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Assessment of Postoperative Pain Management Among Patients Who Underwent Abdominal Surgery

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ABSTRACT

Background: Postoperative pain is major clinical practice concern, especially in abdominal surgery where improper treatment may result in slow recovery process and development of complications. In Kurdistan Region of Iraq, there is poor use of multimodal control and pain assessments, which in the vast majority of cases leads to under-treatment.

Aim: The study aims to access the severity and management of postoperative pain for patients after abdominal surgery in Qalladze Teaching Hospital and determine some factors that affect the experiences of pain and satisfaction with care.

Methodology: Descriptive cross-sectional study was carried out from April to June of 2025. Purposive sampling carried out on 90 adults, in first 24 hours after abdominal surgery. Data were measured in a validated structured questionnaire that comprised of demographic, clinical, pain level according to numeric rating scale (NRS), and patient satisfaction.

Results: Severe pain reported 82.2% of participants (mean score 7.44±1.44). There were Significant associations of gender ($p = 0.042$) and surgery duration ($p = 0.026$) with the level of pain. Patient satisfaction was 68.9% with limited use of multimodal analgesia and lack of preoperative education. The most frequent analgesics were NSAIDs and tramadol. Non-pharmacologic interventions were not frequent application.

Conclusion: Postoperative pain poorly managed and little structured protocols and education have been applied in regional hospitals. Efforts should aim at incorporating well-defined pain measurement instruments, multimodal interventions, and clinical education of care that should result in the outcomes and match with international standards.

INTRODUCTION

Postoperative pain is a large and frequent problem in clinical practice, which affects healing and patient satisfaction. It is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage [1]. Even with the current enhancements in the surgical technologies and pain medications, not all the patients respond to surgery with a moderate or severe [2,3].

Uncontrolled pain may prolong the healing process by inducing stress that results in increase of cortisol level which reduces immunity levels and facilitates delaying of the wound healing process [4]. Deep breathing or coughing in an abdominal surgery could be inhibited due to pain and this could lead to pneumonia and atelectasis. Another major risk factor with regard to chronic postsurgical pain is persistent acute pain which may extend up to months and years and affect the quality of life [5].

Abdominal surgery is usually related to deep tissue injury and visceral suffering, which is more difficult to evaluate than that of somatic pain [6]. Such pain is typically treated using opioids, but when overused they can lead to such adverse effects as sedation, nausea, and postoperative ileus, especially in the case of abdominal [7]. Whereas the application of Enhanced Recovery After Surgery (ERAS) mechanisms encourages multimodal pain management and mobilization, it is poorly implemented in most low-resource settings [8]. Regional research shows that implementation of ERAS in the region has been conducted primarily on paper, with its actual practice continuing to be based on obsolete opioid-based strategies [9].

Successful postoperative pain management should be initiated by systematically assessing the pain. A variety of tools (Visual Analog Scale; VAS, Numeric Rating Scale; NRS) are necessary to assess the level of pain, and their reliability will be high subject to the constancy of their application by qualified medical personnel [10]. But in most lower-resource areas, such as regions of Iraq there are cases wherein the pain is under-rated or not documented regularly, causing untimely actions and resulting in patient dissatisfaction [11]. There is also evidence to inform the incorporation of non-pharmacologic measures like relaxation methods, cognitive distraction, guided breathing, as adjuvants to pharmacologic programs to increase pain relief and diminish the need to consume opioids [12].

In Iraq, with the Kurdistan Region, postoperative pain control is not optimal because of the absence of standardized assessment instruments, educational barriers, and concerns on the cultural or regulatory level about opioids [13]. Besides, evidence indicates that crucial elements of enhanced recovery protocols, including preoperative education, systematic pain analysis, and non-pharmacological practices, are not commonly undertaken in regional hospitals, such as those located in the Kurdistan Region, because of limited resources[8,14]. This study assess the postoperative pain and the medication of managing pain among patients who have undergone abdominal surgical procedures in the Qalladze Teaching Hospital with the aim of providing practical remedies to the medical practice.

MATERILS AND METHODS

2.1 Study Design and Setting

The study was carried out as a descriptive cross-sectional and it was conducted at Qalladze Teaching Hospital in Qaladiza, Sulaimanyah Governorate, Kurdistan Region of Iraq. The hospital is a general center in the region in general surgery and offers varied elective and emergency treatment.

2.2 Study Period

The data were going to be taken continuously between April 1 and June 20 of 2025.

2.3 Study Population

The study population was made up of adult patients receiving abdominal surgery in the hospital in the time frame of the data collection process. Inclusion criteria were that patients that underwent open abdominal surgeries early after surgery, no more than 24 hours. Exclusion criteria included patients that is not adult, and those who unable to understand or follow instructions due to problems with cognitive ability or should they be in the late postoperative period (more than 24 hours). The exclusion criteria also were patients who had maternity related checkups like caesarean section and those people who had minimal invasive surgery.

2.4 Sampling and Sample Size

Purposive sampling process was used whereby the researcher identified the participants who fit the inclusion criteria and were available within the stipulated time. The last sample was 90 patients, which was created proportionately of 426 abdominal surgeries done in the hospital in 2024. The purpose of the sampling was that the sampling should enable a sampling to the representation of the surgical volume in the period between April 1 and June 20 when the data were collected.

2.5 Data Collection Tool and Procedure

The data was gathered with the help of a structured questionnaire (validated), which contained questions with closed lines and scaled questions. The intensity of pain was also evaluated with the help of the Numerical Rating Scale (NRS), where 0 (no pain) and 10 (the most serious imaginable pain) are the extremes. Of specific demographic variables (age, gender, education level…etc.), clinical variables (type of surgery, type of analgesia used…etc.) and satisfaction of patients with the pain management was also addressed in the questionnaire. All the data were attained by the principal investigator in a maximum of 24 hours after surgery hence administration and timing were uniform.

2.6 Study Variables

The dependent variables were: level of pain after surgery and patient satisfaction level on the pain management. Demographic features (sex, age, education…etc.), clinical data (surgery type, analgesic type…etc.) served as independent variables.

2.7 Ethical Considerations

The study had been ethically approved by the administrative board of the hospital, and the corresponding ethics committee by the college. The study purpose was explained to the respondents through informed consent. The study was conducted with dignity and confidentiality and also the anonymity.

2.8 Inclusion and exclusion criteria:

Inclusion criteria:

- Adult patients 18 years and older who underwent open abdominal surgery.
- Patients assessed within 24 hours post-surgery.
- Those who provided consent.

Exclusion Criteria:

- Patients undergoing minimally invasive procedures (e.g., laparoscopic surgeries).
- Caesarean section cases and maternity-related procedures.
- Patients with cognitive impairment or communication limitations.
- Patients beyond 24 hours post-surgery.

2.9 Data Analysis

The program (SPSS) Statistics version 27 was employed to enter data and analyses them. Patient characteristics and their patterns of pain management were summarized in descriptive statistics, namely frequencies, percentages, means, and standard deviations. Inferential statistics that included chi-square tests were used to view relationships between variables that are categorical in nature. P-value was found to be less than 0.05 and was considered significant.

RESULTS

This research evaluated the severity, character, as well as alleviation of postoperative pain in 90 abdominal surgical patients. The results highlight the high amount of moderate to severe pain, a low use of multimodal strategy, and a serious flaw in patient education.

Demographic characteristic: The sample demographic characteristic shown (Table 1). Mean age of 39.56 ± 14.74 years. Most participants were between 26–35 years (27.8%) . Females constituted the majority (63.3%), while males accounted for 36.7%. Educational attainment varied, with the largest group having completed primary school (36.7%), followed by preparatory and undergraduate levels. A notable portion of participants (17.8%) were illiterate.

In terms of employment, more than half (58.9%) were unemployed. Most participants were married (70%), and a small proportion were single, widowed, or divorced. The vast majority resided in urban areas (94.4%). Regarding monthly income, 78.9% described it as barely sufficient, while only 6.7% considered it sufficient, reflecting economic vulnerability among the sample.

Clinical characteristic: a summary patient response for clinical data is shown in (Table 2). The most common surgeries were appendectomy (23.3%) and right inguinal hernia repair (20%), followed by ovarian cyst removal and total abdominal hysterectomy. Most procedures lasted less than one hour (72.2%) and were performed under spinal anaesthesia (53.3%). Nearly one-fourth of patients had chronic diseases, primarily hypertension. Two-thirds had a history of previous surgery. Notably, none of the patients received preoperative pain education.

Pain Severity Overview

The majority of patients (82.2%) reported severe postoperative pain, with a mean pain score of 7.44 ± 1.44. Only 2.2% reported mild pain. These results strongly suggest inadequate early pain control in abdominal surgical patients, as shown in (Figure 1).

Pain Severity and Patient Characteristics:

Gender was significantly associated with pain severity ($\chi^2 = 6.33$, $p = 0.042$), with females more likely to report severe pain. No significant associations were found between pain severity and age, chronic illness, or

history of previous surgery, although descriptively, patients with chronic illness tended to report more severe pain. Pain intensity did not significantly differ by type of anesthesia, though general anesthesia was associated with higher frequencies of NRS 8 and 9 descriptively. A Kruskal-Wallis H test confirmed a significant relationship between pain severity and surgery duration (H = 7.296, p = 0.026), suggesting longer surgeries were linked to more intense pain.

Type of Surgery and Pain

Although the Chi-square test for surgery type and pain severity was not significant (χ^2 = 114.43, p = 0.626), Kruskal-Wallis testing revealed a statistically significant difference in pain scores across surgery types (H = 33.69, $p < 0.01$). Surgeries such as TAH and RIH tended to be associated with more intense pain. Patients frequently described their pain as sharp, throbbing, and shooting, all pain descriptor frequencies shown in the (Fig 1). Chi-square tests showed these descriptors were significantly linked to higher pain severity:

- *Sharp* (χ^2 = 10.451, p = 0.005),
- *Throbbing* (χ^2 = 14.754, $p < 0.001$),
- *Shooting* (χ^2 = 9.708, p = 0.008).

This supports the value of including qualitative pain assessments in clinical evaluations.

Pain Management Practices

NSAIDs were the most commonly administered analgesic (93.3%), followed by tramadol (77.8%) and acetaminophen (70%). No opioids, local anaesthetics, or advanced adjuvants were used, reflecting a narrow pharmacologic approach, shown in (Table 4). Non-pharmacological methods were limited to distraction and resting, with almost no use of evidence-based interventions like breathing exercises or heat/cold therapy, shown in (Table 5).

Patient Satisfaction

Despite high pain intensity, 68.9% of patients reported full satisfaction with pain management. Notably; There was no statistically significant relationship between satisfaction and either pain severity (χ^2 = 1.85, p = 0.763) or gender ($p > 0.05$). A Spearman's rho test showed a weak, non-significant correlation between higher pain scores and lower satisfaction.

Multivariate Insights

Regression analysis reaffirmed duration of surgery, gender and type of pain descriptor were independent variables as far as pain intensity was concerned. In the meantime, pharmacological regimens did not correlate with increased satisfaction or decreased pain implying that there was an incongruence between the observed types of treatments and reported types of pain mechanism.

DISCUSSION

In the study, The social demographic analysis showed that most of the patients were females, unemployed and urban and more than three quarters of them had indicated that their income was barely enough. It is known that these social determinants affect postoperative reporting of pain and pain coping strategies. The past studies indicate that the low income, level of education and unemployment contribute to greater pain perception and reduced involvement in pain management practices [15,16]. In that regard, the pain management plans should not rely on clinical indicators only but also on social determinants of health that are likely to influence the patient response and satisfaction.

Regarding the clinical profile, the most frequent operations were appendectomy and repair of right inguinal hernia where the majority of the performed procedures took up less than one hour, and the

anesthesia involved spinal anesthesia. The fact that short-duration surgeries dominated indicates that there is a possibility of faster healing and reduced analgesic requirement. Nevertheless, this profile is striking in terms of its comparatively high rates of severe pain, a fact that may indicate a flaw in pain control strategy, arguably insufficient intraoperative analgesic pre-planning or insufficient application of regional blocks [17]. Insufficient preoperative education that was mentioned in all the cases, might also be an explanation to the discrepancy in between clinical expectation and experience of pain by the patient**.**

This study shows that there is a high postoperative pain burden in abdominal surgery patients in Qalladze Teaching Hospital in the Kurdistan Region of Iraq. More than 82% of patients experienced severe pain based on the average score of 7.44 ± 1.44, as shown in (Table 1). This was an indication of inadequate early pain control. These findings can be linked to wider results in Iraq where pain management is unreliable and rather lacking, particularly at the secondary-level hospitals [2,18]

There was a strong connection between gender and pain level wherein females experienced significant pain ($x\ 2 = 6.33$, $p = 0.042$) which was consistent with the findings of previous studies showing a positive relationship of gender in pain response[19]. There was also a strong correlation between the severity of pain and the length of surgery ($H = 7.296$, $p = 0.026$), a summarized results shown in (Table 2). That resluts showing that the longer a surgical procedure is the more painful the aftermath of the procedure will be much in the same way that is found in similar surgical conditions [3].

No clear association existed between the pain severity and surgery type based on chi-square test, whereas, functional differences were identified on pain perception based on Kruskal-Wallis test ($H = 33.69$, $p < 0.01$) where all the processes involved, including TAH and RIH processes, were reported higher in their intensity. There was also a marked association of descriptors such as sharp, throbbing and shooting pain with increased severity indicating that the stand of using qualitative description of pain in clinical evaluation can never be underestimated [20].

In spite of the pain being in high levels, 68.9% of the patients were totally satisfied with pain control. Nevertheless, no patient had preoperative education and pain could only be managed using NSAIDs, paracetamol, and tramadol; there was no consumption of opioids or non-pharmacologic approach, both approaches summarized in (Table 3) and (Table 4). These trends are caused by familiar obstacles within the Kurdistan Region, such as a lack of resources, undermanned wards, and a shortage of standard pain procedures [8]. The obtained results also indicate the necessity to better care of the postoperative pain in regional hospitals based on particularities of the area development and training.

This study has several limitations that should be considered when interpreting the findings. Firstly, partial staff boycott due to delays in salary payments reduced cooperation and may have affected the data collection process. Some patients were also reluctant to provide information, which resulted in incomplete responses in certain areas. The sample size, although adequate for statistical analysis, was not large enough to detect smaller but clinically significant associations; larger and stratified samples across different departments and surgeries would enhance reliability. Another limitation is the lack of longitudinal follow-up, which restricted the ability to assess long-term outcomes such as chronic postsurgical pain, recovery, or patient satisfaction over time. Furthermore, the study relied on self-reported data, which is subject to recall, cultural, and social desirability biases that may have influenced patients' accounts of pain intensity and staff interactions. The

absence of qualitative data, such as interviews or focus groups, limited the depth of understanding regarding patients' feelings and cultural interpretations of pain. Additionally, important confounding factors such as pre-existing chronic pain, opioid tolerance, psychological history, and surgeon-specific practices were not controlled, which may have distorted associations between variables. Finally, the use of nursing documentation as a proxy for quality of care may not fully represent actual practice, since some interventions may not have been recorded.

Conclusion and recommendations:

Conclusion:
This research points out that the issue of postoperative pain among patients of abdominal surgery in the Kurdistan Region is a serious but poorly treated problem. The presence of high pain levels, gender- and duration of surgery associations as well as the underuse of the educational and non-pharmacologic strategies demonstrates system imperfections in the perioperative care. Although satisfaction rate is high, it is expected to be a low expectation as opposed to good pain relievers. In order to overcome these problems, it is suggested that implementation of common pain assessment technology, regional recommendations, training of nurses in multimodal techniques, such as, use of opioid and regional blocks and advancing the education of patients should be carried out. Leaders and policymakers should make pain control a major quality indicator in surgical care.

Recommendations:

- Institutional practice: Adopt evidence-based pain assessment protocols and train staff on validated tools (NRS, VAS).
- Patient education: Provide preoperative guidance on pain expectations, reporting, and analgesic use.
- Multimodal analgesia: Promote opioid-sparing, multimodal, and regional anesthesia techniques.
- Data monitoring: Use audits and electronic systems to track pain levels and responses.
- Policy: Integrate postoperative pain care into national guidelines with proper resources and standards.
- Future research should explore psychological and cultural factors influencing pain reporting and analgesic response, while also evaluating long-term effects of institutional interventions and comparing practices across public and private hospitals to identify systemic challenges and best practices.

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TABLES:

Table 1: Distribution of socio-demographic characteristics of studied sample (n=90)

Socio-Demographic Characteristics	Items	F	(%)
Age Group	26–35	25	27.8
	36–45	22	24.4
	46–55	15	16.7
	18–25	15	16.7
	56–65	8	8.9
	66+ ≥ 66	5	5.6
	Mean age	39.56 year	
	Standard Deviation	14.74 years	
Gender	Male	33	36.7
	Female	57	63.3
Education Level	Primary school	33	36.7
	Preparatory school	19	21.1
	Undergraduate Level	16	17.8
	Illiterate	16	17.8
	Some elementary education	6	6.7
Occupation	Unemployed	53	58.9
	Employed	15	16.7
	Self-employed	12	13.3
	Re-tired	10	11.1
Marital Status	Married	63	70
	Single	20	22.2
	Widow/Widower	6	6.7
	Divorced	1	1.1
Residence	Urban	85	94.4
	Rural	5	5.6
Monthly Income	Barely Sufficient	71	78.9
	insufficient	13	14.4
	Sufficient	6	6.7

Table 2: Distribution of Clinical characteristics of studied sample (n=90)

Clinical Characteristics	**Category**	**F**	**(%)**
Surgery Name	Appendectomy	21	23.3
	Appendectomy +holecystectomy	1	1.1
	Appendectomy + Ovarian cystectomy (O.C)	2	2.2
	Bilateral Inguinal Hernia (BIH)	2	2.2
	Bowel resection	1	1.1
	Cholecystectomy	3	3.3
	Incisional Hernia	1	1.1
	Left Inguinal hernia (LIH)	6	6.7
	Ovarian cyst removing O.C	12	13.3
	Polypectomy	1	1.1
	Paraumbilical Hernia(PUH)	6	6.7
	PUH+RIH	1	1.1
	Right Inguinal hernia (RIH)	18	20.0
	Total Abdominal Hysterectomy (TAH)	10	11.1
	Total Colectomy	1	1.1
	Uterus mass	4	4.4
Surgery Duration	< 1 hour	65	72.2
	1–2 hours	21	23.3
	2-3 hours	4	4.4
Type of Anaesthesia	Spinal	48	53.3
	General	42	46.7
Chronic Disease	Yes	21	23.3
	No	69	76.7
Chronic Disease Type	Hypertension	12	13.3
	Diabetes Mellitus	4	4.4
	Asthma	2	2.2
	COPD	0	0
Previous Surgery	Yes	60	66.7
	No	30	33.3
Pain Education	Yes (Helpful)	0	0
	Yes (Not helpful)	0	0
	No	90	100

Table 3: Summary of Statistical Tests Examining the Relationship Between Pain Severity and demographic and Clinical characteristics.

	Variable Compared	Statistical Test	Test Statistic (χ^2 / H)	p-value	($p < 0.05$)	Interpretation (if relevant)
Demographic characteristics	Gender	Chi-square	$\chi^2 = 6.33$	0.042	Yes	Females more likely to report severe pain
	Age	Chi-square	–	>0.05	No	No significant association
Clinical characteistsics	Chronic Illness	Chi-square	–	>0.05	No	Descriptive trend: more pain in chronic illness
	Previous Surgery	Chi-square	–	>0.05	No	No significant relationship
	Type of Anesthesia	Chi-square	–	>0.05	No	General anesthesia linked to more NRS 8–9 pain
	Duration of Surgery	Kruskal-Wallis H	H = 7.296	0.026	Yes	Longer surgeries linked to higher pain
	Type of Surgery (Chi-square)	Chi-square	$\chi^2 = 114.43$	0.626	No	No significant association
	Type of Surgery (K-Wallis H)	Kruskal-Wallis H	H = 33.69	<0.01	Yes	TAH and RIH linked to more intense pain

Table 4: Frequency of pharmacologic approach for pain management.

Pharmacological management	Yes		No	
	F	%	F	%
NSAIDs	84	93.3%	6	6.7%
Tramadol	70	77.8%	20	22.2%
Acetaminophen	63	70%	27	30%
Other Opioids	0	0%	90	100%
Local anesthetics	0	0%	90	100%
Opioid sparing	0	0%	90	100%

FIGURES:

Figure 1: Distribution of Postoperative Pain Severity

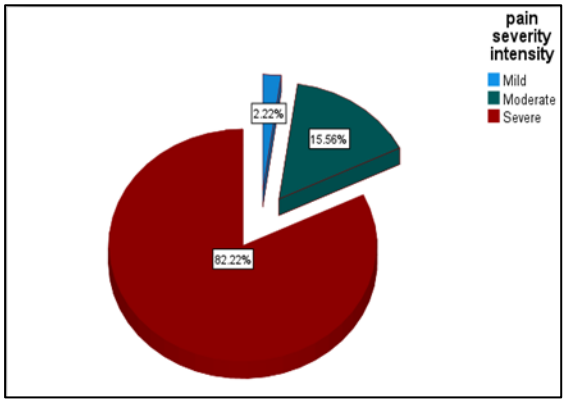

Figure 2: Frequency of reported descriptors for pain