



Nurses' knowledge regarding postoperative pain management at Tikrit Teaching Hospital: a cross-sectional study

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Abstract

Introduction: Postoperative pain (POP) is a common and expected experience after surgery. If not adequately controlled, many complications will occur.

Objective: This study assessed nurses' knowledge of postoperative pain at the Tikrit teaching hospital.

Methods: A cross-sectional study (November 2025-May 2026) included 100 nurses working in surgical units, selected through purposive sampling. Data were collected using a questionnaire covering sociodemographic data and nurses' knowledge about POP management. Analysis by SPSS v25. **Results:** The results showed that 71% of the sample were males, 81% were between 21 and 29 years old, 77% had diplomas in nursing, 92% were nurses, not midwives, 80% of the sample had 1-5 years of working experience, and 64% of the sample had 1-5 years of experience in surgical units. The nurses respond correctly to 9 questions at a moderate level of knowledge. **Conclusion:** The nurses have limited knowledge regarding postoperative pain management. There is a need for POP management training. The questionnaire is suitable for both genders.

Keywords: Postoperative pain, Knowledge, Nurses, Management.

Introduction

Postoperative pain is a common and expected side effect of surgery, and if not managed properly, it can lead to delayed healing, a poor prognosis, increased mortality and morbidity, and an increased chance of chronic pain development [1]. Pain is defined as "an

unpleasant sensory and emotional experience associated with, or similar to, actual or potential tissue damage" [2]. Globally, roughly 312.9 million surgeries are performed annually, with a surgical rate of 4,469 per 100,000 persons. Despite advancements in perioperative management and intervention measures, a significant proportion of surgery patients will experience acute postoperative pain [3].

Pain that emerges after surgery affects roughly 80% of surgical patients, begins with surgical trauma, gradually subsides as the tissue heals, and eventually disappears. Ineffective surgical pain control might lengthen the recovery time, increasing morbidity, death rates, and management costs [4]. Inadequate knowledge of post-operative pain can lead to psychological and physiological effects such as deep vein thrombosis (DVT), insomnia, pneumonia, pulmonary embolism, coronary ischemia, poor wound healing, and patient demoralization, resulting in late discharge and lower life quality [5].

Despite advances in technological and pharmaceutical pain management, there is still a lack of understanding about analgesic drugs, which is critical for pain relief [6]. The level of postoperative pain is determined by the type and location of surgery, the extent of tissue injury, and the surgical position. Pain. Nurses with advanced knowledge and attitudes are critical for managing postoperative pain [7]. The attention on postoperative pain treatment has been intensified to improve it by developing new standards and approaches [8].

This study aimed to assess nurses' knowledge of postoperative pain at Tikrit Teaching Hospital.

Methods

A descriptive cross-sectional study was conducted during the period from the 7th of September 2025 to the 1st of May 2026. The study was conducted in public and private surgical units of Tikrit Teaching Hospital, following the STROBE rules. Non-random sampling (purposive) involved 100 nurses who agreed to participate in the study. The Knowledge and Attitude Survey Regarding Pain (KASRP) standardized questionnaire [9] was used to collect data. that consists of two parts:

1. The first section focused on sociodemographic factors like age, gender, level of education, years of experience, years of experience at surgical units, working unit, access to journals, and if they got program training for POP management.

2. The second section involved true/false questions about nurses' knowledge of postoperative pain management (about vital signs, children's nervous system, patient ability to sleep during pain, NSAIDs effectiveness for bone pain, respiratory depression, combination of NSAIDs and opioids, duration of intravenous morphine, if opioids could be given to patients with a history of substance abuse, encouraging patients to endure before opioids are taken, spiritual beliefs of patients. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.

If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain. Anticonvulsant drugs such as Gabapentin (Neurontin) produce optimal pain relief after a single dose. benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment. Narcotic/opioid addiction is defined as a chronic neurobiological disease characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief, and sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.

Ethical Approval

In ethical considerations, formal approval to carry out the study was obtained by the College of Nursing/University of Kirkuk's scientific review board before beginning the study that took place at Tikrit Teaching Hospital after protocol presentation. An ethical committee of the Department of Adult Health Nursing at Kirkuk University-College of Nursing has approved the protocol of the study (the ethics committee approval number: 28); formal approval was granted from the Salah Alden Health Directorate to facilitate the process of data collection, and an official agreement was obtained from the Training and Human Development Center/Research Committee.

Statistical Analysis

In statistical analysis, using SPSS 22, descriptive statistics were employed to describe the sample, which include table(frequency and percentages), Summary Statistics tables including: observed frequencies, percent, mean of score (MS), percentile grand/global mean of score (PGMS), standard deviation (SD), percentile pooled standard deviation (PPSD), percentile pooled standard error (PPSE), and relative Sufficiency (RS%), as well as scoring scales of two categories of dichotomous binary nominal scales, such that (Correct, and Incorrect) which has responding with integer numbers (1, and 0) respectively.

Results

Table 1. Bar Chart distribution for studied socio-demographical characteristics variables for the studied sampling population.

SDCv.	Classes	No.	%	C.S. (*) p-value
Gender	Male	71	71.0	p=0.000 (HS)
	Female	29	29.0	
Age Groups (per yrs.)	21 _ 29	81	81.0	p=0.000 (HS)
	30 _ 40	17	17.0	
	More than 40	2	2.0	
Educational level	Diploma	77	77.0	p=0.000 (HS)
	Bachelor's	23	23.0	
Occupational Status	Nurse	92	92.0	p=0.000 (HS)
	Midwife	8	8.0	

HS: Highly Sig. at $p < 0.01$, S: Sig. at $p < 0.05$; NS: Non Sig. at $p > 0.05$. Source: Own authorship.

Testing based on a binomial test

All of the studied samples SDCv. have restricted distribution since highly significant differences are accounted for between their observed frequencies, and there are expected outcomes at $P < 0.01$. Relative to the subject of "Gender," most of the studied nurses and midwives were male, and they accounted for

71.0%; and the majority were in the first of the age groups and accounted for 81.0%; and more than three quarters of them had graduated with a diploma, and accounted for 77.0%, while the leftover 23.0% had a bachelor's degree. Finally, 92.0% of them were nurses by occupational specialization, and the leftover 8.0% of midwives. Figure 1 shows cluster bar charts for "Socio-Demographical Characteristic" variables (SDCv), distributed for the studied sampling population.

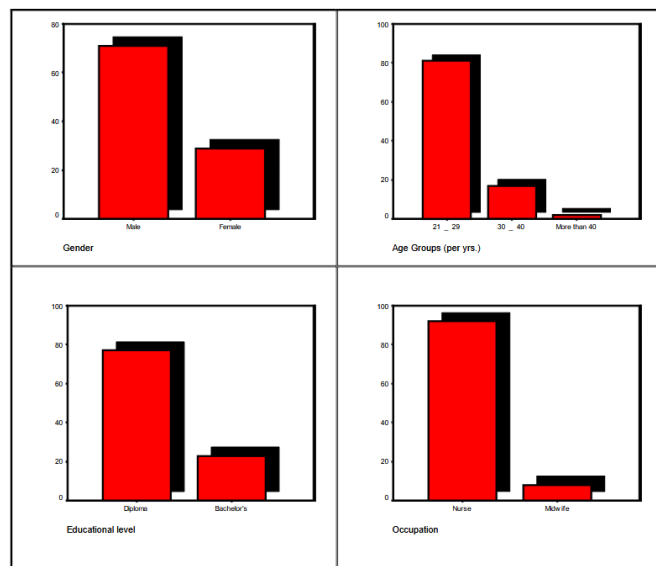


Figure 1 shows cluster bar charts for "Socio-Demographical Characteristic" variables (SDCv), distributed for the studied sampling population. Source: Own authorship.

Table 2 shows observed frequencies and percentages of some related variables (SRv.). In addition, comparisons are significant for the purpose of showing whether the observed frequencies of SRv. are random or may have a restricted (i.e., non-random) distribution.

Table 2. Distribution of the studied sample according to SRv. with significant comparisons (N=100).

SRv.	Classes	No.	%	C.S. (*) p-value
Working years of experience	< 1 yrs.	6	6	$\chi^2 = 98.96$ P=0.000 (HS)
	1 _ 5	80	80	
	6 _ 10	12	12	
	16 _ 20	2	2	
Working experience in surgical unit	< 1 yrs.	36	36	$\chi^2 = 29.36$ P=0.000 (HS)
	1 _ 5	54	54	
	> 5 yrs.	10	10	
Working unit	Orthopedic Surgery	50	50	$\chi^2 = 38.96$ P=0.000 (HS)
	Trauma Surgery	21	21	
	Gynecology	22	22	
	Ophthalmology	7	7	

Access to read journal or article in the last year/month/week	Yes	33	33	P=0.001 (HS)
	No	67	67	
Previous training on POP	Yes	78	78	P=0.000 (HS)
	No	22	22	

HS: Highly Sig. at $P < 0.01$, testing based on a one-sample chi-square test, and binomial test. Shaded classes of the "working years of experience" variable indicate that the last two classes are mixed together for the purpose of the test statistic. Source: Own authorship.

All of the studied sampled SRv. have restricted distribution since highly significant differences are observed between their observed frequencies, and there are expected outcomes at $p < 0.01$. Relative to the subject of "Working years of experience," it shows that most of the studied nurses and midwives had 1 - 5 years and accounted for 80.0%; among them, those had less than five years accounted for 90.0%, and half of them (50.0%) are working at the "Orthopedic Surgery" unit, 21.0% of them are working at the "Trauma Surgery" unit, 22.0% of them are working at the "Gynecology" unit, and finally 7.0% of them are working at the "Ophthalmology" unit. Figure 2 shows bar charts for SRv., distributed for the studied sampling population.

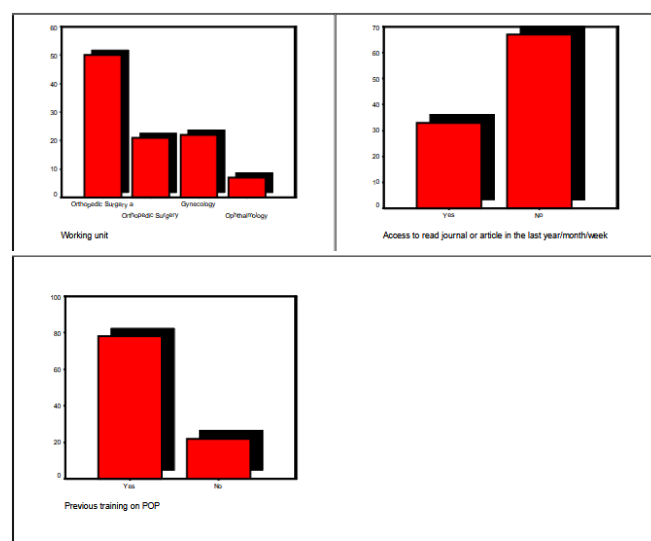


Figure 2. Bar charts for SRv., distributed for the studied sampling population. Source: Own authorship.

Table 3 shows a summary of statistics, such as "Observed frequencies with percentages, Mean of score (MS), Standard deviation (SD), Relative sufficiency (RS%), and assessments by the three classes through reclassification of scoring scales about relative sufficiency coefficients." Results show about half of the studied items that responded have a moderate to low assessed border, since 9 (40.91%) items were assigned, and 7 (31.82%) items had an assessed high level, while the leftover items are

assessed at a low level and accounted for 6 (73.33%), there are 6(20.0%) items that had an assessed at a low level and accounted for 7 (27.27%).

Table 3. Bar charts distribution of some related variables for the studied sampling population.

Knowledge Items	Responses	No.	%	MS	SD	RS % Ass
1.Vital signs are always reliable indicators of the intensity of a patient pain.	Incorrect	82	82	0.1	0.3	18 L
	Correct	18	18	8	9	
2.Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.	Incorrect	68	68	0.3	0.4	32 L
	Correct	32	32	2	7	
3.Patients who can be distracted from pain usually do not have severe pain.	Incorrect	59	59	0.4	0.4	41 M
	Correct	41	41	1	9	
4.Patients may sleep in spite of severe pain	Incorrect	50	50	0.5	0.5	50 M
	Correct	50	50	0	0	
5.Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.	Incorrect	64	64			36
	Correct	36	36	0.3	0.4	
6.Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.	Incorrect	28	28	0.7	0.4	72 H
	Correct	72	72	2	5	
7.Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioids) may result in better pain control with fewer side effects than using a single analgesic agent.	Incorrect	30	30	0.7	0.4	70 H
	Correct	70	70	0	6	
8.The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.	Incorrect	64	64	0.3	0.4	36 M
	Correct	36	36	6	8	
9.Opioids should not be used in patients with a history of substance abuse	Incorrect	70	70	0.3	0.4	30 L
	Correct	30	30	0	6	
10.Elderly patients cannot tolerate opioids for pain relief	Incorrect	56	56	0.4	0.5	44 M
	Correct	44	44	4	0	
11.Patients should be encouraged to endure as much pain as possible before using an opioid.	Incorrect	72	72	0.2	0.4	28 L
	Correct	28	28	8	5	
12.Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent assessment of the child's pain intensity.	Incorrect	69	69	0.3	0.4	31 L
	Correct	31	31	1	6	
13.Patient spiritual beliefs may lead them to think pain and suffering are necessary.	Incorrect	32	32	0.6	0.4	68 H
	Correct	68	68	8	7	
14.After an initial dose of opioids analgesic is given, subsequent doses should be adjusted in accordance with the individual's response.	Incorrect	17	17			83 H
	Correct	83	83	0.8	0.3	
15.Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.	Incorrect	65	65	0.3	0.4	35 M
	Correct	35	35	5	8	
16.Vicodin (Hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.	Incorrect	48	48			52 M
	Correct	52	52	0.5	0.5	
17.If the source of the patient pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.	Incorrect	73	73	0.2	0.4	27 L
	Correct	27	27	7	5	
18.Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.	Incorrect	46	46	0.5	0.5	54 M
	Correct	54	54	4	0	
19.Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regimen.	Incorrect	47	47	0.5	0.5	53 M
	Correct	53	53	3	0	

20.Narcotic/opioids addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.	Incorrect	32	32			
	Correct	68	68	0.6	0.4	68 H
21.The term Equianalgesia means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.	Incorrect	23	23			
	Correct	77	77	0.7	0.4	77 H
22.Sedation assessment is recommended during opioids pain management because excessive sedation precedes opioids-induced respiratory depression.	Incorrect	24	24			
	Correct	76	76	0.7	0.4	76 H

Source: Own authorship.

Figure 3 of the line chart clearly demonstrates the ascending order of knowledge items according to the mean score measurement and the decline in the level of the studied staff's knowledge.

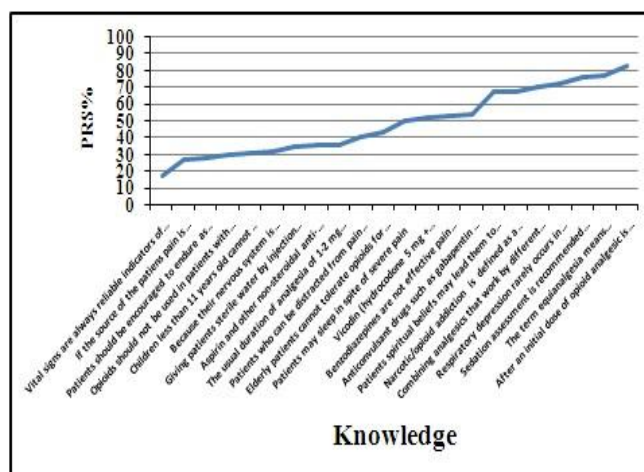


Figure 3. Line chart of ascending ordered knowledge items according to the mean of score measures. Source: Own authorship.

Discussion

Sociodemographic characteristics, regarding the age of the sample, the study revealed a mean age of 27.2 years, with the largest age group being 21-29 years (81%), which was consistent with findings from a study [10] in Southern Ethiopia, which found that the majority of nurses were aged between 20-24 and 25-29 years, and disagree with a study conducted in Norway [11]. The study reported a mean teacher age of 42.9 years. That may contrast with the high median age in Europe.

The results of the gender distribution revealed that most of the nurses' genders were male (71%). Figure 1 in the current study reflects regional trends. For instance, [12] found that 64.1% of nurses in Ethiopia were female. This aligns with the global trend of nursing being a female-dominated profession. Similarly, a study conducted in Romania, Bucharest [5], reported that the gender for nurses is female 11 (100%), as follows the global trend of nursing gender.

The distribution results revealed that the majority of nurses held a diploma (77%). Figure 1 in the current study. For instance, [13] found that 57.6% of nurses in Al-Kut city had a diploma, which is consistent with the study.

According to the study's findings, more than half of nurses (80%) have 1-5 years of experience. The outcome is agreement with the findings of a study in Lahore, Pakistan, that found that 74.3% of nurses had 1-5 years of experience [14]. The results of the current study are in table 4.1.2. and found that nurses working in orthopedic units are 50%, which disagrees with the study conducted in China that found only 8% of nurses working in orthopedic units [3]. The result of this means directions of nurses to work in most units have positive results and get high benefits for patients.

In related sociodemographic characteristics (RSDC), the majority of nurses who were included in the study had previous training on POP with 78%. In the cross-sectional study findings conducted by Techome at Ambo University, Ethiopia, which found that only 23.6% receive training on POP management [15]. A result, Iraqi nurses receive a training program on POP management in contrast to Salah Alden's efforts to decrease this problem. Results of access to the journal regarding the sample weren't access to scientific journals (67%). Similarly, a study conducted at the University of Gondar, Ethiopia [12], reports the access of journals of nurses is only 20%.

Knowledge survey regarding pain, Table 2 shows that the correct answer of vital signs always indicated to patients' pain was only 18; this result is consistent with a study conducted in China that found 29% know the correct answer [3] and also agreed with a study conducted in Iraq, 2025 [3], that found the false answer percentage reaches 82%. It shows a low level of knowledge regarding the underdeveloped nervous systems of children, which may decrease pain, which agrees with a study conducted in Ethiopia [15] that found only 45.1% correct answers but a moderate level. Also consistent with other studies conducted in Ghana [16], which found 67.3% of incorrect responses.

Additionally, Table 2 indicates that only 41% of nurses working in surgical units provided correct responses regarding patients who can be distracted from pain and typically do not experience severe pain. Questions that were agreed upon in a study conducted in Southern Ethiopia [10] found 47.1% of nurses chose the correct responses. This may indicate a low level of knowledge across various topics. The study found that 50% of nurses replied correctly to the question regarding the ability of patients to sleep during pain as a moderate level, and this disagrees

with the study conducted in Erbil, Iraq [17], which found only 14.1% of nurses who were surveyed in the study replied correctly. That may contrast with the experience of forcing patients to this option because nurses in this hospital aren't allowed to take other decisions.

The study shows a moderate level of knowledge, 34%, regarding aspirin and NSAIDs' effectiveness for POP, which disagrees with a study conducted in Kufa, Iraq [18], that found a good knowledge level reflected from the high level of science at Al-Kufa College of Nursing and agrees with study conducted in Vietnam [19] that found a moderate level of knowledge, 54.6%, about the same topic. Table 2 shows high knowledge regarding respiratory depression that rarely occurs in patients who have been receiving stable doses of opioids over a period of months, reach 72%, which is consistent with the study conducted in India [20], which found 71.5% of nurses replied to the correct answer. Similarity with a study conducted in Sri Lanka [21] that found 71.5% of nurses choose the right response.

The study found that the responses to this question (the usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours) were mostly incorrect, 64% (moderate level), and this disagrees with a study conducted in Al-Kufa, Iraq [18], that found good knowledge about the same topic. As a result, nurses in Al-Najaf may be prepared to know information about the drugs that they inject properly through college or a training program. And agree with the study conducted in Sulaimani, Iraq [22] that found 51.65% of correct responses.

Nurses of Tikrit Teaching Hospital reply with the wrong response 70% of the time regarding avoiding giving opioids to patients with a history of substance abuse, which is consistent with Adams et al. (2020) in Ghana [16], who found that only 21.8% of nurses had correct responses due to a low level of knowledge. That means nurses of Third World countries have problems with nurses' knowledge. In another study conducted in Lebanon [23], the correct answer by nurses was 38.71% as a moderate level, and that may indicate nurses' awareness of opioids' dangerous effects.

The results of the study show that there is moderate knowledge (44%) about the ability to give opioidsto the elderly and their effectiveness, and that is consistent with a study conducted at Al-Quds University, Palestine, that found 56.1% as a moderate level of knowledge for nurses. Also, it agrees with a study conducted in a geriatric hospital in Vietnam [19] that found 64.9% as moderate level of knowledge. In the study shows that only 28% of nurses replied

correctly to the false sentence ("Patients should be encouraged to endure as much pain as possible before using opioids"), which disagrees with the study conducted in Jordan [24] that found a moderate level of knowledge of nurses regarding the same topic. This finding contradicts a study conducted in Sri Lanka [21], which reported a moderate level of knowledge among nurses on the same topic.

In addition to that, the result of Table 2 shows that there is a low level of knowledge, 31%, in the question of determining children's pain, which disagrees with a study conducted in Turkey [25] that found a high level, 67.1%, of knowledge, and agrees with another study conducted in Sri Lanka [21].

Therefore, a study conducted in Qatar [26] found a high level of knowledge by nurses regarding spiritual thinking about pain, and that agrees with this study, which found 68% of nurses replied to correct responses about the same topic. Also, it agreed with the study conducted in Malaysia [27] that found 62% agree with the question. Although a study conducted at Al-Quds University [28] found high knowledge, 83% of nurses about the initial dose of opioid and subsequent doses, and this agrees with this study. As a result, nurses may think logically about drug dosages but also fear opioid consumption.

The results show that there is moderate knowledge of nurses (35%) about giving a placebo to assess the reality of patients' pain, consistent with a study conducted in Oman [29] that found only 44.1% of nurses with the correct answer. Similarly, a study conducted in Lebanon [23] found that 52% of nurses chose the correct answer. It suggests that the effect of nurses doesn't use maneuvers from their own thoughts without orders.

On the one hand, this study is in line with a study conducted in Saudi Arabia [30] because both studies found that nurses have correct responses in a moderate level of knowledge about Vicodin equal to the dose of morphine. This may mean studying pharmacology in Iraq, where other countries follow a similar system and curriculum. Table 2 shows that the correct answer of nurses about the assessment of an unknown source of pain is a low level of knowledge, 27% disagree with a study conducted in Spain [31] that found a moderate level of knowledge, 45.9%, regarding the same topic. That contrasts with the low ability of nurses to make decisions. This Table also shows consistent results with another study conducted in the Eastern Province of Saudi Arabia [32], which found a moderate level of knowledge regarding the effectiveness of the anticonvulsant drug (gabapentin). In fact, nurses may know general information about drug effects and side effects.

A study conducted in Al Riyadh, Saudi Arabia [33], found a high level of knowledge among nurses 71.1% regarding the effectiveness of benzodiazepines on pain, which wasn't in line with this study, which found on 53% (moderate level) replied correctly. That contrast situation in Iraq uses benzodiazepines as the only first choice as anticonvulsants.

Limitations

Several limitations were identified in this study. The cross-sectional design did not allow for the determination of causal relationships, and the findings were restricted to postoperative nurses at Salah Aldeen Health Directorate, limiting generalizability to the wider nursing population in Iraq. Additionally, the length of the data collection instrument and participants' time constraints contributed to missing responses on the Knowledge and Attitudes Regarding Pain Survey (KARSP). The response rate of 83.3% exceeded initial projections, which likely reflected an inaccuracy in the estimated number of postoperative care nurses provided by the perioperative nursing network.

Conclusion

It was concluded that the nurses have limited knowledge regarding postoperative pain management. There is a need for POP management training. The questionnaire is suitable for both genders.

Credit

Author contributions: Conceptualization; Data curation; Formal Analysis; Investigation; Methodology; Project administration; Supervision; Writing - original draft; Writing-review & editing - Anwer Amer Farhan and Bestoon Mohammed Ahmad.

Acknowledgment

Not applicable.

Ethical Approval

In ethical considerations, formal approval to carry out the study was obtained by the College of Nursing/University of Kirkuk's scientific review board before beginning the study that took place at Tikrit Teaching Hospital after protocol presentation. An ethical committee of the Department of Adult Health Nursing at Kirkuk University-College of Nursing has approved the protocol of the study (the ethics committee approval number: 28); formal approval was granted from the Salah Alden Health Directorate to facilitate the process of data collection, and an official agreement was obtained from the Training and Human Development Center/Research Committee.

Informed Consent

It was applicable.

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Data Sharing Statement

All referenced sources are accessible through the respective journals or public repositories.

Conflict of Interest

The authors declare no conflict of interest.

Similarity Check

It was applied by Ithenticate®.

Application of Artificial Intelligence (AI)

Not applicable.

Peer Review Process

It was performed.

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