

# Postoperative Pain Management Practice and Associated Factors Among Health Professionals Working in Governmental Hospitals in South Wollo Zone, Ethiopia

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**Abstract:** Introduction: Pain results from real or potential tissue damage that involves a disagreement sensory and emotional experience. Poor practice in post-operative pain management results in negative clinical outcomes, chronic pain, financial burden, and a reduction in patient functionality and productivity. The study was used for the hospitals administrations, health professionals, committee that develop the pain management guideline, researcher, and governmental health institutions regarding the practice of postoperative pain management. Objective: To assess postoperative pain management practices and associated factors towards healthcare professionals working in governmental hospitals in South Wollo Zone, Northeast Ethiopia, 2020. Method and Materials:- Cross-sectional study design was conducted from 20/02/2020 to 25/03/2020. The study population was selected from south Wollo zone governmental hospitals and 386 samples were collected using a self-administered tool and verified, coded, and entered to Epi-data software version 3.1 and exported to SPSS software version 23 for analysis. To summarize descriptive statistics frequencies, percentages, and mean were used and presented with tables, charts, and figures. Result: The response rate of the study participants were 95.8%. Among the participants 57.5%, of the study respondents had good practice and 42.5% had poor practice of postoperative pain management. The variable, working intensive care unit (AOR (95%CI)=14.5 (1.503-139.93)), using assessment tool (AOR (95%CI)=10.622 (4.776-23.621)), using Pain scale (AOR (95%CI)=10.614 (4.803-23.456)), Do documentation (AOR (95%CI)=6.748 (2.977-15.294)), take training (AOR (95%CI)=4.126 (1.707-9.977)), had past pain experience (AOR (95%CI)=4.174 (1.821-9.564)), favorable attitude (AOR (95%CI)=2.592 (1.191-5.643)); such independent variables were significantly association with the postoperative pain management practice. Conclusion: The overall level of poor postoperative pain management practice among health professionals in the study area was low.

**Keywords:** Postoperative Pain, Management, Practice

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## 1. Introduction

Postoperative pain is developed because of the trauma of surgical procedure and management with the inflammatory reaction. It is an individual perception and the most significant symptom that surgical patients report [1-3].

Postoperative pain management practice is weaving of pain

management standards into the fabric of the institution. Postoperative pain management practices are integrating basic principles of pain assessment and management into patterns of daily practice. These daily assessment and practice includes: documentation systems, policies, procedures, practice standards, orientation and continuing education programs, and quality improvement programs [2, 4].

Inadequate postoperative pain management leads to

negative hospital and clinical outcomes; such as, extended hospitalization, poor recovery, diminished and decreases the quality of life, increased healthcare costs and utilization, increased morbidity, higher mortality, and increased the occurring of chronic pain. Poor POP management leads to a financial burden resulting from direct costs due to excess health-care resource use and indirect costs due to reduced patient functionality and productivity [4, 5].

The objective of this study was, to assess the practice of postoperative pain management and associated factors among health professionals working in governmental hospitals in South Wollo Zone, Northeast Ethiopia.

According to the study in Alberta, the prevalence of poor postoperative pain management was 56.7% whereas the study in Jordan, the prevalence of poor postoperative pain control was 32.9% of participants at rest and 56.4% on movement. The prevalence of poor/low practice of postoperative pain management in Bangladeshi was 24.1%. While the mean score of postoperative pain management practice in Bangladeshi was 77.81%. According to the study in Poland, the prevalence of postoperative pain management was 47.89% [6-10].

The study in Tanzania indicates that the prevalence of patients who had postoperative severe pain within 24 and 72 hours were 30% and 40%, respectively. A study conducted in Saint Paulo's Hospital Millennium Medical College (SPHMMC) indicates that the magnitude of postoperative pain was greater than ninety percent, while in Mekele, the magnitude of moderate to severe pain among POP was greater than thirty percent [11-13].

This study finding was used for the hospitals administrations, health professionals, committees that develop the pain management guideline, researcher, and governmental and non-governmental health institutions about the practice of postoperative pain management and answer for the question what are the main factors that affect the POP management.

## 2. Methods and Materials

### 2.1. Study Area and Period

This study was conducted in governmental hospitals which found in South Wollo Zone. The Zone is found in the Amhara region which found in Northeast Ethiopia. The Zone has 20 Woredas, and in this zone, there are 12 governmental hospitals and they serve many populating living inside and around the zone. In this Zone there are 203 general practitioners, 46 anesthetics, 740 nurses, and 187 midwifery (South Wollo health office). The study was conducted from 20/02/20 to 25/03/2020.

### 2.2. Study Design

Institutional based cross sectional study design was conducted.

### 2.3. Source and Study Population

Health professionals working in government hospitals found in South Wollo Zone was source population whereas

health professionals working in the recovery room, intensive care unit (ICU), surgical ward, and orthopedics ward, obstetrics and gynecology of selected governmental hospitals in the South Wollo Zone during the study period was study population.

### 2.4. Sample Size Determination and Sampling Technique

#### 2.4.1. Sample Size Determination

The sample size of this study was determined using single population formula with a 95% of confidence interval, a 5% of margin of error, and 52.1% (0.52) of prevalence [14]. There was 384 of calculated sample size. Substituting to the formula:

To determine the sample size, the following formula was applied.

$$n=(z_{\alpha/2})^2 p (1-p)/w^2.$$

Based on the above formula: n=the required minimum sample size;

P=the prevalence of poor postoperative pain management;

D=margin of error;

Z<sub>α/2</sub>=critical value at 95% confidence level (1.96).

$$n=(1.96)^2 0.52 (1-0.52)/ (0.05)^2$$

$$\Rightarrow n=3.84*0.25/0.0025$$

$$\Rightarrow n=384$$

Using 5% non-response rate because the response rate of the research that done was greater than 96%. The final sample size =384+19.2 (5% of non-response rate). The final sample size was=403.

#### 2.4.2. Sampling Technique

There are 12 governmental hospitals in the South Wollo Zone. Using lottery method of simple random sampling technique, six hospitals were selected from 12 governmental hospitals. After this, study participants selected by using simple random sampling technique from selected hospitals.

### 2.5. Data Collection Tool

A self-administered quantitative tools were used to collect the data. The questionnaire tool was open and closed-end question but most of the questionnaire becomes a closed-end question. The tool used for this particular study was adopted from the study in Arsi zone hospitals. The questionnaire was checked by health profession of senior expert to check the consistency of the questionnaire.

### 2.6. Data Collection Procedures

Six BSc health professionals were collect the data, who were recruited from different hospitals and two trained MSc health professionals were serve as supervisors. The principal investigator was assist and coordinates the data collection by supporting data collectors and study participant. Selected health professionals were the respondents for the data from each

selected governmental hospitals. The supervisors and their responsibility that applied in this study were, coordinating the health professionals and describe the significance of the study, then the participants were volunteered, the supervisor was given orientation about how to fill the questionnaires, how the questionnaire is distributed, and clarification of any difficulty during data collection. When the respond were complete the questionnaire, they return to the data collector.

### 2.7. Data Quality Control

The activity of checkup was applied regarding the format, pattern, and duplication of the questionnaire before distributing to the data collectors. A 5% pretest among the sample size was conducted in the Kombolcha health center to test the consistency of the questionnaire. The training was given for data collector about proper data handling for two days duration.

Close supervision by two trained MSc health professionals was done during the data collection procedure and proper recording was performed. Immediate checkup was carried out and any unfilled data had filled immediately. Data was placed properly in a secure and safe place.

### 2.8. Data Analysis Procedure

The data entry was conducted using Epidata 3.1 and exported into SPSS version 23 for data cleaning and analysis.

To summarize descriptive statistics frequencies, percentages, and mean were used whereas tables, charts, and figures were used for data presentation. Cross tabulation was used to assess the proportion of dependent variables.

## 3. Results

A total of 403 questionnaires were distributed to health professionals working in south wollo zone governmental hospitals. Among those 386 participants were involved making a response rate of 95.8% and the remaining 4.2% were considered non respondents due to incompleteness and inconsistency of the respondents.

More than half of the respondents 216 (56%) were males. The mean age of respondents was 27.24±3.948 years with the minimum and maximum age of 20 and 45, respectively. Two hundred forty-four (63.2%) of participants were Orthodox Tewahido Christianity followers and 368 (95.3%) Amhara in ethnicity. A significant number 287 (74.4%) of the respondents were bachelor degree holders. With regard to marital status of the respondents 202 (52.3%) were married and 1.9% was divorced. From the total respondents, 237 (61.4%) had 1 to 5 years of work experience. One hundred four (26.9%) of the respondents were working in the surgical ward (table 1).

**Table 1.** Socio demographic characteristics of health professionals (n=386) working in South Wollo Zone Governmental hospitals, Ethiopia.

Socio demographics characteristics		Practice of POP management		Total N (%)
		Good N (%)	Poor N (%)	
Gender	Male	134 (62)	82 (38.0)	216 (100.0)
	Female	88 (51.8)	82 (48.2)	170 (100.0)
Age	Age 20-24	56 (59.6)	38 (40.4)	94 (100.0)
	Age 25-29	119 (61.7)	74 (38.3)	193 (100.0)
	Age 30-34	34 (43.6)	44 (56.4)	78 (100.0)
	Age 35-39	10 (66.7)	5 (33.3)	15 (100.0)
	Age 40-45	3 (50.0)	3 (50.0)	6 (100.0)
	Married	122 (60.4)	80 (39.6)	202 (100.0)
Marital status	Single	96 (54.2)	81 (45.8)	177 (100.0)
	Divorced	4 (57.2)	3 (42.8)	7 (100.0)
Working Hospital	Primary hospital	34 (94.4)	2 (5.6)	36 (100.0)
	District hospital	119 (72.6)	45 (27.4)	164 (100.0)
	Referral hospital	69 (37.1)	117 (62.9)	186 (100.0)
	Comp. Nurse	133 (56.4)	103 (43.6)	236 (100)
Type of profession	Surgical nurse	12 (60)	8 (40)	20 (100)
	ORT Nurse	11 (78.6)	3 (21.4)	14 (100)
	ECC Nurse	9 (75)	3 (25)	12 (100)
	Anesthetics	10 (55.6)	8 (44.4)	18 (100)
	Midwifery	47 (54.7)	39 (45.3)	86 (100)
	Diploma	55 (73.3)	20 (26.7)	75 (100)
	Degree	156 (54.4)	131 (45.6)	287 (100)
Level of education	MSc & above	11 (45.8)	13 (54.2)	24 (100)
	Surgical ward	62 (59.6)	42 (40.4)	104 (100)
	Recovery room	42 (50)	42 (50)	84 (100)
	Obstetrics ward	43 (53.8)	37 (46.3)	80 (100)
	Gynecolog ward	10 (76.9)	3 (23.1)	13 (100)
	Orthopedics	6 (40.0)	9 (60)	15 (100)
	ICU	22 (84.6)	4 (15.4)	26 (100)
	Emergency ward	6 (66.7)	3 (33.3)	9 (100)
	Medical ward	31 (56.4)	24 (43.6)	55 (100)
	1-5 years	141 (59.5)	96 (40.5)	237 (100.0)
Years of experience	6-10 years	63 (53.8)	54 (46.2)	117 (100.0)
	≥ 11 years	18 (56.3)	14 (43.8)	32 (100.0)

**3.1. Types of Pain Assessment Tool and Scale**

Fifty-five percent of the respondents have used the postoperative pain assessment tool while fifty-nine percent of the participants have utilized the pain scale of postoperative pain (figure 1).

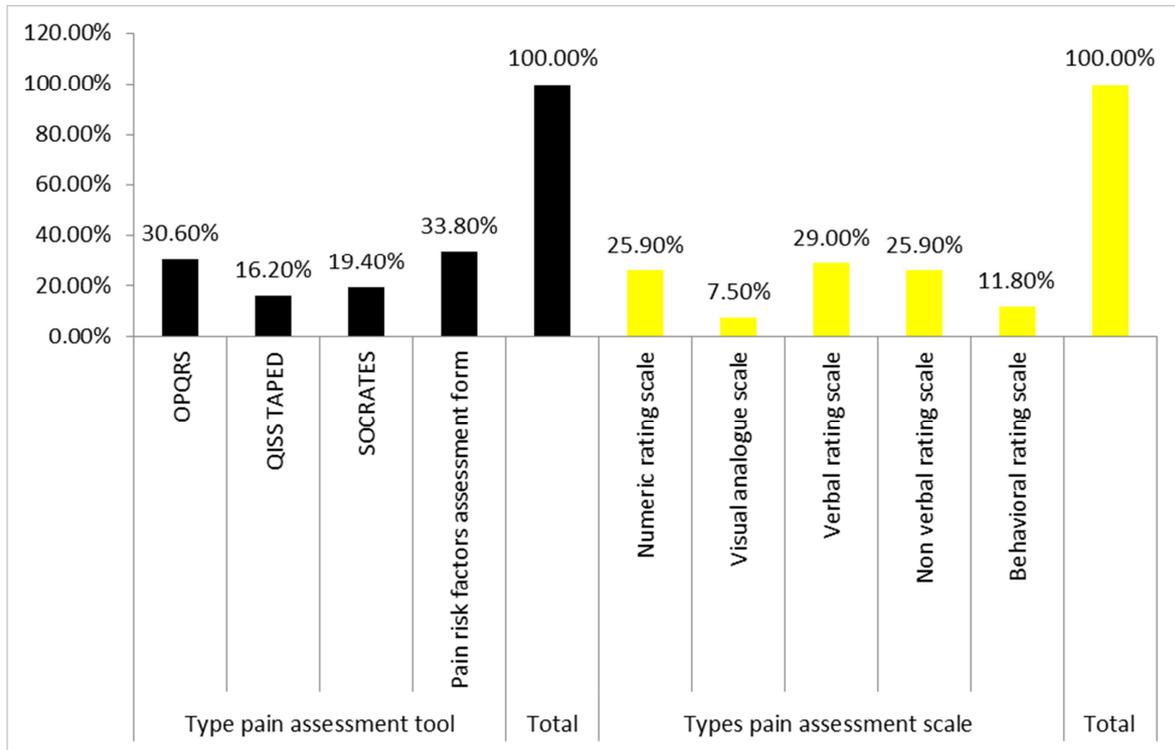


Figure 1. Types of Pain Assessment Tool and Scale That Utilized by Health Professionals (n=386) Working in South Wollo Zone Hospitals, Ethiopia.

**3.2. Postoperative Pain Management Practice**

The mean of postoperative pain management practice was 6.95 with standard deviation of 2.27. Study participants who scored more than or equal to the mean value were regarded as good practice whereas participants who scored less than the mean value were regarded as poor practice. Two hundred twenty two (57.5%) of the study participants had good practice of postoperative pain management while 164 (42.5%) had poor practice of postoperative pain management (figure 2).

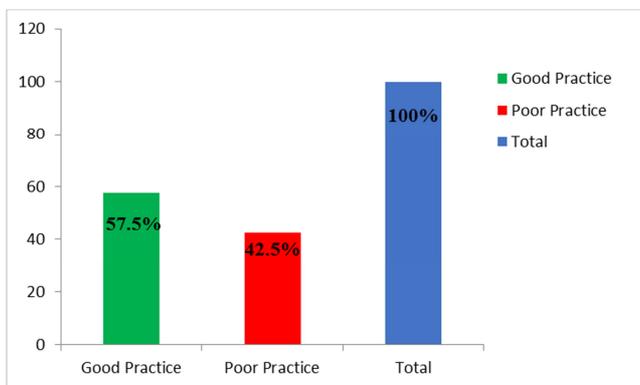


Figure 2. Level of postoperative pain management practice among health professionals (n=386) working in South Wollo Zone Governmental hospitals, Ethiopia.

**3.3. Factors Associated with Postoperative Pain Management Practice**

Among the variables that entered and investigated in the bivariable analysis, sex, working hospitals, level of education, current working ward, assessment tool, assessment scale, documentation, hospital setting, training, POP guideline, past pain experience, interdisciplinary approach, availability of analgesics, knowledge of POP management, attitude of POP management were candidate for multivariable logistic regression with P<0.25 (see table 2).

The multivariable logistic regression analysis was performed by entering all variables that candidate in bivariable analysis in to multiple logistic regressions with the dependent variable. The results revealed that working in ICU (AOR (95%CI)=14.5 (1.503-139.93)), using assessment tool (AOR (95%CI)=10.622 (4.776-23.621)), using pain scale (AOR (95%CI)=10.614 (4.803-23.456)), do documentation of postoperative pain management (AOR (95%CI)=6.748 (2.977-15.294)), taking training (AOR (95%CI)=4.126 (1.707-9.977)), had past pain experience (AOR (95%CI)=4.174 (1.821-9.564)), favorable attitude of POPM (AOR (95%CI)=2.592 (1.191-5.643)) were found to have statistically significant association with good practice of postoperative pain management (table 2).

**Table 2.** Bivariable and multivariable analysis of factors associated with practice of postoperative pain management among health professionals work in South Wollo Zone Governmental hospitals, Ethiopia.

Variable	Practice of POP		COR (95%CI)	AOR (95%CI)	
	Good (222)	Poor (164)			
Sex	Male	134	82	1.523* (1.013-2.289)	1.548 (0.734-3.263)
	Female	88	82	1	1
Working hospital	District hospital	119	45	0.156 (0.036-0.674)	0.459 (0.072-2.925)
	Referral hospital	69	117	0.035* (0.008-0.674)	0.336 (0.053-2.134)
	Primary hospital	34	2	1	1
Qualification	MSC& above	11	13	0.308* (0.119-0.797)	0.253 (0.049-1.311)
	Degree	156	131	0.433 (0.247-0.76)	0.157 (0.056-0.439)
	Diploma	55	20	1	1
	Recovery room	42	42	0.677 (0.379-1.21)	2.112 (0.681-6.55)
Current working ward	Obstetrics	43	37	0.787 (0.437-1.418)	2.742 (0.832-9.035)
	Orthopedics	6	9	0.452 (0.15-1.363)	1.42 (0.201-10.02)
	Medical	31	24	0.875 (0.452-1.695)	1.223 (0.355-4.218)
	Surgical	62	42	1	1
Using assessment tool	ICU	22	4	3.726* (1.197-11.59)	14.5 (1.503-139.93)
	Gynecology	10	3	2.258 (0.586-8.696)	0.579 (0.078-4.306)
	Emergency	6	3	1.355 (0.321-5.719)	0.328 (0.052-2.053)
	Yes	181	33	17.525* (10.51-29.2)	10.622** (4.776-23.62)
Using pain scale	No	41	131	1	1
	Yes	187	39	17.125* (10.28-28.5)	10.614** (4.803-23.45)
Documentation of POP	No	35	125	1	1
	Yes	172	59	6.122* (3.911-9.584)	6.748** (2.977-15.294)
Hospital setting	No	50	105	1	1
	Yes	180	90	3.524* (2.235-5.556)	1.285 (0.533-3.098)
Taking training	No	42	74	1	1
	Yes	119	24	6.739* (4.059-11.19)	4.126** (1.707-9.977)
POP guideline	No	103	140	1	1
	Yes	26	4	5.306* (1.814-15.51)	2.958 (0.563-15.548)
Past pain experience	No	196	160	1	1
	Yes	174	91	2.908* (1.866-4.532)	4.174** (1.821-9.564)
Interdisciplinary approach	No	48	73	1	1
	Yes	155	56	4.462* (2.898-6.87)	2.124 (0.981-4.597)
	No	67	108	1	1

COR=Crude odd ratio, AOR=Adjusted odd ratio, CI=confidence interval

\* Variables which candidate to multiple analysis by COR and P value

\*\* Variables which had association with Postoperative pain management practice by AOR and P value

Overall percentage of the model was 88.35

Significance of hosmer and lemeshow test was 0.57.

## 4. Discussion

This study was a cross sectional designed to assess the level of postoperative pain management practice and its associated factors in south Wollo zone governmental hospitals. Among the study participants 222 (57.5%) (95%CI; 52.57%, 62.43%) of the participants had good practice of postoperative pain management while 164 (42.5%) (95%CI: 37.57%, 47.43%) of the participants had poor practice of postoperative pain management.

### 4.1. Practice of Postoperative Pain Management

This study found that the practice was better than the study in Arsi zone (52.1%) [14] and Addis Ababa public hospitals (87.3%) [15]. The possible explanation is in this finding 45.6% of bachelor degree holders of health professionals had practiced poor management of postoperative pain but in Arsi zone 80.0% of bachelor

degree holders of health professionals had poor practice of postoperative pain management. In the other hand it has more poor practice than the study in Jordan and Bangladesh which is 32.9% and 24.1%, respectively [7]. The possible explanation of behind the increasing of poor practice in south wollo zone was 19.4% of the educational level of health professionals were diploma but not in Jordan and also the professionals of this finding had negative attitude regarding POP management. So, postoperative pain management practice is an essential component in the provision of quality of postoperative pain management. It is unethical to let the patients suffer from pain without adequate efforts to provide high-quality management.

### 4.2. Factors Associated with Practice of Postoperative Pain Management

The study found that there was a relationship between the current working ward of the participants in the ICU unit and their level of practice of POP management. The possible

explanation of professionals working in the ICU unit had good practice than working in the surgical ward as they may be exposed to critical cases and assigned based on training as well as may have chances to take training related to pain management than professionals working in the surgical ward. But, the study in Addis Ababa shows participants working in ICU had poor practice of postoperative pain management. The possible explanation of this difference is 84% of ICU participant working in AA hospitals had poor practice of postoperative pain management while in this study only 15% of ICU participants had poor practice of postoperative pain management [15].

According to this study good practice of postoperative pain management is more likely to occur among those who take training than those who did not take the training. The possible explanation is non-trained health professionals did not achieve their competency in providing safe, high quality, health services to clients through improved work performance. This is because through training different types of skills/practice are thought, including psychomotor skills, clinical-decision making skills, and communication skills. So trained health professionals in quality improvement have the potential to impact positively on attitudes, knowledge, and practice of postoperative pain management, but not non-trained.

The study found that health professionals with past pain experience make an association with the practice of postoperative pain management. The finding is supported by the study in Bangladesh [7]. Experienced professionals tend to provide more accurate pain management because experiences make them more skillful at interpreting pain cues and their management. As well as more experienced professionals become acculturated into the role of a profession, perceptions of pain, and practice of pain management.

The study shows that participants that utilize assessment tools practicing good postoperative pain management are more likely than those who did not use the assessment tool. The possible explanation is assessment tool requires a patient's subjectivity, personal, and private experiences within the dimensions of pain management but the participants who did not use assessment tool lead to loss of patient's subjectivity and current POP pain. The professionals who used pain assessment tools were able to capture the individual's pain experience, determine the type of pain, determine the effect and impact of pain experience and his/her ability to function, and finally, they can develop a treatment plan and manage postoperative pain. So using of assessment tool was used to review the quality of patient care in postoperative pain management, to identify gaps in current practice in postoperative pain management and to help implement an appropriate intervention/quality improvement strategy on postoperative pain management.

The pain assessment scale was associated with the dependent variable. The finding is supported by the study in Ethiopia, and Finland [16, 17]. Pain assessment scale determines what strategies are used for its relief. In

particular, for the postoperative patient, pain assessment scale is a precursor of clinical decisions regarding analgesic requirements. Therefore, if the patient's pain is inadequately or not assessed, analgesic intervention is also likely to be ineffective. For this reason, extensive attention has been given to investigating pain assessment scale by health professionals.

Practicing good postoperative pain management was more likely to occur among those who document POP management than those who did not document POP management. The possible explanation is documentation of postoperative pain and pain management provides both subjective and objective data, from self-reports and assessment tools. This information is about the person's pain characteristics such as pain history, sensory characteristics, impacts of pain on everyday activities, psychosocial impacts, cultural beliefs, and effective interventions used to manage postoperative pain. Documentation is also a professional and legal requirement that promotes safe, effective and ethical pain care; continuity of care across the inter-professional team; and communication of the plan of care, assessment and reassessment findings, the effectiveness of implemented interventions, and education provided to the patient on their condition.

The study found that there is a relationship between favorable attitude of health professionals and level of postoperative pain management practice. This study is supported by the study in Malaysia [18]. The possible explanation of those professionals who has favorable attitude leads to good practice of POP management was unfavorable health professionals often think patients exaggerate their pain, and that the pain should be verified against the patient's behavior and the extent of their surgery. Also they believe that some pain should be expected after surgery, and that patients should be able to cope with a degree of suffering.

## 5. Conclusion

The overall level of postoperative pain management practice among health professionals in the study area was low.

Postoperative pain management practices found in many key areas of POP management have impact on the provision of effective pain management and optimal care given to surgical patients. The factors of postoperative pain management practice were using pain assessment scale, do documentation of POP management, favorable attitude of health professionals, professionals past pain experience, using assessment tool, working in ICU, and taking training had positive association for having good practice of postoperative pain management.

## Limitation of the Study

The study was employed with self-administered questionnaire rather than observational, so there may be response bias/ recall bias in the study population.

## List of Abbreviations

AOR: Adjusted Odd Ratio  
 BUTH: Butare University Teaching Hospital  
 COR: Crude Odd Ratio  
 ICU: Intensive Care Unit  
 KUTH: Kigali University Teaching Hospital  
 OPQRS: Onset, Provocation, Quality, Radiation, Severity  
 PCEA: Patient Controlled Epidural Analgesia  
 POD: Postoperative Daily  
 POP: Postoperative Pain  
 QISS TAPED: Quality, Impact, Site, Severity, Temporal, Aggravating, Preference, Diagnostic  
 SOCRATES: Severity, Onset, Character, Radiation, Aggravating, time, exacerbation, Site  
 SPHMMC: Saint Paulo's Hospital Millennium Medical College  
 TASH: Tikur Anbessa Specialized Hospital  
 UOG: University of Gondar  
 WHO: World Health Organization.

## Declaration

### *Ethics Approval and Consent to Participate*

This study protocol was viewed and approved by research and community service of Wollo University, college of medicine and health science, research, community service and postgraduate coordinator, approval number CMHS-450/013/12. After getting permission from each respective of South Wollo Zone Governmental hospitals, the above mentioned ethics committee was aware and waived the written consent for the study participants instead oral consent was given for the participants, this is because after explaining the study purpose, procedure, duration and other detail explanation participants was interested to give oral consent.

### *Consent for Publication*

Not applicable.

### *Availability of Data and Materials*

All the necessary data generated and analyzed during this study were included in this article and its supplementary material files. Further enquiries can be directed to the corresponding author.

### *Competing Interest*

The authors declare that they have not competing interest.

### *Author's Contribution*

All the co-authors and corresponding author contributing in the activity of writing the proposal, analyzed the data, writing the result and discussion, preparing the manuscript. The authors also read and approve the prepared manuscript for journal publishing.

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