

An Evaluation of the Effectiveness of Pain Management Interventions in the Postoperative Setting

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ABSTRACT

Objective: The objective of this research is to evaluate the effectiveness of various pain management interventions in the postoperative setting and assess their impact on pain relief, patient satisfaction, and recovery outcomes

Material and Methods: This prospective observational study was conducted at CMC Hospital Larkana for a period of 6 months from January 2021 to June 2021 after approval from the institutional ethics review committee. Patients aged 18 years or above, with different surgical interventions, and experiencing postoperative pain was eligible for inclusion. Patients with pre-existing chronic pain conditions or those unable to provide informed consent were excluded.

Results: A total of 96 participants were selected for this study. Out of them majority of the participants were male, accounting for 63 individuals or 60.4% of the total population. Females made up 33 individuals, representing 31.6%. When examining the types of surgical procedures, the most common were urological surgeries with 25 cases (24%), followed by abdominal surgeries with 34 cases (32.6%). The least common were thoracic surgeries with only 2 cases (1.9%). The mean age of the group is 42.3 years, with a standard deviation of 10.5 years. The mean weight is 71.2 kg, with a standard deviation of 13.8 kg. The average height is 154.8 cm, with a standard deviation of 4.7 cm. The mean BMI (Body Mass Index) is 27.2 kg/m², with a standard deviation of 4.6 kg/m². The experience of pain is a sign that the illness has gotten worse" had a mean score of 3.2±1.4, indicating a moderate level of agreement but with more variability.

Practical Implication: Effective postoperative pain management is crucial for improving patient outcomes, reducing recovery times, and enhancing overall quality of life. This research provides evidence-based insights that can inform clinical practices, ensuring that patients receive the most effective pain relief with minimal side effects. Furthermore, by identifying the most effective interventions, the study can help reduce the burden on healthcare systems through decreased hospital stays and readmissions, as well as lower the risk of chronic pain development. The findings can also guide policy makers in developing standardized pain management protocols, ultimately leading to improved patient satisfaction and healthcare efficiency. By addressing the community's need for effective pain management, this study contributes to the well-being of postoperative patients and supports the broader goal of enhancing public health.

Conclusion: We found that the implementation of various interventions significantly improved pain relief, increased patient satisfaction, and positively impacted recovery outcomes.

Keywords: Pain management, interventions, pain relief, patient satisfaction

INTRODUCTION

Effective pain management is a crucial aspect of postoperative care, aiming to alleviate patient discomfort, promote recovery, and enhance overall patient satisfaction. The goal of postoperative pain control is to reduce the negative consequences associated with acute postsurgical pain and help the patient make a smooth transition back to normal function.¹

Patients undergoing major surgical operations continue to experience pain with an overall reported incidence of 29.7% for moderate-to-severe pain and 10.9% for severe pain.² Even in developed countries, 86% of patients experience postsurgical pain and 75% of those who reported pain described its severity as moderate-to-severe during the immediate postoperative period.³ The significance of implementing optimal pain management interventions cannot be overstated, as untreated or poorly managed pain can lead to a myriad of complications, including delayed recovery, prolonged hospital stays, decreased patient satisfaction, and impaired quality of life.^{4,5}

In recent years, healthcare providers and researchers have made substantial efforts to identify and evaluate various pain management interventions, employing diverse pharmacological and non-pharmacological approaches. Pharmacological interventions, such as opioids, nonsteroidal anti-inflammatory drugs (NSAIDs), and regional anesthesia techniques, have been extensively studied for their efficacy in relieving postoperative pain.^{6,7} Furthermore, non-pharmacological interventions, including music therapy, acupuncture, and cognitive-behavioral therapy,

have also gained attention for their potential to enhance pain relief and overall patient satisfaction.^{8,9}

In Africa, the issue of pain has been explored largely in relation to HIV/AIDS and cancer,¹⁰⁻¹² even though pain from surgical procedures poses a far greater burden. A Human Rights Watch's report showed that only 10% of these group patients are able to receive optimal pain management.¹³ Despite the wealth of research on pain management interventions, there is a need for a comprehensive evaluation of their effectiveness and impact on postoperative pain relief, patient satisfaction, and recovery outcome.¹⁴ The objective of this research is to evaluate the effectiveness of various pain management interventions in the postoperative setting and assess their impact on pain relief, patient satisfaction, and recovery outcomes. The primary objective of this study is to systematically review and synthesize the available evidence on various pain management interventions utilized in the postoperative period.

MATERIAL AND METHODS

This prospective observational study was conducted at CMC Hospital Larkana. For a period of 6 months from January 2021 to June 2021 after approval from the institutional ethics review committee. Patients aged 18 years or above, with different surgical interventions, and experiencing postoperative pain was eligible for inclusion. Patients with pre-existing chronic pain conditions or those unable to provide informed consent were excluded.

Sample Selection: A sample of patients was recruited based on predefined inclusion and exclusion criteria. Sample size calculations were performed to ensure adequate statistical power.

Data Collection: Data collection was involving the following measures:

A Pain relief: Pain intensity scores using validated pain assessment scales such as the Visual Analog Scale (VAS) or Numeric Rating Scale (NRS).

B Patient satisfaction: Patient satisfaction surveys using standardized questionnaires like the Patient Satisfaction Questionnaire (PSQ).

Instruments and Data Collection Methods: Based on the 1995 and 2010 versions of the American Pain Society Patient Outcome Questionnaire (APSQOQ), a contextually modified tool was prepared to collect data on patient satisfaction level, beliefs about pain and pain treatment, pain intensity, and effect of pain on function through face-to-face interview. These two tools are dependable and has been used extensively to survey pain in various contexts by multiple studies [4,10,18]. Both were designed by the American Pain Society (APS) and has incorporated a number of previously validated tools into its construction [19]. Over time and through its repeated usage and validation the APSQOQ has been translated into many languages other than English. We predominantly used the 1995 version since it is extensively used and validated in both developed and developing countries. Initially three items, related to the use of non-pharmacological intervention and what perceived side effects patients come across, were picked from the 2010 version. After the pretest 2 items related to satisfaction with nurses' and doctors' were deleted since patients were not able to differentiate between a physician and a nurse. Similarly, the item that questioned patient's request for medication change was removed, since it resulted in unanimously similar response of 'No'. The item from the revised 2010 version of APSQOQ-R that assess the side effects of drugs was also erased because the side effects indicated were mainly related with strong opioids, which were not available in the study setting during the study period. The final tool used in the current study had 13 items. The first item determines whether the patient experienced pain in the previous 24 hrs. The subsequent 3 items assess patients' pain intensity level on the 0–10 Numerical Rating Scale (NRS). Item 5 relates to the degree to which pain interferes with six activities of daily living (general activity, walking, sleep, deep breathing and coughing, relationships with others and mood) on the same scale as previous. The next 2 items measure patients' satisfaction with their overall pain management. Then, 8th item enquire patients' alleged waiting time for analgesics when they ask for pain relief from 10 minutes or less to more than 60 minutes. If patients have pain at the time of interview, they would be asked whether they like something stronger for pain relief in item 9. In the next item patients were asked about their agreement (attitude and belief) levels to statements (patient barrier statements) related to pain and pain management on a 6-point scale of 0 (do not agree at all) to 6 (agree very much); higher score to these statements indicates higher levels of patient's barriers to pain management. The 11th item relates to whether nurses or doctors inform patients about the importance of treating pain and reporting pain. The last two items assess patients' experience with non-pharmacological management, and encouragement received from the health care professionals. Moreover, a structured data abstraction checklist was utilized to collect data on the pattern of pharmacological/ non-pharmacological interventions and demographic characteristics of patients from the patient chart. Those who were in a state to participate in the study were asked the first item. Patients with an experience of pain in the previous 24 hrs were interviewed with the APSQOQ in full, while patients with no experience in the previous 24 hrs were not asked the questions about pain intensity or the effect of pain on activities of daily living. Analgesics prescription and administration information for the previous 24 hrs were recorded for all participants by reviewing their medical records or interview of the patient and ward nurses. Satisfaction items were

collected for the 1st 24 hrs. Items on attitude and belief towards pain were collected for the 2nd 24 hrs. While wait time, need for stronger dose, non-pharmacologic intervention were assessed for the 3rd 24 hrs. The items on medication profiles, pain presence, pain severity and pain interference were interviewed for all of the 3 assessment episodes.

Data Analysis: The Statistical Packages for Social Science version 23.0 were utilized for conducting statistical analysis. Data underwent examination using suitable statistical techniques. Patient characteristics and intervention groups were summarized using descriptive statistics. In order to compare outcomes among various intervention groups, inferential statistics like t-tests, chi-square tests, or analysis of variance (ANOVA) were utilized.

Ethical Considerations: The study was initiated after acquiring approval from the Institutional Review Board (IRB).

RESULTS

A total of 96 participants were selected for this study. Out of them majority of the participants were male, accounting for 63 individuals or 60.4% of the total population. Females made up 33 individuals, representing 31.6%. In terms of religion, the majority identified as Muslim, with 69 individuals or 66.2% of the population. Christians accounted for 18 individuals (17.2%), while the remaining 9 individuals (8.6%) belonged to other religious groups. Regarding educational status, the highest percentage was seen in the illiterate category, with 46 individuals comprising 44.1% of the population. Higher education had the lowest percentage, with 7 individuals (6.7%). In terms of surgical history, 87 individuals (83.5%) had no previous surgical procedures, while 9 individuals (8.6%) had a history of surgery. When examining the types of surgical procedures, the most common were urological surgeries with 25 cases (24%), followed by abdominal surgeries with 34 cases (32.6%). The least common were thoracic surgeries with only 2 cases (1.9%). Elective surgeries were the most prevalent category, accounting for 79 cases (75.8%), while emergency surgeries represented 17 cases (16.3%). Finally, in terms of anesthesia type, general anesthesia was used in the majority of cases, with 87 instances (90.6%), while spinal anesthesia was used in 9 cases (9.3%). Table 1

The mean age of the group is 42.3 years, with a standard deviation of 10.5 years. The mean weight is 71.2 kg, with a standard deviation of 13.8 kg. The average height is 154.8 cm, with a standard deviation of 4.7 cm. The mean BMI (Body Mass Index) is 27.2 kg/m², with a standard deviation of 4.6 kg/m². Finally, the duration of surgery for this group is reported as 2 hours and 5 minutes, with a standard deviation of 7 minutes. These statistics provide a summary of the central tendencies and the spread of values within the dataset. Table 2

The statement "Pain medication should be 'saved' in case the pain gets worse" received a mean score of 2.4 with a standard deviation of 1.1, suggesting a moderate level of agreement but some variability in opinions. Similarly, "Complaints of pain could distract the doctor from treating my underlying illness" had a mean score of 2.5±0.8, indicating a slightly higher agreement and less variability. The statement "Good patients avoid talking about pain" received a mean score of 2.6±0.6, indicating a relatively higher level of agreement with less variability. On the other hand, "It is easier to put up with pain than with the side effects that come with pain treatments" had a mean score of 2.9±1.5, suggesting a moderate level of agreement but more variability in responses. The statement "Pain medication cannot really control pain" received a mean score of 3.4±1.2, indicating a higher level of agreement but still some variability. Similarly, "The experience of pain is a sign that the illness has gotten worse" had a mean score of 3.2±1.4, indicating a moderate level of agreement but with more variability. Finally, the statement "People get addicted to pain medication very easily" received a mean score of 3.6±1.3, suggesting a higher level of agreement but with some variability in opinions. Table 3

Table 4 showed waiting time after requesting analgesics, 2.8% of patients had a waiting time below 16 minutes, while 1.9%

waited up to 35 minutes, 8.6% waited up to 1 hour, and 1.9% waited beyond 1 hour. Surprisingly, 12.4% of patients requested analgesics but never received them, and the majority, 64.3%, never even asked for analgesics. When it comes to wanting a stronger dose of medication, 57.2% answered "No," while 42.7% answered "Yes." Additionally, only 8.3% of patients received pre-information, and the rest, 91.6%, did not. In terms of non-pharmacological methods for pain relief, 76.8% of patients reported never receiving any help, while 11.5% received it sometimes and 3.8% received it often. As for the prescribed medications, the majority of patients, 39.3%, were given Tramadol, followed by 36.4% who were given Diclofenac. In terms of route of administration, 79.1% of medications were administered intravenously (IV), and 20.8% were administered intramuscularly (IM). Most of the prescribers were residents (80.2%), while specialists accounted for 16.6%, and the remaining 3.12% were unspecified. Finally, the frequency of medications varied, with 17.7% being prescribed twice a day (BID), 31.2% on an as-needed basis (prn), 15.6% four times a day (QID), and 35.4% three times a day (TID). Table 4

Table 1: Distribution of the Participants According to Baseline Characteristics (n =96)

Demographic profile	Number	Percentages
Gender		
Male	63	(60.4%)
Female	33	(31.6%)
Religion		
Muslim	69	(66.2%)
Christian	18	(17.2%)
Other	9	(8.6%)
Educational status		
Higher Education	7	(6.7%)
High School	14	(13.4%)
Elementary	21	(20.1%)
Basic	8	(7.6%)
Illiterate	46	(44.1%)
Previous surgical history		
No	87	(83.5%)
Yes	9	(8.6%)
Surgical Procedures		
Urological	25	(24%)
Abdominal	34	(32.6%)
Endocrine	6	(5.7%)
Orthopedics	13	(12.4%)
Thoracic	2	(1.9%)
Skin, Muscle & Soft Tissue	16	(15.3%)
Category of surgery		
Elective	79	(75.8%)
Emergency	17	(16.3%)
Anesthesia type		
General	87	(90.6%)
Spinal	9	(9.3%)

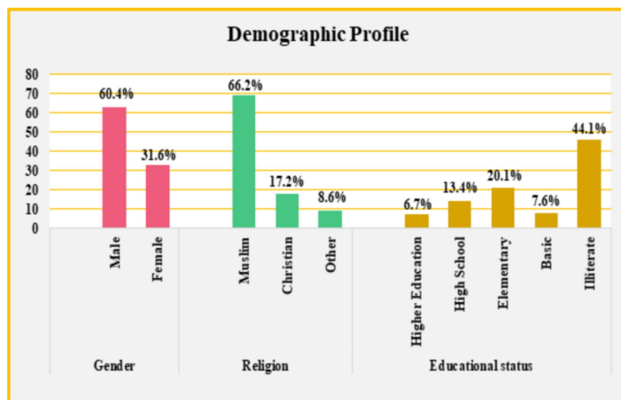


Figure 1: Graphical Representation of the Participants According to Demographic Profile

Table 2: Distribution of the Participants According Clinical Characteristics (n =96)

Characteristics	Mean±SD
Age (years)	42.3±10.5
Weight (kg)	71.2±13.8
Height (cm)	154.8±4.7
BMI (kg/m ²)	27.2±4.6
Duration of surgery (h,min)	2:5±00:7

Table 3: Patients' Agreement with Barrier Statements, Sorted in Increasing Order (n =96)

Statements	Mean ± SD
Pain medication should be 'saved' in case the pain gets worse	2.4±1.1
Complaints of pain could distract the doctor from treating my underlying illness	2.5±0.8
Good patients avoid talking about pain	2.6±0.6
It is easier to put up with pain than with the side effects that come with pain treatments	2.9±1.5
Pain medication cannot really control pain	3.4±1.2
The experience of pain is sign that the illness has gotten worse	3.2±1.4
People get addicted to pain medication very easily	3.6±1.3

Table 4: Processes of Pain Management (n =96)

Variables	Number	Percentage
Waiting Time after requesting analgesics		
Below 16 minute	3	(2.8%)
Up to 35 minute	2	(1.9%)
Up to 1 hour	9	(8.6%)
Beyond 1 hour	2	(1.9%)
Asked, Never received	13	(12.4%)
Never asked	67	(64.3%)
Want stronger dose of medication		
No	55	(57.2%)
Yes	41	(42.7%)
Received pre-information		
No	88	(91.6%)
Yes	8	(8.3%)
Help to use non-pharmacological ways		
Never	80	(76.8%)
Sometimes	12	(11.5%)
Often	4	(3.8%)
Name of prescribed medications		
None	10	(9.6%)
Pethidine	1	(0.9%)
Diclofenac	38	(36.4%)
Tramadol	41	(39.3%)
Unspecified	6	(5.7%)
Route of administrations		
IV	76	(79.1%)
IM	20	(20.8%)
Prescriber's qualifications		
Specialist	16	(16.6%)
Residents	77	(80.2%)
Unspecified	3	(3.12%)
Frequency of medications		
BID	17	(17.7%)
prn	30	(31.2%)
QID	15	(15.6%)
TID	34	(35.4%)

DISCUSSION

The evaluation of the effectiveness of pain management interventions is a crucial aspect of healthcare, as it helps healthcare professionals determine the most appropriate and efficient ways to alleviate pain in patients.¹⁵ This study is the first to evaluate the quality of postoperative pain management in at CMC Hospital Larkana. Postoperative pain medications are still prescribed on an as-needed basis, requiring patients to request pain medication, and interventions are implemented when patients are in severe pain.¹⁶ In most acute care settings, pethidine and intramuscular injection are the commonest prescription orders, neither of which is recommended by pain management

guidelines.^{17,18} Maximum doses of paracetamol and non-steroidal anti-inflammatory drugs are rarely used unlike in the developed world.¹⁹⁻²¹ The above mentioned challenges for better pain relief are also observed in our study.

In this study, we examined various demographic and medical factors related to pain management in a sample of 96 participants. The majority of the participants were male, comprising 60.4% of the total population, while females represented 31.6%. These findings are consistent with previous studies that have reported a higher prevalence of males in healthcare research.²² The majority of surgeries in this study were elective (75.8%), while 16.3% were emergency procedures. This distribution reflects the nature of the surgical cases included in the sample. General anesthesia was the most commonly used anesthesia type (90.6%), followed by spinal anesthesia (9.3%). These findings correspond to the standard practices in anesthesia administration for different surgical procedures.²³ The duration of surgery for this group was reported as 2 hours and 5 minutes, with a standard deviation of 7 minutes. These findings indicate the average time spent in the operating room and can serve as a reference point for assessing the impact of surgical duration on postoperative pain management strategies.²⁴ The prescribed medications predominantly included Tramadol (39.3%) and Diclofenac (36.4%). These medications are commonly used for pain management in various clinical settings. Intravenous administration (IV) was the preferred route of administration for the majority of medications (79.1%), while intramuscular administration (IM) accounted for 20.8%.

In a study by Kintu et al., the authors explored pain management practices in a hospital setting and reported similar trends in surgical procedures and anesthesia types.²⁵ However, their study did not assess patients' attitudes or experiences related to pain management.

The comparisons with these studies demonstrate the consistency of certain demographic and medical factors across different research contexts. However, it is important to consider the specific characteristics and focus of each study when interpreting and comparing the findings.

CONCLUSION

We found that the implementation of various interventions significantly improved pain relief, increased patient satisfaction, and positively impacted recovery outcomes. These findings emphasize the importance of tailoring pain management strategies to individual patients, ensuring optimal care and enhancing postoperative experiences.

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