International Journal of
Health, Medicine and Nursing Practice
(IJHMNP)

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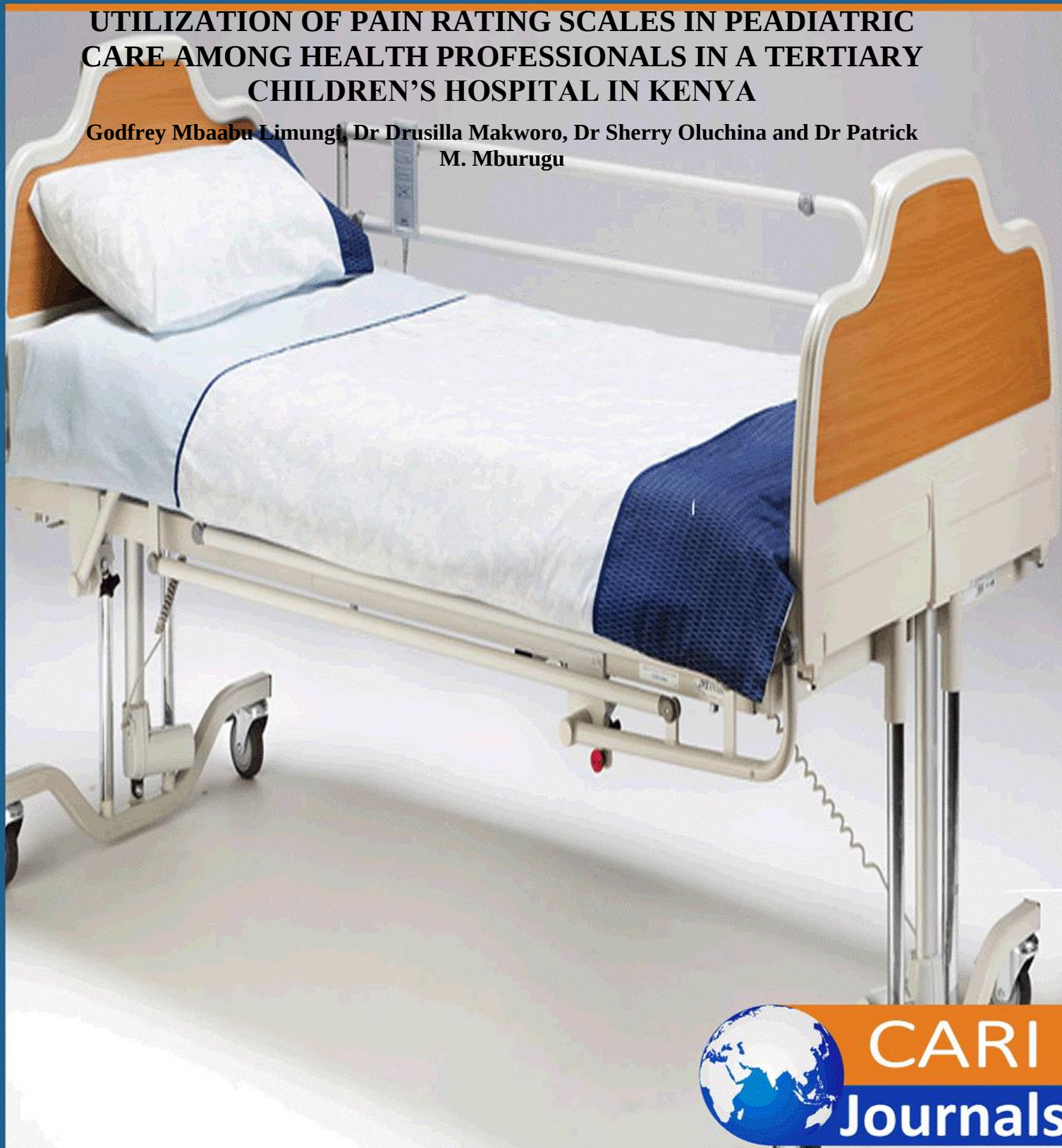

CARI Journals

International Journal of Health, Medicine and Nursing Practice

Vol.2, Issue No.2, pp 47 - 64, 2020

www.carijournals.org

Utilization of Pain Rating Scales in Peadiatric Care Among Health Professionals in A Tertiary Children's Hospital in Kenya

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Abstract

Purpose: The study assessed utilization of pain rating scales at a children's hospital as a basis for making recommendation for their adoption by the ministry of health, Kenya.

Methodology: This was a descriptive cross-sectional study utilizing both quantitative and qualitative approaches, conducted in a tertiary children's hospital in Nairobi-Kenya. Data was collected using semi- structured self-administered questionnaire, key informant interview guide (KII) and observation check list from a sample size of 160 Health Professionals and 71 patients' medical records sampled from a study population of 280 Health professionals and 88 patients' medical records. Quantitative data was analyzed using descriptive statistics where by data was summarized using frequency tables and presented using pie chart, and bar graphs. A content analysis was performed on qualitative data based on stages of qualitative data analysis.

Results: The hospital was found to have adopted four pain rating scales which included Neonatal guide score, FLACC, Wong Baker faces scale, and Numerical pain scale. Utilization of these tools among Health Professionals was found to be excellent, with nurses being the main health professionals who utilized them at 99%.

Unique contribution to theory, practice and policy: This study aims at improving pain management in child health care in Kenya, where many paediatric units do not assess and measure pain in paediatric patients. Though nurses were the main Health Professionals who utilized pain rating scales in the hospital, inclusion of pain guidelines in all patient's medical records would promote their utilization among other Health Professionals.

Key Words: *Health Professionals, Paediatric care, Pain rating scales, Utilization*

1.0 INTRODUCTION

1.1 Background of the Study

Pain rating scales are vital tools in paediatric care for diagnosis and management of pain in paediatric patients. These scales are important diagnostic tools and are used by healthcare providers to evaluate the nature and severity of pain experienced by paediatric patients. In children, selection of appropriate pain rating scales is important because pain is expressed in different ways depending on the developmental stage of the child (Srouji, Ratnapalan, & Schneeweiss, 2010). Pain is the most common stimuli experienced by paediatric patients, and its management mainly depends on utilization of pain rating scales in assessment and measurement of its intensity (Mate, 2014). Even though Pain assessment tools should be reliable, valid, developmentally appropriate, clinically useful and practical to use, literature review has shown that no single tool has been identified as ideal despite development of over 40 pain assessment tools (Dick et al., 2016)

Globally, pain rating scales have been adopted for use in child health care and policy on the same has been implemented. In developed countries these tools are being utilized and their utilization has helped in improvement of pain management in children (Uwaezu, 2014). However, a study done in a Canadian paediatric hospital to determine the frequency of pain assessment in admitted children revealed that pain rating scales were not frequently used in some of the paediatric patients (Bonnie, et al., 2012). In sub-Saharan Africa, most hospitals do not have pain rating scales for utilization in paediatric patients (Mate, 2014). In these hospitals, routine pain assessment for paediatric patients has been hindered by lack of a single-item pain rating scale validated for measuring pain intensity (Walters, 2009). A documented commentary on Queen Elizabeth Central Hospital in Blantyre, Malawi revealed that the hospital did not have a single pain rating scale (Walters, 2009). In Kenya, hospitalised patients are experiencing pain as it remains undertreated. The prevalence of pain has remained high (59% to 98%) in hospitalised patients (Kristin, et al., 2013). Besides, assessment and measurement of pain is never done in most of the hospitals, as they lack a single pain rating scale.

1.2 Problem statement

Pain reported by hospitalized children has not decreased despite the availability of improved pain-assessment tools (Friedrichsdorf et al., 2016)**.** Documented literature has shown that, pain experienced in hospitalized children is known to be common, under-recognized, and under-treated, with more than 10% of hospitalized children showing features of chronic pain (Friedrichsdorf et al., 2016). In United States of America the prevalence of moderate-to-severe pain in hospitalized children has been reported to be between 25% and 64%. (Ternullo & DiAntonio, 2015).Pain is often inadequately assessed and treated, especially in the African setting, where resources and skills are limited (Mate, 2014). Inadequate treatment of pain in paediatric patients has immensely contributed to prolonged hospital stay for admitted children (Uwaezu, 2014).

Not only are paediatric patients vulnerable to inadequate pain treatment, but they are also at risk of experiencing negative consequences resulting from poor pain control (Hauer, 2017).

According to (Wong et al., 2012), if a child's pain is not treated quickly and effectively, it can have long-term physical and psychological sequelae. Literature has shown that poorly controlled pain can reduce patients' quality of life. Paediatric patients may become depressed or anxious and sometimes unable to do many of the things they did without pain. This state of living in pain has affected relationship between children and other family members. The other undesired effects, of uncontrolled pain include the prolong hospital stay and increased cost of treatment (Uwaezu, 2014).In Kenyan hospitals, hospitalised patients are experiencing pain as it remains undertreated. The prevalence of pain has remained high and especially among the cancer and HIV/aids patients where the prevalence of 59% to 98% has been reported (Kristin et al., 2013).

Besides, assessment and measurement of pain is never done in most of the hospitals in Kenya, as they lack a single pain rating scale. The few hospitals with such tools, utilize them mostly in palliative departments. Pain is a cause of mortality among the paediatric patients, yet no guideline has been provided by the ministry of health on assessment and measurement of pain in paediatric care. The basic paediatric protocol provided by the Ministry of Health- Kenya, (2016), has not captured the issue of pain in paediatric care. Though it has guidelines targeting management of the seriously ill new born or child in the first 24 - 48 hours of arrival at hospital, it has failed to capture the assessment and measurement of pain in such patients as a principle of good paediatric care. The prescribed analgesic dosages in the protocol most of the time is not used properly by the health professionals in pain management because there is no guideline on "who and when to be given what". This has left the health care professionals with an "option" of treating pain based on their own perception rather than the exact level of pain in the patients. Therefore, the purpose of this study was to assess utilization of pain rating scales at the children's hospital as a basis for making recommendation for their adoption by the Ministry of Health, Kenya.

1.3 Research questions

i. What is the level of utilization of pain rating scales in pediatric care among health professionals at Gertrude's children's hospital?
ii. What is the perception of the health professionals on importance of use of pain rating scales in measurement of pain in pediatric care at Gertrude's children's hospital?

1.4 Objectives of the study

i. To determine the level of utilization of pain rating scales in pediatric care among health professionals at Gertrude's children's hospital.
ii. To assess the perception of health professionals on the importance of use of pain rating scales in measurement of pain in paediatric care at Gertrude's children's hospital.

1.5 Theoretical Frame work

This study was anchored on general system theory (GST), because of its ability to show the relationship between the study variables. General system theory was developed by Ludwig Bertalanffy in 1950 with a view of integrating various sciences (Cordon, 2013). He emphasized on the importance of viewing system as "whole" which is made up of different units/parts. These parts are interrelated to make the "whole" and they have unifying factors which makes it possible for the "whole" to function. A part does not work in isolation but it work in unity with other parts to achieve the goal of making the system function. However, in

case of malfunction of any part, the whole system becomes non - functional (Cordon, 2013). Ludwig viewed system in "wholeness" rather than in different parts. He described systems in different classes such as open systems, closed systems, simple systems and complex systems.

According to Ludwig, open system is the system that has interaction with the environment; closed system is the system that does not interact with the environment (isolated). Simple system is the system without complexity while complex system may be made up of both the open and closed systems. General system theory (GST) has three contexts which Ludwig describes as input, throughput and output. According to him every system has input which may be taken to mean "raw materials". Input must be processed (through put) to get the end product (output). In this study, general system theory has been used to show the relationship between the health provider characteristics (input), health system factors (throughput) and utilization/non-utilization of pain rating scales (output) in pediatric care among the health professionals at the children's hospital.

1.6 Conceptual Framework

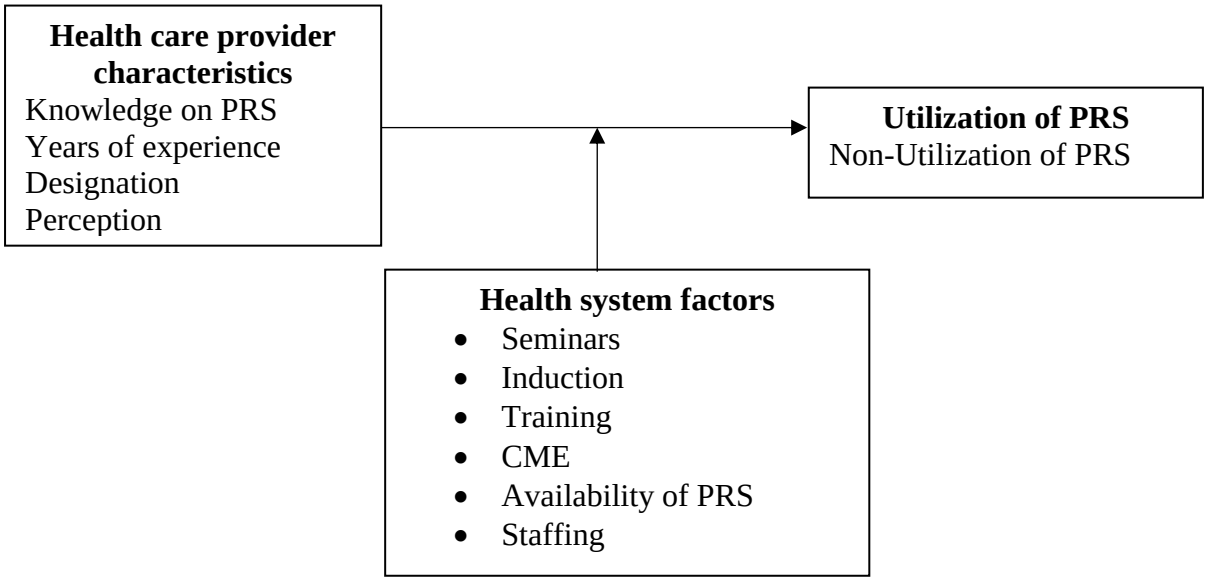

Figure 1: Factors influencing the utilization of pain rating scales.

Source: (limungi, 2020)

Utilization or non-utilization of pain rating scales in pediatric care will depend on health care provider characteristics. However, it can also be influenced by health system factors like induction of the staffs, seminars, training availability of pain rating scales and staffing.

2.0 LITERATURE REVIEW

2.1 Introduction

Pain management in child health care is vital and can be enhanced through utilization of pain rating scales. It requires health care providers to have knowledge on these scales and utilize them appropriately in assessment and measurement of pain intensity among the paediatric patients. Other factors that can influence utilization of pain measurement tools include health

system factors such as training and continuous medical education. Pain rating scales can act as a communication tool between patients and health care providers. This is because it communicates the severity of pain to health care team, and also allows them to assess the effect of medications (O'Brien, Schwartz, & Plattner, 2018).

This review focused on description of paediatric pain rating scales, their utilization, and factors influencing their utilization among health professionals. Though both health care provider factors and health system factors may influence utilization of pain rating scales, this study mainly focused on health system factors. Most sources have revealed adequate utilization of pain rating scales. It is also noted that, health care provider factors have been identified as the most cause of non - utilization of pain rating scales among health professionals. However, no much information is availed in literature on health system factors that influence the utilization of pain rating scales in paediatric care among health professionals. Review has also shown that most hospitals in the developed countries are utilizing PRS in child health care depending on their practicability, and documentation of the same has been done (Albertyn et al., 2010).

2.2 Paediatric pain rating scales

Though pain rating scales in children are numerous and are chosen basically based on the age appropriateness and developmental stage of the child, rating of pediatric pain should be done using appropriate and valid tools (Ogston-Tuck, 2014, Royal College of Nursing, 2009). (Tsze, et al. (2013) observed that two commonly used pain rating scales in child health care are the Visual Analog Scale and Faces Pain Scale–Revised. The FPS-R has 6 faces with each face representing increasing pain severity, such that the right face is more severe than the left face (Mate, 2014). In the VAS, children rate pain intensity on a 10 cm line. One end of the line is labeled "no pain" and the other end "severe pain" (Albertyn et al., 2010). Chiaretti et al. (2013), noted that scores are obtained by taking measurement of the distance between the end that reads "no pain" and the area that is marked by the patient. The measurement is usually taken in millimeters. Documented literature has revealed that different health institutions may select any of the numerous tools for use, defending on their convenience and understanding of the same. For example in South Africa, Touch Visual Pain scale (TVP) is commonly used for infants and children below three years old (Albertyn et al., 2010).

2.2.1 Pain Rating Scales in Neonates and Infant

Raff (2016), noted that self-report measures are not available for infants and non-verbal children, though behavioral indicators for example; facial expressions, crying and sleep-wake patterns can be evaluated to assess pain in such patients. According to Chiaretti et al., (2013), different behavioral scales have been validated by several studies that enrolled infants and neonates. Albertyn et al. (2010), observed that in neonates, behavior is the best way to assess for pain. The quality of these behaviors depends on the infant's gestational age, and maturity as well as the health state of the neonate. Preterm or acutely ill infants, for example, do not illicit similar responses to pain due to illness and lack of energy (Srouji, Ratnapalan, & Schneeweiss, 2010). In addition, Gregory & Waterman (2012) , noted that interpretation of crying in infants is especially difficult as it may indicate general distress rather than pain. Cry characteristics are also not good indicators in preterm or acutely ill infants, as it is difficult for them to produce a robust cry (Srouji et al., 2010). Wong et al. (2012), noted that Premature Infant Pain Profile (PIPP), which consists of 3 behavioral indicators (eye squeeze, nasolabial and furrow brow bulge), 2 physiological indicators (heart rate and oxygen saturation) and 2

contextual indicators (gestational age and behavioral state) is a reliable and valid measure of acute pain in infants.

Srouji et al., (2010)**,** suggested that Neonatal Facial Coding System (NFCS) and the Neonatal Infant Pain Scale (NIPS) as being the most commonly used behavioral measurement of pain in neonates. They noted that Neonatal Facial Coding System is used to monitor facial actions in newborns and that it has been proven reliable for short duration use in assessing acute pain in infants and neonates. It has eight indicators that are used to measure pain intensity: brow bulge, eye squeeze, nasolabial furrow, open lips, stretched mouth, lip purse, tout tongue, and chin quiver. The indicators are recorded on videotape, coded, and scored. They also described Neonatal Infant Pain Scale (NIPS) as a behavioral assessment tool that takes into account pain measurement before, during and after a painful procedure, scored in one-minute intervals. The indicators include: face, cry, breathing pattern, arms, legs, and state of arousal.

2.2.2 Pain Rating Scales in Toddlers

In toddlers, pain can be best assessed and measured using behavioral/observational methods (Twycross, 2017). Such methods involves the use of pain rating scales like NIPS, FLACC and Touch Visual Pain Scale. They are pain measurement tools recommended for infants and children aged below three years (Albertyn et al., 2010). Albertyn et al. (2010), noted that FLACC (Face, Legs, Activity, Cry, Consolability) is used in children who are below the age of three years and also older children who are not able to talk. It has a score of 10 with each parameter scoring a maximum of 2 scores.

FLACC scale

	SCORING		
CATEGORIES	**0**	**1**	**2**
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Each of the five categories: (**F**) Face; (**L**) Legs; (**A**) Activity; (**C**) Cry; (**C**) Consolability, is scored from 0–2 which results in a total score between 0 and 10 (*Merkel et al. 1997*)

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ICPCN (2009): Adapted from Merkel et al

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Face: If there is no facial expression of pain for example if the child has jovial and relaxed face, a score of zero (0) is given.

If there is worried facial expression with partially closed eyes, a score of 1 is given

Score 2 if there is notable facial expression of pain which may be shown by completely closed ayes, with deep furrows in the forehead, and an open mouth.

Legs: If there is normal muscle tone of the lower limbs, score zero (0)

If limbs are noted to have increased tone with partial extension or flexion score one (1)

If the child has hyper-tonicity of the lower extremities with tremors and exaggerated flexion or extension, score two (2)

Activity: Score zero (0) if the child has free movement which is normal and without any restrictions.

If the child shifts positions, and demonstrates guarding, appears hesitant to move, and create pressure on a body part, score one (1)

Score two (2) if the child demonstrates side-to-side head movement or rubbing of a body part and is in a fixed position.

Cry: A score of zero (0) is given if the child has no cry, or is asleep.

Score one (1) if the child moans at times, cries, whimpers or sighs.

If the child has continuous cries or moans, score two (2)

Consolability: If the child does not require to be consoled and is calm, a score of zero (0) is given.

If the child responds to comfort by touching or can stay for half to one minute, (1) is scored.

Score two (2) if the child requires being comforted constantly or is inconsolable.

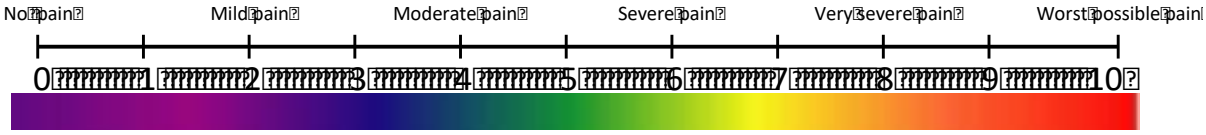
According to Powel (2010), FLACC scale is interpreted as: No pain (score of 0), Mild pain (score of 1-3), Moderate pain (score of 4-6) and severe pain (score of 7-10)

2.2.3 Pain Rating Scales in School Going Children

Twycross (2017), noted that children who are aged between 3 and 7 years are able to describe the characteristics of pain. He described observational scales and self-report scales as useful tools for assessing pain in paediatric patients who are within this age group. According to Wong et al. (2012), pain rating tools have been developed combining behavioral and biological items. Such tools include the Objective Pain Scale and the Comfort Scale which is used to assess both physiologic parameters and behavioral changes in children that may be modified by the presence of pain or discomfort after procedures (Liossi & Howard, 2016). According to Srouji et al. (2010), in younger children, developmental capabilities may hinder the use of purely numeric scales and therefore pictorial based pain scales such as the Faces Pain Scale-Revised is used. The child is asked to select 1 of 6 faces that may correctly reflect his/her pain. The child is shown pictures of six faces which are arranged from left to the right. The left face has no pain, but there is increase in pain intensity to the right face. The child is then informed that the faces show how much something can hurt. The face on the left shows no pain but the faces show more and more pain proceeding from left to right, with the right face having the most pain. The child is then asked to Point to the face that shows how much his/her pain is hurting (Mate, 2014). FPS-R scale is scored beginning from zero to 10 and interpreted as: No pain (score of 0), mild pain (score of 2-4), moderate pain (score of 6-8) and severe pain (score of 10)

2.2.4 Pain Rating Scales in Adolescents

Verbal, non - verbal and self - rating methods are commonly used in rating pain among the adolescent. However, self-report is the best method of measuring pain in older children who can describe the subjective pain experience (Twycross, 2017). Older children (>8 years of age) who are able to understand abstract concepts can use the visual analog scale (VAS) and 0 to 10 Numeric Rating Scale (NRS) The VAS uses either a vertical or horizontal premeasured line (100 mm) to estimate pain. The ends of the lines represent the 2 extremes of pain ("no pain" to "worst pain"). Curtis et al. (2012), noted that it may include a numerical representation along the line. The child makes a mark on the line to indicate his/her level of pain and pain score is calculated by measuring the distance from the left end point of the scale to the child's mark. According to Wong et al. (2012), NRS is administered as a script and the child is asked to rate his/her pain from 0 to 10, with 0 indicating no pain and 10 being the most severe pain. Chiaretti et al. (2013), described Numeric Pain Scale or Visual Analog Scale as a single 10-cm horizontal or vertical line that has descriptors of pain at each end. Marks and numbers are placed at each cm on the line and then health care provider asks the child to show the level of pain he /she is on from the scale of zero to ten, where zero means no pain and ten equals the worst possible pain.



Harvard Medical School, Centre for Palliative Care (2007)

Albertyn et al. (2010), explained that NPS is scored from 0-10 and interpreted as:

0 is no pain 1-3 is mild pain 4-6 is moderate pain 7-10 is severe pain.

2.3 Utilization of pain rating scales

In paediatric care, assessment and measurement of pain is complicated and therefore it requires adequate utilization of pain rating scales, and also the ability of interpreting the score accurately (Albertyn et al., 2010). Utilization of Pain rating scales among health professionals is vital for pain management in paediatric care. According to Chiaretti et al. (2013), assessment and rating of the pain in paediatric patients must be done at regular interval using appropriate pain rating scales. Gregory & Waterman (2012), noted that pain is subjective and health professionals must rely on what patient says, however this is not possible in infant because they cannot report presence of pain. Thus, self-report method is not applicable, but behavioral indices are available for use in infants. According to Raff (2016), vital signs monitoring chart should have a column on which pain intensity can be recorded regularly.

Documented literature has shown that pain rating scales are in use for assessment and measurement of pain in child health care. However, systematic review of the evidence regarding nurses' assessment of post-operative pain in children found that behavioral cues are considered more important than self-report of their pain. It was also revealed that a significant proportion of children did not have pain scores recorded within the first 24 hours after surgery (Twycross, 2017). Literature has revealed existence of many validated pain rating scales for use in pain management among paediatric patients, though different children hospitals use different PRS for pain measurement in pediatric care (Hauer, 2017). According to Raff (2016), pain rating scales should be chosen for a given institution and used consistently. Such scales

should be appropriate to the patient's developmental age, simple-to-use, and easily understood by the patient. Chiaretti et al. (2013), noted that selection of appropriate pain rating scales should consider the type of pain, cognitive level, presence of disability, and the situation in which pain occurs. Gregory & Richardson (2014), found that no one pain assessment scale is used across all health care organization.

A study done by Tsze et al. (2013), on Validation of Self-Report Pain Scales in Children shown that Faces Pain Scale–Revised (FPS-R) and Color Analog Scale (CAS) are self-report pain scales commonly used in children but insufficiently validated in the emergency department setting. The study validated their use in children over 7 years but questioned their validity in less than seven years. Koch (2013), suggested that "patient self-reporting is the most reliable indicator of the existence and intensity of pain. In another study by Gregory & Richardson (2014), on the use of Pain assessment tools in clinical practice, verbally applied self-report pain assessment scales were found to be available and applied in clinical practice. It was noted that nurses used one or a number of self-report pain assessment scales in their clinical practice.

The Numerical Rating Scale was used most commonly, but no one assessment scale was used universally in all the hospitals and clinical areas represented by the sample. Behavioral pain assessment scales, were used by 42% of the respondent. In addition, the study revealed that patients with mental challenge had no available pain rating scales in the majority of organizations represented.

Zahra (2015), noted that children might not be able to indicate pain. Therefore, health care providers should assess and measure pain in paediatric patients without wating for them to indicate it. In such patients, pain may be recognized, and treated using appropriate pain rating scales (Bennett, 2019). Chiaretti et al. (2013), found that in children, selection of appropriate pain assessment tools should consider cognitive level of the patient, age and the presence of eventual disability. Documented literature has identified three main methods that can be used to measure pain intensity. These methods include behavioral/observational (how the child behaves), self-report (what the child says), and physiological/biological (how the child's body reacts) measures. Self-report measures are based on what the child report of his/her pain. Observational/ behavioral measures are based on observation of how child react to pain, while biological measures deals with physiologic parameters that may be changed by the presence of pain. Such parameters include respiratory rates, blood pressure and heart rate (Srouji et al., 2010). However, documented literature has suggested the use of combined methods of behavioral, self-report and physiological methods used together as more appropriate in rating pain in child health care (Christina, 2016).

2.4 Conclusion

Pain management involves assessment and measurement of pain. To adequately assess a child's response to treatment, it is necessary to have ongoing assessment of the child's pain. Because pain is a subjective experience, individual self-reporting is the preferred method for assessing pain. However, for children who cannot communicate this information due to age or developmental status, observational and behavioral assessment tools are acceptable alternatives. Depending on the age of the child and his/her ability to communicate the information to the health care provider, there are many reliable, valid and clinically sensitive assessment tools available for use (Ternullo & DiAntonio, 2015). Research has shown that different tools are used in assessment of pain, but some are preferred over others. However, though no documented evidence, many hospitals never or they rarely rate and document pain

intensity in pediatric patient and especially in the developing countries. Whenever possible, behavioral measurement of pain should be used in conjunction with self-report and physiological signs (Bennett, 2019).Newer diagnostic test are however being developed for precise measurement of pain including quantitative sensory testing, and functional brain imaging (Srouji et al., 2010). It is important not only to assess the intensity and frequency of physical pain but also the presence and intensity of other suffering (total pain).

3.0 MATERIALS AND METHODS

This was a descriptive cross-sectional study utilizing both quantitative and qualitative approaches. It was conducted in a tertiary children's hospital in Nairobi-Kenya. The study population comprised of health professionals working at the hospital and review of patients' medical records. Data was collected using semi- structured self-administered questionnaire, key informant interview guide (KII) and observation check list from a sample size of 160 Health Professionals and 71 patients' medical records sampled from a study population of 280 Health professionals and 88 patients' medical records. This was determined using Cochran formula which is used when the population is less than 10,000 (Sarmah, Hazarika, Choudhury, 2013). Simple random sampling was used to select the study participant from the three strata (Nurses, Medical Officers and Pediatric Consultants), stratified based on their profession. Hence114 nurses, 34 medical officers and 12 pediatric consultants were enrolled for the study using duty roster as the sampling frame while patients' register was used as the sampling frame in selection of patients' medical records. Data was analyzed using SPSS version 21. Quantitative data was analyzed using descriptive statistics where by data was summarized using frequency tables and presented using pie chart, and bar graphs. Qualitative data was analyzed using inductive approach. A content analysis was performed based on stages of qualitative data analysis. Audio recorded data was transcribed to establish first impression and re-read in details identifying relevant data, key words/phrases and coding was done. Codes with similar contents were grouped together and related to the study objectives for validation. Results were presented in narrations.

4.0 FINDINGS AND PRESENTATION

Health professionals were interviewed and their demographic characteristics summarised as illustrated in table I below. A total of 160 questionnaires were distributed to the study participants, with a return rate of 98.8%. Female were majority of the respondents (63.46%), with Nurses being the highest percentage of health professionals (73.5%) while consultant had the lowest percentage (6.5%). Majority of the respondents had diploma as their highest level of education (41%) while master's degree holders were the least (6%). Most of health professionals (57.3%) had 1-5 years of experience, whereas those with over 10years were the least (8.3%).

Table 1: Demographic Characteristics

		Frequency	Percentage
Gender (n=156)	male	57	36.5
	female	99	63.5
Level of education (n=157)	Diploma	63	41
	Higher Diploma	40	26
	Degree	42	27
	Masters	9	6
Designation (n=155)	consultant	10	6.5
	Medical Officer	31	20
	Nurse	114	73.5
Departments	OPD	36	23.1
	Wards	76	48.7
	ICU	20	12.8
	HDU	13	8.3
	Theatre	11	7.1
Experience (n=157)	Below 1 year	16	10.2
	1-5 years	90	57.3
	6-10 years	38	24.2
	Over 10 years	13	8.3

All the study participants (100%) confirmed that pain rating scales were being utilized at the hospital. This was asserted by KII 1 and 2 as stated:

"When I joined this hospital, these tools were not in use, we introduced them like more than five years ago." (KII 1). "*Assessment and measurement of pain has helped us in understanding what pain in children entails. You see pain is the fifth vital sign and we assess it when we are taking vital sign after every four hours or if the intervention done by the nurse mostly the use of medication or any other method is not effective, then it can be reassessed before four hours are over."* (KII 2)

Besides, verification through check list confirmed that the hospital had adopted four pain rating scales which included neonatal guide scale, Flacc, Wong baker faces pain scale and numerical pain rating scales. This was explained by one of the key informants as follows:

"We did a lot of research in the internet in other children's hospitals across the world and looked at their documents and compared them, then opted for what could suit our hospital and that is how we adopted them. We have the neonatal, the flacc, faces and numerical" (KII 1)

However, frequency of utilizing these tools varied among health professionals. Majority (90%) utilized them always, 8% at times, while 2% utilized them when necessary as illustrated in figure 1below.

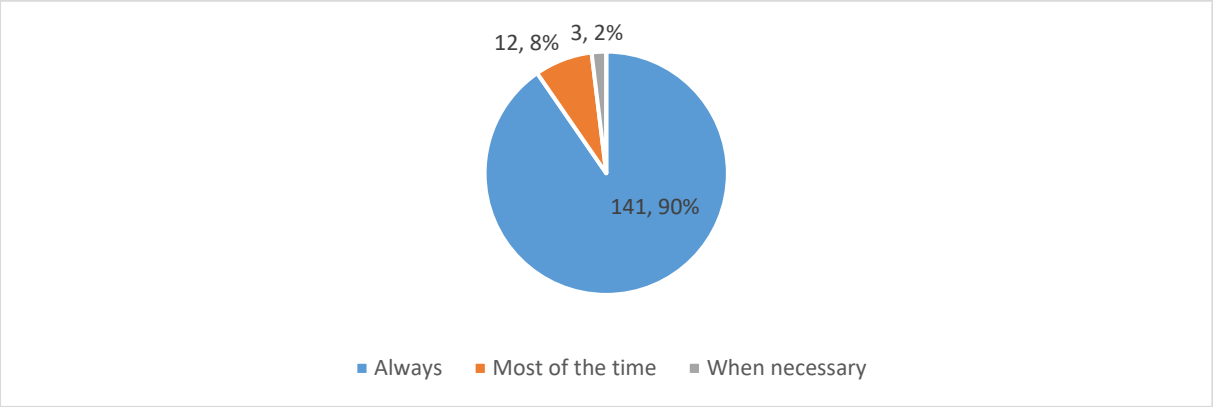


Figure 1: Frequency of utilization of pain rating scales

In addition, 100% of the study participants reported that they documented pain score on line (in pain bundles). KII 1 asserted by stating the following:

"You know when we started, we started with hard copy which is expensive, but now we are on line, I mean we are paperless" (KII 1).

Furthermore, upon scrutinizing patients' medical records, pain was noted to have been assessed and recorded in pain bundles by nurses only (on line recording). This was explained by the key informant 3, as follows *"It is the nurses who mainly document though other health professionals they do. I will say that 99% of documentation is done by the nurses. But most of these tools are put on nursing documents. You know nurses are usually the first ones to be in contact with patients. When you come in the hospital you will meet the nurse first as the triage person. So, it is the nurse to assess the pain first and manage it based on the guide as per the score and the scope of practice or at times they consult on management of the assessed pain."(KII 3)*

More so, 5.7 % of the recorded pain was assessed in neonates using neonatal guide score at100%, infants, 17.1% assessed using Flacc at 100%, toddlers had 31.4% assessed using both flacc and Wong Baker faces pain scale at 95.5% and 4.5% respectively. Pre-school children, had 15.7% assessed using two different tools (Wong Baker faces pain scale 90.9% and numerical pain scale 9.1%). School going children had 20% assessed using three different tools (Flacc 7.1%, Wong Baker faces pain scale 78.6% and numerical pain scale 14.3%). Adolescents had 10% assessed using two different tools which included Wong Baker faces pain scale at 14.3%, and numerical pain scale at 85.7%. Thus, the most used tool was Flacc at 48.6%, while neonatal guide score was the least at 0.6%, as illustrated in table 2 below.

Table 2: Documentation of the rated pain

	Frequency	Percentage
Pain documented (n=155)	155	100
Online charting (n=153)	153	100
Pain assessed in neonates	4	5.7
Tool used: neonatal guide score	4	100
Pain assessed in infants	12	17.1
Tool used: FLACC	12	100
Pain assessed in toddlers	22	31.4
Tool used: 1. FLACC	21	95.5
2.Wong Baker faces pain scale	1	0.5
Pain assessed in pre-school children	11	15.7
Tool used: 1. Wong Baker faces pain scale	10	91
2. Numerical pain scale	1	9
Pain assessed in school going children	14	20
Tool used: 1. FLACC	1	7.1
2. Wong Baker faces pain scale	11	78.6
3. Numerical pain scale	2	14.3
Pain assessed in adolescent	7	10
Tool used: 1. Wong Baker faces pain scale	1	14.3
2. Numerical pain scale	6	85.7

Wong baker faces pain scale was preferred by 11% of health professionals because it was easy to use, Flacc by 6.5%, because it was well detailed and many patients were in the age group that could be assessed using it, while2.5% preferred neonatal guide pain scale because it was efficient (Table 3).

Table 3: Preferred pain assessment tool

	Frequency	Percentage
Neonatal guide score	4	2.5
FLACC	10	6.5
Wong Baker Faces pain scale	17	11
Numerical pain scale	10	6.5
All of them	114	73.5

Again, 64.3% of the respondents rated the utilization of pain rating scales at the hospital as being excellent using a five-point Likert scale, 29.3% very good while 6.4% rated it as being good (figure 2). In addition, scrutiny of patients' medical records revealed that only one patient had not been assessed for pain. This was about 1.5% of non-utilization of pain rating scales and therefore utilization was 98.5% which was excellent based the scoring range (below 40% poor, 40%-59% good, 60%-79% Very good, 80% and above excellent)

Health professionals perceived utilization of pain rating scales in paediatric care as being extremely necessary. Besides, key informants 1 and 4 asserted that health professionals liked utilizing pain rating scales because they perceived it useful in provision of care to paediatric patients. They stated the following:

"They like using them because it has given them a guide on what to do. It is actually making their work easier both physical and scientific. You know you must also have evidence. So, it is also a real good guide for the nurses other than long time ago when we used to ask why the child is crying: is it pain, or is it that mother is not there?" (KII 1)

"You see pain rating scales help us know exactly the pain issues of the child." "Before I joined this hospital, I was in adult hospital with a bit of clinical experience in paediatric but it was like guess work. You know in adult setting adults will say when in pain. So, it was very easy even without measurement tools but for the children it is very hard unless the child is able to speak, then you may not be able to get pain in them. So, it is a very good experience that pain rating scales were introduced in paediatrics and I would recommend every paediatric setting to use them." (KII 4)

They stated many reasons why pain in paediatric patient should be measured, which included: variation in pain intensity (7%), to determine the intervention (53.2%), to promote comfort of the patients (12%), an indicator for good prognosis(1.9%), because pain measurement tools are available (5.1%), because children cannot communicate (10.8%), to give medication in good time(1.3%), research has proved that pain assessment tools are effective (2.5%),to get data for formulating nursing diagnosis(2.5%), while 3.8% reported that pain in children is assessed to help in evaluation of patients' care.

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

The aim of this study was to assess the utilization of pain rating scales at Gertrude's children's hospital as a basis for making recommendation for their adoption by the ministry of health, Kenya. A total of 158 health professionals and 5 heads of departments participated in the study. Patient documents amounting to 70 were also involved.

The results revealed that pain rating scales were being utilized in assessment of pain, after every four hours. This finding was in agreement with the documented literature that pain is the fifth vital sign and should be measured along other vital signs and recorded at a regular interval (Srouji, Ratnapalan, & Schneeweiss, 2010). Most of the health professionals who utilized these tools were nurses at 99%. This contradicts the findings by Olayinka, Ogidan, & Odejide (2018), who found out in their study that only few nurses (32%) utilized pain rating scales in assessment and measurement of pain.

Documentation of pain scores on line at Gertrude's children's hospital has been possible because the hospital has embraced digital technology which is described as cheaper compared to 'analogue' (use of hard copy). Though no much documented literature on where to record pain score, Schellack & Annor (2016), asserted that vital signs monitoring chart should have a column on which pain intensity can be recorded regularly.

The criteria used by the hospital in adoption of pain rating was mainly due to their appropriateness and suitability. Ogston-Tuck (2014), observed that pain rating scales are selected based on the age appropriateness and developmental stage of the child, while(Chiaretti et al. (2013), noted that selection of pain assessment tools should consider cognitive level of the patient, age and the presence of eventual disability. Dick et al. (2016), asserted that no single tool has been identified as ideal despite development of over 40 pain assessment tools.

Utilization of neonatal guide score in neonates as the only tool at 100%, concurred with an observation by Srouji, Ratnapalan, & Schneeweiss (2010), who noted that Neonatal Infant Pain Scale (NIPS) was the most commonly used behavioral measurement of pain in neonates. Wong Baker faces scale was utilized in toddlers at 4.5%, in preschool children at 90.9%, in school going children at78.6%, while in adolescent at14.3%. A study by Twycross (2017), observed that children who are aged between 3 and 7 years are able to describe the characteristics of pain. He described observational scales and self-report scales as useful tools for assessing pain in pediatric patients who are within this age group. Thus, the utilization of Wong Baker faces scale in toddlers and in preschool children at the hospital agrees with the observation by Twycross. However, utilization of the same in school going children and the adolescents is in the contrary.

Numerical pain scale was utilized in preschool children at 9.1%, school going children at14.3% and in adolescent at 85.7%. Twycross (2017), asserted that Self-report is the best method of measuring pain in older children who can describe the subjective pain experience. Numerical pain scale is an example of self-report method of measuring pain in Older children (>8 years of age) who are able to understand abstract concepts. Preschool children cannot understand abstract concept and therefore the use of numerical pain scale in this age group did not concur with Twycross.

Wong Baker faces pain scale was the most preferred tool at 11% because it was easy to use. This finding was similar to an observation by Tsze et al. (2013), who noted that two commonly used pain rating scales in child health care the Visual Analog Scale and Faces Pain Scale–Revised. However, it disagreed with Gregory& Richardson (2014), who revealed that Numerical Pain Rating Scale was used most commonly in his study on the use of Pain assessment tools in clinical practice.

This study established that utilization of pain rating scales in pediatric care is extremely necessary, concurred with previous studies which have emphasized on the importance of pain measurement tools in pediatric care (Mate, 2014, Schellack & Annor, 2016). Mate (2014), emphasized on the importance of pain measurement in children because they may not be able to express it in words though they may be experiencing it. Srouji, Ratnapalan, & Schneeweiss (2010) observed that very sick infants may not be able to express when in pain due to lack of energy and robust cry.

5.2 Conclusion

Neonatal guide score, FLACC, Wong Baker faces scale, and Numerical pain scale were the four pain rating scales adopted by the hospital. Their utilization was excellent, with nurses being the main health professionals who utilized them. Utilization of pain rating scales in pediatric care is paramount hence the need to include pain guidelines in all patient's medical records to promote their utilization among other Health Professionals.

5.3 Recommendation

Pain guidelines may be included in all patient's medical records to promote their utilization among other Health Professionals. Adoption of pain rating scales by the Ministry of Health Kenya, may promote implementation of their utilization in all paediatric units hence improve pain management in child health care.

ACKNOWLEDGEMENTS

The study would like to acknowledge Mr Brian Etole for his great role in data collection, and Mr Elijah Mwangi for his support in data analysis.

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