

**KAP OF POST OPERATIVE PAIN ASSESSMENT AND  
MANAGEMENT FOR PEDIATRICS PATIENTS AMONG  
SURGICAL RESIDENTES OF ST PAUL’S HOSPITAL  
MILLENIUM MEDICAL COLLEGE**

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A Research Paper to be submitted to the department of surgery, St Paul’s hospital  
millennium medical college in partial fulfillment for the requirements of specialty  
certificate in pediatrics surgery

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OF SURGERY

November 2020  
Addis Ababa, Ethiopia

## ABSTRACT

**BACKGROUND:** Pain is a common complaint among admitted children, often as a result of either the underlying illness or invasive procedures performed on them. It is common presentation for almost all children visiting hospitals. However, identifying the presence, grading and effectively managing pain of neonate, infant and children basically depends on knowledge and attitude of health care workers. This study will identify gaps in pediatrics post operative pain assessment and management.

**OBJECTIVES:** This study assessed the knowledge, attitude and practice of childhood post operative pain assessment and management among surgical residents at SPHMMC.

**METHODS:** Institution based descriptive cross sectional study is conducted from September to October 30, 2020. Standardized questionnaire that measures knowledge, attitude and practice of participants is distributed to surgical residents, while principal investigator observing they answered questions. The data is analyzed with SPSS windows version 25. Data is reported as the mean and categorical data, in percent. The findings of the study will be shared with the staff of the department, it will be presented on the annual research conference of the college in local and an international conferences.

**RESULT:** There are a total of 131 surgical residents (Pediatric surgery, general surgery, urology, plastic surgery, neurosurgery and orthopedics surgery) in St Paul hospital and from this 87% or 114 residents are included in this study. Over all mean correct answer 56.88% and mean correct score for practice is 62.06, for attitude it's 57.57% and mean score for knowledge is 51.02%. More than 90% of residences are males.. More than three-fourth of the residents are in age group between 26 years to 30 years. More than half of the residents have worked as general practitioner for 2 – 3 years. Around one third of residents are from general surgery & other one third orthopedics surgery. Twenty-eight percent of residents of residents are first year and third year and fourth year residents each account for one fourth.

Eighty-six percent of residents didn't have any form of formal teaching, learning or training session on pain assessment and management on pediatric patients with in the past two years.

Only seven percent of residents have good knowledge about post operative pain assessment and management for pediatrics patients scoring above the cutoff point of 70% and 93% of residents have poor knowledge.

Only forty percent of residents have good attitude towards postoperative pain assessment and management of pediatrics patients. The rest 60% have poor attitude.

Among 114 residents who are included in this study 53.5% of them have good practice on post operative pain assessment and management for pediatric patients while the rest 46.5% residents have poor practice.

In this study knowledge, attitude and practice are not associated with gender, Age, unit within the department and presence of formal teaching, learning or training session on pain assessment and management.

**CONCLUSION:** Majority of residents in this study are male and in the age group 26-30 years. Residents included in this study are from 1<sup>st</sup> year to 4<sup>th</sup> year residents. General surgery and orthopedics surgery residents each account for one third of the target population. Majority of residents have poor knowledge and attitude about pediatrics post operative pain management but more than half of residents have good practice about pediatrics pain assessment and management. Knowledge, attitude and practice of pediatrics post operative pain management is no associated with sex, unit, year of residency, age and presence of previous training or teaching on pediatrics pain management.

## **ACKNOWLEDGEMENTS**

- I would like to thank my advisors Dr. Maru G, Dr. Fitsum A and Dr Samrawit S for their valuable advice and comment as well as for providing me with valuable references in conducting this research.
- I would like to appreciate the student research program office of SPHMMC for endorsing this program and I am thankful in advance for the support.

# TABLE OF CONTENTS

|                                              |      |
|----------------------------------------------|------|
| ABSTRACT.....                                | II   |
| ACKNOWLEDGEMENTS.....                        | IV   |
| TABLE OF CONTENTS.....                       | V    |
| LIST OF TABLES.....                          | VI   |
| LIST OF FIGURES.....                         | VII  |
| ACRONYMS .....                               | VIII |
| INTRODUCTION.....                            | 9    |
| BACKGROUND INFORMATION.....                  | 9    |
| STATEMENT OF THE PROBLEM.....                | 10   |
| SIGNIFICANCE OF THE STUDY .....              | 11   |
| LITERATURE REVIEW .....                      | 13   |
| OBJECTIVES .....                             | 18   |
| GENERAL OBJECTIVES .....                     | 18   |
| SPECIFIC OBJECTIVES .....                    | 18   |
| METHODOLOGY .....                            | 19   |
| STUDY SETTING .....                          | 19   |
| STUDY PERIOD.....                            | 19   |
| STUDY DESIGN .....                           | 19   |
| POPULATION .....                             | 19   |
| INCLUSION AND EXCLUSION CRITERIA .....       | 19   |
| SAMPLE SIZE AND SAMPLING TECHNIQUE.....      | 20   |
| MEASUREMENT .....                            | 20   |
| LIST OF VARIABLES.....                       | 20   |
| INSTRUMENTS.....                             | 20   |
| DATA COLLECTION .....                        | 20   |
| DATA QUALITY CONTROL.....                    | 21   |
| DATA PROCESSING AND ANALYSIS.....            | 21   |
| ETHICAL CONSIDERATION .....                  | 21   |
| OPERATIONAL DEFINITIONS.....                 | 21   |
| STRENGTHS AND LIMITATIONS OF THE STUDY ..... | 22   |
| DISSEMINATION OF RESULTS .....               | 22   |
| RESULTS .....                                | 23   |
| DISCUSSION.....                              | 31   |
| CONCLUSION.....                              | 32   |
| RECOMENDATION.....                           | 33   |
| REFERENCES.....                              | 34   |
| ANNEX – QUESTIONNAIRE.....                   | 38   |

## LIST OF TABLES

## **LIST OF FIGURES**

## ACRONYMS

|        |                                                 |
|--------|-------------------------------------------------|
| FPS    | Faces Pain Scale                                |
| FMOH   | Federal Ministry of Health                      |
| H/VVAS | Horizontal/Vertical Visual Analog Scale         |
| HIV    | Human Immunodeficiency Virus                    |
| IASP   | International Association for the Study of Pain |
| ICU    | Intensive Care Unit                             |
| NSAID  | Non Steroidal Anti Inflammatory Drugs           |
| SPHMMC | St Paul Hospital Millennium Medical College     |
| VRS    | Verbal Rating Scale                             |
| WHO    | World Health Organization                       |

# INTRODUCTION

## ***BACKGROUND INFORMATION***

The international association for the study of pain (IASP) states “pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.”[1]

Many classification systems are used to describe the different types of pain. The most common classification schemes refer to pain as acute or chronic; malignant or nonmalignant; and nociceptive or neuropathic. Most formal and commonly used means of pediatric assessment tools for pain are available and categorized depending the pediatrics age. [2]

### *Pain Assessment in Neonates*

Major guidelines indicate that the assessment of pain in neonates (term babies up to 4 weeks of age) had better be use the Crying, Requires oxygen for saturation above 95%, Increasing vital signs, Expression and Sleepless (CRIES) scale [4,5].

### *Assessment of pain in infants:*

The FLACC scale has 98% sensitivity and 88% specificity in assessing pain levels [11].

**Table 1:** FLACC behavioral pain assessment tool

| <b>FLACC Behavioral Pain Assessment Tool</b> |                                              |                                                                            |                                                       |
|----------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------|
|                                              | <b>0</b>                                     | <b>1</b>                                                                   | <b>2</b>                                              |
| <b>Face</b>                                  | No particular expression or smile            | Occasional grimace/frown withdrawn or disinterested                        | Frequent/constant quivering chin, clenched jaw        |
| <b>Legs</b>                                  | Normal position or relaxed                   | Uneasy, restless or tense                                                  | Kicking or legs drawn up                              |
| <b>Activity</b>                              | Lying quietly, normal position, moves easily | squirming, shifting back and forth, tense                                  | Arched, rigid or jerking                              |
| <b>Cry</b>                                   | No cry                                       | Moans or Whimpers, occasional complaint                                    | Crying steadily, screams or sobs, frequent complaints |
| <b>Cancelability</b>                         | Content or relaxed                           | Reassured by occasional touching, hugging or being talked to, distractible | Difficult to console or comfort                       |

### *Assessment of pain in older children:*

**Self-report:** The single most reliable indicator of the existence and intensity of pain and any resultant distress is the patient's self-report. For older children, the use of a self-reporting scale can be helpful to staff and empowering to the patient [5].

An important responsibility of health care professionals who care for children is eliminating pain and suffering when possible. However, it has been documented that children are often undertreated for their pain [18]. Pain can be measured by self-report (what children say), biological markers (how their bodies react), and behavior (what children do). Pain is a subjective event and so self-report is best, if it is available. Unfortunately, in many infants, young children, or children with Cognitive or physical impairments, self-report is not available and behavioral or biological measures must be used [19].

Uncontrolled pain has many adverse health consequences besides the obvious distress and suffering of the patient. Chronic pain impacts the patient's quality of life, sleep, mood, and predisposes them to engage in drug use [20].

Pain scales dictate the need and degree of analgesia required. The WHO pain management ladder originally designed for cancer pain relief in 1986, is used worldwide for treatment of non cancer pain as well. Though conflicting data exist on the effectiveness of non-pharmacologic methods, the cognitive, behavioral, and socio- cultural aspects of pain can be treated by non-pharmacologic complimentary alternative options [22-24]. The method includes cognitive therapy acupuncture and acupressure, positioning, massage, exercise, etc.

## ***STATEMENT OF THE PROBLEM***

The American Academy of Pediatrics has stated that, despite the vast literature describing how to assess and manage pain in children by using low-cost, widely available, convenient, and safe methods, it has not been used. [25] Organizations such as the American Pain Society (APS), Agency for Healthcare Research and Quality (AHRQ), and Joint Commission on Accreditation of Healthcare Organizations (JCAHO) have proposed guidelines for pain management [26].

In Ethiopian, a study done in Jimma University Hospital demonstrated the poor recognition of pain and under treatment of it, though it was done in adult medical ward [29].

Children may receive inadequate treatment because of difficulties of perception, identification, and verbalization of pain, or as a result of underutilization of tools to assess pain. Therefore, it is important for professionals not to underestimate children's complaints, to try to know their clinical history as well as the pain characteristics and intensity, to take into consideration the psychological and social aspects involved, and to conduct a physical examination to investigate the cause of pain. According to the rights of hospitalized children and adolescents, every child has the right not to feel pain whenever there are means to avoid it [27]. Considering the high prevalence of pain patients, primary care providers have become discontented and concerned with their training with regards to pain treatment [28].

Barriers to appropriate pain management include health workers insufficient knowledge on pain assessment tools, poor understanding of the health risk attached, general attitude towards patients with pain and concerns related with development of addiction with opioid use. [30,31]. On the patients' part, feeling pain may be misconceived as a normal part of life and unavoidable part and parcel of having sickness thus may be reluctant to request for analgesia or may not even be aware of presence of one [32].

### ***SIGNIFICANCE OF THE STUDY***

Management of pain and stress in children is of significant importance in pediatrics during post operative period. Effective pain management is associated with early mobilization, more rapid recovery, and faster return to work, school, and play. The treatment of acute pain and anxiety in children has a permanent effect on the entire emergency medical experience on a child's and family's reaction to future medical procedures.

Even with the rapid development of pediatric postoperative pain management, pediatric patients have remained under treated for postoperative pain because of difficulty in pain assessment and concerns regarding side effects of opioid analgesics. Using the pain assessment scales for children particularly in infants are with some limitations, but these scales can help us to choose the appropriate potency of analgesics. Availability of analgesia, sedatives and opioids and their antagonists has provided clinicians safe pain management for procedures outside the operating room. Using analgesics and treatment of anxiety in children undergoing therapeutic or diagnostic procedures in emergency departments has developed in the past few years yet the management of

pain in the Emergency Departments has not improved very well [33]. The staff education and protocol development are needed to provide comfort to children in emergency setting and satisfy their family.

Numerous myths, insufficient knowledge among caregivers, and inadequate application of knowledge contribute to the lack of effective management. Personal values and beliefs of health care professionals about the meaning and value of pain in the development of the child (*e.g.*, the belief that pain builds character) and the treatment of pain may interfere with the optimal recognition and treatment of pain for all children.[34] To improve the recognition and treatment of pain in sick children, health care professionals need to expand their knowledge, use appropriate assessment tools and techniques, anticipate painful experiences and intervene accordingly, use a multimodal approach to pain management, use a multidisciplinary approach when possible, involve families, and advocate for the use of effective pain management in children.[35] For improving this aspect of care, it is desirable to assess the knowledge, attitude and practices of health care professionals. This will help in devising appropriate strategies to improve the knowledge and change the attitudes and practices for pain management.

## LITERATURE REVIEW

A study was done in Brazil to assess prevalence, assessment and management of pediatric pain in teaching hospital. The study sample consisted of 121 inpatients (70 infants, 36 children, and 15 adolescents), their families, 40 physicians and 43 nurses. Of the 82 family caregivers 40 reported the presence of pain in their children (49%). Of the 34 children/adolescents (28%) who were able to answer the interview, 20 inpatients (59%) complained of pain in the 24 h preceding the target day for data collection. With regard to pain management, of the 20 children adolescents who reported pain, 13 additionally reported a successful pain relief intervention, whereas 7 did not perceive any pain management. Furthermore, of the 40 family caregivers who detected pain in their children, 28 (70%) observed successful pain management. The physicians reported pain in 44 inpatients (38%) and pain was successfully managed in 66%. [44]

A study conducted at Iran, Mashhad University of Medical Science, on assessment of Pain Management in Pediatric Emergency Department. In this study they evaluated pain and anxiety relieving in 100 children who referred to their Pediatric Emergency Department in Imam Reza Hospital of Mashhad from 21<sup>st</sup> December 2012 to 20<sup>th</sup> March 2013. It was a descriptive and one arm blinded study, Thus the AAP recommendations come in check lists and filling by pediatric resident students asking ED nurses and EMS providers, while they were unaware of performing such a study. The main procedures done to admit patients in ED were included IV line 97%, Intubation 5%, Lumbar Puncture 28%. Their emergency department's performance was assessed based on AAP criteria. The result was training and education had been provided to 70% health providers of Emergency Department (ED). Non-pharmacologic stress reduction was used in 35%. Family presence during painful procedures was allowed only in 5% of cases. So the conclusion was According to results, pain management in our Pediatric Emergency Department was inadequate. Physicians and pre-hospital EMS providers and nurses should be Justified and trained about the importance of pain relieving and how to use all available analgesics and sedative options. [36]

Another study in USA review 17 articles about causes and consequences of inadequate management of acute pain, with the objective of identifying through a review of recent literature the barriers to effective treatment of acute pain and the potential consequences of inadequate

pain management. Studies indicate that treatment of acute pain remains suboptimal due to attitudes and educational barriers on the part of physicians and patients, as well as the intrinsic limitations of available therapies. Inadequate management of acute pain negatively impacts numerous aspects of patient health, and may increase the risk of developing chronic pain. Although opioids are the preferred treatment for most moderate to severe acute pain, their side effects can impede their use, and thus, their clinical effectiveness. Analgesic regimens with an improved efficacy/tolerability balance have the potential to improve acute pain management, and thus reduce the incidence of chronic pain. Studies examining the use of multiple analgesics with different mechanisms of action suggest that multimodal therapies may offer an improved efficacy/tolerability balance over single agent. [37]

A study carried out at three pediatric units (pediatrics, intensive care unit, and oncology) of Hospital de Clínicas de Porto Alegre, which is a university hospital located in southern Brazil. Aim was to evaluate the degree of knowledge about pain management and opioids use by professionals working at three pediatric units. The subjects were physicians, pharmacists, physiotherapists, nurses, nursing technicians, and nursing assistants. Cross-sectional study with a self-applicable semi-structured questionnaire was handed out to 182 professionals from December 2011 to March 2012. The average percentage of correct answers was  $63.2 \pm 1.4\%$ . The most frequent errors were: an opioid must not be used if the cause of pain is unknown (47%; 54/115); patients often develop respiratory depression (42.3%; 22/52); and confusion about symptoms of withdrawal, tolerance, and dependency syndromes (81.9%; 95/116). Only 8.8% (10/114) reported the use of pain scales to identify pain in children. The most often cited hindrance to control pain was the difficulty to measure and spot pain in pediatric patients. Finally, 50.8% (62/122) of them did not have any previous training in pain management. So they concluded, Problems in the processes of pain identification, measurement, and treatment has been found. Results suggest that there is a need for both an investment in continuing education of professionals and the development of protocols to optimize the analgesic therapy, thus preventing increased child suffering. [38].

A study from India on Knowledge, Attitude and Practices among Health Care Professionals Regarding Pain in children, it was a prospective descriptive survey conducted at a tertiary care hospital in north India. A semi structured questionnaire regarding pain in children was

administered to pediatric residents and nurses in a teaching hospital. Of 77 participants, 47 (61.1%) were nurses and 30 (38.9%) were pediatric residents. The result was, 9% agreed that pain assessment scales are ideally meant only for adults, 45.4% of health care professionals did not enumerate any pain scale used in children. One-third of the respondents did not report any adverse consequences of poor pain management in children. Others listed psychological problem (24.6%), hemodynamic instability (20.7%), and problem in conducting the procedure safely (10.3%) as some of the adverse consequences of poor pain management. Majority (64.9%) of the respondents believed that the best judge of the intensity of pain would be child himself/ herself. 42.8% reported that children exaggerate their pain. Only 33% of health care professionals reported that they were assessing pain intensity experienced by children routinely. However, none of them reported routine use of any of the pain assessment scales. Majority (76.6%) of health care professionals' practices showed that they were willing for the parental presence during minor invasive procedure as it helped to calm the child. The other response given was only to give explanation before and during the procedure (10.3%). So they concluded that Health care professionals are able to identify the pain, accept that child's self-report of pain is the best judge of the intensity of pain and were able to practice appropriate pain control measures. The findings of the present study emphasize the need to improve the knowledge and practices of health care professionals for assessment and management of pain in children. [41]

Another study from Sudan with the title of, This was a prospective, descriptive, cross sectional study that was conducted in 9 major pediatric hospitals accredited for training of residents in Sudan, they used , A semi-structured and validated questionnaire was distributed to 174 residents working in these hospitals. Response rate was 68% (120). The result was, of the residents surveyed, 70% said they had never received any kind of formal training, education, or learning sessions in pediatric pain assessment and management during their training as residents. Sixty percent of the responder said they did not know and could not name any of the pain assessment scales/tools used in children. When residents were requested to list as much as they could of the signs, clues, indicators, or variables they used to evaluate the severity of pain in pre-verbal children or children who cannot communicate their pain intensity, 13% of them failed to name any sign/ tool, while none of them used appropriate pain scale. Self-report (the correct answer) was reported as the best tool by 32%. More than 88% of residents reported that there was no pain assessment tool/scale available for evaluating children's pain in their hospital. While most of the

answers (65%) were correct regarding the duration required to develop morphine dependence, 35% thought that dependence is high likely to occur if morphine is given even for less than 48 hours. And they concluded as there is marked gap of knowledge among residents regarding pain assessment and management in children reflected as lack of awareness of pain assessment scales/tool in children as well as distorted knowledge about opioids use. The attitude towards pain in children was generally positive among residents; however, this was rarely reflected as appropriate practices when it comes to peri-procedural pain control and the appropriate use of opioids to relieve pain. Most residents agreed on the sub-sufficient/poor quality of pain assessment and management in children in the studied hospitals, emphasizing the need to implement policies and procedures to improve the situation. They recommend as an introduction of pain assessment and management in the curriculum of pediatrics in medical schools as an essential study subject is the initial step. [42]

In our country there was cross-sectional survey with aim of the study was to assess the level of knowledge and attitudes regarding pain management of the 2013 final year students of Medical and paramedical students of College of Public Health and Medical Sciences(CPHMS) of Jimma University, South-west Ethiopia. To assess the knowledge and attitude towards pain, a questionnaire that contain 23 items having a four likert scales called SD (Strongly Disagree), D (Disagree), A (Agree), and SA (Strongly Agree) were prepared from previously validated tools. Total of 422 students participated in the study making a response rate of 86.7%. The students' academic performances as depicted by their mean (SD) Cumulative Grade Point Average (CGPA) were  $3.31 \pm 0.12$ ,  $3.12 \pm 0.3$ ,  $3.03 \pm 0.35$ ,  $3.01 \pm 0.19$ ,  $2.92 \pm 0.25$ ,  $2.91 \pm 0.23$  for anesthesia, nursing, pharmacy, dentistry, HO, and medicine respectively in their descending order. The overall correct item score ranged from 23.7% to 82.2% with an overall mean correct answer of 52.3%. Only 4.2% of the students scored above the cutoff point (70%) for good knowledge regarding pain management. Pharmacy students had a mean score of correct answer of 55.7% followed by medicine 54.7%, anesthesia 51.8%, HO 50.9%, dentistry 50.6%, and nursing 49.9%. Paradoxical, 73% of the participants responded that they have adequately learnt about pain and its management in their academic carriers. They concluded as The global consensus that pain education is poorly emphasized in medical and paramedical schools is augmented and substantiated by the findings of this study that student less scored below the expected good level of knowledge to handle patients in pain.[31]



## **OBJECTIVES**

### ***GENERAL OBJECTIVES***

- To assess knowledge, attitude and practice of childhood post operative pain assessment and management among surgical residents in SPHMMC from September to October 2020.

### ***SPECIFIC OBJECTIVES***

- To describe knowledge and attitude of surgical residents about pediatric postoperative pain assessment from September to October 2020.
- To assess practice of surgical residents about pediatrics postoperative pain assessment from September to October 2020.
- To describe knowledge and attitude of surgical residents of SPHMMC about pediatric post operative pain management from September to October 2020.
- To assess practice of post operative pediatrics pain management among surgical residents of SPHMMC from September to October 2020.

## **METHODOLOGY**

### ***STUDY SETTING***

SPHMMC is one of the largest teaching hospitals in the country providing undergraduate as well as post graduate teaching service. It has about 700 beds and sees an average of 1200 emergency and outpatient clients daily. The surgery department is staffed with consultants, residents, interns, nurses and other supportive stuffs. The department has 117 beds from which 16 are for pediatrics patients. There is pediatrics surgeon and three pediatrics surgery residents in the department.

### ***STUDY PERIOD***

The study is conducted from September 1, 2020 – October 15, 2020.

### ***STUDY DESIGN***

Descriptive Cross sectional study design is conducted.

### ***POPULATION***

#### **SOURCE POPULATION**

All Residents of SPHMMC.

#### **STUDY POPULATION**

All general, urology, Orthopedics, plastic, neurosurgery and pediatrics surgery residents of SPHMMC.

### ***INCLUSION AND EXCLUSION CRITERIA***

#### **INCLUSION CRITERIA**

All consented general surgery, Neurosurgery, Plastic, orthopedics, urology and pediatric surgery residents are included

#### **EXCLUSION CRITERIA**

There is no exclusion criterion.

## ***SAMPLE SIZE AND SAMPLING TECHNIQUE***

There are total of 41 general surgery, 18 urology, 15 neurosurgery, 8 plastic surgery, 44 orthopedics and there are 4 pediatric surgical residents with a total of 131 residents. All the above residents are included in the study.

## ***MEASUREMENT***

### **LIST OF VARIABLES**

- Knowledge, attitude and practice of residents about pediatric pain assessment and management.
- Age
- Sex
- On job and pre-service training on pain assessment and management on children
- Year of residency
- Practice on pediatric out patient in patient

### **INSTRUMENTS**

- Pens
- Pencils
- Laptop computer
- Eraser
- Sharpener

### **DATA COLLECTION**

Data is collected by principal investigator using standardized questionnaire. The principal investigator directly observed while data is being filled by participants. The questionnaire was derived from PEDIATRICS NURSES KNOWLEDGE AND ATTITUDE SURVEY REGARDING PAIN (PNKAS- SHRINER'S REVISION 2002) which is a tool with established validity and reliability. This tool was initially developed in 1987 by Ferrell and mcAffery and has been used extensively since, with multiple revisions over the years to reflect changes in pain management. The questionnaire has three parts demographic part containing 6 questions, true/false part and MCQ part. All the questions are in English and it will be distributed to residents they will do it on spot.

## **DATA QUALITY CONTROL**

Principal investigator checked data for its completeness and missing information at each point. Furthermore data was checked during data collection by using checklist. Finally data was checked during entry into SPSS before analysis.

## **DATA PROCESSING AND ANALYSIS**

Data is cleaned and entered in to a computer. All analysis are conducted using SPSS for windows version 25. Continuous date is reported as the mean and standard deviation and categorical data, in percent.

## **ETHICAL CONSIDERATION**

The data collection is anonymous which do not include names of individual participant and any other personal identifiers there will no harm for the participant. Verbal consent is obtained from the participants before data collection. Ethical clearance is obtained from the Department Research and Publication Committee, at SPHMMC, department of Surgery. The research will not place the data records unwarranted risk; rather is kept under locked boxes.

## **OPERATIONAL DEFINITIONS**

***Good knowledge regarding pain management;*** – *if  $\geq 70\%$  of questions answered*

***Effect of Pain:*** - any dysfunction of the patient as a result of pain including physical and psychosocial as measured by the patient.

***Standing dose of analgesics:*** - documented order of analgesic to be given at a regular interval.

***Pro re nata (PRN):***- documented order of analgesic to be given as needed instead of fixed interval.

***Circumstance of analgesic order:*** - ordered by a health professional with or without request of the patient.

***Psychiatric disorder:*** -known psychiatric condition that is diagnosed by a psychiatrist.

***Chronic pain:*** -defined as a pain lasting more than 6mths

***Sub acute pain:*** - pain lasting less than 6mths but not associated with recent acute illness or injury

***Acute pain:*** - pain associated with an acute illness or injury

***Procedure:*** - any major or minor operations done

***Received pain medication*** – Presence of documented order or documented administration of analgesics.

***Non pharmacological pain management*** – Any measures taken by the caregiver or the health worker that does not involve drugs which is thought to decrease patient's pain

***Pain assessed*** – Presence or absence is mentioned, measured and documented on the patients chart

***Incomplete Assessment & management documented*** – Partially managed or documented severity of pain at 24hrs after admission.

***Pain Intensity Change*** – Degree of pain at 24<sup>th</sup> hr after admission compared to the time of admission

## **STRENGTHS AND LIMITATIONS OF THE STUDY**

The sample size is relatively small and may limit to conclude this research result to represent the population; however this study may be entry point for large scale studies with large sample size from different institutions.

## **DISSEMINATION OF RESULTS**

The findings of the study will be shared with the staff of the department, it will be presented on the annual research conference of the college in local and an international conferences.

## RESULTS

There are a total of 131 surgical residents (Pediatric surgery, general surgery, urology, plastic surgery, neurosurgery and orthopedics surgery) in St Paul hospital and from this 87% or 114 residents are included in this study.

Over all mean correct answer 56.88% and mean correct score for practice is 62.06, for attitude its 57.57% and mean score for knowledge is 51.02%.

Among residents who are included in this study 91.2% are males and the rest 8.8% are female. More than three-fourth of the residents are in age group between 26 years to 30 years. More than half of the residents have worked as general practitioner for 2 – 3 years. Around one third of residents are from general surgery, other one third orthopedics surgery and 13.2% of them are urology residents. Twenty-eight percent of residents of residents are first year and third year and fourth year residents each account for one fourth.

**Table 2:** Socio-demographic status of residents

|                           |                   | Frequency | Percent |
|---------------------------|-------------------|-----------|---------|
| <b>Gender</b>             | Male              | 104       | 91.2    |
|                           | Female            | 10        | 8.8     |
|                           | Total             | 114       | 100     |
| <b>Age</b>                | <26year           | 3         | 2.6     |
|                           | 26 – 30 year      | 90        | 78.9    |
|                           | 31 – 35 year      | 19        | 16.7    |
|                           | >35 year          | 2         | 1.8     |
|                           | Total             | 114       | 100     |
| <b>Service year as GP</b> | Up to 1 year      | 41        | 36      |
|                           | 2 -3 years        | 66        | 57.9    |
|                           | >3 years          | 7         | 6.1     |
|                           | Total             | 114       | 100     |
| <b>Year of residency</b>  | First             | 32        | 28.1    |
|                           | Second            | 25        | 21.9    |
|                           | Third             | 29        | 25.4    |
|                           | Fourth            | 28        | 24.6    |
|                           | Total             | 114       | 100     |
|                           | General Surgery   | 37        | 32.5    |
|                           | Pediatric surgery | 5         | 4.4     |
|                           | Plastic surgery   | 7         | 6.1     |

|             |              |     |      |
|-------------|--------------|-----|------|
| <b>Unit</b> | Urology      | 15  | 13.2 |
|             | Neurosurgery | 12  | 10.5 |
|             | Orthopedics  | 38  | 33.3 |
|             | Total        | 114 | 100  |

**Table 3:** Formal teaching, learning or training session on pain assessment and management among residents

|              | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| <b>Yes</b>   | 16               | 14             |
| <b>No</b>    | 98               | 86             |
| <b>Total</b> | 114              | 100            |

Eighty-six percent of residents didn't have any form of formal teaching, learning or training session on pain assessment and management on pediatric patients with in the past two years and the rest 16 residents 14% of them have training. And from this 7 residents have 1 – 2 hours training and six residents have more than two hour long training.

**Table 4:** Duration of formal teaching, learning or training session on pain assessment and management among residents

|                    | <b>Frequency</b> | <b>Total</b> |
|--------------------|------------------|--------------|
| <b>&lt; 1 hour</b> | 3                | 18.7         |
| <b>1 – 2 hours</b> | 7                | 43.8         |
| <b>&gt;2 hours</b> | 6                | 37.5         |
| <b>Total</b>       | 16               | 100          |

## **KNOWLEDGE**

There are twelve questions assessing the knowledge of resident on pediatrics post operative pain assessment. Five of the questions are True false questions and other seven are multiple choice questions.

**Table 5:** Knowledge assessing questions

|                                                                                 |       | <b>Frequency</b> | <b>Percent</b> |
|---------------------------------------------------------------------------------|-------|------------------|----------------|
| Vital signs are always reliable indicators of intensity of pain                 | True  | 34               | 29.8           |
|                                                                                 | False | 80               | 70.2           |
| Respiratory depression rarely occurs in patients receiving stable doses opioids | True  | 66               | 57.9           |
|                                                                                 | False | 48               | 42.1           |
| WHO pain ladder suggests using single analgesic agent rather                    | True  | 41               | 64             |

|                                                                                                                              |       |    |      |
|------------------------------------------------------------------------------------------------------------------------------|-------|----|------|
| than combining classes of drugs                                                                                              | False | 73 | 36   |
| Beyond certain doses of morphine increasing the dose will not provide increased pain relief                                  | True  | 61 | 53.5 |
|                                                                                                                              | False | 53 | 46.5 |
| Behavioral observation scales are the most reliable measures of assessing pain and sedation in intubated/ventilated patients | True  | 60 | 52.6 |
|                                                                                                                              | False | 54 | 47.4 |

Seventy percent of residents believe that vital signs are not always reliable indicators of intensity of pain whereas about half of residents said behavioral observation scales are the most reliable measures of assessing pain and sedation in intubated/ventilated patients. Around 58% of residents responded that respiratory depression rarely occurs in patients receiving stable doses of opioids. Two-third of the residents believe that WHO pain ladder suggests using single analgesic agent rather than combining class of drugs.

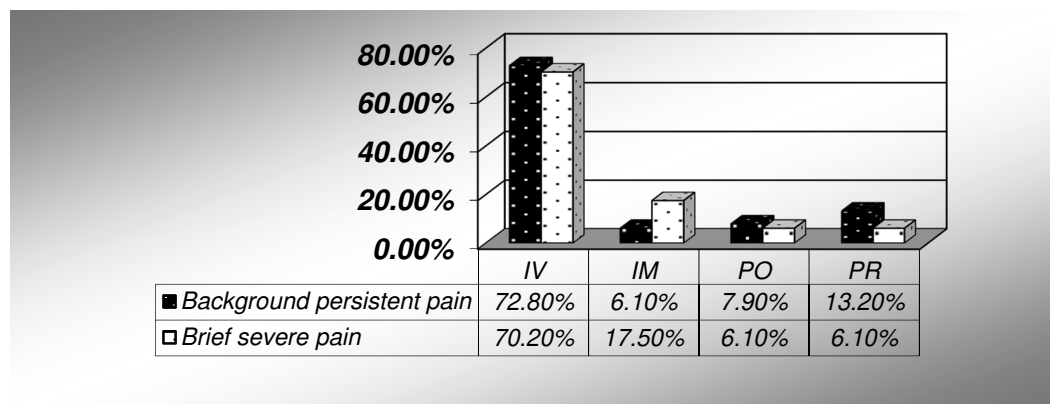


**Figure1:** Recommended route of opioid analgesics administration

Recommended route of opioid analgesics in presence of background persistent pain is IV in around 73% of residents while in case of brief severe pain IV route is recommended according to 70.2% of residents.

**Table 6:** Initial administration of analgesics for post operative pain

|                                                                     | Frequency | Percent |
|---------------------------------------------------------------------|-----------|---------|
| <b>Fixed schedule</b>                                               | 103       | 90.4    |
| <b>Only when the child asks</b>                                     | 3         | 2.6     |
| <b>Only when the clinician determines that the patient has pain</b> | 8         | 7       |
| <b>Total</b>                                                        | 114       | 100     |

More than 90% of residents answered that initial administration of analgesics for post operative pain is based on fixed schedule.

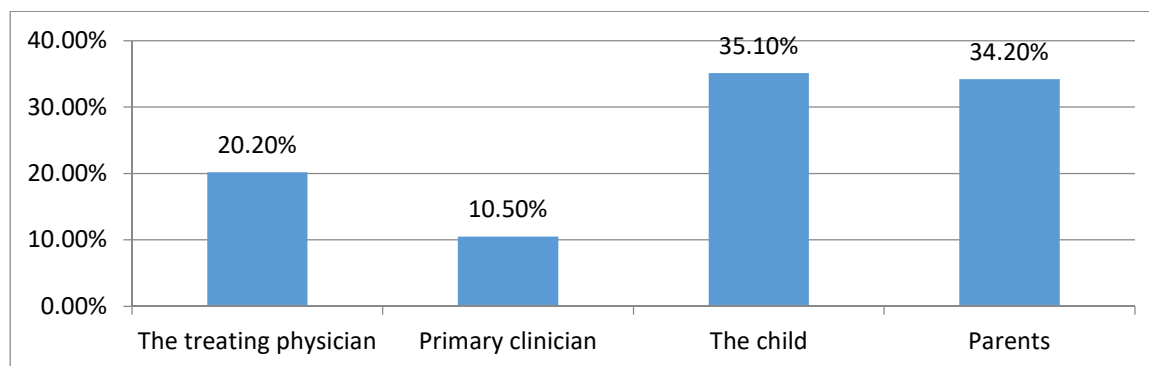


**Figure2:** The most accurate judge of the intensity of the child's/adolescent's pain

Thirty five percent of residents said that the most accurate judge of the intensity of child's/adolescent's pain is the child itself and 34% of residents answered that parents are the most accurate judges.

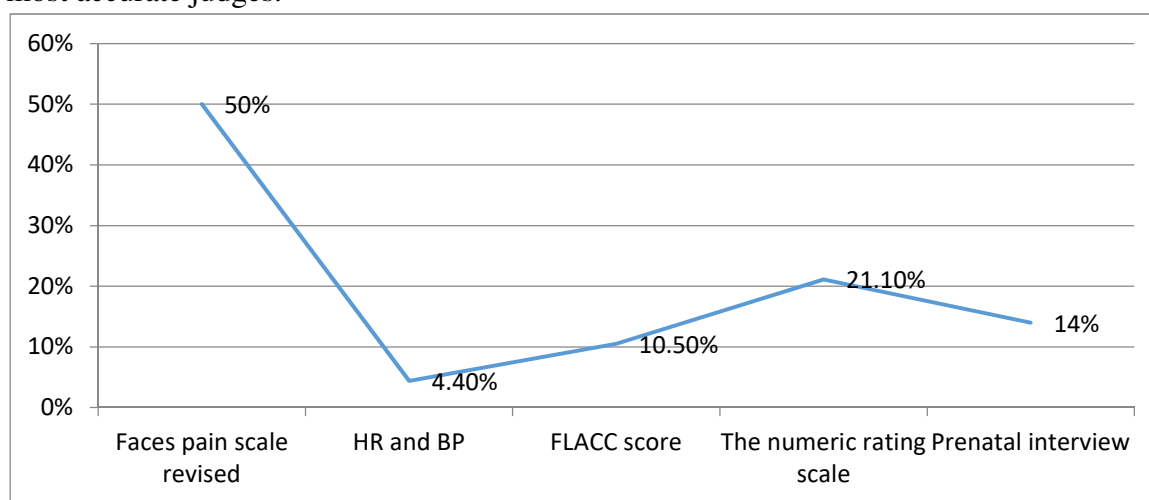


**Figure 3:** Best measure of pain of 4 year developmentally normal child after tonsillectomy

Best measure of pain of 4 years old developmentally normal awake child after tonsillectomy is the numeric rating scale according to 21% of residents and appropriate means to objectively document pain in four month old infant is use of FLACC assessment for 45.6% of residents.

**Table 7:** Appropriate means to objectively document pain in 4 month old infant

|                                          | Frequency | Percent |
|------------------------------------------|-----------|---------|
| Ask bedside nurse                        | 19        | 16.7    |
| Use numeric score of 1 - 10              | 12        | 10.5    |
| Use FLACC assessment                     | 52        | 45.6    |
| Guess based on infants facial expression | 31        | 27.2    |
| Total                                    | 114       | 100     |

Paracetamol is a medication that can cause either analgesia or respiratory depression according to 46% of residents and for 22% of residents codeine is the answer.

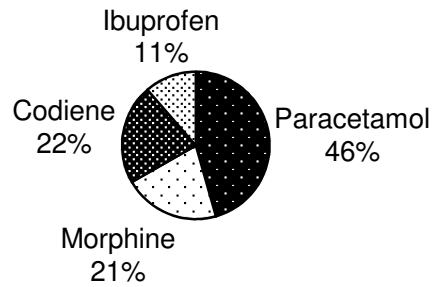


**Figure 4:** Medication that can cause either no analgesia or respiratory depression

Only seven percent of residents have good knowledge about post operative pain assessment and management for pediatrics patients scoring above the cutoff point of 70% and 93% of residents have poor knowledge.

**Table 8:** Knowledge of residents on post operative pain assessment and management for pediatrics patients

|                       | Frequency | Percent |
|-----------------------|-----------|---------|
| <b>Good Knowledge</b> | 8         | 7       |
| <b>Poor Knowledge</b> | 106       | 93      |

## ATTITUDE

**Table 9:** Attitude assessing questions

|                                                                                                                        |       | Frequency | Percent |
|------------------------------------------------------------------------------------------------------------------------|-------|-----------|---------|
| <2 year year children have decreased pain sensitivity & limited memory of painful experience due to underdeveloped N/S | True  | 50        | 43.9    |
|                                                                                                                        | False | 64        | 56.1    |
| Patients who can be distracted from pain usually do not have severe pain                                               | True  | 64        | 56.1    |
|                                                                                                                        | False | 50        | 43.9    |
| Patients may sleep in spite of severe pain                                                                             | True  | 57        | 50      |
|                                                                                                                        | False | 57        | 50      |
| B/c of risk of addiction adolescents with history of substance abuse should not be given opioids                       | True  | 62        | 54.4    |
|                                                                                                                        | False | 52        | 45.6    |
| Parents should not be present during painful procedure                                                                 | True  | 35        | 30.7    |
|                                                                                                                        | False | 79        | 69.3    |
| Under 8 year children can't reliably report pain and clinician should rely on parents assessment of child's pain       | True  | 41        | 36      |
|                                                                                                                        | False | 73        | 64      |
| Young infant, less than 6 months of age can't tolerate opioids                                                         | True  | 41        | 36      |
|                                                                                                                        | False | 73        | 64      |
| Best to start pain medications for post op patients on PRN bases and to decide if it needs standing dose               | True  | 22        | 19.3    |
|                                                                                                                        | False | 92        | 80.7    |

Only forty percent of residents have good attitude towards postoperative pain assessment and management of pediatrics patients. The rest 60% have poor attitude.

**Table 10:** Attitude of residents on post operative pain assessment and management for pediatrics patients

|                      | Frequency | Percent |
|----------------------|-----------|---------|
| <b>Good attitude</b> | 45        | 39.5    |
| <b>Poor attitude</b> | 69        | 60.5    |

## **PRACTICE**

**Table 11:** Practice assessing questions

|                                                                |               | Frequency | Percent |
|----------------------------------------------------------------|---------------|-----------|---------|
| Use of pain assessment tools in post op patients               | Yes           | 21        | 18.4    |
|                                                                | No            | 93        | 81.6    |
| Frequency of analgesics administration in early post op period | PRN           | 6         | 5.3     |
|                                                                | Standing dose | 108       | 94.7    |
| Mode of analgesic administration in early post op period       | Single agent  | 29        | 25.4    |
|                                                                | Combination   | 85        | 74.6    |
| Use of opioid analgesics for post operative patients           | Yes           | 69        | 60.5    |
|                                                                | No            | 45        | 39.5    |

Sixty percent of residents use opioid analgesics for post operative pain forty percent of the residents don't use opioid analgesics post operative pain patients. Among 45 residents who don't use opioid analgesics post operative pain management 51% percent of them do not use because of fear of respirator depression and 31% of them don't use it due to lack of availability.

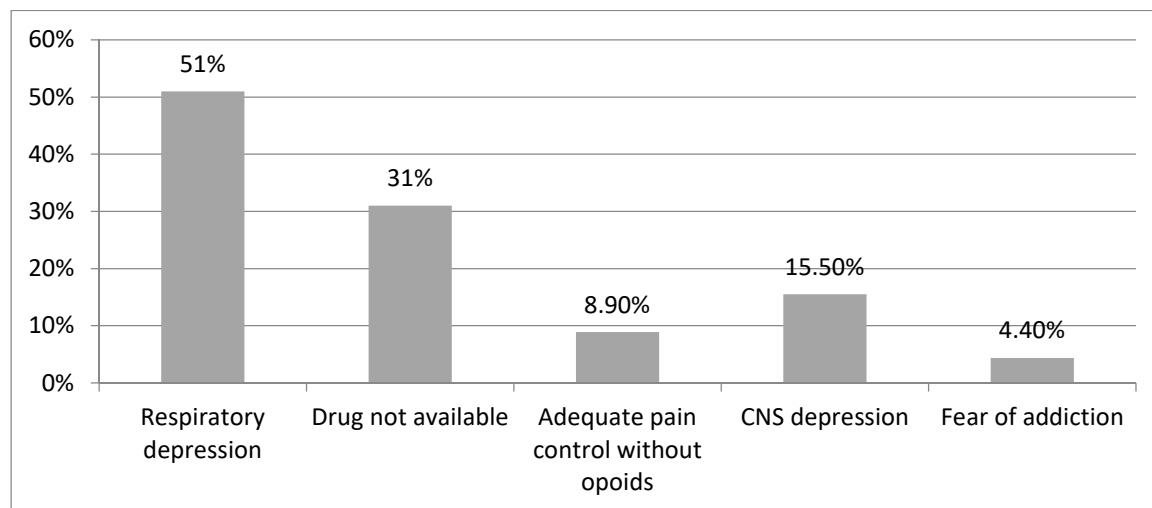


**Figure 5:** Reasons for not giving opioid analgesics in post op period

Among 114 residents who are included in this study 53.5% of them have good practice on post operative pain assessment and management for pediatric patients while the rest 46.5% residents have poor practice.

**Table 12:** Practice of residents on post operative pain assessment and management for pediatrics patients

|                      | Frequency | Percent |
|----------------------|-----------|---------|
| <b>Good practice</b> | 61        | 53.5    |
| <b>Poor practice</b> | 53        | 46.5    |

### ASSOCIATION

**Table 13:** Association of Knowledge

|                                                                                 |                    | Knowledge |      | P value |
|---------------------------------------------------------------------------------|--------------------|-----------|------|---------|
|                                                                                 |                    | Good      | Poor |         |
| Gender                                                                          | Male               | 8         | 96   | 0.827   |
|                                                                                 | Female             | 0         | 10   |         |
| Age                                                                             | <26 year           | 0         | 3    | 0.547   |
|                                                                                 | 26-30year          | 7         | 83   |         |
|                                                                                 | 31-35 year         | 1         | 18   |         |
|                                                                                 | >35 year           | 2         | 0    |         |
| Unit                                                                            | General surgery    | 3         | 34   | 4.723   |
|                                                                                 | Pediatrics surgery | 0         | 5    |         |
|                                                                                 | Plastic surgery    | 0         | 7    |         |
|                                                                                 | Urology            | 2         | 13   |         |
|                                                                                 | Neurosurgery       | 2         | 10   |         |
|                                                                                 | Orthopedics        | 1         | 37   |         |
| Formal teaching, learning or training session on pain assessment and management | Yes                | 2         | 14   | 0.857   |
|                                                                                 | No                 | 6         | 92   |         |

**Table 14:** Association of Attitude

|                                                                                 |                    | Attitude |      | P value |
|---------------------------------------------------------------------------------|--------------------|----------|------|---------|
|                                                                                 |                    | Good     | Poor |         |
| Gender                                                                          | Male               | 40       | 64   | 0.508   |
|                                                                                 | Female             | 5        | 5    |         |
| Age                                                                             | <26 year           | 1        | 2    | 1.417   |
|                                                                                 | 26-30year          | 36       | 54   |         |
|                                                                                 | 31-35 year         | 8        | 11   |         |
|                                                                                 | >35 year           | 0        | 2    |         |
| Unit                                                                            | General surgery    | 18       | 19   | 19.953  |
|                                                                                 | Pediatrics surgery | 4        | 1    |         |
|                                                                                 | Plastic surgery    | 1        | 6    |         |
|                                                                                 | Urology            | 9        | 6    |         |
|                                                                                 | Neurosurgery       | 7        | 5    |         |
|                                                                                 | Orthopedics        | 6        | 32   |         |
| Formal teaching, learning or training session on pain assessment and management | Yes                | 3        | 10   | 0.861   |
|                                                                                 | No                 | 39       | 59   |         |

**Table 15:** Association of Practice

|                                                                                 |                    | Practice |      | P value |
|---------------------------------------------------------------------------------|--------------------|----------|------|---------|
|                                                                                 |                    | Good     | Poor |         |
| Gender                                                                          | Male               | 55       | 49   | 0.186   |
|                                                                                 | Female             | 6        | 4    |         |
| Age                                                                             | <26 year           | 2        | 1    | 3.282   |
|                                                                                 | 26-30year          | 47       | 43   |         |
|                                                                                 | 31-35 year         | 12       | 7    |         |
|                                                                                 | >35 year           | 0        | 2    |         |
| Unit                                                                            | General surgery    | 24       | 13   | 14.145  |
|                                                                                 | Pediatrics surgery | 2        | 3    |         |
|                                                                                 | Plastic surgery    | 2        | 5    |         |
|                                                                                 | Urology            | 6        | 9    |         |
|                                                                                 | Neurosurgery       | 11       | 1    |         |
|                                                                                 | Orthopedics        | 16       | 22   |         |
| Formal teaching, learning or training session on pain assessment and management | Yes                | 7        | 9    | 0.713   |
|                                                                                 | No                 | 54       | 44   |         |

In this study knowledge, attitude and practice are not associated with gender, Age, unit within the department and presence of formal teaching, learning or training session on pain assessment and management.

## DISCUSSION

Eighty-six percent of residents didn't have any form of formal teaching, learning or training session on pain assessment and management on pediatric patients with in the past two years & the rest 16 residents (14%) of them have training. Other studies also showed that there is global consensus that pain education is poorly emphasized in medical schools. [31] [38]

Over all mean correct answer 56.88% and mean correct score for practice is 62.06, for attitude it's 57.57% and mean score for knowledge is 51.02%. In other done in Brazil the mean correct answer was  $63.2 \pm 1.4\%$  which is slightly higher but comparable to this study. [38]

In our country there was cross-sectional survey with aim of the study was to assess the level of knowledge and attitudes regarding pain management of final year students of Medical students of Jimma University. The overall mean correct answer of 52.3%. This is also comparable with this study. [31]

In the study use of pain assessment tools in post op patients by surgical residents is 18.4% and in other study done in Brazil in pediatrics unit only 8.8% of participants use pain assessment tools for pediatrics post operative patients. [38]

Only 7% of residents scored the cut point 70% score for good knowledge and in the study done on medical students of JU good practice was found only 4.2% of students. In both studies percentage of good knowledge is low but this study has slightly higher rate which is most likely due to this study is on residents, postgraduate students and that of Jimma study is on undergraduate students. [31]

Despite lower rate of good knowledge and good attitude (40%), more than half of the residents have scored above the cut off point for good practice (53.5%).

Knowledge, attitude and practice of residents on pediatrics post operative pain assessment and management is not associated with Age, sex, unit within the department, year of residency and presence and absence of previous training on pediatric pain assessment. The study showed that one time training of pediatrics pain assessment doesn't affect the knowledge and practice of resident. The other thing is since pain assessment and management is not included in the curriculum, year of residency and unit within the department do not change the outcome.

## CONCLUSION

- Majority of residents in this study are male and in the age group 26-30 years.
- Residents included in this study are from 1<sup>st</sup> year to 4<sup>th</sup> year residents.
- General surgery and orthopedics surgery residents each account for one third of the target population.
- Majority of residents have poor knowledge and attitude about pediatrics post operative pain management but more than half of residents have good practice about pediatrics pain assessment and management.
- Knowledge, attitude and practice of pediatrics post operative pain management is no associated with sex, unit, year of residency, age and presence of previous training or teaching on pediatrics pain management.

## **RECOMENDATION**

### **To Clinicians:**

- Need to update about pediatrics pain assessment and management.

### **To Institutions (medical schools):**

- Pediatrics pain management should be part of the curriculum

### **To Researchers:**

- Further research is needed including all health care workers and involving different centers all over the country to know the magnitude of the problem

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## ANNEX – QUESTIONNAIRE

**SECTION A: DEMOGRAPHIC PART**

1. Gender            male                                                 female
2. Age              \_\_\_\_\_.
3. Service year as GP    \_\_\_\_\_.
4. Year of residency    A) first year    B) second year    C) third year    D) 4<sup>th</sup> year
5. Unit                A) General surgery                                                 B) Pediatrics surgery                                                 C) Plastic Surgery  
                                D) Urology                                                 E) Neurosurgery                                                 F) Orthopedics
6. Have you had any form of formal teaching, learning or training session on pain assessment and management on pediatric age groups within last 2 years    A) yes            B) no
7. If your answer for question no. 5 is yes for how long    A) < 1 hour    B) 1-2 hours    C) 2-3 hours    D) > 3 hours

## SECTION B: KNOWLAGE AND ATTITUDE SURVEY PART

TRUE/FALSE: PLEASE CIRCLE THE CORRECT ANSWER

1. Vital signs are always reliable indicators of the intensity of a patient's pain. T F
2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. T F
3. Patients who can be distracted from pain usually do not have severe pain. T F
4. Patients may sleep in spite of severe pain. T F
5. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. T F
6. World health organization (WHO) pain ladder suggests using single analgesic agent rather than combining classes of drugs (e.g., combining an NSAID with an opioid). T F
7. Adolescents with history of substance abuse should not be given Opioids for pain because they are at high risk for repeated addiction. T F
8. Parents should not be present during painful procedure. T F
9. Beyond certain dose of morphine increasing the dose will not provide increased pain relief. T F

10. Children less than 8 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity. T F
11. Young infant, less than 6 months of age, can't tolerate opioids. T F
12. Behavioral observation scales are the most reliable measures of assessing pain and sedation in intubated /ventilated patients. T F
13. It is best to start pain medicines for postoperative children on PRN bases and then to decide if they require scheduled medication. T F

Multiple Choice – PLEASE CHOOSE THE CORRECT ANSWER

14. The recommended route of administration of opioid analgesics for children with background (persistent, continuous) pain is  
A. IV                      B. IM                      C. SC                      D. PO                      E. PR
15. The recommended route administration of opioid analgesics for children with brief, severe pain of sudden onset such as trauma or postoperative pain is  
A. IV                      B. IM                      C. SC                      D. PO                      E. PR
16. Analgesics for post-operative pain should initially be given  
A. around the clock on a fixed schedule  
B. only when the child/adolescent asks for the medication  
C. C. only when the clinician determines that the patient has moderate or greater discomfort
17. The most accurate judge of the intensity of the child's/adolescent pain is  
A. The treating physician                      D. The pharmacist  
B. The child/adolescent's primary clinician                      E. The child/adolescent 's parents  
C. The child/adolescent
18. A 4 year old child who is developmentally normal, is in post –op unit after tonsillectomy, she is awake and alert, the mother states that her child is in pain. What is the best measure of this child's pain?  
1. FACES pain scale revised                      4. The numeric rating scale  
2. Heart rate and blood pressure                      5. Parental interview  
3. FLACC score
19. Which of the following is an appropriate means to objectively document pain in 4 month old infant?  
A. Ask bedside nurse                      B. Use numerical score of 1-10

C. Use FLACC assessment

D. Guess based on infant's facial expression

20. Which of the following medication can cause either no analgesia or respiratory depression depending on how it is metabolized by CYP2D6?

A. Paracetamol

C. Codeine

B. Morphine

D. Ibuprofen

***SECTION C: PRACTICE SURVEY PART***

1. Do you use pediatrics pain assessment tools to assess post operative pain? Yes No

2. How frequent are you ordering ant pain medications for pediatrics patients in their early post operative days?

A. PRN

B. Standing dose

3. How are you administering analgesics for post operative pediatrics patients?

A. Single agent

B. Combination of medications

4. Do you give opioid analgesics for post operative pain? (your experience) Yes No

5. If the answer is 'No' for the above question, why?