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NURSES' PERSPECTIVES ON INVASIVE PROCEDURAL PAIN AMONG PAEDIATRIC PATIENTS AT THE REGIONAL HOSPITAL, KOFORIDUA.

BY

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DECLARATION

I, Oboshie Anim-Boamah do hereby declare that with the exception of references made from other researches and writers which have been duly acknowledged, this thesis is my original work which has been produced out of my research work. This work has neither in whole or part been presented to any institution for the award of any degree.

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This thesis has been presented for examination with our approval as supervisors.

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Lydia Aziato (Dr.) Date

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Victoria May Adabayeri (Dr.) Date

DEDICATION

To Kwame, Ama, Abena, and Akua Anim-Boamah.

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LIST OF ABBREVIATIONS

ALA	-	Adrenaline, lidocaine, amethocaine
ASPMN	–	American Society for Pain Management Nursing
EMLA	-	Eutectic mixture of local anaesthesia
FLACC	–	Face, legs, arms, cry, Consolability
GRNA	–	Ghana Registered Nurses' Association
IASP	–	International Association for the Study of Pain
IV	–	Intravenous
LET	-	Lidocaine, epinephrine-tetracaine
MOH	–	Ministry of Health
NHIS	-	National Health Insurance Scheme
NG	–	Naso- gastric
NICU	–	Neonatal Intensive Care Unit
NMC	–	Nursing and Midwifery Council of Ghana
OPD	–	Out Patient Department
TPB	–	Theory of Planned Behaviour
TRA	–	Theory of Reasoned Action
WHO	–	World Health Organization

ABSTRACT

Paediatric patients undergo various painful invasive procedures in paediatric settings which are not managed effectively. The study aimed to explore the perspectives of nurses about invasive procedural pain management among paediatric patients. A qualitative interpretive design was used in this study. Nurses were recruited from the paediatric units at the Regional Hospital, Koforidua and a semi-structured interview guide was used for the data collection. Saturation was achieved at the 16th participant. Data was analysed using thematic content analysis and five main themes emerged from the data. These are knowledge and process on invasive procedural pain management, attitudes of nurses towards invasive procedural pain management, subjective norms towards invasive procedural pain management, intentions to manage invasive procedural pain, and perceived control of invasive procedural pain management. The findings showed that the nurses had limited knowledge about pain assessment scales and pharmacological strategies for managing invasive procedural pain. However, most of the nurses had positive intentions towards invasive procedural pain management while few of the nurses thought that it was a waste of time and money. The nurses were also motivated to manage the pain when they believed that the parents, nurses, doctors, and the managers expected them to manage the procedural pain. Parental support and continuous professional development, and personal initiative were identified as facilitators while lack of knowledge, shortage of staff, lack of policies and facilities and cost implications were the barriers to effective procedural pain management. Nurses in the paediatric settings expressed both positive and negative perceptions about invasive procedural pain in children. There is therefore the need to make invasive procedural pain management a priority in paediatric units and also design interventions to change the nurses'

unfavourable attitudes towards invasive procedural pain management among paediatric patients.

CHAPTER ONE

1.0 Introduction

This chapter includes the background to the study of invasive procedural pain in paediatric patients, the statement of the problem, purpose of the study, aims and objectives, research questions, significance of the study, and operational definitions of keywords used in the study.

1.1 Background to the study

Paediatric patients on admission are exposed to various procedures that are associated with pain which normally occurs on daily, weekly or monthly basis at the Out Patients Department (OPD) and at the wards (Stevens et al., 2011). These procedures may either be invasive or non-invasive and are associated with various degrees of pain. According to the American Society for Pain management Nursing (ASPMN), all patients irrespective of their age are entitled to pain management before, during, and after the procedure and therefore, children need to be made comfortable during these painful procedure (Czarnecki et al., 2011). Although nurses in the paediatric settings are expected to manage this pain adequately in the paediatric patients, certain factors may either promote or hinder the nurses' ability to manage the pain effectively. Some of these factors may be the level of knowledge, attitude and beliefs towards pain, facilitators and barriers, which may determine the nurses' intentions to manage invasive procedural pain in paediatric patients.

The International Association for the Study of Pain (IASP) defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage" (Brand & Court, 2010, p. 214). Procedural pain may occur as a result of

unavoidable nursing, medical and paramedical procedures. It is defined as a medical, nursing, surgical, diagnostic or therapeutic activity which is associated with pain as it invades the neonate's or child's bodily integrity, causing skin injury or mucosal injury from the introduction or removal of foreign material into airway or digestive or urinary tract (Carbajal et al., 2008). Some invasive procedures are venipuncture, intravenous cannulation, injections (subcutaneous and intra muscular, lumbar puncture, circumcision, heel lancing, and central venous port access (Bice, Gunther, & Wyatt, 2014).

The prevalence of pain in children varies with age, sex, race, and the condition of the child (medical or surgical). Children aged five and above scored higher on the pain scales than those below five years, female Caucasian children report pain and consume more opioids than males and non- Caucasian children, (Kozlowski et al., 2014). Also, paediatric patients with surgical conditions consume more opioids than patients with non-surgical patients (Kozlowski et al., 2014) which may be due to the tissue injury during the surgical intervention. It was also found out that children demonstrate pain in three main ways as; vocal pain (crying and saying ouch), verbal fear (scary), and escape behaviour (attempts to run away) (Pichardo, 2010). Children experienced heightened pain intensity due to the immaturity of the dorsal horn which led to poorly localized pain. This causes the infant to experience the pain for a long time since the descending pathway cannot inhibit the pain properly (Baulch, 2010). Another study also reported that the younger the age, the greater the procedural pain (Sclenz et al., 2012).

The consequences of untreated acute pain in children are overwhelming. It has both short term effects such as anxiety, fear, and behaviour changes among children, (Curtis, Wingert, & Ali, 2012) and long term effect as the development of chronic pain (Baulch, 2010; Sinatra, 2010) and can lead to impaired brain development since their

brain cells are associated with reduced white matter and subcortical gray matter (Brummelte et al., 2012).

In nursing practice, various factors may account for and affect the nurses' intentions to manage invasive procedural pain. These factors also inform nurses' perspectives about the procedure. For instance, the ability of a nurse to assess and manage procedural pain in paediatric patients may be determined by the nurses' knowledge about the procedure, attitudes and beliefs, facilitators and barriers towards the procedure. These attitudes and beliefs may therefore prevent the nurse from developing positive attitudes towards reducing or eliminating procedural pain completely during invasive medical and nursing procedures for paediatric patients, (Bice et al., 2014). Therefore, nurses' willingness to manage invasive procedural pain may not be informed by knowledge of procedural pain management alone but also, the interaction of other factors such as attitudes, subjective norm and perceived control (Montano & Kasprzyk, 2008). The theory of planned behaviour which states that, the intentions to perform a behaviour depends on the interaction of attitudes, subjective norms and perceived control but not only on knowledge acquisition was used as the theoretical framework for the study because it enabled the researcher to explore the intentions of the nurses to manage invasive procedural pain. The constructs also helped to identify areas where the nurses had challenges so that interventions could be designed to rectify them. The theory was therefore appropriate for the study.

1.2 Statement of the problem

Paediatric patients in paediatric wards are expose to at least twelve (12) painful procedures due to failed attempts and the procedures are retried without any analgesics (Carbajal et al., 2008). The lack of anticipation and ineffective management of pain in

paediatric patients poses negative consequences such as interference with sleep, recovery from illness, mood, and general relationship with others (Darawad, Al-Hussami, Saleh, & Al-Sutari, 2014). Inadequate procedural pain management is associated with long term effects such as anxiety, fear, and behaviour changes (Curtis et al., 2012). Nurses in Ghana sometimes are unable to manage pain due to knowledge gap and the fear of addiction (Aziato & Adejumo, 2014a). In addition, challenges that prevents a nurse from effectively managing pain in children leaves the nurse morally uncomfortable (Olmstead, Scott, & Austin, 2010). Anecdotal evidence indicated that, although Ghanaian nurses are worried about the procedural pain in paediatric patients, they are handicapped because of inadequate logistics such as pain rating scales, analgesics. Although procedural pain is commonly managed in developed countries with pain rating scales and medications, the practice is limited in Ghanaian Hospitals. Also, there seems to be no study in Ghana in particular about this phenomenon and therefore the need to conduct this study. The study focuses on the perspectives of some Ghanaian nurses about invasive procedural pain in paediatric patients. It explores nurses' knowledge, attitudes and beliefs, and perceived factors that enhance or mitigate their intentions towards invasive procedural pain management among the paediatric patients.

1.3 Purpose of the study

The purpose of this study was to explore the perspectives of nurses on invasive procedural pain management among paediatric patients at the Regional Hospital, Koforidua. The perspectives of the nurses will determine their intentions towards the management of invasive procedural pain in the children.

1.4 Aims and objectives

The study sought to

1. Explore nurses' knowledge about procedural pain in paediatric patients.
2. Identify some attitudes and beliefs of nurses towards procedural pain in paediatric patients.
3. Explore the perceived factors that enhance nurses' performance of procedural pain management among paediatric patients.
4. Identify perceived factors that prevent nurses from performing procedural pain management in paediatric patients.

1.5 Research questions

The following questions were developed to guide the research as follows;

1. What do nurses know about procedural pain in paediatric patients?
2. What are the attitudes and beliefs among nurses about procedural pain in paediatric patients?
3. What factors will enhance the performance of procedural pain management in paediatric patients?
4. What factors will hinder the performance of procedural pain management in paediatric patients?

1.6 Significance of the study

The findings may help identify the level of knowledge, attitudes, and beliefs about procedural pain management among nurses so that continuous education programmes can be designed to fill these gaps in knowledge. Also, the findings will identify nurses' attitudes and beliefs towards procedural pain assessment and management in children so that training programmes will be designed to address those

attitudes and beliefs about children in pain. Then, it will show Ghanaian Nurses' concept of procedural pain in paediatric patients which can be incorporated into a comprehensive educational programme for nurses. Also, the findings may encourage hospital management to provide logistics such as pain rating scales, analgesics, materials for distraction for nurses to manage procedural pain in the paediatric settings. Finally, the findings of the study may lead to further studies on procedural pain and management in children.

1.7 Operational definitions

Pain – an unpleasant sensory and emotional experience associated with actual or potential tissue damage.

Procedural pain – this is an acute pain associated with invasive medical/surgical and nursing procedures performed for paediatric patients.

Invasive procedural pain – pain associated with procedures that involve puncturing or placement of a material into any part of the body

Assessment – the use of various objective and subjective indicators to measure the level and intensity of pain experienced by a patient.

Pain management – incorporation of both pharmacological and non-pharmacological approaches to treat pain in a patient.

Paediatric patient-any patient between the ages of 0-12 years on admission at any of the paediatric units or accessing paediatric services at the Paediatric Out-Patient Department.

Nurse – all professional nurses (general, paediatric, midwives) who are nursing children between the ages of 0-12 years in four wards in the paediatric departments.

Knowledge – the information, understanding and skills about procedural pain acquired through education or experience.

Attitudes – these are thoughts and feelings about procedural pain assessment and management in paediatric patients.

Beliefs – one's feelings towards procedural pain in children which is affected by one's personal and socio-cultural values.

Perspectives – knowledge, attitudes and beliefs, facilitators and barriers about procedural pain in paediatric patients aged 0-12 years.

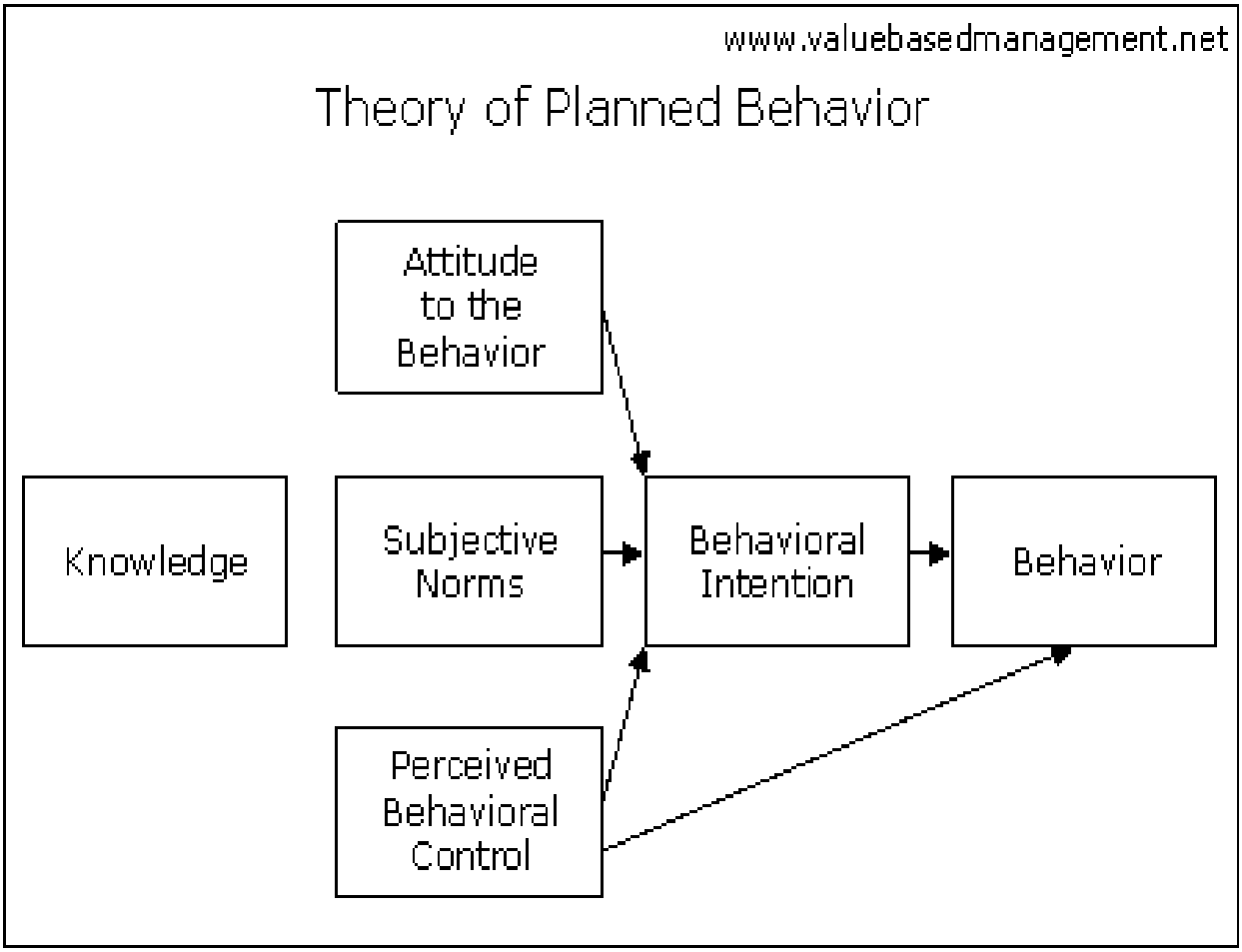
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter of the study involves the review of literature on procedural pain which was organized into five sections. The first section includes an extensive discussion of the theoretical framework; the theory of planned behaviour. The second section examines nurses' knowledge about invasive procedures and procedural pain management in paediatric patients. The third section reviews the nurses' attitudes and beliefs about invasive procedural pain management. The fourth section discusses literature on facilitators of invasive procedural pain management while the fifth section reviews the barriers that nurses' encounter in the management of invasive procedural pain for paediatric patients. Sources that were searched for the literature included Google Scholar, Science Direct, Wiley, Sage, and Medline and the key words used for the search included nurses, knowledge, physical restraint, attitudes, beliefs, barriers, facilitators, procedural pain in paediatric patients.

Figure 2.1: Theoretical Framework



The Theory of Planned Behaviour (TPB) was developed by Fishbein and Aizen in 1975. The TPB is a combination of the Theory of Reasoned Action (TRA) and an additional construct that is, perceived control over the behaviour (Montano & Kasprzyk, 2008). The theory of reasoned action (TRA) was developed to predict and explain behaviours of social relevance that is under a person's volitional control. However, in 1985, it was expanded into the theory of planned behaviour (TPB) which included an additional model for both volitional and non-volitional behaviours (Marcoux & Shope, 1997).

The TRA explains that, the most important behavioural intentions and the direct determinants of the individuals' behavioural intentions are their attitudes towards performing the behaviour, and their subjective norm associated with the behaviour (Montano & Kasprzyk, 2008) The TPB adds the third construct which is the perceived behavioural control over the behaviour and taking into account situations where one may not have complete volitional control over the behaviour (Montano & Kasprzyk, 2008). According to the theory, accurate information is considered necessary for effective action but there is little empirical support for a relationship between knowledge and behaviour(Aizen, 2006). Therefore, programmes that focus on the transfer of knowledge will not succeed and so to ensure that people change their intentions towards behaviour, one should focus more on their attitudes, subjective norms and perceived behavioural control (Aizen, 2002).

Attitude is determined by the individuals' beliefs about outcomes or attributes of performing the behaviour (behavioural beliefs) weighed by evaluations of those outcomes of attributes. A person who holds strong beliefs and positively valued outcomes will result in performing the behaviour whiles a person who holds a strong beliefs and negatively valued outcomes will result from the behaviour will have a negative attitude (Montano & Kasprzyk, 2008). Behavioural beliefs link the behaviour of interest to expected outcomes. A behavioural belief is a subjective probability that the behaviour will produce a given outcome (Aizen, 2006). Although a person may hold many behavioural beliefs, only a small number of these beliefs are accessible and in combination with the subjective values of the expected outcomes which determine the prevailing attitude toward the behaviour. Specifically, the evaluation of each outcome contributes to the attitude in direct proportion to the person's subjective probability that the behaviour produces the outcomes and other attributes (Aizen, 2006).

Subjective norm is the perceived social pressure to engage or not to engage in behaviour. A person's subjective norm is determined by his or her normative beliefs, that is, whether important referent individuals' (parents, supervisor, nurses, doctors) approve or disapprove of performing the behaviour, weighed by his or her motivation to comply with those referents. A person who believes that certain referents think she should perform the behaviour and is motivated to meet expectations of these referents will hold a positive subjective norm whiles a person who believes these referents should think she should not perform the behaviour will have a negative norm and then, a person who is less motivated to comply with those referents will have a relatively neutral subjective norm (Montano & Kasprzyk, 2008). The strength of each normative belief is weighed by the motivation to comply with the referent in question (Aizen, 2006).

Aizen and colleagues added perceived behavioural control to account for factors outside individual control that may affect individual's intentions and behaviour. Perceived control is determined by control beliefs concerning presence and absence of facilitators and barriers to behavioural performance, weighed by their perceived power or the impact of each control factor to facilitate or inhibit the behaviour. Specifically, the perceived power of each control factor to impede or facilitate performance of the behaviour contributes to perceived behavioural control in direct proportion to the person's subjective probability that the control factor is present (Aizen, 2006). TPB also postulated that perceived control is an independent determinant of behavioural intention along with attitude toward the behaviour and subjective norm and therefore holding attitude and subjective norm constant, a person's perception of ease or difficulty of behavioural performance will affect his behavioural intentions (Montano & Kasprzyk, 2008).

The TRA and the TPB assume a causal chain that links behavioural beliefs, normative beliefs, and control beliefs to behavioural intentions and behaviour via attitudes, subjective norms, and perceived control. TRA and TPB provide a framework to identify key behavioural, normative and control beliefs affecting behaviour. Interventions can then be developed to target and change their beliefs or the values placed on them, thereby affecting attitude, subjective norm, or perceived control and leading to changes in intentions and behaviours (Montano & Kasprzyk, 2008).

Intention is an indication of a person's readiness to perform a given behaviour, and it is considered to be the immediate antecedent of behaviour. The intention is based on the attitude toward the behaviour, subjective norm, and perceived control, with each predictor weighed for its importance in relation to the behaviour and population of interest (Aizen, 2006).

Behaviour is the manifest, observable response in a given situation with respect to a given target. Single behavioural observations can be aggregated across the contexts and times to produce a more broadly representative measure of behaviour. In the TPB, behaviour is a function of compatible intentions and perceptions of behavioural control. Perceived behavioural control is expected to moderate the effect of intention on behaviour, such that a favourable intention produces the behaviour only when perceived behavioural control is strong (Aizen, 2006).

The TPB has been applied to behavioural researches such as entrepreneurial behaviour (Kautonen, Van Gelderon, & Tornikoski, 2013), use and misuse of alcohol (Marcoux & Shope, 1997), weight control (Mc Connon et al., 2012), promoting fruit and vegetable consumption (Kothe, Mullan, & Butow, 2012), social network sites use (Pelling & White, 2009), and blood donation (Holdershaw, Gendall, & Wright, 2011).

In a longitudinal research among working population in Finland, to examine whether the intentions to start a business measured at one point in time translates to subsequent entrepreneurial behaviour show that the econometric results support the prediction outlined in the TPB that attitudes, perceived behavioural control and subjective norm are significant predictors of subsequent behaviour. The TPB helped to understand the emergence of complex economic behaviour such as entrepreneurship prior to the onset of the observable action (Kautonen et al., 2013). Also, the TPB helped in predicting and explaining the use, frequency of use, and misuse of alcohol among fifth to eighth graders in a school in Michigan. Intentions to use alcohol explained up to 26% of variance in use, 38% of the variance in frequency of use, and 30% of the variance in misuse of alcohol. Also, up to 76% of the variance in intention to use alcohol was explained by attitudes, subjective norms and perceived behavioural control. This information could be used in developing curricula to prevent alcohol and other drug use, evaluating educational programmes, and a long-range forecasting of these behaviours. It concluded that normative beliefs continue to play an important role in the decision to use alcohol for adolescents. This result led to reinforcement of the need to implement substance abuse prevention programmes in the elementary schools (Marcoux & Shope, 1997).

The TPB was also used to investigate weight control in over weight and obese participants taking part in a dietary intervention trial targeted at weight loss maintenance. Respondents completed TPB measures investigating weight gain presentation at three points and it was found that perceived and subjective norm were significantly related to weight gain (Mc Connon et al., 2012). To evaluate the efficacy of the TPB based intervention to increase fruit and vegetable consumption and change in intake, participants were randomly assigned to two levels of intervention content where email

messages designed to increase fruit and vegetable consumption messages targeted attitude, subjective norm and perceived control. Fruit and vegetable consumption increased by 0.83 servings/day between baseline and follow-up. Intention, attitude, subjective norm and perceived behavioural control also increased. The increase in both fruit and vegetable consumption was a promising preliminary finding for those primarily interested in increasing fruit and vegetable consumption (Kothe et al., 2012).

An extended model of the TPB was used to predict Social Network Websites (SNW) use intentions and behaviour in young people aged 17-24 years. Analysis partially supported the TPB as attitude and subjective norm significantly predicted intentions to engage in high level SNW use is influenced by attitudinal, normative, and self-identity factors and therefore, can be used to inform strategies that aim to modify young peoples' high levels of use or addictive tendencies of SNWs.(Pelling & White, 2009). Last but not the least; the theory was used to test whether the TPB has a predictive ability on blood donation behavioural intentions and actual donation behaviour. The intentions to donate blood were compared with blood donation behaviour following a mobile drive by the New Zealand Blood Service. When the observed outcome is donation rather than intention, the TPB model performance dropped and therefore, the TPB was found to be less effective in predicting intentions to donate blood and therefore, the need to turn to other methods other than the TPB to identify variables that do predict donation behaviour (Holdershaw et al., 2011).

The TPB is therefore appropriate for this study because it will explore the nurses' knowledge, attitudes and beliefs, perceived facilitators and barriers which may determine their intentions about the management of invasive procedural pain among the paediatric patients at the Regional Hospital, Koforidua. Permission was sought from the theorist to use the theory to guide the study (Appendix H).

2.2 Knowledge and processes of invasive procedural pain

Children experience pain during admission in hospital and this includes pain associated with invasive procedures as it is estimated that, out of the total number of patients who are admitted to the hospital, only 27% had pain before the admission, however, 77% of patients experienced pain on admission (Taylor, Boyer, & Campbell, 2008) which may be associated with painful invasive procedure. Some of the invasive procedures are venipuncture, intravenous cannulation, injections, lumbar puncture, circumcision, heel lancing, and central venous port access (Bice et al., 2014). Venipuncture is rated as one of the painful invasive procedures that caused a lot of pain and distress among the children (Bisognis et al, 2014). Vaccine injections (Taddio et al., 2010) intramuscular injections, nasal aspiration, urinary catheterization, joint aspiration and burn dressing (Curtis et al., 2012) were also identified as painful invasive procedures.

Other specialized and painful procedures include bone marrow aspiration, central line insertion, central port access, arterial puncture and cannulation, biopsies, and endotracheal intubation (Curtis et al., 2012). In other studies, procedural pain was categorized into mild, moderate, and severe (Stevens et al., 2011) and this was evident in one study where nurses caring for children with hematologic and oncologic conditions rated bone marrow biopsy as more painful than bone marrow aspiration and lumbar puncture (Po et al., 2011). Some doctors and nurses in another study rated supra pubic aspiration, intra muscular injections, and lumbar puncture as painful procedures whiles nasogastric tube insertion, intravenous insertion, and lumbar puncture were described as the most distressing procedures (Babl, Mandrawa, O'Sullivan, & Crellin, 2008).

Due to the pain associated with these procedures, the children become uncooperative and this warrants the use of restraints. In paediatric ward or units

worldwide, nurses use restraints when the child is uncooperative or when any movement could harm the child during the process (Coyne & Scott, 2013). Additionally, one study explains that during painful invasive procedures, nurses' use supportive holding whiles a restraint should be used to prevent the child from harming him or herself (Jeffery, 2010). Nurses also use physical restraints during the invasive procedures which ranges from gentle, firm and forcible holding but notes that most of the children are held gently (McCarthy et al., 2013).

Children express pain in three main ways as; vocal pain (crying and saying ouch), verbal fear (scary), and escape behaviour (attempts to run away) (Pichardo, 2010). Preverbal children expressed pain in the form of crying, facial grimacing (Nimbalkar, Dongara, Phatak, & Nimbalkar, 2014) and agitated body movement whilst the verbal children from age three were able to self-report in addition to the previously listed behaviours (Taddio et al., 2010). Although paediatric patients and adults suffer from pain equally, the pain in children are aggravated by factors such as anxiety, coping style, and lack of social support which makes the pain more intense (Verghese & Hannallah,2010). Also, children experienced heightened pain intensity due to the immaturity of the dorsal horn which leads to poorly localized pain also affects the descending pathway which cannot inhibit the pain properly and therefore, causes the infant to experience the pain for a long time, (Baulch, 2010). This assertion was also supported by Sclenz et al., (2012) that the younger the age, the greater the procedural pain. The prevalence of pain in children varies with age, sex, race and the condition of the child as children aged five and above scored higher on the pain scales than those below five years. Female Caucasian children report pain and consume more opioids than males and non- Caucasian children, (Kozlowski et al., 2014). Female children rank their pain higher than male paediatric patients (Vaartio, Leino-Kilpi, Suominen, & Puukka, 2008). Also, paediatric patients

with surgical conditions consume more opioids than patients with non-surgical patients (Kozlowski et al., 2014) which may be due to the tissue injury by the surgical intervention. A cross- sectional study to evaluate differences in pain perception among Chinese and Italian children showed that Chinese children experienced higher level of pain than their Italian peers although they expressed more control in their behavioural reaction to the pain during the venipuncture (Bisognis, 2014).

Pain is assessed through "a multi-dimensional approach made up of three components namely self-report, behavioural observation, and physiological measures" (Brand & Court, 2010 p. 35). For the self- report, there are various validated tools for different categories of children such as the neonates, infants and verbal children, and non-verbal children with cognitive disabilities (Stapelcamp, Carter, Gordon, & Watts, 2011). These pain rating scales include Premature Infant Pain Profile (PIPP) (Stapelcamp et al., 2011), Oucher Pain Scale (Thomlinson, Von Bayer, Stinson, & Sung, 2010), and Wong-Baker Faces Pain Rating Scale (Garra et al., 2009; Thomlinson et al., 2010) and the FLACC (Face, Legs, Arms, Cry, Consolability) scale in the assessment of children in pain (Twycross & Collins, 2013). Nurses caring for adults in a surgical unit believed that post- operative pain and its effects is subjective to every individual and therefore believed the patient's self-report, however, some of the nurses informally assessed the patients pain to confirm before administering the analgesia (Aziato & Adejumo, 2014a). Self- report was seen as determinant for managing procedural pain effectively and not the type of procedure to be performed (Rawe et al., 2009).

In a study to explore paediatric nurses' pain management practices, one study found that, apart from the use of the rating scales, the nurses employed other means of assessing pain such as body language, observation, and non-verbal cue (Twycross & Collins, 2013), however, the study, did not state the age, duration of experience, and

level of education of the participants since those factors could affect the results that were given by the nurses. Also, the strategies given by the nurses about other ways of assessing pain needed to be tested before it could be generalized. Although there was evidence of guidelines for pain management (Twycross, 2010), few nurses really practice it on daily basis (Bice et al., 2014) as nurses did not use the pain scales because they were not aware of its importance (Nimbalkar et al., 2014). In one study, only 27% of the patients had their pain score documented during admission (Taylor et al., 2008). Additionally, even though validated pain scales and locally adapted pain tools were available, more nurses than doctors were aware of the names and the use of those pain tools (Akuma & Jordan, 2012). Physiological and observational behaviours such as alteration in vital signs, agitation, sleeplessness, fever, feed intolerance, palmar sweating, and colour changes were used to assess procedural pain in children (Akuma & Jordan, 2012).

Majority of the nurses never use an objective tool for the pain assessment (Lui, So, & Fong, 2008), however, this study included more males and auxiliary nurses. Meanwhile, others also used the combination of body language, verbal cues, and pain rating scales to assess the pain (Twycross & Collins, 2013). Although these pain assessment tools have been validated and are been used in various countries, its reliability and validity have not been established in the Ghanaian context.

Pharmacological remedies for the management of procedural pain include acetaminophen, opioids, anxiolytics, and sedatives (Czarnecki et al., 2011). Sedatives do not have any analgesic effect but causes amnesia and sedation in patients who are expected to be show some distress and therefore there is the need to add analgesics for the procedural pain (Park et al., 2008). The sedatives include ketamine and propofol (Aouad et al., 2008). Other pharmacological medications are morphine, fentanyl,

codeine, and iboprufen (Akuma & Jordan, 2012). Local anaesthetics are used for dermal procedures as they are injected into the subcutaneous tissue, intradermally or topical on the skin (Pasero, Polomano, Portenoy, & McCaffery, 2011). The pharmacological remedies includes topical anaesthetics mixtures, vapocoolant sprays and gels such as Amethocaine, Eutectic Mixture of Local Anaesthesia (EMLA), Liposomal Lidocaine, Tetracaine Adrenaline Codeine, Lidocaine Epinephrene-Tetracaine (LET) gel (Bice et al., 2014; Curtis et al., 2012). However, these remedies may lead to hyperalgesia - excessive sensitivity to pain (Taddio, Shah, Atenafu, & Katz, 2009). In one study, various forms of pharmacological strategies were used which included lidocaine injection, EMLA, combinations of fentanyl and midazolam, and ketamine and midazolam (Maclean, Obispo, & Young, 2007) while a combination of adrenaline, lignocaine, and Amethocaine (ALA) is used for pain associated with wounds (Babl et al., 2008).

Non-pharmacological management that is utilized during painful invasive procedures includes suggestion therapy which is a procedure that involves the inducement of the patient into a relaxed state and then using words and intonations to produce a desired effect or alternative behaviours (Taddio et al., 2010). Nurses use psychological strategies such as suggestion therapy where nurses try to convince the children that the procedure will not be painful, however, telling a child that the pain invasive procedure won't hurt is not an effective way of managing such pain (Taddio et al., 2010). Distraction is another form of non-pharmacological strategy (Stinson, Yamada, Dickson, Lamba, & Stevens, 2008; Tufekci, Celebioglu, & Kucukoglu, 2008; Uman, Chambers, McGrath, & Kisely, 2008). Distraction helps in the management of invasive procedural pain and it could be either clinical-led or child-led. The clinical-led distraction involves the use of toys and other materials that may be provided by the

hospital or the parents of the patient. However, there is the need to clean the toys very well in order to prevent cross infection (Taddio et al., 2010). The child-led distraction techniques that help to reduce the procedural pain include deep breathing and blowing techniques (Taddio et al., 2010). Non-nutritive sucking in older infants and toddlers (Curtis et al., 2012) also aids in the management of the pain associated with the invasive procedures During breastfeeding, the combination of skin-to-skin contact, sweet milk and the act of suckling aids in the management of the painful procedural pain and therefore, mothers need to breastfeed their children during the process of vaccination (Taddio et al., 2010). Other strategies include hypnosis (Stinson et al., 2008; Uman et al., 2008), combined cognitive behavioural interventions (Uman et al., 2008), music (Klassen, Liang, Tjosvold, Klassen, & Hartling, 2008), and small talk during immunization of infants (Plumridge, Goodyear-Smith, & Ross, 2009), gentle human touch (Herrington & Chiodo, 2014), and hand and foot massage (Abbaspoor, Akbari, & Najar, 2014).

Additionally, the process of breastfeeding is also believed to have an analgesic effect which reduces the pain as a result of the vaccination (Taddio et al., 2010) and heel lancing (Ou-Yang et al., 2013) while oral sweet solutions(Joung & Cho, 2010) or sucrose was also used to manage procedural pain in younger children (Akuma & Jordan, 2012; McCarthy et al., 2013). This assertion was supported by another study where nurses were aware of the use and benefits of breast milk and sucrose in managing procedural pain and about 80% of them actually used it (Foster, Spence, Henderson-Smart, & Harrison, 2013). Although these remedies have been proven to be effective and are been used on daily basis to control procedural pain (Bice et al., 2014), some are not readily available in paediatric clinical settings in Ghana. Also, studies show that nurses lack knowledge

about both pharmacological and non-pharmacological remedies for pain in children (Lui et al., 2008).

The combination of both pharmacological and non-pharmacological remedies (multimodal) has been recommended as the preferred treatment regimen for procedural pain management in paediatric patients (Anghelescu et al., 2014). Studies showed that some nurses employed pharmacologic, physical, psychological, and the combination of the interventions (Stevens et al., 2011) and other authors had recommended the usage of a combination therapy of pharmacologic, physical and psychological (Taddio et al., 2010). Combination of analgesics (multimodal therapy) is preferred in the management of moderate to severe pain as it reduces the side effects of the opioids (Sinatra, 2010). This pharmacological strategy was practice by some nurses in one study (McCarthy et al., 2013).

The consequences of untreated acute pain in children are overwhelming as there are both short term and long term effects on the child from the early developmental stages through to adulthood. It is associated with anxiety, fear, and behaviour changes among children, (Curtis et al., 2012) which can lead to the development of chronic pain (Baulch, 2010) and hyperalgesia (Taddio, et al., 2009). In neonates, it can lead to impaired brain development since their brain cells are associated with reduced white matter and subcortical gray matter (Brummelte et al., 2012). Infants who experience procedures such as heel lancing and circumcision were found to have stronger negative responses to venipuncture weeks or months later after the procedure (Kennedy, Luhmann, & Zempski, 2008). Also, older children whose pain was not well managed previously reported more pain during subsequent procedures (Kennedy et al., 2008). Untreated pain also interferes with sleep, recovery from illness, mood, general activity, walking activity, and relations with other people (Darawad et al., 2014). The ineffective

management of pain associated with vaccination also led to procedural anxiety, hyperalgesia, needle fears and avoidance of healthcare (Taddio et al., 2010). This creates a negative relationship between the patient, their families and the healthcare professionals (Leahy et al., 2008) which may affect the level of satisfaction of the healthcare services among patients and their families (Kozlowski et al., 2012). Painful procedures may produce later consequences such as more reports of pain during adulthood, avoidance of healthcare, and altered sensitivity to pain (Pichardo, 2010).

Apart from the patient, the healthcare providers especially nurses are affected as they find it very challenging when performing venipuncture on children who are fearful and anxious (Kennedy et al., 2008). The ineffective management of the invasive procedural pain also affects the nurses as they became uncomfortable when they are not able to effectively manage pain (Olmstead et al., 2010). Most nurses do not communicate any information to the parents although they believe that the parents played an important role in the management of their child's pain (Twycross & Collins, 2013). This attitude can also prevent nurses from assessing pain since they have the belief that parents correctly report the pain of their children and therefore, may not perform any objective assessment to prove the presence of the pain or otherwise (Twycross & Collins, 2013).

Although the expertise, existence, and experience of family members of patients in pain helps in managing the intensity level of pain in the patients (Grondin, Bourgault, & Bolduc, 2014), they sometimes posed as hindrances to effective pain management. A study conducted to ascertain how much nurses perceive potential barriers as interfering with their ability to provide optimal pain showed that parents were reluctant to have their children receive medication (Czarnecki et al., 2011). A follow up study still revealed that the nurses still saw the parents' reluctance to have their children receive medication as a

challenge (Czarnecki, Salamon, Thompson, & Hainsworth, 2014). The participants in this study consisted mainly of Caucasians (whites) and females. However, some parents even encouraged their children to ask for medication even when the child was not in pain (Twycross & Collins, 2013).

Although nurses were aware of the various pain management tasks such as ascertaining previous experiences of pain, using a pain assessment tool, using behavioural and physiologic indicators, using non-drug methods, administering analgesics, reassessing pain, documentation, and communicating with children and parent, however, the importance they attribute to these tasks did not translate into the likelihood of actually performing it (Twycross, 2008). Although nurses scored creditably high on knowledge of pain instruments, just a few of them really provided the care whiles those who scored low on the knowledge instrument gave substandard care to the patients (Latimer, Johnston, Ritchie, Clarke, & Gilin, 2009; Wysong, 2014). This assertion was consistent with the theory of planned behaviour that stipulated although accurate knowledge was important to effect an action, there is little support for a relation between knowledge and behaviour (Aizen, 2006). There is therefore the need to explore other factors that determines an individual's intentions to perform behaviour such as attitudes and beliefs, subjective norms, and perceived control.

2.3 Nurses' attitudes and beliefs about invasive procedural pain

This section reviews literature on the attitudes and beliefs of nurses that may affect the intentions of the nurses to assess and manage invasive procedural pain among paediatric patients. Nurses' have both positive and negative attitudes towards procedural pain management in paediatric patients.

The belief that neonates as young as 28 weeks can perceive more pain as compared with adults was affirmed by most health personnel in one study although a minimum were opposed to that assertion (Akuma & Jordan, 2012). The nurses' viewed that effective pain management helped to reduce distress during procedures such as immunization as it improved adherence to immunization schedules and reduced the effects of untreated pain which sometimes may be long lasting (Taddio, et al., 2009). A qualitative study conducted on how nurses describe optimal pain care found that nurses describe optimal pain care in relation to a lower record on a pain assessment scale (<4), level of functioning, access to safe, effective, timely pain relief, physiological data, side effects of drugs being under control, and appropriate procedural pain management (Czarnecki et al., 2011). A further study three years later, showed similar indicators in relation to their definition of optimal pain (Czarnecki et al., 2014). The ability to perform activities of daily living as an indicator for optimal pain management may not always be true since some individuals may perform their activities of daily living even in the presence of pain. Although the participants in the first research scored patients' assessment score as the best indicator for optimal pain, the nurses in the second research scored patients' level of functioning higher. It was identified that the study used more females than males and also, Caucasians formed the greatest number of participants and therefore, the findings may not be applicable to other nurses from different backgrounds. Also, the use of physiological data by nurses as an indicator for pain may not be correct as it is not supported by various guidelines on pain management (Morgan, 2014).

Nurses also believed that the use of topical medications prior to painful procedures and the support from nurses led to the reduction of distress in children to the bearest minimum (McCarthy et al., 2013) and therefore, analgesia should be used at all times for painful procedures (Akuma & Jordan, 2012). This belief was supported by one

study that showed that all the nurses use topical analgesia for painful procedures such as intravenous insertion, injections, catheterization, and naso gastric tube insertion (Babl et al., 2008). The nurses were eager to manage pain in the patients during the painful invasive procedures as one study found that the nurses chose to uphold their ethics to cause no harm to patients and were ready to advocate for the patient even to the point of losing their license (Morgan, 2014). However, in this study, the nurses who were interviewed reported on what other nurses did but did not explain what they personally did, therefore subsequent studies should employ other data gathering technique such as observation to corroborate the self- report that were given by the participants. Some nurses also observed that, when the pain in the children is better managed, both the patient and the parent will be satisfied with the care given to them which will enhance the nurse-patient relationship (Kozlowski et al., 2014). Additionally, the nurse-patient collaboration may be advantageous to the nurses as the patients described their pain location, intensity, timing of pain, and pain treatment which enhanced an effective management of the pain in the patient (Puia & McDonald, 2014).

The attitudes and beliefs of nurses could also affect the acceptance of the knowledge they have about pain as some healthcare professionals were not aware that pain is the most common symptoms why people seek healthcare, and also did not see themselves managing pain in people who are sick since it is a normal phenomenon (Machintosh-Franklin, 2014). The results of this study was corroborated by a longitudinal study which explored the impact of experience of student nurses response to patients pain where students' saw pain as a normal phenomenon that every patient should expect and the fact that it is negligible, a follow up study still showed that the student nurses still stood by their beliefs (Machintosh-Franklin, 2014). This could be as a result

of personal factors such as the nurses' cultural background, personal experience of pain, family attitudes and values about pain and addiction (Morgan, 2014).

On the other hand, some nurses did not manage pain even when resources were available but gave excuses that those logistics may not be available as was found in one study whereby the nurses blamed their inability to assess and manage pain to lack of age-appropriate pain assessment tools, and not having a flowchart of pain medications (Twycross & Collins, 2013). Even though nurses were aware of pain guidelines in the facilities, few of them used it for the management of procedural pain (Lago et al., 2013). There has been poor compliance for the use of assessment tools for pain although there is an abundance of guidelines and assessment tools for assessing and managing pain in paediatric patients as the nurses believed that the methods were "over-simplistic, burdensome to patients, inaccurate and perhaps even disrespectful of clinical expertise and experience"(Franck & Bruce, 2009 p. 19). Some nurses simply forgot to give analgesia before the procedure (Akuma & Jordan, 2012).

Despite the fact that the nurses had knowledge about pain care, only a minimal number actually provided the pain care during the procedure (Latimer et al., 2009). Yet another study to evaluate the analgesic use during childhood invasive procedures showed that only few health personnel and parents used the available topical medications as they still preferred the oral medications which were less efficacious than the topical medications (Taddio et al., 2007). Nurses are to know that analgesic use in the management of pain in children is not only dependent on the age of the child but rather the type of procedure and the pain threshold (Verghese & Hannallah, 2010). Some nurses also had a misconception that a patient expressing discomfort experiences more pain than the patient in a relaxed manner even though the two patients have the same level of pain and this belief may prevent the nurse from managing the pain adequately just

because the child has not shown any facial expression of pain (Lui et al., 2008). The nurses also believed that children should endure as little pain as possible and opt for non-drug techniques than the combination with pharmacological strategies (Lui et al., 2008) even though there is evidence to show that the combination of pharmacological and non-pharmacological (multimodal approach) is the most preferred in the management of pain (Grondin et al., 2014).

During invasive procedures, most nurses used non-pharmacological strategies as one study showed that in the NICU only 32% of the nurses' use analgesia during heel pricks while the rest use non-pharmacological remedies (Lago et al., 2013). These included conversation, toys/games, and blowing of bubbles (McCarthy et al., 2013). The reason for some nurses reluctance to manage pain pharmacologically was the belief that the procedures last for a brief period and the analgesics have side effects which could cause addiction and other complications and therefore, it was in the interest of the patient to be avoided (Nimbalkar et al., 2014; Verghese & Hannallah, 2010). This assertion was however contradicted by findings that proved that the incorporation of multimodal approach which includes the combination of mild analgesia, local and regional analgesia, and opioids help to minimize the side effects of individual drugs or techniques (Verghese & Hannallah, 2010). In one study, children undergoing painful procedures such as intramuscular injections, lumbar puncture and urethral catheterization were not given any medications because those procedures were thought to be minor procedures whiles medications were given during other procedures such as fracture reduction, incision and drainage, and lumbar puncture (Maclean et al., 2007), and elective intubation and chest drain insertion (Akuma & Jordan, 2012) which the nurses believe were major procedures. Some negative beliefs among nurses affects the health-seeking behaviour of school-aged children as they downplay their symptoms until the pain is unbearable

before they report to the hospital since nurses stigmatized and labeled them as 'drug seeking', and therefore, disbelieving their complain of pain (Morgan, 2014). Some nurses believed that children exaggerated their pain and complained about the existence of pain although their behaviour did not indicate that they were in pain (Twycross & Collins, 2013).

Sometimes, behaviour and expectations of other healthcare professionals such as doctors and biomedical staff affected the nurses' motivation to give analgesia before the invasive procedures. Some doctors expressed low priority to pain management which prevented the nurses from adequately managing the pain (Czarnecki et al., 2014). At other times, there was low collaboration between nurses and physicians as a result of discrepancies in the accurate knowledge of assessment, treatment, and perceptions of intensity caused by procedures (Latimer et al., 2009) and this could affect the teamwork among the health team members. Poor communication between the doctors and nurses also affected the effective management of procedural pain (Akuma & Jordan, 2012).

Advocacy by nurses with respect to pain management in children is very important as nurses saw advocacy as the recognition of nurses' role in pain management, analyzing patients' pain care preferences, and responding to them accordingly (Vaartio et al., 2008). Another study which explored the advocacy of nurses for managing patients with pain showed that more than half of the respondents addressed individual patient needs by disseminating materials regarding rights to assessment and treatment and continue to advocate when those needs were not met, the use of current evidence-based pain guidelines, provided assistance to patients, consulted team members to overcome barriers, and inform patients/family about right to pain care (Ware, Bruckenthal, Davis, & O'Conner-Von, 2011), however, only 68% of the nurse managers felt they were well informed to vote on issues related to pain treatment and management, and only 30% had

made efforts to contact legislators regarding pain management concerns even though they had knowledge and skills about advocacy and were registered voters (Ware et al., 2011). However, in another study, almost half of the nurses said they were capable of influencing pain plans of patients (Vaartio et al., 2008). There is therefore the need to empower nurse managers to always perform their functions as advocates for patients especially when it comes to paediatric patients who sometimes cannot verbally express their feelings. Additionally, the study also found out that some of the nurses were ready to confront doctors to prescribe analgesics and also bend the rules and protocols to ensure that the patients' pain is managed.

There have been suggestions that the years of experience of a nurse may have an effect on the level of knowledge about pain assessment and management. Although it may be true to an extent as shown in a study (Lui et al., 2008), other studies also had a rather negative findings between those two variables as after educational intervention on pain care, nurses with less number of years of experience performed better than those with more years of experience.(Huth, Gregg, & Li, 2010). There is the need for nurses to effectively manage procedural pain since the "relief of pain should be a human right" (Taylor et al., 2008 page 2) and therefore, the refusal by nurses to manage pain associated with invasive procedures, is unethical practice of medicine and the infringement of the human rights of the child (Brennan et al., 2009). The code of conduct for nursing practice expects all nurses to alleviate pain in patients in order to promote health.

While some nurses had positive attitudes towards the management of invasive procedural pain, others had negative attitudes and were not ready to manage the pain and these determine their intentions towards the management of invasive procedural pain in children. Some nurses showed favourable intentions towards procedural pain

management as they were committed to ensuring that the pain was managed and the patients were comfortable, however the study was conducted for nurses who care for adult patients at the surgical ward (Aziato & Adejumo, 2014a). Other nurses also believed that adherence to the pain guidelines reduced the number of attempts to perform the procedure (McCarthy et al., 2013). Others also expressed empathy for the children and their parents when the nurses are informed about the procedure to be done, during the preparation for the procedure and during the process when performing the procedure (Lloyd, Law, Heard, & Kroese, 2008). An evaluation of procedural pain management at a pain centre show that nurses were ready to be trained to manage the pain in the children as they were satisfied with the previous management of procedural pain in the children and thought that there was no excuse for not managing invasive procedural pain in children (Po et al., 2011).

Consequently, other nurses had unfavourable intentions towards the management of invasive procedural pain as they thought that since the procedures did not take a long time to perform, there is no need to give medications (Nimbalkar et al., 2014). Some nurses also believed that the use of the topical creams might waste time especially during emergency cases (McCarthy et al., 2013) as the topical creams take between 20-60 minutes to take effect (Taddio et al., 2010). Also, other nurses thought that they may not have enough time to manage the pain effectively (Po et al., 2011) whiles others were of the opinion that, the application of the topical creams may waste time as it will affect the flow of their work in the unit (Maclean et al., 2007). Another study also showed that although pharmacological management of procedures has improved, the routine practice is still minimal in the paediatric units (Lago et al., 2013).

2.4 Perceived facilitators for effective management of invasive procedural pain in children

Facilitators in the context of this study are the measures that nurses believe will enhance the effective management of invasive procedural pain for children undergoing painful procedures in the paediatric setting. Facilitator is a sub-construct of perceived control of the theory of planned behaviour. The literature review show that facilitators are multifaceted as it includes parental support, knowledge of pain assessment and management, improved attitudes, monitoring workers, peer training and teamwork.

Nurses believed that patients' relatives played an important role in the management of the patients' pain and therefore warranted their involvement in the pain management process (Grondin et al., 2014). Parents of paediatric patients also possessed a wealth of knowledge which could be tapped by the nurses for the management of pain in the children as a study revealed that, the parents had experienced since they stayed with the patient and also their presence could lower the intensity level of the pain (Grondin et al., 2014). In the end, both the patient and the parent will be satisfied with the care given to them which will enhance the nurse-patient relationship (Kozlowski et al., 2014). Additionally, in the paediatric setting, children and parents assisted nurses in the pain management by verbalizing their concerns about pain, parents informing the nurse when their child is in pain and parental involvement in pain care by assisting with the implementation of non-pharmacological remedies such as distraction, playing with the child, comforting the child (Twycross & Collins, 2013). A family-centred collaboration has also being recommended in the effective management of pain (Stevens et al., 2011). Also, during the painful invasive procedures, the presence of a parent or a significant other is helpful as the child is reassured throughout the procedure (Coyne & Scott, 2013).

Nurses obtain their knowledge about pain care from various avenues. A quantitative study that was conducted to assess and compare the knowledge and attitudes regarding neonatal pain found that 85% of the nurses had no formal education on pain, 92% thought that the education they had in their nursing schools was useful in assessing and managing pain in patients while those who had no formal education learn from other colleagues (Nimbalkar et al., 2014). In the absence of a definite protocol for pain management in use, the nurses scored between 3-13 points out of the 17 and marital status had a significant effect on knowledge and attitudes towards pain. Only female nurses were used for the study and also, the sample size was too small (41) for a quantitative research.

In order to ensure effective procedural pain management, there is the need to increase nursing knowledge about pain assessment and management of pain (Bice et al., 2014). There is also the need for quality improvement of nurses in pain management to sharpen their skill (Lago et al., 2013). Most of the educational programmes about pain assessment and management have been beneficial to the nurses as it led to their increased knowledge in non-pharmacological interventions (He et al., 2010) and assessment tools (Zhang et al., 2008) and therefore there is the need for continuous education of all health care personnel as they are expected to advocate and intervene to enhance the best interest of the patients which includes children (Czarnecki, et al., 2011). Additionally, the advantage it gives to the nurses is the fact that it enables them to better advocate for their patients and families (Ware et al., 2011). The education also enabled them improved decision-making, while convincing medical personnel to give the correct dose, and also the educational programme served as a learning tool for the student nurses, doctors and the staff (Twycross & Collins, 2013). These will in turn lead to improvement of the attitudes of the nurses towards invasive procedural pain management.

The management of the healthcare facility can also put measures in place to facilitate the effective management of procedural pain among nurses. There is the need for all stakeholders to support in implementing procedural pain assessment and management in paediatric patients since their involvement serve as a powerful motivation for the continuations of the protocols and communication, and ensure that the training programmes are embraced by the health care professionals (Leahy et al., 2008). Although these facilitators will enhance the effective management of pain in children, there is the need to continuously monitor the healthcare facilities so that those that are non-performing can be identified so that appropriate measures are taken (Leahy et al., 2008). This therefore implies that, there is the need for continuous education of all clinical staff so that they can update themselves with current innovations in pain management (Darawad et al., 2014). Pain management could also be incorporated into the existing curriculum of nursing training institutions (Nimbalkar et al., 2014)

Peer training among nurses on the ward could be helpful as those who have the skills are able to impart it to their colleagues on the ward. This was supported by a study where most nurses gained their knowledge about pain assessment and management from their colleagues. Therefore, there is a need to organize the training for all nurses in the hospital setting and also integrate all specialist nurses during educational training programmes so they could share their wealth of knowledge and evidence-based practices (Latimer et al., 2009). Also, the use of a "local champion" who may be a nurse or a doctor to monitor and support the colleagues on the ward to use the guidelines is also advantageous (Lago et al., 2013).

Teamwork may also help in effective procedural pain management and therefore, education of other healthcare personnel such as doctors, pharmacists, and biomedical personnel may also improve their attitudes which will enhance the effective management

of pain in paediatric patients because their appreciation of pain management will help the nurse to effectively obtain the resources to manage pain in the paediatric patient (Twycross & Collins, 2013). To add to that, nurses can also collaborate with phlebotomists so that they apply the topical creams before blood draws on children (Leahy et al., 2008). Teamwork can also have positive effect on the nurses as the formation of alliances among the healthcare teams may help to improve their attitudes towards pain management (Lago et al., 2013) since differing views among the professionals in relation to pain could affect the effective management (Akuma & Jordan, 2012). According to one study, certain facilitators such as interprofessional collaboration help in improving pain practices (Stevens, et al., 2011). In contrast to this assertion, one study showed that the time an order is given to the time the procedure is performed is between 30-60 minutes and therefore the topical creams could be applied since it took not time to do so (McCarthy et al., 2013).

2.5 Perceived barriers against effective management of invasive procedural pain

Barriers that mitigate effective procedural pain management are lack of knowledge, lack of autonomy, insufficient analgesic prescription, inadequate staff, unavailability of resources, low priority given to pain management by medical staff, cost of medications and powerlessness.

Various studies have been undertaken on the level of knowledge of nurses in the paediatric settings about procedural pain in children. While some researches show that nurses in the paediatric setting have adequate knowledge about procedural pain assessment and management in children (Latimer et al., 2009; Twycross & Collins, 2013), others claim that some of the nurses do not have enough knowledge to manage pain (Huth et al., 2010; Lui et al., 2008).

Nurses also obtained their knowledge about pain care from other sources such as physicians, journals and the internet (Latimer et al., 2009). However in this study, the eligibility criterion that included English-speaking Canadians but excluded the French-speaking Canadians although French was the second national language in Canada was a limitation of the study. One study which included both professional and auxiliary nurses to examine the effectiveness of pain management programme in enhancing knowledge and attitudes of health workers in pain management found that the nurses had inadequate knowledge about pain assessment, pharmacological and non-pharmacological and mostly reported the medical and administrative staff concerning pain in patients (Tse & Ho, 2014).

There is evidence that some nurses have less knowledge in assessing and managing pain in patients (Aziato & Adejumo, 2014a) and this challenge prevented them from effectively managing the pain associated with the procedure (Taddio, et al., 2009). Additionally, there is evidence that research in the area of pain management among paediatric patients was minimal (Verghese & Hannallah, 2010). A study which investigated knowledge and attitudes regarding pain management among nurses working in the medical units in Hong Kong and showed that, out of the 143 nurses, only 19% had ever attended courses related to pain management whiles 70% read books and journals for information about pain management, and although 65% applied the knowledge in practice. This is similar to a finding in Ghana where nurses do not apply what they learn in practice (Aziato & Adejumo, 2014b). The nurses obtain the knowledge about pain management from various areas such as courses in medicine and surgery, reading from books and journals, (Lui et al., 2008). A descriptive cross-sectional survey that was conducted in Jordan to investigate nurses' knowledge and attitudes regarding pain treatment revealed that nurses lacked knowledge on the use of opioid such the dose,

route of administration, and the ability to differentiate between addiction, tolerance, and physical dependency. There was also a positive correlation between knowledge and previous pain education (Al-Qadire & Al-Khalaileh, 2014). This study was not limited to only paediatric patients but all other patients.

Attitudes such as provider/nurse communication, opinions and attitudes, lack of autonomy procedural pain (Bice et al., 2014), lack of awareness of having a challenge, and role confusion (Lui et al., 2008) affected the effective management of invasive procedural pain. Additionally, another study identified barriers among nurses as limited formal lectures on pain in school, inadequate continuous education (Lui et al., 2008). Healthcare professionals' inability to acknowledge that pain may occur during and after the procedure prevented them from adequately managing the pain. (Czarnecki et al., 2011). Other factors included nurses having to follow-up on doctors to ensure that analgesia has been prescribed, insufficient analgesia prescribed by medical staff (Twycross & Collins, 2013). The staff working on the wards was inadequate so there was the need to improve the staffing levels (Akuma & Jordan, 2012; Twycross & Collins, 2013). This caused heavy workload on the ward which prevented the nurses from managing pain effectively (He et al., 2010).

Nurses complained about the unavailability of logistics and treatment availability (Bice et al., 2014) because the presence and use of pain assessment measures, policies and standards, and opportunities for development helps in improving pain practices (Akuma & Jordan, 2012; Stevens, et al., 2011). In addition, hierarchical relationships and systems and unit culture also posed as barriers against effective management of invasive procedural pain (Stevens, et al., 2011). In some health facilities, the medications were relocated topical anaesthetics and sucrose so that the staff will have easy access to them (Leahy et al., 2008). Also, non-pharmacological remedies for procedural pain such as

distraction have been implemented in health care settings whereby educational materials are provided for the parents (Leahy et al., 2008). A focus group discussion to explore paediatric pain management practices in a hospital in South England found out that, nurses identified organizational factors that will enhance their assessment and management of pain as better assessment tools, having a pre- operative questionnaire for parents, availability of equipment for distraction and increased availability of play therapists. In addition, they suggested that resources available for decision-making such as hospital guidelines and algorithms, pain teams and pain plans are useful (Twycross & Collins, 2013). Challenges such as inadequate/insufficient medical doctors' medications orders, insufficient medication orders available before procedures, low priority given to pain management by medical staff also prevented the nurses from adequately managing the pain (Czarnecki et al., 2014).

In Ghana, it was revealed that there is no distinct credit bearing course on pain in the curriculum, however, it is integrated in other courses such as pharmacology and surgical nursing (Aziato & Adejumo, 2014b) and therefore, the knowledge gained was inadequate. Consequently, other studies have recommended the review of existing curriculum and an introduction of a comprehensive programme on pain management (Al-Qadire & Al-Khalaileh, 2014; Lui et al., 2008). Lack of time to administer the medications also prevented the nurses from managing the procedural pain effectively (Bice et al., 2014; He et al., 2010; Ware et al., 2011). Cost of medications was also identified as a barrier that could affect the purchase of the medication for use for pain management (Ware et al., 2011). Some parents will be worried about the cost of the topical creams which costs about 5-10 Dollars (GHC 15-30) per dose although they may support its use (Taddio et al., 2010). The nurses also experienced the feeling of

powerlessness as a result of delay in the prescription of analgesia by the physician which led to prolong unmanaged pain (Brorson, Plymouth, Ormon, & Bolmsjo, 2014).

2.6 Summary

Literature was reviewed on the perspectives of nurses' towards invasive procedural pain management among paediatric patients. It included the knowledge, attitudes and beliefs, perceived facilitators and barriers.

The literature showed that nurses had knowledge about invasive procedural pain in children; however, the knowledge alone is not the determining factor for managing the pain but rather their beliefs, attitudes, and perceived facilitators and barriers. However, most of these studies were conducted in the developed countries which were mostly quantitative. This study will therefore identify the knowledge among the nurses on invasive procedural pain and other factors that will affect their intention to manage invasive procedural pain in paediatric patients. Also, the few studies that have been conducted in this setting were in adult postoperative patients and therefore, this study will use the qualitative approach and explore the perspectives of the nurses in the paediatric settings and identify interventions that will enhance effective procedural pain management. The next chapter addressed the detailed description of methodology in the study.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter included research design, research setting, target population, sample size and technique, and procedure. It also involved data gathering tool, data analysis, data management, methodological rigour, and ethical considerations.

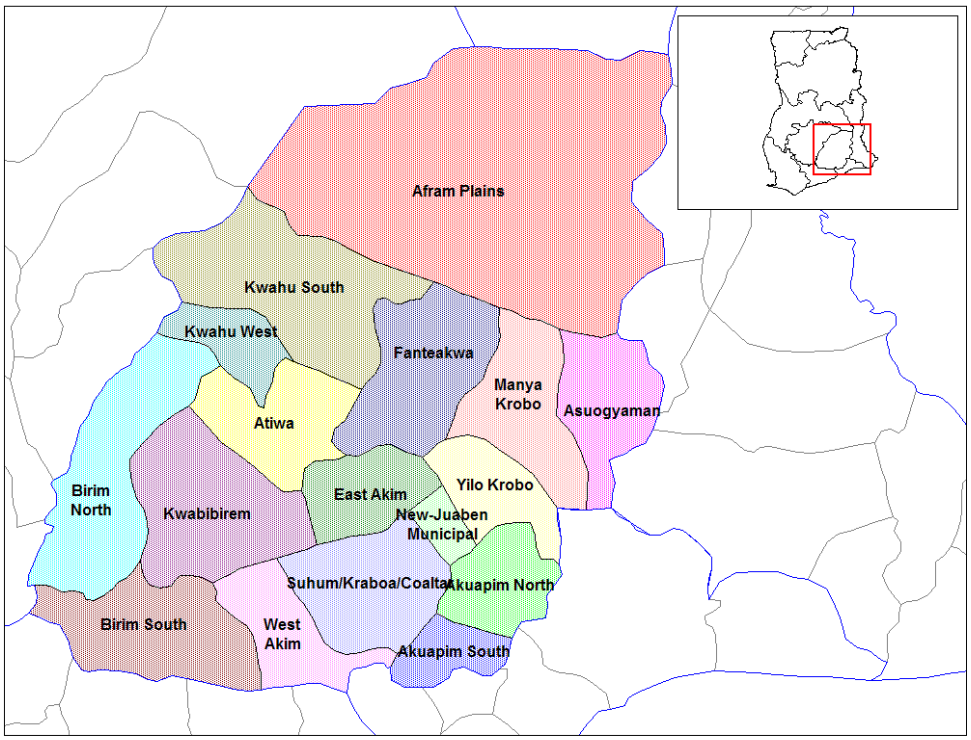
3.1 Research design

Research designs are defined as "types of designs of enquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research design" (Creswell, 2014 p.12). In quantitative research designs, the researcher tests a theory by specifying narrow hypothesis and the collection of data to support or refute the hypotheses, and the information is analyzed using statistical procedures and hypothesis testing (Creswell, 2014). Qualitative research is a research approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem and rely on the fact that knowledge about humans cannot be possible without describing the human experience as it is lived and defined by the actors themselves (Polit, Beck, & Hungler, 2001). The types of qualitative research designs are narrative research, phenomenology, grounded theory, ethnographies, and case studies. This study employed a qualitative interpretive design. The nurses in the paediatric wards had daily interactions with their patients who undergo procedures that are associated with pain and they therefore had experience about procedural pain in paediatric patients. Therefore, the use of qualitative exploratory descriptive design will enabled the researcher to explore and describe the perspectives of nurses about procedural pain and its management in paediatric patients.

3.2 Setting of the Study

The study was conducted at the Paediatric units of the Regional Hospital, Koforidua in the New Juaben Municipality in Eastern Region as shown in figure 3.1.

Figure 3.1: Map of Eastern Region, Ghana showing New Juaben Municipality



The paediatric units of the hospital include paediatric Medical ward, Neonatal Intensive Care Unit, Paediatric Surgical ward, and Emergency/Out Patient Department. The hospital was established in 1926 as a secondary level referral facility and doubles as the Municipal Hospital for the New Juaben Municipality with a population of 199,653. There have been two major structural additions to it since its establishment. In 1972, the Administration Block, Dental unit, Laboratory Department, Adult OPD with Medical Records, Internal Medicine, Kids, Surgical and Maternity Wards with the theatre was added. In 1998, the Catering, Main Theatre, X-ray Department, Laundry and Mortuary Departments were added. The 323 bed hospital serves as a referral point for about

sixteen (16) district hospitals in the Eastern Region. The hospital offers the following services: Internal Medicine, Anti-Retroviral Therapy, Paediatrics, Surgery, Medicine, Dental, Ophthalmology, Physiotherapy, Ear, Nose, and Throat, Pharmacy, Laboratory, X-ray, Ultrasound, Catering, and Hospitality, Laundry, Mortuary and Primary Healthcare Services. The units under the Paediatric Department are Emergency and Out Patient Department, Paediatric Medical ward, and Neonatal Intensive Care Unit (NICU). The Paediatric Surgical ward is a unit under the Department of Surgery.

The Paediatric Medical ward had sixteen (16) nurses from the ranks of Staff nurse to Senior Nursing officers. It was a thirty bed capacity that received children with medical conditions such as malaria and meningitis from the age of more than one month to twelve years. It also had facilities such as a procedure room, pharmacy, and a play area for the patients. The medical staff was made up of one consultant paediatrician, two medical officers, and two physician assistants. Invasive procedures such as injections, cannulation, naso-gastric intubations were performed on daily basis on the ward. The Paediatric Surgical Ward had one ward with an eight bed capacity designated for paediatric patients up to age twelve with diagnosis such as hernia and undescended testes. It had a nursing population of seventeen (17), three surgeons, two medical officers. Invasive procedures were performed on a daily basis on the ward for diagnostic and therapeutic purposes. Neonatal Intensive Care Unit (NICU) admits peadiatric patients from birth to one month. It has twenty cots and incubator capacity for neonates with conditions such as prematurity, neonatal jaundice and sepsis. The patients were received from either the labour ward or as a referral from other healthcare facilities within the region. It had ten (10) nurses. Paediatric Emergency and Out- Patient Department was the entry point for the paediatric patients. They received the patient, took a brief history and then sent the patient for medical consultation. They also took

samples for diagnosis before the patient is either discharged or admitted on the ward. They organized clinics on specific days for paediatric patients with prematurity, sickle cell disease, and neurological conditions. Invasive procedures were performed such as intramuscular injections and blood draws for laboratory investigations. It had a total of twelve (12) nurses.

3.3 Target Population

Target population for the research included all nurses working in the four paediatric units at the Regional Hospital, Koforidua. The total population of nurses was fifty five (55) with ranks ranging from staff nurse to senior nursing officers.

3.4 Inclusion criteria

All professional nurses who have been working for at least six months post rotation in the four paediatric units. This ensured that, only nurses who cared for paediatric patients were recruited for the study.

3.5 Exclusion criteria

The research excluded all professional nurses working in the four paediatric units for less than six months post rotation/orientation, on leave (study, annual, or maternity) and those who did not consent to participate in the study.

3.6 Sample size and Sampling technique

A sample is the selection of individuals from a target population who reflect the characteristics of the target population. Sampling refers to the selection of a part of a group with the aim of collecting complete information and the part that represent (Khan, 2012). There are two main forms of sampling techniques namely probability and non-

probability sampling. The non-probability sampling techniques include convenience, judgment (purposive), and quota. The purposive sampling technique was used to select the participants for the study. In this type of sampling technique, the researcher intentionally draws a sample from the population that has the qualities that is expected in the study and therefore members of the population do not have equal chance of being selected (Khan, 2012). After gaining permission from the hospital management and the unit heads, the researcher informed the professional nurses who were working in the four paediatric units in the hospital about the requirements for participating in the study. Those who consented were selected and interviewed at an agreed time and venue by the participant. The first participant was recruited by volunteering and subsequent participants were recruited using the same approach. Saturation, which was the point at which no new information was received from the participants was reached at the fourteenth participants, however, two more participants were added which confirmed the saturation.

3.7 Data collection tool and Procedure

A semi-structured interview guide was used to conduct a face-to-face interview which explored the perspectives of the nurses about invasive procedural pain in paediatric patients. Interviews are established method of data where the interviewer sits face-to-face with the participant and records the responses and is able to cross-check doubts with the participants (Khan, 2012). Also, semi-structured interviews was more appropriate for this study because, it gave the opportunity to the participants to freely express their views about the phenomenon and also enabled the researcher to divert from the interview guide to seek for clarifications by using probes (Kusi, 2012). The construction of the semi-structured interview was guided by the theory of planned

behaviour and the research objectives. Section A of the interview guide consisted of the demographic information about the participants (appendix A) while Section B consisted of the interview guide (Appendix B) which consisted of open-ended questions and probes. Participants were informed about the study by the researcher on the ward and the inclusion criteria. The date, time, and venue for the interview were decided according to the choice of the participant. On the day of the interview, the participants were presented with the consent form (appendix C) which they read, their questions were clarified and they signed before the interview began. The interviews lasted for about 45-60 minutes and were conducted in the English language. The conversation focused on the nurses' knowledge, attitudes and beliefs about procedural pain in children, and perceived facilitators and barriers about procedural pain management in paediatric patients. The interviews were recorded with an audio recorder and field notes were also taken on the context and behaviour of participants. There was no right or wrong questions and the researcher used probes clarified and summarized the comments and expressions of the participants. In addition to the tape recording, a field note was kept which included detailed information about the environment, gestures, interruptions during the data collection process and the researcher's thoughts, feelings, ideas, moment of confusion, biases and interpretations w. After the interview, the participants were appreciated for their participation with a token. The participants were informed that the researcher may return for clarification when the need arose.

3.8 Piloting the Instruments

Piloting of a research instrument helps in ensuring the efficacy of the instrument to collect the expected responses and also helps in modifying the instrument before it is administered to the participants (Khan, 2012). The instrument (semi-structured interview

guide) was piloted at the St. Joseph's Hospital at Koforidua. This hospital was chosen for the pilot study because it had a paediatric ward which admitted similar children as the main study setting. The semi-structured interviews was used to interview two nurses who met the inclusion criteria and analysis of their responses were used to effect changes in the interview guide before it was administered to the main participants. It also served as a training ground for the researcher who developed her interviewing skills.

3.9 Ethical Consideration

Ethical clearance (appendix F)) was sought from the Noghuchi Memorial Institute for Medical Research before data collection. An introductory letter from the School of Nursing (appendix G) was sent to the Regional Hospital, Koforidua for permission for the study to be conducted. Then, permission was sought from the potential ward-in-charges of the four paediatric units. The purpose of the study was explained to the participants and their consent was sought before they were recruited (Appendix C). The benefits and risks were explained to the participants. Those who voluntarily accepted to participate were given the consent form which they read and signed. Privacy was ensured during all the interviews as any identifiable information about the participants and the recorded tapes were kept in separate lockers and only the principal investigator and the two supervisors had access to the raw data and information. Data presented in the findings were anonymized using identification codes and pseudonyms. The data and field notes were kept in a locker with a password and would be disposed after five years.

3.10 Methodological Rigour

In qualitative research, the rigour of the study can be established by the trustworthiness of the study that is, the ability to infer that the conclusions drawn by the researcher is the true representation of the responses given by the participants. Credibility, transferability, dependability, and confirmability have been identified as the major criteria for establishing trustworthiness in qualitative research (Lincoln & Guba, 1985).

Credibility was ensured by demonstrating that a true picture of the phenomenon under scrutiny was presented. A purposive sampling was used to select the required participants who are professional nurses working at the paediatric units who could share their perspectives about procedural pain in paediatric patients. Member checking was conducted by verifying the responses with the participants after the interview which ensured that their stories had been well documented before conclusions were drawn. The first two interviews were coded independently by the researcher and the supervisor and disparities and similarities that were identified were amended.

Transferability is the provision of sufficient detail of the context of the fieldwork for a reader to be able to decide whether the prevailing environment is similar to another situation and whether the findings can justifiably be applied to other settings. This was ensured as a vivid description of the setting, that is, the four paediatric units of the Regional Hospital, Koforidua, methodology, and the characteristics of the participants were provided. Also, documents such as the transcribed data and field notes were kept for reference.

Dependability determined whether the study can or cannot be replicated by another researcher (Lincoln & Guba, 1985). To achieve dependability of the study, clear questions were asked in order to elicit the responses that could answer the research

objectives. Also, the researcher was assisted by the supervisor and identified the themes and subthemes from the data.

Confirmability ensured that the meanings of the data collected were not changed by the prejudices , knowledge, and experiences of the researcher (Kusi, 2012). In this study, the researcher presented the findings that emerged from the data as a true reflection of the perspectives of the nurses about procedural pain in paediatric patients. In this study, the responses of the participants were recorded and transcribed verbatim and the themes that emerged were supported by direct quotes from the participants.

3.11 Data Management

Data collected during the research was protected in order to maintain the confidentiality of the participants. Each participant was given a code depending on the unit of paediatric department he/she was representing before the recruitment was done. Then pseudonyms were used to replace the codes after the interviews. A folder was then created for each participant's response comprising of the transcribed interviews and the field notes. Also, the audiotapes, transcripts, field notes were kept in a safe locker and separated from the demographic information and consent forms which could be assessed by the researcher and her supervisors only. The raw data (interviews) were stored in an external hard drive in order to guard against data loss. The data would be kept for five years until it was discarded.

3.12 Data Analysis

Qualitative analysis refers to data analysis methods that use non- numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships (Babbie, 2005). The data collection and data analysis was done concurrently. The data was analysed with the use of both thematic and

content analysis. The techniques involved data reduction, data display, and drawing conclusion and verification by (Mills & Huberman, 1994). The recorded interviews were transcribed verbatim and the transcripts were read repeatedly to identify the similar and contrasting ideas, and thoughts. Similar thoughts and words within the data were combined to develop a theme, and the related themes formed categories. During the analysis of the findings, the relationships between the responses were explored. The field notes were used to support the themes such as quotations from the participants. All the categories identified were coded with subheadings and kept in a file, and then each new themes and categories that were identified were added to the file. The process continued until all the transcripts were exhausted. Relationship between the themes and categories were further analyzed and grouped into major categories. The process of summarizing, coding and categorization of the transcribed data was known as data reduction (Mills & Huberman, 1994). The final step of the content analysis is the drawing of conclusion and verification. During the interview, the researcher asked follow-up questions in order to confirm the responses provided by the participants. Tentative conclusions were drawn from the themes and categories identified to depict the perspectives of the nurses about procedural pain in paediatric patients. Discussions were held with the supervisors which ensured that the responses of the participants were well represented in the findings.

CHAPTER FOUR

RESULTS/FINDINGS

4.0 Introduction

This chapter describes the findings of data that were generated from the participants in this study which aimed to explore the nurses' perspectives on invasive procedural pain management among paediatric patients at the paediatric units of the Regional Hospital, Koforidua. Ten main themes emerged from the data with their respective subthemes. The main themes and the subthemes were presented with the anonymized verbatim quotations from the participants. The themes were generated in line with the constructs of the Theory of Planned Behaviour by Acek Aizen (Montano and Kasprzyk, 2008) and the objectives of the study. The main themes that emerged were knowledge and processes of invasive procedures in children, attitudes, subjective norm, perceived control, and intentions to manage invasive procedural pain (appendix E).

4.1 Demographic Characteristics

Sixteen participants (nurses) in the paediatric units were interviewed for the study. It included Kids' Out Patient Department (3), Kids' ward (4), Kids' Surgical ward (6), and Neonatal Intensive Care Unit (3). Saturation was reached at the fourteenth participant, however, two more participants were interviewed which confirmed that saturation had been achieved. The general profile of the participants had been presented as appendix D. The ages of the participants ranged from 21 to 59 years: nine (9) were between the ages of 21-29 years, three (3) were between the ages of 30-39 and three (3) aged between 40-49 years while one (1) participant was between of 50-59 years. Thirteen females and three males participated in the study. Fourteen (14) were general nurses,

one (1) paediatric nurse, and one (1) nurse midwife were included in the study. Also, seven (7) had worked for 1-5 years, two (2) had been working for six months, one each for 11-15 years and 16-20 years, two had been working for 21-25 years. Ten (10) of the participants were married with children while six (6) were single. Eight (8) were Akans, four (4) Ewes, two (2) Krobos, one Ga/Adagme and one was a Guan respectively. All the participants were Ghanaians and Christians.

The data was presented in accordance with the objectives of the study namely – the knowledge and processes of invasive procedural pain management, the attitudes and beliefs, perceived facilitators, and barriers. Five themes emerged from the data which were in conformity with the constructs of the theory of planned behaviour (TPB). The themes were knowledge and process, attitudes and beliefs, subjective norms, perceived control, and intention to manage invasive procedural pain.

4.2 Knowledge and process of invasive procedures and pain in children

To answer the first research question – what is the knowledge of nurses about invasive procedural pain, four themes emerged from the data that was collected. The nurses identified two main types of invasive procedures; traumatizing invasive procedures such as intravenous (IV) cannulation, lumbar puncture and injections, and the other being non-traumatizing invasive procedures which included catheterization and wound dressing. Expression of pain was an individualized phenomenon which was exhibited either verbally for instance; the child complaining about the procedure and non-verbally in the form of crying, shouting and struggling. Observation was the main tool the nurses used in the assessment of the level of pain as they had no knowledge of the various pain scales for assessing procedural pain. Two pain management strategies were used in the management of the pain; however, the nurses mostly used the non-

pharmacological strategy in the form of reassurance, singing, and the provision of sweets and toys. Consequently, the pharmacological strategy was employed for specific procedures such as lumber puncture that was perceived as more painful as compared with IV cannulation which was perceived as less painful. Finally, the nurses were of the opinion that, the effects of unrelieved pain posed various challenges to the child, parents, and the nurses such as becoming exhausted or withdrawing from the nurses for fear that the painful procedures would be repeated. Subsequently, the parents agitated during the procedure to the extent that some of them took their children away from the nurses thus aborting the procedure. More so, the nurses became demoralized due to the failed attempts of performing the painful procedures coupled with the expression of pain by the children.

4.2.1. Types of procedures

This theme described the two types of invasive procedures that nurses believed caused pain among children in the paediatric setting. The invasive traumatizing procedures involved direct entry into the blood vessels using sharp needles such as intravenous puncturing, lumbar puncture, exchange transfusion, injections and paracenthesis thoracis (pleural tap). Some of the responses given by the participants in relation to the traumatizing invasive procedures that caused pain were intravenous line insertion and lumbar puncture;

> *"Most of the time, the procedures that cause pain includes IV lines (IV cannulation), lumbar puncture. These are basically the invasive procedures that we do"* **– Adobea.**
>
> *"We set IV lines which we leave in place for the administration of intravenous medications" –* ***Mamle.***

Other invasive traumatizing procedures that caused pain were pleural tap and chest tube insertion; *We do lumbar puncture, IV lines, pleural tap, sometimes, chest tube insertion if it is not under continuous drainage"*- **Kafui**.

Additionally, injections were also noted as traumatizing invasive procedures that caused pain; "*we give injections to the children which are also very painful procedures" –* **Dufie**.

The non-traumatizing invasive procedures were the procedures that involved passing a blunt material such as rubber tubes into organs and tissues in the body which included passing of nasogastric (NG) tubes, reduction of wound drains, and catheterization; "other painful procedures includes passing of *wound drains, NG tubes, and catheterization" –* **Dzigbordi**.

"On this ward, sometimes we pass NG tubes for the children" **- Boatemaa**

Wound dressing was also identified as a non-traumatizing invasive procedure that caused pain in children;

> *"We dress their wounds especially those who sustain severe burns and the child experiences a lot of pain when they sustain almost about 80 to 90% severe burns and we have to dress the wound for them" –* **Boamaa.**

Another non-traumatizing procedure that caused pain in children was intubation; "*another painful procedure is intubation which we do for babies who are on ventilators"* – **Nene.**

Also, the participants reported that due to the extent of the pain associated with these procedures, the children do not cooperate so the nurses sometimes restrained the children before they could perform the procedure successfully.

> *"Most of the children do not cooperate and even if you provide the motivation they don't cooperate. They have to be coerced or sometimes*

> *forced because it is needed. Though they don't cooperate, they need to be forced and we restrain them before we undertake the procedure"* - **Aboagye**

One participant explained that they had to perform the painful procedure at the OPD because if they do not do it and transfer the child to the ward, the nurses might return the patient to them;

> *"The child may need the IV line so we call some of the nurses to come and help us because when they take the baby to the ward and there is no IV cannula, they will send the baby back to us so that definitely makes it necessary to set the line before we send the baby to the ward"* - **Asantewaa**

During the painful invasive procedures, the nurses were assisted to restrain the children by the nurses, mothers, orderlies, and security men;

> *"We restrain the child physically, the mother holds two legs and we hold the hands firmly for the line to be passed"* **– Dzigbordi.**
>
> *"When we are setting the IV line, one nurse will hold one arm, the other nurse will hold the other arm, then the mother will lie on the child and be talking to her at the same time so they do not struggle"* **– Asantewaa**.
>
> *"Some kids will cry and become aggressive and others too restless and they won't even allow you unless you call orderlies and security men to come and hold them"* – **Tetteh**
>
> *With the lumbar puncture and most of them experience enormous pain and they show it by crying or they become a bit restless and aggressive especially the lumbar puncture. So we even ask the orderlies to come and help us hold the child firmly so that the procedure can be done* - **Boatemaa**

4.2.2 Expression of pain

The sub-theme describes the various ways that children undergoing invasive procedure expressed the pain verbally and non-verbally. Pain expression was also seen as an individual phenomenon.

4.2.2.1 Individuality of pain

Some of the participants believed that the expression of pain among the children during invasive procedures was an individual phenomenon as they expressed pain in different ways, some of the children were believed to have in-born traits that made them stoic;

> *"For some children, it may be their in-born trait or something like that as a result, when you give them injections, they will never cry but rather frown their faces and others will not show any emotional expression"* – **Tetteh**.

Age was believed to have influenced the expression of pain among the children as the participants explained that the expression of pain decreased as the child matured;

> *"Newborns from birth to four years feel more pain as compared to those around 10-13years, who feel the pain but are able to tolerate the pain when you explain the procedure to them",* **– Dzigbordi.**

The nurses also thought that female children openly expressed pain more than their male counterparts;

> *"Males can endure pain more than females as the females cry , I observed that the males will not even show anything at all while some will just frown their face or make their face straight"* **– Tetteh.**

However, one participant did not attach the individual expression of the pain to any influence;

> *"Pain expression does not relate to anything, not to the gender, sex or cultural practices that is going on but all that I have seen is that it is an individual sort of thing. A child may not weep, some cry, yet another laughs just because he is in pain. So you should be able to differentiate these two types of pain expressions. We take it that if you are smiling then*

> *you are not in pain. So we do the procedure fast and go but those who weep are consoled" –* ***Boamaa.***

Also, the competency of the staff was believed to be the reasons why some of the paediatric patients were stoic;

> "*due to the competency of the staff on the ward, we realized that we are able to perform an invasive procedure without any analgesia and during the process, the children do not express any pain till we are done" –* **Boamaa.**

The nurses also realized that, some of the older children coped with the painful procedure because they did not want their parents to be disgraced;

> *"I have realized that some children can cope with the pain they lie down and because you are able to explain to the mother, they tell you "*oh maa mɛyɛ, me ngu w'anim ase , mɛyɛ" meaning mother I will comply I will not disgrace you I will do it" - **Boamaa**

4.2.2.2. Verbal Expression of Pain

Some of the children expressed their pain verbally by shouting, expressing fear, displeasure, accusation, verbal assault towards the health team, and outright rejection of the procedures. Some of the patients shouted as they complained about the pain during the invasive procedure;

> *"Children who are aged five and below normally cry a lot, while those from five to twelve years can verbally express the pain by saying things like* "ɛyɛ me ya" meaning "I am in pain". *Some of the children too, whether it is shyness or for some other reasons, they will not say anything" –* **Dufie**.

Others also verbally expressed their fear of specific invasive procedures such as injections and requested for oral medications instead; "*some will say* "auntie nurse, I fear injection, I don't like injection, give me oral medicine" **– Asantewaa.**

Yet, others showed their displeasure about the procedure to the nurses as they accused them of trying to hurt or kill them in the process of the procedure;

> *"Those who can talk tell you "I am in pain, you want to hurt me, you want to kill me and so these words makes the nurse know that what he or she doing, the child finds it very, very unbearable"* – **Aboagye.**

Consequently, some of the patients verbally assaulted the doctors and nurses who conducted the invasive procedures;

> *"The other time, the doctor was setting the line and we tried all the sites such as the scalp, the hand and the legs, the child started saying,* "doctor Kwasia" meaning "foolish doctor" *and the mother too was standing there and did not correct the child so we told her that the doctor and nurses want to help her child so she should tell the child to stop before she retorted, stop it, stop it"* **– Sakyibea.**

Some of the patients also told the nurses that they would be better without the procedure as they exclaimed**;**

> *"The children will verbally tell you , "Ahh, you are hurting me, it is painful, it is too much, stop and let me be, I don't need the drug, I don't need the drug even after we tell them they need the drug"* **– Dzigbordi.**

Also, the children verbalized their outright rejection of the procedures when the nurses were ready to perform the procedures; "*even before you start pricking they will say* "I won't do it again, leave me, leave me" **– Aboagye.**

4.2.2.3. Non-verbal Expression of pain

The patients showed resistance to the nurses during the invasive procedures by pushing the hands of the nurses or hiding their hands when the nurses approached them to perform the procedure;

> *"Some children try pushing your hand away and some even hide their hand immediately they see you coming, whatever you say, they will still resist the procedure"* – **Asaa.**

Other patients also attempted to hit and bite the nurse during the procedure as one participant described her ordeal with a child who had rabies;

> *"The children may hit you or bite you as I experienced when a child who had rabies wanted to bite me and I was very scared, you can just imagine someone with this condition trying to do that so I was very scared" -* ***Dzifa***

Other participants also reported that the patients frown their faces during the invasive procedures; "s*ometimes, they will also frown their face that is facial expression meaning that they are feeling pain"* **– Dufie.**

Children who had other conditions such as asphyxia expressed the procedural pain in a form of inaudible cry which one of the nurses termed "Silent cry";

> *"Yes, some of the babies cannot cry aloud especially the asphyxiated babies, however you see their facial expression because they cannot cry so see their facial expressions and sometimes the twisting of the whole body so you can see that they want to cry but the sound is not audible, so I call it "silent crying***"- Nene.**

Other ways that children expressed pain as observed by the nurses were sweating and goose pimples on the child's body;

> *Some of the children express the pain in the form of sweating throughout the procedure and some will also have goose pimples on their body which shows that the child is experiencing pain"* **– Dufie.**

Sometimes, the struggling led to the destruction of materials that were to be used for the procedure; "s*ometimes if you are not careful due to the struggling blood and methylated spirit splashes on the whole body of the nurses during the procedure"* **– Awukuwaa.**

4.2.3. Pain Management Strategies

This sub-theme describes the nurses' knowledge about the various pain assessment and pain management strategies that were utilized in the management of invasive procedural pain such as pain rating scales, non-pharmacologic and pharmacologic management strategies.

4.2.3.1. Pain Assessments

It was evident that most of the participants had minimum or no knowledge about any assessment scales that were used to assess the pain of paediatric patients;

> *"Actually, I know there is a pain scale but I have forgotten because we don't use a pain scale on this ward, rather, our focus is to observe the baby when the baby is in pain as he will pull the hand or struggle with you and cry so that is the only means we use to assess the pain"* **– *Mamle***
>
> *"Not really, I don't have much information about it"* – **Kafui;**
>
> *"No we never use any scale to assess pain"* **– Nene.**

One participant had knowledge about the pain scales although it was not used in the health facility; "*yes, I have an idea about rating scale of pain which starts from zero to I think ten but on our ward on our facility I don't think we use those to assess the level of pain"* – **Aboagye**. Another nurse had some knowledge about pain assessment scales but she became confused about the scale and what the numerals meant;

> *"For our ward, we do not have it. I know of some of the rating scales but we do not use it here. Some of the scales are example the facial expression scales. From 1-4 is severe pain and 5 is neutral, then from 6-10 there will be no pain at all"* – **Dufie**.

Although the nurses had minimum knowledge about assessment scales for pain, they used various indicators such as crying and body movement, touch, and probing to assess the pain of the paediatric patients;

> "*Although there are no pain scales, we assess the pain by observing how the patient will pull the hand or struggle with you and cry"* **– Mamle**.
>
> *"Sometimes too we try to touch the site where the child had the pain, especially when the child has a cannula in situ and we try to probe more and find out how the mother knows the child is in pain by asking the child if what the mother said was true. However, with the younger ones, it is not that easy to probe"* **- Asaa**

The participants also used the duration and intensity of cry of the child after the procedure for the assessment of pain;

> *"We assess the pain based on the intensity of the crying and how the crying prolonged. So let's say that if after the invasive procedure a child continue to cry 10 minutes after we expect the child to have stopped crying, then we realize that what she is going through is more painful than expected"* **- Aboagye.**

Consequently, the nurses believed that the assessment scales would help give the correct pain medication for the expected pain associated with the procedure;

> "*the knowledge of pain assessment will help us to know the level of pain the child may experience so that when we are going to perform such a procedure, we know the amount of pain analgesics to administer"* **– Asaa.**

4.2.3.2. Non- pharmacological Management of Procedural Pain

The nurses employed various modalities in the management of invasive procedural pain in children with non-pharmacological strategies such as explaining the procedure, use of diversional strategies, and parental involvement.

4.2.3.2.1. Psychological Management of Procedural pain

Before the procedure, the nurses explained to the patients or the mothers and the children what was to be expected during the process;

> "*what we do is that we explain the procedure to them and tell them that it will be a bit uncomfortable, but we know kids are not like adults so they will usually cry"* **– Dufie**.

> *"Normally, we talk to the younger children even though they don't understand what we are doing we talk to them that we are going to do the procedure which will be a bit painful but later on they will be fine"* **– Tetteh**.

On the contrary, some of the nurses made the patients believe that the procedure would not be painful; *"We tell them "it is just one prick" then we do it, so some will scream ahh, and before they realize, we are done with the procedure"* **– Dzifa.**

However, some nurses also reassured and persuaded the patients during the procedure so they would tolerate the pain;

> "*The nurses may have to persuade the children and talk to them before they may allow them to perform the procedure"* – **Sefakor.**
>
> *"At times, I tell them, you are my friend and I will not hurt you so let me do it for you so you will recover early, then I will come to your school tomorrow and will be in Kindergarten two, at this statement, the child begins to smile*"- **Asantewaa**

4.2.3.2.2. Use of diversional strategies

Nurses use various diversional therapies such as singing, creating jokes, apologizing, offering sweets, drinks, balloons, toys and rattles to the children.

The nurses sang to the children to divert their attention from the painful procedures;

> "*at times we sing some songs to comfort them so that they will calm down for us to set the IV cannula. About three or four will be with one child singing and doing anything that will calm the child during the procedure"* **– Asantewaa**.
>
> "*We calm them down by sometimes singing to them, talking to them that we know the procedure is painful but we will soon finish*" **- Kafui**

Additionally, the nurses created jokes which entertained the children; "*at times, we create some jokes just to entertain them and divert their attention from the procedure"* **– Tetteh**.

During the procedure, the nurses sometimes apologized to the children; "*sometimes we say sorry to the child during the painful procedure"* **– Awukuwaa**.

Some of the participants also gave the children toffees, ice-cream and drinks which enticed them to allow us to do the procedure;

> "*at times, you have to give them some sweets, especially when you are going to do wound dressing for the children with burns, you have to give them the sweets before they will allow you to perform the procedure for them"* **– Sefakor.**

> *"When the children hear you saying "I will buy you "Kallypo" or "Yoghurt" they would look at my face and smile so we do that to win him or her in order to allow us to pass the IV line" –* ***Asantewaa.***

The nurses drew animations and wrote the names of the children on balloons which made the children happy and they played with it during the procedure; "*we blow balloons for them and write their names or draw on them and that made them happy" –* **Dzigbordi.**

Some of the wards had toys and rattles which helped in the diversion of the child's attention from the invasive procedure; "w*e have toys and rattles that we give to the children to play with during the procedure" –* **Sakyibea.**

4.2.3.2.3. Parental Involvement in Management of Procedural pain

The parents helped in the management of pain as they supported the children during the procedures; **"***sometimes if the nurse is alone, the mothers volunteer to help the nurse and hold the baby for the nurse to do the procedure" –* **Nene.**

Other parents also breastfed the babies throughout the procedure and also promised the older children rewards after they had undergone the procedure;

> *"The mothers are always able to control their children as they breastfeed the young ones in order to take their mind off the procedure and those that have passed the breastfeeding stage, they promise them sweets" –* **Dzigbordi.**

Depending on the gravity of the pain expected by the mother, the father was called to come and support during the procedure;

"When you tell them that probably we will be doing lumbar puncture for their child… some will call their husbands who would come and assist with holding the child so the woman would step outside" – **Boatemaa.**

Some parents also brought their media gadgets such as radio, television, and laptops which they gave to their children to listen to music and also watch their favorite cartoons during the procedure;

> *"Some mothers also bring in some toys and we have some other toys that they play with. Some parents and guardians bring their laptops and small radios and televisions for their children to watch cartoons or listen to music to take their mind off the procedure being performed"* **– Boamaa**

Nurses who were in support of parental involvement thought that the mother needed to know whatever procedure was being performed on their child so they could be educated;

> *"Yes, if the mothers are there, it will help us, that will be good because they will know what you are doing for the baby because me for instance, if I am giving medication you should be there because sometimes you go and they will tell you that since morning, my baby has not been given any medication meanwhile the mother was not there when the nurse gave the medication"* **– Mamle.**

Also, the children complied in the presence of their parent as they felt safe;

> "*They really help us because the child is fond of that particular person, let's say if the mother or guardian, when the mother tends to pamper the child, reassure the child, carry him or her, he feels secured and that he or she is in safe hands. I think the parents help us a lot by calming them down"* **– Dzigbordi.**

On the contrary, nurses who were not in support of parental involvement thought that the parents were unable to withstand the procedure so their presence was not needed during the procedure; *"No parent assists with the procedure because they can't stand the procedure so most of the time, we do prevent them from seeing the procedures but afterwards we call them to come for the baby and breastfeed"* -

Adobea

4.2.3.3. Pharmacologic Management of procedural pain

Some nurses had no knowledge about pharmacological management of invasive procedural pain in the hospital;

> "*Seriously I have been here for a year now but I have not seen any patient being given premedication prior to an invasive procedure, no not one" –* **Adobea.**
>
> *"We do not use any local anaesthesia, for me I have never seen it because we do not use it. So if it is IV, we normally clean the place with spirit, but if it is lumbar puncture, that one they use spirit and Povidone but no anaesthesia*" **- Nene**

However, those nurses were aware of the management of procedural pain with analgesics only after the procedure and not before; "*normally, after the procedure maybe we let them assume some positions to minimize the pain, at times too we give them analgesics after the procedure" –* **Tetteh.**

Some of the participants put dextrose in the mouth of the baby during painful procedures but were not aware that it was a form of pharmacological management for procedural pain; "*when the mother is not around, you can pour dextrose onto gauze and push it in the mouth, then the baby will be sucking till the mother returns" –* **Nene.**

Procedural pain management was performed in some of the paediatric units, however, it was reserved for specific procedures such as naso-gastric (NG) tube insertion and catheterization, wound drain, and removal of stitches;

> *"We normally give suppository Paracetamol for pain relief before some procedures like NG tube insertion and then for catheterization, we give the xylocaine gel which has some pain effect, and for wound drainage and removal of stitches, we give Ketamine, however this regimen is reserved for some specific patients and not done for all patients" –* **Dzigbordi.**

To sum up, some nurses thought that, the non-pharmacological strategy was more effective than the pharmacological as the expectation of the tangible things such as

toffees and biscuits were motivations for the children as they complied and allowed the nurses to do the procedure;

> *"I think the non-pharmacological strategies helps better than the pharmacological because when the child gets to know of the sweets and toffees that are promised by the mother, it makes them more focused as the children allow you to do the procedure"* **– Dzigbordi.**

4.2.4. Effect of Unrelieved Pain

This theme described the effect of unrelieved pain caused by invasive procedures such as exhaustion by patients, fear and withdrawal, parental agitation, and nurses became demoralized.

4.2.4.1. Exhaustion of child

According to the participants, the continuous crying of the patient as a result of the pain led to exhaustion; "*sometimes you will realize that as the child cries for a long time, she becomes tired exhausted, weak as the tears may not flow again"* – **Awukuwaa**.

For subsequent attempts to perform the procedure, the child became more exhausted which led to increased aggression due to the pain;

> *"When we are not successful and we have to repeat the procedure, it becomes extra difficult because we have to work extra hard and the child's aggression increases plus the pain and the sickness, they feel this pain here and another pain too somewhere"* **- Dzifa**

Another nurse also said that, the excessive pain could affect the emotional stability of children who were predisposed to psychotic conditions such as depression;

> *"It can torture the child's emotional stability and the child is predispose to some hereditary conditions such as psychiatric condition, the child*

> *might be prone to this because the excessive pain is believed to cause bipolar disorders like depression"* **- Adobea**

4.2.4.2. Fear and withdrawal

Most of the children became angry and refused to eat their food or any toffees that were given to them after the painful procedures;

> "*The pain affects the child psychologically, because when the child cries for some time, he becomes child is quiet, and will refuse eating. When they are given toffees, he or she throws the toffees away, because he or she is angry with what the nurse did"* **– Dzigbordi**.

Additionally, the babies also refused the breast milk after the painful invasive procedure; "*when the baby is put to breast, the baby will cry and refuse breastfeeding"* **– Adobea.**

Then, after the children had experienced the pain, they reacted to other non- painful procedures such as swabbing of a skin before the procedure;

> *"when the premature babies are exposed to the painful procedures, the moment you begin to clean the area with swab they pull either their hand or leg, they know that once you clean there the nurse will inflict another pain"* **– Nene.**

Other children also attached the painful invasive procedures to other non-painful procedures such as cleaning of the body and administration of oral medication; "*when the child has messed up and you want to clean it or give oral medication, they will avoid the nurse although the procedures are not invasive"* – **Kafui**.

Some children cried at the mere presence of another nurse in the same uniform as the one who performed the painful invasive procedure as they believed that he or she may also inflict pain;

> *"At times when they start crying the moment they see anyone wearing green or white they because they know when you come near them you are going to inject them and inflict pain so that put some fear in them"* **– Tetteh.**

The children also cried when they saw the medical doctors and nurses who approached them; "*as soon as they see you in the green and the doctors in their white they start crying because they know you are coming to them" –* **Dzigbordi.**

Subsequently, the fear among the patients let to hatred and mistrust for the nurses on the ward and hence nurses were perceived as people who wanted to hurt the patients;

> "*The very small children will not come close to you, they will really hate you and say "somebody who really likes me would not do this to me"* **– Dzifa.**
>
> *"The children may not allow you to do any other thing for them due to the pain they experienced during the painful invasive procedure, also there is mistrust as they still avoid you because they think you are coming to do another procedure"* **– Kafui.**

Some of the paediatric patients also gave frowned faces as the nurses passed by them; *"They frown their face and they will be eyeing you like you have really hurt them and also when they see you coming, they will turn from your way, like I won't pass here because he or she has seen you coming"* **– Dzigbordi.**

Some of the patients cling to their mothers and would not allow any nurse to touch them; "*they cling to their mothers and wouldn't want you to touch them* **– Kafui.**

Yet other patients requested to be discharged home as a result of the pain they had been exposed to; *The children say* "maa mɛkɔ, maa yɛnkɔ, mɛkɔ fie""dada wɔ hɔ", mɛkɔ fie w'ate" meaning mum let us go home where is Dad? I do not like this place*"* **Boamaa**

As a result of the pain, the nurses believed that most of the children may resolved not to come to the hospital again and therefore would hide their sickness so their parents might not bring them to the hospital. However, the nurses complained that this phenomenon could lead to the patient been brought to the hospital when the condition had deteriorated;

> *"Some will not complain again when they are sick, especially those who can talk, because they are scared of the injections they will receive when they come so they will come in a very bad condition then the mothers will complain that they did not see anything since the child did not tell them anything"* **– Dzifa**

4.2.4.3. Parental Agitation

During the procedures, the parents or guardians showed their displeasure through facial expressions such as squeezing of the face; *"Some mothers will squeeze their face, meaning you are hurting the baby although we have explained the procedure to them before we started the procedure"* **– Asantewaa.**

Other parents also gave a frowned face to register their dislike and complained about the agony the child had gone through; *"During the procedure, you can see from their facial expression that they dislike what you are doing, they frown their face and the way and manner in which the mother looks at you, you can see that she is really angry"* **– Dzigbordi**

Some of the mothers also expressed their sadness as they cried and shivered during the procedure;

> *Sometimes when the parents stand by and watch the procedure being done, they cry as their children are crying, and some of the parents also shiver as if you are performing the procedure on them* **– Dufie**.

Some mothers also pressed their feet hard on the floor during the procedure in response to the pain that the child experienced; *"Sometimes, if they are sitting behind you and you are pricking the babies, the mothers change their facial expression as if they are undergoing the procedure and will press their feet on the floor"* **– Nene**.

Other parents requested that the procedure be discontinued temporary so the child could rest for a while;

> *"The way the mother will look at you like, it is like they are saying "it is too much, so allow the child to rest and maybe later you perform it" or the mother will also be crying within inwardly as the nurse is not able to have access the vein and the child is crying so she becomes emotionally down."*- **Dzigbordi.**

Other parents also requested for the procedure to be discontinued after the child had been pricked for about four times;

> *"When passing the IV line, some parents request that the procedure be stopped because sometimes after several failed attempts of about 2 or 3 or 4 times and the mother sees how the child is crying and suffering they can ask you to stop"* – **Boatemaa**.

Some mothers intervened physically and took their babies away as they perceived the nurses were hurting their children;

> *"Some of mothers will even abuse you by saying "give me my child and let me go" or "stop what you are doing and give my child to me" and I remember a time a mother just had to tell us to stop whatever we are doing and she come an picked her child, so we have to give the baby to her and we told her that if the baby calms down, then we can continue with the procedure"* **Mamle**

The several pricking of the patients also made some of the mothers perceived the nurses as not professional enough to perform that procedure; *"The disadvantages are that when passing an IV line and after several failed attempts to get the line, the mother would complain and have a perception that you are not professional enough to perform the procedure on his or her ward"* – **Dzigbordi.**

Again, other mothers also verbalized the incompetency of the nurses to the doctors as one nurse shared her experience;

> *"I went to the kids ward just yesterday and the nurse was not getting the line, the doctor was not around as at then, but as soon as the doctor came in, the relative complained to the doctor that the nurse is not able to do it so the doctor should come and do it*" - **Adobea**

Most of the mothers who could not stand the procedure and the pain that their children were going through had to leave the procedure room; *"Some of the mothers will go out after giving their babies to the nurse because they do not want to see the child being pricked although they want the procedure to be performed"*. **– Nene**.

> *"Yes most of the time because when they are there, they see what we are doing and they think we are hurting their child. Sometimes, we ask them to go because at our place, the don't normally spend so much time there, when they finish feeding their children they go out and by the time they come back, we might have finished what we were doing"* - **Mamle**

Other mothers were also asked to leave the room by the nurses due to the way they mourned for their children during the procedure;

> "Sometimes when you begin the procedure or giving IV medications, the mother will say "aawoo" as if you are pricking she the mother so we say "oh maame adɛn, eduro no yɛ kakraa bi, ɛna me nya nwɔɔ no paniɛ no,nti wodee nya abotrɛ" meaning Madam, this is a small amount of medication and I have not really injected your baby so calm down please. So mostly with the invasive procedures we do ask them to excuse us so that we do the procedures well" - **Adobea**

4.2.4.4. Effect on nurses

The participants complained that they felt bad and saddened when the children went through the painful invasive procedures;

> *We feel bad because we are helpless. We feel the thing is painful and there is no much you could do so you feel bad* - **Kafui**
>
> *You feel sad because you have not been able to help the child to get well so your day will be slow, you are down and it is like you have not been able to do much* – **Dzigbordi.**

According to one participant, she felt like she had not achieved her goal for the day;

> *"It is like you don't achieve your goal, especially when you have to give some antibiotic and you are not able to give as the child refuses to let you*

> *pass the IV line. So the child will be given orals medications which do slower that the Iv route so you are not able to achieve your goal at the long run"* **- Dzigbordi**

Sometimes, the nurses discontinued the procedure for a while so the child could relax;

> "For me I feel sad although I know that what I am doing will help the patient so I wait a bit for the children to relax then I continue, however, the are other nurses who will stop altogether and will not even continue with the procedure" – **Dufie.**

Another participant also said she felt sad as she experienced backache after the struggle with the children during the procedure and the possibility of puncturing herself;

"Sometimes, it feels very bad since after struggle for the next fifteen minutes or over, you just get up and your back is aching" **– Asaa**.

One nurse added that because she felt sad as the patient went through the pain, she gave the child something at once or promised the next day since she felt bad when the children cried, she exclaimed; *"Eii, I feel very bad, I can't, I don't know. I am that type who does not want kids to be crying so when they are crying, I go to them and talk to them and promise them that I will bring it the next day"* **– Sefakor**.

Another nurse also said she felt bad because she felt helpless in managing the pain as she noted; "*we feel bad because we are helpless. We feel the thing is painful and there is nothing we could do so we feel bad"* **– Kafui.**

However, some of the nurses lamented that although they tried their best and helped the patients, the parents were not appreciative as they sometimes insulted them;

> *"At times we feel bad because as you trying to help the child, the mother is not appreciative and therefore, it is very hurtful. We know we are inflicting pain on the child in a way but we have to manage it because we need the IV line for the baby because without the medication how will the baby get well and go home. Some mothers even insult us on the ward"-* ***Adobea***

4.3 Attitudes towards invasive procedural pain

To answer the second research question-what are the attitudes and beliefs of nurses towards procedural pain management in paediatric patients, two themes emerge from this data, which are attitudes and beliefs towards invasive procedural pain management and subjective norm in managing invasive procedural pain in children. The sub-themes were positive and negative attitudes and beliefs, positive, negative, and neutral subjective norms, and favourable and unfavourable intentions towards invasive procedural pain in children.

4.3.1. Positive attitudes toward invasive procedural pain

The participants expressed positive attitudes and beliefs about managing invasive procedural pain in children as they believed that the pain the children experienced was real and therefore, it was necessary to manage it. They therefore evaluated that if they were able to manage the pain then there would be a reduction in the pain that the children felt, it will make the procedure easy and will in turn build a cordial relationship between the child, the mother and the nurses on the ward.

4.3.1.1. Existence of pain

The participants believed that pain existed during invasive procedure because it involved piercing the skin which was traumatized the child and could be compared with a cut of a scissors or blade;

> *"When one is entering the skin one must know that definitely the child will cry no matter what since all human beings go through some sort of pain such as the cut of a scissors, blade will cause pain"* **– Boamaa.**

To add to that, another participant was of the opinion that so far as the skin was pierced, pain should be expected; "*so far as we are entering the vein, you are piercing the skin so by all means the child will feel the pain so we should do something about it"* **– Sakyibea.**

Some of the participants mentioned IV cannulation as one of the invasive procedures that was associated with pain; "*so far with the setting of IV lines, I think it is more painful, because the children can't really stand it at all"* **– Asaa.**

On certain occasions, IV cannulation may be attempted several times before the nurse was successful which increased the pain felt by the children;

> *"Recently we had to use the jugular because but even before we resorted to use the jugular vein, we had pricked the child more than 10 - 20 times, we can't…one doctor is holding the left arm one is holding the right arm the left leg and all those things so you can see the harm the large amount of pain that we are imposing on the child and the burden that the child is going through"* - **Boatemaa.**

The nurses observed that the invasive procedures were painful as most of the children held onto the site for a long time after the procedure had been done;

> *"From the child's expression, they feel pain so after the procedure, the child will be holding and pressing the site to show that it is very painful. They can hold it for some time before they release their hand"* **– Dzigbordi.**

The nurses believed that children were really in pain since even adult could not withstand such invasive procedures; "*Even as adults, when they pass an IV line, it is very painful so for children, although their cannula is tiny, I believe that it is very painful, very painful* **"– Dzigbordi.**

The nurses viewed that if adults found the invasive procedures painful, and then there was the need to manage the pain in the children;

> The children experience pain more than adults because when setting IV line even an adult like me will scream so for these tiny baby especially the preterm babies mostly, I really feel for them so it will be best if you introduce something to manage the pain **– *Adobea.***

4.3.1.2. Necessity of pain management

The nurses also believed that since invasive procedural pain existed, it was necessary to manage the pain when performing the procedures by giving pre-medications;.

> "*Oh seriously we need to give some premedication to the baby before doing any procedure because they are very young and they experience pain. Somebody will say "oh na wie deɜ ɔte yaw anaa" meaning* "oh this baby, does she experience pain", *the way they will cry when you are about to give the medications as soon as you hold them, they know you are about to perform a procedure on them or to administer something to them so I think it will be best to manage the pain" –* **Adobea.**

Some were also of the view that since the nurses had to repeat the procedure several times, the pain needs to be managed; *"Pain management must be introduce because at times you don't easily get the vein and you will be puncturing all over, yes, so I think the medications would relieve the children from further pain"* **– Sefakor.**

The nurses also complained that they felt uncomfortable when the children complained about the pain and therefore, a pain relief should be given before the procedure begins; "*when I am performing the procedure and the child is complaining, I feel very uncomfortable so there should be pain relief before the procedure"* **– Dzigbordi**.

The nurses also thought that pain management was necessary because the pain was really unbearable and they looked helpless since they could not help the children in that situation; "*I think it is good to have some medication that can be given before the procedure is done to reduce the pain because it is very painful and it really hurts"* **– Kafui.**

Also the lack of pain management made the procedure very challenging as the nurses took more time for a procedure that could have been done early if pain management was provided;

> *"the lack of pain management makes the work very difficult as a procedure that should take about a minute or two to do may take more than 10 minutes to do since the child will not be stable so there should be a way that the child can be calmed before the procedure begins"*- **Boatemaa**

The participants also said that even during emergency situations, it should be possible for the pain to be managed with medications that had a faster effect;

> *"pain management is very important because we are handling children and fear in children go a long way to affect them so if we manage pain, it will help us but in an emergency situation, we need something that can work within some few minutes and is available to everyone, we will love to use"* **– Dzifa.**

4.3.1. 3 Reduction of pain in children

The participants were of the opinion that, the effective management of the invasive procedural pain would prevent the exposure of the children to the pain associated with the procedures;

> *"If you give something that would prevent the child from being exposed to the pain during the invasive procedure, it will lessen the pain that will be inflicted before the procedure is done"* **– Adobea**.

Also, the nurses thought that the management of the pain was the best as the crying of the children would be reduced and their mothers would not insult them on the ward during these procedures;

> *"For me, I think it will be very, very good if it is topical or spray so that during the procedure, you will be at peace for doing it for the babies and the babies crying here and there and other mothers insulting and crying over you will be reduced"* **– Mamle.**

The reduction of pain would also lead to the reduction of fear among the children during the invasive procedures;

> *"I think even psychologically if the patient sees that we are spraying something which will reduce the pain ok, it will reduce the fear and then the emotions that the child will attach to the procedure, so psychologically will also help reduce the pain"* **– Aboagye**.

Since the pain had been reduced, the children may always want to stay on the ward; *"The use of the analgesics will reduce the pain and make their stay here comfortable since the older ones complain that they do not want to stay here anymore due to the repeated pain inflicted on them"* – **Asaa.**

4.3.1.4 Ease of work

According to the participants, the route of administration of the topical sprays and creams would be more appropriate and make the procedure easy as the nurses might not have to undress the child before applying the analgesia as done for the suppositories;

> *"I also think that it is more simple since you just press and the spray comes out and I think it makes the work quite easy than the other route where we have to undress them before we pass the suppository"*- **Aboagye.**

Subsequently, the child would be calm which will make it easier for the nurses to perform the procedure effectively and efficiently;

> *"If the child is calm during the procedure, the work will go on effectively and efficiently as there is less pain so the baby will relax for you to do whatever you want to do and you will finish fast and move to the next person and the work will be enhanced"* **– Mamle.**

According to the nurses, if the medications were applied, the child might not struggle during the procedure and that would prevent the frequent failed attempts when performing the procedure;

> *"the use of the medications will help the nurse in whatever procedure is been done so it can be done very fast because you are not going to waste time on one person so if you introduce these things and the pain is reduced, the baby will not be struggling with the person doing the*

> *procedure too will be comfortable which will enhance the work of the one performing the procedure"* **– Nene.**

According to one nurse, if the medications were applied, it would prevent wastage of materials since the child might not struggle which may lead to the destruction of the materials;

> *"When the children do not feel the pain, it will make the work easier and prevent some things such as the splashing of the blood. During the procedure so if someone has been hurt before during the painful procedure, then it will prevented"* **– Awukuwaa.**

There would also be a reduction of the use of restraints since the application of the medication would make the procedure easier;

> *Where there is no pain, you will have your way and do the procedure more easily as you would not struggle with child in the form of physical restraint, trying to reposition the child which makes the procedure more difficult and time consuming* – **Kafui.**
>
> *"For a baby, it is very hard for one person to set the line so you will need the other person to come and assist to hold the baby so if the medications are provided and the pain is reduced, the baby will not be struggling with the person and it will enhance the work of the one performing the procedure"* **– Nene.**

4.3.1.5. Cordial nurse/patient relationship

According to the participants, the management of pain during the procedure could lead to the reduction of aggression among the children which would enhance rapport between the nurse and the child;

> "*It will help so much as it will reduce the aggressiveness which will enhance rapport between the patients and the nurse"* **– Tetteh.**
>
> *"It will always be good, cordial, and very friendly. It is like working with kids does not make you feel like you are working but rather it is being a mother and a friend, it is not being a professional. Sometimes the children know that if they come and meet one particular nurse, they will be fine*" - **Dzifa**

It will remove the fear that the children have towards the nurses on the ward as they would not feel any pain during the procedure;

> *"If this medications are provided, it will help the babies because at times the children will see you and start crying because of the experience but if you conduct a procedure and the child is laughing and does not feel the pain, I don't think the children will be afraid of us"* – **Sakyibea.**

When the medications are applied, then the children would comply for the procedure to be done since there would be no pain; "*When the kids are in pain, they will be struggling with you during the procedure, however, if there is no pain when you talk to them that you are coming to do the procedure, they will allow you to do it"* **– *Sefakor.***

The cordial relationship would extend to the mothers of the children who will feel comfortable to assess the health facility anytime; "*the cordial relationship will help our work and create an environment where mothers will feel comfortable coming to the hospital and children will also assess the facility any time"* – **Dzifa.**

4.3.2. Negatives attitudes towards invasive procedural pain management

Other nurses expressed negative attitudes as they believed that the pain associated with invasive procedures was a normal phenomenon and that the children exaggerated the pain during the procedures and therefore, they will maintain the status quo. They therefore evaluated that they will not manage the pain since they feared the side effects of the medications and the fact that inexperienced health workers will abuse the medications and the procedures since the child may not feel any pain when the medications were applied.

4.3.2.1. Pain as a normal phenomenon

Although some nurses believed that there was the need to manage pain associated with invasive procedures, other nurses were of the view that, pain was a normal phenomenon that was unbearable but with time, the children coped with it as they matured;

> *"The pain is unbearable for children who are two months to five years, but those at seven to twelve, it is quite okay but those ones you have exceptions. Someone might be twelve years but is so afraid that when he sees you the facial expression changes"* **– Asaa.**

Another nurse believes that procedural pain related to IV line insertion occurs "once" and there is no pain when the line is patent;

> *"Well. I think the pain is just once, for example, for the IV line, the moment you are able to get the vein then the baby stops crying unless there is a blockage but for pricking, once you are able to enter, the baby stops crying because the pain is gone and the IV line is correct, then the baby will not cry"* – **Nene.**

One nurse was of the opinion that as the needle entered the vein, there was no need to give any medication as compared with suturing; "*my opinion is that we are going directly into the vein so you cannot give lidocaine but if it is suturing, then you can give lidocaine"* – **Asantewaa.**

Some nurses also compared the pain associated with different invasive procedures and evaluated that some procedures needed pain management while others did not warrant any pain management;

> *"For lumbar puncture, I think the pain is more severe than IV cannulation because for the IV cannulation, once you are able to move away from the skin and enter the vein itself, it will be left with only the rubber but for the lumbar puncture, the pain lasts longer so we can use the localized anesthesia for that one"* - **Nene**

4.3.2.2. Exaggeration of pain/Trivialization of procedural pain

One nurse was of the viewed that the female children exaggerated their pain because they were spoilt children as they cried no matter how the nurses treated them;

> *"What I have noticed is that, a child may be a spoilt child so whatever you do for her, she will cry especially the females, so sometimes I advise the mothers to talk to their children because if something peculiar is happening to her, everyone will say "*leave her alone that is how she is*" although at that time, we may need to identify and rectify a problem* – **Asantewaa.**
>
> According to the participants, some of the children exaggerated the pain because their mothers were around during the procedure or they needed to talk to someone;
>
> "*at times, when some of the children see that their mothers are present, they exaggerate and cry so at that instance, we ask the mothers to leave"* **– Dufie.**
>
> *"You know at times, the pain too will be psychological, some patients can be exaggerating but as soon you get to them and start talking to them, it is okay, then that one alone will be enough for the patient"* **- Sefakor.**

4.3.2.3. Status quo

Most of the paediatric units in the hospital performed the invasive procedures without pain management;

> "*for this ward, we do not give drugs before we perform the invasive procedures, none that I can remember"* **– Dufie**.
>
> *"For some procedures, the anticipated pain can be so intense for instance, Lumbar Puncture, you know you are entering the intervertebral space and the positioning of the child alone is not comfortable and you are going to be given a needle prick so we think the child should be given something but on the ward here we don't normally give"* **- Dzifa**

Procedural pain management was not done routinely but sometimes they gave medication when it became necessary; *"although it is not a routine, when it becomes necessary, we give the medications"* **– Kafui**.

According to the nurses, doctors prescribed sedatives instead of analgesics in some of the wards; "*we give the sedative to calm the patient, but for the pain medication, it is not that common here"* **– Kafui.**

Some nurses believed that the effect of the medications wore off when given before the procedure;

> *"if the analgesic is given and the patients are many and therefore must wait for the turns, the effect of the medication worn out after the procedure because of the delay and so the pain will still be there and we can't repeat the drug within that short period"* **– Tetteh.**

Also, since no one had complained about the way they performed the procedures, there was no need to waste money to purchase the logistics as that money could be used for other things in the facility;

> *"because we have been passing the line without medication since time immemorial and nobody is complaining so I think that money can be used for something else"* **– Asantewaa.**

One nurse was of the opinion that we should not abuse analgesia for IV cannulation but rather it can be used for wound dressing;

> *"Uhhmm to me I don't think the IV line is something that the pain is so much, ok because it's just the piercing. The moment you are in the vein, the pain will go down by itself so we need not abuse analgesic however, with wound dressing it takes a longer period of time and the child will have to go through some minutes of pain so that is why we give the analgesic for the wound dressing rather than the IV line setting"* **- Aboagye**

Other nurses explained that nurses who thought they were experts ignored the medications when they performed the procedures;

> *"Some nurses might want to go by the olden style of doing things as they say "will get it easily so let me just do it". So when the nurse applies the tourniquet and sees the vein, he or she will say, "ohh, this one, I will just do it don't worry" and might refuse to use any available medication"* **- Dzigbordi.**
>
> *"Because there is no anaesthesia, we make sure we do it well, however, if we know we cannot set the line, we do not go and prick the children repeatedly especially with the premature babies. We know where we can*

> *easily get their line, so if it is a premature baby you know where you prick, the big baby weighing 4.5kg, and the normal baby, we know so these are some of the things that we do to prevent multiple pricking and to reduce the pain of the baby"* **- Nene**

Some nurses also believed that the routine systemic analgesics that were given to the patients would manage the pain associated with the invasive procedures;

> *"we do not give analgesia for procedures but most of the patients are already having wounds that we are managing so when we give the analgesics, we are believing that it will take care of the pains of the wounds and all other painful invasive procedures too"* **- Aboagye**

> *"When the children are on admissions, most at times analgesics such as suppository Paracetamol are prescribed for them so if the child is in pain as indicative by the rise in the temperature, then we give that analgesic already prescribed and not because of the painful procedures"* **- Tetteh**

4.3.2.4. Fear of side effects

Other participants also expressed the fear of addiction of the medications to the children and therefore may not give the medications even when it is available;

"Sometimes, the things may be available but the nurse may not give because of fear of addiction so while the doctor has prescribed the medication, the nurse won't give" **– Tetteh.**

Some were also of the view that if the medication was applied every time the invasive procedure needed to be done, then the children would be addicted and they would request for it;

> *"Sure, all medications although helpful have a side effects, so am sure the children will be addicted because he or she will think that anytime he or she is sick and is brought to the hospital and experiences pain, they may want to have that kind of instant pain reliefs, since the pain has been relieved previously"* **– Dzigbordi.**

Another nurse also thought that when the cream is applied, it might enter the vein during the piercing which might cause allergic reactions;

> *"While you are entering the vein, some of the cream can touch the tip of the cannula before entering the vein so if the child is allergic to that cream, it can give him or her another problem"* **– Asantewaa.**

Others also feared that since the babies were not fully developed, the overdose of the medication could affect their liver and the kidneys;

> "Over*dose could affect the liver and since they are children and their livers are small, they might have problems"* **– Tetteh**.
>
> *"Paracetamol overdose can affect the kidney and cause problems, such as kidney stones and kidney shutdown; these are the ones I know. There is a chemical in the paracetamol that can cause kidney stones in the near future"* **- Dzigbordi**

Due to these side effects, some nurses preferred non-pharmacological strategies in the management of the pain associated with the invasive procedures;

> *"The pharmacological strategies may cause side effects so if we use it for all invasive procedures, then the children will have problems in the near future. Though it helps, already the child is already in pain and then I will give another injection in a form of analgesia which will inflict another pain. This may be more traumatic so I think the non-pharmacological one may help"* **– Dzigbordi.**

However, one nurse thought that if the medications were applied, it might give the opportunity for inexperienced nurses and other health professionals to prick the children repeatedly since the child might not feel the pain;

> *"For the babies maybe we can try to use it due to the repeated attempts when setting the IV line, however, if you are using the localized anaesthesia too it will give people the opportunity to be pricking the babies unnecessarily which will cause infections because once the baby is not crying, the person will just be pricking doing trial and error which will bring problems to the baby"* **– Nene.**

4.4. Subjective norm

The subjective norm explained the expectations of significant others who would want the nurse to manage the invasive procedural pain and whether the nurse is

motivated to comply with their expectations. Nurses who were motivated to manage the invasive procedural pain had positive subjective norm whiles those who were not motivated by the significant others to manage the pain has negative subjective norm. The study also found out that some nurses rather advocated for procedural pain management although the doctors' were opposed to it.

4.4.1 Positive subjective norm

Nurses who expressed positive subjective norms towards invasive procedural pain management in paediatric patients were the ones who were ready to administer the pain medication which were prescribed by the medical doctors.

4.4.1.1. Expectations from significant others

The nurse added that the hospital directors, the supervisors, matrons and the mothers were also interested in the nurses managing pain in the children; "*our bosses that is directors, supervisors, and our matrons and the mothers expect us to manage the pain"*- **Dzifa**.

According to the nurses, parents who were literates requested for pain medications for their children after the procedures;

> *"So the parents who are literates ask "can I give some Supp. Paracetamol or syrup Paracetamol, and then we say yes you can give." But those who are not literates do not ask so we also don't give" –* **Dzigbordi.**

According to the nurses, they were motivated to ensure that the pain was managed in the children because they are there to care for them; "*I don't think anything will prevent me from doing my work because my duty is to take care of the babies so I don't think anybody will have an excuse that they cannot care for the baby"* **– Nene.**

According to the nurses some doctors were very interested in the management of procedural pain in children and are always ready to prescribe medications to manage the pain; *"the doctors prescribe the medications for us to administer to the children during the invasive procedures*" **– Dzifa**

The nurses also complied with the doctors' orders and administered the medications when they were prescribed; *"When the doctors prescribe the medication, for example when we are going to perform an invasive procedure on the child we can give for instance suppository paracetamol so that the child will not feel the pain"* – **Dufie**.

Some of the nurses also said they would advocate for the management of the pain; "*majority of the nurses do advocate for pain management for the children before the procedure"* **– Kafui**.

4.4.2 Negative subjective norm

Nurses who had negative subjective norms about invasive procedural pain management were those who thought that the doctors and their supervisors were not interested and therefore, they also did nothing to manage the pain.

4.4.2.1 Doctors' prescription pattern

Some doctors do not give any premedication for procedures such as lumber puncture and chest tube insertion and when the nurses advocate for it, they respond that the medications would sedate the children;

> *"We normally advocate for pain medication especially for chest tube insertion, and lumbar puncture but normally our doctors say that we have to limit the pain medications because it sedates the children and make them lethargic and so we don't normally give"* – **Kafui.**

For lumber puncture, the doctors prescribed sedatives for children who were aggressive to calm them down; *"For children who are aggressive when you are doing some procedure especially the lumbar puncture, for fear of puncturing the nerve, they give sedative like Diazepam to calm the child down for the procedure to be done"* – **Kafui**.

Some of the doctors responded that the procedures were simple and so there was no need for any analgesia even though the nurses had requested for it; *"Sometimes, they will just tell you it is just a simple procedure and doesn't need analgesics, so you the nurse will think that the child needs an analgesic but they will tell you don't worry, I will just get it and then we are done"*- **Dzigbordi.**

Also, some nurses resorted to reassurance after the procedure since the doctor refused to prescribe any medication but were disappointed in those doctors since they did not help in pain management in the children; "*for me I don't do anything, I just comply, when we finish the procedure, I just reassure the child so at that point the doctor is not helping with the management of pain"* **– Dzigbordi**

Then, there was no coordination between the nurses and the biomedical scientists who come to the ward and just take blood samples from the children without any concern about the pain they inflicted; *"Usually we are not with them when they are taking the samples, we may either be doing something so laboratory technician come in later in the day and asks for the requests and go on with their work"* **– Asaa.**

Some of the nurses too did not show any concern when the child expressed pain but continued with whatever they were doing;

> *"Sometimes, the way the nurses will complain when the baby is crying does not show concern, at least they should try and sympathize with the baby or something, however, the nurses do not mind the children when they are crying but will continue with whatever they are doing and aiming at getting to their target and do not show any concern at all as if "this is*

> *the procedure am performing and I have to get my procedure done no matter how the baby is crying"* **– Adobea.**

4.4.3 Neutral subjective norm

Nurses who had neutral subjective norms were those who went ahead to manage the pain although the doctors were not in support of managing the pain.

4.4.3.1 Advocacy by nurses

Whenever the doctors refused to prescribe the medication, some of the nurses did not comply with those orders as they went ahead and administered analgesia to the patient;

> *"When the doctors do not prescribe the analgesics, we still insist and talk to them because not all of them are quite experienced. We have being staying with the child for twenty four (24) hours so we know how the child is going through the pain. We just explain the condition of the child to them and some agree but others do not listen so we end up administering suppository paracetamol because the pain is unbearable"* **– Boamaa.**

Other nurses advocated for the children and give the medication against the doctor's orders but do not document since the doctor had refused to prescribe them; "*sometimes too we also hide and we give the analgesic without telling anybody"* **– Boatemaa**.

4.5 Intentions to manage invasive procedural pain

The nurses indicated both favourable and unfavorable intentions towards the management of invasive procedural pain among the paediatric patients. While some nurses showed favourable intentions such as empathy and commitment towards the management of invasive procedural pain, other nurses complained about unfavourable factors such time factor and the fact that they were helpless in managing the invasive procedural pain in children.

4.5.1 Favourable intentions to manage invasive procedural pain

Based on the findings from the nurses concerning their attitudes, subjective norms and perceived control, it was deduced that some nurses had favourable intentions which may lead to managing invasive procedural pain. They exhibited empathy, commitment and desire to administer medications to ensure that the invasive procedural pain is managed in the children.

4.5.1.1 Empathy

The participants admitted to the fact that the invasive procedures were very painful as they felt the pain that the children expressed;

> *"We also feel the pain because it is not easy passing an IV line, even when it is been passed for adults , the way the needle goes like that, it is painful so the nurses also feel for the child and we always put ourselves in their shoes"* **– Dzigbordi**.

> *"I think the pain hmmm……I don't even know the word for it but at times when you see the child crying you yourself (long pause) as an adult when we receive IV or IM you see how painful it is so how much more the child who doesn't know anything. We really feel for them* **- Tetteh"**

The nurses who were nursing mothers also empathized with the mothers during the procedure;

> *"When the children cry that much, for me it really hurts because at times I wonder how I will feel if I was in their situation when the baby is undergoing the painful procedures, I will behave the same way as these mothers so I think the pain should be managed to lessen the burden as well"* **– Adobea**

Due to the painful situation, the nurses always hoped they finished the procedure as early as possible; "since *we are humans and sometimes emotional, I feel bad but it is for the child's own good so we go through with the hope that we will get the line soon"* **– Dzifa.**

According to the nurses, the doctors on the ward were also sympathetic towards the children and were ever ready to manage the pain associated with the invasive procedures;

> *"When it comes to pain management, there is team work and in fact when you see how the children are grumbling and complaining about the pain, the doctors themselves cannot stand it and they say "oh momma yɛn mma no biribi na akwadaa yi abrɜ" meaning let's give the child something since he or she is exhausted because of the pain"* - **Boamaa**

The nurses were ready to advocate for the purchase of the medications for use during invasive procedures so the children would be comfortable;

"I am not aware of the availability of topical medication and likewise others too so if everybody becomes aware, we will try to find ways and means of helping our babies to get out of pain so if it means writing a memo to our director to help us with some of these resources, we will do that" – **Mamle.**

4.5.1.3 Commitment

The nurses showed commitment as they were ready to manage the pain at all cost since that was their role as a nurse on the ward;

> *"my role is to make sure that the pain is relieved at long last so whatever I have to do to relieve the pain within my means, I will have to do it"* – **Dzigbordi.**
>
> *"Management of procedural pain is not anything difficult and it is something that we should be doing routinely despite the challenges"* - **Boamaa**

Another nurse was ready to utilize the logistics at once since she believed that the children should be free from the pain;

> *"What I want to add is I want the pain management to be initiated, I want it instantly, at once, ongoing, yes if it happens like that we will all be free because the pain, nobody likes pain If we give the pain killers and the pain subsides, you see your work goes on well, everything goes well. When you are dressing a patient with wound and you want to clean it you toss the leg up and down and in the end if you are not skillful, you*

> *contaminate your items so we need the pain killer for them before the procedure thank you"* **– Boamaa.**

Then, other nurses were ready to apply the medications even at dawn so that by the time they handed- over, the procedure could be done;

> *"Before you plan to perform an invasive procedure, you can give it earlier before the time is due maybe early in the morning we can inform the doctor during ward rounds that this baby does not have a line so after your rounds you have to set lines for the babies. So before that we can administer the drug, so that the time for the drug to be effective will be achieved"* **– Adobea.**

4.5.1.4 Desire to use pain medications

The nurses were ready to learn the use of the medications since it was an innovative way of managing pain in the children; "*I think basically we have to get the analgesics since we are living in modern times, we are ready to embrace new means of preventing pain in our babies"* **– Mamle.**

Other nurses were also ready to use the medication so they would avoid the several failed attempts when they performed the invasive procedures;

> *"The introduction of the medications will be good because it is difficult to pass the IV lines as you might not succeed at the first attempt and you may end up pricking and inflicting pain on child and at the end, you may not be successful. So it is a good idea"* **– Boamaa.**

Although the nurses said they had some knowledge about pain management, they expressed interest in learning the detailed information about pain management in paediatric patients;

> *"The nurses will be interested because they want to know about how to alleviate pain. They know something small but they need to go into details about alleviation of pain. Because of the increasing number of the patients and coupled with the workload, I think the nurses will use the medications if they are initiated and available. All categories of health*

> *workers who are skillful, knowledgeable will be ready to learn and therefore should be taught"* **– Boamaa.**

Also, the nurses wanted to know where they could find the sprays and the rating scales to purchase so they could start using immediately;

> *As a nurse, I will be interested if you have all these sprays you are talking about and the pain management scales so you can let us have a copy or try to help us find the suppliers of these logistics so that we can also request for it and use it in our ward to help our children who are sick"* **– Mamle.**

4.5.2 Unfavorable intentions to manage invasive procedural pain

Based on the findings from the nurses concerning their attitudes, subjective norms and perceived control, it was deduced that some nurses had unfavourable intentions which may lead to not managing invasive procedural pain. The unfavourable intentions included helplessness and waste of time and money.

4.5.2.1 Helplessness

The nurses became irritated since they felt helpless in managing the pain of the children on the ward; *"sometimes, the nurses feel like they've done everything and so when they children are complaining, they say "yɜn yɜ dɜn biom" meaning* "what else should we do" **– Boatemaa.**

Some of the nurses also saw that due to the non-availability of resources, they felt helpless in managing the pain in the children although they were supposed to advocate for the children;

> *"I am supposed to advocate for the child and reduce the pain level of children during procedures but I see myself not to being effective on the ward because we don't have enough logistics***,** *we normally use diversional therapy but if we see that the child is still in pain, we give them some paracetamol or something which may not be very effective"* **– Kafui.**

Other participants also said plainly that when the logistics were not provided, they would not do anything; "if the medications are not available, I will not do anything" **– Awukuwaa.**

4.5.2.2 Waste of time and money

The participants were of the view that time would be wasted since nurses needed time for the preparation of the logistics for all the children undergoing the procedure;

> *"I don't know if the nurses will be willing to manage use the medications since they may think it is the waste of time, as I said you have a lot of patients and using five minutes to perform a procedure and adding all these logistics will extend your time***.** *Maybe, they will feel it is not necessary and moreover, it is wasting a lot of time* **– Asaa.**

Some of the nurses also expressed the possibility of missing out on some of the children since they had to wait for the medication to take effect and may lead to waste of the medication that had been applied to the site;

> *"It will use time because especially when there's a lot to be done on the ward and you spray it and leave the child to attend to other things before you come and perform the procedure, so by the time you come the effect might have worn off ok? And you may have to reapply and wait for some time to perform the procedure"* **– Aboagye.**

Another nurse was also of the view that if the nurses had to wait for some time before the procedure could be performed, then most nurses may not use the medication even when they were made available; *"some nurses may be able to wait for 5 minutes but the truth*

is that, if you have to wait for 30 to 45 minutes before you can do the procedure, only few nurses out of 10 nurses may be willing to wait for such a long time" **– Boatemaa.**

Most of the nurses also complained that during emergency situations where time is of essence, they may not be able to wait for the medication to take effect before they performed the procedure;

> *"When it comes to emergencies, a delay may be a problem because the baby may be going into "hypo" like 0.1 and you want to get a line to give a bolus, if you have to wait for 30 minutes for the drug to be effective before them most nurses will then go ahead and help the child instead of waiting to use this medication, so that will be the nurses' own perspective as to when and how to use it"* - **Mamle.**

Additionally, one of the participant thought that it would be a waste of money to buy those medications and therefore, the money should be used to purchase other drugs; *I think it is a waste of money because we can use that money to buy other drugs for the pharmacy so that we can collect it when we are in need* **– Asantewaa.**

4.6 Perceived control towards procedural pain management

To answer the third and fourth research questions-what factors would enhance or prevent the effective management of invasive procedural pain management in paediatric patients. Two sub-themes emerged as perceived facilitators and perceived barriers.

4.6.1 Perceived facilitators of invasive procedural pain management

The nurses thought that they would be able to effectively manage the invasive procedural among if there was parental support and continuous professional development for the nurses and other health professionals and also showed personal initiative towards invasive procedural pain management.

4.6.1.1 Parental Support

Most of the nurses suggested that there was the need for the parents of the paediatric patients to support during the invasive procedures so they could be reassured during the process; "*for the older ones they are not much of a problem, sometimes too they know their mothers so we ask the mothers to try and talk to them throughout the procedure"* **– Asaa**.

Other nurses also believed that the presence of the parents would make the children calm down during the procedure; "*some of parents stay with their children and their presence helped to calm them down because when the mother talked to them, they understand and stopped crying"* – **Dufie**.

According to one nurse, when the mothers were involved in the management of their children, they were educated about what was done for the child and they complied with the nurses;

> " when we involve and inform the mothers during the procedures, they become educated about the pain the child is supposed to go through so that she is better able to support the child during the painful procedures*"* – **Boamaa**.

The mothers also helped supervised their children when the nurses on the ward attended to emergency situations;

> *"Sometimes when we have emergencies and you critically ill patients that have to attend to, the mothers support the children until we are done with the emergencies or are less busy, we then attend to their children"* **– Asaa.**

4.6.1.2. Continuous professional development

The nurses were of the opinion that, they needed education in pain management of children so they would be able to manage the pain;

> *"We need some in- service education on pain management so that it will help us in the management of the patients"* **– Dufie**.
>
> *"the in-service education will broaden our minds and even though I am getting to my retirement, I think the younger nurses will benefit a lot as they will have the knowledge to manage pain when they are transferred to other hospitals"* **- Asantewaa**

The nurses specified that they needed training on pain rating scales, medications, and pain guidelines in order to manage the pain effectively;

> *"I need education on the pain rating scales because I have not seen the scales before, maybe I know but am not familiar with it"* **– Nene**.
>
> *"we need education on medications for the management of invasive procedural pain because we do more of diversional therapy which are non-pharmacological"* **– Kafui.**

According to the participants, other health professionals such as the doctors and the biomedical scientists should also be educated on pain management among paediatric patients;

> *"The doctors and the laboratory technicians should be educated, and they should be encouraged to use the analgesia before they take the sample, because the cubita fossa when you take, it is painful, very, very painful sometimes when you take it, for about 3 days or 4, 5 days you'll still feel the pain, ahaa it's very painful when they use the 10 cc, the needle is big so if they are educated.. The doctors and also the nurses should be educated"***- Boatemaa.**

One participant was of the view that the in-service education should be organized periodically so that the nurses would be reminded and also gain more insight in pain management during invasive procedures;

> *"When periodic workshops are organized on pain management, it will remind us and also give us more insight about what we need to do during invasive procedures"* **– Aboagye.**
>
> *"The provision of in-service training or programmes that will add to our knowledge on pain management, I think it will be good but for now, a little has been done on pain management*". **- Kafui**

According to the nurses, the periodic education would lead to behavioural change among the nurses in relation to how they treat children who were in pain;

> "*I think it will reduce the rate at which the nurses even shout on the children and all that so we need more knowledge on pain management" –* **Aboagye.**
>
> *"Yes, education changes a lot of things, recently, through education we got to know that the use of methylated spirit for wound dressing dissolves the sutures and bring about complications so we had to switch to normal saline to dress the surgical wounds so I think these trainings help us to improve on our professional standards* **- Dzigbordi**

Another nurse believed that behavioural change among the nurses would lead to improved services;

> "*if it is possible, management should organize some training for staff on pain management in order to improve on our services* **– Kafui.**
>
> *"Most of nurses will utilize the education but not all of them because you see, when you want to effect a change, you need to educate them, so whiles you are educating them, there will be challenges but gradually, they will all accept it"* **- Sakyibea**

One nurse was of the view that the training should be followed by the dissemination of the information so that those who were not able to attend could be educated;

> *"On my ward, we are trained on new procedures, new technologies so the nurses there are abreast with new information, we have periodic meetings when we train our workers in the ward so if there are new changes, we liaise the information or call for meetings to train them and provide the necessary logistics so everyone becomes aware of the change*" **Mamle**

Another nurse shared how effective dissemination had helped them to adopt new techniques;

> *"Dissemination is very important because if you just come and dump anything, the nurses might not be aware of the new development so if a meeting is called to demonstrate the new product for everyone to see, I think they will use it. For instance, on our ward now we have the bilirubinmetre which is used by all the nurses because everybody understands and they know where it is, we all place it at one point so when the baby comes, we use it and then afterwards, place it back. When everybody understands, they will use it"* **- Nene**

4.6.1.3 Personal initiative

Some nurses said they would use any available resources in the management of pain in children even if the needed resources were not available;

"*With my little knowledge and with my little simple, simple rules, I think I can manage pain with the non-pharmacological logistics available, so I can manage pain in my own way"* **– Dzigbordi**.

Other nurses also said if the medications for pain management are not prescribed before the procedure, they would assist with the procedure and then afterwards, they would give any available analgesia such as suppository paracetamol;

> *"If the pain medications are not prescribed, then then the nurse may administer analgesia such as paracetamol suppository after the procedure, but on this ward we normally don't give the paracetamol but I think we can give to the children before the procedure"* **– Sakyibea**.

In relation to the waiting time for the topical medication to take effect, one nurse said she would utilize that time by doing other things so that time would not be wasted;

> *"I think it all boils down to the willingness of the nurses to know that pain is something we need to deal with and as a matter of fact you need to make sure that when you are performing any invasive procedure, you have to give the analgesia so you can just spray and then go and do other things then after 30 to 60 minutes you come back to perform the procedure"* – **Boatemaa.**

4.6.2 Barriers of invasive procedural pain management

The perceived barriers that were identified by the nurses were lack of knowledge, deficient teamwork, and shortage of staff, lack of policies and facilities, and cost implications.

4.6.2.1. Lack of knowledge

The participants were not aware of analgesia in a form of topical creams and sprays that could be used in the management of invasive procedural pain;

> *"I think we the health personnel lack knowledge about things that will help us to reduce the pain because I think if the doctors and nurses on the ward are aware of these creams and topical sprays, maybe we would have written to get a supply or something like that so it is because we don't know that these medications are available for use"* – **Mamle.**

Due to the challenge of not knowing about the existence of topical analgesics, the nurses used Paracetamol suppository for the management of pain after the procedure; *"actually, I have not heard about the use of topical analgesia before the procedure so mostly, we use paracetamol suppositories right after the procedure to manage the pain"* **– Adobea.**

One participant also gave other areas of pain management that she lacked knowledge about;

> *"I do not have any knowledge about the medications, assessing with the scales, knowing how to assess itself is one thing, and reading about pain management in paediatrics not just reading but i really have to take the pains to learn*" **- Dzifa**

On the other hand, some of the nurses were pessimistic about the possibility of managing pain in invasive procedures such as intravenous cannulation; "*well in passing an IV line, you can't give something which will prevent the pain so I don't know"* – **Awukuwaa.**

Another nurse preferred that something could be done for pain management when performing lumber puncture instead of IV cannulation;

> *"For IV lines, I don't think any kind of pain medication could be given before you do the procedure, So does it mean that if you have to do the procedure repeatedly, you need to give a pre-medication? or what? in which form? or what kind of premedication are you going to give?, so that one(chuckles) I don't think or they could still look at it, but I will suggest that for lumbar puncture, a local analgesic if possible should be given before the procedure"* **– Boatemaa**.

4.6.2.2. Shortage of staff and time constraints

The nurses complained that the staff per shift and the amount of work to be done was unfair; "*When you have a busy ward, looking at nurses per shift and the number of patients, it is just unfair"* **– Asaa.**

Due to the heavy workload, the nurses were not able to perform their duties effectively;

> *"Sometimes you come to the ward and there's a lot for you to do. For instance, you are serving medications, a child IV needs to be set up and admissions are coming and a whole lot of things so sometimes these challenges on the ward could make it difficult for the nurses to perform their duties"* – **Boatemaa**

The nurses also found it challenging which procedure to perform first when two children present with life- threatening conditions;

> *"The staff strength is very low, we don't have enough staff, at times two nurses on a duty and only one ward assistant. So sometimes when you have two babies, you have a procedure to perform on a baby may be an IV line and also a preterm baby with apnea who is not breathing, it become a challenging as to which one to do first, the one with apnea or the one with the secretions who needs suctioning*" **- Adobea**

Due to the heavy workload in the paediatric units, most nurses rushed through the procedures that they performed;

> *"Yes, most of the time, they are in haste because of the patient-health worker ratio especially on our ward here where you have several children that you have to take samples for laboratory investigations, you see him rushing through the procedures from one child to the other because of the heavy workload so for that one, some may use the pain medication but am not too sure if all of them will be willing to use it"* **– Kafui.**

The nurses are therefore not able to manage pain effectively since one needs more time to effectively take the child through the pain management process;

> *"When there are not enough nurses, it prevents you from managing the pain because pain management takes a lot of time because you have to be with your patient and give them some psychological, divert the child's mind from the pain and all so if there are not enough nurses on the ward, I think pain management will not be achieved to its fullest*" **– Dzigbordi**

Additionally, one nurse explained that the shortage of staff had made the work very difficult since it was more challenging to nurse children as compared with adults;

> *"We need personnel, because nowadays we are understaffed as compared with the number of children we are caring for and for nursing, you know it is very difficult to work on children as compared with adults so we need more hands. The ward is a combination both adults and children, there may be only two nurses on the whole ward which may cause the nurses to be impatient so they cannot effectively manage the patients on the ward which is a problem"* **– Sefakor.**

Sometimes, the shortage brought about conflict when one nurse spent more time on a child who needed attention;

> *"Sometimes, we may be only two nurses on the ward, and we may have a lot of work to be done so when the other colleague sees you around one particular child who has undergone an invasive procedure and you have to spend most of the time to help him through the pain process, I don't think the other colleague of yours will be happy so it may bring conflicts and therefore, the shortage of staff may hinder the effective management of invasive procedural pain in the children"* - **Aboagye.**

Sometimes, the nurses also refused the administration of the medication even though the doctor had prescribed because the child needed to be monitored which was considered time consuming; "*when the person is in pain and the nurse know that this drug can manage the pain, the nurses do not give even though the doctors have prescribe the medication because monitoring the child for side effects is time consuming"* **– Tetteh.**

It was found out that, the health personnel lacked teamwork which prevented the nurses from administering pain medications to the patients before the procedures were done;

> *"Sometimes there is no teamwork among the doctors and nurses, for instance, premedication may be exempted because the doctor may be in a hurry to perform a procedure so the nurse has to skip the parts of the guidelines that says give premedication and observe for side effects and rather provide diversional therapy which may not be effective"* **– Dufie.**

Some of the biomedical scientists do not interact with the nurses on the ward as they just went to the mothers and took the samples; "*the biomedical staff tell the mothers to*

reassure their wards or get the child's consent before then they take the samples without our knowledge" **– Dzigbordi.**

The biomedical scientists were also accused of using inappropriate materials which made the invasive procedures more painful;

> *"When it comes to pain management, the laboratory technicians are worse, because if I want to take a sample on the ward (pause) I know it's painful so I will go in for a cannula with the smallest size, however, they will take the sample with a 5 cc's needles and syringe which is too big for the child's vein. If you don't know and you go and you enquire why they are using a bigger cannula, they become irritated and say a whole lot of things"* – **Boatemaa.**

One participant also said that the biomedical staff was not punctual to work and they also struggled to get the IV line;

> *"He wasn't punctual so the nurses have decided to take the samples ourselves. They struggle to get access to the vein and prick about five to six times before we insert the cannula, so we decided that we will take the samples for him and that one too, the samples will be here for a long time before he will come for them"* - **Dzifa**

Another nurse said some of the nurses also shouted on the patients and relatives when they requested that then pain should be managed and due to that, the nurse may lose pertinent information from the relatives later on; "*I think the relative can be able to give the nurses some insight about the problems but when the nurse shouts on them like, then they may withhold vital information"* **–Tetteh.**

4.6.2.3. Lack of policies and facilities

The nurses had not heard or seen any protocol pertaining to pain management in paediatric patients before; "*I haven't heard them posting or talking about pain protocol since I came to the ward"* **– Adobea**.

Furthermore, there were no guidelines pertaining to invasive procedural pain management on the wards in the hospital; *"Well, we do not have those guidelines for managing pain, and the sprays and creams are also not available here so the management should provide those things so that we will be able to manage the patients"* **– Dufie**.

Others also said there were no guidelines pertaining to invasive procedural pain management as they had most of their guidelines and protocols posted on the notice board;

> *"No we do not have any guidelines because if we have then it will be posted on the ward because all the guidelines and protocols that we have concerning breastfeeding, Kangaroo are all posted on the ward so if we had anything on pain management, it will be here by all means"* **– Nene.**

However, one of the nurses interjected that for lumbar puncture, they gave IV Diazepam only; "*In this ward we don't have it, for the lumbar puncture, we give the IV Diazepam for about five minutes before we start the procedure, so that is all"* – **Sakyibea.**

The participants pointed out that availability of the medications may be a challenge as the nurses would use the medications if they were made available to make the work easier;

> *Anyway, maybe some of the nurses may not use the analgesics but when the logistics are available, most nurses will admire and use it, some of us are aging so we do not need to stress ourselves too much"* **– Asantewaa.**
>
> *"I have worked at the paediatric unit for two years and I know we don't have any of these logistics around, but now that we have been made aware, we can request for them my unit and the other paediatric units in the hospital use"* **- Mamle**

Some participants also explained that the analgesic creams and the sprays should be readily available at the pharmacy so that its use would be encouraged in the management of pain;

> ***"****If the creams are available we will use it because even with the xylocaine that is been used on the wards, sometimes you have to send for it from the pharmacy and you may not get, at times we even go there and they say they don't have so if the things are there"* **- Sefakor**

The nurses stated that, the availability of non-pharmacological logistics such as toys and music that could be used to divert the attention of the children in order to perform the invasive procedures;

> *"Apart from the availability of the medications, other logistics such as toys and music should also be made available for the child so it could be used to divert the child's attention from the procedure on the ward"* **– Kafui.**

One of the nurses viewed that if the facilities were not provided after the training, then the in-service training would be wasteful;

> *"When you train the person and you do not provide the things that the person needs to do the work then why you are training? If the nurse comes back from learning how to use topical medications and there is none, then the person will do the same things that he used to do but when the person comes back and the things that are supposed to be used are already there, then he will start using the thing and also encourage the colleagues to do same"* **- Nene**

One nurse feared that if the logistics were even made available, the medications may be locked up; *"If the medications are made available, some few people may use it as it will be locked up"* **– Dzifa**.

When probed further, the one nurse said that, the logistics would be kept by the supervisors and may be disbursed only when the supervisor was on duty;

> *"This is because the pharmacy stores will not supply enough so the few ones available, our bosses will have to keep them so that if you need it, you will come to her for it so when she is not on duty, it means there will be no drugs"* **– Dzifa.**

Another nurse was of the opinion that the medication should be available on the ward so that the nurses will have easy access to the medications;

> *"The drug should be available on the ward because most of the time, nurses have to run to the dispensary for drugs. So if they are made available on the wards, we can have easy access the drugs are should be re-stocked periodically. We can then keep record on how the drugs are used. I do not think we will be running up and down again and we will be stable with our pain management here"* **- Boamaa**

4.6.2.4. Cost implications

The participants explained that if the pain management would be effective, then the pain medications should be purchased by the hospital since the relatives may have financial challenges;

> *"The cost will affect the use of the pain drugs even with the medications the health insurance does not cover, purchasing of those drugs is a problem for most of the parents so I would love it if the hospital could help to get those drugs at the pharmacy at least at a lesser price which may be cheaper as compared with the pharmacies outside or if the hospital would provide it on the wards, it will beneficial"* – **Adobea.**

Also, the cost of the analgesia could be included in the Health Insurance drug lists so that those who were insured could get it; "*the inclusion of the procedural pain medication in the National Health Insurance would make it easier for the hospital to provide it to be used for the children"* – **Sakyibea.**

Some of the participants also suggested that, the health insurance could take up half of the cost of the analgesia so that the financial burden could be reduced from the parents; *"it should be made available and covered by the insurance even if the insurance will pay part and the relatives will also pay a small portion, then I think they can afford"* **– Dzifa.**

4.7 Summary

This study used the theory of planned behaviour (TPB) and four objectives to explore the nurses' perspectives toward invasive procedural pain management among paediatric patients at the Regional Hospital, Koforidua. Sixteen nurses consented to participate in the study after the objectives of the study had been read to them. An interview guide was used to moderate the interviews. The interviews were recorded and transcribed and the principles of thematic analysis were employed to analyze the data. The findings showed that nurses had knowledge about the types of painful invasive procedures and its effects on the child, parents, and the nurses. However, they had inadequate knowledge about the pain rating scales and pharmacological strategies in the management of invasive procedural pain. Some nurses had positive attitudes and beliefs about procedural pain management whiles others had negative attitudes and beliefs as they perceived pain as a normal phenomenon and this affected their evaluation of the outcome of invasive procedural pain management. The nurses also believed that doctors, nurses and even parents of the children were interested in the management of invasive procedural pain management. This therefore motivated the nurses to comply with the doctors who prescribed the medications and administered them, however, some nurses did not comply with doctors who were not ready to prescribe the analgesia and went ahead to administer them to the children. The nurses also identified factors that could enhance the effective management of invasive procedural in children as parental support and in-service training for the nurses.

However, some factors which could mitigate effective pain management in children were lack of teamwork, shortage of staff, lack of policies and facilities and lack of knowledge. Based on these factors, the nurses expressed favourable intentions towards invasive procedural pain management as they showed commitment and desire to learn

about pain management strategies. On the contrary, other nurses' had unfavourable intentions as the expressed their helpless and also that pain management was a waste of time and money. The results were in congruence with the constructs of the theory of planned behaviour. It supported the assertion that knowledge only does not lead to the performance of behaviour but rather the interaction of the individual's attitudes, subjective norms, and perceived control. This could explain the reason why although the nurses had inadequate knowledge about the pain assessment scales, and use of topical analgesics and policies guiding invasive procedural pain management, they were committed to use it once it was prescribed by the doctors and made available for use. The main findings from this study would be discussed in the next chapter.

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter discusses the key findings of the study in relation to the wider literature. The aim of the study was to explore the nurses' perspectives about invasive procedural pain management in children. This chapter discusses the knowledge and process of invasive procedural pain management, the attitudes of the nurses, the subjective norms, perceived control and intentions to manage invasive procedural pain in children. The study was guided by the theory of planned behaviour which stipulates that, the intentions of an individual to perform a behaviour is not dependent on knowledge alone about that behaviour but rather, the interactions of the person's attitudes, subjective norms, and perceived control (Montano & Kasprzyk, 2008).

5.1 Knowledge and processes of invasive procedural pain

Painful invasive procedures are common procedures undertaken in the paediatric settings of any hospital. The nurses categorized the invasive procedures into traumatizing which was associated with severe pain and non-traumatizing which was associated with moderate to mild pain. This finding was consistent with findings from another study that categorized pain associated with invasive procedures into mild, moderate to severe pain (Stevens, et al., 2011). The traumatizing invasive procedures included intravenous cannulation, venipuncture, injections, and lumbar puncture which were consistent with earlier studies (Bice et al., 2014; Bisognis, 2014). The non-traumatizing invasive procedures included naso-gastric (NG) tube insertion, wound dressing, reduction of wound drain, and catheterization and these findings were supported by previous findings

about invasive procedures performed for children (Curtis et al., 2012). Due to the level of pain associated with these procedures, the children became aggressive, uncooperative and in an attempt to immobilize the children so the procedure could be performed, the nurses used various forms of physical restraint such gentle, firm and forcible holding (McCarthy et al., 2013). The nurses were assisted by their colleagues to restrain the children during the procedures however, in the absence of the nurses, the primary caregivers of the children – the mothers and sometimes the fathers assisted to restrain the children. Other staff of the hospital such as male orderlies and security men also assisted to immobilize the children during the painful invasive procedures. This was consistent with findings from previous studies that during painful invasive procedures, restraint is utilized when the child is uncooperative and also to immobilize the child to prevent harm (Coyne & Scott, 2013; Jeffery, 2010).

The nurses believed that although pain was a general phenomenon, its expression among the children was an individual affair as supported by a previous study (Aziato & Adejumo, 2014a). While some children cried and become aggressive and even hid from the nurses, others showed little aggression during the painful invasive procedures. This assertion was supported by a study that showed that children expressed pain in various ways such as crying, fears, facial grimacing, movement of body parts, and attempts to run away (Nimbalkar et al., 2014; Pichardo, 2010; Taddio et al., 2010). The nurses also believed that female children expressed more pain than the males during invasive procedures, this supported another study which stipulated that females reported more pain than males (Kozlowski et al., 2014; Vaartio et al., 2008). Age also affected the expression of pain as the nurses believed that younger children expressed pain more than the older children during the invasive procedures and this findings was supported by other studies (Baulch, 2010; Sclenz et al., 2012). Children expressed pain verbally and/or

non-verbally while neonates and preverbal children expressed their pain non-verbally by crying and moving parts of their bodies such as the hands and legs while the verbal children reported pain during the procedure. These findings were consistent with the findings of another study (Taddio et al., 2010).

The nurses had inadequate knowledge about the pain scales used to assess procedural pain in children whiles those who said they had knowledge about the pain scales could not explain them accurately. The findings were contrary to a study that showed that nurses had adequate knowledge about the assessment of pain rating scales even more than other health professionals but still did not use it when assessing pain in the children (Akuma & Jordan, 2012; Nimbalkar et al., 2014; Taylor et al., 2008) such as the numeric rating scale, Wong-Baker rating scale, and the FLACC scales for the assessment of procedural pain in children (Twycross & Collins, 2013). However, in the absence of the rating scales, the nurses used other strategies such as observation, touch, body movement, and duration of cry to assess the pain which were consistent with previous studies (Akuma & Jordan, 2012; Twycross & Collins, 2013).

Pharmacological management was done sparingly in the paediatric unit due to attitudinal beliefs and lack of knowledge about the use of medications in the management of invasive procedural pain. Some nurses gave sweetened solution to the neonates during the procedure as recommended by some studies (Akuma & Jordan, 2012; Joung & Cho, 2010; McCarthy et al., 2013) and also allowed the mothers to give breast milk to the babies after the procedure and this supported previous findings that breast milk had analgesic effects during procedures such as vaccination injections and heel lancing (Ou-Yang et al., 2013; Taddio et al., 2010). None of the nurses was aware of the use of topical creams and sprays such as Eutetic mixture of local anaesthesia (EMLA), and Liposomal lidocaine although numerous studies show that these

medications were effective in the management of procedural pain (Babl et al., 2008; Bice et al., 2014; Maclean et al., 2007; Pasero et al., 2011). Ketamine was also given to some specific patients who were undergoing procedures as it was not available for all the patients although studies show that it is good for managing painful procedures (Aouad et al., 2008; Maclean et al., 2007).

Nurses utilized non-pharmacological strategies to a greater extent in the management of invasive procedural pain in children. These included explaining the procedure to the child to calm him or her. However, this type of strategy which was known as suggestion therapy was not encouraged since just convincing a child that the procedure may not be painful did not lead to the reduction of the pain (Taddio et al., 2010). Distraction was also used to manage the pain with strategies such as singing, offering gifts (ice cream, toffees, and sweet drinks), use of toys, balloons, and cartoons which were provided by the staff and the hospital which was consistent with other studies (Stinson, Yamada, Dickson, Lamda, & Stevens, 2008; Tufekci et al., 2008; Uman et al., 2008). The provision of items by a hospital is known as clinical-led distraction (Taddio et al., 2010). The nurses never employed child-led distractions such as deep breathing and blowing techniques although it was a type of distraction explained by Taddio et al., (2010) which may be due to lack of awareness. The use of music to distract the children during the procedures was also supported (Klassen et al., 2008). Parental involvement during painful procedures helped the children to calm down, so most of the nurses took the children especially the neonates to their mothers to be breastfed after the procedure as they believed that the bonding helped to calm the baby. This assertion was supported by studies that believed that the skin-to-skin contact and the suckling during breastfeeding and presence of family members of the child led to managing the intensity of painful procedures (Taddio et al., 2010).

The findings from the study showed that unrelieved pain from painful procedures has negative consequences to the child, the mother, and the healthcare givers in the hospital. The children became exhausted and anxious which translated to fear and other behavioural changes such as mistrust towards health personnel. This was consistent with the findings from Curtis et al., (2012). Also, children became more aggressive as the nurses retried the procedures after several failed attempts and so the children felt more pain as supported by another study that children who were exposed to the painful procedures had stronger negative responses to other painful procedures (Kennedy et al., 2008). Due to the pain inflicted on the children during the process, it sometimes marred the relationship between the child, the mother and the nurse as supported by other studies (Darawad et al., 2014; Leahy et al., 2008). The mothers also agitated as their children expressed the pain during the painful procedures to the point that some of them took their children and refused to let them undergo the painful procedure, this finding supported another study that, some parents were reluctant to have their children receive some medications (Czarnecki, et al., 2011). The nurses believed that the fear of the painful invasive procedures could prevent the older children from assessing healthcare as early as possible (Pichardo, 2010; Taddio et al., 2010). The nurses also felt uncomfortable when they were unable to manage the invasive procedural pain. These findings were consistent with earlier finding (Olmstead et al., 2010). Some also suffered from body aches as a result of the struggle during the procedure.

Subsequent discussions focus on effect of attitudes, subjective norms and perceived control on nurses' intentions to manage invasive procedural pain in paediatric patients.

5.2 Attitudes and beliefs towards invasive procedural pain in children

The nurses expressed both positive and negative attitudes and beliefs about invasive procedural pain management among paediatric patients and this affected their intentions to either manage or not manage pain in children. Nurses believed that even neonates experience pain during painful procedures which can be more painful than in adults and therefore, the need to manage the pain and this was supported by previous study that neonates as young as 28 weeks perceived more pain than adults (Akuma & Jordan, 2012). The nurses thought that pain associated with invasive procedures was real as they compared their personal pain experiences during such invasive procedures. This finding supported another study that showed that the attitudes that nurses expressed towards pain may be dependent on factors such as personal experience and the value they place on pain (Morgan, 2014). The management of the invasive procedural pain was also believed to be necessary since the pain was unbearable for the children and therefore, its management will lead to the reduction of the pain. This finding supported a previous study that effective pain management helped to reduce stress among the children during the painful procedures (Taddio, et al., 2009). The nurses were optimistic that if the topical analgesia were available, they will use it to manage the pain so as to reduce the distress that the children experienced. This finding supported other studies where nurses administered topical analgesia to all the children since they believe it will reduce the distress (Babl et al., 2008; McCarthy et al., 2013). Also, effective management of invasive procedural pain enhanced the cordial relationship between the nurse and the patient which was supported by a previous study by Kozlowski et al., (2014) that when pain is managed effectively, the patient and parents are satisfied with the care and it enhances the nurse-patient relationship.

Although the nurses were aware of the pain associated with the invasive procedures, they still saw the pain management as unimportant and therefore gave excuses that since time immemorial, invasive procedures were performed without any pain management and no one complained about it so they will maintain the status quo. This assertion was supported by a previous study that nurses gave excuses not to manage the pain even when the logistics were available (Twycross & Collins, 2013) while some nurses simply forgot to give the medications (Akuma & Jordan, 2012). The nurses believed that the pain associated with invasive procedures was a normal phenomenon which the children will grow out of and therefore, there was no need to manage it. This finding was supported by another study that nurses saw procedural pain as a normal phenomenon and therefore did not see the need to manage it and also the fact that the patients should expect some level of pain since it was a normal phenomenon in the healthcare setting (Machintosh-Franklin, 2014). Additionally, some the nurses believed that intravenous (IV) cannulation which was an invasive procedures was not that painful and that the children just exaggerated the pain and therefore, they did not believe them. This findings was supported by other studies that found that, nurses disbelieved patients' complaint of pain and rather stigmatized them as "pill seeking" (Morgan, 2014) while other nurses thought that the patients exaggerated pain since their behaviour did not indicate that they were in pain (Twycross & Collins, 2013).

Another study also found that although nurses had knowledge about pain management strategies, only a minimal number actually managed the pain. This findings was consistent with the theory of planned behaviour that stated that the knowledge of a behaviour was not a guarantee that, the behaviour will be performed but rather the person's attitudes, beliefs, and perceived control rather determine the person's intention to perform the behaviour (Montano & Kasprzyk, 2008). Some nurses were also

unwilling to manage the pain pharmacologically for fear of side effects and addiction among the children and that prevented the nurses from managing the invasive procedural pain as they believed that the continuous application of the topical medications could cause life-threatening complications in the child. This finding supported another study that nurses were reluctant to manage pain because the analgesia will have side effects and cause addiction (Nimbalkar et al., 2014; Verghese & Hannallah, 2010). Due to the perceived side effects that the nurses attached to the medications, they resolved to use the non-pharmacological strategies than the pharmacological strategies as supported by one study (Lui et al., 2008). Some of the nurses thought that there was no need to give any analgesia for passing intravenous line but may be given for other more painful procedure like lumbar puncture and this was consistent with previous studies where analgesics were given to only major procedures to the neglect of the perceived minor painful procedures (Akuma & Jordan, 2012; Maclean et al., 2007).

The nurses believed that the parents of the children were interested in the management of the pain associated with invasive procedures and therefore, some nurses were also motivated to manage the pain. Apart from the parents, the doctors and the nursing supervisors were also interested in the effective management of the invasive procedural pain in the children. The nurses were motivated to manage the pain since certain significant others expected them to do so. However, other nurses who thought that the doctors were not interested in managing the invasive procedural pain did nothing to manage the pain as they believed the doctors were reluctant to prescribe the medications. This finding was supported by previous studies that doctors showed low priority towards pain management and there was no collaboration with the nurses which affected the effective management of procedural pain in children (Czarnecki et al., 2014; Latimer et al., 2009).

Other nurses who advocated for the children thought that it was their responsibility to identify pain and manage accordingly and were therefore ready to overrule the decisions of the doctors as they prescribed and administered pain medications without the consent of a doctors. This finding was supported by other studies that found that, some nurses were ready to bend the rules even to the extent of losing their license to ensure that the pain was managed (Morgan, 2014; Vaartio et al., 2008). The nurses also provided assistance to the patient such as using pain guidelines and informing patients/ family about the right of effective pain management (Ware et al., 2011). It is therefore imperative for nurses to manage the pain associated with painful procedures since it is their human right (Taylor et al., 2008) and therefore, nurses' refusal to manage pain will amount to an unethical practice and gross disrespect to the human rights of the patient (Brennan, Carr, & Cousins, 2007).

5.3 Nurses' intentions to manage invasive procedural pain

The nurses had favourable intentions towards the management of invasive procedural pain as they expressed empathy for the children during the procedures because they believed that the pain was unbearable for the children as supported by previous study (Lloyd et al., 2008). The nurses also thought it was their responsibility to manage the pain in the children and therefore, they were ready to do that at all cost as other studies showed that nurses thought that there was no excuse for not managing pain in children (Po et al., 2011).

On the contrary, other nurses expressed unfavourable intentions to manage the invasive procedural pain in the children as they became irritated when the children complained of the pain as they felt helpless. They were also of the view that the

preparation and the administration of the cream may take too much time so most nurses may not be willing to use it even if it were available on the ward. Some also complained about the fact that during emergencies, they may not use the cream due to lack of time as the conditions of the children may be life threatening and this was corroborated by one study where the nurses did not apply topical analgesia because they thought the procedure was emergency one (McCarthy et al, 2013). One nurse was bold to say that investing in the purchase and use of the topical analgesic creams will be a waste of money that could be used to purchase other medical supplies. This stance showed the low priority that some nurses placed on the management of invasive procedural pain in children.

5.4 Perceived facilitators of invasive procedural pain management

The nurses identified three main factors that could facilitate the effective management of invasive procedural pain in paediatric patients. Firstly, the role of the parents and other guardians in the management of invasive procedural pain in the paediatric setting could not be over emphasized. According to the nurses, parents played an important role as they reported the pain for their children especially the pre-verbal children which facilitated the management of the pain. They also assisted the nurses during the invasive procedures and implemented some of the non-pharmacological strategies such as talking to the children, use of toys to distract the attention of the child during the painful procedure. These findings were consistent with other studies that parents possess a wealth of knowledge that helps with pain management such as comforting and playing with the child, and using distraction (Grondin et al., 2014; Twycross & Collins, 2013).

Secondly, the findings were consistent with previous study that nurses had no formal education in pain care (Nimbalkar et al., 2014) and therefore, the nurses believed that continuous professional development could help ensure that they were better equipped with the assessment and management strategies to manage the invasive procedural pain in the children effectively. This assertion supported previous studies (He et al., 2010; Zhang et al., 2008). The education will also empower the nurses to implement the pain management strategies effectively (Bice et al., 2014). It was also mentioned that since all the nurses on the ward could not attend a training at a time, avenues should be made for those who participated to disseminate the information to the other nurses who could not attend the training programmes to ensure that every nurse benefits in the knowledge as other studies proved that peer training among nurses was very beneficial as other studies had showed that nurses most nurses learn from their colleagues on the wards (Latimer et al., 2009).

Training on effective procedural pain management should involve other healthcare professionals such as doctors and biomedical scientists who also perform painful invasive procedures on children and the pharmacists who were in charge of dispensing of the pharmacological logistics for the management of pain. This finding confirmed other studies that stressed the need for training of other healthcare providers and collaboration to help improve the pain practices in the hospital (Leahy et al., 2008; Stevens, et al., 2011; Twycross & Collins, 2013). Holistic training of the various healthcare staff would have a positive effect on their attitudes towards pain management in children (Lago et al., 2013).

The involvement of the stakeholders of the healthcare setting such as the medical directors and other managers could also serve as a facilitator as they monitor effective training of the healthcare professionals. This was reported in previous studies that the

involvement of powerful stakeholders will ensure that the pain management is implemented and they could monitor the non-performing personnel in order to re-train them so that the clinical staff will be constantly updated on current innovations in pain management (Darawad et al., 2014; Leahy et al., 2008). Also, the nomination of a nurse, doctor or biomedical staff (local champion) in every ward to encourage colleagues to manage pain effectively is encouraged (Lago et al., 2013).

Thirdly, although the nurses also showed personal initiative towards pain management because although they did not have any prior knowledge about the existence and use of the topical analgesic creams and sprays for the management of invasive procedures, they were ready to use it once it is available and would even schedule the time in such a way that they could apply the cream and use the waiting time to perform other procedures on the ward as the study showed that nurses took about 30-60 minutes to prepare materials to perform a procedure (McCarthy et al., 2013) where the nurses' used topical analgesia because it reduced the procedural pain and further attempts of the procedure to the bearest minimum. These findings were consistent with the theory of planned behavior that stated that an individual will have favourable intentions to perform behaviour if certain perceived facilitators were provided (Montano & Kasprzyk, 2008).

5.5 Perceived barriers of invasive procedural pain management

The nurses enumerated certain factors that could mitigate effective procedural pain management among paediatric patients. The nurses perceived lack of knowledge in the effective management of invasive procedural pain as one of the factors and this was supported by previous studies that nurses had less knowledge in the assessment and

management of pain and therefore it prevented the nurses from effectively managing the pain (Aziato & Adejumo, 2014a; Taddio, Chambers, et al., 2009). Most nurses in training learnt about pain management from other courses such as medicine and surgery whiles other read from books and journals (Lui et al., 2008). There was therefore the need for the development of a credit bearing course in pain management in the curriculum of nursing training institutions (Aziato & Adejumo, 2014b).

Secondly, the nurses complained of shortage of staff in most of the paediatric wards which negatively affected their work output. The nurses were unable to manage pain effectively due to the increased workload since effective pain management demanded more nurses at post. In consonance to the above, other studies showed that nurses complained about shortage of staff and heavy workload and this needed to be addressed by improving staffing levels to achieve effective pain management (Akuma & Jordan, 2012; He et al., 2010; Twycross & Collins, 2013).

Also, most of the paediatric wards lacked policies such as pain management guidelines and protocols that will guide them in assessing and managing the pain (Bice et al., 2014). Also, the doctors were perceived to be inpatient to perform painful procedures and therefore the nurses could not have ample time to pre-medicate. The dispensing of medications was also delayed which affected the management of the pain. These findings were supported by other studies (Bice et al., 2014; Czarnecki et al., 2014; Czarnecki, et al., 2011). The unavailability of facilities such as assessment scales, medications, and materials for distraction also prevented the nurses from managing the pain effectively and this was confirmed by other studies that showed that nurses had challenges with the availability of logistics for effective pain management (Czarnecki et al., 2014; Twycross & Collins, 2013; Ware et al., 2011). The cost of the creams and other medication for managing invasive procedural pain could be another challenge as most of the parents

could not afford the medications that were prescribed for their children so the nurses recommended that the cost of medications should be integrated into the National Health Insurance Scheme (NHIS) so that most people will benefit. Previous studies showed that the cost of the medication could be a challenge as the topical creams cost about 5-10 Dollars (15-30 Ghana cedis) per dose (Taddio et al., 2010).

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

The chapter presents the summary of the entire research, conclusion, and implications of the findings to nursing practice, education, management, and research. The limitations, recommendations and suggestions for future studies are also presented.

6.1 Summary

Children on admission in healthcare settings are exposed to various painful procedures on daily basis and most of the pain associated with the procedures is inadequately managed. The consequences of this unrelieved pain could be both short and long term. This study therefore aimed to explore the perspectives of the nurses in the paediatric wards on invasive procedural pain management among paediatric patients. The study employed the qualitative interpretive design. A semi-structured interview guide was developed using the objectives of the study and the theory of planned behaviour. Nurses who worked at the four paediatric units of the Regional Hospital, Koforidua were purposively sampled for the study. Saturation was achieved at the sixteenth participant. Thematic content analysis was used to analyze the data. Five main themes emerged from the data which were knowledge and process of invasive procedures, attitudes towards invasive procedural pain management, subjective norms on invasive procedural pain management, intentions to manage invasive procedural pain, and perceived control about invasive procedural pain management, The findings showed that although the nurses had adequate knowledge about the types of invasive procedures, expression of pain, non-pharmacological management of invasive procedures, and the

effects of unrelieved pain, they lacked knowledge on the use of assessment scales to assess invasive procedural pain and also pharmacological management of invasive procedural pain in children. In spite of the fact that the nurses had inadequate knowledge about pharmacological strategies such as the use of topical medications for the management of invasive procedural pain, they had both positive and negative attitudes and beliefs towards its use. While some believed that the procedural pain was unbearable to the children and therefore the need to be managed, other nurses also thought that the children exaggerated and that pain was a normal phenomenon. Also, the nurses believed that medications could have side effects on the children and this could cause the children to be addicted.

The nurses were also ready to manage the pain since the parents and significant others such as doctors, matrons, and hospital managers expected them to manage the pain, however, other nurses were not motivated to administer because they thought the doctors did not expect the pain to be managed. Yet other nurses went ahead, prescribed and administered the medications without the knowledge of the doctors. Most of the nurses showed favorable intentions to manage the invasive procedural pain as they showed commitment and desire to use the topical creams. Others too expressed unfavorable intentions to manage the invasive procedural pain as they thought they were helpless and also it is a waste of money.

The nurses stressed that parental support and continuous professional development, and personal initiative of nurses could facilitate effective management of invasive procedural pain. On the other hand, barriers such as lack of knowledge, shortage of staff, lack of policies and facilities, and cost implications needed to be addressed. The findings were consistent with the theory of planned behaviour which explained that a person who holds strong beliefs and positively valued outcomes will result in performing

the behaviour whiles a person who holds strong beliefs and negatively valued outcomes will not perform the behaviour (Montano & Kasprzyk, 2008).

6.2 Implications for Nursing

The findings from the study had implications to nursing practice, education, management, and research.

6.2.1. Nursing practice

The findings of the study showed that nurses had both positive and negative attitudes and beliefs towards invasive procedural pain management. To ensure that the nurses manage the pain, the ward manager should reinforce the positive attitudes and identify negative attitudes and beliefs that the nurses attach to invasive procedural pain management and intervene. Then the policies and protocols; World Health Organization (WHO) and Ministry of Health (MOH) about procedural pain management should be posted on the ward so the nurses are always reminded to manage the pain. Routine supervision by the nurse managers could also motivate the nurses to manage procedural pain effectively.

6.2.2. Nursing Education

The study pointed out that the nurses did not have adequate knowledge about invasive procedural pain management. Therefore, tutors in the training colleges should be encouraged to teach pain management when teaching other courses. Also, the curriculum designers for nursing programmes could design a credit bearing course in pain management for trainee nurses and also as a specialist course for already qualified professional nurses.

6.2.3. Nursing management

The findings showed that nurses had both favourable and unfavourable intentions to manage invasive procedural pain in children, managers of the hospital and nurse managers should make procedural pain management a priority in the paediatric units since that would motivate the nurses. Also, there should be constant dissemination of information on pain management to the nurses so they can be abreast with new knowledge in pain management. Logistics should also be available and readily accessible for use since the findings showed that some nurses believed that even if the logistics were available they may not have access to them since the ward managers will keep them in lockers.

6.2.4. Nursing Research

This study illuminated the fact that pharmacologic procedural pain management was not routinely performed in the paediatric units and therefore the children were exposed to preventable pain. There was therefore the need for further studies on the perspectives of other health care professionals such as doctors, biomedical scientists, and pharmacist. Also, an intervention study could be conducted to determine which procedural pain management strategy is most appropriate in procedural pain management in children.

6.3 Limitations of the study

The study was conducted in one regional hospital in the southern part of Ghana where Christianity is predominant. Therefore another study can be conducted at the northern part of Ghana to compare the findings there may be differences in the cultural and religious beliefs could affect the responses of participants.

6.4 Reflections about the study

During the process of data collection, the researcher saw that most of the nurses were passionate about the effects of unrelieved pain on the children as they shared their personal experiences. However, other nurses were indifferent as they thought that the pain was normal. Apart from the nursing care given to the children, the nurses also used their own resources to provide non-pharmacological items for the children so they could perform the procedures. Most nurses expressed mother care as they thought the pain could be prevented. Also, the findings showed that attitudes and beliefs are strong factors in decision-making despite the presence or absence of knowledge.

6.5 Conclusion

Nurses have various attitudes and beliefs about invasive procedural pain management among paediatric patients. The study explored the perspectives of nurses towards invasive procedural pain management among paediatric patients. Although the nurses had knowledge about the non-pharmacological management of invasive procedural pain, they had inadequate knowledge about pharmacological strategies such for the management of invasive procedural pain. However, the nurses were committed to use the medications to manage the pain if an available while other nurses thought it was a waste of time and money. There is therefore the need to change the negative attitudes of the nurses so they will manage the pain effectively. The findings were consistent with the theory of planned behaviour as data was obtained for all the constructs of the theory. The theory therefore, helped to identify the areas that the nurses had challenges so that interventions could be developed to meet those challenges.

6.6 Recommendations

The following recommendations were made to regulatory bodies, interest groups and the management of the hospital.

6.6.1. To Nursing and Midwifery Council of Ghana (NMC)

The curriculum designers of NMC should be committed to integrate pain management into the already existing curricula for the trainee nurses and also design a specialist curriculum in pain management for professional nurses who are working.

6.6.2. To Ghana Registered Nurses Association (GRNA)

The leadership of the Ghana Registered Nurses' Association can also assist by sponsoring continuous professional development in pain assessment and management for its members. They should also advocate for the use of logistics and visit the health institutions to evaluate the education provided.

6.6.3. To management of the hospital

The managers of the hospital should treat pain management as a priority area in the care of its patients and ensure that logistics are readily available for the nurses to use to manage invasive procedural pain in the hospital.

REFERENCES

Abbaspoor, Z., Akbari, M., & Najar, S. (2014). Effect of foot and hand massage in post-cesarean section pain control: A randomized control trial. *Pain Management Nursing*, *15*, 132–136.

Aizen, I. (2002). Value based management [www.valuebasedmanagement.net]. Retrieved from www.valuebasedmanagement.net/methods_aizen_theory_planned_behaviour_html

Aizen, I. (2006). Theory of planned behaviour. Retrieved from http://prople.umas.edu/aizen/tpb

Akuma, A., & Jordan, S. (2012). Pain management in neonates: a survey of nurses and doctors. *Journal of Advanced Nursing*, *68*(6), 1288–1301.

Al-Qadire, M., & Al-Khalaileh, M. (2014). Jordanian Nurses knowledge and attitude regarding pain management. *Pain Management Nursing*, *15*, 220–228.

Anghelescu, D. L., Faughnan, L. G., Popenhagen, M. P., Oakes, L. L., Pei, D., & Burgoyne, L. L. (2014). Neuropathic pain referrals to a multidisciplinary pediatric cancer pain service. *Pain Management Nursing*, *15*, 126–131.

Aouad, M. T., Moussa, A. R., Dagher, C. M., Muwakkit, S. A., Jabbour-Khoury, S. I., Zbeidy, R. A., … Kanazi, G. E. (2008). Addition of ketamine to propofol for initiation of procedural anaesthesia in children reduces propofol consumption and preserves hemodynamic stability. *Acta Anaesthsiologica Scandinavica*, *52*, 561–565.

Aziato, l., & Adejumo. (2014a). The Ghanaian surgical nurse and postoperative pain management: A clinical ethnographic insight. *Pain Management Nursing*, *15*, 265–272.

Aziato, L., & Adejumo, O. (2014b). Determinants of nurses' knowledge gap on pain management in Ghana. *Nurse Education in Practice*. Retrieved from http://www.sciencedirect.com/science/article/pii/S1471595313001637

Babbie, E. (2005). T*he basics of social research* (3rd ed.). California: Thomson Wadsworth.

Babl, F. ., Mandrawa, C., O'Sullivan, R., & Crellin, D. (2008). Procedural pain and distress in young children as perceived by medical and nursing staff. *Pediatric Anesthesia*, *18*, 412–419.

Baulch, I. (2010). Assessment and management of pain in the pediatric patient. *Nursing Standards*, *25*, 35–40.

Bice, A. A., Gunther, M., & Wyatt, T. (2014). Increasing nursing treatment for pediatric procedural pain. *Pain Management Nursing*, *15*, 365–379.

Bisognis, I (2014). Cross-sectional study on differences in pain perception and behavioural distress during venipuncture between Italian and Chinese children.

Brand, K., & Court, C. (2010). Pain Assessment in Children. *Paediatric Anaesthesia*, 214–216.

Brennan, F., Carr, D., & Cousins, M. (2007). Pain management, a fundamental human right. *Anaesthesia &Analgesia*, *105*(1), 205–221.

Brorson, H., Plymouth, H., Ormon, K., & Bolmsjo, I. (2014). Pain relief at end of life: Nurses' experiences regarding End-of-Life pain relief in patients with dementia. *Pain Management Nursing*, *15*, 315–323.

Brummelte, S., Grunau, R. E., Chau, V., Poskitt, K. J., Brant, R., Vinall, J., … Miller, S. P. (2012). Procedural pain and brain development in premature newborns. *Annals of Neurology*, *71*, 385–396.

Carbajal, R., Biran, V., Lenclen, R., Epaud, R., Cimerman, P., Thibault, P., … Fauroux, B. (2008). EMLA Cream and Nitrous Oxide to alleviate pain induced by Palivizumab (Synagis) intramuscular injections in infants and young children. *Pediatrics*, *121*, 1591–1598.

Coyne, I., & Scott, P. (2013). Alternatives to restraining children for clinical procedures. *Nursing Children and Young People*, *26*(2), 22–27.

Creswell, J. W. (2014). *Research Design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles: Sage.

Curtis, S., Wingert, A., & Ali, S. (2012). The Cochrane Library and procedural pain in children: an overview of reviews. *Evidenced-Based Child Health*, *7*, 1363–1399.

Czarnecki, M. ., Turner, H. ., Collins, P. ., Doellman, D., Wrona, S., & Reynolds, J. (2011). Procedural pain management: a position statement with clinical recommendations. *Pain Management Nursing*, *12*(2), 95–111.

Czarnecki, M. L., Salamon, S., Thompson, J. J., & Hainsworth, K. R. (2014). Do barriers to Pediatric pain management as Perceived by Nurses Change over Time? *Pain Management Nursing*, *15*, 292–305.

Czarnecki, M. L., Simon, K., Thompson, J. ., Hanson, T. C., Berg, K. A., Petrie, J. L., … Malin, S. (2011). Barriers to pediatric pain management: A nursing perspective. *Pain Management Nursing*, *12*, 154–162.

Darawad, M. W., Al-Hussami, M., Saleh, A. M., & Al-Sutari, M. (2014). Jordanian patients' satisfaction with pain management. *Pain Management Nursing*, *15*.

Foster, J., Spence, K., Henderson-Smart, D., & Harrison, D. (2013). Procedural pain in neonates in Australia hospitals:a survey update of practices. *Journal of Paediatrics and Child Health*, *49*, E35–E39.

Franck, L. S., & Bruce, E. (2009). Putting pain assessment into practice: Why is it so painful? *Pain Research & Management*, *14*(1), 13–20.

Garra, G., Singer, A. J., Taira, B. R., Choham, J., Cardoz, H., Chisena, E., & Thode, H. C. (2009). Validation of the Wong-baker FACES Pain Rating Scale in pediatric emergency department patients. *Academic Emergency Medicine*, *17*, 50–54.

Grondin, F., Bourgault, P., & Bolduc, N. (2014). Intervention focused on the patient and family for better postoperative pain relief. *Pain Management Nursing*, *15*, 76–86.

He, H. ., Jahja, R., Lee, T. L., Ang, E. N. K., Sinnapan, R., Vehvilainen-Julkunen, K., & Chan, M. F. (2010). Nurses' use of non-pharmacological methods in children's postoperative pain management: educational intervention study. *Journal of Advanced Nursing*, *66*(11), 2398–2409.

Herrington, C. J., & Chiodo, L. M. (2014). Human touch effectively and safety reduces pain in the newborn intensive care unit. *Pain Management Nursing*, *15*, 107–115.

Holdershaw, J., Gendall, P., & Wright, M. (2011). Predicting blood donation behaviour: further application of the theory of planned behaviour. *Journal of Social Marketing*, *1*(2), 120–132.

Huth, M. M., Gregg, T. L., & Li, L. (2010). Education changes Mexican Nurses' knowledge and attitudes regarding pediatric pain. *Pain Management Nursing*, *11*, 201–208.

Jeffery, K. (2010). Supportive holding or restraint: terminology and practice. *Nursing Children and Young People*, *22*(6), 24–28.

Joung, K. H., & Cho, S. C. (2010). The effect of sucrose on infants during a painful procedure. *Korean Journal of Pediatrics*, *53*(8), 790. http://doi.org/10.3345/kjp.2010.53.8.790

Kautonen, T., Van Gelderon, M., & Tornikoski, E. T. (2013). Predicting enterpreneural behaviour: a test of the theory of planned behaviour. *Applied Economics*, *45*(6).

Kennedy, R. M., Luhmann, J., & Zempski, W. T. (2008). Clinical implications of unmanaged needle-insertion pain and distress in children. *Pediatrics*, *122*, 130–133.

Khan, J. A. (2012). *Research methodology*. New Delhi: A P H Publishing.

Klassen, J. A., Liang, Y., Tjosvold, L., Klassen, T. P., & Hartling, L. (2008). Music for pain and anxiety in children undergoing medical procedures: A systematic review of randomized controlled trials. *Ambulatory Pediatrics*, *8*, 117–128.

Kothe, E. J., Mullan, B. A., & Butow, P. (2012). Promoting fruit and vegetable consumption. testing an intervention based on the theory of planned behaviour. *Appetite*, *58*(3), 997–1004.

Kozlowski, L. J., Kost-Byerly, S., Colantuoni, E., Thompson, C. B., Vasquenza, K. ., Rothman, S. ., … Monitto, C. L. (2014). Pain Prevalence, Intensity, Assessment and Management in a Hospitalized Pediatric Population. *Pain Management Nursing*, *15*, 22–35.

Kusi, H. (2012). *Doing qualitative research- A guide for researchers*. Accra-New Town: Emmpong Press.

Lago, P., Boccuzzo, G., Pirelli, A., Pieragostini, L., Merazzi, D., & Ancora, G. (2013). Pain management during invasive procedures at Italian NICUs: has anything changed in the last five years? *The Journal of Maternal-Fetal and Neonatal Medicine*, *26*(3), 303–305.

Latimer, M. A., Johnston, C. C., Ritchie, J. A., Clarke, S. P., & Gilin, D. (2009). Factors affecting delivery of evidence-based procedural pain care in hospitalized

neonates. *Journal of Obstetric, Gynecologic, and Neonatal Nursing : JOGNN / NAACOG*, *38*(2), 182–194.

Leahy, S., Kennedy, R. M., Hesselgrave, J., Gurwitch, K., Barkey, M., & Millar, T. F. (2008). On the front lines: lessons learned in implementing multidesciplinary peripheral venous access pain-management programs in pediatric hospitals. *Pediatrics*, *122*, 161–170.

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. Beverly Hills, CA: Sage.

Lloyd, M., Law, G. ., Heard, A., & Kroese, B. (2008). When a child says "no": experiences of nurses' working with children having invasive procedures. *Paediatric Nursing*, *20*(4), 29–34.

Lui, L. Y. Y., So, W. K. W., & Fong, D. Y. T. (2008). Knowledge and attitudes regarding pain management among nurses in Hong Kong medical units. *Journal of Clinical Nursing*, *17*, 2014–2021.

Machintosh-Franklin, C. (2014). The Impact of experience on undergraduate pre-registration student nurses' responses to patients in pain: A 2-Year qualitative longitudinal study. *Pain Management Nursing*, *15*, 199–207.

Maclean, S., Obispo, J., & Young, K. . (2007). The gap between emergency department procedural pain management treatments available and actual practice. *Pediatric Emergency Care*, *23*, 87–93.

Marcoux, B. C., & Shope, J. T. (1997). Application of the Theory of Planned Behaviour to adolescent use and misuse of alcohol. *Health Education Research, Theory and Practise*, *12*, 323–331.

Mc Connon, A., Raats, M., Astrup, A., Bajova, M., Handjieva-Darlenska, T., Lindros, A. K., … Shepherd, R. (2012). Application of the Theory of Planned Behaviour to

weight control in an overwieght cohort. result from a pan-Europesn dietry intervention trial (DiOGenes). *Appetite*, *58*(1), 313–318.

McCarthy, M., Glick, R., Green, J., Plummer, K., Peters, K., Johnsey, L., & DeLuca, C. (2013). Comfort First: an evaluation of a procedural pain management programme for children with cancer. *Psycho-Oncology*, *22*, 775–782.

Mills, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook*. California: Sage Publications. Thousand Oaks.

Montano, D. E., & Kasprzyk, D. (2008). Theory of Reasoned Action, Theory of Planned Behaviour, and Integrated Behavioural Model. In *Health Behaviour and Health Education-Theory, Research, and Practice* (4th ed., pp. 67–96). San Francisco: John Wilet & Sons.

Morgan, B. D. (2014). Nursing attitudes toward patients with substance use disorders in pain. *Pain Management Nursing*, *15*, 165–175.

Nimbalkar, A. S., Dongara, A. R., Phatak, A. G., & Nimbalkar, S. M. (2014). Knowledge and attitudes regarding neonatal pain among nursing staff of pediatric department: An Indian experience. *Pain Management Nursing*, *15*, 69–75.

Olmstead, D. L., Scott, S. D., & Austin, W. J. (2010). Unresolved pain in children: A relational ethics perspective. *Nursing Ethics*, *17*, 695–708.

Ou-Yang, M., Chen, I., Chen, C., Chung, M., Chen, F., & Huang, H. (2013). Expressed breast milk for procedural pain in pre-term neonates: a randomized, double blind, Placebo-controlled trial. *Acta Paediatrica*, *102*, 15–21.

Park, S ., Bang, S., Nam, E., Cho, E., Shin, D. ., & Lees, J. (2008). A randomized double-blind placebo controlled study of low-dose intravenous Lorazepam to reduce procedural pain during bone marrow aspiration and biopsy. *Pain Medicine*, *9*(2), 249–252.

Pasero, C., Polomano, R. ., Portenoy, R. ., & McCaffery, M. (2011). *Pain assessment and pharmacologic management* (2nd ed.). St. Louis: Mosby Elsevier.

Pelling, E., & White, K. M. (2009). The theory of planned behaviour applied to young people's use of social networking websites. *Cyberpsychology and Behaviour*, *12*, 755–759.

Pichardo, D. (2010). Consequences in not treating pain in children. Retrieved November 9, 2013, from http://www.hcplive.com/conferences/painweek_2010/consequences_in_not_treating_pain_in_children

Plumridge, E., Goodyear-Smith, F., & Ross, J. (2009). Nurse and parent partnership during children's vaccinations: a conversation analysis. *Journal of Advanced Nursing*, *65*, 1187–1194.

Po, C., Benini, F., Sainati, L., Frigo, A. ., Cesaro, S., Farina, M. ., & Agosto, C. (2011). The opinion of clinical staff regarding painfulness of paediatric procedures in paediatric hematology-oncology: an Italian survey. *Italian Journal of Pediatrics*, *37*, 27.

Polit, D. F., Beck, C. T., & Hungler, B. P. (2001). *Essentials of nursing research, methods, appraisal, and utilization* (5th ed). Lippincott.

Puia, D., & McDonald, D. D. (2014). Older black adult osteoarthritis pain communication. *Pain Management Nursing*, *15*, 229–235.

Rawe, C., Trame, C. ., Moddeman, G., O'Malley, P., Biteman, K., Dalton, T., … Walker, S. (2009). Management of procedural pain: empowering nurses to care for patients through clinical nurse specialist consultation and intervention. *Clinical Care Specialist*, *23*, 131–137.

Sclenz, A. M., McClellan, C. B., Mark, T. R. M., McKelvy, A. D., Puffer, E., Roberts, C. W., … Schatz, J. C. (2012). Sensitization to acute procedural pain in pediatric Sickle Cell disease: Modulation by painful Vaso-occlusive Episodes, Age, and Endothelin-1. *Journal of Pain*, *13*.

Sinatra, R. (2010). Causes and consequences of inadequate management of acute pain. *Pain Medicine*, *11*(12), 1859–1871.

Stapelcamp, C., Carter, B., Gordon, J., & Watts, C. (2011). Assessment of acute pain in children: development of evidenced-based guidelines. *International Journal of Evidenced-Based Healthcare*, *9*, 39–50.

Stevens, B., Abbott, L. K., Yamada, J., Harrison, D., Stinson, J., Taddio, A., … Finley, G. A. (2011). Epidemiology and management of painful procedures in children in Canadian hospitals. *Canadian Medical Association Journal*, *183*(7), E403–E410.

Stevens, B., Riahi, S., Cardoso, R., Ballantyne, M., Yamada, J., Beyene, J., … Ohlsson, A. (2011). The influence of context on pain practices in the NICU: perceptions of health care professionals. *Qualitative Health Research*, *21*(6), 757–770.

Stinson, J, Yamada, J., Dickson, A., Lamda, J., & Stevens, B. (2008). Review of systematic reviews on acute procedural pain in children in the hospital setting. *Pain Research & Management*, *13*, 51–57.

Taddio, A., Appleton, M., Bortolussi, R., Chambers, C., Dubey, V., Halperin, S., … Shah, V. (2010). Reducing the pain of childhood vaccination: an evidence-based clinical practice guideline. *Canadian Medical Association Journal*, *182*(18), e843–e855.

Taddio, A., Chambers, C., Halperin, S. ., Ipp, M., Lockett, D., Reider, M. ., & Shah, V. (2009). Inadequate pain management during routine childhood immunizations: the nerve of it. *Clinical Therapeutics*, *31*, S152–S167.

Taddio, A., Shah, V., Atenafu, E., & Katz, J. (2009). Influence of repeated painful procedures and sucrose analgesia on the development of hyperalgesia in newborn infants. *International Association for the Study of Pain*, *144*, 43–48.

Taylor, E., Boyer, K., & Campbell, F. (2008). Pain in hospitalized children: a prospective cross-sectional survey of pain prevalence, intensity, assessment and management in a Canadian pediatric teaching hospital. *Pain Research and Management*, *13*(1), 25–32.

Thomlinson, D., Von Bayer, C. L., Stinson, J., & Sung, L. (2010). A systematic review of Faces Scales for the self-report of pain intensity in children. *Pediatrics*, *126*, e1168–e1198.

Tse, M. M. Y., & Ho, S. S. K. (2014). Enhancing knowledge and Attitudes in pain Management: A pain Management Education program for Nursing Home Staff. *Pain Management Nursing*, *15*, 2–11.

Tufekci, F. G., Celebioglu, A., & Kucukoglu, S. (2008). Turkish children loved distraction: kaleidoscope to reduce perceived pain during venipuncture. *Journal of Clinical Nursing*, *18*, 2180–2186.

Twycross, A. (2008). Does the perceived importance of a pain management task affect the quality of children's nurses' post-operative pain management practices? *Journal of Clinical Nursing*, *17*, 3205–3216.

Twycross, A. (2010). Managing pain in children: where to from here? *Journal of Clinical Nursing*, *19*, 2090–2099.

Twycross, A., & Collins, S. (2013). Nurses' views about the barriers and facilitators to effective management of pediatric pain. *Pain Management Nursing*, *14*, e164–e172.

Uman, L. S., Chambers, C. T., McGrath, P. J., & Kisely, S. (2008). A systematic review of randomized controlled trials examining psychological interventions for needle-related procedural pain and distress in children and adolescents: An abbreviated Cochrane Review. *Journal of Pediatric Psychology*, *33*, 842–854.

Vaartio, H., Leino-Kilpi, H., Suominen, T., & Puukka, P. (2008). The content of advocacy in procedural pain care-patients' and nurses' perspectives. *Journal of Advanced Nursing*, *64*(5), 504–513.

Verghese, S. ., & Hannallah, R. . (2010). Acute pain management in children. *Journal of Pain Research*, *3*, 105–123.

Ware, L. J., Bruckenthal, P., Davis, G. C., & O'Conner-Von, S. (2011). Factors that influence patient advocacy by pain management nurses: results of the American Society for Pain Management Nursing survey. *Pain Management Nursing*, *12*, 25–32.

Wysong, P. R. (2014). Nurses' beliefs and self-reported practices related to pain assessment in nonverbal patients. *Pain Management Nursing*, *15*, 176–185.

Zhang, C. H., Hsu, L., Zou, B. ., Li, J. F., Wang, H. Y., & Huang, J. (2008). Effects of a pain education program on nurses' pain knowledge, attitudes and pain assessment practices in China. *Journal of Pain and Symptom Management*, *36*, 616–627.

APPENDIX A: BACKGROUND INFORMATION FORM

A. Demographic Information

Code number ……..

1. Age 21-29 ( ), 30-39 ( ), 40-49 ( ), 50-59 ( )
2. Sex ……
3. Ward……..
4. Specialty……
5. Number of years of experience…….
6. Marital status ……..
7. Number of children ……..
8. Residence …….
9. Nationality …….
10. Tribe …….
11. Language (s) spoken …….
12.
13. Religion ……

APPENDIX B: INTERVIEW GUIDE

B. Guiding Questions

1. Please can you tell me about pain in children?

   Probe

   Signs and symptoms, causes, effect, cultural beliefs.

2. What can you say about procedural pain management in children?

   Probe

   Assessment (rating scales), Management: pharmacological, pharmacological.

3. What role do you think others can play in managing procedural pain paediatric patients?

   Probe

   Mothers, doctors, other health professionals

4. What do you think may make it possible for you to manage procedural pain in children?

   Probe

   Teamwork, logistics, policies, guidelines, others.

5. What do you think may hinder your ability to manage procedural pain in children

   Probe

   Teamwork, logistics, policies, others

6. Is there anything else you will like to tell me?

APPENDIX C - INDIVIDUAL CONSENT FORM

CONSENT FORM

Title: Nurses Perspectives on Invasive Procedural Pain among Paediatric Patients at the Regional Hospital, Koforidua.

Principal Investigator: Oboshie Anim-Boamah,

School of Nursing, College of Health Sciences, University of Ghana.

General Information about Research

This study involves the interview of nurses who have been managing paediatric patients who are exposed to painful invasive procedures in the paediatric settings of the Regional Hospital, Koforidua.

I will like to seek your views on invasive procedural pain among paediatric patients on your ward. Your views will be sought on areas such as knowledge, attitudes and beliefs, and factors that may enhance or prevent you from effectively managing invasive procedural pain in a paediatric patient on your ward. The information that will be collected will help generate an in-depth understanding of nurses' views on these areas.

I will have a conversation with you which will last for about forty five to sixty minutes in the English language. There is no wrong or right answer and therefore you should be free to share your views on the questions posed to you. The interview will be related to your views about Invasive procedural pain management in paediatric patients on your ward. You will be asked to sign a consent form before the study interview begins. Your permission will also be sought so that the interview will be recorded.

Possible Risks and Discomforts

It is not expected that your participation in this study will expose you to any harm; however, if during the interview you become emotional as a result, the researcher will direct you to the specialist counsellor for support at no cost to you.

Possible Benefits

You may not have a direct benefit at the moment; however, your participation in this study will enable the researcher to understand the feelings of nurses about the management of procedural pain in paediatric patients. It will also expose the perceived factors that enhance or mitigate the effective management of procedural pain in paediatric patients among nurses in the paediatric setting. The study may therefore help

in planning an effective intervention to assist the nurses in managing procedural pain effectively among the paediatric patients.

Confidentiality

Although the conversation between you and I will be recorded, your name and any other information that shows the identity of others will be deleted. However, you will be given a code number or pseudonym that will be attached to the information you give during the interview. The only other people who can have access to the information will be my supervisors.

Compensation

You will be provided with a snack at the end of the interview.

Voluntary Participation and Right to Leave the Research

Your participation in this study is voluntary and therefore, you have the right to withdraw from the study at any point in time without giving any explanation.

Contacts for Additional Information

If you have any challenges or questions, Please contact any of the following:

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Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research (NMIMR-IRB). If you have any questions about your rights as a research participant you can contact the IRB Office between the hours of 8am-5pm through the landline 0302916438 or email addresses: nirb@noguchi.mimcom.org

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research title ***(***: Nurses Perspectives about Invasive Procedural Pain among Paediatric Patients at the Regional Hospital, Koforidua) has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

_____ _____

Date Name and signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

_____ _____

Date Name and signature of witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

_____ _____

Date Name Signature of Person Who Obtained Consent

APPENDIX D: GENERAL PROFILE OF PARTICIPANTS

Name	Age	Sex	Ward	Specialty	Marital status	No. of children	Duration of work	Tribe
Dufie	30-39	female	Surgical	General Nurse	Married	one	Six months	Akan
Asaa	21-29	female	Surgical	General nurse	Single	none	Six months	Akan
Asantewaa	50-59	female	OPD	General nurse	Single	two	16 years	Akan
Nene	21-29	male	NICU	General nurse	Single	none	Two years	Krobo
Kafui	30-39	female	Surgical	General nurse	Married	two	Two years	Ewe
Dzigbordi	21-29	female	surgical	General nurse	Married	one	Two years	Ewe
Tetteh	21-29	male	Kids ward	General nurse	Single	none	Six years	Adangme
Boatemaa	21-29	female	Kids ward	General nurse	Single	none	One year	Akan
Aboagye	21-29	male	Surgical ward	General nurse	Single	none	Two years	Akan
Mamle	30-39	female	NICU	General nurse	Married	three	Ten years	Krobo
Sakyibea	40-49	female	Kids ward	Paediatric nurse	Married	three	Fifteen years	Akan
Dzifa	21-29	female	OPD	General nurse	Married	one	Five years	Ewe
Awukuwaa	21-29	female	OPD	General nurse	Married	two	Six months	Guan
Boamaa	40-49	female	Surgical	General nurse	Married	three	Twenty three years	Akan
Sefarkor	40-49	female	Surgical	Midwifery	Married	three	Twenty four	Ewe
Adobea	21-29	female	NICU	General nurse	Married	one	One year	Akan

APPENDIX E: SUMMARY OF THEMES

THEMES	SUBTHEMES
Knowledge and process about invasive procedural pain	**Types of invasive procedures** • Traumatizing • Non-traumatizing **Expression of pain** • Verbal • Non-verbal **Pain management strategies** • Pain assessment • Non-pharmacological • pharmacological **Effect of unrelieved pain** • Exhaustion of child • Fear and withdrawal • Parental agitation • Effects on nurses
Attitudes towards invasive procedural pain	**Positive attitudes** • existence of pain • necessity of pain management • reduction of pain • ease of work • cordial relationship **Negative attitudes** • pain as a normal phenomenon • exaggeration • status quo • fear of side effects • abuse of medication/abuse
Subjective norms about invasive procedural pain	**Positive subjective norm** • expectations from significant others **Negative subjective norm** • doctors' prescription pattern **Neutral subjective norm** • advocacy by nurses
Intentions to manage invasive procedural pain	**Favourable intentions** • empathy, commitment, • Desire to manage procedural pain **Unfavorable intentions** • helplessness • time factor

Perceived control about invasive procedural pain management	**Perceived facilitators** • parental support • continuous professional development • personal initiative **Perceived barriers** • lack of knowledge • shortage of staff • lack of policies and facilities cost implications)

APPENDIX F - ETHICAL APPROVAL LETTER

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH
Established 1979
A Constituent of the College of Health Sciences
University of Ghana

INSTITUTIONAL REVIEW BOARD

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+233-289-522574
Fax: +233-302-502182/513202
E-mail: nirb@noguchi.mimcom.org
Telex No: 2556 UGL GH

Post Office Box LG 581
Legon, Accra
Ghana

My Ref. No: DF.22
Your Ref. No:

10th June, 2014

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 **IRB 00001276**

NMIMR-IRB CPN 095/13-14 **IORG 0000908**

On 10th June, 2014, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) conducted expedited review and approved your revised protocol titled:

TITLE OF PROTOCOL : **Nurses' Perspectives on Invasive Procedural Pain among Paediatric Patients at the Regional Hospital, Koforidua**

PRINCIPAL INVESTIGATOR : **Oboshie A. Boamah, MPhil Cand**

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 9th June, 2015. You are to submit annual reports for continuing review.

Signature of Chair: .....
Mrs. Chris Dadzie
(NMIMR – IRB, Chair)

cc: Professor Kwadwo Koram
Director, Noguchi Memorial Institute
for Medical Research, University of Ghana, Legon

APPENDIX G: INTRODUCTORY LETTER TO HOSPITAL

SCHOOL OF NURSING
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA
LEGON

Telephone: 021-513255 (Dean)
Ext. 6206
021-513250 } Secretary
028 9531213
Fax: 513255
E-mail: nursing@ug.edu.gh

P. O. Box LG 43
LEGON, GHANA

Our Ref: SON /F11
Your Ref:

August 11, 2014

The Regional Hospital
Koforidua
E/R

Dear Sir,

INTRODUCTORY LETTER

I write to introduce to you Oboshie Anim-Boamah, an M'Phil student of the University of Ghana, School of Nursing. She is seeking your permission to collect data for her research on the topic **"Nurses' perspectives on Invasive Procedural Pain among Paediatric Patients at the Regional, Koforidua."**

I would be grateful if you could kindly assist her with the information that she may require for her thesis.

Thank you.

Yours faithfully,

Permission granted
13/08/14

Dr. Lydia Aziato
LECTURER

APPENDIX H: PERMISSION LETTER TO THEORIST

oboshie anim-boamah
To
Icek Ajzen
Apr 29

I am a graduate student pursuing an MPhil in Nursing at the University of Ghana , Legon, West-Africa.
my thesis on nurses' perspectives about invasive procedural pain management among paediatric patients in Eastern Ghana.
it is expected that their perspectives will determine their intentions to either manage the pain or not. We are required to use a theory to guide the study and i found the theory of planned behaviour as the most appropriate for the study.
i therefore wish to ask for your permission to use the theory for my research.
Counting on your consideration, Thank you very much.
Sincerely yours,
Oboshie Anim-Boamah
School of Nursing
College of Health Sciences
University of Ghana
Icek Aizen
To
'oboshie anim-boamah'
Apr 29

Dear Oboshie Anim-Boamah,

The theory of planned behavior is in the public domain. No permission is needed to use the theory in research, to construct a TPB questionnaire, or to include an ORIGINAL drawing of the model in a thesis, dissertation, presentation, poster, article, or book. If you would like to reproduce a published drawing of the model, you need to get permission from the publisher who holds the copyright. You may use the drawing on my website (http://people.umass.edu/aizen/tpb.diag.html) for non-commercial purposes, including publication in a journal article, so long as you retain the copyright notice.

Best regards,

Icek Ajzen

Professor Emeritus

University of Massachusetts – Amherst

http://www.people.umass.edu/aizen