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Experiences and Knowledge of Nurses Neonatal Pain Management

Literature Review

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<p>Abstract:</p> <p>Background: The perception, knowledge and attitude of nurses about neonatal pain care is assessed and analysed through already published articles. Task and objective: The researchers viewed nurses' perceptions through existing articles. Aim is to reviewed nurses' perception, knowledge and attitude on neonatal pain management and the effect of pain on neonates. The purpose is to find means to improve neonatal pain management. Implementation method: Literature Review is used in this study. The researchers searched articles from CINAHL, Wiley Online Library and google scholar from which they got 1582 articles, of which 12 articles were used in the research. The research questions used is How are nurses assessing and managing neonatal pain.? How neonates feel pain?</p> <p>Result: New-born babies are mature enough to perceive pain before birth. Ineffective management of neonatal pain have short and long-time developmental consequence. Most nurses lack the knowledge needed to manage neonatal pain. Most neonatal ward do not have register record about analgesic use. Low dose analgesic is proven to have less negative effect on neonates, but analgesic use is neglected in new-born by many hospital settings. Conclusion: Pharmacological intervention as well as non-pharmacological intervention must be considered when managing neonatal pain.</p>		
Keywords: Nurses' experiences, neonatal pain and management, pain alleviation, pain assessment, pain management		

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1 Introduction

The management, assessing and processing of pain in neonates is different from older populations (Johnston, Fernandes & Campbell-Yeo 2011). Adequate pain management in neonates is an important issue, not only ethically and or biologically, but also for short- and long-term negative or unwanted consequences. Ensuring efficient management of procedural pain in neonates is required to alleviate acute physiological and behavioural distress and discomfort, this may also help to prevent acute and long-term outcomes such as painful stimuli that activates nociceptive pathways from the peripheral tissue to the cortex.

However, it is important not only to reduce acute behavioural responses to pain in neonates, but also to protect the developing nervous system from persistent sensitization of pain neuropathic pathways and potential damaging effects of altered neural activity on the development of the central nervous system (Walker 2014; Johnston et al. 2011).

Increasing death rates of new-borns and a greater understanding and knowledge of the long-term effects of early exposure to pain in neonates have initiated a greater need for nonpharmacological and pharmacological pain management strategies in the neonatal care wards as well as neonatal intensive care units. In other words, nonpharmacological ways to manage pain in neonates include non-nutritive sucking and kangaroo care (Hartley, Miller, & Gephart 2015).

The aim of the study is to assess nurses' experiences of neonatal pain care through existing literatures, and the effects of pain on neonates. The purpose is to provide nurses information on neonatal pain management. Research questions; How are nurses assessing and managing neonatal pain.? How neonates feel pain? (Johnston, et al. 2011)

2 Nurses earlier perception of pain in neonates

According to Alfes, Hickman, & Fitzpatrick (2018) “pain is defined by the International Association for the Study of Pain (IASP) as an uncomfortable sensory, stress or discomfort and emotional feeling connected with actual or potential tissue damage or described in terms of such”. Pain plays protective role in preserving humans. Pain plays a good role when it serves as protective factor.

For example, “reflexive responses to noxious stimuli” or danger. It is thought to be a bad pain when it derives from a pathological condition such as nerve injury or any debilitating disease. In doing so, pain is viewed as messenger to alert a person about possible peril, or as a risk indicator or post injury recovery. Without pain sensation, a person becomes defenseless for potential injury and ignorance of injury (Alfes, et al. 2018; Gitto, Aversa, Salpietro, Barbe, Arrigo, Trimarchi, Reiter, & Pellegrino 2012).

Studies have shown that if pain left untreated or ineffectively administered, it can result in both short- and long-term adverse effects on the health of neonates. (Pölkki & Laukkala 2018). Previous research on experiences of neonatal pain has illustrated the belief, that neonates do not feel pain or that if experienced was to a lower degree than older children have turned out to be wrong by current studies.

The international guideline neonatal pain states, that nurses are charged with the obligation to prevent, assess and manage neonates’ pain (Walker 2014). Some health nurses believed that neonates could not experience pain because their immature level of myelination, also neonates lack the ability to remember difficult procedures. Another misconception existed that pharmacological procedures for managing pain could be hazardous to the neonates. The risk would outweigh the gains (Gitto 2012; Alfes, et al. 2018; Walker 2014).

Numerous studies have shown that neonates are mature enough for pain perception and also have memory of painful procedures (Walker, 2014). It is known that neonates’ nerve endings grow in the perioral region in the seventh week of pregnancy, next to the face, palms and plantar region in the 11th week, the nerves appear in trunk and proximal region at the 15th week and about the 20th to 24th, the nerve synapses are ready for

the perception of pain. In so doing, neonates feel pain the same as older children or neonates maybe more sensitive to pain than older children and adults (Smith, Schoenbeck, Clyton, 2009; Woragidpoonpol et al.)

Newborns are at risk adverse long-term behavioural and developmental effects if their pain is not adequately relieved. Pain in neonates can be very problematic for both the neonates and the neonatal nurses. The painful experience of sick newborns and preterm infants can be traumatic, raising concerns about whether enough is done about their pain relief, and if more is needed to comfort these newborns (Gitto, et al. 2012; Johnston, et al. 2011; Johnston, et al. 2011).

2.1 Nurses later perception of neonatal pain

Pain intensity is based on the interpretation of the individual feeling the pain. Neonatal pain must be studied by nurses because it creates unease, stress and suffering for both neonates, family and nurses. In addition, pain is perceived differently in different cultures. For instance, during a research of 17 Hispanic patients with cancer, the researchers noticed that patient's "stoicism" often prevented the participants from seeking medical treatment for pain. It was also noted that Hispanic patients may believe in folk remedies and nonmedicinal treatments for pain than non-Hispanic patients, and individuals don't personally feel pain same way (Santos, Medeiros, Oliveira, Souza, and Freitas 2015).

Pain can be identified in different ways. In children the diagnosis is very important. Research has proven that health care workers tend to misunderstand or underestimate neonatal pain, which result in distress and suffering for new-born and can have consequences in the long run in terms of interactions with their family (Alfes, et al. 2018).

There is a need to apply proper evaluation method for this population. One easy applicable pain measurement tool is the NIPA scale, as it uses non-invasive method and allows joint assessment of major neonate pain signals. If pain is not treated, it may lead to physiological and hemodynamic alterations that may risk the new-born's well-being and recovery process. Untreated pain in neonates may result in other

consequences due to their neurobehavioral development in the medium and long term. Stressing the importance of pain is to help identify, evaluate and, above all, to have pain appropriately treated (Alfes, et al. 2018; 2015; Walker 2014).

2.2 Controlling pain in neonates

Neonatal Intensive Care Unit (NICU) these days possess advance skills and knowledge in translating and understanding of preterm infant physiological and behavioral patterns and responses to pain, thereby providing relevant intervention to ease such pains. With this, it refutes the earlier believe that neonates do not feel pains. Neonates do feel pain like adults do. The neonates group require special standard attention and concern. The need for human right demands humanitarian right across all age group, starting from the unborn child in conception to the elderly dying adults (Cignacco, Hamers, Van Lingen, Stoffel, Buchi, Muller & Nelle 2009).

There are several pharmacological treatments that reduce pain in neonates, it has proven that opiate as an analgesic, is very effective in managing stress and alleviating physiological instability in many ways in new-born. Various studies have shown that opiates cause lesser degree of hypoxemia, less blood pressure fluctuation, decrease in behavioural and hormonal and stress reaction (Walker 2014; Gitto, et al. 2012).

Several studies have shown less effect of morphine infusions on poor neurological outcomes and minor effects on pain scores and scales. In terms of analgesics, Morphine and Fentanyl are equally effective (Gitto et al. 2012). When taking care of mild and moderate pain in neonates, nonpharmacological treatments are considered more. These therapies include breastfeeding, kangaroo approach, reduction of light and ensuring a quiet environment, music therapy and curdling.

Positioning neonates in a suitable and comfortable way to provide containment that maintains a flexed position either with blanket rolls or via “facilitated tucking” helps to promote self-regulation and lessen crying time during heel sticks. The use of analgesic, glucose and sucrose sucking are among the pharmacological approach used in neonatal

pain intervention (Gitto et al. 2012; Walker, S.M., 2014; Tasso, & Behar-Horenstein 2004)

3 Aim, Purpose and Research Question

The aim of the study is to assess nurses' experiences of neonatal pain care through existing literatures, and the effects of pain on neonates. The purpose is to provide nurses information on neonatal pain management. Research questions; How are nurses assessing and managing neonatal pain.? How neonates feel pain?

4 Methodology

4.1 Literature review

This is a unique method for summarizing previously published information concerning a particular subject. A form of method of research that reviews criticisms and synthesizes literature on a topic in an integrated manner such that new frameworks and perspectives are generated. Review of literature can be the sources of summary, but often has well organized routine process and can combine both summery and recap of essential source information. Its reviews may have a new meaning of already published literature. In this thesis we use systematic literation review which method by identifying critically, evaluating and integrating the results that are relevant, high-quality individual studies dealing with one or more research questions. A good systematic review might achieve most or all the following steps (Neill 2017; Kowalczyk, & Truluck 2013).

Literature review might trace intellectual development of the field and might cause major argument. Base on the situation, it might evaluate the sources and guide the reader on the most relevant. Literature reviews provides a guide to a specific topic, if there is not ample time to undergo a research. It is used as steppingstone for professionals. Data analysis brings up relevant information that keep up to date. In review of literature, the

credibility of the writer is emphasized in his or her own field. It also provides tangible background for investigating research papers. This background will be done using research questions, measures/key variables, research design, participants, time frame and or data search (Literature Reviews, 2018; Neill 2017; Kowalczyk & Truluck 2013; Ward-Smith 2016).

4.2 Data search

Data used are from CINAHL(EBSCO) Google scholar and Wiley Online Library. The key words are “Nurses’ experiences” “knowledge” “neonatal pain and management”, “pain alleviation”, “ pain assessment ”. From these key words, the target articles for the research topic emerged and their synonym are illustrated below in

Table 1 Data search

Data base	Key terms	Data search results	Choosen on the bases of full texts	Chosen on the basis of abstract	Final selection for results and analysis
CINAHL	“Nurses experience” OR “nurses perception” AND “neonatal pain manegement*” OR “ neonatal pain alleviation*” OR “pain assessment”	1562	200	20	12
Google scholar / wily online library		20	10	5	0

4.3 Articles inclusion and exclusion process

The selection process contains 5 stages. The first stage was the exclusion of duplicate articles. When the key words were used in CINAHL search engine, wiley online library and google scholar, the result was 1582 materials, which was narrowed to 200 articles by choosing full text. 1362 materials were excluded as the duplicates (articles that are not in full text). Second stage: The 200 articles were narrowed to 176 by selecting English language. The articles were further reduced to 173 when the authors chose articles that were produced between 1999- 2019. Magazines and books were excluded, and the authors were left with 138 articles.

The third stage of the selection process was to select articles that contain the key words that are used in the research, which were: nursing experiences, nurses' knowledge, neonatal pain, and management. The authors were left with 85 articles. The fourth stage was based on the heading and the abstract were briefly read. The authors were left with 20 articles. Those Titles and abstract that mainly focused on nurses' experiences about neonatal pain management were accepted. Briefly accessed full articles and the researchers were left with 12 articles, all of which came from CINAHL.

Table 2 Inclusion and Exclusion

Inclusion	Exclusion criteria
After considering full text	All article that are not in full text
Language of English Language	Excluding nurses experience other than neonates
Years of publication (1998- 2018)	Articles below 1999
Titles contain key words used in the research	

Consideration of abstracts	
Assessment of texts	

5 Data analysis

Data analysis is a way of systematically applying and/or logical strategies to describe, illustrate, evaluate, and summarize data. Data analysis often starts with by reading interview transcripts or other documentaries many times to bring out emerging topics, patterns and categories (Yates and Leggett 2016).

The aim and goal is to logically sum up findings in order to produce a new and integrative meaning of finding that will be more substantive than those of each individual research (Tuomi & Sarajärvi 2009 103; Aveyard 2010, 124; Yates et al. 2016))

Qualitative synthesis has the goal of induction and interpretation of the researches use in the review. Qualitative studies collect and breaks down conclusions from individual researches (Flemming 2007). Those findings are then assessed, essential features are recognised and compiled into a transformed whole. The objective is to create inclusive interpretations of the study findings that are substantial than the sum of individual studies involved (Flemming, 2007).

Researchers may analyze content inductively or deductively, depending on whether the study is exploratory or confirmatory. Many qualitative researches use part of both (Yates & Leggett 2016). Inductive data analysis is used in this literature review. The inductive content analysis has three phases in this research; 1st reduction of the data, 2nd clustering of the data and 3rd abstraction of the data. In the reduction phase, the authors read the articles numerously until the researchers gather understanding and knowledge of the articles and highlighted by writing separately and colouring statements that are relevant to the research questions and those that satisfied the research questions.

Irrelevant data was then deducted. During clustering stage, similarities and differences were separated base on the codes and then evaluated. Concepts that expressed similarity in meaning were grouped as categories, and then pattern were formed. In the abstraction phase, the relevant information is separated based on the main message. The researchers proceeded from original expressions to theoretical concept. Synthesizing categories as much as possible (Tuomi & Sarajärvi 2009, 108-111).

The researchers began the data analysis inductively by a means of developing conceptual framework and resulting codes (Yates & Leggett 2016). The researchers then continued the procedure by using the codes to categorize to identify applicable quotes within the transcripts. Later continue the process by meaningful patterns, themes and categories, and then the answer to research questions emerged. Bellow in table 3 illustrates sample step by step data analysis process

Table 3 Data Analysis example

Findings	Untreated pain equals extended stay in hospital
Code	Effective neonatal pain
Categories	Pain
Themes	Early developmental perception of pain

6 Results

Analysis and synthesis of the materials collected for the use in the thesis formed two main categories of experiences and knowledge of nurses in neonatal pain management; nurses knowledge and beliefs, developmental perception of pain. (Table 4). These

corresponds and correlates with each other, mentioned above topics fulfill the overall understanding of nurses' experiences and knowledge.

Table 4 categories and outcome.

Questions	Themes	Categories
How nurses feel about neonatal pain management	Nurses' knowledge and believes	<ul style="list-style-type: none"> • Untreated outcome of pain • Pain assessment • Pain management • Pharmacological interventions • Nonpharmacological interventions
How are nurses assessing and managing neonatal pain How neonates feel pain	Early developmental perception of pain	<ul style="list-style-type: none"> • Pain • Pain in NICU • Pain effects

6.1 Nurses' knowledge and believes

Several hospitals have neglected analgesic in neonate, even though they subject neonates to uncomfortable therapeutic and diagnostic procedures (Malarvizhi, & Vatsa 2012). Historically, there was misconception that newborns could not feel pain, because of their underdeveloped myelinization, and that neonates lack memory of painful

process or that if felt, was to lesser extent than older children. This believe has been proven wrong by numerous studies (Thomé da Cruz et al. 2015). There were also misinterpretation that if pharmacological treatments are used to control pain, will result in drug tolerance and dependency (Malarvizhi, & Vatsa 2012).

Health care professionals caring for neonatal pain lack theoretical and scientific basis, which are pivotal for guiding their therapeutic approaches pertaining neonatal pain. (Pereira, Herdy, Pereira, Birindiba, Andrade & Paiva (2016)). Despite the numerous obvious evidence that neonates do feel pain, still there are some nurses who do believe that ineffective management of neonatal pain will have no short- and long-term development effects on neonates. (Malarvizhi, & Vatsa 2012).

Promoting awareness to health nurses about developmental aspects of neonatal pain management and the effects of untreated pain management is essential (Malarvizhi, & Vatsa 2012; Khoza, & Tjale 2014).

Studies on the perception of pain in newborn by nursing group, identifies that assessing pain in neonates is a major challenge, pointing out scientific knowledge combined with effective records and actions, not necessarily pharmacological means, aimed at pain relief (Thomé da Cruz et al. 2015; Pölkki et al. 2018).

In fact, new-born patients still experience pain as a result of improper management of pain (Anand & Hall 2008; Pölkki et al. 2018; Khoza, & Tjale, 2014). This is due to the lack of healthcare workers appropriate knowledge of neonatal pain. The attitudes and believes concern pain and fear of effective analgesia as factor resulting to improper pain management in neonates (Khoza, & Tjale, 2014; Pölkki et al. 2018).

Numerous of factors could be affecting pain assessment of new-born, such as caregivers' knowledge, attitude, experience, work burden, unit, language barrier when communicating with neonates' family, for example, the lack of knowledge or education as the major barrier in using pain assessment tools (Pereira et al. 2016).

In contrast, nurses had rather appropriate education and knowledge about the pain experience in neonates, but the knowledge was inconsistent with their actions (Pölkki

et al. 2010). For those healthcare professionals who categorize pain as the fifth vital sign are not using day-to-day tools (Thomé da Cruz 2015). Pain as the fifth vital sign must be assessed in the daily routine of health workers, with the sole aim of offering humanized and quality healthcare to neonates (Pereira et al. 2016). In most hospitals, there are no register in the medical records of the use of pain assessment scales or of analgesic treatment for neonates (Pereira al. 2016).

The lack of layout routine for management of neonatal pain and the lack of adequate knowledge on the use of pain assessment scales in nurses, result in nurses using their own criteria without appropriate scientific background to guide their therapeutic practices regarding clinical management of neonatal pain (Pereira et all 2016; Khoza et al 2014; Pölkki et al. 2010).

6.2 Untreated outcome Improper managements of pain

Neonates admitted on neonatal ward in hospital are often subjected to very serious and or acute pain. Physiological instability sometimes occurs and leads to changes in brain development, behavior and stress responses, leading to persistent severe pain vulnerability (Stadlar 2018).

Unmanaged or inadequately treated pain has negative effect on the health of the neonatal group. These effects comprise of intracranial haemorrhage, decreased immune response, increases time spent at hospital that result in high costs of hospital bill (Khoza 2018; Mundim de Oliveira et al 2016). Effective and adequate pain alleviation is also directly related to the satisfaction of patient with hospitalization and care (Khoza 2018).

6.3 Pain assessment

On average, ill newborn admitted in NICU experiences about 130-234 manipulations within a day and most of these manipulations result in pain (Thomé da Cruz, et al. 2015.) Knowledge and understanding of neonatal pain begins with the believe that new- born babies do feel pain (Khoza, & Tjale 2014). Since neonates are unable to verbally say their discomfort, they solely rely on health care professionals and their family members

to detect, assess and manage their discomfort (Khoza & Tjale 2014; Thomé da Cruz et al. 2015.) The 1st step toward efficient pain alleviation in neonates is pain assessment. Nurses who do not recognize that an infant feel pain are unable to treat it. Therefore, the development of pain assessment in the clinical setting can also be a part of the quality nursing care. The use of pain assessment scales in new-born is a low-cost clinical tool and great different on the identification of symptom (Pölkki 2010).

6.4 Pain management

Appropriate and effective management of pain has greater health benefits: It reduces physiological and behavioral unwanted effects, reduces the days and need for ventilators, promotes weight gain, supports fast healing, shorten time spent at hospital, as a result of neonates experiencing lesser problems, fewer incidences of infections and consistent weight gain (Malarvizhi & Vatsa 2012; Khoza & Tjale 2014). In order to implement proper pain care, educating nurses about neonatal pain is primarily essential. Neonatal pain management requires multi- professional team work as well as parents involvement (Malarvizhi et al. 2012). Experience in neonatal pain management, results in recognition of neonates' pain and promote efficient pain care (Pereira 2016). This knowledge is officially obtained through academic studies and informally through clinical practices. (Khoza & Tjale 2014).

The goals of nursing care is to provide compassionate care and focus attention and intervention in bringing comfort to all patient. Maximizing effective pain management in neonates leads to increase growth. Untreated or poor pain management has both short long term consequences on the health of neonates, which may include intracranial haemorrhage, reduces immune response, delayed weight gain among others, various approaches are used by neonatal care givers in managing neonatal pain.

These includes both pharmacological and non- pharmacological therapies, such as kangaroo approach, cuddling, reduction of light and ensuring a more quiet environment, and the use of analgesic, glucose and sucrose sucking are among the pharmacological approach used in neonatal pain management (Boxwell 2010).

6.5 Pharmacological interventions

Recent studies show that more development has been done in the understanding and comprehending the physiological effect of neonatal pain and the efficacy of pharmacological and nonpharmacological procedures (Stadler 2018). With the help of analgesic, neonatal Pain may be effectively managed. Local anaesthetics, anxiolytics and sedatives often alleviate pain and manage the heart rate and blood pressure.

6.6 Nonpharmacological interventions.

Nursing studies responsible for neonatal pain care support and encourage the use of non-pharmacological management, most especially with prevention, alleviation and caring of neonatal procedural pain. Non-pharmacological therapy also minimizes environmental effects, reduces stress, and prevents changes in physiological and behavioral (Pereira et al. 2016). Nonpharmacological therapy such as breastfeeding, massaging, touching, kangaroo positioning and skin to skin contacting are quite effective procedures in reducing painful response and stabilizing neonatal physiological pain effects (Khoza, & Tjale, 2014; Stadler 2018). Swaddling and non-nutritive sucking are used as non-pharmacological pain management therapies. Research has proven that low doses of sucrose do not raise neonates' blood glucose. (Khoza & Tjale 2014). Non-pharmacological treatment, such as non-nutritive sucking, administering of oral glucose solution, promoting comfort and proper positioning, minimal handling, minimizing environmental light and unpleasant sounds. Inviting a caregiver for help during invasive procedures promotes comfort and safety for neonates (Pereira et al. 2016). However, the primary aim is to avoid the intensity of a painful process and to reduce pain repercussions. These non-pharmacological procedures are recommended for mild pain, but for moderate and severe pain, the non-pharmacological methods should be used alongside with pharmacological interventions. (Pereira Dames et al 2016). Pharmacological intervention is the international standard for the adequate pain management of moderate to severe pain (Khoza, & Tjale 2014).

6.7 Early Developmental perception of pain

New born perceives pain based on pain sensation developed in utero before gestational week 24. This pain signal is slowly transferred from the periphery to the brain over non-myelinated nerve fibers before gestational week 30 and move through myelinated nerve fibers beyond gestational week 30. This indicates that newborn babies' nerves are capable of perceiving and experiencing pain before birth (Khoza, & Tjale, 2014; Malarvizhi, & Vatsa, 2012; Woragidpoonpol et al. 2018; Pölkki 2018). Neonates' memories are mature enough for painful procedure. (Malarvizhi, & Vatsa, 2012, Thomé da Cruz et al. 2015).

The nerve endings grow in the perioral section during gestational week eleventh, the face, palms and plantar region in gestational week 14th , The nerves ending appears in the trunk and proximal region during gestational week 15th and from the 20th to 24th week, the nerve synapses are fully developed for pain sensation. However, this fact is above scientific knowledge and the existence of protocols and routines. (Thomé da Cruz et al 2015). Pain channels to the brainstem is myelinated by gestational week 30, as well as the thalamocortical pain fibers in the posterior limbs of the internal capsule and the corona radiata are myelinated by gestational week 37. By late gestation, “the fetus has developed the anatomical, neurophysiological and hormonal component necessary to perceive pain” (Khoza, & Tjale 2014)

Pain nociception is generally spread in the brain in the absence of recognizable ‘brain center’ and initiated the release of catecholamines and cortisol. These hormones Increase body physiological response to stress leading to a different physiological response to pain. However, neonatal patients less than 25 weeks’ gestation demonstrate the incapability to differentiate between touch and pain stimuli (Khoza, & Tjale 2014). Moreover, neonates feel pain more intense than adults and older children, and therefore have high sensitivity of pain. (Khoza, & Tjale 2014; Pereira et al. 2016).

6.8 Pain

Pain is a personal social concept as its physiology, it is being perceived differently in societies, cultures, most especially its appearance and its representation in human disease processes. Pain is regarded as an undesirable sensory and emotional feeling that is connected to the actual or possible tissue damage (Khoza, 2014; Pereira et al 2015.) Pain can also be described as a composite and subjective phenomenon, an unwanted sensory (Pereira 2016; Santos 2015).

Pain is an absorbing phenomenon, in that it is a vital sense in humans physiology that is personally sensed, experienced or felt differently from an individual to another. Pain is an unwanted stimulus and an emotional feeling resulting from real or possible lesion or described in terms of such impairment. Pain is experienced and felt in human as early the fatal stage. Due to the incomplete myelination of neurons during prenatal period, neonates feel even a higher degree of pain than adults (Pereira 2016). One's own expression of pain is expressed through verbal and subjective aspects, making pain assessment in neonates more demanding and challenging (Pereira et al. 2016).

6.9 Pain in NICU

Invasive procedures used to treat or administer medication cause severe pain during neonatal care in hospital, as well as situation such as bright light, uncomfortable handling, synthetic temperature, and multiple instruments used. Despite those instruments being important to the treatments, still result in uncomfortable feeling for neonates (Pereira et al. 2016., Khoza, & Tjale 2014). In the NICU, each seriously ill newborn is subjected to about 50-150 painful procedures per day (Pereira Dames et al. 2016; Thomé da Cruz et al. 2015). The disappearance of pain is the main goal for an individual's wellbeing and is also a quality indicator in healthcare (Pereira 2016). If a process is painful adults, is also should also be considered painful in neonates or even more; the expression may differ from that of an adult (Khoza, & Tjale 2014). Neonatal patients also feel pain as a result of ineffective pain care. (Khoza, & Tjale 2014)

6.10 Pain effects

The early neonatal period is a stage of great plasticity. Considerable gelatinous neurons in neonates start to grow their dendric arbor. If there is an obstructional modulation of spinal nociceptive circuits, as the result of consistent inflammation and pain during this period, it is likely to negatively influence many developmental processes within the neonate. Acute pain in neonates causes stress response as well as discomfort that includes physiological changes, follow by endocrine-metabolic reaction in release of adrenaline, noradrenaline and cortisol, which interrupt the homeostatic balance. This imbalance can cause decrease in oxygen saturation, increased heart and respiratory rate, stress and other long-term health condition such as impaired growth, development, decreased threshold pain and hyperalgesia (Thomé da Cruz et al 2015; Malarvizhi, & Vatsa 2012). Neonates experience pain similarly and maybe more intensely than older children and adults (Malarvizhi, & Vatsa 2012). The experiences of neonates' pain can be traumatic for both the neonates, family member and the caretaker if not effectively taken care of (Malarvizhi, & Vatsa 2012). Pain plays an ensential role as a protective agent when it causes a reflexive response to noxious stimuli or danger. It is seen as a bad or negative pain when it serves as bad pain results from pathophysiological conditions, such as nerves injury or depilating disease. (Khoza, & Tjale 2014; Ponder 2012).

Amongst these are development of complications such as intracranial haemorrhage, decreased immune response, delayed and loss weight gain, prolonged hospitalisation, impaired neonate-parent bonding, and development of psychosomatic conditions such as hyperalgesia and allodynia (Khoza, & Tjale 2014).

7 Discussion

The aim of the study is to assess nurses' experiences and attitudes on neonatal pain care through already published literatures and to assess the effects of pain on neonates. The purpose of the study is to provide information that may help nurses to improve neonatal pain management. The research question to be answered are; How are nurses assessing and managing neonatal pain, how neonates feel pain

The neonatal period is the first 4 weeks of life and it is the most endangered period of childhood, approximately half of all neonatal deaths are in the first twenty four hours of life (Hanson et al. 2019). Nurses must be be aware of these and ensure proper care to the newborn and family, guiding the family member how to care for the neonates right from the hospital prepares them for life after discharge.

Neonates form part of the larger pediatric patient population and most of the general principles of paediatric pharmacotherapy is also applicable to newborns,. The paediatric patient population consists of a diverse group of patients with a variety of characteristics, ranging from the newborns to the adolescent. There fore when a child is born, proper assement must be done before the child leaves the hospital and continuous care follows after discharge.(Schellack N 2012).

It is important to understand that low weight is a factor that leads to high mortality and clinical complications during hospitalization of neonates. This exposes neonates to painful processes. The stress neonates experience from handling in the NICU increases the metabolic need and demand for oxygen, which lead to physiological and behavioural effects that impacts neurobehavioral development of neonates. (Thome da Cruz. et al. 2015)

Comfort should be prioritized when managing critically ill neonates. Health care professionals have a long -held perception that neonates do not feel pain and they are less sensitive to noxious stimuli. Some healthcare staffs believed that analgesics and sedatives use in neonates lead to drug addiction. Many nurses do did believe that improper neonatal pain management will have long time effects

neonates. Adverse sensory experiences of neonates may result in series of negative effects on the child development. The creation of awareness to nurses about the effects of improper neonatal pain management is very important policy. Majority of the nurses could only identify neonatal pain through cry whereas the body response shown by new born was hardly appreciable. (Malarvizhi & Vatsa 2012)

Health care workers need fundamental education of neonatal pain in order to function in their role. This knowledge of results in identification of neonatal pain and promote effective pain management. This knowledge is formally obtained through academic preparation and informally through clinical experiential learning. Neonates are more sensitive to pain than adults and older children. Pharmacology intervention is largely consistent with international standards for effective pain care for moderate and severe pain, but non- pharmacological interventions are also appreciated, especially with prevention and management of neonatal procedure pain (Khoza & Tjale 2014).

The significant of pain scale and that of systematic documentation is the prerequisite for quality pain management. During the study, most of the participants agreed that neonate's sense pain although they could not express it. Less than half of the participant were not aware that neonate sense pain than adult. It is confirmed in this study that nurses lack knowledge on the state of physiological, hormonal and behavioural changes in new-born. Nurses' pain assessment in children is mostly influenced by professional experience. This was confirmed during the study; nurses with lower work experience manifested more misconceptions on neonatal ability to sense and express pain than those nurses with more working experience on neonatal ward (Pölkki T et al. 2010)

Drug prescription in this population must follow the general principles and guide lines of rational drug use, as prescribed by Finnish Medicines Agency (FIMEA).Regulatory authority The Finnish Medicines Agency (FIMEA) is responsible for the licensing of drugs in Finland, these include correct drug (for the illness or infection being treated). Appropriate indication, Appropriate drug (for the patient being treated), Appropriate dosage, administration, and duration of treatment, Appropriate patient.

7.1 Ethical considerations

The term, medical ethics was coined in the early nineteenth century by the British physician Percival (1803). It simplifies study of moral values and ethical judgments in medicine. In 1847 the code of ethics was adopted by the “American Medical Association”, this paved way for bioethical guidelines on how these ethics can be combined in medical school curriculum. This guideline mostly based on Percival’s work. The code was later based on libertarian theory and procedural justice, clearing the way for bioethical guidelines on how to integrate ethics into medical school curricula (Lohfeld et al 2012).

Over the years, research ethics has been described as “ reactive” and can sometime be referred to as “guidance documents” issued by national and international organizations (Wenner 2018). The articles used in this study were compiled ethically in accordance with the National Health Council Ethical principles and was approved by the ethics committee. The instrumentation was based on pain assessment and it’s intervention the fifth vital sign. (Thome da Cruz et al. 2015). The authority to undertake the research was given by the School of “Therapeutic Sciences of Research Assessor Group”. The ethic committee gave approval to the research. “Gauteng department of health, pediatric and clinical units” allowed access to the neonatal ward. Each participant received educational letters inviting and asking them to provide data. The letters assured them their refusal to participate in the research would have no penalties. (Pereira Dames et al. 2016: (Pölkki & colleagues 2010)

7.2 Reliability

Reliability is an analytical attribute of an outcome measure, measures with poor or no reliability should not be used to measure the outcome of thesis . If reliability is poor then findings cannot be drawn. More over even if a research tool is used, poor reliability will result in misinterpretation and uncertain evaluations of a concept’s relationship to other measured items used. (Oddson 2013).In addition, the research language (English)

was chosen for this project was kept as simple as possible to make sure that the content is clearly understood for nurses and neonates (patients) families.

Finally, this thesis is written with reference to the reporting guidelines of JAMK to guarantee right referencing and in-text quotes to avoid any issues of plagiarism or copyright. By doing this, we have been able to increase both the ethicality and reliability of our thesis and this will pave way for the reader to find the original source material undoubtedly. This thesis consists of information which has been collected from Wiley Online Library, CINAHL, GOOGLE SCHOLAR to fit the aim and purpose of the thesis through literature search. Furthermore the focus of this thesis has been on taken from the most recent evidence based referencing, besides all the articles and materials used were reviewed by this thesis authors to ensure adequate reliability of the information.

7.3 Conclusion

Our study confirmed existing knowledge about nurses' attitudes and perceptions of pain assessment in infants born within the birth date and 28 days. The need for pain assessment of infants receiving intensive care or monitoring is essential university hospital. Nevertheless, there were some gaps in knowledge concerning perceptions of premature babies' ability to sense pain and means of expressing pain. The result is a challenge to improving the quality of nursing care. There is a need to develop systematic and evidence-based guidelines for pain assessment practices in neonatal care units. In the future, it is also important to arrange pain assessment education for healthcare providers and to test the efficacy of the programme on paediatric patients' care. Finally, an observational study is required in order to draw conclusions from the nurses' actions in the pain assessment of premature infants.

Pain in the olden days has widely been ignored by caregivers and parents of neonates as it was believed that neonates don't feel pain as much as young children or adult do, neonates may not be able to express their pain as adult do, therefore, care givers should ensure that proper pain assessment is done with the neonates in order to determine if they feel pain or not. When proper assessment is done then adequate pain management

can be given to the neonates. In neonates pain management, proper consideration must be ensured when administering analgesics to the neonates as improper management may lead to unwanted adverse effect. Pharmacological intervention as well as nonpharmacological intervention must be considered when managing neonatal pain. In order to have opportunities for continued improvement in the nearest future of neonatal pain management, invasive diagnostic test should be increased, testing the efficacy of analgesic in the management of neonates is important as relying on neonates verbal way of expressing pain report cannot be used to assume that analgesic medication and dose used for adults and children can also be used for neonates.

8 References

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9 Appendices

Appendices 1. Description of the selected articles

Authors, year, country	Titles	Purpose	Study size	Main Finding
Barker, A., Spence, K., & Wilson, V. 2014.	Knowledge, Attitude and Management of Neonatal Pain among Health Care Professional in Neonatal units	To describe a process for mapping current practice within the neonatal intensive care unit (NICU) to inform practice change.	A convenience sample from a larger, population-based study was utilized. The unit of 80 nurses	Guideline of pain practices remain inconsistent. raising awareness about postoperative pain, revising the guideline and providing education for pain management techniques
Boxwell, G. ed., 2010.. Routledge.	Neonatal intensive care nursing	To explore the concept of evidenced based neonatal nursing care and encourage the reflexion on differing forms of evidenced used in day to day practice.	Qualitative study of 10 mothers in order to find out their experiences of having a baby in neonatal intensive care unit.	Exploration of different evidenced should be used in day to day nursing

Khoza, S. L. T., & Tjale, A. A. 2014. South Africa	Knowledge, attitudes and practices of neonatal staff concerning neonatal pain management	To describe the knowledge, attitudes and practices of nurses and doctors regarding pain management for neonates	m 150 nurses and doctors working in the neonatal wards of two academic hospitals in central Gauteng.	The interventions to manage moderate neonatal pain are in line with international guidelines. The implementation of a guideline to standardize practice and ensure consistent and adequate pain management in neonates
Malarvizhi, G., & Vatsa, M. 2012. India	Knowledge, Attitude and Management of Neonatal Pain among Health Care Professionals in Neonatal units	To describe pharmacologic and non-pharmacologic techniques of pain management		There are inconsistencies in neonatal pain management; Standard protocol in neonatal units regarding various pain management approaches to minimize the pain needs to be implemented.
Mundim de Oliveira, I., Corrêa Castrai, T., Peres Cavalcante, M. M. F., Calatayud Carvalho, J., Firmino Daré, M., & Marques	Nursing professionals' knowledge and attitude related to assessment and treatment of neonatal pain	To verify the knowledge and attitude of nursing professionals from a neonatal unit regarding assessment and treatment of acute procedural pain in newborns.	26 nursing professionals from a neonatal unit at the Center-Western region of	nursing professionals are knowledgeable about assessment and treatment of neonatal pain, but there is a need of updates.

Salge, A. K. 2016. Brazil.				
Pereira Dames, L. J., Herdy Alves, V., Pereira Rodrigues, D., Birindiba de Souza, R. R., do Valle Andrade Medeiros, F., & Paiva, E. D. 2016. Brazil	Nurses' practical knowledge on the clinical management of neonatal pain: a descriptive study	to analyze the practical knowledge of nurses on the clinical management of neonatal pain	20 Neonatal Intensive Care Unit nurses of two public maternity hospitals	It was found that nurses lack knowledge of the clinical management of pain, which is not a part of the daily neonatal care routine. They were also unaware of the application of rating scales for pain assessment.
Pölkki, T., Korhonen, A., & Laukkala, H. .2018. Finland	Nurses' perceptions of pain assessment and management practices in neonates: a cross-sectional survey	This study aimed to describe pain assessment and management practices for neonates based on nurses' perceptions in neonatal intensive care units (NICUs)	294 participants to a questionnaire. The data were analysed by statistical	Educational interventions for nurses are needed for pain management practices in the NICUs. In addition, there is a need for national guidelines in order to ensure the equal treatment to all neonates
Pölkki T, Korhonen A, Laukkala H, Saarela T, Vehviläinen-Julkunen K, & Pietil A. 2010. Finland	Nurses' attitudes and perceptions of pain assessment in neonatal intensive care	To describe nurses' attitudes towards and perceptions of pain assessment in neonatal intensive care and the demographic factors related to these attitudes and perceptions of pain.	257 Finnish nurses participated in the survey	The authors concluded that on average nurses' attitudes were positive towards the pain assessment in neonatal. There were gaps in the knowledge concerning the respondents' perceptions of the items, which is a challenge to nursing and j nursing education

Santos Dos GC, de Medeiros Lima L, Barbosa de Oliveira G, Roque de Souza A, dos	Nursing Intervention for Pain Control in Newborns: Effectiveness of Non-Pharmacological Actions	checking the effectiveness of non-pharmacological actions in pain control in neonates and applying the NIPS scale while collecting blood comparing the scores	This is a descriptive and exploratory study quantitative in nature with hospitalized neonates of the Neonatal Intensive Care Unit (NICU) that has five beds.	the nursing interventions in pain management enable better newborn response to painful procedures and should be part of the care process.
Stadler, J., Avian, A., Posch, K., Urlesberger, B. and Raith, W., 2018. Germany	Lasar Acupuncture At Large Intestine Compared with Oral Glucose Administration for Pain Prevention in Healthy	To investigate the effect of laser acupuncture at LI 4 for pain prevention in healthy term neonates undergoing minor painful interventions compared to standard care with orally administrated glucose solution.	95 healthy term neonates during their hospitalisation after delivery.	The observer-blinded randomised controlled trial has been designed to explore potential advantages of laser acupuncture in the management of neonatal pain because more data are required to provide information about its efficacy and safety
Thomé da Cruz, C., Stübe, M., Rieth Benetti, E. R., Sonogo Gomes, J., Kirchner, R. M., & Fernandes Stumm, E. M. 2015. Brazil.	Evaluation of Pain in Newborns Hospitalized to a Neonatal Intensive Care Unit	To describe the clinical characteristics of newborns admitted to the Neonatal Intensive Care Unit	Transversal reach, descriptive, quantitative, with 34 newborns, developed	It was found that pain was strong hospitalization of infants in the NICU with highest average.
Woragidpoonpol, P., Tiansawad, S., Mesukko, J., & Klunklin, P. 2018. Thailand	Development of a Clinical Pain Scale for Preterm Neonates	To develop a clinical pain assessment scale for preterm neonates in the NICU and to examine its psychometric properties and clinical utility	19 preterm neonates in two neonatal intensive care units	The median pain score of the puncture phase was significantly higher than those of baseline and recovery phases.

