

**ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF ALLIED HEALTH
DEPARTMENT OF NURSING AND MIDWIFERY**

**ASSESSMENT OF POSTOPERATIVE PAEDIATRICS PAIN MANAGEMENT
PRACTICE OF NURSES IN GOVERNMENT HOSPITALS OF ADDIS ABABA**

PRINCIPAL INVESTIGATOR: AMINA BESHIR (BSc)

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF
ADDISABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE OF MASTERS OF SCIENCE IN PAEDIATRICS AND CHILD
HEALTH NURSING**

JUNE, 2015

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APPROVED BY THE BOARD OF EXAMINATION

This thesis by Amina Beshir is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of Masters of Science in pediatrics and child health nursing.

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Abstract

Background: Pain in children is often overlooked mainly due to their inability to communicate rightly their feelings to the caregivers. Postoperative pain is one of the pains which children suffer due to various reasons but not limited to poor health practices or lack of knowledge on the consequences by nurses and other health care professionals. The causes and effects associated with knowledge and attitude in post-operative pain management of children in Ethiopia is inadequately addressed and not well documented.

Objective: To assess post-operative paediatrics pain management practice of nurses in government hospitals of Addis Ababa, Ethiopia 2015.

Methods: Institutional based quantitative cross-sectional study design was implemented from April to May 2015 .The study population were selected from four governmental public hospitals with a sample size of 210 nurses. Data was collected using structured self-administered, questionnaire. After analysis frequency and percentages were used to summarize the finding and significance of determinant factors were tested using Logistic regression and Odds Ratio & $P < 0.05$ was considered significant.

Result: The results of the study showed that 49.5% of nurses" postoperative pain management practice was at moderate level, 2.9% and 47.6% of nurses had good and poor practice of postoperative pain management respectively. Regarding their knowledge and attitude the result showed nurses had moderate level of knowledge and negative attitude towards postoperative pain management. It was found that factors attitude, knowledge, education, service year, pain management contents included in nursing curriculum and training were found significantly associated to postoperative paediatrics pain management practice with <0.05 P- value.

Conclusion: Majority of the nurses in the study had moderate levels of postoperative pain management practice of children. It was also found that factors other than age, gender, paediatric assessment tool, and guide line and drug availability had an important impact on to postoperative paediatrics pain management practice.

Recommendation: This study recommends development of mechanism to provide nurse in-service training on post-operative pain management of children, including pain management and incorporate content into the nursing curriculum promoting paediatric nurses educational level.

Key words:- *Pain, postoperative pain, children, paediatric nurses, practice, knowledge, attitude*

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Acronyms

AAU	Addis Ababa University
BSC-	Bachelor of science
CHS	Collage of health science
FLACC	face, leg, activity, cry and consolability
HCPs	Health care professionals
Hr	Hour
IASP	International association for the study of pain
JCAHO	Joint collaboration accreditation of health organization
NGOs	Nongovernmental organizations
SPSS	Statistical Package for Social Science
VAS	visual analogue scale

1. Introduction

1.1. Background

Generally pain in children is often overlooked mainly due to their inability to communicate rightly their feelings to the caregivers. Expression of pain in children or adults is commonly caused by tissue damage, various diseases, medical procedure, or surgery (1). Pain particularly in children needs close follow up as it may cause various complications to occur in their immune system. Postoperative pain is among the various pains that children suffer due to various reasons including but not limited to poor health practices or lack of knowledge on the consequences by nurses and other health care professionals.

Among the most common post-operative complications occur in children are delayed healing of wounds, higher readmission rate and most importantly altered immune system. A previous study also showed that poorly managed postoperative pain further result in increased level of stress and anxiety for children and their families and most importantly will cause long-lasting effect on increased emotion and behavioural responses in case of future painful events(2). It also causes hyperactivity, attention deficit disorder which will have a profound effect in the quality of life of the child (3). This necessitates the importance of adequate knowledge and right attitude by nurses to avoid the untoward effect of postoperative pain in children.

Unlike the advanced health system in the developed world which is characterized by highest standards of procedures, the health system in developing countries including Ethiopia needs adequate improvement to deliver standard services to patients. Children are the most vulnerable in situations where pain management is not well understood.

Absence of pain education in medical and paramedical schools in Ethiopia is mentioned as the most important cause for poor pain management (4). Despite the limited studies and guidelines developed in general pain management in Ethiopia (5), the causes and effects associated with knowledge and attitude in post-operative pain management of children in Ethiopia is inadequately addressed and not well documented. However, a systematic and well-designed research is imperative to understand the volume, causes and effects of the problem which will contribute to develop practical recommendations.

1.2. Statement of the problem

Pain is a stressful experience that is considered to be a global health problem, and commonly severe form of pain is expected after surgery. Paediatrics surgical patients are a population at risk of inadequate pain management. Despite the exponential increase in scientific evidence about paediatrics pain in the last few decades, there are many barriers to the transfer of knowledge to clinical practice. Consequently, postoperative children still experience unnecessary pain during hospitalization (4, 6, 7).

Hospitalized children suffer from a variety of types of pain which are not always adequately managed (8). One of the most challenging roles of medical providers serving children is to appropriately assess and treat their pain. New Joint collaboration Accreditation of Health Organization (JCAHO) regulations regard pain as “the fifth vital sign” and require caregivers to regularly assess and address pain. However, it is one of the most misunderstood, under diagnosed, and under treated/untreated medical problems, particularly in children (9).

Failure to control pain can result in long term complications. A previous study reported that if pain is not addressed and treated early it can greatly impact a child’s quality of life by interfering with mood, sleep, appetite, school attendance, academic performance, and participation in sports and other extracurricular activities. Furthermore, if unrelieved, childhood pain can enhance a child’s vulnerability to pain later in life. Repeated exposure to pain may cause altered pain sensitivity, impaired social skills, and patterns of self-destructive behaviour (3).

Pain assessment in children is more challenging than in adults because children experience pain differently and unable to express their feelings as adults do. Compared to adults, children are generally not malingerers, however, to understand their pain and distress is not easy for clinicians (10). An earlier study conducted on nurses beliefs in pain assessment and management in United States of America reported that nurses do not use pain assessment tools routinely in their practices when dealing with pain management in children. The study further revealed that some nurses consider that pain assessment tools are subjective and inaccurate and sometimes as useless.

Post-operative pain management in children needs appropriate knowledge, attitude and skills by nurses. Lack of knowledge by nurses is considered as one of the causes of poor pain management and to ensure the best quality of care for patients, nurses need effective

knowledge, skills, and attitudes (11). Increased in knowledge of the mechanism of pain, effective pain assessment and pharmacological and non-pharmacological management will promote positive patient outcomes (12). Insufficient knowledge about pain, inadequate assessment, evaluation of pain and various attitudes on pain management were among the barriers for effective post-operative pain management in children (13).

In addition, outdated attitudes, myths, and misconceptions about pain and its treatment among nurses and patients contribute to unsafe, inadequate, and inappropriate pain management (14). According to an earlier study accurate knowledge, appropriate attitudes and proper assessment skills help to enhance outcomes of treatment in a timely manner (15). However, the study in nurses' knowledge, attitude, and practices on post-operative pain management in the government hospitals of Addis Ababa and Ethiopia at large is not well addressed and adequately documented. Therefore, the objective of this study is to assess postoperative paediatrics pain management practice of nurses.

1.3. Significance of the study

This study is expected to contribute for proper nursing administration, enhance the quality of health given to children, develop applicable guidelines, help to design nursing education and research in the government hospitals of Addis Ababa and Ethiopia at large.

1. **Nursing administration:** results from this study will contribute for proper planning and implementation of postoperative nursing care particularly in the government hospital of Addis Ababa. The information gathered from this study will highlight nursing and hospital administrators on the level of care available for post-operative pain in children.
2. **Quality of health:** The results from this study will help to enhance the quality of health given to children. The study will help to reduce health complications occur during the poor management of postoperative pain which includes; prolonged wound healing, readmission to hospital, and most importantly will help to avoid behavioral changes, hyper activity, anxiety, poor school performance and others that will affect social and economic life of the child.
3. **Applicable guidelines:** the study will help to develop doable guidelines for nurses and hospitals to efficiently and timely address impaired health of children due to poor post-operative pain management. The study further reinforces the importance of specific post-operative pain management procedures particularly for children rather than general pain management guidelines.
4. **Nursing education and research:** The findings from this study will help to design the curriculum of nursing education in higher learning institutions. The study will identify major gaps in knowledge, attitude and practices of nurses that affect postoperative pain in children. The study will also serve as a valuable source of information to researchers or academicians interested in nurses' attitude, level of knowledge and practices in post-operative pain management in children.

2. Literature Review

2.1. Concepts and types of pain

The word pain is derived from the Latin word “poena”, meaning a fine or a penalty. According to Taber's Cyclopedia Medical Dictionary, pain is “a sensation in which a person experiences discomfort, distress, or suffering due to provocation of sensory nerves.” Taber's further define pain as “one of the cardinal symptoms of inflammation which may vary in intensity from mild discomfort to intolerable agony and, in most cases, pain stimuli are harmful to the body, tend to bring about reactions by which the body protects itself, and with adaptation to pain stimuli not readily occurring”(16). The International Association for the Study of Pain (IASP) defines it as: the unpleasant sensory and emotional experience resulting from actual or potential tissue damage (1). Therefore, according to the various definitions, pain is not only confined to physical injury which can be assessed objectively but also related to emotional aspects of one's life which is subjective and only the suffering person knows how the experience feels. However, the IASP definition is a widely cited medical definition.

Pain has been classified by anatomic location, body system, duration, severity, frequency, and aetiology. The simplest traditional categorization of pain has been based on the duration “acute” and “chronic.” Pain like postoperative one categorized as acute pain; chronic pain merely means that pain is perceived over a long period of time, which is often arbitrarily set at 3 to 6 months. This may be resulted from poorly managed acute care or the result of untreated acute pain that cause chronic pain secondary tissue damages (17).

2.2. Post-operative pain

Postoperative pain usually consists of acute pain which is a natural result of the tissue damage caused by surgery experience the most severe pain just after operation, when the effect of anaesthesia worn off. pain is usually present on the first and second postoperative day after which it decrease rapidly .According to study done on paediatric patient, the experience of pain is common among children undergoing surgery out of 48 children about 46% of them reported severe pain (18).similarly a prior study reported the majority of children experiencing intensive pain after surgery, Even when receiving analgesics (19).

Nurses with a strong clinical knowledge, attitudes and skills are essential for relieving the suffering of pain in children undergoing surgery. A retrospective study done on post surgical

under 3 years admitted patients chart review over one year period of 200 children at surgery of 98 days were analyzed and found a mean of 11 assessment in the first 72hr postoperatively per patient had been recorded. A total of 2103 pain assessments were retrieved, of which 1675 (20%) suggested discomfort, reassessment and correct medication was provided in 66 (15.4%) of the 428 assessments suggesting pain or distress (20). After surgery the duration and intensity of pain depends on the site and type of operation, the degree of tissue damage and positioning of the child during operation may contribute to over all incidence and severity of postoperative pain.

2.3. Assessment of Pain in children

Pain assessment in children is difficult since it is affected by different factors: development, culture and family issues. There are three pain assessment methods which include looking the physiologic signs of pain; Behavioural tools and Self reporting tools. Infants and preschool children (younger than 5 years of age) cannot understand the nature of self-report scales, and their assessment, therefore, relies on observer report (21). Numeric rate of pain assessment can be done for children 8 years and older. However for age less than 5 years are sparse face scale is commonly used to assess self-report of pain scale. The majority of the currently available infant pain assessment tools use a combination of Behavioural measures (e.g. leg movements, crying) and physiological measures (e.g. heart rate, oxygen saturation) and characteristic facial expressions of pain as originally described (22).

2.4. Management of Pain

Even with the rapid development of paediatrics postoperative pain management, paediatrics patients have remained undertreated for postoperative pain because of difficulty in pain assessment and concerns regarding side effects of opioid analgesics. Although there are no perfect pain assessment techniques and no absolutely safe analgesics, proper monitoring and an individualized analgesic plan after due consideration of age, operative procedures, and underlying illness, using multimodal analgesics may improve the quality of pain control in children(23). Optimal pain management begins with an accurate and thorough pain assessment. Following the assessment, a treatment plan is developed, including pharmacological and non-pharmacological interventions (24).

In a study done in Brazil 68% of adolescents reported that they received pharmacological intervention for pain relief. Out of these, 40 family caregivers (51%) had observed no response on their child's pain. In addition, 74% reported that the inpatients received pharmacological management. Physicians reported that 38% of the inpatients exhibited pain signs, which were predominantly acute pain detected during clinical procedures. They reported that 66% of patients received pharmacological intervention. The nurses reported pain signs in 50% of the inpatients, which were detected during clinical procedures. The nurses reported that pain was managed in 78% of inpatients by using pharmacological and/or non-pharmacological interventions. The findings provide evidence of the high prevalence of pain in paediatrics inpatients and the under recognition of pain by health professionals, these shows pain still needs follow up by nurses assigned in post-operative care unit(25).

2.5. Nurses' Knowledge and Attitudes Regarding Pain

To ensure the best quality of care for patient, nurses need effective knowledge and proper attitude to address pain issues. Many studies done in global, regional and national level revealed that knowledge and attitude of nurses about paediatrics postoperative pain management is still poor. According to the study conducted in Bangladesh to assess nurses' knowledge and attitude, and pain management practice of postoperative children, 65.6% had moderate level of knowledge, 23.7% had low level and the rest 10.8% were at high level (26).

A comparative descriptive, co relational, cross sectional study in Taiwan among 63 nurses revealed that there were deficient pharmacology knowledge including duration, route and dosage of analgesics. Only 31.7% of nurses correctly identified the incidence of opioid addiction is <1%. Nearly two third of nurses do not know that analgesics should initially be given around the clock on a fixed schedule for postoperative children (27).

A study conducted in India to assess knowledge attitude and practice of health care professionals (HCPs) regarding pain in children among 47 nurses and 30 paediatrics residents showed that 9% of participants agreed that pain assessment scales are ideally meant only for adults. Forty five point five percent of HCPs did not enumerate any pain scale used in children. And from questions about consequences of poor pain management one third of respondent did not report any adverse consequences of poor pain management in children. Majority 64.9% of respondent believed that the best judge of the intensity of pain would be child himself /herself. Forty two point eight reported that children exaggerate their pain. Only 33%of them reported that they were assessing pain routinely and nearly two third of

respondents (62.3%) felt that non pharmacological measures are better to control pain rather than drugs (28).

A study done among 246 nurses in Turkey explore that only 11.8% had taken a pain management course and 31.7% had read a book or journal on pain (29). According to a study done in Uganda on nurses knowledge and practice related to pain assessment among critically ill patient revealed that almost half of the participant lacked knowledge on key pain assessment principles and 44% of them do not agree with patient statement about pain (30).

In a study aimed at determining the knowledge and practices among 200 clinicians 170, (87%) nurses who managed post-operative pain at the Moi Teaching and Referral Hospital in Kenya, only 41% of nurses indicated that they had sufficient knowledge to recognize and manage pain .In the same study, 21% of all the participants had never had any formal teaching in relation to pain evaluation and management (31).

A cross sectional survey conducted to assess the level of knowledge and attitude among nurses of 3 health center and 20 small clinics in western Ethiopia shown that the overall correct answer for all item pain related question was 49.8%. Only 3.8% of them scored above the passing of 70%.The only aspect participant performed well was regarding the benefits of non-pharmacological ways of managing pain. On the contrary the domains on general principles of pain management, attention paid to and assessment of pain, question pertinent to opioid and issues regarding pain management in children were only answered correctly in rate way below the 70%(32).

And also another study done in Ethiopia among final year undergraduate medical & Para medical students of Jimma university to assess the level of knowledge and attitude regarding pain management revealed that the overall correct answer was 52.3% the mean percentage of correct answer for non-pharmacologic pain management 80.3%,assesment and attention paid to pain is 62.4%,general principles of pain management is 52.1%,using opioids pain management is 40.3% and children pain management items were answered 31.5%. Only 4.2% of the student scored above 70% and the average score of nursing student was 49.9% (3).

2.6. Nurses ,pain management practice on postoperative children

A prospective cross sectional survey conducted in Canada on pain in hospitalized children prevalence, intensity, assessment and management revealed that 241 inpatients or their caregivers were interviewed. 77% experienced pain during admission. Of these, 23%had moderate of severe pain at time of interview and 64%had moderate of severe pain sometime

in the previous 24 hour (hr.). Fifty-eight percent of those with pain received analgesics in the preceding 24hr but only 25% received regular analgesia. And 27% of children had any pain score documented in the preceding 24hr. It was concluded that pain was infrequently assessed and managed (33).

A study conducted in Finland on non-pharmacological methods of relieving children's postoperative pain among nurses found that nurses commonly use non drug intervention to relieve children's pain, such as emotional support, helping with daily activities and creating a comfortable environment. Cognitive behavioural and physical methods are practiced less commonly in their control of children's pain. Regarding non pharmacologic method the mean score was 69% whereas pharmacologic pain management mean score was 51% this showed that gaps in nursing pain management (34).

According to the study in Bangladesh paediatrics surgical nurses were asked to score 19 questions related to pain management practice in children. Overall, it was found that nurses' pain management practice were 78.16 % (minimum 66.3% and maximum 98.95%) respectively, which were moderate level (60.2%), and the rest was at the high level (39.8%) (26).

According to study done in Uganda to assess knowledge and practice of nurses related to pain assessment explored that majority (90%) of the participants reported to assess pain among critically ill patients but almost all of them (96%) do not use pain assessment tools (30).

2.7. Factors Influencing Pain and pain managements

Nurses' knowledge and attitudes, and pain management practices are still less than optimal level. This can be attributed to many factors that influence nurses' knowledge and attitude as well their pain management practices in the clinical setting. This includes institutional factors, personal factors relating to nurses themselves, and patient related factor (35).

Institutional factor: Hospitals need to have written and established measurable standards of care and pain service in order to achieve optimal pain management as their institutional goal. However many studies explore that absence of protocols and guidelines, limitation of evaluation tools and unavailability of drugs especially opioids among the mentioned barriers of optimal pain management. (36.37.38.)

Patient related factor: The age of the child is an important factor in dealing with pain. Paediatrics nurses have to know that at different ages, children respond to pain in different ways. Younger children may not report pain verbally whereas older children are able to report their pain. Children of preschool and school age can report pain but not intensely (39).the other patient related factor that influence pain management is past experience of pain. It is common that children who have previous experience of multiple or prolonged pain will be less anxious and more tolerant of pain than those who have little experience of pain (40)

Fear and anxiety is another factor influencing pain. Anxiety related to anticipatory pain or a fearful event can increase the intensity of pain. Fear tends to increase the perception of pain and pain increases feelings of fear (41)

Personal factors of nurses themselves: Nurses“ are often found to have knowledge deficits and negative attitude regarding pain assessment and management. This has an effect on optimal pain management for children. Nurses“ knowledge about the effects of pain relieving interventions may contribute to their practice. Hence nurses with a greater knowledge regarding opioid analgesics appeared more comfortable about administering them.

The fact that nurses work in a paediatrics post-operative unit, and the duration of that experience, may contribute to determining how a child’s pain can be managed effectively (42). For example the findings of the study in Hong Kong showed that participants who had more working years of experience and were able to apply their knowledge of pain management to daily practice were more likely to have a higher knowledge percentage of correct scores on knowledge questions and had better attitudes (43). A significantly higher level of knowledge and attitudes regarding the management of children’s pain was found among nurses who had higher levels of educational preparation (44).

A focused ethnographic study conducted in Ghana on determinants of nurses knowledge gap on pain management among 14 nurses explored that inadequate postoperative pain management resulted from curriculum gaps during training; inadequate clinical supervision and negative attitude of nurses were among mentioned (45).

Many literatures suggested that nurses must have in-depth knowledge and positive attitudes in the areas of pain assessment and management of children, particularly post-operative pain. Thus, the management of pain is a professional obligation and also humanistic action that needs more attention. The ultimate goal of this study is to identify and explore the postoperative paediatrics pain management practice of nurses.

2.8. Conceptual Frame work

This conceptual frame work is developed by principal investigator based on different literature assessed. It has four main factors: knowledge, attitude, socio demographic and environment which may influence the postoperative paediatric pain management.

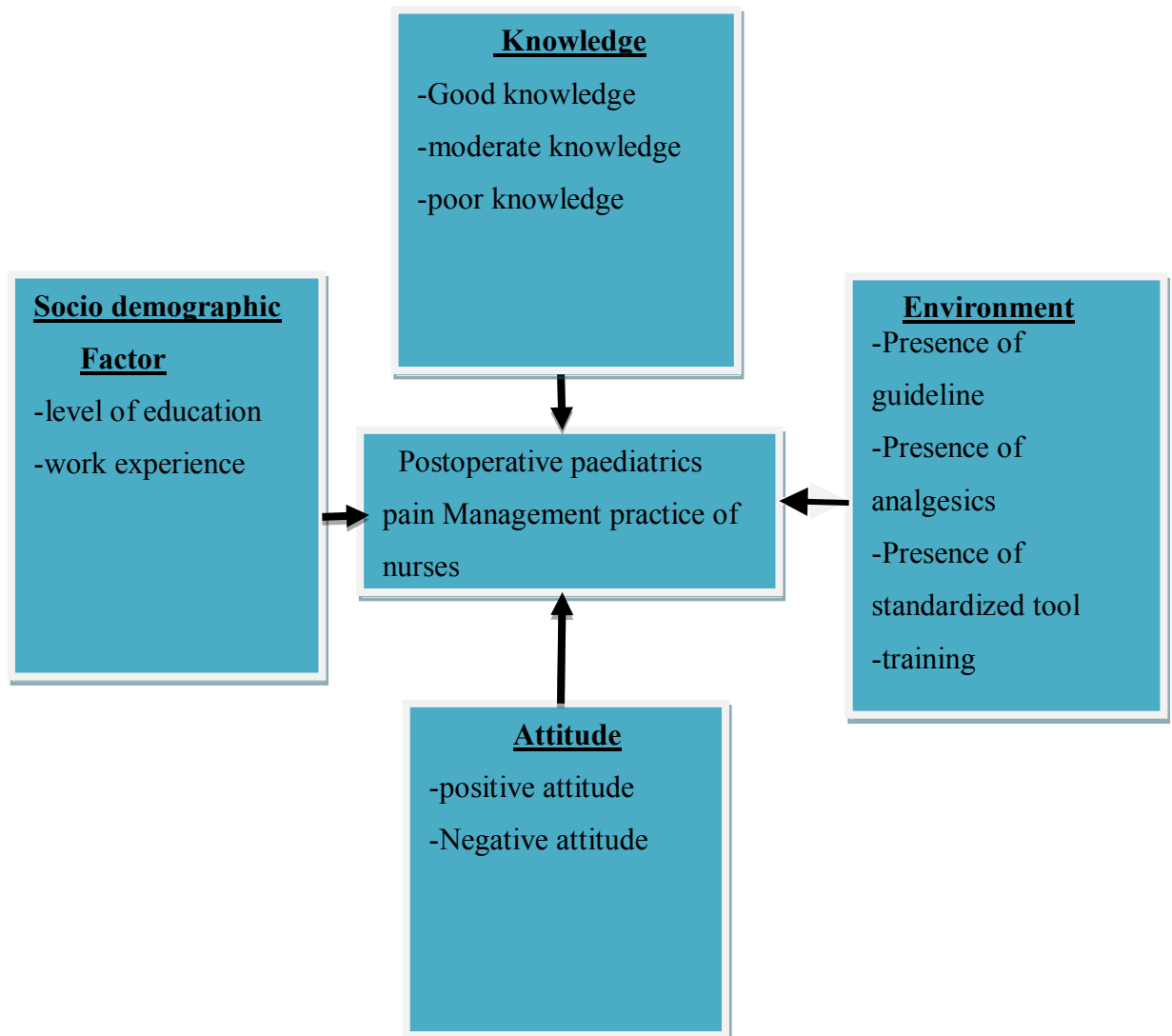


Figure 1- Conceptual Frame Work developed by principal investigator

3. Objective

3.1. General Objective

- To assess postoperative paediatrics pain management practice of nurses on selected government hospitals of Addis Ababa, Ethiopia, 2015.

3.2. Specific Objectives

The specific objectives of this study are:

- ❖ To identify the level of pain management practice of nurses regarding postoperative pain management in children;
- ❖ To assess the knowledge of nurses about postoperative pain assessment and management
- ❖ To explore the attitude of nurses about postoperative pain assessment and management;
- ❖ To identify factors affecting postoperative pediatrics pain management practice of nurses.

4. Methodology

4.1 Study Area

The study was conducted in Addis Ababa, the Capital City of Ethiopia. The city administration is divided into ten sub cities and 116 Woredas (districts). As compared to other regions of Ethiopia, Addis Ababa has highest concentration of health care facilities and health professionals. Nurses share the highest number among the estimated 10,000 health professionals that needs to cater for health related needs of the city's 3.3 million people. (46)

In Addis Ababa; there are six hospitals and 84 health centres governed by Addis Ababa city administration, 5 hospitals governed by federal government, 38 private hospitals, and 46 private higher clinics. Among the 11 hospitals in the city only Zewditu memorial hospital, Yekatit 12 hospital, St. Paul specialized hospital and Black Lion hospital provide paediatric surgical health care services. Due to this reason the above hospitals were selected.

4.2 Study Design and Period

Institutional based cross sectional quantitative study was employed to assess postoperative pediatrics pain management practice of nurses in Addis Ababa government hospitals from April to May 2015.

4.3 Population

4.3.1. Source population

- The source populations were all nurses working in the four hospitals in Addis Ababa

4.3.2 Study population

- The study populations were all nurses working in paediatric surgical wards of the four selected hospitals.

4.4 Inclusion and exclusion criteria

4.4.1 Inclusion criteria

- Nurses who have at least 6 months work experience at paediatric surgical units of the selected hospital and willing to participate.

4.4.2 Exclusion criteria

- Nurses who have less than 6 months' work experience in paediatric surgical wards and who took annual, Sick or maternity leave and not willing to participate.

4.5 Variable

4.5.1 The independent variable

- ❖ Socio demographic factor (age, sex, religion level of education, work experience)
- ❖ Knowledge
- ❖ Attitude,
- ❖ Environment (presence of guideline, presence of assessment tool, presence of analgesics and training)

4.5.2 Dependent (outcome variable)

- ❖ The dependent variable in this study was postoperative pediatrics pain management practice of nurses.

4.6 Operational definition

Good Practice: Refers to those study participants who correctly respond to practice questions and score above 80%

Moderate practice: Refers to those study participants who correctly respond to practice questions and score between 60-79%

Poor Practice: Refers to those study participants who correctly respond to practice questions and score below 60%

Good Knowledge: Refers for those study participants who answer more than 80% of knowledge questions correctly.

Moderate knowledge: Refers for those study participants who answer 60-79% of knowledge question correctly.

Poor knowledge: Refers for those study participants who answer less than 60% of knowledge questions correctly.

Positive Attitude: Refers to those study participants who scored point greater than 60% of attitude questions

Negative Attitude: Refers to those study participants who scored point less than 60% of attitude questions

Presence of protocol/guideline: refers to availability of standard postoperative pain management guideline

Presence of analgesic: availability of essentials analgesic drug used for postoperative pain management for children like opioids, acetaminophen and non-steroidal anti-inflammatory drugs (NSAIDs)

Presence of standard tool: availability of children's pain assessment tool

4.7 Conceptual definitions

Pain: Pain is unpleasant sensory and emotional experience associated with actual or potential tissue damage.

Acute pain: Acute pain is short lasting and usually manifests in ways that can be easily described.

Chronic pain: is defined as pain lasting more than six months.

Pain management: Pain management is the relieve of pain or reduction in pain to a level that is acceptable to the client.

4.8. Sample size determination and sampling procedure

4.8.1 Sample size determination

The sample size was determined using the formula for single population proportion by assuming 5% marginal error and 95% confidence interval ($\alpha=0.05$) and The proportion (p) = 50% since there was no research done in the same setting as this study concerning postoperative paediatric pain management practice of nurses.

$$n = \frac{\left(Z \frac{\alpha}{2}\right)^2 p(1-p)}{d^2} = \frac{Z^2 p(1-p)}{d^2} = \frac{(1.96)^2 \times 0.05(1-0.05)}{(0.05)^2} = 384$$

n = the required sample size

z = the value of the standard normal curve score corresponding to the given confidence interval=1.96

p = Assumed proportion of postoperative pain = 50%

d = the permissible margin of error (the required precision)=5%

Since the total population is less than ten thousand correction formula is needed

$$n_f = n_i \times N / n_i + N$$

$$n_f = 384 \times 210 / 384 + 120 = 160$$

By taking additional 20% contingency for non-response rate, the sample size is:

$$160 + 20 \% \text{ (non-response rate)} = \underline{192}$$

Since the total population of the study subjects (nurses who working in the paediatric surgical ward) of the four selected hospitals are **210** hence the researcher include all available subjects so that it can answer the research question.

4.8.2 Sampling technique

This study involved sample of 210 nurses who were conveniently selected from four hospitals of Addis Ababa who met the inclusion criteria.

4.8.3 Sampling procedure

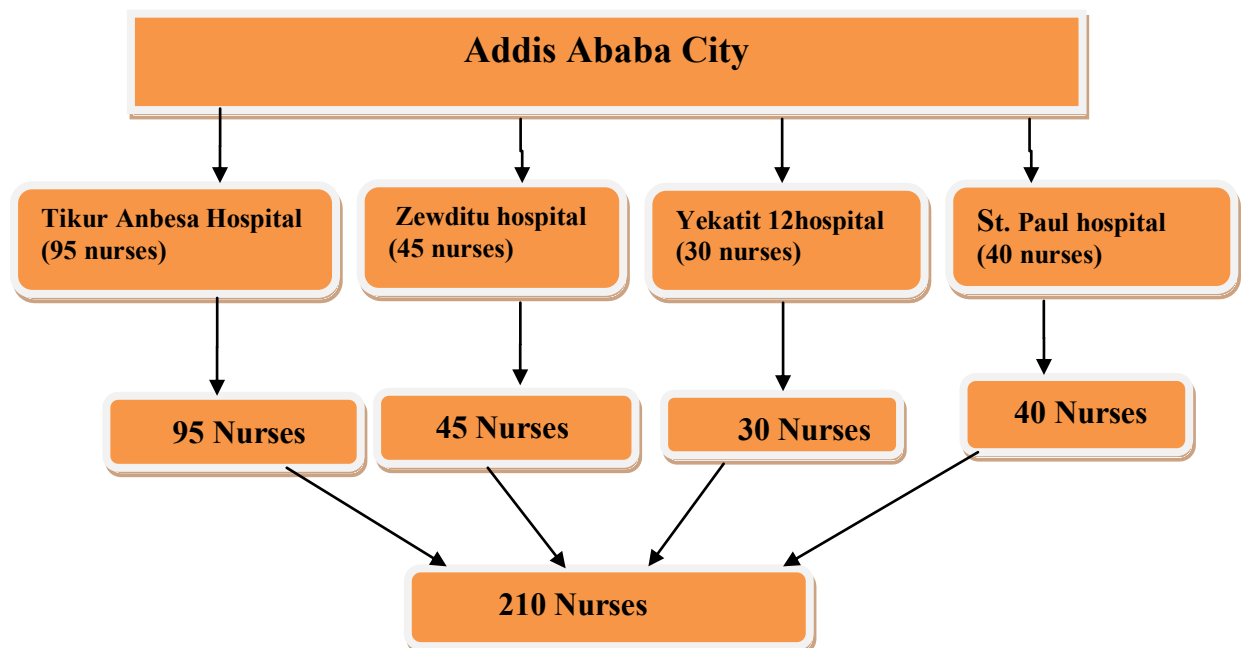


Figure 2 : Schematic presentation of the sampling procedure

4.9. Data collection instrument

A structured questionnaire was used for the „knowledge and attitude survey regarding pain“ developed by Ferrel and McCaffery in 1987 and revised in 2008 available through the internet. For the second part ``survey of paediatrics pain practices“ developed by Broom et al 1996 was used with modification. This instrument consisted of five parts the first was demographic characteristics of nurse's participant. The second is a survey questionnaire for nurse's knowledge on paediatric postoperative pain management it consists of 18 true or false questions. The third was survey questionnaire for nurse's attitude regarding postoperative pain in paediatrics it consists of 13 true or false questions. The fourth was also a survey questionnaire for paediatrics pain management practice of nurse's it consists of 17 five point likert scale questions. Finally the fifth was survey questionnaire for perceived barriers to optimal pain management for children it consist 5 yes or no questions.

4.10. Data collection

Data was collected from April 16 to May 16 2015, after permission obtained from the hospitals. The researcher collected the list of nurses who are currently working in paediatric ward and self-administered questionnaire distributed directly to nurses with the help of head nurses and their friends. A total of 4 diploma nurses and two BSC nurses for supervision were recruited and training was given on the objective, confidentiality of information, Respondent Rights, Informed consent, and technique of questioner administration. The principal investigator was closely following the data collection process throughout the data collection period and check that all returned questionnaire were complete. If any question incomplete the researcher asked the respondent to complete. All filled questionnaires were reviewed each night.

4.11 Data processing and analysis

The whole data was checked for completeness, coded before entry in order to avoid missing. Statistical package for social sciences (SPSS) version 21 was used for data entry and analysis. Descriptive analysis was computed to determine frequency of the variables. Odds ratio and Logistic regression was used to identify factors affecting postoperative pain management, tables and graphs were used to display the result. A corresponding p-value of <0.05 was considered to be statistically significant for association.

4.12. Quality control (Data quality assurance)

To ensure the data quality the questionnaires was tested on 10% of the total sample who were working paediatrics ward before rotate to another ward of the hospital to check the clarity and consistency of the tool. Those nurses who pre test was done were not part of the actual study. In addition the data collectors and supervisors were trained appropriately on rules and regulation during data collection. And the principal investigator was closely following the data collection process.

Privacy and confidentiality of the respondents as well as good interaction between respondents and data collector was maintained, filed questionnaires were checked daily for completeness.

Reliability of the instrument: The Cronbach's coefficient alpha was calculated for each field of the questionnaire. The table shows the values of Cronbach's Alpha for each field of the questionnaire and the entire Questionnaire. For the fields, values of Cronbach's Alpha ranged from 0.817 and 0.961. This range is considered high as the result ensures the reliability of each field of the questionnaire. Cronbach's Alpha equals 0.961 for the entire questionnaire which indicates very good Reliability of the entire questionnaire. Therefore, based on the test, the results for the items are reliable and acceptable.

Table 1 Reliability Statistics Addis Ababa, Ethiopia March 2015.

Variables	Number of Items	Cronbach's Alpha
Knowledge	18	0.752
Attitude	13	0.831
Practice	17	0.945
Factors Affecting	5	0.921
	Entire 52	0.961

4.13. Ethical Consideration

Ethical issue was considered in all stages of the research process, some of the most important are the following.

- Ethical approval of the research proposal was obtained from the Ethical Review committee of AAU, CHS department of nursing and midwifery.
- A formal letter was written by the department of nursing to the concerned office.
- Permission was asked from the responsible Authorities of each Hospital and pediatrics surgical wards.

- Explanation about the objective (purpose) and benefit of the study was described clearly to the study population and their full cooperation, verbal and written consent was taken.

4.14. Plan for dissemination of Result

The study result will be, communicated to AAU, CHS and respective Hospitals through presentation and submission of copy of reports. And also a copy of the final paper of this study will be given to the Relevant Authorities and the result of the study will be communicated to the appropriate Government Bodies, NGOs and private Agencies. Publication on peer reviewed journal will be attempted.

5. Result

5.1. Demographic Characteristics of the Participants

A total of 210 questionnaires were distributed to nurses in four hospitals in Addis Ababa. The response rate for the distributed questionnaire was 210(100%). The majority 159 (75.7%) were females. The respondents' mean ($\pm$ SD) age was 31($\pm$ 7.48) years with 23 years minimum and 55 years maximum. Most of the respondents 131 (62.4%) were found within the ages of 20-29. Out of all the respondents for this study 10(4.8%) were more than 50 years of age. The majority of respondents 122(58.1%) were orthodox Christian. The majority of the respondents 101(48.1%) were with duration of nursing service from one to five years. There were also 19(9.0%) respondents with more than 16 years of service. Out of the total 210 104 (49.5%) had 6 months to 11 months experience in paediatrics postoperative area. There were also 92 (43.8%) respondents with 1 to 5 years of experience in paediatrics postoperative area. Majority of the respondents 159(75.7%) had degree in nursing while only 3(1.4%) were masters graduates. (Table 2)

Table 2 Socio demographic characteristics of nurses working at paediatrics postoperative area in the selected four government hospitals of Addis Ababa April to May 2015

Variables	Number (Percent %)
Age	
20-29 years	131 (62.4%)
30 - 39 years	47 (22.4%)
40-49 years	22 (10.5%)
50 - 59 years	10 (4.8%)
Gender	
Male	51(24.3%)
Female	159(75.7%)
Religion	
Muslim	27(12.9%)
Orthodox	122(58.1%)
Protestant	55(26.2%)
Others	6(2.9%)
Duration of nursing service in year	
<1 year	30 (14.3%)
1-5 years	101(48.1%)
6-10 years	52(24.8%)
11-15 years	8(3.8%)
More than 16 years	19(9.0%)
Duration of service in paediatrics post operative area	
6-11 months	104 (49.5%)
1-5 years	92 (43.8%)
6-10 years	7 (3.3%)
11-15 years	4 (1.9%)
More than 16 years	3(1.4%)
Educational qualification in nursing	
Diploma	48(22.9%)
B Sc in nursing	159(75.7%)
M Sc in	3(1.4%)

5.2. Nurses knowledge regarding postoperative paediatrics pain management

The respondents were asked to answer 18 true or false questions in order to assess nurse's knowledge on postoperative pain management in children. The questionnaire includes questions about pain assessment in children, pharmacological and non pharmacological pain management information. The score of the respondents were also categorized in to three levels which were good, moderate and low.

This study had found almost half of 97 (46.2%) of the nurses had poor knowledge on post-operative pain management. Almost the same proportion 91(43.3%) of the respondents also had moderate knowledge on post-operative pain management. As it is shown in figure 3 those respondents with good knowledge were only 22 (10.5%).

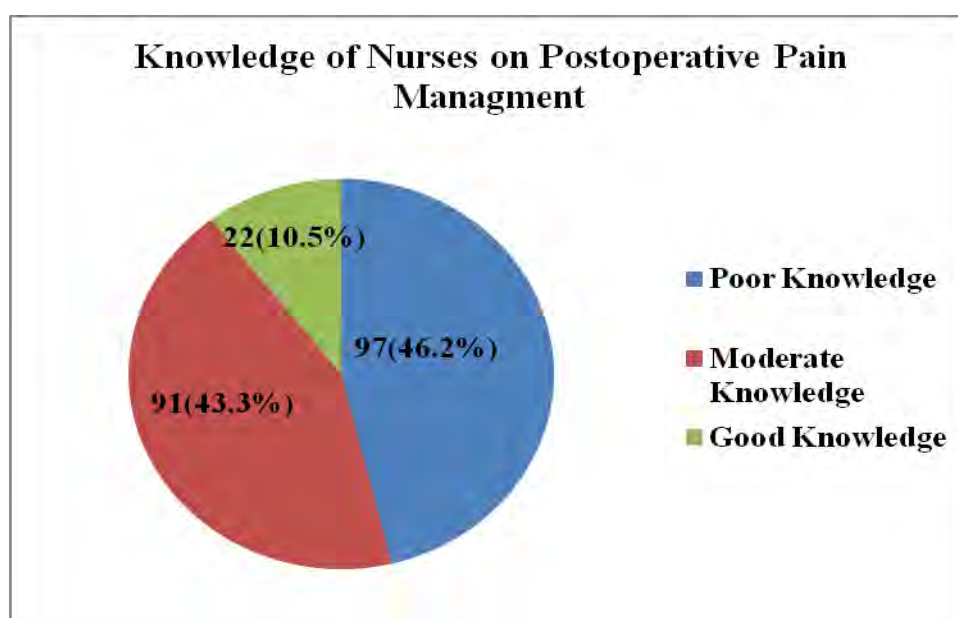


Figure 3 Knowledge of the Respondent working at pediatric postoperative area in selected four hospitals of Addis Ababa April to May 2015

Out of the total 210 respondents, the majority 160 (76.2%) knows as pain should be assessed before and after administering pain drugs. Similarly 148(70.5%) knows as the experience of pain affects the psychological, neurological and personal development of a child. There were also 147(70%) of the respondents know that pain assessment by behavioural observation is not appropriate for young children. The respondents who know that providing comfort and positioning them may help to reduce muscle tension during the caring of paediatrics patients constitutes 142(67.6%). Those respondents who know as mepridn (pethidine) are generally not

recommended for the treatment of children's post operative pain accounts 141 (67.2%). It was also 140 (66.7%) who know if the children have severe pain after operation, they may show abnormality in vital signs.

On the other hand it was only half of 99(47.1%) of the respondents had knowledge as children can use self report to identify their pain intensity by themselves. There were also almost the same number of respondents 107 (51%) knows as acetaminophen and non steroidal anti inflammatory agents are effective analgesics for children's postoperative pain. There were also 110 (52.2%) respondents know as previous pain experience cannot increase a child current postoperative pain. Similar number of respondents 111 (52.9%) knows the most common side effect of morphine is respiratory distress. Moreover 114 (54.3%) of the respondents know the side effect of narcotics should be observed at least 20 minutes after administration. There were also 115(54.8%) know as initially postoperative analgesics should be given around the clock on a fixed schedule. (Table 3)

Table 3 Knowledge of nurses working at paediatrics postoperative area in the selected four government hospitals of Addis Ababa from April to May 2015

Variable	True N (%)	False N (%)
1.Repeated experience pain no effect on the development of children	85 (40.5%)	125 (59.5%)
2.The cause of post-operative pain is tissue injury	120 (57.1%)	90(42.9%)
3.The experience of pain will affect thepsychological,neurological and personal development of a child	147 (70.5%)	63 (30.0%)
4. Previous pain experience cannot increase a child current postoperative pain	110 (52.4%)	100 (47.6%)
5. After operations, if the children have severe pain, they may show abnormality in vital signs	140 (66.7%)	70 (33.3%)
6. Pain assessment by behavioral observation is not appropriate for young children	63 (30.0%)	147 (70.0%)
7. Children can use self-report to identify their pain intensity by themselves	99 (47.1%)	111(52.9%)
8. Pain should be assessed before and after administering pain drugs	160 (76.2%)	50 (23.8)
9. Physiological pain assessment is a more suitable method than behavioral and self-reporting assessment of pain in children	100 (47.6%)	110 (52.4%)
10. Assessment of school aged children's pain by self-report is more reliable than physiological assessment	130 (61.9%)	80 (38.1%)
11. The usual duration of action of IV morphine sulphate is 6-8 hours	83(39.5%)	127 (60.5%)
12. Acetaminophen and non-steroidal anti-inflammatory agents are effective analgesics for children's postoperative pain	107 (51.0%)	103 (49.0%)
13. The most common side effect of morphine is respiratory distress	111(52.9%)	99 (47.1%)
14. Initially post-operative analgesics should be given around the clock on a fixed schedule	115 (54.8%)	95 (45.2%)
15.The side effects of narcotics should be observed at least 20 minutes after administration	114 (54.3%)	96 (45.7%)
16. Mepridin (pethidine) are generally not recommended for the treatment of children's postoperative pain	140 (66.7%)	70(33.3%)
17. During the caring of pediatric patients, providing comfort and positioning them may help to reduce muscle tension which in turn, can reduce pain	142 (67.6%)	68 (32.4%)
18. Children should be advised to use non-drug techniques along with pain medication	129 (61.4%)	81 (38.6%)

5.3 Nurses attitude regarding postoperative paediatrics pain management

The respondents were asked 13 attitude questions related to nurses' attitude towards postoperative pain in children. The score for participant were categorized in to two positive and negative categories. Based on the classification outlined in the operational definition, The respondents attitude on post-operative pain management as it is shown in figure 4 was therefore dominantly negative 124 (59%). On the other hand only 86 (41 %) of the respondent have positive attitude of post-operative pain management.

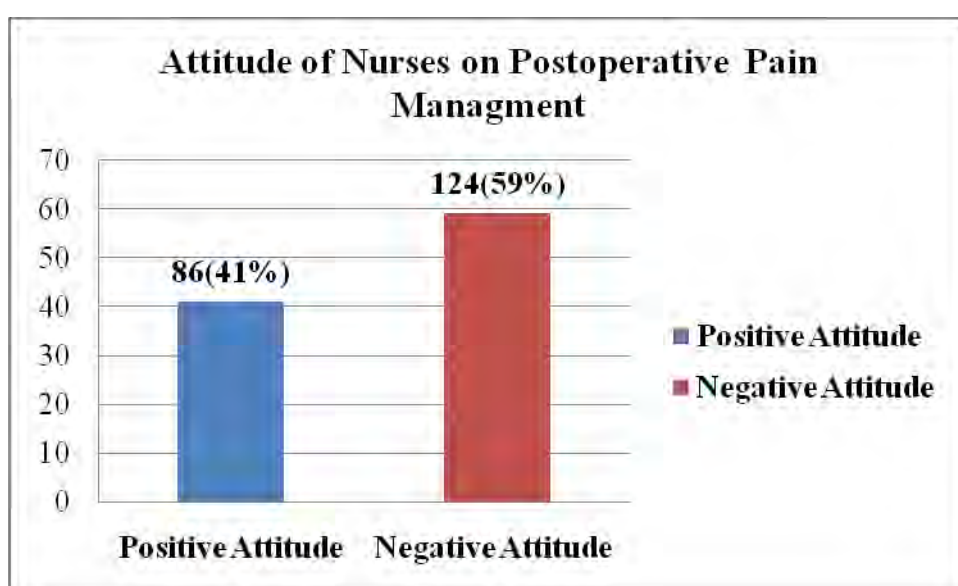


Figure 4: Attitude of the Respondents working at pediatrics postoperative area in selected four hospitals of Addis Ababa April to May 2015

Out of the responses found from the respondents related to their attitude towards postoperative paediatrics pain management, those who have attitude as the nurse's role during post-operative pain management is only to follow the doctors' orders accounts 137 (65.2%). Similarly 124 (59%) of the respondents have awareness that usually less than 10% of children over report their pain. There were 121(57.6%) of the respondents think if the child seems to rest in bed with no body movement after an operation, it means that the child has no postoperative pain. Out of all 210 respondents, 117 (55.7%) have the awareness that the nurses should not administer pain medication continuously during the first 24-48 hours because the child may become addicted to drugs. The respondents who have the awareness that when children get pain, this will be reduced or disappear immediately and spontaneously constitutes 110 (52.4%). (Table 4)

On the other hand there were only 72 (34.3%) of the respondents had the attitude that usually children perceive pain less than adults. Almost the same number of respondents 82 (39%) have the attitude that because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences. Similarly 83 (39.5%) of the respondents expressed that the child/ adolescent with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure. The respondents with an attitude that if the infant/ child/ adolescent can be distracted from his pain this usually means that he is not experiencing a high level of pain were 94(44.8%). At the same time 96 (45.7%) thinks that heat and cold should be applied directly to the painful area in order to be effective (Table 4)

Table 4: The attitude of Nurses working at paediatrics postoperative area in the selected four government hospitals of Addis Ababa from April to May 2015

Variable	True N (%)	False N (%)
1. Usually children perceive pain less than adults	134(63.8%)	76(36.2%)
2. Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity	127 (60.5)	83(39.5%)
3. The child/ adolescent with pain encouraged to endure as much pain as possible before resorting to a pain relief measure	127(60.5%)	83(39.5%)
4. Usually 10% of children over report their pain	124(59.0%)	84(41.0%)
5. Based on one's religious beliefs a child/adolescent may think that pain and suffering is necessary	114 (54.3%)	96 (45.7%)
6. In order to be effective heat and cold should be applied directly to the painful area	100(47.6%)	110(52.4%)
7. Based on cultural or spiritual beliefs, children or their parents may think that pain and suffering is necessary	101(48.1%)	109(51.9%)
8. The nurse's role during post-operative pain management is to only follow the doctors' orders	37(34.8%)	137(65.2%)
9. The nurse is the best one who can tell the children's feelings of pain	157(74.8%)	53(25.2%)
10. Nurses should not administer pain medication continuously during the first 24-48 hours because the child may addict drugs	117(55.7%)	93(44.3%)
11. Giving children/ adolescents sterile water by injection (placebo) is often a useful test to determine if the pain is real	108 (51.4%)	102 (48.6%)
12. If the infant/ child/ can be distracted from his pain this usually means that he is not experiencing a high level of pain	94(44.8%)	116 (55.2%)
13. After an operation, if the child seems to rest in bed with no movement ,it means that the child has no postoperative pain	121 (57.6%)	89 (42.4%)

5.4 Nurses postoperative paediatrics pain management practice level

The respondents were also asked to answer five point likert scale questions related to nurses post operative pain management practice in children. Based on the category specified in the operational definition, this study found, 104 (49.5%) of the respondents had moderate and 100(47.6%) of nurses had poor level of practice on post-operative pain management score. The respondent with good practice on post-operative pain management score constitutes 6 (2.9%). (Figure 5)

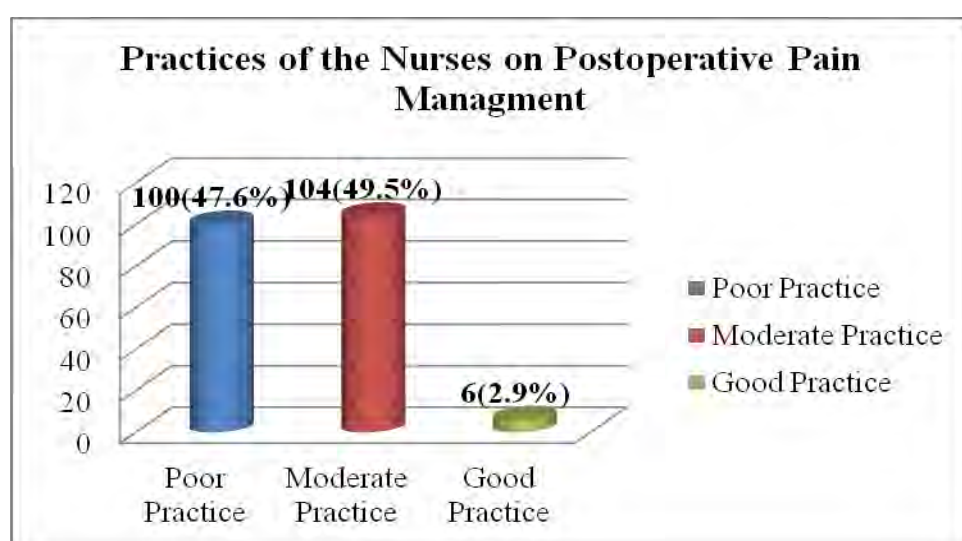


Figure 5: Practical level of the Respondents working at pediatric postoperative area in selected four hospitals of Addis Ababa June 2015

In order to know the areas that nurses constantly perform to manage paediatrics postoperative pain were assessed using 18 questions. It was found that 194 (92.4%) respondents administer pain medication to children as ordered by a doctor around the clock. There were 191 (90.9) respondents arrange the environment to be calm and quiet in order to help children sleep easily after surgery. There were also 178 (84.8%) respondents tell children to tell the nurse when they are in pain after surgery. The respondents who observe the side effects of pain medication (such as Morphine) after giving it to the child constitute 165 (78.6%). The same number 164 (78.1%) observe behavioral change in children (such as being awake, crying, limited body movement, withdrawal, agitation, or not talking) in order to assess their pain after surgery. Out of the total 210 respondents, 161 (76.7%) talk with children with a soft voice to comfort them when they are in pain. (Table 5)

On the contrary, only 12 (5.7%) respondents use a behavioural pain scale (such as FLACC) for assessment of children's pain in your practice. Similarly 16(7.7%) respondents use self-

reporting pain scale (such as VAS, FACE scale) for the assessment of children's pain in their practice. There were 65 (30.9%) reassess children's pains after giving pain medication in order to evaluate the effectiveness of pain medication. The respondents who 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) constitute 66 (31.4%). There were also 67 (31.9%) distract children from pain by using several techniques (such as giving them toys for playing, listening to music, telling stories, touching them) after surgery. The respondents who administer pain medication to children by your own judgment were 69 (32.9%). (Table 5)

Table 5: The practice of Nurses working at paediatrics postoperative area in the selected four government hospitals of Addis Ababa from April to May 2015

Variable	Constantly No (%)	Frequently No (%)	Occasionally No (%)	Infrequently No (%)	Never No (%)
After surgery you observe behavioural change	25(11.9%)	73(34.8%)	66 (31.4%)	39 (18.6%)	7 (3.3%)
After surgery, you observe physiological change	48(22.9%)	103(49.0%)	50(23.8%)	9 (4.3%)	0(0%)
After surgery, you assess children's pain at least once a shift	30(14.3%)	57(27.7%)	70(33.3%)	42(20.0%)	11(5.2%)
You use self-reporting pain scale	3 (1.4%)	3 (1.4%)	10 (4.9%)	95 (45.2%)	99 (47.1)
You use a behavioural pain scale	2 (1.0%)	3 (1.4%)	7 (3.3%)	104 (49.5%)	94 (44.8%)
You administer pain medication around the clock	45(21.4%)	100(47.6%)	49(23.3%)	12(5.7%)	4(1.9%)
You observe the side effects of pain medication	26(12.4%)	72(34.5%)	67(31.9%)	32(15.2%)	13(6.2%)
You administer pain medication to children by your own judgment	3 (1.4%)	10(4.8%)	56(26.0%)	66(31.4%)	75(35.7%)
You reassess children's pain after giving pain medication	20(9.5%)	44(21.0%)	81(38.6%)	54(25.7%)	11(5.2%)
After surgery, you distract children from pain by using several techniques	5 (2.4%)	11 (5.2%)	51 (24.3%)	76 (36.2%)	67 (31.9%)
After surgery, you talk with children with a soft voice to comfort them	19(9.0%)	46(21.9%)	96(45.7%)	42(20.0%)	7 (3.3%)
After surgery, you arrange the environment to be calm and quiet	40(19.0%)	76 (36.2%)	75 (35.7%)	17 (8.1%)	2 (1.0%)
After surgery, you advise parents	19 (9.0%)	47 (22.4%)	82 (39.0%)	54 (25.7%)	8 (3.8%)
After surgery, you ask parents to be involved in assessing pain	15(7.1%)	51(21.3%)	78(37.1%)	50(23.8%)	16(7.6%)
After surgery, you provide comfort to help relieve children's pain	30(14.3%)	81 (38.6%)	63 (30.0%)	28(13.3)	8(3.8)
After surgery, you tell children to tell the nurse when they are in pain	1 (0.5%)	60 (28.6%)	72 (34.3%)	57 (27.1%)	20 (9.5%)
You ask and help children to support the painful area	1(0.5%)	60 (28.6%)	72 (34.3%)	57 (27.1%)	20 (9.5%)

5.5 Barriers to optimal pain management practice of nurses

As it is shown in table 6, the study revealed that more than half 115 (54.8%) of the respondents reported paediatrics pain management contents included in nursing curriculum. However it was only one-third of the respondents 62 (29.5%) undertake any further continue education (training) relate to paediatrics pain management after graduation. The study found that only 26 (12.4%) of respondents reported any pain management standards or protocols put in place in hospitals and 16(7.6%) reported standard pain assessment tool in their hospital However almost half 108 (51.4%) of the respondents mentioned essential analgesics available in their hospital. (Table 6)

Table 6: Barriers to post-operative pain management experienced by Nurses working at pediatrics postoperative area in the selected four government hospitals of Addis Ababa from April to May 2015.

Variables	Response	Frequency	Percent
Is there paediatrics pain management contents included in nursing curriculum when you studied	Yes	115	54.8
	No	95	45.2
	Total	210	100.0
Have you undertaken any further continue education (training) relate to paediatrics pain management after graduation?	Yes	62	29.5
	No	148	70.5
	Total	210	100.0
Are there any pain management standards or protocols in your hospital?	Yes	26	12.4
	No	184	87.6
	Total	210	100.0
Is there any standard pain assessment tool in your hospital?	Yes	16	7.6
	No	194	92.4
	Total	210	100.0
Are all essential analgesics always available in your hospital (like opioids, NSAIDs)?	Yes	108	51.4
	No	102	48.6
	Total	210	100

5.6 Association of Postoperative Pediatrics Pain Management Practice and Associated Factors

The factors in postoperative paediatrics pain management practice were examined using bivariate and multivariate logistic regression model. It was found that attitude, knowledge, education, nursing service in paediatrics, paediatric pain management contents included in nursing curriculum and continue education were found significantly associated to postoperative paediatrics pain management practice with <0.05 P- value.

In the binary and multiple regression tests used in this study, the attitude and knowledge were significantly associated with postoperative paediatrics pain management practice. The nurses who have positive attitude towards the postoperative paediatric Pain Management were 2.37 times more likely to practice than those who have negative attitude (0.018 P- values, 95% CI 1.157-4,851).

Nurses with poor knowledge on the postoperative paediatric Pain management 83% less likely to practice the postoperative paediatric Pain management than nurses had good knowledge of practice (0.024 p-value, 95%CI 0.035-.787). Similarly nurses who had moderate knowledge also 79.9% less likely to practice the postoperative paediatric Pain management than nurses had good knowledge (0.043 p-value 95%CI.043-.951).

Education significantly associated with the practice postoperative paediatrics pain management. It was also found that nurses who had diploma were 80.8% less likely to practice postoperative paediatrics pain management than first degree and above holders (0.000 p- value95%CI.078-.473). Nursing service years in paediatrics was significantly associated with postoperative paediatrics pain management practice. Nurses with less than 1 years of experience were 90.5% less likely to practice postoperative paediatrics pain management than those who have more than 5 years of experience. (.045 p-value95%CI .10-.949)Nurses with between 1-5 years of experience were less likely to practice postoperative paediatrics pain management than those who have more than 5 years of experience but was not significant both in bivariate and multivariate analysis.

General nursing service with less than 5 years of experience were 78.7% less likely to practice postoperative paediatrics pain management than those who have more than 10 years of experience (.034 p-value95%CI .213(.051-.893) General nursing experience between 6-10 years of experience were less likely to practice postoperative paediatrics pain management

than those who have more than 10 years of experience but was not significant both in bivariate and multivariate analysis.

Including paediatric pain management contents in the nursing curriculum had significant relation with postoperative paediatrics pain management practice. Nurses who included paediatric pain management contents in the nursing curriculum were 3.42 times more likely to practice postoperative paediatrics pain management (0.000 p-value 95%CI 1.917-6.118)

There were a significant relation between postoperative paediatrics pain management and continuing education. Those nurses who continued their education were 2.38 times more likely to practice postoperative paediatrics pain management (.009 p-value 95%CI 1.241-4.564) the result of logistic regression presented in table below.

Table 7: Association of Postoperative Paediatrics Pain Management Practice of Nurses and Associated Factors in Addis Ababa Hospitals, 2015

Variables		Pain Management Practice		Odds Ratio and 95% CI		X ² (P-Value)
		poor	Good	COR(95% CI)	AOR(95% CI)	
Attitude	Negative	73	51	1		
	Positive	27	59	2.97 (1.673-5.288)	2.37 (1.157-4.851)**	.018
Knowledge	Poor	56	41	0.116(.032-.417)	0.166(0.035-.787)**	.024
	Moderate	41	50	0.193(0.053-0.697)	0.201(0.043-0.951) **	.043
	Good	3	19	1		
Education	Diploma	35	13	0.249(0.112-0.506)	0.192(0.078-0.473) **	.000
	Degree& Above	65	97	1		
Nursing service in paediatrics	<1years	75	29	0.032(0.004-0.254)	0 .095(.10-.949) **	.045
	1-5years	24	68	0.212(0.026-1.705)	0.682(0.068-6.838)	.075
	>5years	1	13	1		
Nursing Service Years	1-5years	77	54	0.122(0.040-0.373)	0.213(0.051-0.893)**	.034
	6-10years	19	33	0.302(0.091-0.950)	0.260(0.057-1.118)*	.081
	>10years	4	23	1		
Paediatric pain management contents included in nursing curriculum	Included	39	76	3.27(1.82-5.67)	3.42(1.917-6.118)**	0.000
	Not Included	61	34	1		
Continue Education	Trained	21	41	2.15(1.158-3.990)	2.38 (1.241-4.564)**	0.009
	No Training	79	69	1		
Presence of Pain Protocol	Yes	11	15	1.588(.692-3.643)	1.84(.712-4.75)	.208
	No	99	85	1		
Presence of Standard tools	Yes	5	11	1.19(.400-3.074)	1.21(.369-3.974)	.752
	No	102	92	1		
Availability of essential analgesics	Yes	49	59	1.20(.700-2.071)	1.004(.559-1.802)	.991
	No	60	42	1		

*= significance at p- value < 0.05in only by bivariate analysis

** =significance at p-value <0.05 in both bivariate and multivariate analysis

6. Discussion

6.1. The Socio-Demographic Information Of The Respondents

In this study the majority of the respondents 159 (75.7%) were females. and 131 (62.4%) were between the ages of 20 and 29. The finding was congruent with an earlier study done in Bangladesh which reports almost all of nurses were female (26). It was also found that the majority of the respondents 101(48.1%) were with duration of nursing service from one to five years. This was similar with other studies done in Turkey and Bangladesh (26, 30).

Regarding educational level the current study showed that the majority of nurses 159(75.7%) were degree holders. This was different from the study done in Bangladesh which reports majority (80.6%) of nurses were diploma holders (26). This may be due the expansion of universities and college through the country and government policies to provide continuous education for health profession.

Only half of the nurses were reported that there was paediatrics pain management content included in nursing curriculum during their study. Majority of nurses 148(70.5%) reported that they haven't undertaken any further education or training related to paediatrics pain management after graduation. The majority 184(87.6%) of respondent reported that neither there is pain management standard or protocol nor 194(92.4%) pain assessment tool in their hospital. Almost half of the respondent reported that unavailability of essential analgesics in their hospital. This finding is similar with various previous studies explored that absence of guide lines, limitation of evaluation tool and unavailability of drugs (36, 37, 38). Although half of the respondent reported that no paediatrics pain management content included in nursing curriculum when they studied and also they haven't undertake any further education or training related to post operative pain management. As a result of this they have no advanced knowledge that helps to manage postoperative pain.

6.2. Knowledge regarding postoperative pediatrics pain management

In relation to the level of nurse's postoperative pain management knowledge the result of this study showed that the nurse's knowledge levels were poor. This was similar with the study conducted in Taiwan that revealed knowledge of nurses' insufficient or poor level with mean of 52.8% (27).

The majority 160(70%) of the respondents have good knowledge on the pain should be assessed before and after administering pain drugs. The respondents who have good knowledge as the experience of pain will affect the psychological, neurological and personal development of a child and pain assessment by behavioural observation is appropriate for young children were 148(70.5%). Selected question were analyzed to compare with different study from knowledge test question.

The knowledge test question on initially postoperative analgesics should be given around the clock on fixed schedule. Only half 115(54.8%) responded correctly answered while finding the same question in Bangladesh was showed the majority (87%) nurses have good knowledge or responded correctly. Similarly in Taiwan nurses knowledge on the above question was (54.8%) or it was poor (26, 27). This might be due to the fact that pain management was not included in curriculum.

6.3. Attitude regarding postoperative pediatrics pain management

Attitude of nurses regarding postoperative pain in children based on the result of this study revealed that the majority (59%) of the nurses respondents have negative attitude and (41%) of nurses had positive attitude. The study finding was consistent with the study conducted in Taiwan as majority nurse respondents have negative attitude with mean 52.8% (27).

The majority of the nurses have correctly answered attitude questions on the nurse's role during post-operative pain management is to only follow the doctors' orders, usually less than 10% of children over report their pain, after an operation if the child seems to rest in bed with no body movement, it means that the child has no postoperative pain. Nurses should not administer pain medication continuously during the first 24-48 hours because the child may become addicted to drugs. The ethnographic study conducted in Ghana on determinants of nurses knowledge gap on pain management among 14 nurses explored that inadequate postoperative pain management resulted from curriculum gaps during training; inadequate clinical supervision and negative attitude of nurses were among mentioned (45).

While only one-third of the nurses respondents have correctly answered attitude questions on the Usually children perceive pain less than adults, because of an underdeveloped neurological system, children under two years of age have decreased pain sensitivity and limited memory of painful experiences, the child/ adolescent with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure and if the infant/

child/ adolescent can be distracted from his pain this usually means that he is not experiencing a high level of pain.

Some specific items were selected to compare with the finding of previous studies for instances, this study find that more than half (59%) nurses answered correctly attitude question on less than 10% of children over report their pain which is less than the study conducted in Bangladesh which showed majority of the nurses (71 %) correctly answered this question.

6.4. Practice of postoperative pediatrics pain management

This study found that postoperative pain management practice of nurses was at moderate level. This finding of the study is similar with previous study conducted in Bangladesh which reports postoperative pain management practice of nurses was at moderate level 78.16% (26).

Majority of the nurse respondents correctly answered practice question; such as you administer pain medication to children as ordered by a doctor around the clock (92.4%), After surgery, you arrange the environment to be calm and quiet in order to help children sleep easily (90.9%) and After surgery, you tell children to tell the nurse when they are in pain (84.8%).The finding of these highly performed items higher than previous study in conducted Bangladesh which reports (26). This might be due to educational and cultural difference.

Only half and less of the nurse respondents correctly answered practice question such as; 12(5.7%) use a behavioural pain scale (such as FLACC) for assessment of children's pain in their practice. The other 16(7.7%) also use self-reporting pain scale (such as VAS, FACE scale) for the assessment of children's pain in their practice. The finding of the study was similar to study done in Uganda which report 96% of nurses do not use pain assessment tool and similarly the study done in India reports almost 50% of health care professionals did not enumerate any pain scale used in children.

The effect of attitude on Practice of Post-operative pain management was analyzed by using multivariate analysis which showed attitude has a positive relation with practice of postoperative pain management and nurses who have positive attitude more likely practice post-operative pain management than those who have negative attitude (AOR=2.37 [95%CI :1.157-4.851]). The relationship between knowledge and practice of pain management was assessed. The study found respondents with poor knowledge were less likely to practice pain management than those who are with good knowledge (AOR=0.166[95%CI: 0.035-0.787]).

The study revealed that as the educational level of the respondents increase, the post-operative pain management of the nurses will increase. For instances, respondents who obtained diploma less likely manage postoperative paediatrics pain than respondents who have BSc degree and above (AOR=0.192[95%CI: 0.078-0.473]). The study also found that respondents who have less than one year service experience on paediatrics less likely to practice post operative paediatrics pain management than greater than five years (AOR=0.095[95%CI :0.10-0.949]). Nurses who have 1-5 years experience in nursing are less likely to manage postoperative paediatrics pain as compared who has more than 10 years of experience (AOR=0.213[95%CI:0.051-0.893]). The findings of the study in Hong Kong also showed that participants who had more working years of experience and were able to apply their knowledge of pain management to daily practice were have a higher knowledge percentage of correct scores on knowledge questions and had better attitudes (43).

6.5. Strength of the study

The researcher believes that the strengths of this study are:

1. The major strength of the study is the response rate of the questionnaire which was hundred percent since the sample size were small achieving this is a major strength therefore the sample were representative of the population.
2. The study is the first in its kind and could generate new ideas about paediatrics postoperative pain management.
3. The study conducted on hospitals that have almost similar setting so that the study subjects who participate in this study practiced the same postoperative pain management.

6.6. Limitation of the study

The researcher acknowledges the following limitations of this study:

1. Lack of similar study in the country to compare the result.
2. The study subjects in this study only included government hospitals hence the result may not be representative for private hospitals.
3. The finding of this study might have been influenced by subject response bias because self reporting nature of the questionnaire.

4. The study design used was a cross sectional quantitative method because of time constraint. However it was better to conduct a qualitative design especially observation.

7. Conclusion and Recommendation

7.1 Conclusion

The study found the practical level of postoperative pain management of nurses respondents were at moderate level, almost half of the respondent knowledge level was found poor and the attitude of the majority of nurse was negative. It was also found that nurses who have obtained degree and above were more likely perform post-operative pain management than who attained diploma. The study also discovered that respondents who have extensive service years of experience on paediatrics more likely practice postoperative paediatrics pain management than less service years in paediatrics.

The study showed majority of nurses reported that they haven't undertaken any further education or training related to paediatrics pain management after graduation. Similarly the majority of respondent reported that neither there is pain management standard or protocol nor pain assessment tool in their hospital. Only half of nurses reported that there was paediatrics pain management content included in nursing curriculum during their study.

The study revealed respondents with good knowledge more likely to practice pain management than respondents with poor knowledge. The study also showed nurses who have positive attitude were more likely practice post-operative pain management than those who have negative attitude.

7.2 Recommendation

Based on the finding in this study the following recommendations are forwarded:

- It is recommended to develop a mechanism to provide nurse in-service training on post-operative pain management of children.
- It is advisable to include paediatrics postoperative pain management content in nursing curriculum.
- It is also important to improve or promote paediatrics nurse's educational level.
- It is also helpful to establish and put in place pain management guideline and assessment tools in hospitals.
- It is helpful to conduct further study in order to gain additional information on the level paediatrics pain management practice of nurses.

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Annexes

Annex-1 Information sheet

My name is Amina Beshir . I am a postgraduate child health nursing student at Addis Ababa university school of health science department of nursing and midwifery . AAU, CHS and the nursing department at this hospital have given me permission to talk to you about the study that I am conducting. As part of my MSC study, I must conduct a research study. This study is about postoperative pediatric pain management practice of nurses. I am here to invite you to participate in this study. As in any study of this nature, this information provided will be kept confidential.

If you decide to participate, I will ask you to complete a survey that will take you about twenty minutes to fill out. As I said earlier, all information is confidential. Upon receipt of your completed survey, your name is not needed only a code number assigned. No one at this hospital have access to your information.

If you agree, your participation is voluntary. You are free to withdraw your consent or discontinue participation at any time without explanation and without any effect on your present position. If you are willing to participate, please read and sign the consent form and return it to me. If you have any questions, I am willing to answer them now or at a later time.

Introduction/Purpose

I am being asked to participate in a research study. I have read and understood the following explanation which describes the purpose, procedures, benefits, and risks of the study. It also describes the right to withdraw from the study at any time. It is important to understand that no guarantee or assurance can be made as to the results of the study. Also I understood that refusal to participate will not influence my employment at this institution. The purpose of the study is to better understand how nurses practice postoperative pain management of children.

Procedure

I understand that researcher/ or research assistant from the study will ask me to complete a survey about my knowledge and attitudes about children's pain management and I will also be asked to provide some demographic information.

Benefits

I understand that one direct benefit to my participation in the study may be that I gain increased knowledge and a more positive attitude about children's pain management. An indirect benefit is that information gained in this study may help improve nursing education and nurses' abilities for improved pain management for children in the postoperative period.

Risks

I understand that a possible risk that I may experience is the psychological discomfort that may be associated with answering questions honestly, rather than how I think they should be answer.

Compensation

There is no monetary compensation for participation in this study.

Voluntary Participation/ Withdrawal

I understand that I may withdraw from participation in this study at any time. I also understand that withdraw from the study will not influence my employment at this institution in any way.

Questions

If I have any questions concerning my participation in this study now or in the future, Investigator Amina Beshir can be contacted at +251 0911128484 or keduti_2001@yahoo.com.

Confidentiality

I understand that my responses and my personal demographic data will be coded and held in strict confidence. The coding will be done by someone who does not know me. Although the overall results of the study will be reported, at no time will my identity be revealed.

Annex-2 Consent

I have read all the above information about this research 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. I hereby consent and voluntarily offer to follow the study requirements and take part in the study. I understand that if want I will receive a copy of the signed consent form.

Witnessing and Signature

Investigator/Research assistant

Date: _____

Annex 3-Research Instruments

“Survey Questionnaire for postoperative Pediatric pain management practice of Nurses”

Thank you for giving time to help me with this aspect of my Masters study. Your investment of time will help me to improve the understanding and management of pediatric post-operative pain in Ethiopia perspective. The attached questionnaire has 5 parts. There are 6 items in part 1; 16 items in part 2; 12 items in part 3; 18 items in part 4 and 5 items in part 5. It will take approximately 20-30 minutes to complete 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”

Direction: Please mark “X” in the box that is appropriate for you

1. Age -- - - - years
2. Gender- ☐ Male ☐ Female
3. Religion - ☐ Muslim ☐ Christian ☐ protestant ☐ other
4. Duration of nursing service year
☐ 6 – 11 months ☐ 1- 5 Years ☐ 6 – 10 years
☐ 11 - 15 years ☐ More than 16 years
5. Duration of service in pediatric post-operative area
☐ 6 – 11 months ☐ 1- 5 Years ☐ 6 – 10 years
☐ 11 - 15 years ☐ More than 16 years
6. Educational qualification in nursing
☐ Diploma ☐ Bachelor in Nursing Science (B Sc)
☐ Master in Nursing Science (M Sc) ☐ Others (Please specify)

Part 2 Knowledge of nurses participant

Ser	Question	True	False
1	If children experience pain frequently and over long periods, there is no effect on the development of children		
2	The cause of post-operative pain is tissue injury		
3	The experience of pain will affect the psychological, neurological and personal development of a child		
4	Previous pain experience cannot increase the current postoperative pain		
5	After operations, if the children have severe pain, they may show abnormality in vital signs		
6	Pain assessment by behavioral observation is not appropriate for young children		
7	Children can use self-report to identify their pain intensity by themselves		
8	Pain should be assessed before and after administering pain drugs		
9	Physiological pain assessment is a more suitable method than behavioral and self-reporting assessment of pain in children		
10	Assessment of school aged children's pain by self-report is more reliable than physiological assessment		
11	The usual duration of action of IV morphine sulphate is 6-8 hours		
12	Acetaminophen and non-steroidal anti-inflammatory agents are effective analgesics for children's post-operative pain		
13	The most common side effect of morphine is respiratory distress		

14	Initially post-operative analgesics should be given around the clock on a fixed schedule		
15	The side effects of narcotics should be observed at least 20 minutes after administration		
16	Mepridin(pethidine)are generally not recommended for the treatment of children postoperative pain		
17	During the caring of pediatric patients, providing comfort and positioning them may help to reduce muscle tension which, in turn, can reduce pain		
18	Children should be advised to use non-drug techniques along with pain medication		

Part 3 Attitude question

S.No	Question	True	False
1	Usually children perceive pain less than adults		
2	Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences		
3	The child/ adolescent with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure		
4	Based on one's religious beliefs a child/ adolescent may think that pain and suffering is necessary		
5	In order to be effective, heat and cold should be applied directly to the painful area		
6	When children get pain, this will be reduced or disappear immediately and spontaneously		
7	Based on cultural or spiritual beliefs, children or their parents may think that pain and suffering is necessary		
8	The nurse's role during post-operative pain management is to only follow the doctors' orders		
9	The nurse is the best one who can tell the children's feelings of pain		
10	Nurses should not administer pain medication continuously during the first 24-48 hours because the child may become addicted to drugs		
11	Giving children/ adolescents sterile water by injection (placebo) is often a useful test to determine if the pain is real		
12	If the infant/ child/ adolescent can be distracted from his pain this usually means that he is not experiencing a high level of pain.		
13	After an operation, if the child seems to rest in bed with no body movement ,it means that the child has no postoperative pain		

Part 4 Practice of Participant Nurses

1. After surgery 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	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
2. After surgery, you measure physiological change in children (such as BP, respiration rate, heart rate, body temperature, or O2 saturation) in order to assess their pain	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
3. After surgery, you assess children's pain at least once a shift	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
4. You use self-reporting pain scale (such as VAS, FACE scale) for the assessment of children's pain in your practice	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
5. You use a behavioral pain scale (such as FLACC) for assessment of children's pain in your practice	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
6. You administer pain medication to children as ordered by a doctor around the clock	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
7. You observe the side effects of pain medication (such as Morphine) after giving it to the child	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally

8. You observe the following side effects such as respiratory distress, urticaria, nausea, vomiting if a child receive opioids drug (Morphine)	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
9. You administer pain medication to children by your own judgment	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
10. You reassess children's pain after giving pain medication in order to evaluate the effectiveness of pain medication	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
11. After surgery, you distract children from pain by using several techniques(such as giving them toys for playing, listening to music, telling stories,touching them)	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
12. After surgery, you talk with children with a soft voice to comfort them when they are in pain	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
13. After surgery, you arrange the environment to be calm and quiet in order to help children sleep easily	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
14. After surgery, you advise and give opportunities to parents to help reduce their children's pain	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally

15. After surgery, 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)	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
16 After surgery, you provide comfortable positions to help relieve children's pain	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
17. After surgery, you tell children to tell the nurse when they are in pain	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally
18. You ask and help children to support the painful areas when moving or coughing after surgery	☐ Constantly ☐ Infrequently ☐ Frequently ☐ Never ☐ Occasionally

Part 5: Factor Affecting postoperative pain management

Ser		yes	No
1	Is there pediatric pain management contents included in nursing curriculum when you studied		
2	Have you undertake any further continue education(training) relate to pediatric pain management after graduation?		
3	Are there any pain management standards or protocols in your hospital?		
4	Is there any standard pain assessment tool in your hospital?		
5	Are essential analgesics available in your hospital (like opioids, NSAIDs)		

THANKS FOR YOUR COOPERATION

Declaration

I the undersigned declared that this is my original work and has not been presented in this or other University and all sources of materials used for the thesis have been fully acknowledged.

Name of Principal Investigator: Amina Beshir

Signature _____

Date _____

Place: Addis Ababa University School of Allied Health Department of Nursing and Midwifery

This thesis has been submitted for approval to:

Advisor: Yosief Tsige (MSc, BSc, RN)

Signature _____

Date _____

Place: Addis Ababa University School of Allied Health Department of Nursing and Midwifery