



**COLLEGE OF MEDICINE AND HEALTH SCIENCE, SCHOOL OF
MEDICINE, DEPARTMENT OF PEDIATRIC AND CHILD HEALTH**

**NURSES' KNOWLEDGE,PRACTICE,AND ASSOCIATED FACTORS
IN PEDIATRIC PAIN MANAGEMENT AT SELECTED PUBLIC
HOSPITALS OF CENTRAL ETHIOPIA REGION, 2026**

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THESIS WAS SUBMITTED TO THE DEPARTMENT OF PEDIATRICS AND CHILD HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCE, SCHOOL OF MEDICINE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE SPECIALTY IN PEDIATRICS AND CHILD HEALTH.

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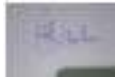
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DECLARATION

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ACRONYMS AND ABBREVIATIONS

ASA	American Society of Anesthesiologists
BSc	Bachelor of Science
CHS	College of Health Science
ETB	Ethiopian Birr
FLACCS	Face, Legs, Activity, Cry, Consolability Scale
FMOH	Federal Ministry of Health
HCPS	Public hospitals
IASP	International Association for the Study of Pain
MD	Medical Doctor
NANDA	North American Nursing Diagnosis Association
NICU	Neonatal intensive care unit
NSAID	Non-steroidal Anti-Inflammatory Drug
SPSS	Statistical Package for the Social Sciences
UN	United Nation
USA	United States of America
VAS	Visual Analogue Scale
WCSH	Warabe Comprehensive specialized Hospital
WCUCSH	Wachamo University Comprehensive specialized Hospital
WKUCSH	Wolkite University Comprehensive specialized Hospital

Contents

APPROVAL SHEET	II
CERTIFICATION SHEET	III
DECLARATION	IV
ACKNOWLEDGEMENT	V
ACRONYMS AND ABBREVIATIONS	VI
List of Tables	IX
List of Figures	X
ABSTRACT	XI
1.INTRODUCTION	1
1.1 Background Information	1
1.2 Statement of problem	2
1.3 Significance of the Study	4
2.LITERATURE REVIEW	5
2.1. General Concepts about Pain	5
2.2. Nurse’s Knowledge towards Pediatric Pain Management	5
2.3. Nurses’ Practice towards Pediatric Pain Management	6
2.5 Factors affecting nurses’ practice toward pediatric pain management	8
2.6 Conceptual Framework	10
3.OBJECTIVES	11
3.1. General Objective	11
3.2. Specific Objectives	11
4.METHOD AND MATERIALS	12
4.1. Study area	12
4.2 Study Design and Period	12
4.3 Population	12
4.3.1. Source population	12
4.3.2 Study population	12
4.4. Sample Size Determination and Sampling Procedure	13
4.4.1 Sample size determination	13
4.4.2 Sampling procedure	15

4.5. Eligibility Criteria	16
4.5.1 Inclusion criteria	16
4.5.2 Exclusion criteria	16
4.6 Variables	16
4.6.1 Independent variables.....	16
4.6.2 Dependent variables.....	16
4.7 Operational definitions	17
4.8. Data Collection Instrument	18
4.9 Data Collection Procedure.....	18
4.10 Data Processing and Analysis	18
4.11 Data Quality Assurance	19
4.12 Ethical Consideration	19
5.RESULTS	20
5.1 Sociodemographic characteristics.....	20
5.2 Knowledge of nurses towards pain management.....	21
5.3 Factors associated with knowledge of nurses for pain management.....	22
5.4 Nurses' practice about pediatric pain management	24
5.5 Factors associated with nurses' practices of pediatric pain management.....	26
6.DISCUSSION	28
6.1 Strength of the study	29
6.2 limitation of the study.....	29
7.CONCLUSION.....	29
7.1 Recommendation.....	30
8: REFERENCES.....	31
ANNEXES	36
Annex I—Information Sheet in English	36
Annex -II –Consent Form	37
Annex III-Research Instruments.....	38

List of Tables

Table 1 Socio-demographic characteristics of nurses working in public hospitals in Central Ethiopia, 2026.	20
Table 2 Knowledge on pain management among nurses for hospitalized children, Central Ethiopia, 2026.	21
Table 3 Socio-demographic and other determinant variables on knowledge of nurses for pain management in public hospitals, Central Ethiopia, 2026 (n = 403).....	23
Table 4 Nurses' practice about pediatric pain management in public hospitals in Central Ethiopia 2026 (n = 403)	24
Table 5 Socio-demographic and other determinant variables on practice of nurses for pain management in public hospitals, Central Ethiopia, 2026 (n = 403)	26

List of Figures

Figure 1 :Conceptual framework for assessment of nurses’ knowledge, practice, and associated factors toward pediatric pain management.....	10
Figure 2 Diagrammatic presentation of sampling procedure for assessment of nurses’ knowledge, practice and associated factors towards pediatrics pain management in selected public Hospitals of Central Ethiopia, 2026.....	15
Figure 3 Nurses knowledge on pediatric pain managemen	22
Figure 4 Nurses practice toward pediatric pain management.....	25

ABSTRACT

Background: *Pain is an unpleasant emotional and sensory experience that is linked to or characterized as actual or possible tissue damage. According to national studies and preliminary observations with nursing staff at public Hospitals of central Ethiopia region variability in pain assessment practice and knowledge reliance on subjective judgment rather than standardized tools. Pediatric pain is not properly assessed and managed despite the presence of pain management guidelines.*

Objective: *To assess nurses' knowledge, practice, and associated factors in pediatric pain management at selected public Hospitals of Central Ethiopia Region, 2026.*

Methods: *An institution-based descriptive cross-sectional study were done, simple random sampling method was used, and a total of 420 Nurses were included from selected public Hospitals. Data were collected from January 1–30, 2026, after permission is obtained from the ethical review commites of Wolkite univeresty .Data was collected by 8 health officers. After data collection, it was coded and then entered into the Epi Data Version 4.1 software, and then it was analyzed by the Statistical Package for the Social Sciences (SPSS) Version 27 software. Bivariate and multivariate logistic regression were done to identify factors that were associated with knowledge and practice of pediatric pain management of nurses.*

Results :-*Out of 403 participants more than half (64.4%) of nurses had Good knowledge and only 43.2 % of participants had good practice. Those nurses who had training after graduation, nurses working in pediatric ward and experience in nursing were significant associated factors.*

Conclusions:-*Nurses working at central Ethiopia region comprehensive specialized hosipitals were 64.4% good knwldege and 43.2% practice . Therefore the findings of this study suggest that Much work is expected to be done to improve their Knowledge and practice towards pediatrics pain management.*

Key words: *knowledge, practice, pediatrics pain*

1.INTRODUCTION

1.1 Background Information

According to the International Association for the Study of Pain (IASP), Pain is unpleasant sensory and emotional experience related to actual or potential tissue damage(1). It also described as throbbing, stinging, hurting, pinching, or acute or chronic pain(2). Pain is a cardinal symptom that is common in various disease states and drives many patients to seek treatment. A new definition of pain states that it is unpleasant sensation that involves real or possible tissue damage and comprises sensory, emotional, cognitive, and social components (3). Biological, psychological, and social factors all have varied degrees of influence on pain, which is usually a personal experience(4). Children of the same age have different perceptions and tolerances of pain(5). According to a prospective cross-sectional survey carried out in United States (US) Hospitals, 12% of Hospitalized patients reported chronic pain and 76% had experienced pain in the preceding 24 hours, typically from acute or procedural pain. Of those, 20% of kids reported moderate pain throughout that time, and 30% had severe pain. Needle pokes accounted for 40% of the worst pain that patients described, with trauma/injury coming in second at 34%(6). Reducing children's pain symptoms improves their prognosis, quality of life, and safety for parents and even medical professionals (7, 8). The special needs of children can influence nurses' knowledge and practice of pain treatment, including dosage restrictions and medication contraindications (9, 10). Currently, the minister of health in Ethiopia has developed a national pain-free hospital initiative policy and guidelines incorporating protocols for pain assessment and management. Pain has been registered as a fifth vital sign and documented in the nursing vital sign register(11, 12) .

1.2 Statement of problem

Nurses managing pediatric pain ineffectively affect the patient's quality of life negatively and results in higher hospital readmission rates, more repeated outpatient visits, prolonged hospital stays, increased risk of hospital-acquired infection, and increased stress and anxiety for the patient as well as families (13). Mainly It is the responsibility of the nursing profession to assess, plan, implement, and evaluate pain(14). Therefore, nurses' knowledge and practice have an impact on how children's pain is assessed and managed. Untreated persistent pain causes several potential complications like, depression, insomnia, fatigue, poor concentration and short-term memory, stress-related health problems, lack of daily structure and feeling aimless, and also lack of meaning or direction in life. Similarly, untreated pain leads to biological, psychological, social, developmental, and behavioral problems in children(15).

The availability of medications and equipment, protocols and guidelines, lack of in-service training, a lack of tools for pain assessment, work experience managing pain, and a lack of knowledge regarding pediatric pain management are all factors linked to a low level of practice(13).

According to a study done at Jimma Hospital, overall, nurses' pain management practice was poor which was 36.6%(16). According to a study done at Debre Tabor Comprehensive Specialized Hospital, just 26% of nurses had good practice in non-pharmacology pain management techniques(17).

A study carried out at the Amhara Region Referral Hospital revealed that only 45.7% had good practice (18). According to a cross-sectional institution-based study carried out in the public hospitals (HCPS) in Bahir Dar City, 76.8% of participants managed pediatric pain using the WHO pain management ladder. To control pain, 95.5% of respondents use paracetamol, and 84.5% use NSAIDs. Analgesics were utilized by most individuals (72.3%) during wound care and 79.3% during bone marrow aspiration(19). Previous studies on pediatric pain treatment knowledge and practices in Ethiopia had found inconsistent prevalence and related characteristics among nurses. While the prevalence of effective pediatric pain treatment practice varies from 16 to 59%((20, 21), the prevalence of good

pediatric pain management knowledge ranges from 33.1 to 68%(22, 23). Different factors affect the knowledge and practice of pediatric pain management among nurses.

Still In Ethiopia, little is known about pediatric pain management practices among nurses in hospitalized children. As many studies showed, pain is unrecognized and under treated by healthcare professionals all over the world. Despite studies done in different areas of Ethiopia, pediatric pain management and assessment are still not properly practiced. Thus, managing pain properly is the only option that can prevent children from unnecessarily staying in hospitals and suffering from pain.

preliminary observations, and National studies variability in pain knowledge ,practice and reliance on subjective judgment rather than standardized tools at Ethiopia comprehensive specialized hospitals.

Limited evidence from central Ethiopia region.

1.3 Significance of the Study

For Patient Care: Improve the quality of healthcare for children.

For the Hospital: Provide evidence to improve utilization of protocols and guidelines ,analgesics for pain management .

For Nursing Practice: Highlight training needs and reinforce the importance of specific pediatric pain management techniques.

For Research: Serve as a source of information for future researchers and scholars.

2.LITERATUR E REVIEW

2.1. General Concepts about Pain

Pain has roots in ancient ideas, with the Greek term historically linked to penalty and Plato suggesting pain comes from within the body.Chronic pain is defined as pain lasting more than six months after an injury heals(24).Globally, admitted children often endure high levels of pain despite better access to therapy,indicating gaps in pain management(25).Overall, pain affects up to 30% of both adults and children worldwide(26).

2.2. Nurse's Knowledge towards Pediatric Pain Management

In order to provide patients with the highest level of care, nurses must be well trained and knowledgeable on how to handle pain(27). Nursing professionals' understanding of pediatric pain is still lacking, according to numerous international, regional, and national studies(28). **Globally**; Indian study 16.87% of respondents had good knowledge , 2% of them knew assessment tools and none of the nurses were able to answer questions on how morphine is administered for chronic and persistent pain(29). However, the overall mean percentage of correct scores was low at 45.2%, which is consistent with the studies conducted in Turkey,and Mongolia(27).

In Turkey, pediatric pain knowledge among nurses was notably limited.Specifically,51% knew little about evaluating pain,56.9% had no formal pain education, and 65.6% were unaware of the names of pain assessment tools.Additionally,22.5% believed that pain is always caused by illness.Misconceptions extended to clinical beliefs, with 49% thinking preterm infants are not more prone to pain than term infants, 47.1% asserting there is no pain when a child is asleep, and 37.3% claiming that pain in an unconscious child cannot be assessed. Overall, only 19.1% of nurses were categorized as having good knowledge,(29).

In Africa: Ghana study 41% had good knowledge , southern Nigeria, 30.4% of participants were able to list up to three non-pharmacological pain management techniques.The most popular ones were cold compresses (24.4%), hot compresses (19%), and distraction (12%) (30-32) study in Rwanda, nurses' knowledge of pediatric pain management was poor; 51.1%

of participants answered incorrectly regarding pediatric pain evaluation, while 56.9% of respondents correctly identified pain medications(33).

In Ethiopia, a study at the University of Gondar Comprehensive Specialized Hospital found that a large majority held specific beliefs about pediatric pain management: 85.5% thought paracetamol is well-suited for treating pain in children, and 81.2% agreed that long-term use of anti-inflammatory drugs can irritate a child's digestive system. Additionally, 65.1% believed that children do not need analgesic drugs before burn dressings are changed (15), yet about 67.94% demonstrated good knowledge in pediatric pain management(23).

A study carried out in public hospitals in Nekemte City found that only 33.1% demonstrated good knowledge regarding pediatric pain management(34).

2.3. Nurses' Practice towards Pediatric Pain Management

Globally few studies conducted have focused on nurses' practices in managing pediatric pain, particularly after surgery(33). An American study found that while 5.56 percent of patients had insufficient pain treatment, 72.16% of patients had their pain treated with ibuprofen and acetaminophen, whereas 18.56% did not require any medication following surgery(37). Indian study, 60% of participants provided a good response about practices, whereas only 40% of nurses were aware of the pain score method but did not apply it in their everyday work(38). A Norwegian study found 59% of nurse had written protocols for both assessing and managing pain, 84% of nurses said they have used tools to measure children's and teenagers' pain. Of them, the Visual Analogue Scale (VAS) (51%) and the Face, Legs, Activity, Cry, Consolability Scale (FLACC) (24%) were the most often used. However, only 22% of nurses were seen to use validated pain assessment instruments(39,40).

In africa ;According to a Ghanaian study, 78.8% of participants utilized a self-reported pain scale, 78.3% used a behavioral pain scale, to divert children from suffering, the majority (88.9%) employed a variety of strategies. In order to evaluate the efficacy of the drug, the majority of participants (91.7%) additionally reassessed juvenile pain following analgesia. The majority of respondents (91.7%) claimed that they soothed children in pain by speaking to them in a gentle tone. Again, most of the participants (78.9%) requested older children to hold the painful areas when moving or coughing(30).

In Ethiopia; A study conducted in comprehensive specialized hospitals of Addis Ababa found that only 5.7% of participants use a behavioral pain scale, such as FLACC. Similarly, 7.7% of respondents use a pain scale (such as the VAS scale) to measure children's pain. In order to determine the efficacy of painkillers, 30.9% of youngsters reassessed their pain after taking them and 31.4% of respondents, parents should be included in assessing their children's discomfort using terminology they are familiar with. Some children (31.9%) also employed a range of techniques, including playing with toys, listening to music, telling stories, or touching objects, to distract themselves from the pain they were experiencing after the treatment. 32.9% of respondents self-reported administering pain medication to children (28). Additionally, a study conducted in Black Lion hospital showed that 52.7% of respondents had good practice regarding pediatric pain management (41).

2.4 Factors Affecting Nurses' Knowledge towards Pediatric Pain Management

Globally; The Indian study revealed a strong correlation between the nurses' years of experience and their level of knowledge (30). Iranian study (35). Nurses with 15–27 years of clinical practice experience scored considerably higher on the knowledge test than nurses with fewer than 15 years of experience. According to a study conducted in Bangladesh, nurses lack formal education or training for pain management and have no pain content in their nursing curriculum, which results in 92.5% of them having poor knowledge of pain assessment; 88.2% of nurses have no formal education or training on pain medications, which results in poor knowledge of pain medications and how to calculate dosages (36). As to the findings of the Turkish study, nurses with baccalaureate training and a master's degree or above had a statistically significant higher knowledge score than those with an associate degree (37).

Ethiopian study found that nurses who reported their institution had a particular pain treatment policy were 2.159 times more likely to be aware of it (18). In a study carried out at the University of Gondar Comprehensive Specialized Hospital, age, reading guidelines, and rotation did not affect pain management. Nurses who worked on the OPD were 52% less likely to have good knowledge compared to nurses who worked in the pediatric ward (23).

2.5 Factors affecting nurses' practice toward pediatric pain management

Globally ;study done in Indonesia showed that inadequate knowledge about pain evaluation and its treatment, difficulty in making decisions regarding pain treatment, and nurses fear about the use of opioid drugs are the most important factors in applying effective pain control(38).A study conducted in Saudi Arabia revealed that nurses with a bachelor's degree scored considerably higher than those with a diploma(27).A study conducted in Iran found a substantial correlation between practice and work experience in a pediatric ward, as well as between knowledge and scores of overall practice and involvement in institutional training regarding pain management in children(39).Ghanaian study, 72.2% of respondents said the hospital lacked evidence-based guidelines for managing children's pain, and 73.9% said there were insufficient methods for assessing pediatric pain(30).

In Ethiopia ;According to a study in a comprehensive and specialized hospital in Northwest Ethiopia, 62.3 % the lack of an evidence-based protocol for pain management in the facility, 64.6% poor pediatrics pain assessment tool and staff concerns about drug side Effect.

Multivariable logistic analysis showed that nurses who took pain management training were 2.64 times higher as compared to nurses who did not take training, Additionally, nurses who had a master's degree were 3.26 times more likely to have pediatrics pain management practice compared to diploma and BSc degree holder . The odds of having a good practice for pediatric pain management among nurses who had a cooperative child for taking pain medication in pediatric pain management were 2.11 times more than those uncooperative to take pain medication on all other variables constant (21).The availability of pediatric pain assessment tools also had three times more engagement in good pediatric pain management practices than those who did not have adequate pediatric pain assessment tools(22).Together with the previously specified qualifications, nurses who had worked in the fields for more than 2 years were roughly twice as likely to have a good pediatrics pain management practice compared to those who had less than or equal to 2 years and Analgesics, standardized evaluation instruments, and documented and quantifiable processes and recommendations must be available in healthcare facilities. Additionally, hospitals should train healthcare

professionals in pain management so that they can achieve their institutional goal of effective pain treatment. The lack of protocols and recommendations, the paucity of instruments for measuring pain, and the scarcity of medications, especially opioids, were found to be among the obstacles to the best possible pain management(40).

Study done in Northwest Ethiopia Comprehensive and specialized hospital-level education, training on pain management, a child's uncooperative to take medication, a lack of evidence-based protocol in pediatric pain management facilities, and inadequate pediatric pain assessment tools were associated with pediatric pain management practices among nurses(21). While previous studies in Ethiopia show wide variations in Knowledge (33.1%-68%) and practice (16-59%), a synthesis reveals consistent lack of standardized protocols and training as key barriers. Furthermore, no study has yet provided baseline data for selected public hospitals of central Ethiopia. This study aim to fill that gap and identify the context specific factors at play in this setting.

Global findings show nurses' knowledge of pediatric pain management is generally suboptimal, with mean correct scores around 45% or lower across multiple regions. Regional patterns reveal notable gaps in India, Turkey, and parts of Africa, plus common misconceptions about pain assessment in preterm, asleep, or unconscious children. Non-pharmacological techniques are inconsistently known, underscoring a need for targeted education and standardized pain-management training for nurses.

2.6 Conceptual Framework

This conceptual framework is developed based on various reviews of literature. It has main variables: institutional factors, and health care provider factors. Related factors that can influence pediatric pain management (17, 33, 36, 41-44).

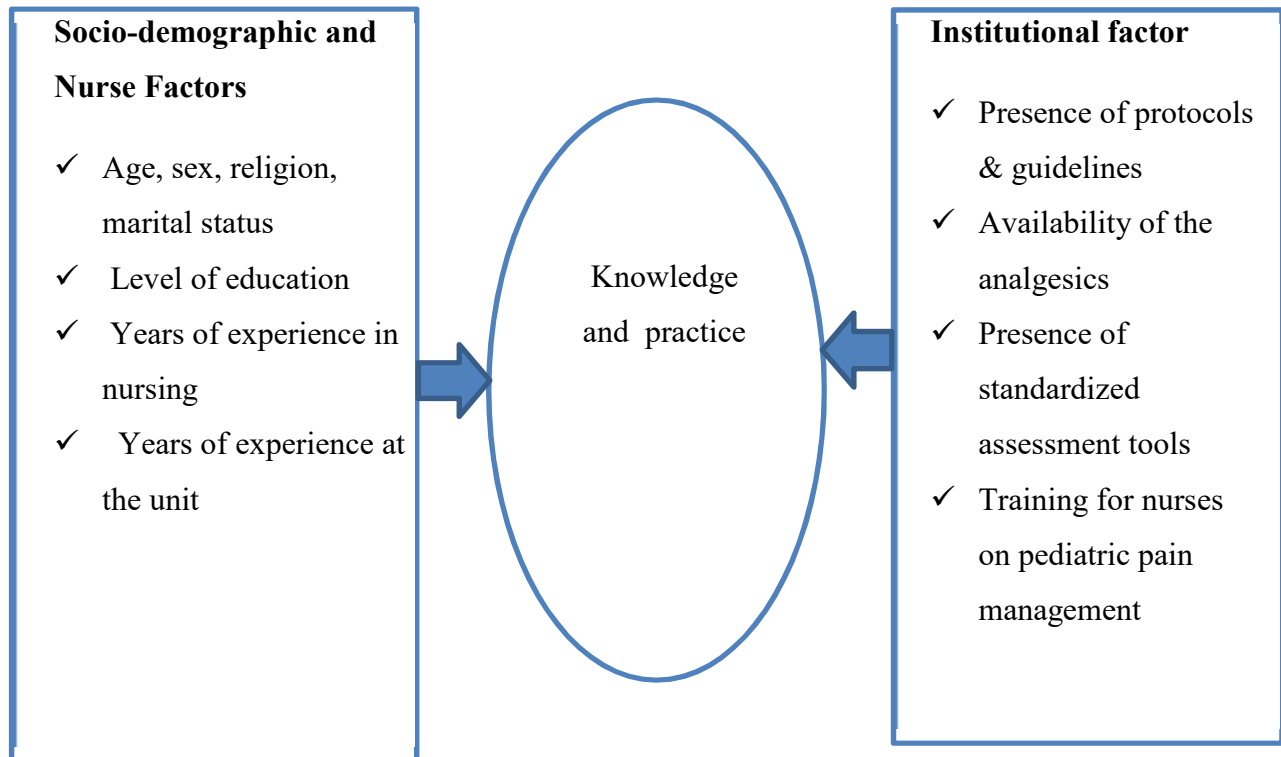


Figure 1: Conceptual framework for assessment of nurses' knowledge, practice, and associated factors toward pediatric pain management.

3.OBJECTIVES

3.1. General Objective

- ✓ To assess nurses' knowledge, practices, and associated factors in pediatric pain management at Selected Public Hospitals of Central Ethiopia, 2026.

3.2. Specific Objectives

- ✓ To determine the level of nurses knowledge on pediatric pain management at Selected Public Hospitals of Central Ethiopia, 2026.
- ✓ To evaluate the practice of pediatric pain management among nurses at Selected Public Hospitals of Central Ethiopia, 2026.
- ✓ To identify factors affecting nurses knowledge in pediatric pain management at Selected Public Hospitals of Central Ethiopia, 2026.
- ✓ To identify factors affecting nurses practice in pediatric pain management at Selected Public Hospitals of Central Ethiopia, 2026.

4.METHOD AND MATERIALS

4.1. Study area

Central Ethiopia Regional state, established in August 2023 is one of the most densely populated regions and is characterized by significant ethnic diversities. According to data of 2024 population number estimated 10,561,000 and around 13,995 health care professionals from this approximately 34% of health care professionals are Nurses. Hosanna town is the capital of the Central Ethiopia region. It is found 231 km North-west of Addis Ababa, the capital of Ethiopia. It includes Gurage zone, Silte zone, Halaba zone, Hadiya zone, and other special wardas.the Central Ethiopia has 30 Hospitals, from these 24 primaries, 4 general and 3 comprehensive specialized hospitals. The study will be conducted in 3 comprehensive specialized hospitals of central Ethiopia region, by 2026. According to data from Human resource at specific Hospitals currently total nurse at WCUCSH 287, WKUCSH, 118, and WCSH, 192 with total Number 596.From this 416 degrees , 50 Masters and 85 diplomas working nurses in each facility.

4.2 Study Design and Period

An institutional-based cross-sectional quantitative study design was conducted from January 01/2026 to January 30/2026.

4.3 Population

4.3.1. *Source population*

- ✓ The source population were all nurses at selected public Hospitals in Central Ethiopia Region.

4.3.2 Study population

- ✓ The study population were all nurses' work experience in pediatrics department at least 3 months at selected public hospitals of central Ethiopia region.

4.4. Sample Size Determination and Sampling Procedure

4.4.1 Sample size determination

The sample size were determined using the formula for single population proportion by assuming 5% marginal error and 95% confidence interval ($\alpha=0.05$) and the proportion (p) = study carried out at the University of Gondar Comprehensive Specialized Hospital Previous knowledge and study conducted in Black Lion hospital practice of nurses“ on pediatrics pain management was 67.94%, and 52.7% respectively (18, 22), and According to a Ghanaian study, respondents said the hospital have evidence-based guidelines for managing children's pain 46 % good practice.I used the proportion for “practice” (52.7%) from a previous study because it is closer to 50% than the “knowledge” proportion (67.94%) and associated factors.A proportion of 52.7% gives the maximum possible sample size, making this conservative and robust choice.

$$n = \frac{(Z_{\alpha/2})^2 p (1-P)}{d^2} = \frac{(1.96)^2 * 0.527(1-0.527)}{(0.05)^2} = 382$$

Where n=minimum sample size needed p=proportion (52.7%)

Z=significance level at confidence interval of 95%

d=margin of error (0.05)

Z $\alpha/2$ =value of standard normal distribution

corresponding to significant level of alpha (α) 0.05 which is 1.96. Since the calculated sample size from the previous study became 382, by adding non respondent rate of 10% total sample size were 420, working in selected public hospitals of Central Ethiopia region who fulfill the inclusion criteria, were included in the study

For p value =67.945% sample size is **335**, p value 52.7% sample size **382**.

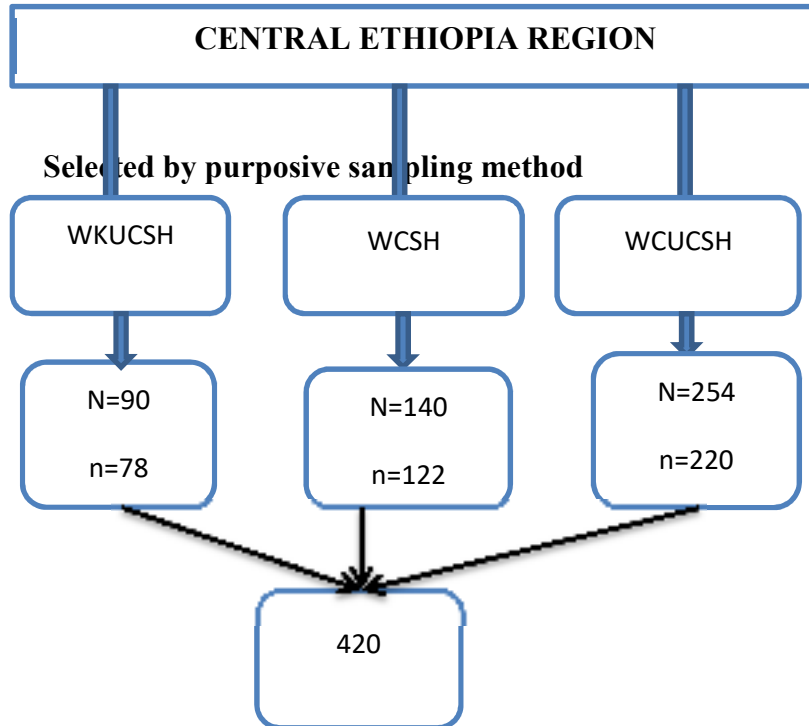
Double Population Proportion Sample Size

Variable (Exposure)	p_1 (Exposed)	p_2 (Unexposed)	n / group	Final n	Power	Reference
Training after graduation (No vs Yes)	0.45	0.62	170	340	80%	(21)
Level of education (Diploma vs BSc+)	0.40	0.60	178	356	80%	(27)
Availability of protocol (No vs Yes)	0.38	0.55	120	240	80%	(40)
Experience in nursing (<2 yrs vs ≥ 2 yrs)	0.42	0.65	190	380	80%	(22)
Experience in pediatric ward (<2 yrs vs ≥ 2 yrs)	0.44	0.63	187	374	80%	(39)

NB; Final sample size from dependent variables 420 (previous Blakclion hospital)

4.4.2 Sampling procedure

Purposely selected hospitals were included, these are: WKUCSH, WUCSH And WCSH



Total eligible nurse at WCUCSH =254,

WKUCSH=90

WCSH=140

TOTAL =484

Among 484 eligible nurses I need only 420 by proportional allocation for each Hospitals

WCUCSH $254 * 420 / 484 = 220$

WKUCSH $90 * 420 / 484 = 78$

WCSH $140 * 420 / 484 = 122$

Figure 2 Diagrammatic presentation of sampling procedure for assessment of nurses''

knowledge, practice and associated factors towards pediatrics pain management in selected public Hospitals of Central Ethiopia, 2026.

4.5. Eligibility Criteria

4.5.1 Inclusion criteria

- ✓ Nurses who have been work experience at least 3 month at pediatric units.

4.5.2 Exclusion criteria

- ✓ Nurses who take annual leave, sick or maternity leave.

4.6 Variables

4.6.1 Independent variables

Socio-demographic factors

Age, sex, religion, marital status

Nurse factors

- ✓ Level of education
- ✓ Years of experience in nursing
- ✓ Years of experience at the pediatric unit.

Institutional factors

- ✓ Presence of protocols & guidelines
- ✓ Availability of the analgesics
- ✓ Presence of standardized assessment tools
- ✓ Training for nurses on pediatric pain management
- ✓ Pediatric Pain management in nursing curriculam

4.6.2 Dependent variables

- ✓ Knowledge
- ✓ Practice

4.7 Operational definitions

Good practice: Refers to those study subjects who answered practice questions and scored more than or equal to 70%(28, 35).

Poor practice: Refers to those study subjects who answered practice questions and scored below 70% (28, 35).

Good knowledge: Refers to participants in this study who answered more than or equal to 70% of the knowledge questions correctly(28, 35).

Poor knowledge: Refers to those study subjects who respond to less than 70% of knowledge questions correctly(28, 35).

Presence of standard assessment tool: availability of children's pain assessment tool (28).

Pain assessment tool refers to a tool that is used to assess pain.

FLACC Scale—a validated observational tool used for pain assessment from 2 months to 7 years and children with cognitive disabilities (45).

VAS—a self-report scale that allows children to select their level of pain based on a 100 mm horizontal line, and it is used for children >7 years (45).

Physiological measure—Changes in blood pressure and heart rate may indicate severity of pain (45).

Wong Baker Faces Scale—A self-report scale designed for children ages 3 and older. Children point to their level of pain depicted through 6 faces differing in their facial expression and corresponding numerical value ranging from 0 to 10 (45).

4.8. Data Collection Instrument

Data were collected by using a self-administered structured questionnaire. This questionnaire consists of five parts. Part I—Demographic characteristics of participants and it consists of 7 Yes or no questions. Part II is a knowledge assessment questionnaire, and it consists of 14 True or false questions. Part III—Self-Reported Practice Assessment Questionnaire, and it consists of 14-point Likert scale questions. Part IV—Questionnaire for Factors Affecting Practice in Pediatric Pain Management, and it consists of 5 Yes or No questions and Part V: Questionnaire for Factors Affecting Knowledge on Pediatric Pain Management, which consists of 4 yes or no questions. These instruments are adopted from studies.

4.9 Data Collection Procedure

Data were collected from January 01 to 30, 2026, after permission is obtained from Wolkite university ethical review committee. The investigator was collect the list of nurses who are working in selected public Hospitals of central Ethiopia region and self-administered questionnaires were distributed directly to the nurses with the help of head nurses. A total of 8 health officers for data collection and training was given for one day on the objective, confidentiality of information, respondent rights, informed consent, and technique of questionnaire administration. The principal investigator was closely following the data collection process throughout the data collection period and check that all returned questionnaires are complete. If any question is incomplete, the researcher ask the respondent to complete it.

4.10 Data Processing and Analysis

The whole data were checked for completeness and coded before entry in order to avoid missing. Then entered into Epi data version 4.1 software and transferred to the Statistical Package for the Social Sciences (SPSS) version 27 software for analysis. Descriptive analysis were computed to determine the frequency of the variables. Bivariate and multivariate logistic regression were done to identify factors that are associated with knowledge and practice of pediatric pain management and variables with P-value of 0.20 were entered into

multivariate logistic regression analysis. Tables and graphs were used to display the results. A corresponding p-value of <0.05 in multivariate logistic regression were considered to be statistically significant for association.

4.11 Data Quality Assurance

Data collectors and supervisors were trained appropriately on rules and regulations during data collection. And the principal investigator closely follow the data collection process. Privacy and confidentiality of the respondents, as well as good interaction between respondents and data collectors, was maintained, and collected questionnaires were checked daily.

4.12 Ethical Consideration

Ethical issues were considered in all steps of the research process; of these, the most important are the following:

Ethical approval of the research proposal were obtained from the department ethical review committee of Wolkite University, and a formal letter were written by the department of pediatrics and child health to the concerned areas. Explanation about the objective and benefit of the study was described clearly to the study population, and written Letters were obtained from study Hospitals from Ethical committees for protecting autonomy and ensuring confidentiality

5.RESULTS

5.1 Sociodemographic characteristics

403(95.9%) response rate was obtained out of the anticipated 420 participants in this survey. With a mean age of 24 years (SD = ± 7.775), 193 (47.9%) of the participants were female. 53.8% of the population was between the ages of 20 and 30. The majority of participants were Bsc nurses 314 (77.9%) and 24.1% of the participants had greater than five years of work experience, while 40 (9.9%) had three to six months of nursing experience. Of all participants, 192(47.6%) nurses were three to six months and 99(24.6%) had seven to eleven months work experience in pediatric ward.

Table 1 Socio-demographic characteristics of nurses working in public hospitals in Central Ethiopia, 2026.

Variables	Frequency(n=403)	Percent(%)	
Age	20-24	46	11.4
	25-29	183	45.4
	30-34	146	36.2
	>34	28	6.9
Sex	Male	210	52.1
	Female	193	47.9
Educational qualification	Diploma	53	13.2
	Bsc	314	77.9
	Master	31	7.7
	Others	5	1.2
Year of experience	3-6 month	40	9.9
	7-11 month	86	21.3
	1-5 year	180	44.7
	>5 year	97	24.1

Duration service in pediatric ward	3-6 month	192	47.6
	7-11 month	99	24.6
	1-5 year	96	23.8
	>5year	16	4.0

5.2 Knowledge of nurses towards pain management

The majority of nurses 372(92.3%) of the participants answered that appropriate pain assessment was the first priority for effective pain management where as 292(72.5%) of nurses said that self reporting of pain was the golden standard for pain assessment. More than half percent 293(73.7%) of nurses answered that non pharmacologic pain management were effective for mild to moderate pain however 223(55.3%) of nurses knew that acetaminophen and NSAIDs are not effective for mild pain management.

About 18.9% respondents didn,t understand assessment of pain before and after administering pain drugs and 69.5% and 69.7% didn.t knew most common side effect of morphine and duration of IV morphine respectively. Generally only 64.40% of nurses had good knowledge about pain management in children.

Table 2 Knowledge on pain management among nurses for hospitalized children, Central Ethiopia, 2026.

S.no	Questions	Response	Frequency(n=403)	Percent(%)
1	Appropriate pain assessment is the first priority for effective pain management in pediatric patients.	True	372	92.3
		False	31	7.7
2	Self -reporting of pain is the golden standard for pain assessment	True	292	72.5
		False	111	27.5
3	Non pharmacological interventions (egg heat, music; touch are very effective for mild-moderate pain control but are rarely helpful for severe pain	True	297	73.7
		False	106	26.3

4	Acetaminophen and non-steroidal anti-inflammatory agents are not effective analgesics for children's mild pain.	True	178	44.2
		False	223	55.3
5	The most common side effect of morphine is respiratory distress	True	280	69.5
		False	123	30.5
6	The usual duration of action of IV morphine sulphate is 6-8 hours	True	281	69.7
		False	122	30.3

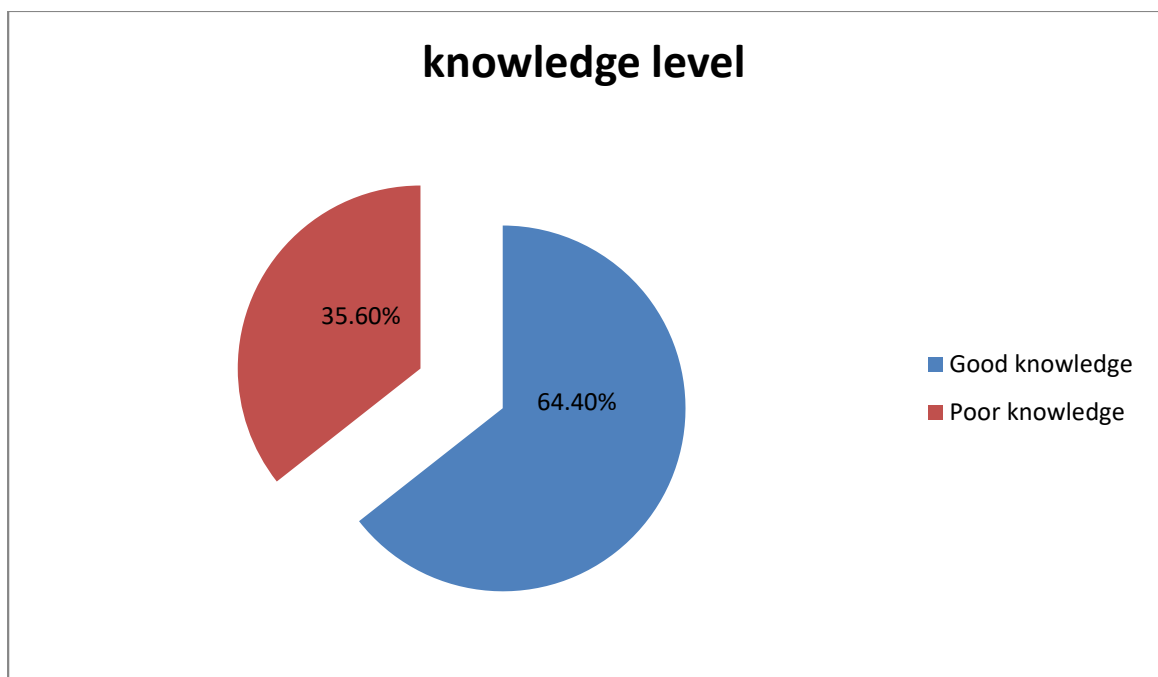


Figure 3 Nurses knowledge on pediatric pain management

5.3 Factors associated with knowledge of nurses for pain management

Logistic regression analysis was conducted to identify factors predicting nurses' knowledge on pediatric pain management. In the bi-variate analysis, significant associations were observed with age of respondents, service experience in nursing, duration of service in pediatric ward, pain management content in nursing curriculum, having pain management training after graduation and presence of pain management protocols and tools. However in multivariate logistic regression analysis, more than five years of service experience in

nursing, one upto ten years of duration in pediatric ward and pain management training after graduation were statistically significant. Nurses who had greater than five years of experience were 20% of more likely to be knowledgeable than less than five years of experience [AOR = 0.19; 95% CI: 0.048–0.798]. Similarly, nurses working in pediatric ward for more than five year were 16.820 times more likely knowledgeable than work experience less than five year with a specific pediatric ward pain management. Nurse who had training on pediatric pain management were 2.18 times more likely to have adequate knowledge of pediatric pain management [AOR = 2.18; 95% CI: 1.723–3.01].

Table 3 Socio-demographic and other determinant variables on knowledge of nurses for pain management in public hospitals, Central Ethiopia, 2026 (n = 403)

Variables	Category	Knowledge		Odd ratios(95% CI)		P-value
		Good	Poor	COR	AOR	
Age	20-24	80.4%	19.6%	1	1	
	25-29	93.6%	6.4%	0.14(1.292-10.172)	0.409(0.352-1.529)	
	30-34	96.6%	3.4%	0.016(1.220-7.225)	0.172(0.257-1.274)	
	>34	80.0%	20.0%	0.074(0.925-5.607)	0.188(0.121-1.516)	
Experience in nursing	3-6 month	87.5%	12.5%	1	1	
	7-11month	88.4%	11.6%	0.67(0.275-7.392)	0.183(0.243-1.310)	
	1-5 year	94.4%	5.6%	0.879(0.18-4.32)	0.342(0.306-1.509)	
	>5 year	97.2%	18.8%	0.156(0.611-21.441)	0.19(0.048-0.798)	0.023*
Experience in pediatric ward	3-6 month	85.4%	14.6%	1	1	
	7-11	99.0%	1.0%	0.996(0.000-0.000)	0.128(0.887-2.577)	
	1-5 year	97.9%	2.1%	0.020(0.012-0.685)	(1.166-3.644)	0.013*
	>5 year	100%	0.0%	0.999(0.000-0.000)	16.820 (1.953-34.28)	0.010*
Pediatric pain management in nursing	Yes	93.3%	6.7%	0.022(1.171-7.369)	1.00(0.00-00)	
	No	87.8%	12.2%	1	1	

curriculum						
Traing in pain management	Yes	92.6%	7.4%	0.120(0.209-1.197)	2.18(1.723-3.01)	0.027*
	No	92.2%	7.8%	1	1	
Pain management protocol	Yes	93.4%	6.6%	0.99(0.00-0.00)	0.588(0.048-5.605)	
	No	80.0%	20.0%	1	1	
Pain assessment tool	Yes	91.0%	9.0%	0.037(0.102-0.933)	1.00(0.00-0.00)	
	No	94.1%	5.9%	1	1	

5.4 Nurses' practice about pediatric pain management

The findings indicated that,152 (37.7%) of the nurses had constantly used behavioral changes in children in order to assess pediatric pain where as 4(1%) of nurses didn,t use behavioral changes like being awake,crying,limited body movement and agitation for assessing pain practices for children pain management and 50 (12.4%) of nurses never used pain assessment tool.Similarly 114(28.3%) of nurses were didn,t use self reporting pain scale for assessing children's pain and only 104 (25.8%) of nurses assess the side effect of pain medication after given to the children.The majority 229(56.8%) of the respondents never administer pain medications by their own judgment to pediatrics and 205(50.9%) of participants apply heat and cold compress to relief pain as non pharmacological management.

Table 4 Nurses' practice about pediatric pain management in public hospitals in Central Ethiopia 2026 (n = 403)

	Variables	Categories			
		Constantly	Frequently	Infrequently	Nevere
1	Behavioral change in children in order to assess their pain.	152(37.7%)	169(41.9%)	78(19,4%)	4(1%)
2	Using pain assessment tool	136(33.7%)	138(34.2%)	79(19.6%)	50(12.4%)
3	Self-reporting pain scale (such as VAS, FACE scale) for the assessment of children's	92(22.8%)	126(31.3%)	71(17.6%)	114(28.3%)
4	Side effects of pain medication (such as Morphine) after giving it to the child.	104(25.8%)	173(42.9%)	98(24.3%)	28(6.9%)
5	Applying heat and cold compresses to	205(50.9%)	149(37%)	41(10.2%)	8(2%)

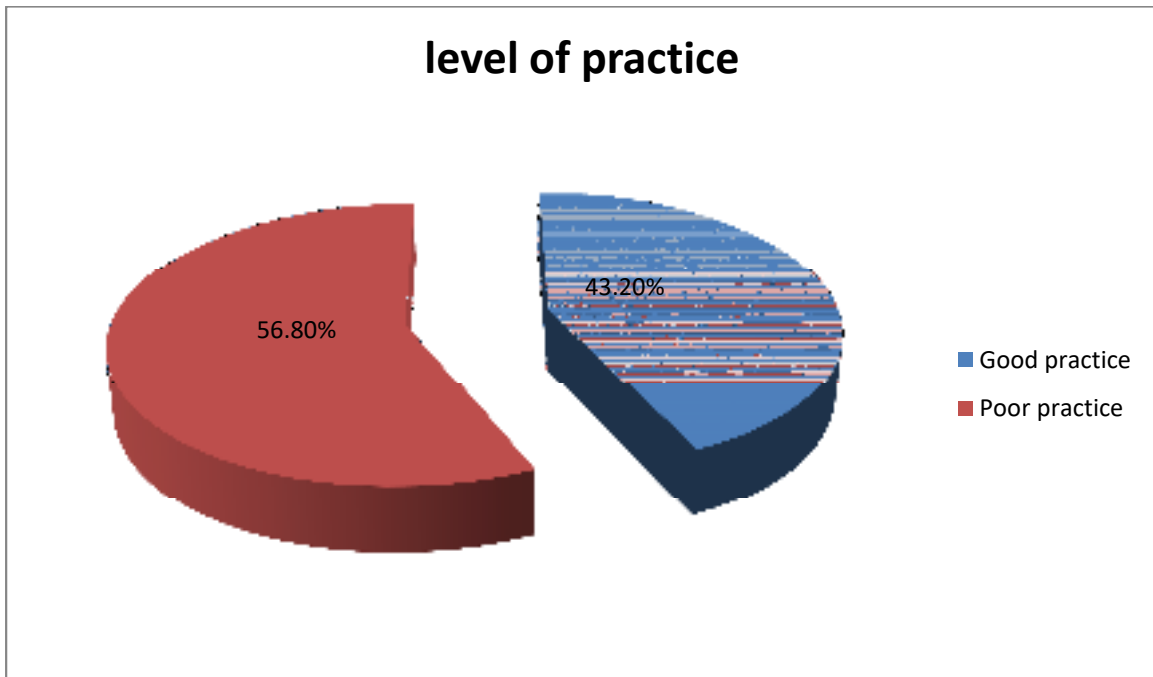


Figure 4 Nurses practice toward pediatric pain managemen

5.5 Factors associated with nurses' practices of pediatric pain management

In multivariate analysis, variables such as years of working experience, in-service training, and work experience at pediatric ward were significant association with the practice of nurses. This findings also revealed that nurses not trained in pain management had less practice compared to those nurses who took training (AOR =0.382; 95% CI = 0.366–0.938). Similarly, nurses with less than 10 years of working experience demonstrated poorer practice in pediatric pain management than those with more than 5 years of experience (odds ratio 0.04, 95% CI 0.035–0.469). Additionally, nurses who had experience working in a pediatric ward were 16.82 times more likely to have better practice than those who had no training after graduation (AOR = 16.820, 95% CI 1.003–34.28).

Table 5 Socio- demographic and other determinant variables on practice of nurses for pain management in public hospitals, Central Ethiopia, 2026 (n = 403)

Variables	Level of practice	Odd ratios(95%)			P-value
		Good	Poor	COR	
		37.0%	63.0%		
Age	20-24	38.0%	62.0%	1	1
	25-29	48.3%	51.7%	0.557(0.421-1.159)	0.163(0.251-1.262)
	30-34	64.0%	64.0%	0.181(0.318-1.242)	0.325(0.323-1.455)
	>34	34.1%	65.9%	0.014(0.098-0.774)	0.129(0.216-1.214)
Year of experience in nursing	3-6 month	47.1%	52.9%	1	1
	7-11 month	38.3%	61.7%	0.192(0.279-1.292)	0.163(0.251-1.262)
	1-5 year	43.1%	56.9%	0.674(0.424-1.741)	0.325(0.323-1.455)
	>5 year	80.0%	20.0%	0.001(0.047-0.484)	0.04(0.035-0.469) 0.002*
Duration Service in pediatric ward	3-6 month	42.9%	57.1%	1	1
	7-11 month	38.8%	61.2%	0.252(0.816-2.166)	0.407(0.737-2.118)

	1-5 year	8.3%	91.7%	0.056(0.989-2.682)	0.063(0.972-2.996)	
	>5 year	100.0%	0.0%	0.022(1.422-88.704)	16.820(2.003-34.8)	0.010*
Qualification in nursing	Diploma	28.3%	71.7%	1	1	
	Degree/BSc	45.5%	54.5%	0.084(0.317-1.075)	0.072(0.417-1.065)	
	Master	45.2%	54.8%	0.194(0.22-1.356)	(0.258-1.068)	
	Other	40.0%	60.0%	0.786(0.118-5.042)	(0.268-2.437)	
Pediatric pain management in nursing curriculum	Yes	43.6%	56.4%	1.00(0.00-0.00)	(0.082-4.066)	
	No	41.9%	58.1%	1	1	
Training in pain management	Yes	50.7%	49.3%	0.201(0.511-1.152)	0.382(0.366-0.938)	0.026*
	No	38.9%	61.1%	1	1	
Pain management protocol	Yes	46.9%	53.1%	0.760(0.124-4.593)	0.33(0.029-3.319)	
	No	37.6%	62.4%	1	1	
Pain assessment tool	Yes	44.6%	55.4%	1.00(0.00-0.00)	1.00(0.00-0.00)	
	No	40.8%	59.2%	1	1	

Nurses' knowledge and practice of pediatric pain management across three hospitals based on knowledge of pediatric pain management. From 122 respondents in WCSH, 84 nurses(69.23%) were more knowledgeable than WKUSH and WCUCSH, 13(17.21%) and 89(43.84 %) respectively. For practice, 74 nurses (60%) owned higher levels of practice, with the remaining two hospitals showing 47.3% and 40.16% in comparable practice of pediatric pain management.

6.DISCUSSION

In Children, little is known about the burden of under-treated pain. Good knowledge and good practice are required to properly assess and effectively manage pain. Primarily assessing the knowledge and practice of nurses towards pain management will precisely help in identifying the gap.

This study was aimed at describing the knowledge, practices and associated factors to pediatrics pain management among nurses working in selected public hospitals in Central Ethiopia region.

The knowledge, practice and associated factors of nurses towards pediatrics pain management was assessed and results were interpreted as having good or poor knowledge, good or poor practice and significance of related factors respectively as per the operational definition using the 70% as a reference.

According to my study the knowledge of nurses working at comprehensive specialized hospitals in central Ethiopia towards pediatrics pain management was good in 259(64.4%) of the participants. This result was relatively higher than the results of the studies done in Rwanda, India and Mekelle university (54.3%, 54.7%, 40% and 58.6% respectively)(18, 46). The reason could be because this research was specific to those nurses working at least 3 month in pediatrics unit while the rest of the researches were not specific to pediatrics nurses except the Indian research. On the another way, nurses participating in this study showed lower level of knowledge regarding pain assessment and management in children compared to studies done at the university of Gondar comprehensive specialized hospital (67.94%) and a study done Western Australia (77.56%)(47, 48). The reason for this difference might be the Gondar study were conducted in single facility, whereas the higher score in Western Australia nurses about pain relief in children might be related a continuous professional training about current pain management principles and more work experience at pediatric ward.

The result of this study showed that 144 (43.2%) of the study participants had good practice which is slightly lower than study conducted in Black Lion hospital(41).

The likely reason for the difference might be my study was conducted only in three hospitals and their study was done in multi-center and might be assigned focal person to follow pain mangment implementation.

Multi-variable logistic regression was done and the result showed that the adjusted odds ratio of nurses had training on pediatric pain management were having good knowledge towards pediatric pain management was 2.18(95%CI 1.723-3.01; p-value 0.027) times more likely than nurses not take training.Nurses with less than 10 years of work experience demonstrated poorer practice in pediatric pain management compared with those who had more than 10 years of experience.The odds ratio was 0.04 (95% CI: 0.035–0.469), and the p-value was 0.002, indicating a statistically significant difference between the two groups.

Since this study was only involved a specialized hospital group of nurses, it may not represent the knowledge,and practice of nurses towards pediatric pain management in other hospitals.Additionally,this study also had cross sectional nature of study design and didn,t involve patient factors and didn,t indicate direct cause and effect..Therefore a large multi centered and broader research which also includes observations and in depth interviews may help understand the situation better and help policy makers to depend on the results of the larger study to improve the pain service delivered to patients.

6.1 Strength of the study

This finding includes knowledge and practice of nurses in three comprehensive specialized hospitals in central Ethiopia and gives intervention package for nurses.

6.2 limitation of the study

Since this is a self-reported study, survey respondents' bias is possible and study was conducted only comprehensive referral hosipitals.

7.CONCLUSION

In my study Nurses had both poor knowledge (64.4%) and poor practice(43.2%). Therefore the findings of this study suggest that Much work is expected to be done to improve their Knowldege and practice towards pediatrics pain management.

7.1 Recommendation

Based on the findings of this study, the following are recommended;

Knowledge of Nurses

Nurses had poor knowledge towards pediatrics pain management. This should be need improving and providing additional training by the department of pediatrics and child health.

Practice of Nurses

Nurses had poor practice towards pediatric pain management therefor

- ✓ Meetings for experience sharing between different strata of the pediatrics units should be organized by the nursing team and the department of pediatrics and child health.

For Future Researchers

- ✓ Employing mixed methods of studies involving patient factors is recommended to gain more information .

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ANNEXES

Annex I—Information Sheet in English

Hello! Good morning/afternoon! My name is _____, I came from _____. Today, I am here to collect data on the research conducted by AKMEL AHMED (pediatrics and child health specialty candidate at WUCSH) with the objective of assessment of knowledge, and practice of nurses towards pediatrics pain management. I would like to give you an answer to a few questions about knowledge, practice, and factors affecting pediatric pain management. I would like to tell you that the study is confidential, and I will not put your name and address. Your participation in the study will be totally based on your willingness. For your participation, the process of the study has no payment or special benefit. I can assure you that the study also has no physical or psychological trauma as well as political problems, but participation in the study by giving your correct answer can play a great role in the success of the study, and also it will provide great input to bring change in the quality of health. So, you are kindly invited to answer genuinely and voluntarily. To fill out these questions, it may take 20 to 25 minutes.

Annex -II –Consent Form

I have read all the above information about this study, including the possible risks, side effects and the likelihood of any benefits to me. The consent and meaning of this information has been explained and is understood. All my questions have been answered. As a result of this, consent and voluntarily offer to follow the study requirements and participate in the study. When signing this consent, I promise to answer honestly to all reasonable questions and not provide any false information.

Witnessing and Signature

Investigator/Research assistant

Date

Result:

- 1. Questionnaire completed _____
- 2. Questionnaire partially completed _____
- 3. Participant refused _____
- 4. Others (please Specify) _____

Checked by Supervisor:

Name _____ Signature _____ Date ____/____/____

Annex III-Research Instruments

Questionnaire for knowledge, practice and associated factors of pediatric pain management practice of nurses.

Thank you for your time and cooperation to help me in this aspect of my specialty’s study. Your devoted time will help me to improve the understanding and management of pediatric pain in Ethiopia perspective. The attached questionnaire has four parts. There are Items in 1st part 7 items ,in 2nd part 14 items ,in 3rd part,14items ,in 4th part 5 items and in 5th part 4 items. It will take approximately 20-25 minutes to finish the questionnaire. This is not a test so no right or wrong answer, but it is very important for my study that you provide information by completing these questionnaires. Please answer the entire questionnaires individually and independently so that the information analyzed will be accurate and valid

Part 1: Demographic characteristics of nurse participants

Instruction: Below there are questions which intended to assessing your background. Please circle the number in front of the option you choose or if you are asked to write a response, please do in the blank space provided

S/N	Questions	Answer
101	How old are you?	1.20-24yrs 2. 25-29yrs 3.30-34yrs 4.> 34 yrs.
102	Gender	1.Male 2 .Female
103	Religion	1.Orthodox 2.Muslim 3.Protestant 4.Catholic 5.Others specify-----
104	Marital status	1.Single 2.Married 3.Divorced

105	Educational qualification in nursing	<p>4. Widowed</p> <ol style="list-style-type: none"> 1. Diploma 2. Bachelor of Science 3. Master of Science 4. Others
106	Year of experience	<ol style="list-style-type: none"> 1) 3 -6months 2) 6-11month 3) 1- 5 years 4) 6-10 years 5) More than 10 years
107	Duration of service in pediatric ward	<ol style="list-style-type: none"> 1) 3 -6months 2) 6-11month 3) 1- 5 years 4) 6-10 years 5) More than 10 years

Part 2. Questions related to nurses' knowledge towards pediatrics pain management

Instruction: Below are questions intended to assess your knowledge towards pediatrics pain management. Please circle one number for each question that describes your best on

S/ N	Question	True	False
201	Appropriate pain assessment is the first priority for effective pain management in pediatric patients	1	2
202	Self -reporting of pain is the golden standard for pain assessment	1	2
203	Intravenous is the recommended route of Administration of opioid analgesics to children with brief, severe pain.	1	2
204	Non pharmacological interventions (egg heat, music; touch are very effective for mild-moderate pain control but are rarely helpful for severe pain	1	2
205	Combining analgesics has better pain control than using a single analgesic agent	1	2
206	Acetaminophen and non-steroidal anti-inflammatory agents are not effective analgesics for children's mild pain	1	2
207	Pain should be assessed before and after administering pain drugs	1	2
208	Pain assessment by behavioral observation is not appropriate for children less than three year	1	2
209	Previous pain experience aggravate the current pain	1	2
210	The usual duration of action of IV morphine sulphate is 6-8 hours	1	2
211	The most common side effect of morphine is respiratory distress	1	2
212	Initially analgesics should be given around the clock on a fixed schedule	1	2
213	Morphine is the drug of choice for the treatment of prolonged moderate to severe pain for children	1	2
214	Children should be advised to use non-drug techniques along with pain medication.	1	2

Part3. Questions related to nurses’ practice towards pediatrics pain management

Instruction: Below are questions intended to assess your practice towards pediatric pain management. Please circle one number for each question that describes your practices best.

S/N	Questions	Alternatives
301	you observe behavioral change in children (such as being awake, crying, limited body movement, withdrawal, agitation, or not talking) in order to assess their pain	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
302	you measure physiological change in children (such as BP, respiration rate, heart rate, body temperature, or O2 saturation) in order to assess their pain	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
303	you assess children’s pain at least once a shift	1.Constantly 2.Frequently 3.Infrequently
304	you use pain assessment tool for pain assessment	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
305	You use self-reporting pain scale (such as VAS, FACE scale) for the assessment of children’s pain in your practice	1.Constantly 2. Frequently 3. Infrequently 4.Never
306	You use a behavioral pain scale (such as FLACC) for assessment of children’s pain in your practice	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
307	You administer pain medication to children as ordered by a doctor around the clock	1.Constantly 2. Frequently 3. Infrequently 4.Never Occasionally

308	You observe the side effects of pain medication (such as Morphine) after giving it to the child	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
309	You administer pain medication to children by your own Judgment	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
310	You reassess children's pain after giving pain medication in order to evaluate the effectiveness of pain medication	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
311	you distract children from pain by using several techniques(such as giving them toys for playing, listening to music, telling stories,touching them)	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
312	you talk with children with a soft voice to comfort them when they are in pain	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
313	you ask parents to be involved in assessing their children's pain (such as asking children if he/she has pain by using familiar words and language)	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally
314	You apply heat and cold compresses to manage pediatric pain	1.Constantly 2.Frequently 3.Infrequently 4.Never Occasionally

Part 4: Factor affecting nurses practice towards pediatric pain management

Instruction: For the following questions there are questions that assess factors that affect practice of pediatrics pain management. Please answer 'Yes', if you agree with the statement or, 'No' if you do not agree

S/ N	Questions	Yes	No
401	Is there pediatric pain management contents included in nursing curriculum when you studied	1	2
402	Have you undertaken any further continue education (training) relate to pediatric pain management after graduation?	1	2
403	Are there any pain management standards or Protocols in your hospital?	1	2
404	Is there any standard pain assessment tool in your Hospital?	1	2
405	Are essential analgesics available in your hospital (like opioids, NSAIDs)	1	2

Part 5: Factor affecting nurses' knowledge towards pediatrics pain management

S/ N	Questions	Yes	No
501	Is there pediatric pain management contents included in nursing curriculum when you studied	1	2
502	Have you taken any further training about pediatric pain management after graduation?	1	2
503	Are there any pain management protocols in Hospital?	1	2
504	Is there any standard pain assessment tool in your Hospital?	1	2

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