

# Investigations of pain status in children admitted to pediatric critical care in a tertiary medical center in Ethiopia

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## SUMMARY

The pain status of hospitalized pediatric patients in Ethiopia remains unstudied. This hospital based prospective survey assessed 162 children for pain before, at and after admission using previously validated age specific pain assessment tools. Sociodemographic, clinical and treatment profile of patients were abstracted from charts and interview. The aim was to describe the prevalence, severity, documentation and treatment of pain at Jimma University Hospital during April 1 to May 25, 2013. At admission moderate to severe pain prevalence was 90.1% at admission. Analgesics were prescribed for 44 of the children only, while 2 received combination of paracetamol and Tramadol. Only 11.1% of the patients were brought within the first 24 hrs of the onset of pain. There were no any pre-procedure (pre-emptive) analgesics given to all infants and children. Despite this, pain was assessed and documented for 47.5% of the children. The prevalence of pain in pediatrics was quite high and was under assessed, undertreated and undocumented. A further research might explore the impact of the gaps observed at the level of assessment, documentation and treatment of pain.

**Key words:** Ethiopia, pediatrics, infant, children, pain, prevalence

## Introduction

All children encounter and endure “everyday” pain associated with casual activities, diseases and medical procedures. Pain in children can result in psychological, behavioral and physiological disturbances (1, 2). There is no evidence that shows the experience of pain in children is less than in adults, while the converse is confirmed true (3, 4).

It is over a decade since the declaration of “the relief of pain should be a human right” by World Health Organization (WHO), and the International Association for the Study of Pain (IASP) (5). But, studies from different regions of the world continued to report that pain in hospitalized children is staggeringly prevalent but undocumented and untreated (3, 5-10).

Successful management of pain depends on regular assessment, reassessment and documentation of the source, cause, and characteristics (intensity, site, and type) of the pain (11, 12). Besides, adequate knowledge of health care providers and pain recognized systems are equally important. Pain audit geared quality improvements by various organization in USA, Canada, Sweden and Brazil showed that standardization, assessment, documentation and treatment of pain had significantly decreased pain sufferings in pediatric patient groups (3, 5, 13).

In Ethiopia, a national survey reported that health care providers believed pain is neglected in the country (14). Moreover, two studies revealed the pediatric pain knowledge gap among health care providers from over 6 disciplines (15, 16). The fact that children are the most vulnerable and no study explored pediatric pain prevalence was the motive for this research. Thus, this research aims to describe the prevalence, severity, documentation and treatment of pain among hospitalized children so that appropriate quality improvement could be taken based researched evidences.

## Materials and Methods

### Study area and period

The study was conducted in Jimma University Specialized Hospital (JUSH) department of pediatrics and child health from April 1 - May 25 (for 55 days), 2012. JUSH is located in Jimma town 350 KM southwest of Addis Ababa. It is the only referral hospital for over 15 million people in the Southwest region. It is a teaching hospital with different public health services. A pediatrics emergency ward gives different services for seriously ill infants and children like treating acute medical and surgical conditions and acute exacerbation of chronic diseases.

### Sample

All infants and children admitted to pediatrics critical ward,

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except those in exclusion criteria (Age less than 2 months old and Infants and children with impaired cognitive) were included using convenient non probable sampling technique.

### Study Design

#### A hospital based prospective study

#### Tool and data collection procedure

All of 162 infants and children were assessed for pain by FACIAL PAIN rating scale for children above three years old, Verbal rating scale for children above six years old and FLACC PAIN rating scale for infants and children ranges 2 months up to three years old, they were assessed at admission, 4th, 8th, 12th, and 24th hours after admission. Particularly axillary temperature, respiratory rate and pulse rate of the infants and children were taken at admission, and 4th, 8th, 12th and 24th hrs post admission. Sociodemographic, clinical and treatment profile of patients were abstracted from charts or interview of families and nurses who were not involved in the care of the patient at the time of data collection.

Before proceeding to data collection the team had a day of Training on the activities and clinical skills on pain assessment and management practice training. To evaluate the validity and reliability of the data pre-test was done on the 10 patients before the actual data collection procedure. The data collection process was monitored for completeness, accuracy and clarity.

#### Data entry and analysis

All data were summarized on master sheet after they were coded. After double entry into EPI Data, data were analyzed using statistical package for social scientists (SPSS) version 16 software. Missing values and range errors were corrected in reference to the original database. Results were prepared using narrations, means, percentages, figure and tables. Chi-square was used to test the association of categorical variables with degree of pain, while McNemar's to test the time change of proportion of patients with pain. For all, a p value of <0.05 was taken to be statically significant.

#### Ethical statement

An ethical clearance and permission was obtained from Ethical and Research committee of Jimma University to access patients' records from the authorities of the hospital. All necessary procedure done to the infant and children were clearly explained for the families, attendants or care givers by the language they can speak and their permission sought for enrolment. All information was kept confidential and the study subject had full right not to be involved in the study.

## Result

#### Sample description

Out of the total sample of 162 infants and children admission to JUSH emergency pediatric ward 43.8% were females. The sample contains 38 infants, 68 toddlers/preschool age, and 56 school age and above. Cardiopulmonary origin of pain accounted for the 27.2% of patients (Figure 1). From all the admissions, 23.5% had orthopedic and musculoskeletal problems. The proportion of the literate care givers of the patients were 54% (Table I).

#### Child presentation at admission

Combinations of multi systemic manifestations like cough, shortness of breath, vomiting of ingested matter, diarrhea, poor feeding behavior, skin lesions and local swelling were seen in

the great majority 79.6% of patients during admission. Isolated cough and shortness of breath were observed in 8.6%, whereas localized swelling and limping 5.6%, failure to feeding, vomiting and diarrhea 3.1%, abnormal body movement 1.2%. Similarly, urgency, frequency, facial swelling, fever, poisoning and bleeding were seen in of the cases (Table I).

**Table I** Sociodemographic and clinical characteristics of sample (n = 162)

Variables	Frequency n (%)
Gender	
Male	91(56.0)
Female	71(44.0)
Age(Years)	
2/12-1	38(23.4)
1-3	32(20.0)
3-6	36(22.2)
>6	56(34.4)
Feeding status	
Breast feeding only	10(6.2)
Complementary feeding	48(29.6)
Family diet	104(64.2)
Causes of Procedural pain	
IV line, IV/IM medication	118(72.8)
Catheterization	1(0.6)
Combination	4326.5)
Pain assessed and documented	
Yes	77(47.5)
No	85(52.5)
Medication prescribed	
Yes	44(27.0)
No	118(73.0)
Non-pharmacologic intervention	
Yes	61(37.6)
No	101(62.3)
Chief complaint for admission	
Fever	1(0.6)
Cough/difficulty of breathing/palpitation	14(8.6)
Vomiting/diarrhea/poor feeding/abdominal pain	5(3.1)
Abnormal body movement/comma	1(0.6)
Urgency/Dysuria/Flank pain/General swelling	2(1.2)
Localized swelling/Limping	9(5.6)
Bleeding and poisoning	1(0.6)
Combination of the above	129(79.6)
Educational status of parents	
Illiterate	74(46.0)
Literate	88(54.0)

Around 11.1% of the patients were brought within the first 24hrs of the onset of pain, while 54.3% between 1st to 7th days, and 34.6% beyond 7 days. At admission, 72.8% the children had procedures like IV line opening, IV or IM medication. Likewise, major/minor surgery, drainage of abscess and lumbar puncture were done in 26.5%, and catheterization in 0.6% of the patients (Table 1).

Hypothermic temperatures were identified in 4.9% 4.9%, 3.1%, 3.1% portion of the participants. Similarly, tachypnic children were 79%, 68.5%, 40.7%, 37% while 81.5%, 69.1%, 38.9%, 35.8% of the cases were tachycardic.

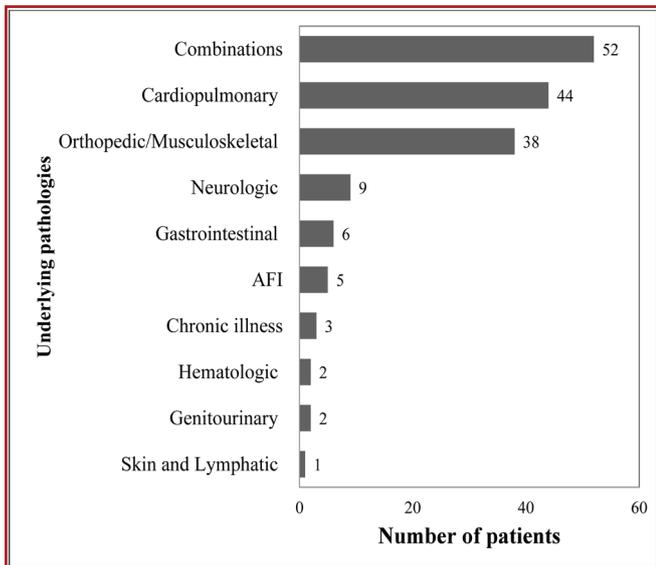


Figure 1 Underlying pathologies for pain

### Prevalence, documentation and characteristics of Pain

Almost all the patients had reported that they had felt pain before, at or after admission. Moderate to severe pain prevalence was 88.9% before admission while 90.1 % at admission. This was decreased to 64.2% 24 hrs after admission (Figure 2). But, only 47.5% of the participants had their pain intensity documented.

Based on our assessment, the pattern of pain that we found was continuous in 38.3%, and intermittent in 61.7% of the cases. Disturbances on sleep, mood, feeding, disturbance attention secondary to pain were observed in 92.4% of the patients. In line with this, the pain was aggravated by activity, feeding and crying in 64.8%. A further exacerbation by sleeping/sitting and feeding were seen in 1.9% and 13.6% respectively but, 19.8% were not able to identify the aggravating factors (Table I).

After 12 to 24 hrs of admission, patients were reevaluated for their pain intensity and exactly half of them were not improved from their pain 50%. Most of these unimproved groups of patients had had moderate to severe degree of pain at admission (Figure 2).

### Pharmacologic and non-pharmacologic interventions

With regard to the medication experience of the patients, there were no any pre-procedure analgesics given to infants and children. Even though, all of the infants and children had different degree of pain, analgesics were ordered and prescribed for 72.8% of the participants, but it was only administered for 41 of them (Table I).

In as much as the previous fact, majority 70% of the prescription holders received Paracetamol followed by Diclofenac 23%, Tramadol 2.3% and combination of Tramadol and Paracetamol 4.6%. The route of administration of the given drugs were suppository 47%, per oral 25%, Intramuscular 18% and Intravenous 9%. As per needed mode of prescription accounted for 70% of the medication orders while around the clock (BID and TID) only 30.3%. Among the prescribed participants, only 66% of them were able to receive their medications accordingly (Table II).

Table II: Analgesics prescribed (n=43)

Analgesics given	Frequency regimen n (%)			Total (%)
	BID	TID	PRN	
Paracetamol	1(2.3)	2(4.6)	27(63)	30(70)
Diclofenac	0(0)	8(18.8)	2(4.6)	10(23)
Tramadol	0(0)	0(0)	1(2.3)	1(2.3)
Combinations	0(0)	2(4.6)	0(0)	2(4.6)

BID: Twice per day TID: Three times per day PRN: As needed

Beyond the pharmacologic interventions, 37.7% patients were able to receive non pharmacological managements like physical methods (Positioning, localized massage supporting), emotional support (Touching, reassuring, and presence of family), and finally a combination of the previous mentioned techniques in 8.2%, 13.1%, and 78.7% of the cases respectively. Though no statistically significant association was found ( $p>0.05$ ), the literate care givers gave the higher proportion of the non-pharmacological cares 23.5% (Table I).

### Discussion

Pain is a commonest evil even in a well-resourced referral pediatric center and to the worst it is under-recognized and undertreated. Then it is not that hard to imagine the shadow of the damage in our poor resource setting. However, still when even simple analgesia was received, it was effective for most patients though this is not true in our case (5, 17).

Of the total 162 patients, only 47.5% had their pain documented. Prevalence of pain in infants and children in our study area is quite high. Moderate to severe pain prevalence was 88.9% before admission while 90.1 % at admission. Half of the patients didn't improve after the treatment. From all unimproved patients surprisingly 48.7% of them with mild pain didn't show any sign of improvements despite the treatment. This distressing nature of the result is incomparable even with other studies suggesting pain is still undertreated (3, 5, 8, 10, 18); for the insanely high figure in this audit.

After medication half of study subjects had some pain left. The observed poor utilization analgesics (no preemptive analgesia, failure to prescribe and administer full doses of the drugs, and almost nil opioids prescription) might explain the observed. This is also the part of the epitome of our study that, the pain was continuous and intermittent in 38.3% and 61.7%

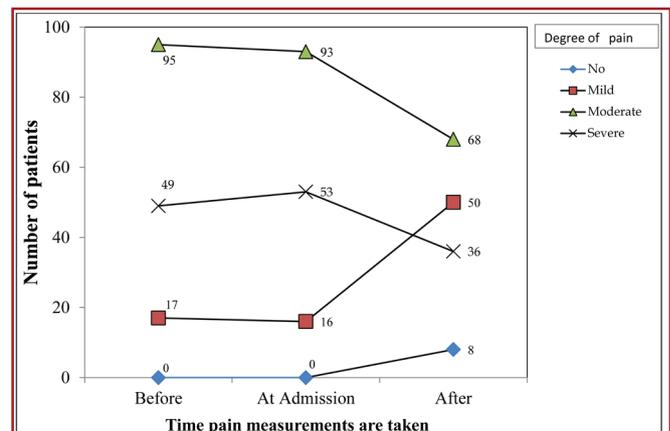


Figure 2 Change over time of Degree of pain

patients respectively.

Moreover, medical and surgical procedures were implicated in exacerbation and causation of untreated pain. Our patients endure unacceptable level of pain during their hospitalization that resulted on constant quivering of their face and the authors of this paper to utter. This could have been resolved if pain had recognized and regularly documented as a vital sign. Instead, our study children were left battling their life time enemy (pain) and inborn right for pain free soul and body, it was not intervened. A significant proportion of our study participants were sustained on elevated vital signs, mirroring that they were in pain.

The analgesics given for majority of the infants and children was paracetamol, suppository and largely prescribed based on per needed (as required) which accounts 68.5%, despite of the age and degree of pain. No use of regional anesthesia technique is also the limitation of the pain management. Many studies confirmed Regional anesthesia techniques for pediatric patients are becoming more popular, and large audits have revealed remarkably low complication rates (19, 20). Majority of the parents were practicing the non-pharmacologic method of pain management. Literacy status of the parents has nothing to do with the non-pharmacological method of pain management according to our study analysis result

This study is the first in the Ethiopia to determine the prevalence, severity, documentation and treatment of pain among pediatrics using previously validated tool. But it is not without its limitations. The fact it is done in a single site and only among critical patient must be taken in to consideration while consuming the results of the study.

This study demonstrates that the prevalence of pain was in hospitalized pediatric patients. Despite this, it was left undocumented and untreated with the available analgesics. The absence of articulated policy and guideline for pain management in the setting backed the findings. Current evidence-based strategies for the pain management of the patients should be implemented and frequent audit to compare the results for better quality health service of our country.

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