceclofenac with paracetamol were each used in 6.45% of cases, indicating the practice of multimodal pain management.

Table 3. Distribution of Pain Severity Over 7 Days Post-Surgery Using VAS Scale (n = 124)

Post-operative Day	Mild Pain (0–3)	Moderate Pain (4–6)	Severe Pain (7–10)
Day 1	4	18	102
Day 2	0	5	119
Day 3	1	27	96
Day 4	6	69	49
Day 5	58	31	35
Day 6	86	14	24
Day 7	105	14	5

Table 3 presents the distribution of pain severity over seven postoperative days using the VAS scale.

Severe pain was most common on Day 1 and Day 2, affecting 102 and 119 patients respectively. Pain intensity gradually reduced over time, with mild pain increasing steadily. By Day 7, most patients (105) experienced only mild pain, showing effective postoperative pain control during hospitalization.

Table 4. Mean ± SD of VAS Pain Scores from Day 1 to Day 7 Across Different Analgesic Regimens (n = 124)

Day	Non-Opioid (n=7)	Opioid (n=35)	NSAID (n=63)	NSAID + Non-Opioid (n=16)	Opioid + NSAID (n=3)
Day 1	7.71 ± 1.11	8.00 ± 1.47	7.81 ± 1.55	7.06 ± 1.91	9.00 ± 1.00
Day 2	9.29 ± 0.95	9.26 ± 0.95	8.54 ± 1.25	8.19 ± 1.79	8.67 ± 1.15
Day 3	7.71 ± 0.95	7.51 ± 1.35	7.76 ± 1.32	7.13 ± 1.96	7.00 ± 1.00
Day 4	4.14 ± 3.02	6.31 ± 1.79	6.11 ± 1.46	5.88 ± 2.36	5.00 ± 4.35
Day 5	2.29 ± 2.36	4.29 ± 2.40	3.56 ± 2.75	2.25 ± 3.10	4.00 ± 3.60
Day 6	0.29 ± 0.75	2.37 ± 2.31	2.08 ± 2.41	1.31 ± 2.84	3.33 ± 3.05
Day 7	0.00 ± 0.00	1.11 ± 1.69	0.86 ± 1.70	0.94 ± 2.01	2.00 ± 2.00

Table 4 shows the change in mean VAS pain scores over seven days with different analgesic regimens.

On Day 1, pain scores were high across all groups, ranging from 7.06 to 9.00. Pain gradually decreased in every group. By Day 7, pain scores reduced to 0.00 in the non-opioid group, 0.86 in the NSAID group, and 1.11 in the opioid group, indicating effective pain relief.

Discussion

In our study, more males (59.67%) than females (40.33%) underwent surgery, with most patients aged 18–40 years. This male predominance is similar to other postoperative studies where men formed the majority of surgical patients, indicating a consistent demographic trend in clinical settings. In a study of 400 surgical patients, about 60.75% were male, reinforcing this pattern of higher male participation in surgical care. Age also influences pain outcomes; younger adults often report higher pain scores than older groups, suggesting age and gender both shape postoperative experiences.[9]

In our study, NSAIDs like diclofenac were the most commonly prescribed analgesics, similar to other hospital-based post-operative studies where diclofenac remained the dominant choice for pain relief. This pattern supports the widespread use of NSAIDs due to their effectiveness in reducing inflammation and pain after surgery. A study from Assam also reported diclofenac as the main analgesic used, followed by paracetamol and tramadol, highlighting similar prescribing trends in Indian surgical settings. These findings suggest that NSAIDs continue to be preferred first-line agents for postoperative pain management.[10]

Our results demonstrated progressive reduction in pain scores over seven days, confirming effective analgesic therapy. On Day 1, severe pain was prevalent, but by Day 7 most patients reported only mild pain. This trend aligns with findings from a larger observational study, where significant decreases in pain intensity were observed within 48 hours when standardized analgesic protocols were followed. Such consistency with other real-world data reinforces the role of structured pain assessment and tailored analgesic administration in achieving timely pain relief and improving patient comfort during recovery.[11]

Comparing analgesic types, our study found NSAID and combination regimens generally provided adequate pain relief, which is consistent with broader literature supporting multimodal pain management. Meta-analyses have shown NSAIDs can reduce pain scores and reduce opioid needs after surgery compared to opioid-only approaches. This aligns with our findings where opioid use was less frequent and scores declined steadily across all regimens, indicating NSAIDs' central role in balanced pain control with fewer opioid-related side effects. Such evidence highlights the effectiveness of multimodal postoperative pain regimens.[12]

While our study showed good analgesic control, comparison with other research suggests there is

room to improve rational prescribing. Some audits reported frequent use of tramadol and other opioids on the first postoperative day, which differs from our practice of favoring NSAIDs and combinations. Rational use of analgesics, including generics and adherence to protocols, has been linked to improved satisfaction and fewer adverse events. Regular review of prescribing patterns, guided by pain scores like VAS, can optimize clinical outcomes and reduce unnecessary opioid exposure, reflecting best practices in postoperative care.[13

Conclusion

This study shows that effective postoperative pain management can be achieved through rational use of analgesics and regular pain assessment. NSAIDs, particularly diclofenac, were the most commonly prescribed drugs and provided adequate pain relief either alone or in combination. Pain severity was highest during the initial postoperative days and gradually reduced over time, as reflected by decreasing VAS scores. Limited use of opioids and preference for multimodal analgesic therapy helped achieve satisfactory pain control. Routine monitoring of pain levels and appropriate selection of analgesics can improve patient comfort, recovery outcomes, and promote rational drug use in post-surgical care.

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Quick Response Code	Subject: Pharmacology
DOI: 10.22192/ijcrms.2026.12.02.003	

How to cite this article:
Premraj S. Chaudhari, Pankaj S. Patil, Anuj C. Aware, Hindavi H. Patil, Krishna G. Beldar, Rameshwar S Rathod. (2026). Drug Utilization Pattern Of Analgesics In Post-Surgical Patients At A Secondary Care Hospital: A Prospective Observational Study. Int. J. Curr. Res. Med. Sci. 12(2): 21-27.
DOI: http://dx.doi.org/10.22192/ijcrms.2026.12.02.003