



NON PHARMACOLOGICAL PAIN MANAGEMENT FOR CHILDREN IN POSTOPERATIVE CARE.

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The purpose of this study work was to describe the non-pharmacological pain relief methods which can be used for post-operative care in paediatric patients, and how non-pharmacological pain management is used with pediatric patients. Nurses and parents are playing vital roles in the recovery of pediatric patients by using non pharmacological methods which shall be explored in this thesis. This study also aims at telling the non-pharmacological methods of pain management in paediatric surgical care. Exploring also limitations, argumentation, and recommendation to this research theme which in future might be a developmental care plan and strategy for the improvement of pain care.

The theoretical background information for this study comprises of pain concept, factors affecting pain, classification of pain, post-operative management and the non-pharmacological pain management concepts for pediatric patients.

This study was done by content based analysis literature review method and the purpose of the research is to describe ten articles and one book using the deductive method reviewed and critically proven. The research reviewed in this thesis is from reliable databases, e-journals and reliable text books.

The result of the literature showed that non-pharmacological methods can be used to manage postoperative pain for paediatrics care the literatures identifies the use of non-pharmacological method to aid the care of paediatrics such as use of psychological, emotional and physical pain relieving methods.

Keywords: Non-pharmacological pain management, pediatric patient, acute pain, Post-operative care, children,pain,study

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1 INTRODUCTION

The motivation for this study was influenced by writers experience in the pediatric post-operative care unit. The practice experiences necessitated this study and learning more about pain management in paediatrics found out that non-pharmacological methods were not commonly used in comparison with pharmacological methods. Non-pharmacological methods proved a success when they were used alone or when they were combined with pharmacological methods, however study shows that experienced nurses were likely to use it more.

Children's pain is so difficult and challenging especially during childhood, for this reason the approach to the treatment of pain must be multi-modal, including the use of pharmacological and non-pharmacological methods. Children's lives are non medical and in need of therapeutic services which address the psychological, social and intellectual needs of paediatric patient. Children's pain hasn't been catered for adequately, although this study focuses on acute pain related to children. Children are mostly disturbed before and after surgery for the fear of pain and distress, (Owens et al 2014; 34-40).

The major aim of pain treatment is to eliminate pain-related suffering. Pain as a subjective experience and should be assessed and treated appropriately to reduce this stress. Pain has sensory, emotional, cognitive, and behavioural components that are connected with the environmental, developmental, sociocultural, and contextual factors. Assessment of pain and the evaluation of pain methods are considered as important as the pain in the child too. This will aid nurses to know how to help pediatric patients to control pain and put everything under control. (Tumalad C. Brennan P. 2010).

A study reported that in real life children receive less analgesic than adult due to lack of knowledge in clinical practices such as dosages, pain evaluation, fear of harming child and insufficient monitoring. These on the other hand cause physical and psychological stress for child resulting to long-lasting memory of pain in children care later in life. A standardized pain concept is therefore required for children pain care such as pain measurement scale, constant pain documentation and non-pharmacotherapy and pharmacotherapy plan (Messerer B et al 2010).

This study will show non-pharmacological techniques in paediatrics pain alleviation. It is important to understand how to recognize children's pain also as the cognitive and developmental skills differs with every child. (Simona C 2010; 44- 73).

Acute pain experiences are also frequent over the course of a child's development, from routine immunizations to everyday living course. Painful experiences for children if not serious allow parents to take the role of assessing their child's pain and provide comfort and treatment. When a child is seriously hurt and must be assessed and treated by professionals, parents are typically present and are frequently called upon to provide information regarding their child's pain (Erin C 2008). Children have different pain thresholds for example one child might feel pain when injured while the other just laugh and feels like nothing has happened at all during the incident. Children are difficult to assess as they cannot define or express their feelings as little ones, they just aren't comfortable and restless. Nurses or other health professionals are unable to evaluate the children's pain intensity for this reason.

A good preoperative care must have started before the child has gone for surgical procedure because at this stage, pre-operative care does have a great effect on the post-operative care either negatively or positively, it helps to minimize and manage risk factors after surgery that is pain. (AAP 2001:3,793-7).

Surgical pain is usually a short time experience, however, post-operative care management if not adequately controlled can produce in children high levels of fear and anxiety, which can influence the experiences the child will have in the future with healthcare professionals.

Nurses in pediatric wards are professionals trained to help children and their families in navigating and adjusting to pediatric healthcare experiences of this kind most especially those with procedural situations thereby reducing the stress attached to procedure and hospital environment. (Nancy F, 2008; 320-329). Nursing staff also lack training and skills, particularly in the area of non-pharmacological approaches to procedural pain management making it more challenging for them to meet up with vital needs in their care plans.

Another challenge also is parents' knowledge and opinion about giving opioid particularly dosages and its effect on the children is highly demanding for them. The issue of tolerance, addiction and physical dependence arises. Majority of parents believe that their children cannot tolerate the level of pain behind the procedure going on and that respiratory depression and confusion might set in after procedure leading to dependency in some drugs use.

Parental participation has become routine in many hospitals in Europe and parents are encouraged to participate more fully in the care of their children. Therefore as nurses or health care professionals, it's a necessity to care for children's pain and reduce it as much as possible especially before, during and after a surgical procedure has been carried out. (Stephanie D et al 2008; 321-326).

Parents also should be educated and informed about their expectations and how to handle situation with children at this point of care since they are the closest with the child, this is more comforting and homely for the child. In recent years, support activities such as Clowns, musicians and animals and little handicrafts rooms have been placed in children wards in pediatric hospitals and have actively involved the therapeutic process of the child care plan; this has

influenced distraction which has led to reduction of pains in hospitalized children. (Australia Emergency Nursing Journal, June 2009 Vol 17 issue 3, pg. 12-17).

2 PURPOSE OF STUDY AND RESEARCH QUESTIONS

The specific purpose of this study is to describe the non-pharmacological pain relief methods which can be used for post-operative pediatric patients, alleviation of pain and how non-pharmacological pain management can be effective to pediatric patients.

The aim of this study is to help nurses review and discover how to manage the care of children with pain via non-pharmacological method and techniques.

The task for this study is to find out:

1. What are the non-pharmacological pain intervention techniques?
2. What are the barriers encountered while using non-pharmacological pain management for paediatrics?

3. CONCEPTUALIZING PAIN

Conceptualizing pain explains the concept of pain, pediatric patient, postoperative pain, pain management, non-pharmacological pain management and pain scales.

3.1 Definition of Pain

Pain is personal and subjective phenomena unique to every individual. According to the Association For the study of pain (2010) “An unpleasant sensory and emotional experience associated with actual potential damage”. (IASP, 2010). Pain is whatever the experiencing person says it is, existing whenever they say it does Pain is a physiological as well as psychological phenomenon (Michael L.et al 2008 29-34). The Association of Paediatrics Anaesthetists (2008) recommends that pain management is planned and takes into account the age and developmental stage of the child, and the differences in responses to pain and analgesia across childhood and between individuals (Shrestha-Ranjit and Manias 2010).

3.1.1 Factors Affecting Pain

Gender according to earlier study has noted and recognized that females suffer more pain than males. Age is a key factor in children developmental stages. Children differ in ages as they grow which also does have a vital impact in the recognition of pain such as infant, toddlers, school ages, adolescent until they grow to young adults usually between ages 0-18 years. This factor has to be properly assessed in relevance with children's age groups. (Hall-Lord and Larsson 2006)

Culture plays a role in children pain as cultural difference does affect pain in children as some culture pain is normal way of life and its part of growth and development. Previous experience that is pain is subjective to individual experiencing it inclusive of individual coping skills being the predominant one. (Hall-Lord and Larsson Shaw 2006).

Psychologically organisms respond to external and internal stimuli. Human behavioural or physiological responses could be adaptive or maladaptive .Pain is a nociceptive stimulus usually a driving force which leads individual to seek treatment when they ache, hurt or suffer. Pain alters ones psychological state of being. Physical and emotional pain exist on the same continuum.(Borsook et al,2007; Elman et al ,2011; Perl 2007).Common brain network is involved (Bendelow and Williams, 2008).Cognition is the act of knowing and includes awareness ,perception, reasoning and judgement(Van der Meer et al,2012).Pain therefore has a negative effect on cognitive performance and process attention in children.

Complex combination of factors denotes that it is impossible to prejudge or identify amount of pain an individual experiences following any surgical procedure. Lack of correlation between tissue damage and physical pain means that every experience of pain for each person can only be assessed and managed at individual level (Middleton 2004, Sloman et al 2005). Documentation is important as it helps in knowing which methods work best for the pediatric patient. Child and parental expectations had a positive impact as parents and children appeared satisfied with the quality of the pain care provided even though the child was perceived to be in severe pain. Parents were generally satisfied with nurse's stabilization of pain. A mother interviewed about her child's pain was satisfied about her child's pain management, as the nurses had managed the pain well. (Alison and Twycross, 2013).

3.1.2 Classification of Pain

Scientifically and medically, Pain has been classified as Acute and chronic (Clark, 2013, 3). The main difference between acute and chronic pain is the pain duration and causative effect. Acute pain can be described as pain of sudden onset usually as a result of a clearly defined cause.

Chronic pain on the other hand is usually associated with an underlying condition, which may persist for weeks or months (M. Stöppler, 2012).

Pain is a multidimensional phenomenon and should be considered from physiological, psychological and experimental due to different stages of development. Young children have difficulty verbalizing or communicating pain (Nursing Standard 2010 Vol25 issue 1 p 36-39).

Children of normal cognitive development are able to describe their pain (Pölkki et al 2003, Pederson et al. 2000) even at the age of 3 years. Children are therefore able to describe where pain comes from. Emotions are psychological responses to pain and can be perceived similar to physical pain. Relationship between anxiety and pain is reciprocal Peterson et al. (1991). Fear can cause more physical and emotional discomfort than the stressful stimulus itself. Older children tend to hide their pain and are reluctant to ask for help from healthcare providers in painful situations. (International Journal of Nursing Studies 44 (2007) 869–881).

3.1.3 Postoperative Pain

Postoperative pain consists of acute pain which is as a result of tissue damage caused by surgery. Individuals who have undergone surgery usually feel a lot of pain after the operation when anaesthesia is wearing off. Pain is present on the

first and second postoperative days, which later decreases (Salomäki et al. 2001). The experience of pain is common among children undergoing surgery (Gillies et al 2001) Gauthier et al. (1998) found that 46% of the children reported severe pain after surgery. (Vasey 2014, 13).

Factors that affect intensity of postoperative pain include severity of the operation procedure and the anaesthesia and analgesics administered (Salomäki et al. 2001) other factors include physiological, psychological and experiential aspects in the individual's pain experience Inadequate assessment and management of post-operative pain can lead to consequences such as sleep disturbance, difficulty in mobilization, restlessness aggression, irritability, raised level of anxiety most importantly lead to unnecessary level of distress and suffering (Sjostrom et al 2000, Machintyre and Ready 2002, Carr et al 2005). Poorly assessed postoperative pain could lead to Physiological effects on patients which can lead to complications and delayed discharge. (Sjostrom et al 2000, Macintyre and Ready 2002).

3.1.4 Pain Management

Pain management refers to using the processes of nursing that is assessment, planning, implementation and evaluation in treatment of pain. Unrelieved pain can lead to a number of undesirable physical and psychological consequences. Children's memories of pain also influence subsequent pain experiences (Noel et al 2012). Pain affects children's anxiety, mood and general quality of life (Schanberg et al. 2003; Martin et al 2007). Post-operative management interventions include Pharmacological and Non-Pharmacological Methods.

Poor management of children's postoperative pain could be due to inadequate pain medication and non-pharmacological methods used on pediatric patients. The use of pain medication is effective in treatment of pain. Pain is beyond sensory experience that's why non-pharmacological treatment plays a big role

in paediatrics patient's care together with medications. Analgesic medications alone cannot adequately reduce or eliminate pain due to complex and multidimensional nature of pain. Emotions in children such as fear and anxiety can cause more physical and emotional discomfort than the stressful stimulus itself (Ahola et al, 2012)

Pharmacological interventions include use of opioid, while non-pharmacological that is physiological measures include positioning of patients, music and relaxation, healthcare professional's tone we will discuss more about the physiological and psychological that is the non-pharmacological method. (He et al 2011)

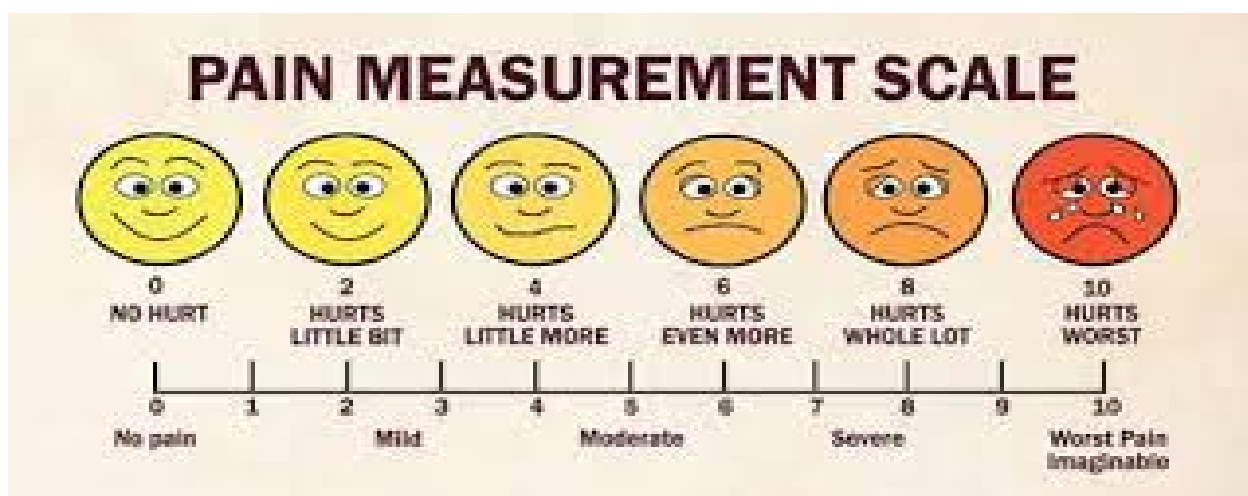
3.1.5 Non-Pharmacological Method

Non-pharmacological pain management is a method which uses other methods to manage pain with exemption of drugs. Methods used in non-pharmacological methods include, cognitive-behavioural methods, psychological methods, emotional support, physical methods and creation of a comfortable environment. The above named methods are opened and discussed more in this study. Barriers are factors that inhibit use of non-pharmacological methods. In our study we will focus on nurse's use of non-pharmacological methods and factors which inhibit use of the method. Barriers were included in our study so as to help nurses and nurse managers to be able to identify factors which prevented use of non-pharmacological methods hence allowing improvement for the method. Non-pharmacological methods make pain more tolerable and give children a greater sense of control over painful situation (Cignnacco et al, 2010). Selected non-pharmacological methods tend to change patient's perception of pain and alter pain behaviour; Methods like imagery and distraction affect pain perception by giving less attention or focus available to perceive pain hence altering or suppressing painful sensations. Nurse's role in

management of pain is important as they are the individuals that take care of hospitalized children whereby implementation of non-pharmacological methods is used. (Howard et al, 2010).

3.1.6 Pain Scales

Pain scales have been developed to help patient quantify pain intensity and current, evidence shows numeric, verbal, and facial scales are reliable and valid tools for pain intensity assessment (Hadjistavropoulos et al, 2007). Pain intensity has been measured by instrument such as Numeric rating scale NRS, verbal descriptor scale VDS and facial pain scales FPS as shown in the graph 1 below.



Graph 1: Pain measurement Scale.

<http://www.crdamc.amedd.army.mil/surgery/child6.aspx>

Earlier research showed that NRS, VDS ad FPS were preferred scales for older adults including those with mild to moderate cognitive impairment while Visual analogue scale(VAS) selected by researchers due to its high sensitivity was

least preferred due to higher error rates (Chibnall & Tait, 2001; Gagliese, Weizblit, Ellis & Chan, 2005). In earlier researches, it has been noted that pain management is underestimated after surgery which has led to the establishment of pain teams in hospitals in the UK.

4. METHODOLOGY

4.1 Systematic Literature Review

The method for data collection was systematic literature review, which involves literature search, data selection, description of data and data analysis. Systematic literature review was based on books, accredited articles and journals. The data was gathered from literature search in accordance to the study task and purpose for this study.

Systematic literature review method refers to a more detailed method which identifies comprehensively and tracks down all the available literature on a topic while describing a clear, comprehensive methodology. Systematic literature review uses explicit and rigorous method to identify critically, appraise and synthesize relevant studies in order to answer a predefined question (Helen Aveyard 2010).

Literature review can be exploratory, descriptive, or evaluative depending on the study task and purpose. It can be a part of a research proposal, a section in a completed research study report, and can also be a part of a journal article where it is sometimes called the introduction (Tranfield et.al 2003). The systematic review is very explicit about inclusion and exclusion criteria. (Moule, 2009).

A numbers of articles, books, Journals have been identified, analysed and shuffled through so as to get a suitable match for the purpose of this study. It is important to understand articles in terms of their respective purpose. (Price B.2009, 43).

The material has been taken from reliable sources because systematic literature review is based on earlier researches that can be trusted (Neale, 2009, 51).

Literature review method is designed to reduce any unintended bias, which may occur if other methods were used as literature review is systematic and each step of the research is noted and accounted for. Systematic literature review is chosen in order to extract important information from already available material and important concepts and theories related to this study.

The principles of conducting a systematic review is done by using clear objectives and a comprehensive search strategy and explicit inclusion and exclusion criteria ,which were applied. (Callaghan & Waldock 2006, p. 344) Answering questions is also made possible when using this method of data analysis. According to Brophy et al. (2008, p. 11), systematic literature review makes it possible to identify study task that could be suitable for the study. In this study, study task were set to serve as guide and providing answers to purpose during the review.

There are guidelines to these namely; planning ,developing research questions, searching for literatures, choosing literature, evaluating the quality of literature and analysing data.(Kääriäinen et al 2006,37-45).

The plan for this bachelor's thesis was done October 2013 which was later accepted in May 2014 officially and completed end of September 2014.

The study task sets an aim to find an answer to certain questions. There can be one or more study tasks. Careful planning of the tasks is crucial, since they cannot be changed during research process. Otherwise, the whole process of research has to be started all over again. Researches usually supplement each other, that is, the first set basis to the second question during this study.

Search for literature: Databases such as EBSCO, CINACHL, and ELSIVIER amongst others were used to search literatures relevant to this study, though they were not enough since the study theme is quite uncommon.

Choosing literature in this study has been extensively and carefully done by both researchers to avoid bias choice of documentation. The inclusion and

exclusion criteria were applied during this search too in order to get proper amount of information relevant to the study theme. Purpose and study task or research question depends on quality of a research. Validity and truthfulness are vital tools when carrying systematic literature review as can be demonstrated in our study.

4.2 Content Based Analysis

Content Based analysis according to LoBiondo-Wood & Haber (2006 page 559-575) is a research technique which can be used for objective, systematic and qualitative description of documentary evidence. Data analysis requires complete understanding of the data collected to be able to categorize the data into suitable categories. This is done in order for it to be easier and more precise to group the different themes into their respective categories. This study uses content based analysis method. Content analysis is used in describing the examined phenomenon (keywords). In addition, content analysis can help to create categories which describe the examined phenomenon, concepts, concept systems, mind maps or models. (Kyngäs et al 2011).

Contents analysis can be implemented inductively or deductively. The reason of the method used depends on the purpose of the research. Inductive analysis proceeds by the terms of the material.

In deductive analysis an analysis frame will be done first according to the previous knowledge. Then facts suitable for the content will be searched from the material (Kyngäs et al. 2011). The principles of inductive content analysis are applicable in the data analysis of this study to categorize the non-pharmacological method of pain alleviation postoperatively in children.

Table 1: Database search results

Inclusion: The authors were careful to include criteria. Criteria were used to determine the quality of the study. In the search, there was a room to accommodate flexibility as the numbers of articles used was 10 articles which was considered appropriate for this study.

5. IMPLEMENTATION OF ANALYSIS

5.1 Data Search

The data collected was from articles, journals and books through the authorized school data base system Nelliportaali. The data collected was screened, extracted and analysed through sites such as EBSCO, Science direct, PubMed, Ebrary, when conducting data search we got numerous articles which were helpful while others lacked important information. Specification using keywords and purposes statement were of help when narrowing down to our search below is a table illustrating data we collected, the librarian advised us that it was good if we used individual sites to get accurate number of articles since meta search articles did not match the number of articles in the corresponding sites. When carrying out data search we got a huge number of articles that were of help narrowing down to the main topic also was problematic as we received a large number in hits or no hits with certain word combinations. Purpose, statement and keywords helped to get clear specifications.

Table 2: Criteria describing inclusion and exclusion.

Inclusion	Exclusion
Articles published after 2004 until 2014	Articles published before 2004
Pediatric non-pharmacological pain management methods articles	Articles not associated with pediatric non-pharmacological pain management methods
English Articles	Articles not in English
Full text articles which opened	Articles which were not full text and which did not open
Articles agreeing with our research questions and purpose statement	Articles which did not agree with our research question nor purpose statement

5.2 Data Screening

Screening data is vital so as to obtain articles according to the relevance of the research question. Narrowing of data leads to inclusion and exclusion criteria. Inclusion and exclusion criteria enable the systematic literature review to identify the literature that addresses the research question and that which does not. (A. Helen, 2010). Criteria developed are as a result of the research question and enables an individual articulate focus of the research. Inclusion and exclusion criteria enable one to show the scope and detail of the review that may be difficult to demonstrate in review question alone. Inclusion and exclusion helps us to get vital information about the scope and relevance of the review. A clear and well defined inclusion and exclusion criteria ensures that an individual does not get sidetracked with data that is literature that may not be relevant to the review. Hence, setting appropriate criteria helps an individual to be focused in the study and avoid distractions (A Helen. 2010).

5.3 Data extraction

Data extraction deals with critical assessment of articles to obtain relevance to the material being reviewed, in accordance with the screening method. Qualitative study typically adopt flexible data collection plan which evolve as the study progresses, self-report is the frequently used method type of data in qualitative studies. (Polit and Beck 2012, 553). Qualitative method was developed which supported the process of analysing, synthesizing and reporting review findings. Data extraction method was influenced by the research question and purpose statement so as to screen and get relevant data. Extraction of data was from abstract, findings and discussions of selected

articles. Articles which were of relevancy have been listed and described in detail. Data collected dealt with two major subjects that are research question and purpose statement. The articles discussed non-pharmacological post-operative surgical pain management in paediatrics. Data collection was in form of previous research articles and books.

5.4 Data Analysis

Data that was collected was analyzed using qualitative content analysis. Qualitative research method has been defined as “a research method which uses subjective interpretation of the content of the text data using systematic classification process of coding and identifying themes or patterns. (Hsieh and Shannon 2005). Data analysis is defined as a process of evidence synthesis which involves the extraction of details example the method, setting and type of participants from original study including aggregation of original findings into categories and further into synthesis (K Hannes. 2011). Following the principle of qualitative content analysis, data extracted was synthesized and analyzed based on the research objective of the study that is deductive way and also using identified findings after numerous readings and interpretation of raw data that is the inductive method. The analysis method involved reading thoroughly through the ten articles and two books whose chapters were in relation to the study topic systematically. We colour coded all the relevant information of the research study and wrote short description of the articles on the margin which we used as content areas. The process was vital to help identify the main theme of the underlined phrases. Underlined phrases were later grouped to phrases which had similar content areas giving it a title that described the group that it was allocated. The final step involved further synthesis of the allocated titles to main categorized themes namely cognitive-behavioral methods, emotional support, physical methods, comfortable environment and barriers nurses experience using non-pharmacological methods.

Table 3: Data Search Analysis

Authors	Purpose	Analysis	Main results
Hong-Gu He et al 2010. Nurse's use of non-pharmacological methods in children's postoperative pain management: educational intervention study.	Check how nurses use non-pharmacological methods to manage post-operative pain in children.	Data was analysed using SPSS and the percentage was used to report respondent demographics.	Check comparison of nurse's provision of preparatory information between pre and post-tests. Check nurses use of non-pharmacological methods between pre and post-tests.
Qian Wen Sng et al 2013 Postoperative pain management experiences among school aged children: a qualitative study.	Check how children respond to post-operative pain management.	Data was analysed using thematic method that is all audio recorded data was transcribed by the researcher conducting the interview.	Identify children's self-directed actions to relieve pain postoperatively. Identify children's perception of actions parents and nurses take to control post-operative pain. Identify suitable methods by nurses to control post-operative pain.
Hong-Gu He et al 2005	To check how Chinese nurses	Data was analysed using descriptive	Identify the non-pharmacological

Authors	Purpose	Analysis	Main results
Chinese Nurse's use of non-pharmacological method in children's postoperative pain relief.	perceived and used non-pharmacological methods for postoperative pediatric care.	statistics method used by nurses and divided into 3 main categories that is seldom, sometimes and always.	methods that nurses used often in controlling pain in pediatric patients and the limiting factors in using the methods.
Siew Hoon Lim et al 2012 An exploration of Singaporean parental experiences in managing school-aged children's post-operative pain a descriptive qualitative approach.	Enhance understanding of the experience of parents in managing their child's post-operative pain.	Data was analysed thematically that is a technique which relies on the interpretation of descriptive data.	Actions of parents in alleviating their child's post-operative pain. Factors influencing parent's management and needs of parents in the process of caring for their child's post-operative pain.
Edel Jannecke Svendsen, Ida Torunn Bjørk 2014 Experienced nurses use of non-pharmacological Approaches comprise more than relief from pain.	Identify methods that experienced nurse's use for non-pharmacological methods.	Data was analysed thematically that is written interviews were transcribed and analysed.	The role of non-pharmacological methods in building and maintaining co-operation caring for the child by individualizing use of non-pharmacological

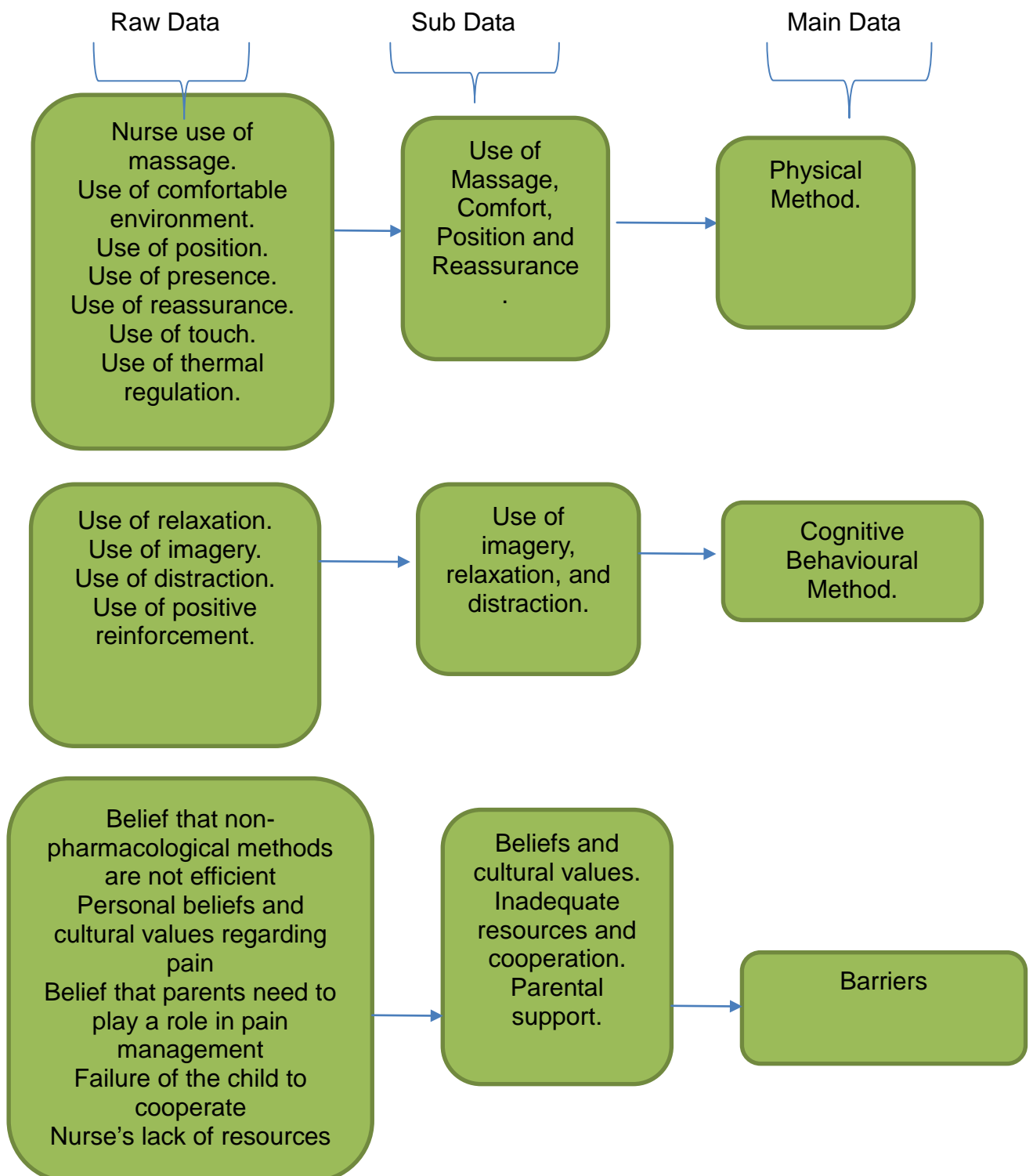
Authors	Purpose	Analysis	Main results
<p>Alison Twycross 2005 children’s nurse’s post-operative pain management practices: An observational study.</p>	<p>To observe the most commonly used method by nurses in caring for pediatric post- operative pain.</p>	<p>Data was analysed thematically that is information was coded to identify recurring themes and provide a picture of current pain management practice.</p>	<p>methods. Nurses administered analgesics drugs when child complained of pain, in most other areas practice did not conform to current recommendations and in need of improvement. Nurses did not for example routinely asses a child’s pain nor use non-drug method of pain relief on a regular basis.</p>
<p>Sarah Hurter, Yannis Paloyelis, Amanda C.de C.williams, Aikaterini Fotopoulou 2014</p>	<p>How empathy from a partner and personal attachment style affect pain report, tolerance, and facial expressions of pain.</p>	<p>Data were analysed by observation method in patients and their partners in response to pain.</p>	<p>Empathy from one's partner may influence pain report beyond behavioural reactions.</p>
<p>Pei-Fan Mu, Yu-</p>	<p>Determine the best</p>	<p>Meta-analysis was</p>	<p>Among the various</p>

Authors	Purpose	Analysis	Main results
Chih Chen, Shu-Chen Cheng 2009	available evidence on the effectiveness of non-pharmacological pain management in relieving chronic pain for children and adolescents.	used to pool the data from studies to determine the effectiveness of the intervention.	five outcomes biofeedback treatment of headaches in children, behavioural treatment psychosocial treatment cognitive behaviour therapy relaxation training program, and acupuncture shows the effectiveness of reduced anxiety of children and adolescent with chronic pain respectively.
Rosa Esteve, Vanessa Marquina-Aponte, and Carmen Ramrez-Maestre 2014	Highlight the relevance of catastrophizing children's pain and post-operative children's pain experience.	Path analysis was used to test a hypothetical model of the associations between anxiety sensitivity, catastrophizing, parental responses, and postoperative	The results indicated that children and caregivers characterized by higher levels of anxiety sensitivity reported higher levels of pain

Authors	Purpose	Analysis	Main results
		pain in children.	catastrophizing and catastrophic thinking about children's pain, respectively.
Catherine Van Hulle Vincent, Diana J. Wilkie, and Laura Szalacha 2010	Cognitive representation of assessment and children's pain using mixed methods.	Content and descriptive analysis was used to obtain the conceptual cognitive maps using test and variables.	Nurse's measurement of Cognitive representation solely relies on their misconceptions, understanding in assessing and managing children's pain.

6 .FINDINGS

This chapter explores the body of evidence which we gathered from literature that we reviewed in correspondence to the research question. Non-pharmacological methods that nurses used were sought throughout this study and grouped to form sub data and main data which later formed the main themes for discussion. The sub data included themes such as nurse use of massage, use of relaxation, use of comfortable environment, use of imagery, use of position, use of presence, use of resources, use of reassurance, use of distraction, use of touch, use of positive reinforcement, use of thermal regulation, reduction of work load, beliefs and cultural values regarding pain, belief that parents need to take charge in non-pharmacological methods, Poor parental support and co-operation in using non-pharmacological methods, belief that nurses primary role is administration of pain medications, lack of experience in using non-pharmacological methods, use of thermal regulation, inadequate knowledge regarding non-pharmacological methods. The themes named have been outlined and split as illustrated on the table below. The phrases were shortened to get sub data and main data.



Graph 2: Overview of Non-Pharmacological Methods

This study identified the non-pharmacological methods that can be used post-operatively to paediatrics and barriers that nurses encounter while trying to use the non-pharmacological methods. According to the findings the non-pharmacological methods can be categorized to major themes namely cognitive-behavioural method, physical method and emotional support.

The articles reviewed showed that nurse's knowledge in managing post-operative pain is inadequate and nurses need more courses in management of pain. The studies also support the combination of use of non-pharmacological methods depending on the severity of pain. Distraction is one of the key non-pharmacological methods, however patients who suffer from severe pain may not benefit from distraction as the pain could hinder them on concentrating enough on complicated physical or mental tasks (Smeltzer et al. 2009). Studies have shown combination of distraction, relaxation, hypnosis and imagery is an effective strategy and support use of non-pharmacological methods in pediatric clinical setting (Uman et al. 2006, Pölkki et al. 2008). Children depend on nurses to help them with activities of daily living during the post-operative period. Studies also show that nurses did not use non-pharmacological methods frequently and when they used the non-pharmacological method in most cases they used cognitive-behavioural methods, distraction, helping with activities of daily living and positioning. Studies have shown that nurse's experience and education determines how they use the non-pharmacological methods. Nursing literature emphasizes how and what extent non-pharmacological approaches may reduce children's stress and pain in post-operative pain management (He, Vehvilainen-Julkunen, Pölkki, and Pietilä, 2007).

Non-pharmacological method has been shown to promote interaction between nurse and children hence fostering co-operation. The articles also showed that nurses often used pharmacological methods and did not use non-pharmacological methods often. Organizational behaviour also played a role in

influencing use of non-pharmacological method as a sympathetic and team work spirit was more likely to encourage use of non-pharmacological method. We also explored barriers nurses encounter trying to implement the method, we thought it was useful to list it down since every pro has its cons. Singaporean nurses who used non-pharmacological methods reported that barriers that nurses experience caring for post-operative pediatric patients were nurses heavy workload, children's inability to co-operate and lack of parental support and co-operation in using non-pharmacological methods (He et al. 2010). An earlier research recommended refresher courses to be provided periodically, as nurse's knowledge is lost over time (Guardini et al. 2008).

“Pain management is influenced by intrinsic variables such as professional knowledge and experience, personal values, beliefs and by extrinsic variables such as the physical environment, staffing resources and interpersonal relationships between healthcare professionals, patients and families.” (Seers et al. 2006)

Paediatrics post-operative non-pharmacological pain management Interventions methods, they are interventions that don't use pharmacological methods in nursing practice, they use physical and psychological methods available to aid in relief of pain in children (Twycross et al. 2013). Use of non-pharmacological methods can help reduce opioid intake (Pellino et al. 2005) and potentially harmful physiological responses to pain (Chan 2007). Non-pharmacological methods however work together with pharmacological methods to produce effective results; we will discuss some of the methods that can be used basing our findings on nurse's point of view. Nursing staff who have been trained to use non-pharmacological methods can use this methods independently to manage pain, by using this methods they are not restricted by physicians prescriptions hence they develop an integrative approach in nursing care (Lin et al. 2008)

6.1 Physical Pain Relieving Methods

6.1.1 Heat and Cold

Topical sources of heat and cold can be administered to painful areas and are useful to relieve pain. Mechanisms of pain relief from heat and cold remain uncertain. (Hasanpour et al. 2006) studied the use of local cold therapy and distraction in pain relief for children (n=90) aged 5-12 years who were receiving intramuscular penicillin injection. Pain intensity was considered high in the control group receiving neither cold nor distraction.

Contradictions for heat and cold therapy include: - (that is heat and cold therapy should not be used on the skin with an absence of sensation caused by vascular disorders, burns, wounds, oedema dermatological conditions, grafted tissues or with epidural or local anaesthesia blocks.

Patient who are unable to move away from heat or cold source are unable to say whether heat or cold source has become uncomfortable.

6.1.2 Transcutaneous Electric Nerve Stimulation (TENS)

Transcutaneous electric nerve stimulation is a method of stimulating nerves through electrodes applied to the skin. Transcutaneous electric nerve stimulation is a safe, non-invasive pain relieving strategy for partial or complete blocking of pain. The analgesic effect of this method is explained by gate control theory which states that stimulation of large diameter afferent nerve fibres may close the gate.

6.2 Psychological Pain Relieving Methods

6.2.1 Biofeedback

Biofeedback is a technique which trains people to control bodily processes that occur involuntary such as heart rate muscle, blood pressure and skin

temperatures. Electrodes on the skin measure and display the processes involved on a monitor. Biofeedback therapist can train children to alter their heart rate or blood pressure. Initially the monitor is used by children to view their progress but later learn to do without the monitor. Examples of biofeedback include thermal, electroencephalographic (EEG) muscle electromyography (EMG) and temporal pulse biofeedback. Children should be trained by professional biofeedback therapists.

6.2.2 Cognitive Behavioural Therapy

Cognitive behavioural therapy is a type of psychotherapy also known as talk therapy. Cognitive behavioural therapy is based on theory of psychological symptoms and is related to interaction of thoughts behaviours and emotions. Cognitive behavioural therapy involves therapist and patients who collaborate in working together on identifying and changing negative thoughts and behaviours that maybe persistent. Cognitive behavioural therapy aims to improve how children cope with pain via technique such as distraction, education, relaxation and biofeedback. The aim is to help a child use healthy adaptive behaviours.

6.2.3 Distraction

Distraction is a mechanism to help a child deal with painful or difficult procedure. It alters child's mindset off the pain and concentrating on something else. Distraction is an easy strategy for nurses to use and help children cope with pain. (Sinha et al. 2006) found that distraction techniques reduced sensory and affective emotional components of pain among children (n=240) aged 6-18 years who were undergoing laceration in the emergency department to identify effective distraction strategy the nurse should work in collaboration with the

child and parents to identify what is interesting to the child. The method chosen should be relevant to child's age and developmental stage.

Characteristics of effective distraction strategies for minimal interval pain should be interesting distraction technique to the child distraction and should match up with the child's energy level and ability to concentrate. Distraction should stimulate one of the major sources that are hearing, vision, touch or movement also distraction should be able to provide change in stimuli when pain changes example increasing stimuli when pain increases.

Parents need guidance from nurses on how to use distraction. Studies have shown that this method has produced positive results. Parents who are taught on how to distract children during painful procedure help children experience less anxiety and pain (Walker et al. 2006;Mc Murtly et al. 2010) Parents who learn how to use distraction technique benefit from it by reducing feelings of helplessness. Distraction as a pain relieving strategy is influenced by the method in use. Active methods of distraction are more effective than passive methods.

6.2.4 Hypnosis

Hypnosis is an artificially induced methods altering the state of consciousness and characterized by heightened suggestibility and receptivity to direction. Altered state of consciousness occurs with relaxed physical state and allows a trance which is different from normal state of being awake and stages associated with sleep. Hypnosis help children focus away from pain and focus on imaginative experience which is viewed as comforting, safe, fun or intriguing. Hypnosis and postoperative pain on evidence based research. (Huth et al. 2004) studied children aged 7-12 years who had been admitted for tonsillectomy and were randomly assigned to two groups. Children (n=36) in the control group watched a video on use of hypnosis and listened to 30 minutes audio tape on hypnosis a week before surgery. Children (n=37) in attention

control received equal amount of preoperative time from the investigator. Children who received hypnosis training had significantly lower pain scores in the first four hours postoperatively this is research evidence based on hypnosis and postoperative pain experiment.

6.2.5 Music Therapy

Music therapy can either be active or passive. Active music therapy refers to when music therapist is involved and music is used as a method of interactive communication. Passive music therapy is when an individual listens to music without involvement of a music therapist. Systematic review of the effect of active and passive music therapy showed a reduction in pain and anxiety in children undergoing painful procedures and medical procedures (Klassen et al. 2008). Music therapy has been of help in postoperative pain according to evidence based research. (Nilson et al. 2009) tested the effect of postoperative music on morphine consumption, pain, distress and anxiety with children (n=80) aged 7-16 years who were undergoing day surgery. Children who were in the music group received less morphine in the recovery room and had significantly lower facial scores; there were no significant differences in pain scores or vital signs. Children reported music as calming and relaxing.

6.2.6 Relaxation

Relaxation is a method that incorporates several techniques which promote stress reduction, elimination of tension through the body and a calm and peaceful state of mind. Relaxation to children may consist of being held in a comfortable well-supported position or being rocked in a wide rhythmic arc. Relaxation according to older children involves actively teaching them to

engage in progressive relaxation of the muscle group. Systematic review found good evidence that relaxation is effective in reducing the severity and frequency of chronic headache, recurrent abdominal pain and fibromyalgia in children (Ealeston et al. 2012)

Emotional Support Method is a non-pharmacological method that we came across in our research it comprised of presence, comfort or reassurance to the child and touch, which showed that most nurses used it according to a previous research. (He et al. 2005, 2008)

Helping with activities of daily living is a non-pharmacological method which nurses use it to help post-operative paediatrics, studies carried out on the method showed that nurses did not use it often. (He et al. 2005, 2008)

Creating a comfortable environment it involves personalizing the environment according to the patient wishes to create a conducive or homely atmosphere is a non-pharmacological method that can be effective to some children nurses did not use this method often compared to other stated methods. (He et al. 2005, 2008)

Barriers Inhibiting Non-pharmacological Method in Post-Operative Paediatrics

The ten articles that we read highlighted barriers to non-pharmacological methods that nurses encountered while using this method, the common barriers which were highlighted from all the articles are namely, lack of resources, lack of experience in using non-pharmacological methods, Child lack of cooperation, poor parental support and cooperation in using non-pharmacological methods, Insufficient knowledge of non-pharmacological pain relief methods, Personal beliefs and cultural values regarding pain and relief methods, belief nurses primary role is administration of pain medication, belief that non pharmacological methods are not efficient, belief that parents need to take charge in using non-pharmacological methods and heavy workload .

The barriers named above in the articles hindered nurses to use the non-pharmacological methods to paediatrics post-operatively. Hospital managers who support use of non-pharmacological methods need to reduce nurse's workload for the method to be effective. Previous studies have demonstrated that children use non-pharmacological methods such as sleep, position and distraction for their own pain relief (He et al. 2007). According to the studies pain management education need to be delivered to the parents in order to support nurse's use of non-pharmacological method for post-operative pain relief in children. Nurses lack of knowledge is one of the factors limiting use of non-pharmacological method, nurses need to further and sharpen their knowledge about using this method so as to be confident in using it.

Nurses can try to improve cooperation between them and children by establishing a mutual and cordial relationship, they can try starting a conversation with the child or finding an activity that they like and engage them in it, this way the cooperation aspect will improve. Nurses lack time to perform pharmacological intervention as sometimes the patient nurse ratio may not be proportion hence leading to ineffective use of this method. Nurses need to encourage parents in using non-pharmacological methods, though parents use this example of touch and their presence. Nurses need to involve parents in management of pain of their children by letting them be part of the process in management of pain, in earlier studies it was noted that some nurses did not involve parents in the pain management of their child. Nurses need to use pain scales often to evaluate the level of pain in children (Journal of Pediatric Nursing January 22 2014).

Organizational behaviour plays a big role in evaluation or pain management in children, it was noted that nurses who were experienced and had children who had likely undergone post-operative pain were more keen to use non-pharmacological pain interventions and communicate more with the children.

Organizational behaviour affected the nurses culture of working in the ward for instance it was noted if a ward did not have a tendency to take into account pain experience history or use pain assessment tools, even nurses who were experienced were unlikely to use it because of the culture in the ward, it was noted that nurses that had established a mutual relationship with the child were more likely to use non-pharmacological method as they could identify an earlier method which they used and was effective, they did this by reminding the child about earlier encounters(Journal of Pediatric Nursing January 22 2014).

Cooperation between nurses and pediatric is vital for use of any non-pharmacological method. Different non-pharmacological methods need to be used effectively on a child, the needs of pediatric patient need to be understood first. Pediatric patients need to feel safe during non-pharmacological method application. It was noted in one study nurses evaluated the individual child's needs rather than taking a predetermined approach, example a scared child did not benefit from being distracted or having his or her focus directed away from the situation, giving control over the situation was found to be safer than using distraction since child's feeling of control and power was the basis for successful use of different types of non-pharmacological methods (Journal of Pediatric Nursing January 22 2014). Nurses can use non-pharmacological method not only as pain relief but also as a tool to promote interaction between child and nurse. In literature, interaction is the factor affecting the child's pain and less emphasized than factors such as genetics and the child's temperament (Walco, 2008). Fostering co-operation helped nurses avoid use of restraint when performing procedures.

7. CONCLUSION

Pediatric post-operative non-pharmacological method can be categorized to namely, cognitive-behavioural method, emotional support method, physical method and psychological methods, the above named methods are faced with factors which inhibit use of the method that is barriers. A Cognitive-behavioural method was a method of choice for most nurses. Nurses who were likely to use this method had to consider child's age so as to determine what was suitable and likely to work for them. Cognitive-behavioural method comprised of methods such as distraction which was used a lot according to the findings. Hypnosis which involved altering state of consciousness from the findings was less used. Music as a therapy tool was categorized as passive or active. Active music therapy involved a music therapist while passive involved listening to music. Relaxation involved a comfortable environment and change in the positions of the pediatric patient in question. Emotional support involved reassurance and availability that is presence to the child has to be strong and well bonded. Physical method involved methods such as heat and cold, transcutaneous electric nerve stimulation (TENS). Heat and cold method was seen to be effective according to the researches done. Transcutaneous electric nerve stimulation involved stimulation of nerves through electrodes applied to the skin few nurses attempted the method from the findings. Psychological method involves method such as biofeedback. Biofeedback is a method which is used to control body processes that are involuntary and requires training. Barriers refer to factors that inhibit use of the non-pharmacological methods. Several barriers arose while trying to implement use of post-operative pediatric non-pharmacological methods. Common barrier was heavy workload that some nurses experienced which prevented them using the method. Lack of sufficient knowledge in using the method was another barrier that prevented nurses to

use the method. Nurses certain beliefs and organizational culture prevented them from using the method adequately.

Nurses can help children in managing pain by using distraction as a tool depending on their ages.

7.1 Implication of the Research

Findings from the study suggest that post-operative pediatric non-pharmacological method should be encouraged to be used more often, this can be done by educating nurses on the non-pharmacological methods. Senior managers who support the method need to create conducive organizational culture and create an enabling environment by reducing nurse's workload. Non-pharmacological methods should be encouraged since they do not require any prescription. Combination of pharmacological and non-pharmacological methods yields good results when used effectively.

8. DISCUSSION

The chapter identifies ethical aspects that we applied during the research, credibility and reliability of the findings, discussion about the findings strengths and limitations of the review, conclusion and recommendations of the research.

8.1 Discussion of Findings

The research aimed at identifying different non-pharmacological methods for post-operative paediatrics and barriers that nurses encounter while using the non-pharmacological method. The non-pharmacological method can be described into categories namely, physical method, cognitive and behavioural method, psychological method and emotional support method. Nurses are tasked with the responsibility of evaluating and taking the best non-pharmacological method for pediatric. According to the research many nurses opted to use the cognitive-behavioural method that is the distraction method was used mostly. According to the reviewed articles nurses took the patient as an individual who was unique to be able to get the best non-pharmacological method. A combination of non-pharmacological therapies was preferred to achieve desired results. Validity refers to the degree to which an instrument measures what is supposed to be measured; content validity is concerned with sampling adequacy of the content being measured. Reliability refers to the degree of consistency or accuracy with which an instrument measures an attribute. The higher the reliability of an instrument the lower the amount of error present in obtained scores. (Polit and Hungler Nursing Research Principles and Methods 1999, pg. 433-434)

Nurses who were experienced and had their own children who had experienced post-operative pain were not more likely to use the non-pharmacological method than those who did not have children nor had any experiences.

Organizational behaviour influenced use of non-pharmacological method as the culture in the ward influenced how nurses worked example if a ward was keen and supported use of non-pharmacological methods then nurses were more likely to use it. Barriers that affected use of non-pharmacological method included factors such as nurse's heavy workload, lack of experience in using non-pharmacological method, child's lack of cooperation and beliefs and culture of the ward such as belief that nurses primary role is administration of pain medication. Non-pharmacological methods when used together with pharmacological methods were likely achieving the desired result that is relief pain. Non-pharmacological method should be advocated by nurses as this method does not need any prescription from the physician and it has no limitation of using it. Senior nurses or managers who advocate for use of non-pharmacological method need to reduce nurse's workload to enable them concentrate in using the method. Nurses should also include parents in the non-pharmacological method as this is likely to foster cooperation amongst all of them. Non-pharmacological method should be encouraged since it does not have any restrictions.

8.2 Ethical Considerations

Ethics refers to a process of investigation, criticism and decision making, ethical codes refers to a set of rules established for a group of people. "Ethical considerations comprise moral standards which are principle and must be held to be true throughout the research. The ethical consideration aspect requires us to attempt to balance the moral standards within the circumstances of a research project this results in disclosure which leads to moral decision and course of action."(Cunningham, Christopher J. L.Weathengton, Bart L. Pittenger, David J 2013)

The study topic was chosen as a result of our practice and observation of post-operative pediatric patients at Lansipohjan Keskus Sairaala children's ward.

The topic was approved by our supervisors after presentation and we were given a go ahead.

The thesis was carried out through the systematic literature review method implying that we did not use interviews observations or questionnaires as an aspect of the methodology. We did not have any contact with the patients or the authors of the articles nor books we used hence no need for confidentiality and privacy of names and identities. We searched databases extensively to identify articles which we later screened without bias in accordance with our inclusion criteria. Articles and books used for this research were accurately reported and any information that was not ours was well quoted and references put accordingly to avoid plagiarism. We prevented academic fraud by clearly reporting our findings from the articles we analysed in the original format. The literature we searched was limited to English though most of articles we used were from different countries hence our result was clearly outlined to allow precise findings in accordance to our research question although differences could arise due to choice of data analysis which is subject to individual interpretations.

This study aims to benefit nurses who are working in post-operative pediatric unit and also those nurses who aspire to work there, in using different non-pharmacological pain management interventions in Finland and around the world. Nurses who have interest in using non-pharmacological method in children will also benefit from it.

8.3 Trustworthiness

Trustworthiness comprises credibility, dependability, confirmability and transferability (Lincoln and Guba 1985). The criteria aim to allow the researcher to demonstrate how interpretations are presented in the data and how data is drawn. The literature research was based on 10 documented articles and viable sources based on pediatric post-operative non-pharmacological pain

management. Qualitative research trustworthiness aims to support the argument that the research findings are worth considering. In this study the writers ensured credibility by following the appropriate methods of conducting a systematic literature review. Articles used were recorded in their original forms. To allow transferability we have documented our research methodology in detail so that it can be repeated. The well documented research methodology also ensured conformability and dependability. We also outlined our limitations and effects they had on this study.

8.4 Strengths of the Review

Data collected was screened and selected in accordance to trustworthiness criteria. The study gave answer to the research question by identifying suitable articles. Articles analysed were relevant as they were from different countries around the globe Finland, Norway, Singapore, Australia, America, China hence showing pediatric post-operative non-pharmacological intervention is a widespread issue. The articles we reviewed had the content and quality of what our research was about. Articles used were not more than 10 years making the contents to be valid. Two strategies have been developed to determine the authenticity and accuracy of the source, these strategies are external and internal criticism, external criticism determines the validity of the source material while internal criticism involves examination of the reliability of the document.(Burns and Grove Understanding Nursing Research 1995,p 436) The findings of the study add to the already available evidence based knowledge about pediatric post-operative non-pharmacological pain management and barriers that nurse's face while trying to implement non-pharmacological interventions. This systematic literature review will be of help to already nurses and future nurses who want to explore more about pediatric post-operative non-

pharmacological pain management, the thesis was also of much help to us as it helped us understand this field better it's our hope that the pediatric post-operative non-pharmacological pain management will be encouraged and used more by nurses and barriers that inhibit use of this method checked and prevented to encourage use of the method.

8.5 Limitations of the Study

Using the inclusion criteria automatically disregarded articles that were not in English hence language bias, some articles were not in full text hence could not open although they were based on author's opinion. The authors of the article were not contacted for any query, when doing the research using the school site metasearch we obtained data that sometimes did not correspond to individual site such as Ebsco, Science direct that is there was difference in number of hits in the two sites. The research was limited to authorized school websites therefore we could not use other sources. The articles could be biased maybe due to the writer's support of a certain method over another method.

8.6 Recommendation

We recommend this study work for nurses in future who can develop more methods that suitably would improve care of children who are in pain postoperatively such as after a procedure during care of muscular pain and emotional trauma.

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10 APPENDICES

Appendix 1

Pain measurement scale graph

<<http://www.crdamc.amedd.army.mil/surgery/child6.aspx>>

Referenced 9th June 2013.

Appendix 2

Table 3: search analysis

Appendix 3

Graph 2: Overview of Non-Pharmacological Methods

Appendix 3 1(5)

Table 3: search analysis

Authors	Purpose	Analysis	Main results
Hong-Gu He et al 2010. Nurse's use of non-pharmacological methods in children's postoperative pain management: educational intervention study.	Check how nurses use non-pharmacological methods to manage post-operative pain in children.	Data was analysed using SPSS and the percentage was used to report respondent demographics.	Check comparison of nurse's provision of preparatory information between pre and post tests. Check nurses use of non-pharmacological methods between pre and post tests.
Qian Wen Sng et al 2013 Postoperative pain management experiences among school aged children: a qualitative study.	Check how children respond to post-operative pain management.	Data was analysed using thematic method that is all audio recorded data was transcribed by the researcher conducting the interview.	Identify children's self-directed actions to relieve pain postoperatively. Identify children's perception of actions parents and nurses take to control post-operative pain. Identify suitable methods by nurses to control post-operative pain.

Appendix 3 2 (5)

<p>Hong-Gu He et al 2005</p> <p>Chinese Nurse's use of non-pharmacological method in children's postoperative pain relief.</p>	<p>To check how Chinese nurses perceived and used non-pharmacological methods for postoperative paediatric care.</p>	<p>Data was analysed using descriptive statistics method used by nurses and divided into 3 main categories that is seldom, sometimes and always.</p>	<p>Identify the non-pharmacological methods that nurses used often in controlling pain in paediatric patients and the limiting factors in using the methods.</p>
<p>Siew Hoon Lim et al 2012</p> <p>An exploration of Singaporean parental experiences in managing school-aged children's post-operative pain a descriptive qualitative approach.</p>	<p>Enhance understanding of the experience of parents in managing their child's post-operative pain.</p>	<p>Data was analysed thematically that is a technique which relies on the interpretation of descriptive data.</p>	<p>Actions of parents in alleviating their child's post-operative pain. Factors influencing parent's management and needs of parents in the process of caring for their child's post-operative pain.</p>

<p>Edel Jannecke Svendsen, Ida Torunn Bjørk 2014 Experienced nurses use of non- pharmacological Approaches comprise more than relief from pain.</p>	<p>Identify methods that experienced nurse's use for non- pharmacological methods.</p>	<p>Data was analyzed thematically that is written interviews were transcribed and analyzed.</p>	<p>The role of non- pharmacological methods in building and maintaining co- operation caring for the child by individualizing use of non-pharmacological methods.</p>
<p>Alison Twycross 2005 children's nurse's post-operative pain management practices: An observational study</p>	<p>To observe the most commonly used method by nurses in caring for pediatric post-operative pain.</p>	<p>Data was analyzed thematically that is information was coded to identify recurring themes and provide a picture of current pain management practice.</p>	<p>Nurses administered analgesics drugs when child complained of pain, in most other areas practice did not conform to current recommendations and in need of improvement. Nurses did not for example routinely asses a child's pain nor use non-drug method of pain relief on a regular basis.</p>

<p>Sarah Hurter, Yannis Paloyelis, Amanda C.de C.williams, Aikaterini Fotopoulou 2014</p>	<p>How empathy from a partner and personal attachment style affect pain report, tolerance, and facial expressions of pain.</p>	<p>Data were analyzed by observation method in patients and their partners in response to pain.</p>	<p>Empathy from one's partner may influence pain report beyond behavioural reactions.</p>
<p>Lei-Fan Mu, Au-Chih Chen, Thu-Chen Cheng 2009</p>	<p>Determine the best available evidence on the effectiveness of non-pharmacological pain management in relieving chronic pain for children and adolescents.</p>	<p>Meta-analysis was used to pool the data from studies to determine the effectiveness of the intervention</p>	<p>Among the various five outcomes biofeedback treatment of headaches in children, behavioural treatment psychosocial treatment cognitive behaviour therapy relaxation training program, and acupuncture shows the effectiveness of reduced anxiety of children and adolescent with chronic pain respectively</p>

Appendix 3

<p>Rosa Esteve, Vanessa Marquina-Aponte, and Carmen Ramrez-Maestre 2014</p>	<p>Highlight the relevance of catastrophizing about children's pain and children's pain catastrophizing in the experience of post</p>	<p>Path analysis was used to test a hypothetical model of the associations between anxiety sensitivity, catastrophizing, parental responses, and postoperative pain in children</p>	<p>The results indicated that children and caregivers characterized by higher levels of anxiety sensitivity reported higher levels of pain catastrophizing and catastrophic thinking about children's pain, respectively</p>
<p>Catherine Van Hulle Vincent, Diana J. Wilkie, and Laura Szalacha 2010</p>	<p>Cognitive representation of assessment of children pain using mixed methods.</p>	<p>Content and descriptive analysis were used to obtain the conceptual cognitive maps using test and variables</p>	<p>Nurses measurement of Cognitive representation solely rely on their misconceptions, understanding in assessing and managing children pain.</p>

Appendix 4

Table 4: Distraction as a non-pharmacological technique (Tywcross et al. 2013)

Pre-school Children	School Aged Children	Teenagers
Blowing bubbles	Games and puzzles	Listening to headphones to stories or music
Windmill toys	Listening through headphones to stories or music	Watching television or video
Singing	Watching television or video	Playing interactive computer games
Reading pop-up books	Playing interactive computer game	Reading their favourite novel
Blowing an imaginary feather off the doctors nose	Blowing an imaginary candle to make it flicker	Breathing out or controlled breathing
Playing with kaleidoscope	Breathing out or controlled breathing	Playing their favourite video or computer game
Playing with finger puppets	Looking in a mirror to see view through a nearby window	Listening to favourite music
Singing along	Singing along	