

Exploring Post-Operative Pain Management Strategies to Enhance Patients' Satisfaction after Abdominal Surgeries in Selected South-West, Nigerian Federal Teaching Hospitals

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ABSTRACT

Patient satisfaction is a key indicator of postoperative care quality, particularly following abdominal surgeries, which remain common in Nigerian teaching hospitals. Inadequate management of postoperative pain contributes to delayed recovery and prolonged hospital stays. Despite the high frequency of abdominal surgeries, there is limited evidence on how to improve patient satisfaction, and many patients in Federal Teaching Hospitals in South-West Nigeria continue to report suboptimal satisfaction.

Objective

The study aimed to explore post-operative pain management strategies to enhance patients' satisfaction after abdominal surgeries in selected Federal Teaching Hospitals in South-West Nigeria

Methods

A sequential exploratory mixed-methods design was used. The qualitative phase consisted of purposive interviews with twelve patients, while the quantitative phase involved 420 patients sampled from two hospitals. Data were obtained using semi-structured interviews and a validated questionnaire. Thematic analysis was applied to qualitative data, while quantitative data were analyzed using descriptive and inferential statistics at 5% significance level.

Results

Qualitative findings generated six themes related to pain experiences, satisfaction with pain management, coping strategies, and recommendations for improvement. Quantitatively, 88% of patients who received NSAIDs and 36% who used opioids reported higher satisfaction; although, 25% of patients remained dissatisfied due to severe postoperative pain. Significant associations ($p < 0.05$) were found between satisfaction and hospital setting ($X^2 = 48.13$), educational level ($X^2 = 10.98$), and combined pain management strategies ($X^2 = 39.41$).

Conclusion

The study concluded that multimodal pain management strategies significantly improve patients' satisfaction after abdominal surgery. The study recommends that personalized, patient-centred and compassionate approaches to postoperative pain management to enhance recovery and overall satisfaction. Word Count: 260 words

Keywords: Abdominal surgery, Multimodal analgesia, Patient satisfaction, Postoperative pain management, Pain management strategies

Plain Language Summary

This study explored patients' perceptions of pain management after abdominal surgery in teaching hospitals in South-West Nigeria. Many patients still experience significant pain and dissatisfaction, which delays recovery and extends hospital stays. Researchers interviewed 12 patients and surveyed 420 others to understand what works well and what does not. Patients who received combined pain treatments, especially NSAIDs and opioids, were more satisfied. However, one in four patients (25%) still felt dissatisfied due to persistent pain. Satisfaction varied according to hospital location, education level, and pain treatment methods. The study recommends compassionate care, personalized treatment, and multimodal pain management to help patients recover faster and with less discomfort.

INTRODUCTION

Abdominal surgery encompasses a wide range of procedures within the abdominal cavity aimed at treating conditions such as appendicitis, hernias, and cancers to restore normal organ function and remove obstructions. These procedures serve both diagnostic and therapeutic purposes (1). Postoperative pain is a universal concern that significantly affects recovery, patient satisfaction, and overall healthcare outcomes. Effective pain management not only reduces physical discomfort but also improves psychological well-being and accelerates recovery, making it a vital aspect of surgical care (22)

Globally, optimal postoperative pain management emphasizes multidisciplinary collaboration, individualized treatment plans, preoperative education, and multimodal analgesia. A multimodal analgesia approach is defined as the concurrent use of two or more analgesic modalities, pharmacologic or non-pharmacologic, targeting different pain pathways, to enhance pain relief while minimizing side effects. In this study, multimodal analgesia operationally includes any combination of NSAIDs, opioids, local anesthetics, topical agents, antidepressants (gabapentinoids), and/or non-pharmacologic measures, for example, diversional therapy, early mobilization.

Despite technological advances such as laparoscopy (a minimally invasive technique), disparities persist due to limited access to skilled personnel and modern equipment (3, 14). Factors such as demographics, surgery type, and pain tolerance influence patients' pain experiences, while satisfaction depends on effective communication, involvement in decision-making, and quality care delivery (20, 6).

In Africa, pain management is shaped by cultural beliefs, limited healthcare resources, and insufficient staff training. Strategies such as multimodal analgesia are essential to address these contextual challenges (16, 17, 18, 22). In Nigeria, inadequate resources, inconsistent pain protocols, and underreporting due to cultural norms hinder effective postoperative care (19, 10, 21, 11). Addressing these gaps requires integrating pharmacological and non-pharmacological methods within a patient-centered framework (2, 13, 14). Guided by the Kolcaba Theory of comfort (15). This study explores post-operative pain management strategies to enhance patients' satisfaction after abdominal surgeries in selected South-West Nigerian Federal Teaching Hospitals.

Research Questions

1. What is the level of patients' satisfaction with pain management post-abdominal surgery in the two selected Federal Teaching Hospitals in South-West, Nigeria?
2. What are the current pain management methods enhancing patients' satisfaction post-abdominal surgery in the selected Federal Teaching Hospitals in the Southwest, Nigeria?

3. What is the relationship between factors such as gender, socioeconomic status, and educational level, and patients' satisfaction with pain management following abdominal surgery in the selected Federal Teaching Hospitals in South-West Nigeria?
4. What is the impact of a multimodal approach in pain management on patients' satisfaction with abdominal surgery in the selected Federal Teaching Hospitals in the South-West, Nigeria?
5. What is the overall patients' satisfaction level with various pain management methods administered postabdominal surgery within both health institutions in South-West, Nigeria?
6. What are the pain management strategies to improve patients' satisfaction post-abdominal surgeries in the selected Federal Teaching Hospitals in the South-West, Nigeria?

MATERIALS AND METHOD

Study Setting

This study was conducted at two Federal tertiary hospitals in South-West Nigeria: Lagos University Teaching Hospital (LUTH) in Lagos State, and Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) in Osun State.

Study Design

A sequential exploratory mixed-methods design was adopted. The qualitative phase preceded the quantitative phase, allowing insights from interviews to inform questionnaire development.

Population

The study population was adult patients who had undergone abdominal surgery at LUTH and OAUTHC) in Southwest Nigeria.

Inclusion/ Exclusion Criteria

Included were patients aged ≥ 18 years who experienced postoperative pain within one week after surgery and could provide informed feedback. Patients with chronic pain conditions, ICU admissions, day surgeries, advanced surgical techniques, cognitive impairments, language barriers, or unwillingness to provide written consent were excluded.

Sample size

The study's qualitative component involved interviews with 12 participants until data saturation was achieved, and the calculated minimum sample size for the quantitative aspect was 423 patients, with 420 responses analyzed.

Sampling Method

Purposive sampling was used for the qualitative phase to gather detailed patient insights. In the quantitative phase, cluster sampling selected two of the hospitals three Federal Teaching Hospitals in Southwest Nigeria. All eligible abdominal surgery patients were included until the sample size was reached.

Data Collection Instrument

Semi-structured interviews captured qualitative narratives, while a structured questionnaire—developed using qualitative insights—assessed satisfaction, pain intensity, and pain management methods.

Validity and Reliability

Interview guides were pretested with five patients, and expert reviews ensured credibility. A pilot test on 10% of quantitative participants assessed instrument clarity. Cronbach's alpha values (0.784–0.900) confirmed strong internal consistency.

Data Collection Procedure

Qualitative interviews were conducted after patients regained full consciousness, with audio recordings transcribed verbatim. For the quantitative phase, questionnaires were administered after informed consent, and pain scores were recorded at multiple postoperative intervals (day 0, day 1, day 3, and one week).

Data Analysis

Qualitative data were thematically analyzed using ATLAS.ti (Version 24). Quantitative data were analyzed with SPSS (Version 29) using descriptive statistics, chi-square tests, and logistic and Poisson regression ($p < 0.05$).

Ethical consideration

Ethical approval was obtained from BUHREC and hospital review boards with ethical clearance ADM/DSCST/HREC/APP/6492 and ERC/2024/06/05 from Lagos University Teaching Hospital, Idiaraba, Surulere, Lagos, Nigeria (LUTH) and Obafemi Awolowo University Teaching Hospital Complex Ile Ife, Nigeria, OAUTHC, respectively.

RESULTS

Qualitative Results

A total of 12 patients participated in the semi-structured interviews, with ages ranging from 26 to 48 years and a mean age of 37 ± 7 years. The majority were married, with diverse occupations: 7 public servants, 4 traders, and 1 artisan. This socio-demographic diversity was essential for exploring the influence of socio-demographic factors on pain management and patient satisfaction with pain relief.

Table 4.1: Socio-Demographics of the Participants in the Study

Respondents	Ages	Gender	Marital status	Education	Occupation	Monthly Income (₦)	Institution
Participant 1	39	F	Married	BSc	Clerical Officer	90,000.00	LUTH
Participant 2	48	F	Married	SSCE	Cleaner	27,000.00	LUTH
Participant 3	38	F	Divorce	SSCE	Caterer	25,000.00 above	OAUTHC
Participant 4	41	F	Single	SSCE	Fashion Designer	30,000	OAUTHC
Participant 5	39	F	Married	BSc	Business	50,000.00 above	LUTH
Participant 6	35	M	Divorcee	ND	Civil Servant	100,000.00	OAUTHC
Participant 7	26	M	Married	HND	Civil Servant	105,000.00	OAUTHC

Participant 8	38	M	Married	BSc	Business	80,000.00	LUTH
Participant 9	38	M	Married	SSCE	Clerk	50,000.00	LUTH
Participant 10	32	F	Married	BSc	Business	70,000.00	LUTH
Participant 11	32	M	Married	OND	Civil Servant	60,000.00	OAUTHC
Participant 12	46	M	Married	SSCE	Business	110,000.00	LUTH

The results were systematically organized and presented according to themes derived from participants' responses.

Below are the expressions of their experiences:

Patient Experiences with Abdominal Surgical Pain

Participants vividly described their postoperative abdominal pain as severe, distressing, and difficult to ignore. Many used words such as “bad,” “terrible,” and “unbearable” to express their experiences. Female respondent 2 stated, “Though the experience was bad because of the pain, eh... but I take my drugs to feel better, but the pain remains, not relief o.” Similarly, Male respondent 2 shared, “Oh! ...I was told there would be pain after the operation, but never expected it to be too much to bear when I woke up, you know, the pain was terrible.” Male respondent 4 added, “Yes, now... I know pain drugs like ibuprofen tablets, and doing things that will take your mind from the pain you know... the pain does allow one to want to watch television and do other things.” These accounts reflect the intense and persistent nature of postoperative pain and its disruptive impact on daily functioning.

Factors Promoting Coping Mechanisms

Respondents highlighted gender, age, and ethnicity as factors influencing pain tolerance. Male respondent 2 mentioned, “Age and gender could be a factor,” while Male respondent 4 added, “Men withstand pain more than women.” Male respondent 5 explained, “People have different ways of bearing pain, and our bodies are not the same.” Male respondent 6 stated, “The way we feel pain is different from others... where one comes from in Nigeria, the Fulani and the Hausas don’t feel pain as such.” Similarly, Male respondent 7 said, “Men and women feel pain differently... up north don’t feel pain as such.” Female respondent 4 emphasized preoperative counseling, saying, “They told me about the operation... how to manage my pain well, to move around and take my drugs well.” Male respondent 1 also believed that “age, sex, and the extent of the operation” could *affect* pain perception.

Fear of Adverse Drug Side Effects

Several participants expressed concerns about the adverse effects of analgesics. Male respondent 1 acknowledged that while medications like Panadol, ibuprofen, and cocodamol were effective, he avoided frequent use due to fear of side effects. Male respondent 4 echoed this sentiment, saying, “Sometimes you don’t want to take the drugs all the time because of the adverse effects; you try to endure it, but you cannot take the pain away.”

Satisfaction with Pain Management Methods

Despite challenges, most participants appreciated the responsiveness and compassion of healthcare workers. Female respondent 2 stated, “I am satisfied. They give me my drugs for the pain on time.” Female respondent 1 added, “The nurses and the doctors are friendly,” while Female respondent 3 said, “God bless them, I love the way they treat me.” Male respondent 1 and Male respondent 2 both affirmed satisfaction, while Male respondent 5 praised the staff’s professionalism but suggested improvement. However, Male respondent 6

admitted being “a bit satisfied,” and another male respondent lamented, “The pain is not easy, my brother. I am not satisfied.”

Strategies and Suggestions for Improvement

Participants proposed stronger pain medications, diversional therapy, and better hospital responsiveness. Female respondent 1 suggested, “Stronger pain drugs and diversional therapy,” while Male respondent 1 and Male respondent 2 recommended “stronger pain drugs like diclofenac” and “moving around and doing something else.” Female respondent 3 appealed, “Help me thank the nurses... the government should help them too.” Male respondent 5 added, “The nurses and doctors are good, but the government should provide more resources.”

Collectively, these perspectives offer valuable insight into patients’ experiences, coping mechanisms, and satisfaction levels, emphasizing the need for multimodal, patient-centered pain management approaches after abdominal surgery.

Summary of qualitative results

The study revealed that pain management practices often fall short of patient needs, emphasizing personalized approaches, compassionate communication, and regular monitoring. Individual pain tolerance, fear of drug side effects, and financial barriers affected adherence. Patients recommended stronger medications, diversional therapies, responsive staff, and government support for improved postoperative pain management.

Quantitative Results and Interpretations

This section summarizes the socio-demographic characteristics of 420 abdominal surgery patients from Federal Teaching Hospitals in Southwest Nigeria. Variables such as age, gender, marital status, education, occupation, income, and surgery location were analyzed using Excel and SPSS. Descriptive and inferential statistics, including chi-square and regression analyses, ensured valid results ($p < 0.05$)

Table 4.2 Socio-demographic Characteristics of Respondents of the Study

Socio-Demographic Characteristic	Socio-Demographic Characteristic	Frequency	Percentage%
Variables			
Age (N=420)	18-24	69	16.4
	23-35	84	20.0
	35-44	86	20.5
	45-54	108	25.7
	≥ 55	73	17.4
Gender	Male	211	50.2
	Female	209	49.8
Marital Status	Single	88	21.0
	Married	239	56.9

	Divorced/ Separated	58	13.8
	Widowed	35	8.3
Education	No Formal Education	40	9.5
	Primary Education	39	9.3
	Secondary Education	181	43.1
	Tertiary Education	160	38.1
Occupation	Employed	139	33.1
	Self-employed	179	42.6
	Un-employed	59	14.0
	Student	43	10.2
Monthly Income	Less than 50,000	74	17.6
	50,000 - 100,000.	144	34.3
	100,000 - 200,000	142	33.8
	More than 200,000	60	14.3
Surgery Location	LUTH	240	57.1
	OAUTHC	180	42.9

Table 4.2 shows the socio-demographic characteristics of 420 respondents. The largest age group was 45-54 years, 108 (25.7%). Males made up 211(50.2%) of respondents. Most were married, 239 (57%), with 181 (43%) having secondary education. Many were self-employed, 179 (43%), and earned between 50,000-100,000 naira, 144 (34%). Most 240 (57%) used the Federal Tertiary Hospital in Lagos.

Table 4.3 Evaluation of Patient Experience with Pain Management Post-Abdominal Surgery

Clinical Characteristic	Clinical Characteristic	Frequency N	Percentage%
Post Op. In Hospital Days (N=420)	1 – 2	45	10.7
	3-4	283	67.4
	5-6	45	10.7
	More than 6 days	47	11.2

Type of Abdominal Surgery	Appendectomy	104	24.8
	Cholecystectomy	58	13.8
	Colon/ Anorectal Surgery	47	11.2
	Colon/ Large Bowel Resection	60	14.3
	Hernia Surgery	72	17.1
	Small Bowel Resection	48	11.4
	Gastrectomy	31	7.3

Table 4.3 shows the clinical characteristics of respondents. Two hundred and 83 (67%) respondents spent 3-4 days in hospital post-operation, 104 (25%) had an appendectomy done, and 72 (17%) had hernia surgery.

Table 4.4 Intensity of Pain Post-Abdominal Surgery at Day 0, Day 1, and one week measured using a numeric pain rating scale (0–100) at four time points: day 0, day 1, day 3, and one week post-operation.

Intensity of Pain	0 days (%) (n=420)	Day One (%)	Day Three (%)	One week (%)
00 (no pain)	2 (0.5)	0 (0.0)	3 (0.7)	18 (4.3)
10	24 (5.7)	7 (1.7)	21 (5.0)	97 (23.1)
20	20 (4.8)	16 (3.8)	32 (7.6)	141 (33.6)
30	6 (1.4)	21 (5.0)	84 (20.0)	99 (23.6)
40	8 (1.9)	55 (13.1)	114 (27.1)	36 (8.6)
50	29 (6.9)	94 (22.4)	70 (16.7)	20 (4.8)
60	53 (12.6)	119 (28.3)	38 (9.0)	2 (0.5)
70	76 (18.1)	67 (16.0)	23 (5.5)	3 (0.7)
80	104 (24.8)	26 (6.2)	25 (6.0)	3 (0.7)
90	96 (22.9)	15 (3.6)	9 (2.1)	1 (0.2)
100 (worst possible pain)	2 (0.5)	0 (0.0)	1 (0.2)	0 (0.0)

Table 4.4 shows the distribution of the intensity of pain of respondents after surgery up to one week. 2 (0.5%) respondents had 00 pain (no pain), and 104 (25%) respondents had 80 pain (close to worst-possible-pain 100) immediately after surgery. Zero respondents had 00 pain, and 119 (28%) respondents had 60 pain on day one after surgery. Three (0.7%) and 18 (4%) respondents had 00 pain three days and one week after surgery,

respectively. One hundred and fourteen (27%) and 141 (34%) respondents had 40 pain and 20 pain on day 3 and one week after surgery, respectively.

Table 4.5: Patient Satisfaction with Pain Relief Strategy Post-Abdominal Surgery

Pain relief Administration Variable	Median	IQR	Mode
Pain relief dosage (mg)	50	0	50
No. of times of daily use	3	1	3
No. of days of using pain relief post-op.	5	3.25	5

Table 4.5 presents the pain-relief administration characteristics of respondents. The median dosage of pain relief was 50 mg, with no variability in the central 50% of the data. The mode was also 50 mg, indicating it was the most common dosage. The median frequency of daily use was 3 times, with a 1-day variability, while the mode was 3 times per day. The median duration of pain relief use post-operation was 5 days, with an interquartile range of 3.25, and the mode was 5 days. Overall, the dosage, daily use frequency, and post-op use duration were consistent across respondents.

Table 4.6 Distribution of Pain Management Strategies Post-Abdominal Surgery

Pain Management Strategies Post Abdominal Surgery		Freq.	%
Anaesthesia	General Anaesthesia	347	82.6
	Local Anaesthesia	68	16.2
	Regional Anaesthesia	5	1.2
NSAIDS (Ibuprofen, Naproxen, Diclofenac) (N = 420)	Yes	368	87.6
	No	52	12.4
Opioids For Pain Relief	Yes	33	7.9
	No	387	92.1
Local Anaesthetics (Lidocaine, Bupivacaine)	Yes	27	6.4
	No	393	93.6
Topical Analgesics (Lidocaine Gel, Diclofenac Gel)	Yes	231	55.0
	No	189	45.0
Antidepressants (Gabapentin, Pregabalin)	Yes	11	2.6
	No	409	97.4
Steroids (Prednisone, Dexamethasone)	Yes	6	1.4
	No	414	98.6.

Table 4.6 shows the distribution of pain management methods post-abdominal surgery. Most participants, 347 (83%) received general anaesthesia, while 16% had local anaesthesia. NSAIDs were administered to 368 (88%), and opioids to 12 (8%). Other treatments included local anaesthetics 68 (16%), topical analgesics 231 (55%), antidepressants 11 (3%), and steroids 6 (1%).

Figure 4.1 Patients' Satisfaction with Pain Management Strategies Post- Post-Abdominal Surgery

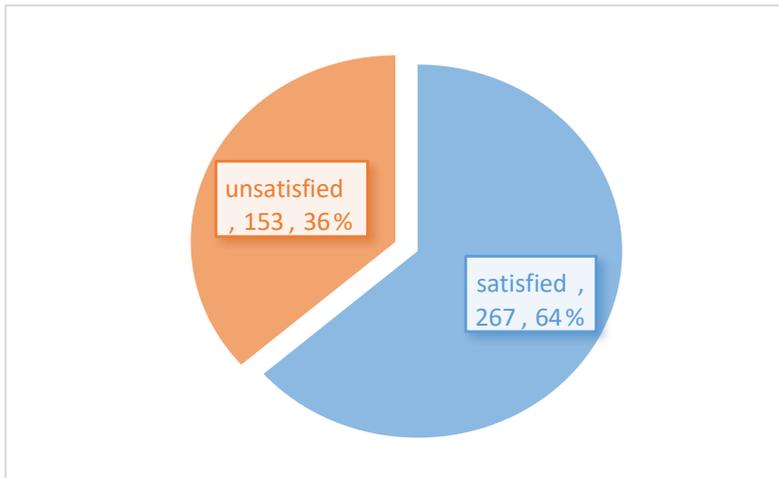


Figure 4.1 shows the distribution of patients' Satisfaction with Pain management post-operation. 267 (64%) participants were satisfied with pain management post-abdominal surgeries, while 153 (36%) participants were not satisfied. Measured using a validated questionnaire (Cronbach α 0.784–0.900)

Table 4.7 Influence of Multimodal approach in pain Management on patient satisfaction post abdominal surgery in Federal Teaching Hospitals in South-West, Nigeria

Pain Management Strategies	Pain Management Strategies	Client's Satisfaction	Client's Satisfaction	χ^2 -value	p-value
Pain Management Strategies	Pain Management Strategies	Satisfied (%)	Unsatisfied (%)	χ^2 -value	p-value
Multimodal (\geq three of these pain management modes)	Yes	8 (3.0)	10 (6.5)	2.97	0.130
Multimodal (\geq three of these pain management modes)	No	259(97.0)	143 (93.5)		
NSAIDs (Ibuprofen, Naproxen, Diclofenac)	Yes	244 (91.4)	124 (81.0)	9.59*	0.003
NSAIDs (Ibuprofen, Naproxen, Diclofenac)	No	23 (8.6)	29 (19.0)		
Opioids (Codeine, Tramadol, Oxycodone, Morphine)	Yes	21 (7.9)	12 (7.8)	0.000	1.000
Opioids (Codeine, Tramadol, Oxycodone, Morphine)	No	246 (92.1)	141 (92.2)		
Local Anaesthetics (Lidocaine, Bupivacaine)	Yes	17 (6.4)	10 (6.5)	0.005	1.000
Local Anaesthetics (Lidocaine, Bupivacaine)	No	250 (93.6)	143(93.5)		

Topical Anaesthetics (Lidocaine gel, Diclofenac gel)	Yes	176 (65.9)	55 (35.9)	35.30*	0.000
Topical Anaesthetics (Lidocaine gel, Diclofenac gel)	No	91 (34.1)	98 (64.1)		
Antidepressants (Gabapentin, Pregabalin)	Yes	3 (1.1)	8 (5.2)	6.43*	0.021
Antidepressants (Gabapentin, Pregabalin)	No	264 (98.9)	145 (94.8)		
Steroids (Prednisone, Dexamethasone)	Yes	2(0.7)	4 (2.6)	2.40	0.197
Steroids (Prednisone, Dexamethasone)	No	265 (99.3)	149 (97.4)		

Of the respondents, 7% of those unsatisfied and 3% of satisfied clients used multi-modal pain management, but the difference was not statistically significant ($\chi^2=2.97$; $p=0.130$). While 81% of the unsatisfied group and 91% of the satisfied group were administered NSAIDs, NSAID use was significantly associated with higher satisfaction (OR = 2.41, 95% CI: 1.34–4.35, $p = 0.003$), also the difference was statistically significant ($\chi^2 = 9.59$; $p = 0.003$). Opioid use was similar in both groups: 21 (8%) unsatisfied and 12 (8%) satisfied, with no significant difference ($\chi^2 = 0.000$; $p = 1.000$). Local anaesthetics were used by 7% of unsatisfied and 6.4% of satisfied respondents, with no significant difference ($\chi^2 = 0.005$; $p = 1.000$). Topical anaesthetics were more commonly used in the satisfied group (66%) compared to the unsatisfied group (36%).

Table 4.8 Factors influencing patients’ satisfaction with pain management post-abdominal surgery by Location

Factors	Location	N	Mean ± S.D	t- value	p-value
Health Care Provider	LUTH	240	23.96± 2.08	0.57	0.567
	OAUTHC	180	23.86± 1.50		
Patient Factor	LUTH	240	26.75 ± 4.05	3.71	0.000*
	OAUTHC	180	27.95 ±1.85		
Health Facility factor	LUTH	240	15.77 ± 1.55	1.10	0.271
	OAUTHC	180	15.92± 1.12		

*significant at $p = 0.05$

Table 4.8 analysed factors influencing patient satisfaction with pain management post-abdominal surgery at LUTH and OAUTHC. The healthcare provider factor showed no significant difference between the two

hospitals ($t = 0.57, p = 0.567$). However, a statistically significant difference was found in the patient factor ($t = 3.71, p = 0.000$). The health facility factor showed no significant difference between hospitals ($t = 1.10, p = 0.271$). These findings highlight the importance of patient-related factors that influence satisfaction, with hospital location having minimal impact on healthcare provider and facility factors.

Predictors of Patients' Satisfaction Post-Abdominal Surgery.

Table 4.9 Logistic Regression of the Relationship between Patient Satisfaction Post-Operation and Selected Respondents' Characteristics

Variables	Estimate (β)	p-value	OR	Confidence Interval for 95% O.R	Confidence Interval for 95% O.R
				----- ---- Lower boundary	
Constant	-10.350	0.000	0.017		
Age Group					
18-24 Years	-0.313	0.578	0.731	0.243	2.204
25-35 Years	0.361	0.511	1.435	0.489	4.209
35-44 Years	0.461	0.420	1.585	0.517	4.858
45-54 Years	0.078	0.876	1.082	0.404	2.896
55 Years and above	(Ref.)	(Ref.)	1	(Ref.)	(Ref.)
Federal Tertiary Hospital					
LUTH	-0.867	0.032	0.420*	0.190	0.929
OAUTHC	(Ref.)	(Ref.)	1	(Ref.)	(Ref.)
Health Care Provider Score	0.067	0.502	1.069	0.880	1.298
Personal Factors Score	0.356	0.068	1.428	0.974	2.093
Health Facility Factors Score	0.216	0.245	1.241	0.863	1.785
Pain Immediately After Surgery	-0.196	0.096	0.822	0.652	1.035
Pain One Day After Surgery	0.064	0.634	1.066	0.818	1.390
Pain Three Days After Surgery	-0.197	0.218	0.872	0.702	1.084
Pain One Week After Surgery	-0.072	0.624	0.931	0.698	1.241

Table 4.9 highlights factors affecting patient satisfaction with postoperative pain relief. Patients aged 25–54 reported higher satisfaction than those 55 and above, while males were 1.5 times more satisfied than females ($p > 0.05$). Satisfaction was greater OAUTHC ($p < 0.05$). Higher provider, personal, and facility scores (1.1–1.4 times) and reduced pain intensity increased satisfaction. Patients at LUTH were less likely to be satisfied compared with OAUTHC (OR = 0.42, 95% CI: 0.19–0.93, $p = 0.032$). Higher personal factor scores showed a positive trend toward satisfaction (OR = 1.43, 95% CI: 0.97–2.09, $p = 0.068$).

DISCUSSION

This study demonstrates that postoperative satisfaction among abdominal surgery patients is driven more by the type of pharmacologic strategy implemented than by demographic characteristics. NSAIDs emerged as a particularly strong predictor of satisfaction (OR = 2.41), reflecting their accessibility, effectiveness in managing inflammatory pain, and relatively low side-effect burden. Similarly, topical analgesics contributed positively to satisfaction, suggesting that patients appreciate analgesic options that provide relief without the systemic risks associated with opioids. Although opioid use was relatively low, multimodal combinations that included NSAIDs and opioids yielded greater comfort, reinforcing the value of integrating multiple analgesic modalities into postoperative regimens. A notable finding was the higher satisfaction observed at OAUTHC compared with LUTH. This difference may reflect variations in organizational culture, provider responsiveness, communication quality, or resource availability. The discrepancy underscores the importance of standardized postoperative pain management protocols across institutions to ensure equitable patient experiences.

The mixed-methods approach strengthened the study by integrating patient narratives into quantitative analysis. Qualitative themes such as fear of medication side effects, financial constraints, cultural beliefs about pain endurance, and the role of nurse empathy provided essential context for interpreting quantitative relationships. This integration enhanced construct validity and ensured that patient-reported experiences informed the development of the measurement tools. Tracking pain scores over four postoperative time points offered a meaningful depiction of pain trajectories, though future studies may benefit from incorporating objective indicators such as opioid consumption and standardized assessments of nurse–patient communication. Kolcaba’s Comfort Theory provides a useful lens for understanding these findings. The theory posits that comfort arises through *relief*, *ease*, and *transcendence* across physical, psychospiritual, sociocultural, and environmental dimensions.

1. Physical comfort was supported through effective NSAID use and the overall reduction in pain scores over time.
2. Psychospiritual comfort emerged from patient-reported kindness, reassurance, and emotional support from healthcare providers factors that mitigated anxiety and enhanced feelings of safety.
3. Sociocultural comfort was reflected in the influence of education, coping behaviors, and patient expectations on satisfaction. Higher educational attainment appeared to facilitate better understanding of pain management plans, potentially contributing to greater satisfaction.
4. Environmental comfort was shaped by institutional factors such as timeliness of care, availability of analgesics, and staff responsiveness. These elements affected satisfaction independently of demographic characteristics.

Collectively, the findings extend Kolcaba’s theory by demonstrating that multimodal analgesia promotes comfort across multiple domains simultaneously, explaining why combined therapeutic strategies result in higher satisfaction than single-method approaches. Descriptive data further contextualize these relationships. Respondents ranged from 26 to 48 years, with a mean age of 37 years, and represented diverse occupations, including public servants, traders, and artisans. Although most respondents were male (50.2%) and married (57%), demographic variables, including age and gender, did not significantly influence satisfaction. Pain intensity was initially high but reduced progressively, aligning with typical postoperative trajectories. NSAIDs were overwhelmingly the most used analgesic (88%), followed by topical agents (55%) and opioids (8%). Despite their limited use, opioids remained an important component of multimodal therapy for patients

experiencing severe pain. Pain tolerance varied by individual factors such as age, gender norms, and ethnic background, while concerns about medication side effects and financial limitations often shaped patient perceptions and willingness to use analgesics. Higher income levels facilitated better access to recommended medications, which may partly explain observed differences in satisfaction.

Overall, satisfaction was significantly associated with surgery location, analgesic modality, health literacy, and facility-related factors rather than demographic attributes. Effective strategies to enhance satisfaction include the adoption of multimodal pain management, consistent use of NSAIDs and opioids when clinically appropriate, adherence to standardized protocols, and ongoing patient education and monitoring. The findings emphasize the need for personalized pain management plans and compassionate care delivery to optimize postoperative outcomes in Nigerian teaching hospitals.

CONCLUSION

Postoperative pain satisfaction is shaped primarily by the choice of analgesic strategy, the quality of provider patient communication, and the responsiveness of the healthcare institution, rather than by demographic characteristics such as age or gender. The use of multimodal analgesia was particularly effective, enhancing patient comfort across physical and psychosocial dimensions in ways that align with Kolcaba's Comfort Theory. These findings underscore the importance of implementing standardized, patient-centered, multimodal pain management protocols across teaching hospitals to improve both recovery and satisfaction outcomes. Within the Federal Teaching Hospitals in South-West Nigeria, satisfaction levels were influenced most notably by the hospital setting, patients' educational background, and the specific pain management methods employed. The study reinforces the need for tailored analgesic strategies and strengthened institutional standards to optimize postoperative care. Overall, participants reported meaningful pain relief and expressed high levels of satisfaction with postoperative pain management following abdominal surgery at both study sites, highlighting the positive impact of effective and individualized pain management practices.

Study Limitation

The study included only patients from two hospitals who consented to participate, which may limit generalizability. However, the limited existing literature enhances the value of the findings.

Ethical Statement

The study adhered to the Declaration of Helsinki and obtained ethical approval from BUHREC (BUHREC/761/23), LUTH (ADM/DSCST/HREC/APP/6492), and OAUTHC (ERC/2024/06/05). Participants were fully informed, provided written consent, and assured confidentiality. Voluntary participation, anonymity, and data protection were maintained, ensuring ethical compliance and respect for participants' rights and dignity throughout the research.

Data Access Statement

Due to the sensitive nature of patients' information, data are available upon request from the principal investigator and subject to approval by the Health Research Ethics Committee of LUTH and OAUTHC.

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Declarations of Interests:

We declare that there is no conflict of interest between the authors in this study.

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