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Post-operative pain assessment knowledge and practice among nurses working at Jimma University Medical Center, South West Ethiopia

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ABSTRACT

Aim: The aim of this study was to assess post-operative pain assessment knowledge and practices among nurses.

Methods: Institution based a cross-sectional study was conducted among 242 randomly selected nurses. Data were collected via a self-administered questionnaire and analyzed by SPSS version 25. Descriptive statistics and multivariable logistic regression were done. A p value of < 0.05 was used to declare statistical significance.

Results: The largest proportion (61.3 %) of the respondents was between 20 and 30 years of age group. The study revealed that 60.5% of the respondents had good practice on pain assessment. Knowledge level, training and workload had significant association with pain assessment practice.

Conclusion: In general, the level of knowledge and practice on pain assessment is not adequate in this setting. This is mainly due to lack of in-service training on pain assessment, lack of familiarity with pain assessment tools and the presence of workload. In the hospital setting, much of the responsibility for the patients' comfort rests in the hands of nurses and they play pivotal role in post-operative pain assessment and management too. Thus, the Hospital should work to improve these gaps by strengthening practical based in-service training and decrease nurses work load.

1. Introduction

Post-operative pain (POP) is unpleasant sensory and emotional experience associated with tissue injury together with muscle spasm following surgery (Johan and Loeser, 2011). Pain is subjective feeling and experience of the patient. Patients self-report is, therefore, the most reliable indicator of pain than health care provider and attendants (Kituyi et al., 2011; Pasero, 2009; Wood, 2008). As described in British Journal of Anesthesia in 2018, pain assessment has been considered as the fifth vital sign; Pain assessment which is an important goal in patient care is the first step in proper pain relief. Many health institutions nationally and internationally apply policies to include pain assessment in each patient's medical chart along with vital signs. Therefore, pain should be assessed at least as frequent as vital signs are taken. Accuracy

in pain assessment is a basic input for quality pain management. Nurses should identify and document the presence of post-operative pain for each patient and score its intensity using standardized pain scales (Kizza, 2012; Kafkia et al, 2014; Johan and Loeser, 2011). During pain the assessment, the use of standardized scales has its own advantages and the use of different pain rating scales are recommended based on the patients' literacy level and scales accuracy. In Numeric Rating Scale for instance, the patient is asked to rate their pain intensity on a scale of 0 (no pain) to 10 (the worst possible pain) (Solman, Rosen, Rom, & Shir, 2010; Myles and Christelis, 2011).

Postoperative pain remains one of the common concerns for patients following surgical procedures. Pain increases the sympathetic response of the body with subsequent alteration of body's physiology. Prolonged pain reduces physical activity and increases risk of deep vein thrombosis

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(Thomas, 2008; Bennetts, Campbell-Brophy, Huckson and Doherty, 2012). Post-operative pain increases morbidity, mortality and the number of unexpected readmissions. For these reasons, appropriate Post-operative pain assessment is crucial and is part of noble clinical practice (Pasero, 2009; Arif & Grap, 2009). Adequate POP Management reduces the patients' length of hospitalization and decrease post-operative complications. This cannot be attained without prompt, adequate and accurate pain assessment. Inaccurate pain assessment results in inadequate treatment (Labiran et al., 2009; Wood, 2008; Derman et al., 2009; Zimmermann, 2011).

Adequate knowledge and practice of pain assessment are essential components in the management of Post-operative pain. Despite nurses spend much of their time with patients than any other health care provider, they have been considered as contributors for inadequate pain management due to low level of knowledge and practice on pain assessment (Ho, Choy & Rozainiee, 2009; Al-Quliti, and Alamri, 2015). Nurses' knowledge deficits regarding pain assessment principles, failure to assess and acknowledge the existence of pain and poor communication between the patient and the health-care providers can considerably contribute to underestimate pain, sub-optimal pain management and document pain infrequently (Arif-Rahu & Grap, 2010; Arif & Grap, 2009).

A study conducted in Bangladesh reported that >4/5 of nurses had adequate knowledge about pain assessment (Mondol, Muhammad & Chowdhury, 2018). Study in Ghana revealed that, although participants were knowledgeable of assessing and managing postoperative pain, practice of assessing and managing postoperative pain was not adequate (Mahama & Ninnoni, 2019). In Uganda, it is reported that almost all (96%) of participants did not use pain assessment tools while doing pain assessment, 79.1% of the participants documented the findings of pain assessment, 91.2% had adequate knowledge, 43.5% mentioned people other than the patient as the most accurate in rating the pain intensity (Kizza, 2012).

Study report in Hawassa, Ethiopia indicated that, 35.9% of participants were found to be knowledgeable on pain assessment and management. In this study, nurses' pain assessment and management was very low (Tadesse, Yohannes & Beza, 2016).

Different factors can affect nurses' level of knowledge and practice of pain assessment and these factors are varying from area to area. Some of the barriers to pain assessment include but not limited are workload, lack of assessment tools, lack of in-service training on pain assessment tools, lack of familiarity with existing pain assessment tools, lack of institutional policy and protocols on pain assessment and management, poor documentation of pain assessment results and poor communication of pain assessment priorities at the unit. Study in Malaysia and Ghana revealed that adequate training with provision of resources could help in the proper assessment and management of post-operative pain (Mahama & Ninnoni, 2019; Dharmalingam & Muniandy, 2020).

Much of the responsibility for the patients' comfort in the post-operative and surgical units rests in the hands of nurses. Nurses' pain assessment knowledge and skill is therefore a basic and fundamental for pain management. Since nurses play a pivotal role in post-operative pain assessment and management, they need to have adequate knowledge and skills about pain assessment. Despite the above facts, research related to pain assessment knowledge and practice in the post-operative care setting remains limited in developing countries including Ethiopia. Furthermore, nurses have been assessing and interpreting pain inconsistently and wrongly in some areas. This indicates that there is a gap on nurses' pain assessment. Moreover, the level of knowledge and practice about post-operative pain assessment among nurses in this setting is not studied. The implication of this study is therefore, to indicate the area to be improved in pain assessment knowledge and skill. More specifically, the aim of this study was to determine the level of knowledge and practice about post-operative pain assessment among nurses.

2. Methods and materials

2.1. Study design

Institution based cross-sectional study was conducted in the Hospital.

2.2. Setting

This study was conducted in specialized teaching and referral hospital in the South Western region of Ethiopia from January to February 2020. The average patient undergone surgery in this hospital is 18 per day. The hospital has a total of 583 nurses. In this hospital, nurses rotate from one ward/unit to other every six months and at a time on average 40 nurses have been working in operations rooms.

2.3. Study participants

The Source population of this study was all nurses who were working in the Hospital whereas study population was all nurses who had exposure to surgical ward within the last two years to the time of the survey, volunteer to participate and available during data collection. First, nurses who had exposure of surgical ward were identified and then the calculated sample size was proportionally allocated to each unit where they are working. Then, simple random sampling was used to select each study participant.

2.4. Study variables

The outcome variable of this study is knowledge and practice about post-operative pain assessment practice and those predictor variables are Age, Sex, Religion, Marital Status, Educational status, Monthly salary, Work experience, work load and in-service training.

2.5. Measurement

The questionnaire for this study was adapted from the previous works (Kizza, 2012; Mahama & Ninnoni, 2019). Content and construct validity of the instruments was done by consulting senior professionals from school of nursing and midwifery and further modification was done. The researchers then, pre-tested the questionnaire at Other Hospital on 12 nurses for evaluation and refining. Reliability test was done and chrombach's alpha coefficient was 0.72. The pretest also provided insight on how much time was needed to administer the instruments, clarity, and sequencing and adjustments were done depending on the results.

Bias: The author tried to decrease Social desirability bias, data was collected through self-administered questionnaires by eliminating personal identifiers and assured by the data collectors and supervisors.

2.6. Population and sample size

The sample size was determined using single population proportion formula as follow:

$$n = \frac{\left(\frac{z\alpha}{2}\right)^2 p(1-p)}{d^2}$$

Where.

n = minimum sample size.

Z α /2 = confidence interval (1.96).

p = proportion of knowledge to recognize and manage pain (35.9%); from previous study (Tadesse, Yohannes, & Beza, 2016).

d = margin of error to be tolerated (0.05).

Finally by considering 10% of final sample size for non-respondent rate, the final sample size was 242. First, nurses who had exposure of

surgical ward were identified and proportionally allocated to a unit where they are working. Then, simple random sampling was used using the lists of nurses in each unit to select each study participant. In this, number one (1) and zero (0) assigned to those has exposure and those nurses picked up number one (1) were participated whereas those nurses picked.

2.7. Data collection

Data were collected through a self-administered structured questionnaire and facilitated by two trained diploma nurses. The data collectors tried to inform and assure that the data will be used only for research purpose and it will be kept anonymous to avoid social response bias. Data collectors waited for 30 min for each respondent to complete their questionnaire individually at separate nurses' duty room and immediately retrieved after they completed.

2.8. Data analysis procedure

After data was checked for consistency and completeness, then entered in to Epi-Data version 3.1 and exported to SPSS version 25 for analysis. Each correct alternative under each knowledge question was graded as 1 point and incorrect was graded as 0. Finally, it was dichotomized as good knowledge and poor knowledge based on the sum of correct responses of each item of knowledge questions by taking the mean score as cutoff point. Practice of postoperative pain assessment was graded by assigning scores to Likert scale responses on a scale of 1–3 points: 1 = never, 2 = sometimes, 3 = always. The total score was dichotomized in to good practice and poor practice based on the summed score taking the mean score as cut-off point. Simple frequencies were done to see the overall distribution of the study participants with the different study variables. Variables those had significant association at Binary analysis were further analyzed by multivariate logistic regression and statistical association were considered significant at p-value of less than 0.05.

2.9. Ethical consideration

Ethical clearance was obtained from Institutional Review Board of Institute of Health of the University prior to actual data collection. A formal letter from Institute of health science was taken and submitted to the study Hospital to get permission and co-operation. Prior to administering the questionnaires, the participants were informed that the participation is voluntary and they can withdraw from the study at any stage. The participants were also assured that the information they provide would be used for research purposes only and would be treated as confidential. Informed consent was secured from each participant prior to data collection.

3. Results

From the total 242 distributed questionnaires, four were excluded from analysis as a result of incomplete questionnaires which made the response rate of 98.35%. The analysis was done based on the data collected from 238 participants.

3.1. Socio-demographic characteristics

According to the study, 127 (53.4%) of participants were females. The largest proportion (61.3 %) of the respondents was between the age group of 20 and 30 years. Nearly 2/3 of the participants were baccalaureate degree holders. Almost half of study participants had less than six years working experience. Majority (78.6%) of the participants perceived that they had work load. Only one-third (31.9%) of nurses reported that they took in-service training of pain management and nearly two-third (63.0%) of nurses reported that pain assessment tool

had not been available in their respective working unit (Table 1).

3.2. Knowledge of post-operative pain assessment

When the participants asked about the importance of assessing POP, 156 (65.5%) of them knew that it is extremely important. Concerning the rating of pain intensity, only 52 (21.8%) of nurses were aware that patient is the right person who can give an accurate rating of pain. Though frequent assessment and documentation of pain is important irrespective of the patient's ability to communicate, nearly two-fifth of the study participants did not aware that it is extremely important. About half (51.3%) of study participants perceived themselves as their current knowledge about post-operative pain assessment is adequate. The study revealed that 63.9% of the respondents had good knowledge about postoperative pain assessment with the mean knowledge score of 5.96 (SD=±1.569) out of the total 10 points (Table 2).

3.3. Practice of post-operative pain assessment

Regarding to assessing the need of analgesia before procedures, 136 (57.1%) of the study participants reported that they usually assess the need of analgesia before Patient repositioning, 103(43.3%) of them assess before Endotracheal suctioning, 161(67.6%) of them assess before wound care and 104(43.7%) of them assess before drain removal. The mean score of practice of postoperative pain assessment was 6.21 (SD=±2.185) out of the total 12 points. Generally, 60.5% of the respondents had good level of practice on pain assessment (Table 3). More than half (55.5%) of nurses felt that they are competent in effectively assessing patient having pain.

3.4. Factors associated with nurses' knowledge and practice of POP assessment.

In this study, in-service training of pain management [AOR (95%CI) 0.184(0.089–0.382)] and Education qualification [AOR (95%CI) 0.484 (0.271–0.866)] were found to have significant association with participants' level of knowledge on POP assessment. Regarding to practice of POP assessment, perceived workload; [AOR (95%CI) 2.544 (1.211–5.346)], presence of in-service training; [AOR (95%CI) 0.448 (0.231–0.87)] and participants' level of knowledge on POP assessment;

Table 1
Distribution of socio-demographic characteristics of Nurses (n = 238).

Variable	Frequency	Percent	
Sex	Female	127	53.4
	Male	111	46.6
Age in years	20–30	146	61.3
	31–40	68	28.6
	41–50	16	6.7
	>51	8	3.4
	Religion	Muslim	62
Religion	Orthodox	107	45.0
	Protestant	56	23.5
	Others	13	5.5
	Educational status	Degree	147
Educational status	Diploma	91	38.2
	Marital status	Single	110
Marital status	Married	122	51.3
	Other *	6	2.5
	Monthly salary in Ethiopian birr	1401–2350	4
2351–3550		49	20.6
3551–5000		126	52.9
>5000		59	24.8
Work experience in years	0–5	116	48.7
	6–10	76	31.9
	11–15	17	7.1
	16–20	22	9.2
	>21	7	2.9

*=Divorced and widowed.

Table 2
Nurses' knowledge on post-operative pain assessment among nurses (n = 238).

Items	Response	Frequency	Percent
How much Important to assess pain	Not all important	15	6.3
	Minimally important	24	10.1
	Moderately important	43	18.1
	Extremely important	156	65.5
	Not all important	15	6.3
How much Pain assessment tool is important	Minimally important	18	7.6
	Moderately important	47	19.7
	Extremely important	158	66.4
	Not all important	15	6.3
Who provide the most accurate rating of pain intensity	Physician	30	12.6
	Patients	52	21.8
	Nurses	150	63.0
	Attendant	6	2.5
Frequent assessment and documentation of pain is important for patient able to communicate	Not all important	12	5.0
	Minimally important	27	11.3
	Moderately important	72	30.3
	Extremely important	127	53.4
Pain should be assessed before and after administering pain drug	Yes	208	87.4
	No	30	12.6
Observation is part of the method used in post-operative pain assessment	Yes	218	91.6
	No	20	8.4
Numerical Rating scale ranging from (0) no pain at all to(10)the worst pain	Yes	169	71.0
	No	69	29.0
If the patient sleeps with no movement post operatively this indicate that pt. is not in pain	Yes	99	41.6
	No	139	58.4
Consistence high score on pain rating scale for minimal to moderate pain, which means patient is exaggerating the pain	Yes	148	62.2
	No	90	37.8
Changes in vital signs are reliable indicators of post-operative pain severity	Yes	193	81.1
	No	45	18.9

[AOR (95%CI) 2.435(1.326–4.470)]were significantly associated with nurses' practice of post-operative pain assessment (Table 4).

4. Discussion

Pain assessment is a starting point and a basic input for quality post-operative pain management. One of the biggest hindrances to pain management among post-operative patients is inaccurate pain assessment by nurses. Nurses' adequate practice of pain assessment is the essential component in the management of Post-Operative pain. Nurses' knowledge is one of the crucial aspects of health systems for post-operative pain assessment practices and lack of knowledge may impede provision of post-operative pain assessment and management. Therefore, this study tried to assess nurse' knowledge and self-report practice on post-operative pain assessment. In this study, despite considerable number of nurses knew that assessing POP frequently for all patients is extremely important, only 52 (21.8%) of nurses knew that patient is the right person who can give an accurate rating of pain whereas significant number of nurses mentioned that health care providers (63% nurses and 12.6% physicians) as the most accurate in rating the pain intensity which is contradicting with pain assessment principles. This finding is by far lower than that of Uganda, 56.5%of nurses knew that patients is the right person in rating the pain intensity (Kizza, 2012). In our study, though frequent assessment and documentation of

Table 3
Nurses' practice report on post-operative pain assessment among nurses (n = 238).

Items	Response	Frequency	Percent
Assess pain for post-operative patient who able to communicate	No never	28	11.8
	Some times	123	51.7
	Always	87	36.6
Frequently Use pain assessment tool for post-operative patient	No never	37	15.5
	Some times	107	45.0
	Always	94	39.5
Always agree with patients statements about their pain	Yes	149	62.6
	No	89	37.4
Document the findings after pain assessment for patient able to communicate	No never	38	16.0
	Some times	134	56.3
	Always	66	27.7
Use any guide line for pain assessment and management for post-operative patient	Yes	99	41.6
	No	139	58.4
Discussed pain scores and management during nurse to nurse report	No never	65	27.3
	Some times	111	46.6
	Always	62	26.1
Discussed pain scores and management during unit round	No never	73	30.7
	Some times	121	50.8
	Always	44	18.5
Assess the need of analgesia before Patient repositioning	Yes	136	57.1
	No	102	42.9
Assess the need of analgesia before endo-tracheal suctioning	Yes	103	43.3
	No	135	56.7
Assess the need of analgesia before Wound care	Yes	77	32.4
	No	161	67.6
Assess the need of analgesia before Drain removal	Yes	104	43.7
	No	134	56.3

Table 4
Factors associated with nurses' practice on POP assessment among nurses (n = 238).

Variable	Good practice	Poor practice	AOR(95% CI)	P. value	
In-service training	Yes	58(40.3%)	18(19%)	0.448 (0.231–0.87)	0.018
	No	86(59.7%)	76(81%)		
Has Workload	Yes	107 (74.3%)	80(85%)	2.544 (1.211–5.346)	0.014
	No	37(25.7%)	14(15%)		
Knowledge level	Good	104(72%)	48(51%)	2.435 (1.326–4.470)	0.004
	Poor	40(28%)	46(49%)		

pain is important irrespective of the patient ability to communicate, nearly 2/5 of the study participants did not know that it is extremely important. Three-fifth of the participants were wrongly interpreted that sleeping patient with no movement post operatively is not in pain. About half of study participants perceived as their current knowledge about post-operative pain assessment is adequate. Our study revealed that 63.9% of the respondents had good level of knowledge about post-operative pain assessment. This finding is less than that of Bangladesh (Mondol, Muhammad & Chowdhury, 2018) and Uganda (Kizza, 2012). On the other hand, the level of knowledge in this study is almost double that of study conducted in Hawassa, Ethiopia (Tadesse, Yohannes & Beza, 2016). The above knowledge discrepancies might be due to difference in in-service training on pain management among and within the countries. The reason of this difference can also be explained as educational difference on pain assessment and management during pre-services training among the countries.

The study findings also revealed, for a patient who able to communicate, nurses reported that they assess pain inconsistently; 36.6%

responded that they assessed always, 51.7% assess sometimes whereas 11.8% of the respondents did not assess at all. Regarding pain assessment tool, 94 (39.5%) of the respondents reported that they use always, 45.0% use sometimes whereas 15.5% do not use at all. Regarding documentation of findings after pain assessment for patient able to communicate, less than one-third of participants document always, more than half apply only for some times and nearly one-fifth of them never document. This report on utilizing pain assessment tool was by far higher than that of Uganda. But, in Uganda, documenting the findings of pain assessment was better than that of our finding (Kizza, 2012). This difference might be due to knowledge difference on pain assessment, availability of pain assessment tool and difference in hospital protocol. In our study, nearly two-fifth reported that they used any guide line of pain assessment and management for post-operative pain assessment whereas three-fifth of them did not use any guidelines. Regarding consistency of report, in our study only less than one-third reported that they discussed pain scores and management during nurse to nurse report all always and nearly half of them apply this principle only some times and almost one-third did not discussed at all. In addition to this, there was also inconsistent discussion of pain scores and management during unit round. Generally, 60.5% of the respondents found to have good level of practice on pain assessment which is better than that of study reported in Ghana (Mahama & Ninnoni, 2019) and in Hawassa, Ethiopia (Tadesse, Yohannes & Beza, 2016). These differences might be due to difference in nurses' work load, hospital protocol, and in-service training on pain management that results in knowledge difference which in turns impede practice.

Regarding to factors influencing knowledge and practice of post-operative pain assessment, there may be factors those positively or negatively influence the nurses' level of knowledge and practice of post-operative pain assessment. In our study, there was significant association between knowledge of post-operative pain assessment and in-service training of pain management [AOR (95%CI) 0.184 (0.089–0.382)]. Those nurses who had no training were 81.6 % less likely knowledgeable about POP assessment than their counterparts. Education qualification also found to have significant association with participants' level of knowledge on Post-operative Pain assessment [AOR (95%CI) 0.484(0.271–0.866)]. Accordingly, those diploma holders were 51.6% less likely knowledgeable than those of baccalaureate degree holder nurses. Regarding to practice of Post-operative Pain assessment, in-service training on pain management demonstrated significant practice difference [AOR (95%CI) 0.448(0.231–0.87)]; those nurses who had no in-service training were 55.2% less likely had good practice of Post-operative Pain assessment than their counter parts. This implies that the given training could bring difference and this indicates the importance of in service training for all nurses. This finding is agreed with other studies which revealed that taking pain course and in-service training on pain could show significant effect on pain assessment practice (Mahama & Ninnoni, 2019; Dharmalingam & Muniandy, 2020). Nurses' perceived work load was also showed significant difference on Post-operative Pain assessment practice [AOR (95%CI) 2.544 (1.211–5.346)]; those nurses who perceived as they had no workload were 2.544 times more likely practiced Post-operative Pain assessment than who perceived they had a workload. This is due to those nurses who have work load may have not enough time and feel tire to apply all principles of pain assessment rather than trying to address only routine cares. Nurses' level of knowledge was also significantly affected their practice of POP assessment [AOR (95%CI) 2.435(1.326–4.470)]; those participants who had good knowledge were 2.435times more likely practiced of Post-Operative Pain assessment than those who had poor knowledge. Lack of knowledge on basic pain assessment principle can impede pain assessment practice.

Limitation: Since the data collected through self administered questionnaire, there may be little social desirability response bias on performance self report of practice that in turns may decrease the magnitude of poor performance.

5. Conclusion

In general, since pain is common problem among post-operative patients, the level of knowledge and practice on pain assessment is not adequate. Majority of nurses did not know that the pain is subjective expression of the patient and they did not know that a patient is a right person who can give an accurate rating. This indicated that post-operative patients in this setting have been getting suboptimal pain assessment and management. This is mainly due to lack in-service training on pain assessment, lack of familiarity with pain assessment tools, presence of a workload, lack of course on pain assessment principles, especially for diploma holders. It is better if the Hospital strengthens practical based in-service training that should be given for all nurses on post-operative pain assessment including how to use pain assessment tools and Ministry of education incorporates practical based post-operative pain assessment principles in the curriculum for both degree and diploma nursing programs.

CRedit authorship contribution statement

Bayisa Bereka Negussie: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **Endale Mulatu Gizachew:** Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing – original draft. **Admasu Belay Gizaw:** Methodology, Validation, Writing – original draft, Writing – review & editing. **Kenenisa Tegenu Lemma:** Conceptualization, Methodology, Validation, Writing – review & editing. **Dereje Endale Mammo:** Conceptualization, Methodology, Validation, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Authorship statement

We all authors declared that this manuscript is our own work. We also confirmed that the all listed authors meet the authorship criteria and all authors are in agreement with the content of the manuscript.

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