


# Knowledge and Attitude of Ethiopian Oncology Nurses About Cancer Pain Management: National Survey

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**Background:** Cancer is becoming a leading cause of death worldwide. Pain is a common and devastating symptom of cancer patients that can significantly affect the patient's quality of life. Optimal cancer pain control requires adequate knowledge and positive attitudes of nurses. Little is known about the knowledge and attitudes of oncology nurses towards cancer pain management in Ethiopia. The current study aimed to assess the knowledge and attitude of nurses and determinants of cancer pain management in all oncology centers in Ethiopia.

**Methods:** A nationwide cross-sectional survey was conducted on 138 nurses in all oncology centers in Ethiopia. Self-completed survey questionnaires were distributed using the 'Knowledge and Attitudes Survey Regarding Pain (KASRP)' tool. Both bivariable and multivariable logistic regression analyses were used. Both crude odds ratio and adjusted odds ratio with the corresponding 95% CI were calculated to show the strength of association. Variables with a p-value of <0.05 were considered as statistically significant.

**Results:** Only 7.2% (95% CI: 2.9, 11.6) of oncology nurses had good knowledge and attitude about cancer pain management. Among 41 items, the mean number of correctly answered questions was 20.4 (SD = 5.13). Nurses who had a master's degree in nursing were positively associated with good knowledge and attitude about cancer pain management.

**Conclusion:** In this nationwide study, the overall knowledge and attitude level of oncology nurses towards cancer pain management were poor. Nurses who had a master's degree in nursing were significantly associated with good knowledge and attitude towards cancer pain management. Regular training and revision of the contents of pain management education in the academic curriculum of nursing education are recommended.

**Keywords:** pain management, nurses, cancer, knowledge, attitude

## Background

Cancer is becoming a leading cause of death worldwide.<sup>1-3</sup> Sub-Saharan Africa is predicted to have a greater than 85% increase in cancer burden by 2030.<sup>4</sup> Currently, its burden overlaps with the magnitude of infectious diseases in these countries.<sup>5-8</sup> In Ethiopia, it has been the second leading cause of death among non-communicable diseases.<sup>9</sup> Despite this fact, it continues to receive low priority, largely because of the overwhelming burden of communicable diseases and limited resources.<sup>9,10</sup>

Pain due to cancer is a common and devastating symptom that affects a patient's life more than the disease itself.<sup>11</sup> It has a profound effect on all aspects of the quality of life, and may also affect the patient's will to live or to cooperate in

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treatment.<sup>12,13</sup> The cause of pain ranges from direct tumor invasion and metastasis to other sites.<sup>14,15</sup>

Despite advances in current pharmacology of cancer pain management and improvements in interventions; studies documented that many patients with cancer continued to experience high levels of pain worldwide. Approximately, 30% to 50% of cancer patients receiving treatment experience pain and 70% to 90% with advanced stages of cancer experienced moderate to severe pain<sup>16–20</sup>. Data regarding the status of cancer pain management in Ethiopia are limited. However, according to a study conducted in Gondar, Ethiopia, inadequate pain management accounts for 91% of patients with cancer.<sup>16</sup> The high prevalence may be attributed to a lack of awareness of patients, limited treatment options, late presentation of patients with advanced malignancy, and inadequate knowledge and attitude of nurses.<sup>21–23</sup>

Globally nurses play a crucial role in assessing pain, administering medications, monitoring and reassessing patients' responses.<sup>24–26</sup> Despite they have different levels of training backgrounds, nurses have the same bedside responsibilities in Ethiopia, which requires an understanding of the nature of pain and individual attitude to a patient's clinical condition to control the pain optimally.<sup>27</sup> However, in Ethiopia, there is no cancer speciality training to nurse for palliative care rather general BSc and/or MSc nursing which contains some limited palliative care related courses in their curriculum. As a result, nurses most of the time gave the service through limited ongoing training and experience in palliative units.

Many barriers can make inadequate treatment of cancer pain, which might be provider related, system related or patient related. Unfortunately, poor knowledge and negative attitude of nurses towards cancer pain managements reported as one of the commonest hurdles in cancer pain management.<sup>15,28–33</sup> Although data regarding the status of cancer pain management and knowledge and attitude of nurses towards cancer pain management is limited in Ethiopia, a survey conducted at selected oncology centers in Addis Ababa, Ethiopia showed that nurses had poor practice and negative attitudes towards cancer pain management. The main barriers were lack of courses related to pain in the undergraduate classes, lack of continuing training, role confusion, and lack of motivation.<sup>22</sup> Therefore, the current study aimed to conduct a nationwide survey regarding nurses' knowledge, and attitude of cancer pain management in all oncology centers in Ethiopia.

## Methods

### Design and Setting

A nationwide cross-sectional survey was conducted from February 15 to April 30, 2019, in all cancer centers in Ethiopia. Currently, there are seven functional oncology centers located in the northern, southern, west and central regions of Ethiopia. The oncology centers of Ayder Referral Hospital, University of Gondar Comprehensive Specialized Teaching Hospital, Felege Hiwot Referral Hospital, Hawassa Referral Hospital, Jimma Referral Hospital, St. Paul Referral Hospital and Black Lion Specialized Hospital were areas of the study. Information regarding the study participants was obtained from the human resource management of each institution. There was an average of twenty nurses and a few specialist oncologists dedicated to curative and palliative care during the study period (Figure 1). We included all nurses (bachelor degree and above) working in each oncology center in the survey to have an adequate sample size. Nurses who were on annual leave and not interested in giving consent to participate in the study were excluded.

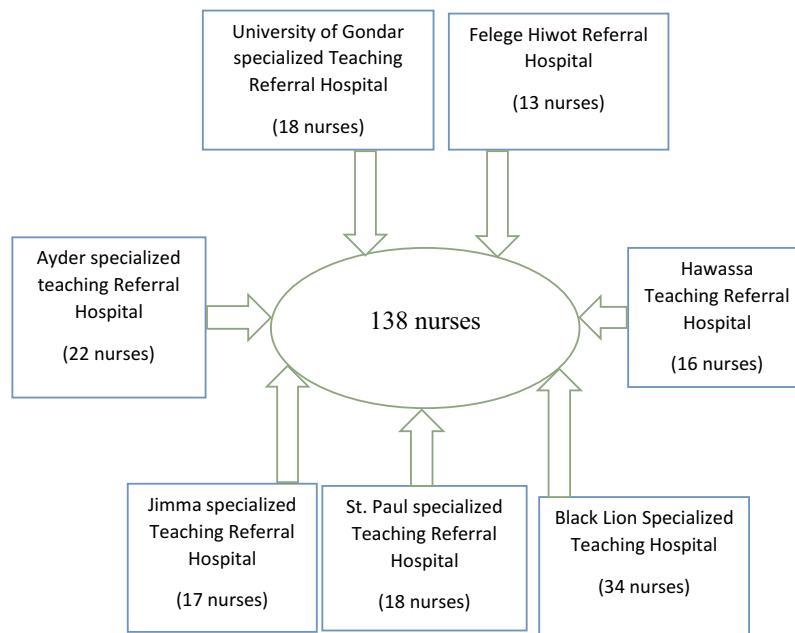
### Study Variables

The outcome variable of this study was nurses' knowledge and attitude about cancer pain management. The study participants who achieved a score of 80% or greater on nurses' knowledge and attitude survey regarding pain survey were considered as having good knowledge and attitude whereas those who achieved a score of less than 80% on nurses' knowledge and attitude survey regarding pain survey were considered as having poor knowledge and attitude.<sup>29,34,35</sup>

The independent variables were socio-demographic and work-related characteristics of nurses working in oncology centers.

### Instrument

A self-administered questionnaire including socio-demographic variables and nurses Knowledge and attitude regarding pain survey (NKARP) tool was distributed to nurses working on all oncology units in Ethiopia. Even though English is a second language in Ethiopia, as the medium of instruction at all study areas of the institution was English. Therefore, the English version of a self-administered survey tool was used to collect data from the nurses. The importance and purpose of the study were stated on the first page of the questionnaire and further explanation was provided by the head nurse of



**Figure 1** Flow diagram of study participant recruitment for the assessment of knowledge and attitude of Ethiopian nurses about cancer pain management.

each center. The questionnaire was handed to the head nurses of each oncology center, who undertake to give it to all nurses in the oncology wards who are starting the morning shift. They were instructed to keep the questionnaire anonymous. The questionnaire was completed quickly on the ward by the participants on their own, without consulting medical or nursing textbooks and then the questionnaire was returned to the head nurse.

The nurses' knowledge and attitude survey regarding pain (NKASRP) tool developed by Ferrel, Betty and McCaffery which contained 22 true/false questions, 15 multiple-choice questions and two case studies with two questions each (a total of 41 questions).<sup>36</sup> The content of the tool was established from standards of pain management from the American Pain Society (APS), World Health Organization (WHO), and Agency for Health Care Policy and Research (AHCPR). Construct validity of the original version was established by comparing scores of nurses at various levels of pain management expertise. Internal consistency for the English language version was reported at 0.70 and the test-retest reliability as 0.80.<sup>37</sup>

The scoring system of NKASRP is by analyzing the data in terms of the overall percentage of correct scores as well as in analyzing individual items. All items were equally weighted with the maximum possible score being 41. The correct responses were given a value of one and an incorrect or blank responses were given a value of zero.

## Data Analysis and Interpretation

Epi-data and SPSS were used for data entry and analysis, respectively. Data were coded, entered, cleaned before statistical analysis. Descriptive statistics were carried out and the results were prepared using narrations, percentage and tables. Hosmer Lemeshow test was used for checking goodness of fit. Both bi-variable and multivariable binary logistic regression analyses were used to identify factors associated with knowledge and attitude level of nurses. Variables with a p-value of less than <0.2 in the bivariable analysis were fitted into the multivariable logistic regression analysis. Both crude odds ratio (COR) and adjusted odds ratio (AOR) with the corresponding 95% confidence interval were calculated to show the strength of association. In multivariable analysis, variables with a p-value of <0.05 were considered as statistically significant.

## Results

### Socio-Demographic and Work-Related Characteristics of Oncology Nurses

A total of 138 study participants were involved with the response rate of 99.3%. Only one participant was on annual leave during the study period and not included in the analysis of the study. The median age of the study participants was 28 years. 62.3% of the participants were female, and the majority (83.3%) of participants had

a bachelor's degree in nursing. 52.2% of the respondents had 1 to 5 years of work experience. More than half (52.9%) of the study participants did not receive pain management training. Only 1.4% of study participants had personal cancer pain experience and 33.3% of participants had a friend or family member of the cancer pain experience. Most (81.9%) of study participants had a desire to attend pain management training in the future (Table 1).

## Knowledge and Attitude Level of Oncology Nurses About Cancer Pain Management

Overall, only ten of 138 (7.2%) oncology nurses scored above the cut-off point (80%) for good knowledge and attitude about cancer pain management. The mean (SD) knowledge and attitude score was 20.4 (5.13) and their correct item score ranged from 10.1% to 88.4% with an overall mean correct answer of 49.84%. The highest percentages of nurses responding to the correct answers were for items 21 (80.4%) and 25 (88.4%). Seven items had a correct answer rate of more than 70% of respondents. Nineteen items were correctly answered by less than 50% of the participants. 44.9% of nurses wrongly believed that placebo is a useful test to determine if the pain is real, and 77.5% of them were wrongly perceived that patients may develop a clinically significant respiratory depression if an opioid was administered. Only 51.4% of respondents knew that patients could request increasing doses of pain medication because of experiencing the increased intensity of pain, and 53.2% of them believed that the most accurate judge of the intensity of the patient's pain is the patients themselves. Less than 25% of respondents correctly answered items 28 and 38 which are determinant of cancer pain management.

The analysis of the two case studies (38A and 39A) showed that 63% and 35.5% of nurses underestimated the patients' pain in each case, respectively, and 33.3% of them underestimated the pain in both cases. Only 10.1% and 20.3% of respondents administered the correct dosage of morphine to relieve the pain, respectively (Table 2).

## Factors Associated with the Knowledge and Attitude of Oncology Nurses About Cancer Pain Management

On the bi-variable logistic regression analysis the level of education, sex of the respondent, and previous pain training

**Table 1** Nurses' Demographic and Work-Related Characteristics

Variable	Frequency (n)	Percentage (%)
Age in years		
20–24	22	15.9
25–30	79	57.3
>30	37	26.8
Sex		
Male	52	37.7
Female	86	62.3
Religion		
Orthodox	98	71.1
Muslim	10	7.2
Protestant	26	18.8
Others	4	2.9
Level of education		
BSc	115	83.3
MSc	23	16.7
Total work experience in years		
<1	12	8.7
1–5	72	52.2
6–10	33	23.9
>10	21	15.2
Work experience at oncology units in years		
<1	53	38.4
1–3	72	52.2
>3	13	9.4%
Did you receive pain management training?		
Yes	65	47.1
No	73	52.9
Did you have a cancer pain experience personally?		
Yes	2	1.4
No	136	98.6
friend or family member of cancer pain experience?		
Yes	46	33.3
No	92	66.7
Would you like to attend pain management training?		
Yes	113	81.9
No	25	18.1

**Abbreviations:** BSc, Bachelor of Science; MSc, Master of Science

were associated with the knowledge and attitude of nurses towards cancer pain management. In the multivariable logistic regression analysis, a significant association

**Table 2** Correct Answers for 41 Knowledge and Attitude Questions (N=138)

S. N.	Items Content (Correct Answer)	Correct Response n(%)
1.	Vital signs are always reliable indicators of the intensity of a patient's pain. (false)	60(43.5)
2.	Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (false)	78(56.5)
3.	Patients who can be distracted from pain usually do not have severe pain.(false)	87(63)
4.	Patients may sleep in spite of severe pain.(true)	50(36.2)
5.	Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (false)	53(38.4)
6.	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.(true)	92(66.7)
7.	Combining analgesics that work by different mechanisms (eg, combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.(true)	108(78.3)
8.	The usual duration of analgesia of 1–2 mg morphine IV is 4–5 hours.(false)	44(31.9)
9.	Opioids should not be used in patients with a history of substance abuse.(false)	69(50)
10.	Elderly patients cannot tolerate opioids for pain relief.(false)	94(68.1)
11.	Patients should be encouraged to endure as much pain as possible before using an opioid.(false)	59(42.8)
12.	Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity. (false)	63(45.7)
13.	Patients' spiritual beliefs may lead them to think pain and suffering are necessary.(true)	89(64.5)
14.	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.(true)	106(76.8)
15.	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (false)	76(55.1)
16.	Vicodin (hydrocodone 5 mg + paracetamol 300 mg) PO is approximately equal to 5–10 mg of morphine PO.(true)	73(52.9)
17.	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.(false)	48(34.8)
18.	Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (false)	60(43.5)
19.	Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regimen.(true)	72(52.2)
20.	Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviours that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.(true)	106(76.8)
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.(true)	111(80.4)
22.	Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid induced respiratory depression.(true)	101(73.2)
23.	The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is: (oral)	72(52.2)
24.	The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is:(intravenous)	109(79)

(Continued)

Table 2 (Continued).

S. N.	Items Content (Correct Answer)	Correct Response n(%)
25.	Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? (morphine)	122(88.4)
26.	A 30 mg dose of oral morphine is approximately equivalent to:(morphine 10mg IV)	45(32.6)
27.	327 Analgesics for post-operative pain should initially be given: (around the clock on a fixed schedule)	81(58.7)
28.	A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new co morbidity is: (less than 1%)	31(22.5)
29.	The most likely reason a patient with pain would request increased doses of pain medication is: (The patient is experiencing increased pain)	71(51.4)
30.	Which of the following is useful for treatment of cancer pain? (All of the above)	78(56.5)
31.	The most accurate judge of the intensity of the patient's pain is: (the patient)	72(52.2)
32.	Which of the following describes the best approach for cultural considerations in caring for patients in pain: (Patients should be individually assessed to determine cultural influences)	48(34.8)
33.	How likely is that patients who develop pain already have an alcohol and/or drug abuse problem? (5–15%)	50(36.2)
34.	The time to peak effect for morphine given IV is:(15 min.)	70(50.7)
35.	The time to peak effect for morphine given orally is: (1–2 hours)	45(32.6)
36.	Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: (Sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued)	40(29)
37.	Which statement is true regarding opioid induced respiratory depression: (Obstructive sleep apnea is an important risk factor.)	30(21.7)
38A	<b>Patient A:</b> Andrew is 25 years old and this is his first day following abdominal surgery. As you enter His room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain. (8) 0 1 2 3 4 5 6 7 8 9 10 _____ No pain Worst pain	51(37)
38B	Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1–3 mg q1h PRN pain relief." Check the action you will take at this time: (Administer morphine 3 mg IV now)	14(10.1)
39A	<b>Patient B:</b> Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain: (8) 0 1 2 3 4 5 6 7 8 9 10 _____ No pain worst pain	64(46.4)

(Continued)

**Table 2** (Continued).

S. N.	Items Content (Correct Answer)	Correct Response n(%)
39B	Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1–3 mg q1h PRN pain relief." Check the action you will take at this time: (Administer morphine 3 mg IV now.)	28(20.3)

**Note:** Correct answer is indicated in brackets.

(AOR=5.57; CI = 1.12–19.73; P = 0.034) were found among nurses with their level of education. Those who had MSc in nursing were 4.7 times more likely to have good knowledge and attitude as compared to those who had a BSc degree. However, there was no significant knowledge and attitude level differences between male and female participants and those who had previous pain training in the multiple logistic regression analysis (Table 3).

## Discussion

This study provides important evidence about the level of oncology nurses' knowledge and attitude towards cancer pain management in Ethiopian oncology centers. Overall, there was inadequate knowledge and poor attitude about cancer pain management among nurses in Ethiopia. Only 7.2% (95% CI = 2.9–11.6) out of 138 oncology nurses had good knowledge and attitude about cancer pain management; indicating nurses continued to lack sufficient knowledge about pain management. This can be explained by the fact that lack of attention for pre-service and in-service

pain education and training, as documented in previous literatures conducted in Ethiopia.<sup>38–41</sup> For example, a study conducted among recently graduated paramedical students in Ethiopian universities reported that only 4.2% of the participants scored above the cutoff point (70%) for good knowledge regarding pain management with 49.8% mean score of correct answers.<sup>39</sup> This shows an urgent need to start continuous quality improvement initiatives and include pain management training in the nursing curriculum to produce nurses who are competent to effectively control pain.

Among the 41 items examined, the mean knowledge and attitude score correctly answered was 20.43 (49.84% correct answer) in our study. This finding was consistent with similar studies conducted in Italy (21.4), Taiwan (18.52), and Jordan (19.3) which revealed that the total mean score of knowledge and attitude of nurses about cancer pain management was low.<sup>32,42,43</sup> In contrast, studies conducted in the kingdom of Saudi Arabia and Turkey had lower mean scores (16.9 and 13.8) compared to our

**Table 3** Bivariate and Multivariate Logistic Regression Analyses of Factors Associated with Knowledge & Attitude of Oncology Nurses in Ethiopia, 2019 (N=138)

Variable	Knowledge and Attitude Level		COR (95% CI)	AOR (95% CI)	P-value
	Good (n %)	Poor (n %)			
Level of education					
BSc	5(4.3%)	110(95.7%)	I*	I**	
MSc	5(21.7%)	18(78.3%)	6.11(1.60, 23.24)	4.703(1.12, 19.73)	0.034
Sex					
Male	7(13.5%)	45(86.5%)	4.30(1.06, 17.46)	3.76(0.89, 15.92)	0.071
Female	3(3.5%)	83(96.5%)	I*	I***	
Prior pain training					
Yes	7(10.8%)	58(89.2%)	2.82(0.69, 11.38)	1.75(0.38, 7.90)	0.469
No	3(4.1%)	70(95.9%)	I*	I***	

**Notes:** \*Significant in the bi-variate, \*\* significant in the multivariate, \*\*\* not significant and failed to appear in the final multivariate logistic regression model.

**Abbreviations:** COR, crude odds ratio; AOR, adjusted odds ratio and I: reference.

study.<sup>31,44</sup> This difference probably indicates that the slight variation of assessment tools used. However, a similar study conducted using the same tool in Iran revealed that 18.9% of respondents had good knowledge and attitude with 28.5 correctly answered mean scores about cancer pain management which was higher than our findings. This discrepancy might be variation in the pain management education and training, sample size (62 participants), and overall experience of the study participants. A study conducted by Lewthwaite et al in Canada reported that nearly half of the nurses achieved a passing score of 80% or greater and there was a positive correlation between the knowledge and attitude score and educational level of study participants.<sup>35</sup> This study did however use only the true or false item of nurses' knowledge and attitude survey regarding pain tools, which made the score higher.

In the present study, items related to knowledge of pharmacologic pain medications (such as right dose, effect, and duration of drugs), preferred route of administration, and fear of addiction were incorrectly answered. These results are consistent with findings reported by earlier studies.<sup>45,46</sup>

Further analysis of the two case studies (38A and 39A) showed that nurses had inadequate knowledge of pain relief medication, particularly morphine. Sixty-three percent (n=87) and 35.5% (n=49) of nurses underestimated the patient's pain in each case, respectively; and 33.3% (n=46) of nurses underestimated the pain in both cases. Only 10.1% (n=14) and 20.3% (n=28) of respondents, administered the correct dosage of morphine to relieve the pain of the two patients, respectively. This finding is very comparable with the result of similar study conducted in Italy<sup>42</sup> which indicated that nurses underestimated the intensity of a patient's pain and they did not believe in the pain reported by the patients. This shows nurses' clinical reasoning about pain is complicated and may be highly influenced by the patient's expression, position, and even by individual pain experiences.<sup>47</sup>

According to an experimental study done by Lavigne et al, pain perception remains active throughout all sleep stages.<sup>48</sup> Therefore, patients may continue to experience pain despite being in sleep. In this study, only 36.2% of nurses correctly recognized that patients may sleep despite experiencing severe pain.

In this study, 44.9% of nurses could use a placebo to check whether the pain is real. This practice might indicate that nurses still devalued the patient's self-reporting of pain and the application of nurses' wrong attitude in

their clinical practice. This result is in line with a study done in Jordan in which 46.4% of nurses may use a placebo during the clinical assessment of pain.<sup>43</sup>

Even though there are concerns regarding the safe administration of opioid analgesics to elderly patients, it can be tolerated in lower doses by geriatric patients. However, in this study, 31.9% of respondents, wrongly, believed that elderly patients cannot tolerate opioids for pain relief. This result is comparable with studies done in Iran and Jordan of which 32.2% and 35.1% of nurses, respectively, believed that elderly patients could not tolerate opioid analgesics.<sup>29,43</sup>

Even though children's pain is affected by constant development, relatively limited cognitive ability, limited verbal skills, and limited behavioral competencies; they can report their pain. In this study, only 45.7% of oncology nurses believed that children can state their pain. This response was lower than studies conducted in Iran and Italy which were 63.7% and 74.9%, respectively.<sup>29,42</sup> This showed that nurses do not believe that pain can be reported by children because they might think that children's understanding of pain is limited and leads to under-treatment of pain.

In this study, 77.5% of nurses had an exaggerated concern about opioid-induced respiratory depression and in Taiwanese study, 84%<sup>32</sup> and in Italy, 72.5%<sup>42</sup> of respondents were concerned about opioid-induced respiratory depression which was comparable to the result of this study. This fear or concern, wrongly, may lead to the inadequate relief of patients from cancer pain.

One of the purposes of this study was to identify predictors of oncology nurses' knowledge and attitude about cancer pain management. Age and sex of respondents, level of education, total work experience, oncology work experience and those who had the experience of cancer pain with a family member were analysed. Among all parameters, there was significant relationship between only knowledge and attitude and level of education. This finding was supported with the study done in Taiwan.<sup>32</sup>

The present study demonstrates that nurses who received previous pain training and those who had more work experience had not got significantly higher knowledge and attitude scores than those who did not receive previous pain training and those who had more work experience. This was inconsistent with results reported by earlier studies done in Taiwan, Italy and Jordan.<sup>32,42,43</sup> This indicated that the more the nurses are educated through advanced training, the more they know about pain and its

management. This discrepancy might be because of the difference in the number of study participants, duration of pain training and the tool they used.

A similar study conducted in Canada, with only true or false item of NKASRP, nurses having MSc holders had a high score and no significant correlations were found with nurses' desire to learn more about pain which was in line with our study result. However, in contradiction to the result of our study; age, years of professional experience and BSc degree had a positive correlation with the knowledge and attitude level of nurses.<sup>35</sup> This could be due to the differences in the number of study participants and they used only the true or false item of the tool.

The relationship between number of years working in oncology center on knowledge and attitude of nurses to manage cancer pain is unclear.<sup>49</sup> Our study revealed that number of years working in oncology unit had no influence on the knowledge and attitude of nurses on cancer pain management. This was consistent with results reported by Bernardi et al and Wilson<sup>28,50</sup> but it contradicts the findings of one study that reported years of working in oncology unit is influencing factor on nurses' knowledge and attitudes regarding pain.<sup>46</sup> However, the small sample size might not be enough to detect such a difference with the use of regression analysis. Further studies with larger samples that control for possible confounding variables (eg, training) might be required to explain this contradiction.

To the best of our knowledge, this is the first nationwide survey of all oncology nurses' pain knowledge and attitude in Ethiopia. The NKASRP is reliable and valid questionnaire that has been used by researchers in many countries. This study has high response rate, the findings really reflect the current status of oncology nurses' knowledge and attitude towards cancer pain management in Ethiopia. However, there is some limitation in this study. The sample size was relatively small to effectively measure the knowledge and attitude level. Despite this limitation, the findings support that cancer pain and pain management issues should be further considered in nursing curriculum and continuing education program should further include contents about these issues to provide effective pain management.

## Conclusion

In this survey study, the knowledge and attitude level of the majority of oncology nurses towards cancer pain management was poor which augments the universal concern

of inadequate knowledge and attitudes regarding pain management. Nurses who had a master's degree were significantly associated with good knowledge and attitude towards cancer pain management. Thus, regular cancer pain management training and revision of the academic curriculum of nursing education are necessary to enhance their knowledge and attitude.

## Abbreviations

AHCPR, Agency for Health Care Policy and Research; AOR, adjusted odds ratio; APS, American Pain Society; BSc, Bachelor of Science; CI, confidence interval; COR, crude odds ratio; EAA, Ethiopian Association of Anesthetists; IQR, interquartile range; MSc, Master of Science; NKASRP, nurses' knowledge and attitude survey regarding pain; PMP, pain management program; SD, standard deviation; SPSS, Statistical Packages for Social Science; WHO, World Health Organization.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

To conduct the current research, the ethical approval was obtained from Ethical Review Board of School of Medicine, College of Medicine and Health Sciences, University of Gondar (Ref.No. SOM/1182/2019). Permission letter from each institution and informed consent from each study participant were obtained. Potential ethical issues were addressed accordingly during the study period.

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## Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the

version to be published; and agree to be accountable for all aspects of the work.

## Disclosure

All authors declared that they have no competing interests.

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