



ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

GRADUATE STUDY PROGRAM

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE
TOWARDS PEDIATRIC PAIN MANAGEMENT AMONG HEALTH
PROFESSIONALS WORKING IN SAINT PAUL HOSPITAL
MILLENNIUM MEDICAL COLLEGE.**

A THESIS

BY: JIMA DIRO(MD)

ADDIS ABABA, ETHIOPIA

March, 2026

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**A THESIS REPORT SUBMITTED TO THE DEPARTMENT OF ANESTHESIOLOGY,
CRITICAL CARE AND PAIN MEDICINE, SAINT PAUL HOSPITAL MILLENNIUM
MEDICAL COLLEGE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR
CERTIFICATION OF SPECIALTY IN ANESTHESIOLOGY, CRITICAL CARE AND
PAIN MEDICINE.**

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THESIS SUBMISSION APPROVAL SHEET

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

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THESIS APPROVAL SHEET

The thesis entitled-**Assessment of knowledge, attitude and practice towards pediatric pain management among health professionals working in saint Paul hospital millennium medical college**, submitted in partial fulfillment of the requirement for certification of specialty in anesthesiology, critical care and pain medicine has been carried out by Dr. Jima Diro, under my/our supervision and evaluation. This is to certify that the thesis is accepted by the board of examiners as a thesis meeting requirements for the certification of specialty in anesthesiology, critical care and pain medicine.

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ABBREVIATION AND ACRONYMS

ETB	Ethiopian Birr
LP	Lumbar Puncture
MD	Medical Doctor
NICU	Neonatal Intensive Care Unit
PACU	Post Anesthesia Care Unit
PHPKASRP	Pediatric Healthcare Providers' Knowledge and Attitudes Survey Regarding Pain
PICU	Pediatric Intensive Care Unit
PNKAS	Pediatric Nurses Knowledge and Attitude Survey
POPD	Pediatric Outpatient Department
PTSD	Post-Traumatic Stress Disorder
SPHMMC	Saint Paul Hospital Millennium Medical College
SPSS	Statistical Package for Social Sciences

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ABSTRACT

Background: Pain is an important public health problem due to both its frequency and impact on daily life. Despite increased awareness and improvements in pediatric pain assessment and management, findings show that the magnitude of poor management of pain in hospitalized children remains high. Different studies report a gap of knowledge among physicians and nurses regarding pediatric pain assessment and management including lack of awareness of pain scales in children and misconception about opioids use. Though some professionals have better understanding of pain the practicality is questionable. Therefore; this study aimed to assess the attitude, knowledge and practice towards pediatric pain management among health professionals working in Saint Paul hospital millennium medical college.

Methods: institution based cross sectional study among randomly selected 374 health professionals working in Saint Paul hospital was conducted. Pre validated self-administered digital questionnaire was employed to collect the data. All the collected data were entered into the statistical package for social science version 26.0 and analyzed. To identify factors associated with good practice of health professional, binary logistic regression was employed. The adjusted odds ratios, accompanied by a 95% confidence interval, were computed to interpret the results effectively. A p-value of less than 0.05 was deemed statistically significant for this study.

Results: The study found a favorable attitude of 81.6%, a good knowledge of 56.1% and a good practice of 55.9% among health professionals participated in the study. The odds of good practice were found to be 2.5 times higher among professional with two or more years of work experience (AOR = 2.5; 95% CI: 1.52, 4.05).

The likelihood of good practice among professionals with specific training on pediatrics pain assessment was 4.7 times higher than their counterparts (AOR= 4.7; 95% CI: 1.27, 17.33).

Conclusion: The attitude, knowledge and practice of health professionals towards pediatrics pain management revealed by this study are roughly comparable with the reports of other studies conducted in the country. However, there are significant differences compared to findings of studies from other countries. Adopting a clear guideline and providing specific training about pediatrics pain assessment could improve the knowledge and practice of pediatric pain management.

Key words: pediatrics pain, attitude, knowledge, practice, Saint Paul hospital.

1. INTRODUCTION

1.1 Background

Pain is defined by the international association for the study of pain as an unpleasant experience associated with, or resembling that associated with, actual or potential tissue damage(1). The definition has also underscored that pain is always a personal experience, different from nociception phenomena, and a concept that can be learned through life experience. An individual's report of pain should be respected and inability to communicate does not rule out the presence of pain(1).

Pain has been classified as acute and chronic. Acute pain is a specific nociceptive event, injury or illness, and is usually limited to short duration of period, less than three months, while chronic pain is defined as a pain that has persisted beyond the expected tissue repair time(2). Chronic pain can also be recurrent or prolonged, lasting more than three months(3).

There are various means of assessing pain in pediatrics. Self-report is thought to be most reliable and 'the gold standard' method for assessment of pain and measurement of its intensity in most children aged 4 years and older(2). Infants and young children are better assessed with behavioral method, which used to signal the need for intervention and to evaluate treatment effectiveness to reduce pain(4). Currently brain responses and pain biomarkers are being studied for their use in pediatric pain measurement (2).

Although various ways of pain measurement have been devised and validated, most of them failed to meet the needs of newborns and infants, especially the most vulnerable ones, preterm newborns, critically ill infants, infants with cognitive impairment or developmental delay(2). The lack of ideal pain assessment tool in neonates and infants continues to be a challenge in delivering optimal pain assessment and management for those populations(2).

The prevalence of chronic pain in children and adolescents is estimated to be one in five children, with girls having a higher prevalence of pain(3). However, the prevalence of chronic pain in children's of low and middle income countries challenged by insufficient data and reported to be much lower(5). Though, there are no precise estimates of prevalence of chronic pain in infants, they may be more vulnerable to the consequence of chronic pain(2).

1.2 Statement of the problem

Pediatric pain is prevalent, disabling, and costly(2). It is an important public health problem due to both its frequency and impact on daily life. Because of scarce use of appropriate pediatric pain assessment tools, the chance of underestimating of the burden is high(6).

Despite increased awareness and improvements in pediatric pain assessment and management, findings show that the magnitude of poor management of pain in hospitalized children remains high(7). Particularly, children with severe and moderate levels of pain were found to be more likely to receive inadequate pain management compared with those with a mild level of pain(8).

Evidences suggest that neonatal pain can result in long-term changes in cognitive and affective behavior(2). Findings show that pain is related to negative changes in the developmental domains of autonomy, identity, and peer relationships of children(9).

The effectiveness of pain management depends on different factors such as child sex and age, type of pain, analgesics administration, clinical experience, education and training of the health professional(7). Involvement of parent has also a paramount importance in pediatric pain management(10).

Different studies report a gap of knowledge among physicians and nurses regarding pediatric pain assessment and management including lack of awareness of pain scales in children and misconception about opioids use(11). It is reported that physicians prefer to distract and comfort children while performing painful procedures over using appropriate analgesics(12).

Though nurses have favorable attitude towards pain management, stating that measurement and control of pain in a child is essential and needs to be considered as a vital sign, the practicality is questionable(13,14).

This study is expected to explore the knowledge of health professionals about pediatrics pain assessment and management, their attitude about the need to properly assess and manage pain as well as their daily practice in reducing pediatrics pain in different wards of Saint Paul Hospital Millennium Medical College, one of the busiest teaching hospitals in Ethiopia. A similar study at Tikur Anbessa specialized hospital reported poor attitude, knowledge and practice among residents towards pediatric pain management. However this study is not comprehensive in its nature and the questionnaire were not pre-validated. This study tried to address those limitations.

1.3 Significance of the study

This study will have a paramount importance for health professionals by uncovering and reflecting on common misconceptions of pediatrics pain management. It will also be of great importance for hospital administrators and teaching department by showing the gap of knowledge and inconsistencies of practices as well as forwarding appropriate recommendations. The finding of the study can be used by policy makers as an input to design initiatives to ultimately improve pediatrics pain management. The study can also be used as a reference for similar studies that will be conducted in the field.

2. LITERATURE REVIEW

2.1 Overview of pediatric pain assessment and management

Despite the continuous exposure of hospitalized infants to multiple painful procedures for diagnostic and treatment purposes, acute pain during infancy has been ignored until recently due to biases and misconceptions as well as lack of a single reliable pain assessment tool that can be used to assess pain in infants(2,15). The inability of infants to verbally report pain and their perceived inability to remember it compounds the problem(2).

There are also limitations in pediatric pain management, especially for procedural and chronic pain(16). Health care professionals in different setups have also mentioned that they had difficulties with the assessment and management of chronic pain in children(17). Health care professionals attitudes and misconception on pediatric pain perception, opioid analgesia, multimodal analgesia, and non-pharmacologic pain therapies is a major contributor for suboptimal management of pain in pediatrics(14).

Knowledge about pediatric pain by healthcare professionals seems to be unsatisfactory and it varies among health care professionals based on level of education and years of experience(12,18,19). Even if health professionals demonstrate theoretical knowledge regarding pediatric pain management and its importance, there are difficulties in translating it into clinical practice(20). Systemic changes and medical staff training programs on pain assessment and treatment are believed to improve patient care(21).

2.2 Health professionals attitude towards pediatric pain

A cross sectional study conducted in Sudan reported that More than half of pediatric residents believe that neonatal perception of pain is less than that of older children and adults, and a third of them thought long term oral opioids are contraindicated in children. According to this study half of them believed children should not have routine topical anesthesia before non-urgent vein cannulation(11).

In one multicenter study conducted in Ethiopia on knowledge and attitude of nurses towards pediatric pain management, only 17.1% of nurses believed that children experience pain as much as adults and 74.8% believed that the patient is the accurate judge of the intensity of pain. 46.2% of nurses believe that post procedural pain is not a serious issue(14).

Similarly, a study conducted in Gonder reported that 32.3% of nurses believe that children tolerate pain better than adults and majority of them thought that children do not need analgesic drugs before having burn dressing changed(13). Likewise a study conducted in India reported that half of the participants believed that infants perceive pain less than adults and the majority felt that infants also forget pain faster than adults(22).

A study conducted among nurses in Germany on End-of-life opioid administration on neonatal and pediatric intensive care units reported that nearly four-fifth and three-fourth of NICU and PICU nurses favored starting opioid administration to dying NICU and PICU patients with signs of pain or distress, respectively(23).

2.3 Knowledge of pediatric pain assessment

Pediatric pain assessment is difficult and still evolving. The commonly used face pain rating scales were influenced by stimulus type, professional role, view context, and professional experience(24).

The national Danish survey on pediatric pain knowledge and attitude has depicted significant differences among health care professionals' awareness of pain management, stating a huge difference across departments, with a better knowledge reported among health care professionals who work in the pediatric setting(18). An integrative review on twenty seven studies on knowledge and attitude towards pediatric pain management concluded that nurses in general have poor knowledge and unsupportive attitudes towards pain and assessment and management of pain in infants and children(25).

According to one systematic mixed study review on pediatrics pain conducted in United Kingdom, Clinicians felt unprepared, reporting that education was insufficient for child pain assessment(26). Similarly a study conducted in Spain showed that health professionals report that they did not receive sufficient training in the management of pediatric chronic pain(17). Studies conducted in Ethiopia and Sudan revealed that more than two-third of resident physicians had never received any kind of formal training, education, or learning sessions in pediatric pain assessment and management during their training as residents(11,12).

A cross sectional survey from Southern Nigeria showed that Majority of health professionals participating in the study are unaware whether a standard protocol for management of pain in children exist in the hospital(27). Similarly, a cross sectional study conducted in India reported

that Only 40% nurses knew about pain scoring system and a little more than half of the nurses knew that children can tolerate opioids(22).

A study that surveyed Taiwanese pediatric clinicians' knowledge and attitudes toward pain management reported a 23.67 average correct response rate on questions measuring knowledge. It also found a significant positive relationship between clinicians' knowledge and prior training experience(25). One systematic review and meta-analysis in Ethiopia reported that the pooled prevalence for good knowledge of pediatric pain management among nurses in Ethiopia was 60%(28). Another multi-site survey conducted in South Gonder showed that three quarters of participating nurses demonstrated inadequate knowledge, scoring below 50% on Pediatric Nurses Knowledge and Attitude survey (PNKAS) regarding pediatric pain management(29). In contrast, a cross sectional study from Bahirdar reported that 57.8% of nurses participated on the study had good knowledge about pediatric pain management(30).

2.4 Pain management practices

A survey of Canadian pediatric emergency physicians reported that despite the availability of effective topical analgesics, 60% of physicians provide no analgesia for pediatric urinary catheterizations; half of them use analgesia for venipuncture and two-third of physicians use topical anesthetic for lumbar puncture (LP)(31). On the contrary, more than 90% of pediatric and pediatric surgical residents in Tikur Anbessa hospital use distraction, comforting, and providing position during LP procedure in children(12).

A study conducted on variability of analgesics practices in North America showed a significant variations in the prescription and administration of analgesics for pediatrics pain management with a high likelihood of sub-therapeutic doses prescribed for children(32). Similarly, resident physician in Sudan believe that opioids were either under prescribed or rarely prescribed(11).

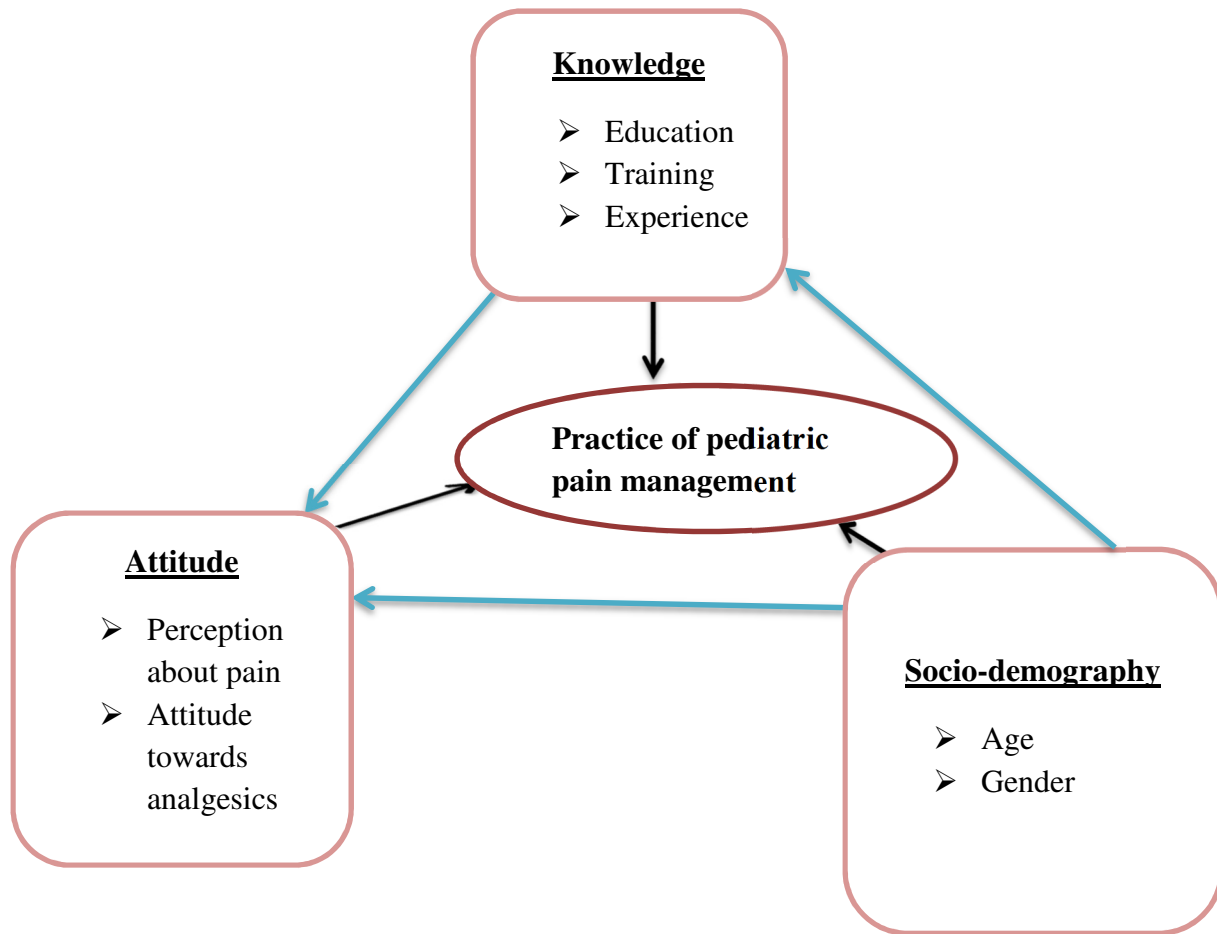
According to studies conducted in teaching hospitals in Ethiopia and Sudan, none of the pediatric residents in Sudan and Most residents (86.2%) in Ethiopia were not using pain scales to assess children's pain(11,12). Another study from India reported that none of the participated nurses use pain scoring system to assess pediatric pain(22).

A systematic review in Ethiopia showed that the pooled prevalence for good practice of pediatric pain management among nurses was 42%(28). A cross sectional study carried out in Bahirdar

showed that 53.6% nurses had good practice regarding the pain management of children(30). But another study conducted in Northern Ethiopia reported that 30.4% of participants never prescribed opioids when necessary to relieve neonatal pain(25).

The practice of pain management can be affected by various factors. A qualitative study conducted in Canada concluded that Clinicians are less comfortable prescribing opioids to children for at-home use and find pain assessment and lack of clear guidelines to be barriers to pain care(33). A systematic review conducted in the United Kingdom reported that fearing the side effects of strong analgesics, insufficient experience or inadequate education and training as well as lack of support from colleagues negatively affect administration of analgesics for pediatric pain management(26). Likewise a systematic review in Ethiopia revealed that Nurses with better educational status, prior training and in-service training perform better in pediatric pain management practice(28).

2.5 Conceptual framework



Adapted with modification from (22,27,28,30).

Figure 1 Conceptual frame work for the study on Assessment of Knowledge, Attitude and Practice towards pediatric pain management among health professionals working in Saint Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia

3. OBJECTIVES

General objective

- To assess Knowledge, Attitude and Practice towards pediatric pain management among health professionals working in SPHMMC, Ethiopia

Specific objectives

- To assess the knowledge of health professionals about pediatric pain management
- To explore the attitude of health professionals towards pediatric pain management
- To study the practice of health care professionals in managing pediatric pain
- Determine factors affecting the practice of health care professionals during pediatric pain management

4. METHODS AND MATERIALS

4.1 Study area and period

The study was conducted in Saint Paul Hospital Millennium Medical College (SPHMMC), one of the largest teaching hospitals in Ethiopia, located in Addis Ababa, the capital city of Ethiopia. The hospital was established in 1968 by the late Emperor Haile Selassie and the medical school opened in 2007. The college has more than 2800 clinical, academic and administrative and support staffs that provide medical specialty services to patients. While the inpatient capacity is more than 700 beds, The College sees an average of 1200 emergency and outpatient clients daily.

The study conducted among health care professionals including medical interns, nurses, anesthetists, residents and senior physicians working with pediatrics in various wards of the hospital including neonatal intensive care unit(NICU), pediatric intensive care unit(PICU), pediatric emergency department, pediatric outpatient department(POPD), pediatric operation room and pediatric post anesthesia care unit(PACU). The study assessed the Knowledge, Attitude and Practice towards pediatric pain management among those health care professionals between September and December 2025.

4.1 Study design

An institution-based cross sectional study was conducted to assess the knowledge, attitude and practice of health care professionals to wards pediatric pain management.

4.2 Population

Source population: All health care professionals working with pediatrics in Saint Paul hospital millennium medical college in between September and December 2025.

Study unit: All randomly selected health care professionals working with pediatrics in Saint Paul hospital millennium medical college between September and December 2025, who fulfilled the inclusion criteria and included in the study.

4.3 Eligibility criteria

Inclusion criteria: All health care professional currently practicing on pediatric age group in Saint Paul Hospital Medical College and consented to participate in the study were included.

Exclusion criteria: Health care professionals practicing on pediatric age group in Saint Paul Hospital Medical College but unable to participate because of illness and those who do not consent to participate in the study were excluded from the study.

4.4 Sample size determination and sampling techniques

Sample size determination

The sample size of the study was calculated by using a single population proportion formula for cross sectional study with the assumption of: 67.1% proportion of nurses with good knowledge from the study conducted in tertiary hospitals in Ethiopia(14), 95% confidence level and 5% margin of error. 10% was added for possible non-response, making the final sample size 374.

$$n = \frac{\left(z \frac{\alpha}{2}\right)^2 \times (p \times 1 - p)}{d^2}$$
$$n = \frac{(1.96)^2 \times (0.67 \times 1 - 0.33)}{(0.05)^2}$$
$$n = 340$$

n = the sample size

z = the value corresponding to a 95% level of significance

p = the prevalence in the previous study and

d = the margin of error assumed to be 5%.

Sampling technique

The total number of health care professionals employed in pediatrics, pediatric surgery, Pediatric PACU and PICU were stratified into their respective profession, consultants, residents, medical interns, anesthetists and nurses. The list of nurses, residents and consultants working in those departments was obtained from human resource administrators and samples were proportionately allocated to each profession. Simple random sampling, using lottery method was deployed to select study participants. Fig 2.

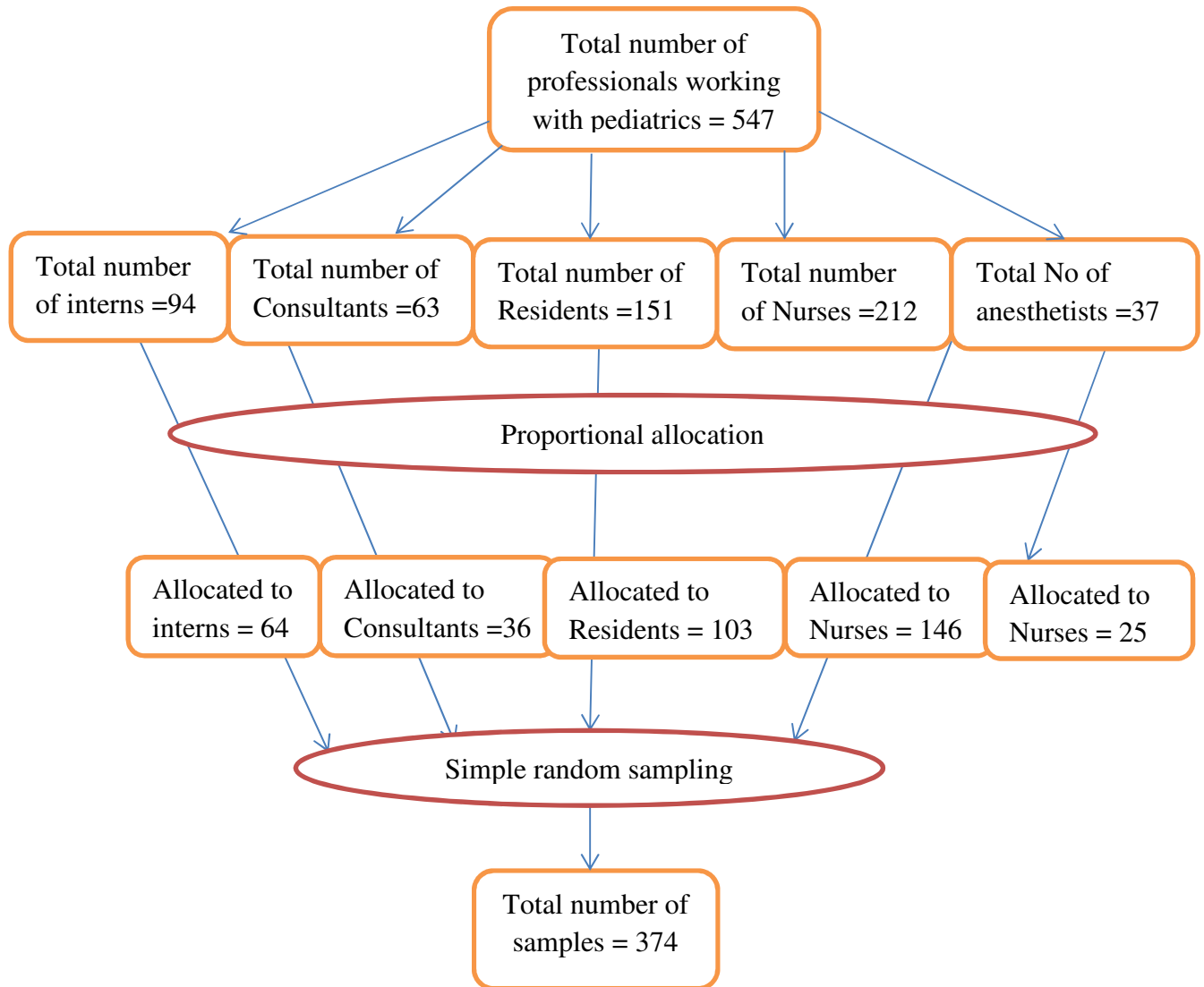


Figure 2 Sampling frame for the study on Assessment of Knowledge, Attitude and Practice towards pediatric pain management among health professionals working in Saint Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia

4.5 Operational definitions and measurement

Good knowledge: when proportion of participants who score more than average on the overall pain assessment and management questions exceeds 50%(13)

Poor knowledge: when proportion of participants who score more than average on the overall pain assessment and management questions is less than 50% (13).

Favorable attitude: when proportion of participants who score more than average on the overall

question on attitude is above 50%(13).

Unfavorable attitude: when proportion of participants who score more than average on the overall question on attitude is below 50% (13).

Good practice: when proportion of participants who score more than average on the overall pain management practice question (responding sometimes/always to the practice question) is above 50%(34).

Poor practice: when proportion of participants who score more than average on the overall pain management practice question (responding sometimes/always to the practice question) is below 50%(34).

4.6 Data collection procedure

Data were collected by using a structured self-administered digital questionnaire using kobo toolbox. A pre-validated questionnaire, Pediatric Healthcare Providers' Knowledge and Attitudes Survey Regarding Pain (PHPKASRP) was adopted with modification and used for data collection(35). Data were collected by the principal investigator and four medical interns from SPHMMC. Before data collection data collectors were trained on data collection tool and data collection process. The entire process of data collection was supervised by the principal researcher.

4.7 Data quality assurance

Data quality was checked by ensuring the quality of data collection tool. Pre-test was conducted on 5% of the total sample size at Tikur Anbessa hospital and necessary corrections were made accordingly. Training was given to the data collectors. The filled questionnaires were checked by data collectors and Principal investigator for completeness and clarity on a daily basis.

4.8 Data management and analysis

All the collected data were entered into the statistical package for social science (SPSS) version 26.0 for data cleaning and analysis. Descriptive statistics were computed for all variables according to the type of variables. Categorical variables were assessed by computing frequency and proportions. A binary logistic regression model was used to determine the significant association between dependent and independent variables. Variables that had an association with the outcome variable at a p-value ≤ 0.25 were selected for multivariable analysis. The Hosmer Lemeshow test

was applied to test the model's goodness of fit. Odds ratios with 95% CI were used to show the strength and direction of the associations. Finally, variables with a p-value of less than 0.05 were considered statistically significant.

4.9 Ethical consideration

Ethical approval was obtained from Saint Paul Hospital Millennium Medical College ethical review board with a protocol number; SPHMMC-ERC374/25. The study participants were provided with adequate information about the study, confidentiality, and their rights during data collection and written informed consent was taken from participants before data collection. We declare that there is no conflict of interest.

5. RESULTS

5.1 Demographic status of participants

Slightly more than half of the participants (51.9%) were female health professionals. The minimum age of the participant was 22 while the maximum was 42 years old. The mean age of the health professionals participated in this research was 28.6 with a standard deviation of 3.75.

5.2 Professional and training status of participants

The mean year of experience of the participating health professionals was 3.2. The minimum and maximum years of experience were six months and 25 years respectively. Only 53(14.2%) health professionals had specific training on pediatric pain assessment and only 49(13.1%) participants had specific training on pediatric pain management. Table 1

Table 1 Specific training status by profession of health professionals participated on the study of knowledge, attitude and practice of health professionals towards pediatric pain management

Profession	Ever had specific training on pediatric pain assessment		Ever had specific training on pediatric pain management	
	Yes (%)	No (%)	Yes (%)	No (%)
Anesthetist	3(12%)	22(88%)	3(12%)	22(88%)
Consultant	4(11.1%)	32(88.9%)	5(13.9%)	31(86.1%)
Medical intern	8(12.5%)	56(87.5%)	6(9.2%)	58(90.8%)
Nurse	27(18.5%)	119(81.5%)	22(15.1%)	124(84.9%)
Resident	11(10.7%)	92(89.3%)	13(12.6%)	90(87.4%)
Total	53(14.2%)	322(86.1%)	49(13.1%)	329(86.9%)

5.3 Knowledge and attitude of health professional

On the knowledge assessment of health professionals towards pediatric pain 210(56.1%) of participants have correctly answered at least fifty percent of the questions. By the operational definition of this study 56.1% had good knowledge about pediatric pain. On the attitude

questionnaire 305(81.6%) of the participants had good attitude towards pediatric pain. While only 18.4% had poor attitude about it (annex 1).

5.4 Practice of pediatric pain management

More than half of the participants (55.9%) showed that they have good practice concerning pediatric pain management. Slightly more than sixty percent (60.4%) of the health professionals participated in this research reported that they do not routinely use pediatric pain scoring system in their daily practice. Majority (77.7%) of those who use pediatric pain scoring system prefers to use behavioral pain scoring system while the rest uses self-reporting. See figure below.

More than two-thirds(70.1%) of the participating health professionals had never used local anesthetics/analgesics before procedures like venipuncture, urinary catheterization of NG tube insertion and 40.6% of the participants never used local anesthetics/analgesics before lumbar puncture procedure. A significant proportion of participants (48.7% and 50.8%) had never prescribed or administered NSAIDs for mild to moderate acute pain and opioids for moderate to severe pain respectively. More than sixty percent of the health professionals participated in this study had never prescribed or administered the combination of NSAIDs and opioids. Table 2.

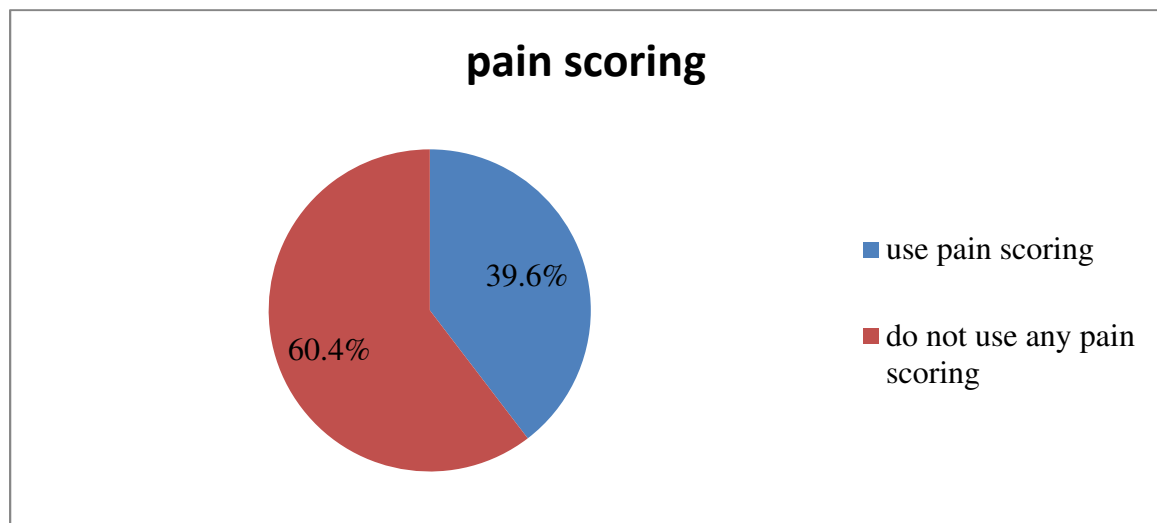


Figure 3 Practice of pediatric pain assessment for the study on knowledge, attitude and practice of health professionals towards pediatric pain management.

Table 2 Practice of health professionals participated on the study of knowledge, attitude and practice of health professionals towards pediatric pain management.

Question	Always N (%)	Sometime s N (%)	Rarely N (%)	Never N (%)
How often do you prescribe/administer NSAID for mild to moderate acute pain	126(34%)	2(0.5%)	63(16.8%)	182(48.7%)
How often do you prescribe opioids for moderate to severe acute pain	123(32.9%)	3(0.8%)	57(15.2%)	190(50.8%)
How often do you prescribe/administer the combination of NSAIDs and opioids	42(11.2%)	7(1.9%)	95(25.4%)	230(61.5%)
How often do you use non-pharmacologic pain management for infants/children with mild to moderate acute pain	71(19%)	7(1.9%)	120(32.1%)	175(46.8%)
How often do you use non-pharmacologic pain management for infants/children with moderate severe pain acute pain	70(18.7%)	24(6.4%)	106(28.3%)	174(46.5%)
How often do you combine non pharmacologic and pharmacologic pain managements for infants/children with moderate severe pain acute pain	92(24.6%)	12(3.2%)	77(20.6%)	193(51.6%)

5.5 Factors affecting the practice of health professionals towards pediatric pain management

The binary logistic regression showed that age, profession, year of experience and having a specific training on pediatrics pain assessment or management have significant impact on the knowledge of health professionals towards pediatric pain management. On the contrary, gender has no effect on pain management practice. On multivariable logistic regression only having experience of more than two years and having specific training on pediatric pain assessment were significantly associated with a better practice of pain management. Table 3 and 4

Table 3 Multi-variable logistic regression analysis of factors affecting the practice of health professional towards pediatric pain management

Variable	Poor knowledge	Good knowledge	COR ^a (95% CI ^b)	AOR ^c (95% CI)	P-value
	Frequency n (%)	Frequency n (%)			
Age of the health professional					
<30 Years	138(83.6%)	135(64.6%)	1	1	
=>30 Years	27(16.4%)	74(35.4%)	2.801(1.70-4.62)	1.673(0.95-2.96)	0.077
Years of experience					
<2 years	117(70.9%)	87(41.6%)	1	1	
=>2 years	48(29.1.1%)	122(58.4%)	3.418(2.21-5.28)	2.483(1.52-4.05)	0.000*
Have specific training on pediatric pain assessment					
Yes	7(4.2%)	46(22%)	1	4.691(1.27-17.33)	0.020*
No	158(95.8%)	163(78%)	0.157(0.07-0.36)	1	
Having specific training on pediatrics pain management					
Yes	7(4.2%)	42(20.1%)	1	1.109(0.29-4.29)	0.881
No	158(95.8%)	167(79.9%)	0.176(0.08-0.40)	1	

^a Crude odds ratio ^b confidence interval, ^c adjusted odds ratio, ^{*} significant at p value 0.05

6. DISCUSSIONS

Although untreated pain can have a tremendous impact on physiological and psychological wellbeing of pediatric population, pediatric pains have been undermined under different circumstances and due to various reasons. In the context of developing countries, the understanding

of pediatric pain and suffering can be affected by the attitude and knowledge of health professionals towards pediatric pain which intern can be affected by the level of educational training, year of experience and professional motivation as well as availability of up-to-date guidelines and resources. This study aimed to assess the knowledge, attitude and practice towards pediatric pain management among health professional working in Saint Paul hospital millennium medical college. The finding of this research plays a significant role in informing targeted intervention strategies to optimize pediatric pain management. Additionally, raising awareness among healthcare providers about the practice of pediatric pain assessment and management will be vital for improving overall pediatrics pain management practices.

According to the finding of this report 81.6% of the participants had favorable attitude towards pediatric pain management. This number is grossly comparable to the finding of the study conducted among nurses working in tertiary hospitals of northwest Ethiopia but it is slightly higher than a study conducted among pediatric residents in Sudan(11,14).

This study showed that 56.1% of health professionals participated in this study had good knowledge about pediatrics pain management. The finding is somehow lower than the reports of studies conducted in Gondar university comprehensive hospital, tertiary hospitals in northern Ethiopia and one systematic review and meta-analysis of nine studies conducted in Ethiopia among nurses(13,14,28). However, the report is significantly higher than the finding of another cross sectional study conducted in the same area(29). This discrepancy could be due to a genuine gap in knowledge among health professionals or due to differences in methodology (administered questionnaire), therefore conducting standardized study is recommended. Regarding training, 89.3% of residents participated in the study replied that they have never had specific training on pediatric pain assessment. This is higher than the finding reported by a study conducted among Sudanese residents(11).

Practice towards pediatric pain management was reported to be good among 55.9% of health professionals participated in this study. This finding is higher than the reported percentage of good practice by a systematic review and meta-analysis conducted among nurses in Ethiopia(28).

Similar to a study conducted among pediatric residents in Sudan(11), 60.4% of health professionals never used pediatric pain scoring system in their daily practice. This finding is much lower than the finding reported by a cross sectional study conducted among pediatric and pediatric surgery

residents in Tikur Anbessa specialized hospital but higher than the reports from a study conducted among nurses in India and a survey of Italian pediatrician (6,12,22).

More than seventy percent of participants never used local anesthetics/analgesics for procedures like urinary catheterization or venipuncture. The finding is higher than the one reported from the study conducted among Canadian pediatric emergency physicians where more than 40% have used analgesics but the finding is better than the report from a study conducted in Tikur Anbessa(12,31). Unlike the studies conducted in Tikur Anbessa where none of the participants used anesthesia or analgesia, 59.4% of participants reported that they used anesthesia/analgesia during lumbar puncture.

Year of experience and having a specific training on pediatrics pain assessment were the two significant factors associated to better practice towards pediatrics pain management. Health professionals with more than two years of experience were more than two times more likely to have a good practice of pain management (AOR = 2.5; 95% CI: 1.52, 4.05). This data is supported by a similar finding from a study conducted among nurses in northwest Ethiopia (30,34).

Health professionals who had specific training about pain management are expected to show better practice. A systematic review and meta-analysis of studies conducted among nurses in Ethiopia reported that pre-service and in-service trainings were positively associated with good practice of pediatrics pain management. Likewise, health professionals who had specific training on pediatrics pain assessment in this study had more than four times (AOR= 4.7; 95% CI: 1.27, 17.33) higher chance of performing better on pediatric pain management practice.

Strength and limitation of the study

The study used a standardized and pre-validated questionnaire to better assess the attitude, knowledge, and practice of a diversified health care professionals which has increased the validity of the study. However, due to the cross sectional nature of the study, the report is not immune to recall and desirability biases. The study is institution based, being conducted in a teaching hospital where there are lots of trainees in the process of acquiring knowledge and building attitude, the finding of this study may not be generalized to other non-teaching health care facilities.

Conclusion

In conclusion, this study used a pre-validated questionnaire to assess the attitude, knowledge and practice of health professionals toward pediatric pain management. Generally it can be concluded that the knowledge, attitude and practice of health professionals toward pediatric pain management in Saint Paul hospital are good. Year of experience more than two years and having a specific training on pediatrics pain assessment were positively associated to good practice of pediatrics pain management.

Recommendation

Based on the findings of this study the author recommends the hospital to use a standardized pediatrics pain assessment tools. The institution is also expected to provide specific training on pediatrics pain assessment and management for their trainees. Adapting a guideline with a clear management protocol for pediatric pain assessment and management could improve the practice of pediatric pain management.

7. REFERENCES

1. International Association for the Study of Pain Terminology Working Group. IASP Revises Its Definition for the First Time Since 1979. Int Assoc Study Pain [Internet]. 2020;4. Available from: <http://186.42.188.158:8090/guias/TRATAMIENTO DEL DOLOR ONCOLOGICO EN ADULTOS.pdf>
2. Asaf S, Ijaz A. Oxford Textbook of Pediatric Pain. Vol. 26, Anaesthesia, Pain & Intensive Care. 2022. 578–579 p.
3. Chambers CT, Dol J, Tutelman PR, Langley CL, Parker JA, Cormier BT, et al. The prevalence of chronic pain in children and adolescents: a systematic review update and

- meta-analysis. *Pain*. 2024;165(10):2215–34.
4. Blount RL, Loiselle KA. Behavioural assessment of pediatric pain. *Pain Res Manag*. 2009;14(1):47–52.
 5. Liao ZW, Le C, Kynes JM, Niconchuk JA, Pinto E, Laferriere HE, et al. Paediatric chronic pain prevalence in low- and middle-income countries: A systematic review and meta-analysis. *eClinicalMedicine* [Internet]. 2022;45:101296. Available from: <https://doi.org/10.1016/j.eclinm.2022.101296>
 6. Marseglia GL, Alessio M, Da Dalt L, Giuliano M, Ravelli A, Marchisio P. Acute pain management in children: A survey of Italian pediatricians. *Ital J Pediatr*. 2019;45(1):1–12.
 7. Birnie KA, Hons BA, Chambers CT, Fernandez C V, Forgeron PA, Latimer MA, et al. Hospitalized children continue to report undertreated and preventable pain. 2014;19(4):198–204.
 8. Kasahun AE, Abebe RB. adequacy among hospitalized. 2023;(August).
 9. Jones A, Ms C, Caes L, Mcmurtry CM, Eccleston C, Jordan A. Sociodevelopmental Challenges Faced by Young People with Chronic Pain : A Scoping Review. 2021;46(November 2020):219–30.
 10. Greenfield DK, Carter B, Harrop DE, Jassal DS, Bayliss MJ, Renton DK, et al. Healthcare Professionals’ Experiences of the Barriers and Facilitators to Pediatric Pain Management in the Community at End-of-Life: A Qualitative Interview Study. *J Pain Symptom Manage*. 2022;63(1):98–105.
 11. Alhassan MAA, Ahmed FE, Bannaga AA. Pain assessment and management: The knowledge, attitude and practice of Sudanese Paediatric Residents. *Sudan J Paediatr* [Internet]. 2017;17(1):25–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29213167>0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC5621854
 12. Dana D, Tefera M. Knowledge, attitude, and practice of pain assessment and management in children among pediatric and pediatric surgical residents in Tikur Anbessa Specialized Hospital. *Ethiop J Heal Dev* [Internet]. 2021;35(3):177–82. Available from: <https://www.ajol.info/index.php/ejhd/article/view/222702>

13. Lulie E, Berhanu M, Kassa SF. Knowledge, attitude, and associated factors toward pediatric pain management among nurses at the University of Gondar Comprehensive Specialized Hospital: A cross-sectional study. *SAGE Open Med.* 2022;10.
14. Tagele TD, Berhe YW. Knowledge and attitude towards pediatric pain management among nurses at Ethiopian tertiary hospitals ; a multi-center study. 2023;1–8.
15. Arabiat D, Mörelius E, Hoti K, Hughes J. Pain assessment tools for use in infants: a meta-review. *BMC Pediatr* [Internet]. 2023;23(1):1–22. Available from: <https://doi.org/10.1186/s12887-023-04099-7>
16. Dowden S, McCarthy M, Chalkiadis G. Achieving organizational change in pediatric pain management. *Pain Res Manag.* 2008;13(4):321–6.
17. Pico M, Matey-rodr C, Dom A, Lista S, Santos-lozano A. Healthcare Professionals ' Knowledge about Pediatric Chronic Pain : A Systematic Review. 2023;
18. Würtz G, Schmidt C, Sixtus C, Teilman G, Konradsen H. Pediatric pain knowledge and attitudes among health care professionals — - A National Danish Survey. 2023;(February):76–85.
19. Zuazua-Rico D, Maestro-Gonzalez A, Cano-García C, Mosteiro-Diaz MP. Spanish Validation of Pediatric Nurses Knowledge and Attitudes Survey Regarding Pain. *Pain Manag Nurs* [Internet]. 2023;24(3):365–70. Available from: <https://doi.org/10.1016/j.pmn.2022.09.007>
20. Gaúcha R. Pain management in hospitalized children : unveiling barriers from the nursing perspective. 2024;1–12.
21. Ganzijeva K. Evolution in acute pain assessment and treatment in the paediatric emergency department of a tertiary health care centre. *Eur J Pain.* 2020;24(November 2019):773–82.
22. Patnaik S, Swain N, Behera CK, Jain MK, Nayak MK. Evaluation of knowledge, perception, attitudes, and practices of pain management of children among pediatric nursing personnel of a tertiary care hospital. *Indian J Child Health.* 2017;4(1):75–8.
23. Garten L, Daehmlow S, Reindl T, Wendt A, Münch A, Bühner C. End-of-life opioid

- administration on neonatal and pediatric intensive care units : Nurses ' attitudes and practice. *Eur J Pain*. 2011;15:958–65.
24. Deindl P, Luister A, Vettorazzi E, Pointner N, Singer D, Berger A. Eyes on Newborns : How NICU Staff ' s Attention and Emotions Shape Neonatal Pain Assessment. *Eur J Pain*. 2025;29:1–11.
 25. Peng NH, Amy RN, Chih H, Chao L, Chen H, Lee MC, et al. Knowledge and attitudes of pediatric clinicians regarding pediatric pain management. 2020;(May).
 26. Whitley GA, Hemingway P, Law GR, Jones AW, Curtis F, Siriwardena AN. The predictors , barriers and facilitators to effective management of acute pain in children by emergency medical services : A systematic mixed studies review. 2021;
 27. Centre T. Management of Paediatric Pain : Knowledge and Practice of Healthcare Providers Management of Paediatric Pain : Knowledge and Practice of Healthcare Providers at a Tertiary Centre ,. 2019;(March).
 28. Abebe MT, Tegegne KT, Shiferaw DA, Gonete YA. Knowledge and practice of pediatric pain management and associated factors among nurses in Ethiopia : a systematic review and meta - analysis. *BMC Nurs* [Internet]. 2024; Available from: <https://doi.org/10.1186/s12912-024-02507-6>
 29. Fenta E, Kibret S, Hunie M, Tamire T, Eshetie D, Seid S, et al. Nurses ' knowledge and attitude. 2023;(June):1–6. Available from: <https://doi.org/10.3389/fped.2023.1182529>
 30. Berihun B, Fentahun N, Asmare L, Anteneh Z, Id Y. Practice and factors associated with pediatrics pain management among nurses working in Bahir Dar city public hospitals : A mixed method study. 2024;216:1–26. Available from: <http://dx.doi.org/10.1371/journal.pone.0300853>
 31. Ali S, Chambers A, Johnson DW, Newton AS, Vandermeer B, Williamson J, et al. Reported practice variation in pediatric pain management : a survey of Canadian pediatric emergency physicians. 2014;16(5):352–60.
 32. Jacob E, Puntillo KA. Variability of Analgesic Practices for Hospitalized Children on Different Pediatric Specialty Units. 2000;20(1):59–67.

33. Slim G, Manen M Van, Fowler M, Poonai N, Ali S. What influences physician opioid prescribing for children with acute pain? *Br J Pain*. 2023;17(2):195–205.
34. Alemu EA, Tawuye HY, Ferede YA, Fentie DY. Paediatrics pain management practice and associated factor among nurses at comprehensive and specialized hospital, Northwest Ethiopia, 2023: hospital based multicentre cross-sectional study. 2023;43–50.
35. Kusi A, Id A, Bam V, Stolt M, Korhonen J, Axelin A. Evaluating the content validity of two versions of an instrument used in measuring pediatric pain knowledge and attitudes in the Ghanaian context. 2020;1–17. Available from: <http://dx.doi.org/10.1371/journal.pone.0241983>

Annex I result summary of participants' score on the study of knowledge, attitude and practice of health professionals towards pediatric pain management

Attitude questions	Right answer N (%)		Wrong answer N (%)	
Because their nervous system is underdeveloped, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences	238	63.6	136	36.4

Comparable stimuli in different people produce the same intensity of pain	321	85.8	53	14.2
Infants/ children/ adolescents may sleep in spite of severe pain	253	67.6	121	32.4
Parents should not be present during painful procedures.	240	64.2	134	35.8
Spiritual beliefs may lead a child /adolescent to think that pain and suffering are necessary	297	79.4	75	20.1
The most accurate judge of the intensity of the child's/ adolescent's pain is the	198	52.9	176	47.1
Which of the following describes the best approach for cultural considerations in caring for a child/adolescent in pain?	220	58.8	154	41.2
Children generally over report their pain	288	77.0	84	22.5
Knowledge questions	Right answer N (%)		Wrong answer N (%)	
Most children as young as 4 years of age can reliably report pain intensity using a developmentally appropriate self-report tool.	197	52.7	177	47.3
Giving children/ adolescents sterile water by injection (placebo) is often a useful test to determine if the pain is real	277	74.1	95	25.4
Pediatric patients (infants, children, adolescents) who can be distracted from pain usually do not have severe pain	259	69.3	115	30.7
Observable changes in vital signs must be relied upon to verify a child's/ adolescents self-report of severe pain.	117	31.3	256	68.4
Children who will require repeated painful procedures (e.g., daily blood draws), should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures.	332	88.8	38	10.2
Evidence-based non-drug interventions are very effective for mild-moderate pain control but are rarely helpful for more severe pain.	62	16.6	312	83.4
The child/ adolescent should be advised to use non-drug techniques alone rather than concurrently with pain medications.	272	72.7	101	27.0

Combining analgesics (e.g. using acetaminophen, topical anesthetics) and non-drug therapies (e.g. sucrose, non-nutritive sucking) that work by different mechanisms may result in better pain control with fewer side effects than using a single analgesic agent	350	93.6	24	6.4
Young infants, less than 6 months of age, cannot tolerate opioids for pain relief	222	59.4	151	40.4
The child/ adolescent with pain should be encouraged to endure as much pain as possible before resorting to an opioid for pain relief.	283	75.7	90	24.1
The usual time to peak effects for traditional analgesics (acetaminophen, non-steroidal anti-inflammatory drugs, and opioids given orally is	102	27.3	272	72.7
The usual duration of analgesia of morphine IV is 4-5 hours	78	20.9	294	78.6
Analgesics for post-operative pain should initially be given	300	80.2	74	19.8
The recommended route administration of opioid analgesics to children with brief, severe pain of sudden onset, e.g., trauma or postoperative pain, is	333	89.0	41	11.0
Which of the following drugs are potentially useful for treatment of children's cancer pain	189	50.5		
Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for children with cancer?	284	75.9	90	24.1
The recommended route of administration of opioid analgesics to children with prolonged cancer-related pain is	232	62.0	142	38.0
Analgesia for chronic cancer pain should be given:	210	56.1	164	43.9
The most likely reason a child/ adolescent with pain would request increased doses of pain medication is	374	100.0		
Anxiolytics, sedatives and barbiturates are appropriate medications for the relief of pain during painful procedures.	189	50.5	185	49.5
Benzodiazepines do not reliably potentiate the analgesia of opioids unless the pain is related to muscle spasms	213	57.0	160	42.8

Respiratory depression rarely occurs in children/ adolescents who have been receiving stable doses of opioids over a period of months	291	77.8	83	22.2
After the initial dose of opioid analgesic is given, subsequent doses should be adjusted based on the individual patient's response	333	89.0	41	11.0
Beyond a certain dosage of morphine, increases in dosage will NOT provide increased pain relief	127	34.0	246	65.8
Adolescents with a history of substance abuse should not be given opioids for pain because they are at high risk for repeated addiction	142	38.0	231	61.8
Sedation always precedes opioid related respiratory depression	241	64.4	129	34.5

Practice questions	Yes		No	
Do you routinely use pediatric pain scoring system	148	39.6	226	60.4
	behavioral		Self-report	
Which pain scoring system do you often use	115(77.7%)		33(22.3%)	
Do you use local anesthetics/analgesics before procedures like venipuncture, urinary catheterization of NG tube insertion	111	29.7	262	70.1
Do you use local anesthetics/analgesics before lumbar puncture procedure	222	59.4	152	40.6
	Always	sometimes	Rarely	Never
How often do you prescribe/administer NSAID for mild to moderate acute pain	126(34%)	2(0.5%)	63(16.8%)	182(48.7%)
How often do you prescribe opioids for moderate to severe acute pain	123(32.9%)	3(0.8%)	57(15.2%)	190(50.8%)

How often do you prescribe/administer the combination of NSAIDs and opioids	42(11.2%)	7(1.9%)	95(25.4%)	230(61.5%)
How often do you use non-pharmacologic pain management for infants/children with mild to moderate acute pain	71(19%)	7(1.9%)	120(32.1%)	175(46.8%)
How often do you use non-pharmacologic pain management for infants/children with moderate severe pain acute pain	70(18.7%)	24(6.4%)	106(28.3%)	174(46.5%)
How often do you combine non pharmacologic and pharmacologic pain managements for infants/children with moderate severe pain acute pain	92(24.6%)	12(3.2%)	77(20.6%)	193(51.6%)

Annex II: Ethical clearance for the study of knowledge, attitude and practice of health professionals towards pediatric pain management



IRERC approval letter
Protocol number: - SPHMMC-ERC-374/25

Ref. No. PM23/238
Date: 07/10/2025

Protocol Title: Assessment of knowledge, attitude and practice towards Pediatric pain management among health professionals working in Saint Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia

Investigators: Dr. Jima Diro

Study Site: - St Paul's Hospital Millennium Medical College.

Application Type: Initial ☒ Amendment ☐ Renewal ☐
Review Procedure: Full Board ☐ Expedited ☐ Secretariat ☒
Decision of the meeting: ☒ Approved

- I. Elements approved- 1. Protocol Version No. V-1
2. Protocol Version Date 01/10/2025
3. Informed consent Version No. V-1
4. Informed Consent Version Date 01/10/2025
5. CRF Version No. _____
6. CRF version Date _____

II. Obligations of the PI-

1. Should comply with the standard international & national scientific and ethical guidelines
2. All amendments and changes made in protocol and consent form needs IRERC approval
3. The PI should report SAE within 10 days of the event
4. End of the study, including manuscripts and thesis works should be reported to the IRERC

IRERC Approval date: 02/10/2025

Approval period from 02/10/2025 to 01/10/2026

☐ NRER (if the protocol should go to National ERC)

Follow up report expected in

3 Months _____ 6 Months _____ year ✓

Signature

Prof Delayohu Beke
IRERC Chair



Dr. Yordanos Shiferaw

02/10/2025

IRERC Secretary

Cc:

- Vice Provost for Academic and Research
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