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Postoperative pain management practice and associated factors among nurses working at public hospitals, in Oromia region, Ethiopia, 2021: an institution-based cross-sectional study

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ABSTRACT

Background Management of postoperative pain leads to positive patient progress and shortens the duration of hospital stay. There is a lack of information on nurse's postoperative pain management practice and its associated factors.

Objective To assess postoperative pain management practice and associated factors among nurses working in public hospitals of West Shoa Zone, Oromia, Ethiopia, 2021.

Design An institutional-based cross-sectional study was employed.

Setting Study was conducted among eight public hospitals (two tertiary hospitals and six secondary hospitals), which were located in West Shoa Zone in Oromia, Ethiopia.

Participants Totally 377 participants were selected by using simple random sampling. From this, 277 were men and 100 participants were women. All nurses who were worked in surgical ward, medical wards, minor operation room and major operation room, recovery rooms, emergency, obstetrics and gynaecology wards were included.

Methods Data were collected by distributing structured self-administered questionnaires that adapted from different literatures and were entered into Epi data V.3.1 and exported to SPSS V.22 for analysis. Variables with significant association in the bivariate analyses were entered into a multivariable regression analysis to identify the independent factors associated with nurses' postoperative pain management practice. Significant factors were declared at $p<0.05$.

Result The result showed that 66% of nurses had good pain management practice. Nurses favourable attitude towards postoperative pain management (adjusted OR (AOR): 4.698, 95% CI (2.725 to 8.100)), having access to read pain management guideline (AOR: 3.112, 95% CI (1.652 to 5.862)), adequate knowledge of postoperative pain management (AOR: 2.939, 95% CI (1.652 to 5.227)), working at operation room (AOR: 2.934, 95% CI (1.27 to 6.795)) and received training on pain management (AOR: 3.289, 95% CI (1.461 to 7.403)) were significantly associated with the practices of postoperative pain management.

Conclusion and recommendation 65% of participants (nurses) have a good level of practice of postoperative pain management. Training, access to pain management guidelines, knowledge and attitude are significant factors in postoperative pain management practice. Governmental and other bodies concerned to postoperative care quality needs to show commitment on availing needed training and infrastructures.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ All public hospitals in West Shoa Zone were included during data collection period.
⇒ The study design was cross-sectional, where cross-sectional study design cannot create causal attribution between independent variables and dependent variables.
⇒ Though postoperative pain management is the multidisciplinary approach, this study focuses only among nurses.
⇒ A notable limitation of the study lies in the definition of adequate knowledge and favourable attitude, which was determined based solely on the mean value of approximately 50%, assuming a normal distribution of the data. This approach may not accurately reflect the true distribution of knowledge and attitudes among the participants, potentially oversimplifying the complexities of these constructs.

INTRODUCTION

Postoperative pain (POP) is a form of acute pain after surgical trauma as a result of the inflammatory reaction and the initiation of afferent neurological barriers.[1] Pain is felt in response to the inflammatory process, resulting from tissue injury during surgical procedures such as skin incision, tissue dissection, manipulation and traction.[2] Surgery is typically followed by acute pain, and correct

identification of the type of pain allows the selection of an appropriate effective treatment.[3]

POP is a critical community health issue in both economically developed and developing countries. Currently, it is estimated that about 28%–32% of global disease requires surgical intervention.[4] More than five million surgical interventions are needed in Ethiopia each year.[5] The increase in the number of operations is not without risk. Unless adequately managed, postoperative pain can be complicated by delayed ambulation, reduced patient satisfaction and increased incidence of pulmonary complication.[6] For example, persistent pain after major abdominal surgery can lead to shallow breathing, which facilitates retention of secretion, with eventual development of pneumonia contributing to organ dysfunction and prolonged convalescence.[7] Furthermore, poorly managed postoperative pain (POP) is always associated with delayed mobility, which can lead to delayed wound healing, deep vein thrombosis, anxiety, sleep disturbance, myocardial infarction, depressed immune function, and can also progress to chronic pain, which impairs the ability to carry out daily activities, and ultimately may lead to decreased quality of life.[8] In the USA, between 10% and 60% and in Ethiopia, 22% of the patients were developed chronic pains as a result of poorly managed POP.[9 10] Hence, in Ethiopia, discomfort due to postoperative pain remains prevalent and affects between 47% and 100% of patients after surgery.[10]

Hence, pain relief has been recognised as a human right and is also considered as the 'fifth' vital sign that must be regularly assessed and managed; nurses must pay attention to control POP.[11] The roles and responsibilities of nurses in pain management; according to the American Nurses Association, include assessment of pain, plan for pain management strategies and evaluation of responses of the patients for the given interventions and to take actions accordingly. Since nurses are always spending 24 hours at bedside to provide care for patients, and are also the point of contact between other health professionals and patients, they are expected to play a vital role in postoperative pain management (POPM) practice.[12] Alleviating patient suffering is also a core ethical and legal obligation for health professionals, and the nursing process can support this practice through enhanced pain assessment, nursing diagnoses, care planning and implementation and evaluation of perioperative interventions that support the vulnerable population.[13 14]

In Ethiopia, emergency and elective surgical interventions are provided at all levels of hospitals, which are primary, secondary (general) and tertiary (referral) hospitals for diagnostic or therapeutic purposes.[15] According to the national surgical care strategic plan, Ethiopia, postoperative patient in the wards shall receive postoperative care from qualified nurses. Hospitals establish a nursing workforce that identifies priority areas that include perioperative care.[16] Postoperative pain management practice is an important aspect of nursing care to alleviate pain for the patients using pharmacologic and non-pharmacologic methods.[10] Postoperative pain management practice includes a set of measures that evaluate pain, provide appropriate interventions to relieve the pain and reassess the patients' pain after intervention. Assessing pain is the first and crucial step in properly managing pain.[4] Techniques for pain assessments include patient self-report and observing for patient's physiological and behavioural responses to pain. The self-reporting methods include numeric rating scale, verbal rating scale, visual analogue scale? and the faces pain scale.[17]

From different study conducted factors like level of education, experiences, working area, favourable attitude, presence of guideline and standardised tool, training, and adequate knowledge were factors significantly associated with postoperative pain management practice.[6–18]

Although POPM continues to be a problem in developed and developing countries, the suffering from untreated POP is sadly greater and more worrying among economically disadvantageous individuals in developing countries. Today, there is a growing awareness of the aetiology of pain and the advancement of pharmacological and non-pharmacological pain management. However, information on postoperative pain management by nurses and their associated factors in Oromia region, Ethiopia, was scarce. Previous studies focused mainly on tertiary hospitals, where advanced care is expected. Furthermore, the studies were conducted on nurses who were statically (fixed shift) working in the operation room (OR) and surgical ward, despite most nurses working in patient wards have an exposure to the postoperative patient through a ward rotation. The study was carried out with the aim of identify nurses postoperative pain management practice at public hospitals found in Oromia, Ethiopia; so that the finding will best serve to prioritise the problem and develop strategies for improving postoperative pain management.

METHODS

Study design

Cross-sectional study design was implemented to identify postoperative pain management practice and associated factors among those nurses working in public Hospital of West Shoa Zone.

Study setting and period

The study was done at public hospitals found in West Shoa Zone, Oromia regional state, Ethiopia from 1 June to 30 August 2021. There are one referral, three general and four districts (total of eight public hospitals) in that zone. These hospitals provide different health service ranging from prevention of disease to surgical therapies for peoples in the area and closer zones in the Oromia region. So that postoperative nursing care is given for patients in need of the services.

Participants

All nurses who were worked in surgical ward, medical wards, minor OR and major OR, recovery rooms, emergency, obstetrics and gynaecology wards were included. The working wards were purposely due to the fact that hospitals in the area are applying ward rotation quarterly, so that all nurses have exposure to the postoperative services. There are 564 nurses working in the selected wards of public hospitals in the West Shoa Zone of Oromia region, Ethiopia.

A sample size was calculated and determined by using single proportion population formula using the width of 95% CI of the mean practice score by considering 65.2% of nurses had good postoperative pain management practice[12] at 5% margin of error, and considering a 10% non-response rate. With this calculation, the final sample size was 349. A non-response rate of 10% (35) nurses was considered, and the sample size becomes 384. The total calculated sample size (384 nurses) was proportionally allocated to each hospital according to the number of their nurses working on the selected wards. Study participants were selected from nurses working on the wards of those hospitals by using simple random sampling technique. The nurses' registration numbers at each hospital, collected from the daily attendance sheet of hospitals, were used to randomly select the study participants using the lottery methods, simple random sample technique.

Study variables

The dependent variable of the study was the level of postoperative pain management practice. Independent variables were sociodemographic characteristics such as sex, age, marital status, educational status, experience, working unit/ward, knowledge towards POPM, attitude towards POPM and organisational factors such as availability of standardised tools, guideline and pain management training.

Data source (measurements)

Postoperative pain management practice was measured using 18 postoperative pain management practice questions with correct/incorrect response options. Depending on the descriptive analysis of the collected data, the postoperative pain management practice was classified as good practice and poor practice. The mean score of the participant's response to the questions was calculated to determine the good and poor postoperative pain management practice.

Nurses' knowledge of postoperative pain management was measured using 15 questions with an 'yes' or 'no' response options. Those who scored mean and above correct answers were labelled as having adequate knowledge while those who scored less than mean were labelled as having inadequate knowledge of postoperative pain management. Similarly, to measure nurses' attitude towards postoperative pain, nine questions with a two response options, agree or disagree, were used. Those nurses who scored mean and above were considered to have a favourable attitude, where as those who scored below mean have an unfavourable attitude towards POP.[18–20] The organisational factors such as on job training and presence of postoperative pain management guideline are also collected through related questions.

Operational definitions

Good practice

Refers to those study participants, who have scored mean and/or above the value of the total 18 practice questions.

Poor practice

Refers to those study participants who have scored below the mean value of the total 18 practice questions.

Knowledge

Is measured by 15 items in yes/no format. Correct answer was given '1' and '0' was given for incorrect and for not sure. Those who scored mean and above were labelled as having adequate knowledge where as those who scored less than mean labelled as having inadequate knowledge about postoperative pain management.

Attitude

Is measured by nine items in agree/disagree format. For correctly responded item '1' was given and '0' was given for incorrect and don't know. Those who scored mean and above considered as having favourable attitude where as those who scored below mean have unfavourable attitude towards POPM.[12–14]

Data collection tools, process, quality assurance and analysis

The data were collected using a structured self-administered questionnaire. The questionnaires were adapted from different studies conducted previously and modified in order to achieve the objectives of the current study[18–20] (online supplemental annex 1). To ensure data quality, the questionnaire was reviewed by expert panels. The cross-sectional Strengthening the Reporting of Observational Studies in Epidemiology checklist was used for each component of the manuscript as the reference (online supplemental annex 2). A clinical nurse specialist, three lecturers (Masters of Science in Nursing) and one registered nurse (BSC nurse) were participated in the panel. The questionnaire was pretested on 5% of the study population at the Wollega referral and teaching hospital 1 week before the data collection date. A reliability test was calculated for the practice, knowledge and attitude components of the questionnaire, to check the internal consistency. The result indicates 0.781, 0.743 and 0.833 for practice, knowledge and attitude-related items, respectively. The principal investigator gave training for data collectors.

The collected data were coded, cleaned and entered into Epi Data V.3.1 software and finally exported to statistical package for social study (SPSS) V.22 software for analysis. Descriptive analyses were performed first to understand the general characteristics of all the study variables. The results were presented in tables and graphs using summary measures such as percentages and mean. Bivariate logistic regression

was carried out to identify factors associated with POPM practice of nurses. The Hosmer-Lemeshow test was performed to test fitness of the model, the result was 0.45. Variables with p<0.25 in the bivariate analyses were entered into multivariate logistic regression analysis to identify independent factors associated with the outcome variable. Finally, the result of bivariate and multivariate logistic regression analysis was presented in a crude OR and adjusted OR (AOR) with 95% CIs. The level of significance was established at a value (p)≤0.05.

Patient and public involvement

No patient and public involved.

RESULT

Sociodemographic characteristics

A total of 384 questionnaires were distributed, of which 377 were completed and returned with the response rate of 98.2%. The majority of participants: 227 (60.2%) were men, 200 (53.1%) were married and 240 (63.7%) were between the age group of 26 and 34 years (table 1).

Knowledge of nurses towards postoperative pain management

The mean score for knowledge was 8.89 with an SD of ±2.85. Thus, the result revealed that, from the total of 377 study participants, about 54.9% (95% CI 50.1 to 60.2) had adequate knowledge about POPM (figure 1).

Nurses' attitude of POPM

The mean score for attitude was computed and it was 4.99 with an SD of 1.73. According to the classification

Table 1 Sociodemographic characteristics of respondents, working at public hospitals in Oromia region, Ethiopia, 2021

Variables	Category	Frequency (n=377)	Percentage
Sex	Male	227	60.2
	Female	150	39.8
Age	<25	71	18.8
	26–34	240	63.7
	>35	66	17.5
Ethnicity	Oromo	360	95.5
	Amhara	17	4.5
Marital status	Married	200	53.1
	Single	177	46.9
Religion	Protestant	217	57.6
	Orthodox	103	27.3
	Muslims	40	10.6
	Wakefata	17	4.5
Educational level	Diploma	28	7.4
	Bachelor degree	346	91.8
	Masters	3	0.8
Years of experience	<5	234	62.1
	6–9	75	19.9
	>10	68	18
Work experience in surgical unit (in years)	<1	199	52.8
	2–4	140	37.1
	>5	38	10.1
Current area of practice	Medical ward	65	17.2
	Emergence ward	70	18.6
	Obstetrics and gynaecology ward	65	17.2
	OR and recovery	72	19.1
	Surgical ward	105	27.9

n, number; OR, operation room.

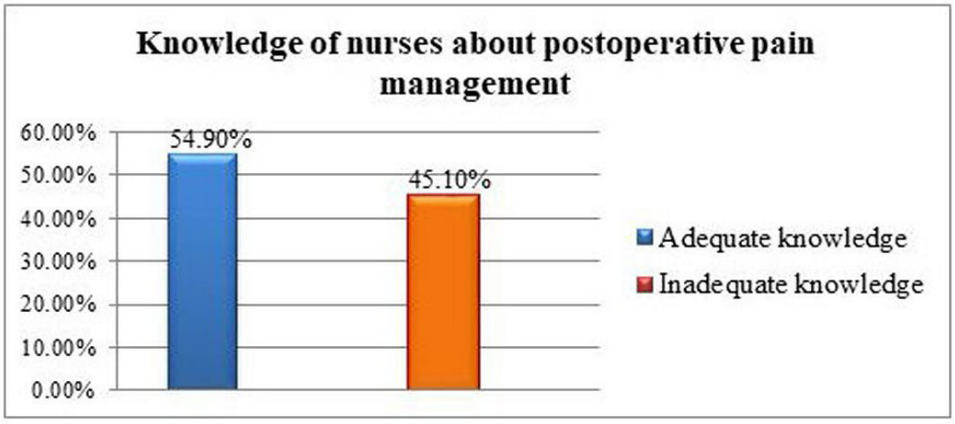

Figure 1 Knowledge of nurses on postoperative pain management at public hospitals in West Shoa Zone, Ethiopia, 2021.

outlined in the operational definition, the percentage score of categories showed that, among 377 respondents, 59.4% (95% CI 54.6, 64.5) of participants had favourable attitude towards postoperative pain management practice (figure 2).

Practices of nurses on POPM

The responses of nurses to the nine practice questions are computed and dichotomised into good practice and poor practice. The mean score of the self-report practice of postoperative pain management was 10.37 with an SD of (±2.89). It was calculated based on the category specified in the operational definitions. Accordingly, this study revealed that about two-thirds (66%) (95% CI (61 to 71)) of the respondents had good POPM practice (table 2).

Organisational-related factors

According to the nurses' response regarding the organisational factors, majority, 273 (72.4%), of the participants reported that they have not taken any training regarding POPM while 221 (58.3%) did not access postoperative pain management guidelines to use for practice. Among those received training regarding POPM, 59 (56.7%), 39 (37.5%), 2 (1.9%) and 4 (3.8%) received training by the means of lecturing, course, conference and workshop, respectively.

Factors associated with POPM practice

To assess the factors associated with the nurses' POPM practice, bivariate analysis was done first. Accordingly, 10 of the variables, age of the participants, marital status, level of education, work experience, experience in postoperative area, current area of practice, training related to pain management, access to read pain management guideline, knowledge and attitude of the participants regarding POPM, were found to be significantly associated with the nurses' 'POPM practice at p value of 0.25'. These variables were included in multiple logistic regression analysis. The model fit was checked by Hosmer and Lemeshow test (p value=0.45) and it was fitted.

After adjustment, attitude, getting access to read guidelines, training, knowledge and current area of practice were significantly associated with the nurses' POPM practice. Accordingly, respondents who had favourable attitude were almost five times more likely to practice

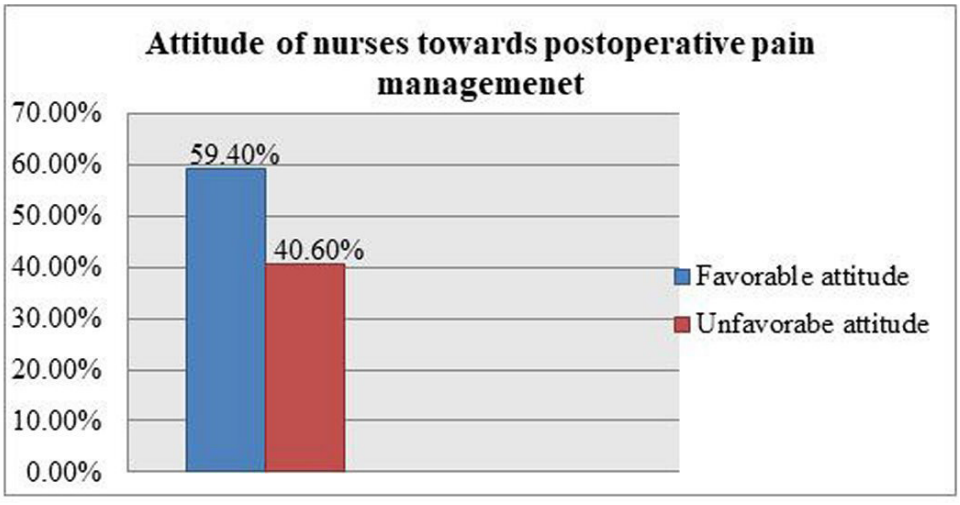

Figure 2 Attitude levels of nurses towards postoperative pain management at public hospitals in West Shoa Zone, Ethiopia, 2021.

Table 2 Practices of nurses on postoperative pain management, working at public hospitals in Oromia region, Ethiopia, 2021

Variables	Yes N (%)	No N (%)
Do you assess pain for the patients those able to communicate?	327 (86.7)	50 (13.3)
Do you encourage the use of transcutaneous electrical nerve stimulator for pain management?	4 (1)	373 (99)
Do you combine opioids with NSAIDs rather than single analgesic agents when managing POP as suggested by WHO?	302 (80.1)	75 (19.9)
Do you document the findings after pain assessment?	110 (29.2)	267 (70.8)
Do you encourage prayer by patients or religious leader postoperatively?	206 (54.6)	171 (45.4)
Do you administer ordered pain medication, around the clock (regularly) as ordered?	374 (99.2)	3 (0.8)
Do you use music therapy to reduce pain?	2 (0.5)	375 (99.5)
Do you reassess pain after giving pain medication in order to evaluate the effectiveness of pain medication?	338 (89.7)	39 (10.3)
After surgery, do you provide comfortable positions to help relieve pain?	360 (95.5)	17 (4.5)
Do you ask and help to support the painful areas when moving or coughing after surgery?	283 (75.1)	94 (24.9)
Do you provide clean, calm and ventilated ward environment for postoperative pain management?	259 (68.7)	118 (31.3)
Do you lay patients on neat, well-laid bed postoperatively?	294 (78)	83 (22)
Do you use massage and stretch to reduce postoperative pain?	283 (75.1)	94 (24.9)
Do you apply heat and cold compresses to manage POP?	288 (76.4)	89 (23.7)
Do you encourage early ambulation/exercise with analgesia?	347 (92)	30 (8)
Do you encourage use of acupuncture?	2 (0.5)	375 (99.5)
Do you use patient distraction, relaxation, and guided imagery postoperatively to reduce pain?	131 (34.2)	246 (65.2)
Do you usually dress, bandage, splint and reinforce wound sites postoperatively?	359 (95.2)	18 (4.8)

NSAID, none steroidal antinfilamatory drugs; POP, postoperative pain.

than those who had unfavourable attitude (AOR: 4.698, 95% CI (2.725 to 8.100)). Respondents who have taken POPM training were 3.2 times more likely to practice than those who did not take such training (AOR: 3.289, 95% CI (1.461 to 7.403)). Similarly, study participants who get access to read pain management guidelines were 3.1 times more likely to practice compared with their counterparts (AOR: 3.112, 95% CI (1.652 to 5.862)). The study also revealed that respondents who had adequate knowledge on POPM were 2.9 times more likely to practice than those who had inadequate knowledge (AOR: 2.939, 95% CI (1.652 to 5.227)] and participants those who were currently practising in OR were 2.9 times more likely practice compared with those practising in medical ward (AOR: 2.934, 95% CI 1.267 to 6.795 p<0.012) (table 3).

DISCUSSION

The current study revealed that general POPM practices among 66% nurses were found to be good. This finding is lower compared with the study conducted in Rwanda on POPM, which was 88%.[21] However, the finding of this study was greater than the study conducted in Addis Ababa, in which only 6% of them had good practice.[18] The discrepancy may be attributed to the fact that the previous study at Addis Ababa hospitals was mainly concerned to nurses working in the adult postoperative care units such as major and minor OR and adult surgical wards. The result is also higher compared with the finding of a study conducted in the Arsi zone, southeastern Ethiopia, where almost half (47.9%) of the study participants had good pain management practice.[22] This discrepancy can be attributed to access to the guideline, sample size and the use of different data collection tools. In the current study, participants were selected using the probability method, the sample was larger than the previous study participants. The methodological limitations include potential sample bias, as it lacks details on the selection process and sample size, which may not be representative of the broader nursing population. Furthermore, the temporal context of the referenced studies is not addressed, which may affect the comparability of practices over time.

More than 50% (53.41%) of nurses who have good practice have an access to the POPM guideline. Furthermore, as POP is managed pharmacologically or non-pharmacologically, it might be important to describe the care provided in terms the mode of management due to the fact that nurses have professionally independent accountability to the non-pharmacological care and collaborative role in pharmacological/medical care. It is also not convincing to determine the management of POP

Table 3 Binary and multiple logistic regression analysis results on factors associated with postoperative pain management practice among nurses working at public hospitals in West Shoa Zone, Ethiopia, 2021

Variables	Category	Practice status		COR at (95% CI)	AOR at (95% CI)	P value
		Good N (%)	Poor N (%)			
Age in years	<25	51	20	1.0		
	26–34	151	89	0.665 (0.373 to 1.188)*	0.706 (0.341 to 1.465)	0.350
	>35	47	19	0.970 (0.462 to 2.038)	0.387 (0.116 to 1.294)	0.123
Marital status	Single	109	68	0.687 (0.448 to 1.054)*	1.039 (0.566 to 1.909)	0.901
	Married	140	60	1.0		
Educational level	BSc/above	234	115	1.763 (0.812 to 3.830)*	2.495 (0.863 to 7.209)	0.091
	Diploma	15	13	1.0		
Years of experience	<5	140	94	1.0		
	6–9	60	15	2.686 (1.440 to 5.009)*	2.301 (0.931 to 5.682)	0.071
	>10	49	19	1.732 (0.959 to 3.126)*	1.613 (0.499 to 5.217)	0.425
Experience in SW	<1	125	74	1.0		
	2–4	90	50	1.066 (0.680 to 1.671)	1.796 (0.387 to 8.342)	0.455
	>5	34	4	5.032 (1.717 to 14.746)*	0.552 (0.266 to 1.144)	0.110
Current area of practice	MW	31	34	1.0		
	EU	42	27	1.706 (0.859 to 3.388)*	2.342 (0.916 to 5.989)	0.076
	GW	48	17	3.097 (1.482 to 6.470)*	1.683 (0.708 to 4.002)	0.239
	OR/R	45	27	1.828 (0.925 to 3.614)*	2.934 (1.27 to 6.795)**	0.012
	SW	83	23	3.958 (2.023 to 7.742)*	1.625 (0.689 to 3.833)	0.267
Training on POPM	Yes	78	13	4.035 (2.143 to 7.599)*	3.289 (1.461 to 7.403)**	0.004
	No	171	115	1.0		
Access to pain management guidelines	Yes	133	23	5.234 (3.126 to 8.763)*	3.112 (1.652 to 5.862)**	0.001
	No	116	105	1.0		
Knowledge	Adequate	169	38	5.003 (3.149 to 7.951)*	2.939 (1.652 to 5.227)**	0.001
	Inadequate	80	90	1.0		
Attitude	Favourable	182	42	5.562 (3.500 to 8.839)*	4.698 (2.725 to 8.100)**	0.001
	Not favourable	67	86	1.0		

1.00=reference, *p value<0.25, **statistically significant at p<0.05.
EU, emergency unit; GW, gyneacology ward; MW, medical ward; OR/R, operation or recovery room; POPM, postoperative pain management; SW, surgical ward.

using only the self-report of nurses, suggesting the need to use observational checklist. In addition, since postoperative pain management is the multidisciplinary approach and the current study was based on only nurses, it may not reflect the practice of postoperative care provided for patients who received operation services at hospitals. The methodological limitations of the study discussed include reliance on self-reported data from nurses, which may not accurately reflect their actual practices in POP management. This approach can introduce bias and undermine the validity of the findings, as nurses may overestimate their adherence to guidelines.

This study revealed that those who had a favourable attitude were nearly five times more likely to have good POPM practices than those who did not. This is consistent with a study conducted in Addis Ababa and Ghana.[19 22] This similarity could be attributed to the fact that attitude is the most important value in nursing.[23] But the current study reveals that only around 60% of nurses have a favourable attitude, which might suggest the importance of improving the nurse's attitude with respect to the practice of POPM.

Those who had received training were more than three times more likely to have good pain management practices than those who did not. This finding was comparable to the study conducted in Debra Berhan, northern Ethiopia.[24] A study conducted on the knowledge, attitude and practice of nurses working at Jimma Medical centre revealed that prior training on pain management was significantly associated with postoperative pain management practice.[25] This might be due to the fact that those people who had taken POPM training could have current

information on pain management, which can promote the practice. This underscores the need for timely on-job-training in postoperative pain management. The current study also identified that those who got access to read pain management guidelines were three times more likely to practice postoperative pain management than their counterparts. This finding is supported by studies conducted in Greece and Debra Berhan.[24 26] This is because accessibility to refer guidelines can enhance the practices of POPM, according to the recommended standard. It is also currently the most advisable for clinicians that stay up-to-date with evidence-based practice. The methodological limitations of the findings presented in the paragraph include potential confounding variables that may not have been adequately controlled for, such as the participants' previous experience, the specific content and duration of the training received, and the context in which pain management guidelines were accessed.

Individuals who were knowledgeable were nearly three times more likely to have good practice than those who had inadequate knowledge. This finding is in line with the finding of a study in Rwanda and Arsi zone of south-eastern Ethiopia.[18 21] The possible justification is that the right knowledge about pain and its management practice can avoid confusion regarding POP and the disease condition, which can also create a clear understanding of its negative impact on patients and on health institutions, unless appropriately managed. This study also showed an association between the current working area of nurses and level of practice, which is consistent with the finding of the study conducted at the Jimma Medical Center.[25] The methodological limitations of the findings include the potential for selection bias, as the study may have only included nurses with varying levels of knowledge, which could skew the results. Additionally, the reliance on self-reported knowledge and practice levels may lead to inaccuracies, as participants might exaggerate their understanding of pain management. The cross-sectional design limits the ability to infer causality between knowledge and practice.

Conclusion and recommendation

More than half of participants (nurses) have a good level of practice of POPM. Training on postoperative pain management (POPM), access to pain management guidelines, knowledge and attitude are significant factors in post-operative pain management practice. Regional health bureau, Zonal health offices, hospital administrations and other concerned bodies needs to work for enhancing post-operative pain management through organising different trainings to improve knowledge and attitude of nurses and timely distributing standard pain assessment and management guidelines for enhancing accessibility. To enhance the validity of future research, it is essential to develop more nuanced and comprehensive definitions of adequate knowledge and favourable attitude that consider a broader range of factors and distribution patterns, rather than relying solely on statistical averages.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Consent obtained directly from patients.

Ethics approval Ethical clearance was first obtained from Ambo University CMHS's ethical review board with ethical ID. Of AU/SGS/059/2020. The letter was written by the Zonal health office to obtain ethical approval to conduct the study in the hospitals. Then the ethical clearance and support letter were taken to all public hospitals. All participants were asked for their willingness to participate in the study and were told that it would not have any risk to them. Written informed consent was obtained from each study subject before data collection after approval by ethical review board. Confidentiality of the information was assured, and the privacy of the respondents was maintained. All procedures were followed in accordance with the relevant guidelines and regulations as Declaration of Helsinki.

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Data availability statement Data are available upon reasonable request.

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