Non-Pharmacological Pain Management of Child from 1 to 10 Years

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Laurea University of Applied Sciences **Abstract**
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The purpose of this research was to explore different types of non-pharmacological pain management methods that are effective to manage pain in pediatric patients. Nurses play a vital role in the assessment and management of children's pain. Therefore, it is important that nurses know the concept of pain, assessment, and classification of pain, and its management. This bachelor's thesis aimed to provide knowledge among pediatric nurses about the management of pain in children through different methods of the non-pharmacological pain management process. The background of this study includes child and child development, the concept of pain, classification, and assessment of pain and its management. There are two research questions, which are: What kind of non-pharmacological pain management method are used by nurses to manage pediatric pain? What are the commonly used non-pharmacological pain management methods for children?

Data were collected through a descriptive literature review method, which means conducting a literature search, selecting data relevant to the research question, description of selected data, and analyzing the data. In addition, the findings are based on previously conducted studies from relevant articles and journals. Databases that were used for article searches are CINAHL, Google Scholar, and ProQuest Central. Also, a manual search was conducted for the data collection process. Analysis of the data was done using the inductive content analysis method.

The results of the literature review depict that a variety of non-pharmacological methods are used in managing pain in pediatric nursing. These methods include cognitive-behavioral therapy, physical method, emotional support method, helping with activities of daily living, and creating a comfortable environment. Study shows that cognitive-behavioral therapy and physical therapy has been commonly used by the nurses to manage children pain. Therefore, further research in the field of non-pharmacological pain management in children and barrier to implement them are recommended.

Keywords: Child, Pain, Pain Management, Non-pharmacological method

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1 Introduction

The authors of this thesis are interested in the management of pain in children using non-pharmacological methods. Merriam Webster (n.d.) defines pain as "a localized or generalized unpleasant bodily sensation or complex of sensations that causes mild to severe physical discomfort and emotional distress and typically results from bodily disorder (such as injury or disease)''; also, as a state which is felt by the existence of those sensations. Pain is always an individual, subjective experience. The perception of pain differs in a child than in adults. (Srouji R., Ratnapalan S., & Schneeweiss S. 2010).

The assessment of pain is difficult in children as it is experienced due to physiological, psychological, behavioural, and developmental factors. Accurate assessment of the pain in different developmental stages and effective management is essential for children. (Srouji R. et al. 2010.) Pain in children can be assessed by observing their behavior, expression, changes in skin colour, and by asking them about the location and type of pain if a child can explain. (Twycross, A., Finley, G., & Latimer, M. 2013). Pain is classified into four different types, Pathophysiological mechanism, Duration, Etiology, and Anatomical location. (WHO 2012). Untreated pain in children might cause a delay in the physical and psychological development of the children. (Şahiner, N., & Bal, M. 2016). Early detection of pain and its cause help to determine the best method for its management. Pain can be managed in two different ways; Pharmacological intervention and Non-pharmacological intervention. Pharmacological is done by using medicines or drugs while Non-pharmacological is done using alternative therapies instead of drugs. (Ahmad, B. 2019.)

2 Background

2.1 Child

According to the World Health Organization, a person who is 19 years old or younger, unless the national law defines him/her as an adult, is a child. Children are categorized into different stages along with corresponding to their age (WHO 2012). New-born babies until 28 days old are called neonates. A child from the age of 1 month until one year is called an infant. Consequently, toddlerhood starts at one until three years of age. A child from 3-6 years is called pre-schooler, school age from 7-12 years, and becomes an adolescent from 12 until 18 years old. (Storvik-Sydänmaa, S., Talvensaari, H., Kaisvuo, T., & Uotila, N. 2012.) Biologically, a human being is a child between birth and puberty phases. Some of the child's biological meanings include the fetus as an unborn child. In general, the legal definition of a child belongs to a minor, typically defined as an individual younger than a majority age. (Child n.d.)

2.2 Development of Child

Child development is a dynamic process that involves a system of expansion of physical, cognitive, psychological, and socioemotional abilities that lead to an increase of competences, autonomy, and independence. (Souza, N. S., Pereira, L. P. S., Silva, S. V., & Paula, W. K. A. S. 2019). Human development is a mechanism in which humans grow and mature, typically from infant stages to adulthood. The various aspects assessed for growth and development involve physical growth, behavioral growth, and social growth. Childhood development focuses on human changes as they mature from birth to age seventeen. (Study 2015.)

The skills and behaviors, such as, rolling over, crawling, walking, and talking are called developmental milestones that children learn as they grow. These changes are different for every age group of children. During this period, they go through many changes like social and emotional changes. They learn to communicate and start to develop cognitive behaviors such as learning, thinking, and problem-solving. Along with these growth and developmental changes, children make physical development in their everyday life. (Medline plus 2019.)

3 Pain

3.1 Concept of Pain

According to the current definition of the International Association for the Study of Pain (2017), ‘‘Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage’’ (IASP 2017). Recently, IASP (2019) has proposed a new definition of pain, which defines pain as an aversive sensory and emotional experience typically caused by, or resembling that caused by actual, or potential tissue injury (IASP 2019). It is a stressful situation experienced by every child at some point in their life. (Ahmad, B. 2019). Pain is a sensation that is transmitted to the brain through nerve cells that affect the physiological, cognitive, behavioural, and spiritual aspects of an individual. It is important to manage the pain in children effectively and quickly to prevent the long-term effect. Well-managed and properly treated pain helps in faster recovery. (Srouji R. et al. 2010.)

Pain is a complex physiological and psychological phenomenon. The fundamental principle of successful pain management can be done by the assessment and documentation of pain in an effective way. Pain can be acute (less than 3 months) or chronic (more than 3 months). Pain can also be classified by the cause of pain. For example, neuropathic pain arises from nerve damage and nociceptive pain comes occurs from sprains or fractures, tissue damage, etc. There are many causes of pain that may emerge from chronic conditions like, arthritis or fibromyalgia that may appear after surgery. (Cox, F. 2010.)

3.2 Pain in Children

Pain in children is regarded as a global health problem and most stressful situation, however, children are sensitive and underserved. Although the researches on pediatric pain have increased rapidly from the past decades, there are still some barriers to utilize knowledge in clinical trials. And, children still suffer from pain during hospitalization unnecessarily. (Linhares, M. B., Doca, F. N., Martinez, F. E., Carlotti, A. P., Cassiano, R. G., Pfeifer, L. I., Funayama, C. A., Rossi, L. R., & Finley, G. A. 2012.) Pain in pediatric patients is sudden and profound by circumstantial fear and concern prominent to undesirable action. The assessment and management of pain are done for all human beings but, for children and babies, situations are more challenging because there needs to be considerations of a child's age, developmental level, cognitive and communication skills, experiences from previous pain, and beliefs that vary from everyone. (Srouji R. et al. 2010.)

Studies have shown that experiencing pain in early childhood presents long-term changes in the context of pain and related behavior. Minimizing ache and unease is a part of patient safety that must be taken care of by health practitioners. Health care professionals working in children care should be able to determine the signs and symptoms of pain in children of different ages, which is triggered by pain or some other unfamiliar stimuli. However, it is difficult for health care professionals to find out the exact pain measuring system in the pediatric community. Therefore, the assessment of pain in children and infants has driven to the production of the number of age-specific pain management appliances and tools. While researchers are targeting to find out assessment products, health practitioners prefer a practical way to follow a kid's pain experience and control. There are some obstacles to manage pain in children, such as individual beliefs, values, and culture. (Srouji R. et al. 2010.)

Pain is characterized as an important health concern for children and adults. There are many direct and long-term negative consequences associated with ineffective pain control. Children often undergo traumatic encounters and extreme surgical stress related to negative emotional and psychological conditions in hospitals. Children with incomplete control of sensation during painful procedures may suffer instant and long-term harmful complications. In fact, unpleasant methods can cause undesirable results in the short and the long term. Such effects consist of a range of physical, physiological, behavioral, cognitive, and psychological outcomes Children's most common triggers of pain are needle procedures. (Tufekci, F. G., Kucukoglu, S., Aytekin, A., Polat, H., & Bakan, E. 2017.)

3.3 Assessment of Pain

Pain assessment in children is very important. It is always a subjective experience. Pain in children should be taken seriously because there is always a reason behind the pain. The

children who have been suffering from pain and got delayed in the treatment of his/her pain might affect growth and development of children. Therefore, the detection of pain and early management according to the cause and severity should be done using appropriate treatment methods. The accurate assessment of pain is very important in different age groups in order to deliver effective treatment. There are three techniques to measure the depth of pain; self-report, behavioural, and physiological measures. Self-report is the best and most valid. Either, the report is verbal or non-verbal, there needs to be a level of understanding in a child to understand and respond which develops according to age and experience throughout their developmental stages. Behavioural measures assess facial pattern, crying, postures and body movement during conversation. Similarly, psychological measures include assessment of heart rate, blood pressure, respiration, oxygen saturation, neuroendocrine response, etc. (Srouji R. et al. 2010.)

Pain-related activities in toddler tend to be the primary indicator for assessments. Nonverbal expressions such as facial appearance, movement of limbs, grasping, holding and crying are regarded to be accurate and reliable pain indicators. Nevertheless, most children of this stage develop signs of pain spontaneously. Facial expression scales are commonly used among pre-schoolers as self-report pain expression. Such scales allow the child to indicate the face that reflects how they feel, as well as how much pain they experience. School-age children are capable to self-report their pain though the language of reporting pain differs from an adult. Children start to understand characteristics of pain at the age of 7-8 years. Self-reported visual analogue and numerical scales are useful among this age group. (Srouji R. et al. 2010.)

Assessment of pain in children can be done by using various pain assessment tools such as Wong-Baker Faces, FLACC (faces, legs, activity, crying and consolability), and Numeric Pain Rating Scale. Another pain assessment tool is CRIES (crying, requires oxygen, increased vital signs, expression and sleepless) which is used for infants. (O'Neal, K., & Old's, D. 2016.)

Some important pain assessment tools are further described as following;

3.3.1 Wong-Baker Faces

This tool was created for the children which helps them to communicate about the pain and enhance in assessment on time. This scale is used with children from age three and older. This self-assessment tool should be understood by children so that they can select the face expression to explain the severity of pain they are experiencing. This measuring scale is not supposed to use by a third person like parents, nurses, or other caregivers to assess the patient's pain. There are other tools available for those persons. (Muhamad Abdelghany, S. A. 2018.)

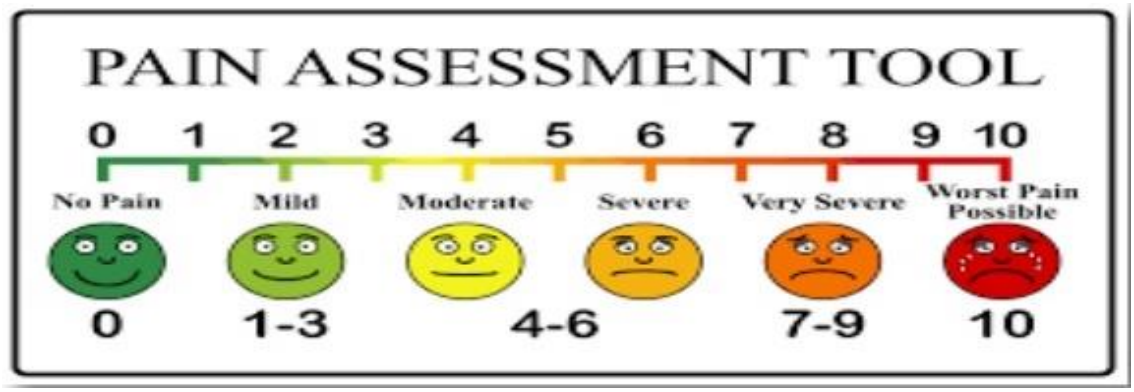

Figure 1: Wong-Baker Faces (Muhamad abdelghany, S. A. 2018)

3.3.2 Faces, Legs, Activity, Crying and Consolability (FLACC)

FLACC, which means face, legs, activity, crying and consolability. The FLACC pain level has been created to enable clinical practitioners to determine the degree of pain in small kids. It can also be used with individuals who cannot speak. FLACC scale consists of zero to two points for all five areas, depending on the observation.

The average ranking is as follows:

0 = Relaxed and relaxed

1 to 3 = Slight distress

4 to 6 = Mild pain

7 to 10 = Extreme pain

Healthcare professionals may understand if someone's discomfort is growing, declining, or constant by registering the FLACC score regularly. (Jacques, E. 2019.)

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

Figure 2: Faces, Legs, Activity, Crying and Consolability (FLACC) (Jacques, E. 2019)

3.3.3 Numeric pain rating scale

This scale is used to determine the strength intensity of pain in the past 24 hours on a scale of 0 (no pain) to 10 (the worst pain ever). In this rating scale, 3 ratings are done to identify current, least and worst pain (Physiopedia 2019).

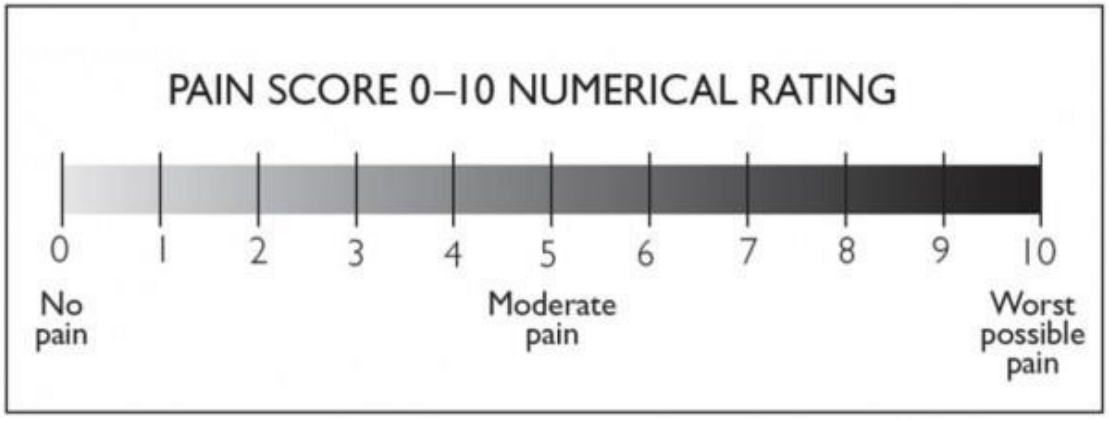

Figure 3: Numeric pain rating Scale (Physiopedia 2019)

3.4 Classification of Pain

Pain is a complex aspect including physiological, cognitive, sensory, affective, spiritual and behavioural factors, (WHO 2012.) Classifying pain provides a guide to nurses and other health professionals for the assessment of pain and its treatment (Sullivan, A. 2010). According to WHO (2012), pain is classified into different categories based on its characteristics which are mentioned in the figure shown below:

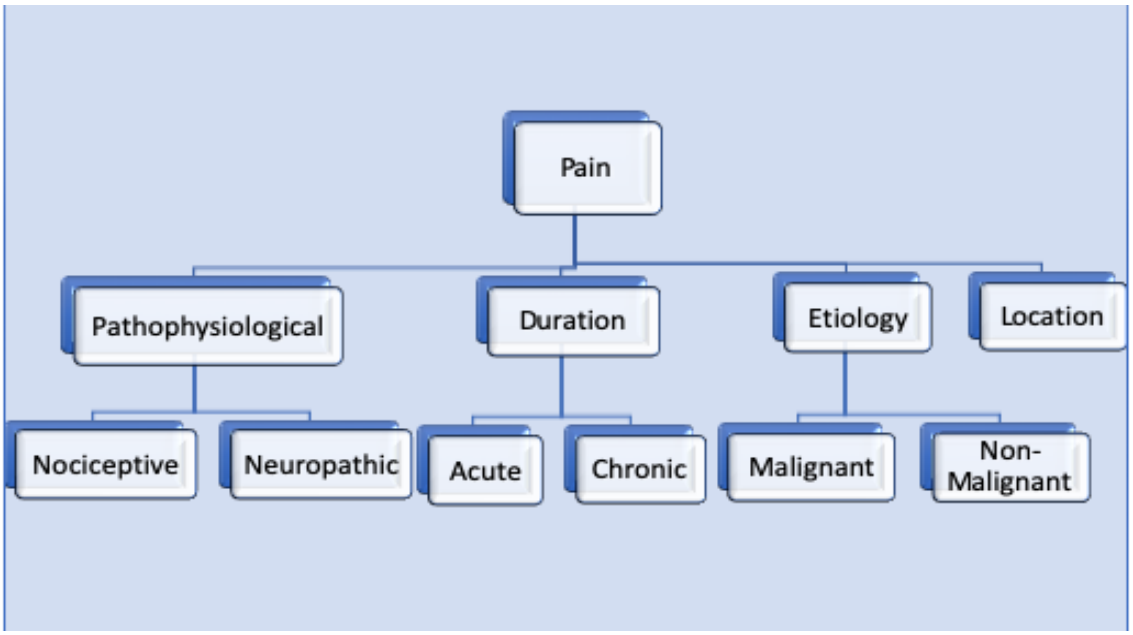

Figure 4: Classification of Pain (WHO, 2012)

The pathophysiological mechanism of pain includes nociceptive and neuropathic pain.
Nociceptive pain: These are pain receptors that activate when a tissue is injured. Nociceptors react to heat, cold vibration, stretch stimuli and chemical substances coming from tissues in return to oxygen deprivation, tissue separation or swelling. Depending on the location of active nociceptors, this pain is further subdivided into visceral and somatic pain. Somatic pain receptors get activated in the surface (skin, mucosa of mouth, nose, anus, urethra) and deep tissues (bone, joint muscles or connective tissue). Cuts and sprains cause surface somatic pain, but muscle cramps cause deep somatic pain. Similarly, on the contrary, visceral pain receptors activate when there is an injury in an internal organ (thoracic and abdominal organs) which develops due to infection, stretching or compression from tumors. (WHO 2012.)

Neuropathic pain: Neuropathic pain usually causes burning or shooting pain, also defined as sharp pain, which can be treated or otherwise becomes chronic. It arises due to nerve damage or dysfunction in the nervous system. (Wheeler, T. 2019.)

Based on duration, pain is classified into acute and chronic. Generally, acute pain is described as pain that lasts up to 30 days and the prolonged pain that lasts more than 3 months is known as chronic pain. But, just defining pain according to duration is not important on the decision making of the treatment procedure. Acute pain is an immediate injury, complex in intensity and short-term resulting from of tissue injury which ends gradually as the injury heals. However, chronic pain is reoccurring and continues over a longer period. Therefore, chronic pain might affect daily living that comprises of physical activities, sleeping patterns, family cooperation, and other social relationships that which eventually drives to stress, anxiety, insomnia, and mood changes. (WHO 2012.)

According to the World Health Organization, Etiological classification of pain is based on the disease condition which can be malignant or non-malignant (WHO 2012). Malignancy, a term used to describe diseases where abnormal cells divide without control and may invade surrounding tissues. Malignant cells might also spread across the bloodstream and lymphatic systems to various parts of the body. Non-malignant tumours can increase in size but do not spread to other areas of the body. Often, non-malignant cells are termed as benign, and may not be cancerous. (National Cancer Institute n.d.)

Location pain is also classified by the location of the body like head, back or neck or by the anatomical function of damaged/affected tissue (rheumatic, skeletal, neurological and vascular). (WHO 2012).

There are some reasons of continuous pain in children that arises from chronic diseases like arthritis, rheumatological disorders, sickle cell illness, musculoskeletal ache and other chronic conditions such as bowel inflammation that causes reoccurring abdominal sickness. Another reason for pain in children is trauma which comprises of physical, electrical, thermal and chemical injuries that lead to phantom limb pain or lower back injury. Similarly, children experience pain due to life-threatening illness like cancer or HIV/AIDS that require regular treatments. (WHO 2012.)

Sometimes the experience of pain is sharp or dull, constant or on-and-off, or burning or aching. It is very difficult to identify pain since the pain appears in different spots and there are a variety of reasons for it. Hence, to make a correct assessment, patient and health professionals should work together to find out the cause and its symptoms so that pain can be relieved. Chronic pain is one of the consequential problems in a pediatric patient. The main purpose of managing pain in children is to improve children’s capacity to subsist with pain so that they will be able to survive normal quality of life. About 20-35% of children and adolescents living with a variety of chronic pain syndrome. (El-Radhi, S. 2015.)

3.5 Pain Management

Providing therapeutic or medicinal care that helps in relieving pain is defined as pain management. (Shiel, W. 2018). Nurses should be able to address pain and painful procedures to minimize the effect of pain in children and manage it. There are two different ways to alleviate pain. Pharmacological pain management method, where the pain is managed by using different pharmaceutical products and Non-pharmacological methods of pain management involves different alternative approaches that include a variety of measures to reduce the pain experience in children. (Stanford Children's Health n.d.)

3.5.1 Pharmacological Pain Management

Pharmacological pain management is a measure where moderate to severe pain can be managed by using certain medicines. For chronic pain, opioids and sedatives are also used. (Shiel, W. 2018). In response to tissue damage, chemical agents/pathogens (nociceptive pain), or nerve damage (neuropathic pain), a variety of medications are used to treat pain caused by inflammation (Physiopedia 2019). There are many forms of drugs and several techniques used to give them according to the requirement for a very brief (10-minute) mild sedation to full general anaesthesia in an operating room. Pain-relieving medicines are given through different routes. Such as; oral, intravenous, intramuscular, epidural, on the skin, etc. (Stanford Children's Health n.d.)

Analgesic and painkillers tolerance can develop in children. This indicates the dosage needs to increase exponentially or the option of medicinal products might need to change. The concern of drug abuse is growing within families. It is essential to remember that the main priorities are comfort, functionality and standard of life overall, that means taking an action to ensure that child is free of pain. Kids being treated for cancer show no history of addiction to pain medicines. (Stanford Children's Health n.d.)

3.5.2 Non-pharmacological Pain Management

Non-pharmacological pain management is the technique that is practised for the management of pain without using any medicine or drug. This method focuses on changing thoughts and attention to better manage and reduces the pain. The choice of this method of pain management depends on the cause, severity of pain and depends on the age of the patient. (Stanford Children's Health n.d.)

Non-pharmacological pain management refers to treatments that do not require the use of pain medications. The purpose of non-pharmacological treatments is to lower down fear, stress

and anxiety, relieve pain and provide a sense of comfort. Taking consideration about the patient's age, developmental level, medical history and prior experiences, the current degree of pain and/or anticipated pain provide a pathway to decide the effective non-pharmacological technique. The benefit of non-pharmacological treatments is relatively cheap and safe. (Geziry, A. E., Toble, Y., Kadhi, F. A., Pervaiz, M., & Nobani, M. A. 2018.) Sometimes the children just have a mild pain where the pharmacological treatment is not necessary. In such case, nurses need to know what kind of non-pharmacological treatment can be effective for children. The types of treatment depend on the pain and its severity. (Srouji R. et al. 2010.) Nonpharmacological approaches represent a large portion of pediatric medical treatment combined with pain control, with a view on providing sufficient pain management. Nonpharmacological approaches are usually known to be alternative techniques used either alone or with medication. The advantages of using non-pharmacological approaches include minimal side-effects, discomfort, depression and anxiety identified by the patient, child and/or the observer. (Çelebioğlu, A., Küçükoğlu, S., & Odabaşoğlu, E. 2015.)

The Non-pharmacological approach has been favourable in most cases and is accepted globally. Non-pharmacological pain management seems to be safe, effective and inexpensive for many procedural pains. Several nonpharmacological approaches have been effective in reducing the pain perception for co-operating school-age children and are a dynamic, incredibly complex, and subjective experience consisting of adequate cognitive development in physiology, sensory, emotion, cognitive, and behavior. (Tufekci F. et al. 2017.)

4 Purpose, Aim, and Research Questions

The purpose of this research was to explore different types of non-pharmacological pain management methods that are effective to manage pain in pediatric patients.

The aim of the thesis was to provide knowledge among pediatric nurses about the management of pain in children through different methods of the non-pharmacological pain management process.

Research questions:

1. What kind of non-pharmacological pain management method are used by nurses to manage pediatric pain?

2. What are the commonly used non-pharmacological pain management methods for children?

5 Research Method

5.1 Literature Review

The research method used in this study is a descriptive literature review, which is used to review the results of previously published research works or studies on a chosen topic systematically. Such study describes what is already known about the subject and what kind of research information are available. (TENK 2012.) A literature review doesn't mean just to analyse the research. It consists four objectives that include, assessment of the literature in the field of study, analysis and interpretation of the content gathered by finding differences in existing knowledge by illustrating limits of concept along with ideas and implementing contexts for further study of controversial issues. And, finally presenting the review of literature in a systematic format. (The Royal Literary Fund 2020.)

5.2 Inclusion and Exclusion Criteria

The databases used for the literature research are ProQuest Central, CINAHL, and Google Scholar. Authors have also used some other manual searches for the data collection. The keywords that have been used are Child, Pain, Pain management, Non-pharmacological management. To make the limitation of the data collection process, authors have made some inclusion and exclusion criteria.

Table 1: Inclusion and Exclusion Criteria

INCLUSION	EXCLUSION
Articles that have full-text	Articles that were not free
Articles published from 2010 to 2020	Articles published before 2010
Articles written in the English language only.	Articles written in any other language than English
Articles that address children pain and their management (1-10 years).	Articles that talk about the pain in neonates, infants, teenagers and adults and their pain management.
Articles that are addressing non-pharmacological pain intervention in children (1- 10 years).	Articles related to pharmacological pain management methods.
Scientific and research articles, master thesis or dissertation. Manual search from other research is accepted.	Magazine, bachelor thesis and unreliable material online.

5.3 Literature Search

An illustration of the literature research and data collection process are mentioned in the table below:

Table 2: Data Search Process

DATABASES	SEARCH	LIMITS	RESULT	ACCEPTED WITH ABSTRACT	ACCEPTED
CINAHL	Non-pharmacological therapies and pain management And Children	2010-2020 English Research articles PDF Full text	69	2	0
Google Scholar	Nonpharmacological Methods, Children Pain and Nurses use	2010-2020 Anywhere in the articles PDF	1647	5	3
ProQuest Central	Non-pharmacological Intervention and Children Pain Management	2010-2020 Full text English Language Publication title with: Pediatric Nursing, Pain Research and Treatment and Alternative Therapies in Health and Medicine	28	3	1

Manual Search	Non-pharmacological management And Children Pain	2010-2020 Free Full text	-	-	1

Table 3: Accepted Articles for Research

Title of Article	Authors /year	Purpose of the study	Findings
Non-pharmacological Methods in Relieving Children's Pain in Hospital: a pilot study	Seldon, L. A. (2017)	This article's aim was to determine registered nurses utilization of non-pharmacological methods of postoperative pain management for pediatric surgical patients.	Commonly used non-pharmacological pain management method based on research result.
Patients and ICU nurses perspectives of non-pharmacological interventions for pain management	Gélinas, C., Arbour, C., Michaud, C., Robar, L., & Côté, J. (2013)	To describe the perspectives of patients/family members and nurses about the usefulness, relevance and feasibility of non-pharmacological interventions for pain management in the intensive care unit (ICU).	Different non-pharmacological pain management methods and their subcategories.
Turkish Nurses Use of Nonpharmacological Methods for Relieving Children's Postoperative Pain	Çelebioğlu, A., Küçükoğlu, S., & Odabaşoğlu, E. (2015)	Aim of this study was to investigate and analyze Turkish nurses use of nonpharmacological methods to relieve postoperative pain in children.	Definitions and use of non-pharmacological pain management methods

Turkish Pediatric Nurses Use of Non-Pharmacological Methods for Postoperative Pain Relief in 6 to 12 Year Old Children	Efe, E., Özcan, D., Dikmen, Ş., & Altaş, N. (2017)	To describing the Turkish pediatric nurses' use of non-pharmacological methods for relieving 6 to 12-year-old children's postoperative pain.	Definitions and other methods of non-pharmacological pain management.
The effects of three different distraction methods on pain and anxiety in children.	Şahiner, N. C., & Bal, M. D. (2016)	This aim of this study was to compare the effect of distraction by applying distraction cards (Flippits1), listening to the music of a cartoon, and balloon inflation to reduce procedural pain and anxiety during phlebotomy in children between the ages of 6 and 12.	Purpose and use of different types of distraction.

5.4 Data Analysis

Analysis of data distinguishes patterns and relationships between variables and describes the data collection process. This assists in data interpretation and makes a conclusion or solves the research question. Analysis of the data begins with data collection accompanied by classification and analysis of the raw data. The data processing measure is to find the main elements and the differences and similarities between all the information. Data analysis should be appropriate to disclose its importance and the reliability of the data must be carefully reviewed. (Polit, F., & Beck, C. 2012.)

The concepts of inductive content analysis method were used in this literature review. Preparation, Organization and Reporting of the data are the three major steps in the inductive content analysis. An inquiry was done on relevant research articles from numerous databases. All the gathered articles were reviewed by both authors. The gathered articles were sent to the supervisor for approval beforehand. Following the approval from the supervisor, data were collected. In the preparation stage, raw data were collected after a thorough study on the chosen articles which were reliable for research questions. While, in the organization stage,

the raw data was finalized and answers for the research questions were aggregated. Thus, in the reporting phase, the results are presented by making categories and sub-categories of the analysed information. (Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. 2014.)

6 Findings

Non-pharmacological treatments are described as therapies not involving the use of medicinal products or other active substances. Non-pharmacological treatments relate to non-pharmacological approaches used by health care professionals in general practice. (Gélinas, C., Arbour, C., Michaud, C., Robar, L., & Côté, J. 2013) Nonpharmacological approaches target in, decreasing the nervousness of kids, reducing their anxiety and discomfort and giving them a feeling of control. (Çelebioğlu, A., Küçükoğlu, S., & Odabaşoğlu, E. 2015).

6.1 Non- Pharmacological Pain Management Methods Used by Nurses in Children Pain Management

According to the findings from the selected articles for this research, the non- pharmacological methods that are used by nurses in relieving pain in children can be categorized into five categories. They are cognitive-behavioral therapy, physical method, emotional support, creating a supportive environment and assisting in daily living activities. These methods are further sub-categorized into other sub-categories as shown in figure 5. (Gélinas C. et. al. 2013; Efe, E., Özcan, D., Dikmen, Ş., & Altaş, N. 2017; Seldon, L. 2017.)

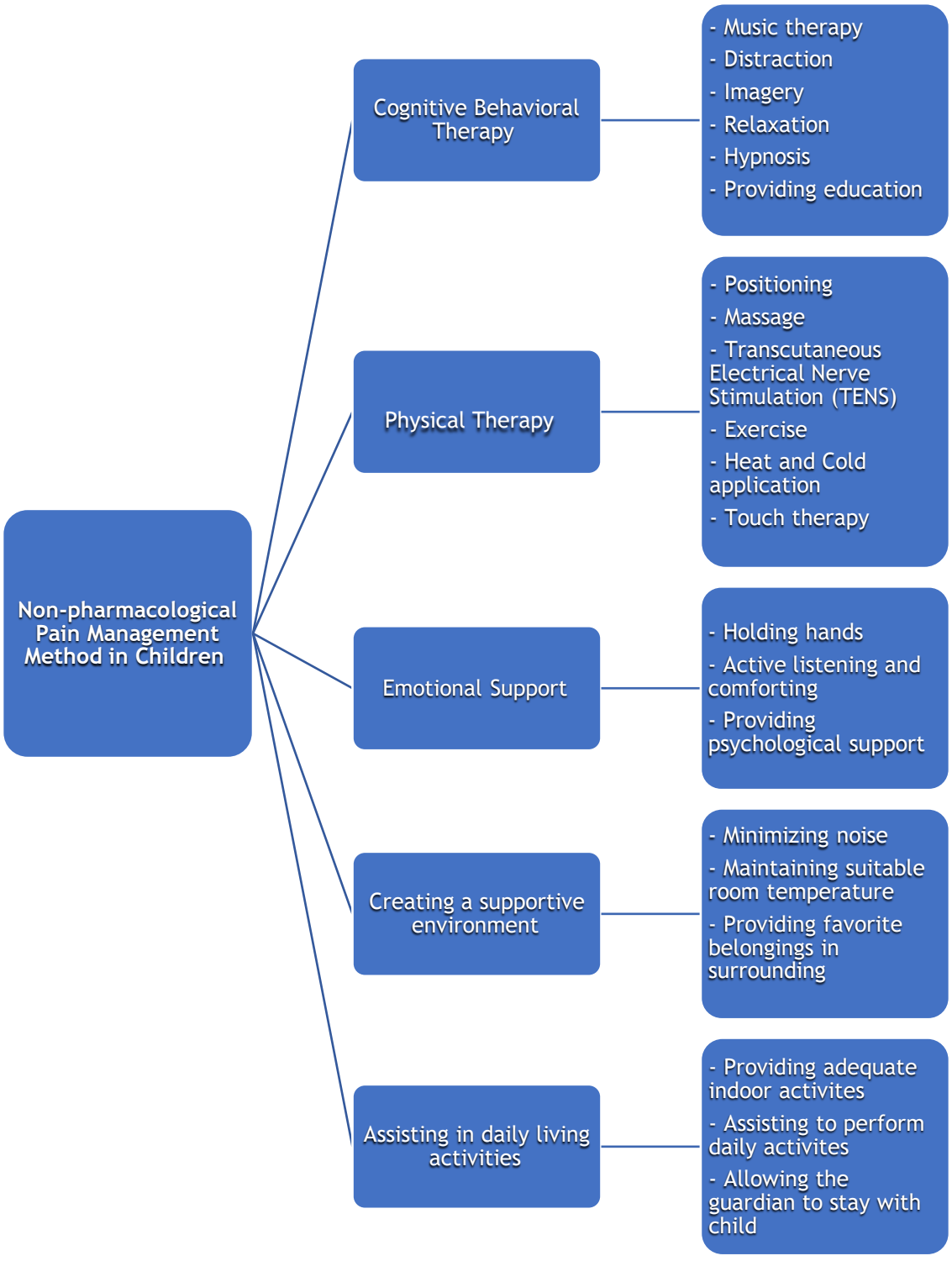

Figure 5: Non-pharmacological Pain Management Methods

6.1.1 Cognitive Behavioural Therapy

Cognitive behavioural therapy is a functional approach, which involves motivational reinforcement approaches by emotionally motivating kids, rewarding them with prizes, encouraging them to stay positive, letting to use their imagination and creativity, supplying them with music, calming them, making them take deep breaths as well as trying to read the books (Çelebioğlu A. et. al. 2015). Cognitive approaches help the child concentrate on anything else rather than distress, thus their use has been reduced to older kids since they require abstract thought and communication skills. Consequently, most cognitive techniques cannot be used prior to school age. School-age children are at a specific practical stage of learning; they may begin to respond to psychological distress, and they want to be in charge of their situation. (Efe E. et. al. 2017.)

The different therapies that include in cognitive behavioural therapies are music therapy which supports to bring about a specific adjustment in mood, emotion or physiology. The first non-pharmacological treatments used to control pain was music therapy. Music therapy is shown to lower pain severity and improve the length of time until patients require a further dosage of pain reliever. Distraction was proven effective and important for pain control. The use of distraction strategies in patients also can be diversion outlets for nurses (Gélinas C. et al. 2013.) Distraction is a fast and easy method that draws the attention of children away from frightening triggers. Non-pharmacological methods involve diversion strategies like singing, reading or playing a game. There are number of diversion related strategies and innovations. Nursing staff have been using entertainment for a long time to relieve pain (Şahiner, N., & Bal, M. 2016.) Simple guided imagery is an intentional use of imagery to gain relief or direct focus away from unwanted stimuli. Simple relaxation therapy is a usage of strategies (e.g. deep breathing) to induce and encourage relaxation to relieve symptoms. Hypnosis helps a patient trigger a modified state of awareness to establish an acute perception and concentrated awareness. Patient education is a process of getting a patient ready to recognize and brace themselves emotionally for a recommended operation or procedure (Gélinas C. et. al. 2013.)

6.1.2 Physical Therapy

Physical therapy focuses mainly on physical structures and processes, involving joints and muscles, soft tissues, and circulatory and lymphatic processes (Gélinas C. et. al. 2013). The physical methods include offering massages, putting the object you like next to them and adjusting their positions. (Çelebioğlu A. et. al. 2015). Similarly, exercise therapy, heat and cold applications, touch/therapeutic touch are other physical methods of non-pharmacological pain management. Massage is a technique for the Incitement of the skin and the surrounding tissues with different hand angles pressure to minimize discomfort, relax and/or boost blood

flow. Individuals perceived basic massage as an effective non-pharmacological method to relieve the pain. Nurses consider massage beneficial, appropriate and achievable in pain management. Positioning is an intentional positioning of an individual or body part (e.g. use of appropriate cushions or mattresses to allow a correct body position) to facilitate functional and/or emotional well-being. Exercise therapy encourages to position and motion during everyday tasks (e.g. doing passive or active body exercises, getting off from the bed and sitting in a chair) to avoid tiredness, muscle rigidity or illness. Touch is an intentional action to ensure ease and contact by means of sensory touch. Hot/cold application is the process of activation of the skin and inner tissues to alleviate discomfort, muscle spasms and swelling (Gélinas C. et al. 2013.) Heating pads and towels were the heat distribution approaches most frequently found (Seldon, L. 2017). Therapeutic touch is the use of the hands natural responsiveness to softly concentrate and guide the process of healing (Gélinas C. et al. 2013).

6.1.3 Emotional Support

Emotional support means providing encouragement, recognition and motivation through tough times (Gélinas C. et al. 2013). Hence, it means to be always nearby and to reach them both physically and psychologically when needed (Çelebioğlu A. et al. 2015). This emotional method of non-pharmacological pain management concentrate on responsive, compassionate and accommodating strategies that improve restlessness/sadness communication, foster acceptance and support in handling challenges (e.g. participation, holding hands, constructive attention and comforting). An emotional method of pain management in children to relieve pain by spending time together, the most used method (Seldon, L. 2017.) Furthermore, active listening is a process of watching, understanding and adding meaning to the verbal and non-verbal communications of a person is a part of emotional therapy (Gélinas C. et al. 2013).

6.1.4 Assisting in Daily Living Activities and Creating a Supportive Environment

Assisting in daily living activities means to concentrate on the support needed to carry out tasks that people usually need to be able to do regularly in order to be recognized completely capable, like body washing for soothing, hygienic and therapeutic purposes. Therefore, creating a supportive environment means to enable daily bed cycles (e.g. letting rest time without nurse, medical personnel and family involvement). Controlling of the patient's environment is to enable efficient ease (e.g., reduction of brightness and buzzers) (Gélinas C. et al. 2013.) Also, providing an adequate indoor environment and decent ventilation is a part of a supportive environment. There is also another procedure that includes in non-pharmacological pain management methods like, enhancing room smell, cute bedsheets, good personal hygiene habits, playing cards/texts/photographs in front of the bed of the kid,

Individuals giving importance to the interiors and allowing the guardian of the kids to carry several of his or her own personal items to the unit (Seldon, L. 2017.)

6.2 Commonly Used Non- Pharmacological Pain Management Methods for Children

The finding of this research identified various non-pharmacological pain management methods that are commonly used by nurses for the management of pain in children. Research has shown that numerous non-pharmacological pain-alleviating methods have been beneficial in children pain management. Among those, some measures are highly recommended in relieving pain in children.

Several techniques are used during medical treatments to minimize pain perception. The different measures like, distraction, hypnosis, simple relaxation therapy, simple guided imagery, music therapy, biofeedback and patient education are the example of cognitive therapy, among which distraction is the most used in children of different age groups. (Şahiner, N., & Bal, M. 2016). Also, research by Seldon, L. (2017), shows that distraction methods of cognitive-behavioral approaches have been used mostly by nurses. There is wide use of various distraction techniques including thinking about children everyday lives, watching television or web videos, playing music. (Gélinas C. et al. 2013; Şahiner, N., & Bal, M. 2016). Furthermore, distraction includes enabling the kids to think of or visualize fun things, motivating the child to relax various part of their body and training the child the proper breathing exercises to reduce pain were all most widely used by nurses as a non-pharmacological pain relief technique (Seldon, L. 2017). Active involvement of the children in cognitive behavioural therapy helps them to cope in fearful and painful procedures. (Çelebioğlu A. et al. 2015).

Frequently used physical methods of non-pharmacological pain control measure include pain relief by maintaining a comfortable position (Çelebioğlu A. et al. 2015; Seldon, L. 2017). Heating pads and towels were the heat distribution approaches which is used most frequently. Therapeutic contact was often used to relieve pain. Nurses have also utilized emotional support strategies typically to alleviate pain in children. Emotional support measure includes encouragement, recognition and motivation during hard times, holding hands, constructive attention and comforting. Finally, a supportive environment means to enhance room temperature, lighting, allowing to rest without any disturbance. (Seldon, L. 2017.)

Seldon (2017), state that the majority of nurses have always or nearly always used the physical methods, emotional support, helping with daily activities and creating a comfortable environment. Whereas, the research also indicates that, imagery, relaxation, breathing technique, and thermal regulation techniques have been used ‘‘sometimes’’. The method of

non-pharmacological intervention which is rarely or not often used is transcutaneous electrical nerve stimulation (TENS). (Seldon, L. 2017.)

7 Discussion

The purpose of this research was to explore different types of non-pharmacological pain management methods that are effective to manage pain in pediatric patients. This thesis was aimed to provide knowledge among pediatric nurses about the management of pain in children through different methods of the non-pharmacological pain management process.

Managing children's pain is an important factor in the arrangement of adequate health care, and the use of different methods for pain control benefits children. Many non-pharmaceutical methods have been researched to analyse their effectiveness that is used as a method to manage pain. (Short, S., Pace, G., & Birnbaum, C. 2017). Precise pain measures are tough to obtain in children. Various forms of pain management tools can be used in children of several age groups therefore, age-specific non-pharmacological treatments treat pain in kids and are beneficial when designed per child's developmental phase. (Srouji R. et al. 2010). The assessment of pain in children has been improved in past decades, but still lacks behind the adult pain assessment. This is due to the inadequate clinical knowledge, less research in pediatric pain and agitation of opioids side effects and their addiction. Several organizations have conducted trials on pediatric analgesics trials to provide an evidence-based recommendation in pain management in children of all ages. (Verghese, S. & Hannallah, R. 2010.)

Pain in children is one of the frequent complaints and if not managed it causes systematic problems such as respiratory illness, bowel or urinary complications, circulatory problems and many other integral difficulties, which effect on the quality of life (Yaban, Z. 2019). Children pain management is an important part of the delivery of adequate medical care and the use of different non-pharmacological methods of pain control benefits children. (Short S. et al. 2017).

Considering different types of pain based on their classification, research was focused on a different form of non-pharmacological pain management methods which are highly effective in managing the pain of children from 1 to 10 years. The findings suggest that nurses use several non-pharmacological approaches to treat pain in children and significant evidence also support that use of non-pharmacological approaches provide additional pain relief in younger patients by reducing psychological pain perception, improving relaxation and promoting coping skills. The non-pharmacological interventions used to manage pain in pediatric nursing are categorized into five different groups which include cognitive behavioural therapy, physical

methods, emotional support, assisting in daily living activities and creating a supportive environment. Different supportive techniques and therapies are further sub-categorized which includes different types of pain alleviating process. (Efe E. et al. 2017.)

According to the findings, some non-pharmacological pain management methods that have been commonly used by nurses in managing pediatric pain. Distraction from cognitive behavioral therapy, positioning in the physical method. Including these several other methods like therapeutic touch, heat application, emotional support has been used sometime by nurses. Short S. et al. 2017, supports distraction, a non-pharmacological method that has been very effective to decrease pain throughout the developmental stage. Different methods of distraction are useful for different age group. Toddlers and pre-scholars gain advantage from blowing bubbles which are a form of distraction technique of pain management, that helps by minimizing methodological discomfort and effective for young children. Similarly, older children select the strategies themselves to be distracted from the pain and painful procedure. Some of the common options for this age group are; discussing their hobbies, video games, gadgets and other technologies such as phones, I-pads. (Short S. et al. 2017; Srouji R. et al. 2010.)

This study has focused on the use of non-pharmacological approaches by nurses for pediatric pain relief that seemed to be increased from past decades but however the evidence research seems to be inconsistent and these non-pharmacological methods are not used often (Efe E. et al. 2017). Some barriers that influence nurses or other health practitioners in delivering non-pharmacological methods are due to lack of knowledge about alternative measures, lack of experience in the selected field and also due to lack of time as such procedure consume more time (Seldon, L. 2017).

This research is based on the use of non-pharmacological approaches by nurses for pediatric pain relief that seemed to be increased from past decades but however the evidence research seems to be inconsistent and non-pharmacological methods are not used often (Efe E. et al. 2017). Use of medicine is important in pain management procedure but they do not always alleviate pain per expectation neither needs for minimal pain and have several unpleasant side effects. Therefore, the use of non-pharmacological methods with pharmacological interventions helps to relieve pain experienced by children. (Yaban, Z. 2019.) Proper pain assessment is important as well, knowledge on both pharmacological and non-pharmacological interventions is necessary for effective pain management.

Therefore, non-pharmacological pain management should be integrated into medical education to assure that nursing staff are conscious of all accessible non-pharmacological approaches and how such strategies can be applied in an age-appropriate manner. Proper recording of successful nonpharmacological approaches to promote their usage must also be done. The

results indicate that nurses can independently incorporate nonpharmacological approaches in pediatric nursing to minimize pain and provide comfort in everyday life.

8 Ethical Consideration

The ethical principles should be considered to protect the rights and autonomy of research subjects as well as to maintain privacy and data protection. The authors of this research took consideration to follow ethical standards and code of conduct that, The European Code of Conduct for Research Integrity made as a guideline in conducting research. According to Finnish Advisory Board on Research Integrity, fabrication, where the outcomes are unrealistic due to inappropriate methods, plagiarism, which means copying the content of other research without mentioning the researcher, misappropriation, using other researcher's data to own work which against the law, and falsification that is the misrepresentation of the data. (TENK 2012.)

This research was carried out by literature review, therefore no interviews, observations, questionnaires were used as part of the research. Data were collected from reliable articles. So, privacy and confidentiality of identities were not mandatory, as there wasn't any personal interaction with children, nurses and articles authors during the data collection process. All sources used for this research such as journals, online materials, and scientific research articles have been referenced and authors are mentioned properly according to Laurea UAS thesis guidelines. Research integrity was maintained by the authors to avoid any misconduct, such as falsification by manipulation of the research process, plagiarism, and fabrication regarding data or the results.

9 Limitation

This thesis aims to provide knowledge among pediatric nurses about the management of pain in children through different methods of non-pharmacological pain management processes. There were some limitations that authors faced while conducting the research. The very first limitation for this research was the age group of children which is mentioned in the topic of the thesis. Some good scientific articles were outdated as inclusion and exclusion criteria limits their validity. English language inclusion requirements are restricted in such a way that research performed in several other languages haven’t used in the research process. Some of the scientific articles which appeared reasonable and important to the study were unavailable or cannot be retrieved from Laurea database. This research did not mention the search results done for other terms as well as other databases because they did not generate any results. However, this research was conducted by using articles that were found most relevant for the topic.

10 Conclusion and Recommendation

Pain in children is a difficult situation, so proper management of pain is essential. Pain in children can be managed by using different non-pharmacological methods, considering the severity and types of pain and based on the age of the child. Participation of children in planning and implementing the pain management process increase effectiveness of the outcomes. Introducing pain control as part of nursing practice could be a useful way of encouraging pain relief measures. Therefore, several alternative methods are best for pain alleviation.

Reducing and controlling pain totally may not be possible but the discomfort can be managed to a level so that the patient feels relaxed. Therefore, nurses have a major role in pain management procedure. Active involvement of nurse is important so that they will be able to evaluate the children situation and make a care plan according to the nursing process including pharmacological along with non-pharmacological pain management strategies. Along with pharmacological treatment, non-pharmacological pain management methods are also an important part of children pain management. Therefore, proper education on non-pharmacological pain management should be integrated to ensure that nurses become conscious about all applicable non-pharmacological approaches and how to implement such interventions in an age-appropriate aspect. And, there should be proper documentation of appropriate non-pharmacological approaches to promote their usage.

The authors recommend more research are needed to recognize challenges that are preventing the implementation of nonpharmacological pain management practices by nurses, as this information will encourage nurses to utilize those measures adequately throughout nursing care. Further awareness is required to enhance the assessment and treatment of pain in pediatric nursing and to use non-pharmacological measures of pain management.

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Figures

Tables

Appendices

Appendix 1: First appendix