Pain Assessment and Management in Infants and Children: A Mixed Methods Study of the Knowledge and Attitudes of Nurses Working in Saudi Arabia

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Statement of Originality

I hereby certify that the work embodied in the thesis is my own work, conducted under normal supervision.

The thesis contains no material which has been accepted, or is being examined, for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968 and any approved embargo.

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Signed: _ __ Date: 21/01/2019

Acknowledgement of Authorship

I hereby certify that the work embodied in this thesis contains published papers of which I am a joint author. I have included a written declaration below, endorsed in writing by my supervisor, attesting to my contribution to the joint publication/s/scholarly work.

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By signing below I confirm that Khalaf Alotaibi contributed to the following publications:

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Dedication

Praise be to Allah (God) who has the first and last credit, and is the most merciful of the merciful. This work is dedicated with love to:

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List of Abbreviations

ANOVA	Analysis of Variance
BSN	Bachelor of Science in Nursing
CASP	Critical Appraisal Skills Programme
HREC	Human Research Ethics Committee
IASP	International Association for the Study of Pain
IV	Intravenous
MOH	Ministry of Health
MSN	Master of Science in Nursing
NSAID	Non-Steroidal Anti-Inflammatory Drugs
PNKAS	Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain
PRN	Pro re nata (when necessary)
RN	Registered Nurse
RNs	Registered Nurses
SA	Saudi Arabia
SACM	Saudi Arabian Cultural Mission
SCFHS	Saudi Commission for Health Specialities
SNB	Scientific Nursing Board
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UON	University of Newcastle
USA	United States of America
WHO	World Health Organization

Keywords

1. Pain management
2. Pain assessment
3. Children
4. Nurses
5. Knowledge
6. Attitudes
7. Barriers
8. Facilitators
9. Culture
10. Mixed Methods
11. Saudi Arabia

Abstract

Background

Unrelieved pain amongst hospitalised infants and children remains a widespread problem, despite decades of extensive research and the development and ready availability of evidence-based guidelines and standards supporting clinical practice for effective management of children's pain. Research into pain in hospitalised children shows that their pain is often ignored or neglected, under diagnosed, poorly assessed, under treated, unmanaged and unaddressed. Whilst relief from pain is a fundamental human right, hospitalised children worldwide continue to experience unrelieved pain and distress. Unrelieved pain may be harmful to children both physiologically and psychologically and it has many adverse effects, short term and long term. Providing effective pain care is an integral part of the nurse's professional role and practice.

This thesis focuses on the understanding of knowledge, attitudes and beliefs of professional nurses in SA (Saudi Arabia), who are largely expatriates providing care for Saudi children with pain. In the light of the large expatriate workforce, it was also important to understand the barriers and facilitators to pain management and the impact of cultural differences on the pain care provision for children. At the time of writing this thesis, there were no published studies conducted in SA on this topic to guide the improvement of children's pain management.

Aims of the Study

The aims of the study were to: (1) examine the knowledge and attitudes of Saudi and non-Saudi nurses in relation to infants' and children's pain assessment and management, (2) identify the barriers and facilitators to effective pain assessment and management for infants and children in SA, and (3) identify the cultural factors impacting pain assessment and management for infants and children in SA.

Methods

A two-phase sequential explanatory mixed-methods design was used in the study reported in this thesis. In Phase 1, a descriptive cross-sectional survey, the Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS-Shriners Revision) was distributed amongst 750 eligible Registered Nurses (RNs) working at five government hospitals in the Riyadh region of SA. Data were analysed using descriptive (frequency, percentage, mean and standard deviation) and inferential statistics, including Pearson Correlation, Independent Samples *t*-test and one-way ANOVA tests. Phase 2 of the study adopted a qualitative approach involving semi-structured interviews with 17 nurses, drawn from the survey participants. These interviews explored the nurses' experiences of working in SA with children in pain. Data were transcribed verbatim and thematically analysed. Significant relevant statements were highlighted, coded, categorised and clustered thematically.

Results

In Phase 1, 410 valid surveys were received representing an overall response rate of 54.7%. The overall mean correct score achieved by all participants; Saudi (n=75, 18.3%) and non-Saudi nurses (n=335, 81.7%), was 15.04 on the 31 items assessed for knowledge. While on the nine items relating to attitude, their overall score for correct answers was 3.08. Poor overall knowledge and attitudes about children's pain and its management was evident in this study in different areas, such as pharmacology, non-pharmacological approaches and pain assessment. Phase 2 of the study identified many barriers to managing children's pain effectively. Themes that emerged from the data were (1) children's pain: a low priority, (2) culture, religion, mistrust, and pain, and (3) understanding/misunderstanding childhood pain behaviour.

Pain in children was not a priority of care for either nurses, physicians or hospitals as health organisations. Barriers to effective pain management included cultural and language differences and misunderstandings, religious matters and conflicts, distrust in expatriate nurses' care as well as poor team communication and collaboration. Facilitators for pain management included parents' participation in their child's pain care and developing a trusting relationship with the child during hospitalisation.

Conclusion

This thesis shows that many expatriate nurses in SA were unable to care for children in pain because of cultural, religious and language challenges. Findings should be responded to with urgency to ensure quality pain care for children in SA. Recommendations include prioritising children's pain into hospital policy and daily routine practice, and improving

team communication and collaboration through a teamwork approach to pain management. Ongoing educational opportunities are essential on culture and pain management for families of children, for nurses, and for any health professionals who are involved in childcare. This study is the first of its kind in SA and also the first of its kind globally on pain management in children involving a heterogeneous nursing population. The findings of this study could be used to improve nursing care and pain management practices in multicultural healthcare settings similar to those of SA and neighbouring Arab countries, and across the globe.

Chapter 1 The Case for Exploring Pain Assessment and Management in Children in Saudi Arabia

1.1 Introduction and Statement of the Problem

Unrelieved pain amongst hospitalised infants and children is a common experience (Vakili et al., 2015; Walther-Larsen et al., 2016). Research into pain in hospitalised children around the world shows that their pain is often poorly understood or ignored, under diagnosed and assessed, under treated and unmanaged (Birnie et al., 2014; Kozlowski et al., 2014; Mathews, 2011; Walther-Larsen et al., 2016). Relief from pain is a basic human right, yet children continue to experience unrelieved pain and distress during hospitalisation that may lead to harmful physiological and psychological effects, both short and long term (Zunino et al., 2018). It is a concern that unrelieved pain in children remains a widespread problem today, despite decades of extensive research and the development and availability of evidence-based guidelines and standards that support clinical practice for the management of children's pain (Ramira, Instone, & Clark, 2016; Stevens et al., 2014; Walther-Larsen et al., 2016). Further, there is little known about the cultural factors that might impact nurses' pain assessment and management, even though this is an important aspect in nursing practice and in providing healthcare for patients, including children (Abazari & Namnabati, 2017; Twycross, 2013).

Pain is defined by the International Association for the Study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Van Griensven, Strong, & Unruh, 2014, p. 2). Pain is widely recognised as a complex multidimensional subjective phenomenon

modulated by the interaction of physiological, psychological, cultural, developmental, and situational factors (Kattan & Cowen, 2009) and requires a multidisciplinary approach to assessment, evaluation and management (Brennan, Lohman, & Gwyther, 2019).

Children often present to hospital with pain for a range of reasons, including bruises, bumps, and headaches; injuries such as bites, cuts, burns, or bone fractures; or acute and chronic illness, infection, and disability (Oakes, 2011; Twycross, Dowden, & Bruce, 2009). During hospitalisation, they may also experience inflicted pain during necessary medical investigations, diagnostic tests and surgical interventions involving procedures such as intravenous and intramuscular injections and cannulations (Burns et al., 2017; Oakes, 2011).

Although pain is one of the most frequent complaints that nurses and other healthcare professionals encounter and address in healthcare settings, evidence suggested that pain has a low priority, and is poorly assessed and managed, particularly in paediatric patients (World Health Organization, 2012). Numerous studies found that many hospitalised children worldwide, like adult patients, still suffer unnecessarily from unrelieved pain (Birnie et al., 2014; Harrison et al., 2014; Kozlowski et al., 2014; Shomaker, Dutton, & Mark, 2015; Walther-Larsen et al., 2016), despite advances in knowledge and understanding of pain mechanisms and its assessment and management. This issue remains a matter of global concern, despite also the wide availability of pain assessment tools and evidence-based guidelines on how paediatric pain can be assessed and managed (Kozlowski et al., 2014; Linhares et al., 2012; Vittinghoff et al., 2018; Walther-Larsen et al., 2016). Of concern to this thesis is that a child's pain in SA, as with many children around the world, may go undetected, unassessed, undiagnosed, under treated and unmanaged (Mathews, 2011).

Pain in children has not always been detected or relieved effectively or has been underassessed for a range of reasons including poor education and a lack of knowledge and understanding about children's pain and its management (Davies & Davies, 2011). Until recently, it was believed that infants and children did not feel or respond to painful stimuli due to the immaturity of their nervous system (Enskär et al., 2007). It was also believed that assessing pain in young children was impossible because they cannot remember, express or indicate their pain (Davies & Davies, 2011). Paediatric pain is often misunderstood, underestimated and/or not well assessed and managed due to such common myths and misconceptions, despite scientific evidence that these are incorrect or misguided, showing that healthy children of all ages can feel and respond to pain from birth (Enskär et al., 2007; Mathews, 2011). That opioid therapy is unsafe to use for infants and children due to its potential side effects and fear of addiction is also a common misconception still shared by many health professionals and parents or families of children (Davies & Davies, 2011; Peirce, Corkish, Lane, & Wilson, 2018). As a result, children do not always receive the analgesic medications needed to mitigate or control their pain and suffering (Bissonnette, 2011).

Other factors contributing to inffective pain assessment and management for children include the low priority given to children's pain, a lack of pain management resources and access to opioid analgesics, a lack of or inadequate education and training for families, nurses, physicians or other health professionals, and cultural and language barriers (Albertyn, Rode, Millar, & Thomas, 2009; Lohman, Schleifer, & Amon, 2010). These factors may also be an underlying cause of inadequate pain management for children in the Arab world, including SA (Forgeron et al., 2006).

A lack of pain management approaches, such as the use of analgesics, has been reported as problematic, particularly in developing countries (Albertyn et al., 2009; Saini & Bhatnagar, 2016). In Egypt for example, morphine was unavailable for use in numerous hospitals in 2014 (Alsirafy & Farag, 2016). Even when available, many patients, including children, suffered with pain because of the lack of access to opioid analgesics (Kunnumpurath et al., 2018). Limited resources, fear of addiction and restrictive policies and regulations were identified as one of the major impediments to the availability and/or access to opioids (Kunnumpurath et al., 2018). In India, patients with severe pain were found to receive insufficient opioids due to the lack of access or physicians' under-dosing and fear of related side effects (Thota, Jain, Bakshi, & Dhanve, 2011). This may also be the case in SA as there is a restrictive law on ordering opioids because of fear of drug abuse problems in the community, which in turn, may lead to a lack of prescriptions or difficulty in accessing them (Nuessle et al., 1996). To support this, SA has been widely reported as one of the countries that underuse opioids, such as morphine, to relieve pain (Alshammary, Abdullah, Duraisamy, & Anbar, 2014; Brant, Newton, & Maurer, 2017; Ghodse, 2016; Silbermann, 2010).

The lack of, or poor education and training of health professionals on pain, pain assessment, and pharmacological and non-pharmacological management has also been highlighted as an issue of concern across the globe. This has resulted in poor pain knowledge and understanding, and unsupportive attitudes. A study by Briggs, Carr and Whittaker (2011) revealed limited teaching and hours dedicated to pain and its assessment and management in the curricula of medical, nursing, pharmacy and other health professionals in the United Kingdom (UK). However, this issue is not confined to the developed world. Education on pain and its management generally, was reported to be scarcer in developing countries (Albertyn et al., 2009; Bond, 2011; Lunsford, 2015;

Silbermann et al., 2012) and confirmed by the IASP (2011). Today, many health professionals, including nurses, face a lack of education and access to essential knowledge when attempting to learn about pain in children. Developing countries are most likely facing such a phenomenon for several reasons, including the inability to access pain knowledge online and textbooks which, if available, are expensive (Albertyn et al., 2009; Eid, Manias, Bucknall, & Almazrooa, 2014).

Furthermore, cultural and language differences have been shown to significantly impact the provision of care and management for children in pain. Research conducted in Morocco with paediatric oncology physicians and nurses (McCarthy, Chammas, Wilimas, Alaoui, & Harif, 2004) showed that there were several cultural barriers to the management of children's cancer pain. Pain, for example, was viewed as normal, and specifically, boys were expected to endure and suffer with pain. A survey by Levin (2006) on barriers to effective care for Xhosa-speaking parents whose children were admitted to a South African paediatric hospital where English or Afrikaans was the language of communication, revealed language barriers resulted in poor communication and dissatisfaction with care. For example, many parents (64%) experienced difficulties in understanding physicians, or making themselves easily understood when asking questions, or discussing or seeking healthcare for their admitted child. A case-control study conducted in a large children's hospital in Spain by Cohen, Rivara, Marcuse, McPhillips, and Davis (2005) revealed data that suggested medical errors and events because of language barriers. The study concluded that Spanish-speaking patients whose families had a language barrier, seemed to be at risk of errors and might encounter serious medical events during their hospital stay.

The knowledge, beliefs and attitudes of nurses are essential elements when it comes to assessing and managing pain effectively (Goucke & Morriss, 2012). The quality of paediatric pain care and management relies on these basic elements that are also necessary for education and training, and nursing curriculum (Wang & Tsai, 2010). As with physicians, nurses are cited as a common denominator in the under-treatment of pain in children (Ball, Bindler, Cowen, & Shaw, 2015; Twycross, 2006; Van Hulle Vincent, 2007). Nurses' knowledge about pain and their practices in pain assessment and management along with their attitudes, beliefs, perspectives, education levels and experiences in relation to pain all shape and contribute to the ongoing ineffective nursing care and pain management for children (Jacob & Puntillo, 1999; LaFond, Van Hulle Vincent, Oosterhouse, & Wilkie, 2016; Twycross, 2007; Van Hulle Vincent, 2007; Vincent & Denyes, 2004; Zisk-Rony, Lev, & Haviv, 2015). The effective management of children's pain requires nurses to have a sound knowledge base, supportive attitudes, and a good understanding of the basic principles of pain assessment and management (Ekim & Ocakcı, 2013).

1.2 Background and Significance of the Study

According to the IASP (2005), children's pain is an essential component of contemporary healthcare practices. Regardless of a person's age, effective pain relief should be a health care and ethical imperative; a priority for all healthcare professionals (Brennan, Carr, & Cousins, 2007; Daher, 2010). Hospitalised children have the right to receive safe and quality care with judicious assessment and relief of pain guided by evidence-based guidelines and approaches (Olmstead, Scott, & Austin, 2010). Nurses and other health professionals who care for children should be competent, knowledgeable practitioners

with appropriate attitudes and beliefs that support the provision of quality pain management and better health outcomes (Clarke, Corkin, & Liggett, 2012).

Assessing and managing pain in children is a complex process. The subjectivity of pain means that children, depending on their developmental stage, communicate and express pain differently to adults. Children express pain in ways that may not clearly convey they are in pain: adults may not understand the nuances of child growth and development and may not be skilled in communicating with children (James, Nelson, & Ashwill, 2013; Kyle & Carman, 2017). Children may not understand or predict their pain due to their limited experience of pain events (Ball et al., 2015; Sorrentino & Remmert, 2012). Additionally, parents' responses to pain may help or hinder judicious pain assessment and management for children, depending on their knowledge, attitudes and cultural or religious beliefs (James et al., 2013; Motoyama, Davis, & Cladis, 2011). They may also be reluctant to allow care provision or hinder approaches to the care of their child in pain for a range of reasons, such as fear of addiction and other side effects of opioids, and misbeliefs or poor understanding of pain mechanisms and treatments (James et al., 2013; Motoyama et al., 2011). The evidence, described in Chapter Two of this thesis shows that unrelieved pain in early life is a significant health issue that can negatively affect the child at the time and later in adulthood.

The health workforce in SA is a culturally diverse workforce comprising both Saudi and other nationalities (Al Mutair, Plummer, O'Brien, & Clerehan, 2013). The Saudi healthcare system depends heavily on expatriate nurses due to a high rate of nurse turnover and a chronic shortage in the supply of local Saudi nurses. As a result, the majority of nurses who currently provide care for infants and children are expatriates or non-Saudi nurses (n = 71,792 or 70.9%, 2008 estimates), largely from India and the

Philippines, with very diverse religious and cultural backgrounds (Almalki et al., 2011b). These nurses, recruited based on their professional qualifications and clinical experiences, have little awareness about the culture of SA and Islam (Aboshaiqah, 2016). Not only is it important to determine the knowledge and understanding of nurses in SA in relation to children's pain management, but it is also important to understand the cross-cultural differences, understandings, attitudes and beliefs that impact effective and safe pain care for hospitalised children. Of concern in this thesis, is the need to understand the extent of knowledge held by the professional nurses who care for children in SA and the impact of language and cultural understandings, misunderstandings and differences in care.

Although previous research (Ekim & Ocakcı, 2013; Manworren, 2000; Namnabati, Abazari, & Talakoub, 2012; Ortiz et al., 2015; Rieman & Gordon, 2007) has provided insights into the management of pain in children and the knowledge and attitudes of nurses, none of the published studies has addressed issues relating to culture. Most previous studies were conducted in countries with culturally homogeneous nursing populations. Furthermore, there is no published study in SA that addresses nurses' knowledge and attitudes towards children' pain and its management. No study has been conducted to address the barriers, facilitators and cultural factors impacting nursing care in relation to children's pain in SA. There is a significant knowledge gap on this topic.

The study reported in this thesis used a mixed-methodology research approach in an attempt to provide baseline information for health administrators, health leaders, clinicians, educators, and policymakers to help improve the quality of nursing care and pain management for paediatric patients in SA. Such information could also be used to develop educational strategies, improve nursing curriculum and guide the improvement of pain management practices, whether in neighbouring Arab countries or other countries

of the world that are in a similar situation with regard to a large number of expatiate nurses. This thesis provides recommendations for further research and for future clinical practice and education that could support establishing strategies for change or improving paediatric pain management and nursing practices in both SA and other countries where expatriate nurses provide care to children.

1.3 Researcher's Experience and Engagement with the Study Phenomenon

The researcher is a registered nurse and a Saudi citizen with a bachelor and a master's degree in nursing from Australian universities. He has six years of experience in providing medical-surgical nursing care for both adult and paediatric patients. Through these experiences, the researcher has gained insights into pain management for children. This work is motivated by the researcher's observations of paediatric patients' frequent complaints of pain and inconsistent pain assessment practices and ineffective care and pain management by the researcher's nursing colleagues. At the beginning of this investigation, the researcher was aware that while there was a body of existing evidence on children's unrelieved pain in clinical settings across the world, there was scant evidence within the context of SA of this phenomenon. This study was therefore initiated to investigate ways to improve nursing care and practice relating to paediatric pain management at regional, national and international levels.

1.4 Aims of the Study

This study examined the knowledge and attitudes of nurses working in SA regarding pain assessment and management in infants and children. The specific aims of the study were to:

- examine the knowledge and attitudes of Saudi and non-Saudi nurses in relation to infants' and children's pain assessment and management;
- identify the barriers and facilitators to effective pain assessment and management for infants and children in SA; and
- identify the cultural factors impacting pain assessment and management for infants and children in SA.

1.5 Research Questions

With specific reference to SA, the research questions that guided this study were:

1. What knowledge and attitudes do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?
2. What are the barriers and facilitators to effective pain assessment and management in infants and children?
3. What cultural factors impact Saudi and non-Saudi nurses' pain assessment and management in infants and children?

1.6 Overview of the Study Setting

The following provides an overview of SA, its healthcare system, the nursing profession and the education of nurses.

1.6.1 Saudi Arabia - Country Profile

The Kingdom of Saudi Arabia, commonly referred to as Saudi Arabia (SA) is a developing country, located in the Middle East and is one of the Gulf Arab counries (Figure 1.1). Riyadh is the capital city. It is the largest country in the Gulf States, occupying almost 80% of the Arabian Peninsula with a total area of about 2.24 million square kilometres. It is bordered by the Red Sea to the west and to the east by the Arabian Gulf, Qatar, Bahrain and the United Arab Emirates. It also shares borders with Jordan, Kuwait and Iraq to the north and Yemen and Oman to the south (Stair, 2003). In 2010, the total population (Saudi and non-Saudi) was estimated at around 27.1 million inhabitants, nearly 30% of which are foreign nationals (Jeffreys, 2010). Saudi Arabia is characterised by the fast growth and development of the population due to a high birth rate. According to Kepel (2004), the total fertility rate is 8.26 children per Saudi woman and the average birth rate is 50 births per 1,000 people. As a result, the Saudi government has improved healthcare services for children and mothers, both during and after birth. This includes specialised hospitals with preventive, therapeutic and rehabilitative services (Saudi National Comission for Childhood, 2014).

Figure 1.1. Map of Saudi Arabia

The culture of SA is dominated by its 1400-year Islamic heritage (Al-Shahri, 2002). Saudi society is deeply religious, conservative and traditional, which is also the case in most neighbouring Gulf societies. Saudi traditions are rooted in the religion of Islam, from which the majority of Saudis make rules for their personal, economic, political, legal and social lives. In other words, the attitude and behaviour of Saudi society is shaped and directed by Islam, its principles and teachings. The life model of Saudis is based on the two Islamic sources: the Quran, “the Holy Book revealed to Allah’s last messenger” (Al-Shahri, 2002, p. 134), and the Sunnah, which reflects or follows the sayings, actions, teachings, and approvals of the Prophet Mohammad (Koenig, 2014). Islam is the religion of 100% of the Saudi people and thus it dominates daily life and activities, including providing and receiving healthcare and treatment. The Muslim, whether the healthcare provider or the patient, is committed to daily religious practices, such as prayer, supplication and reading the Quranic verses. Some of these practices, described below, may have an impact on the timely delivery of some aspects of health care.

The name of Allah (God), the creator of universe, is the main principle in all events and dealings as Islam means total submission to the will of Allah by conforming internally and externally to his law (Abudari, Hazeim, & Ginete, 2016; Al-Shahri, 2002). Religious matters, such as praying five times a day, are important and integral part of daily life and general and practical business, and are not considered to be flexible. Fasting is also a central practice in Islam which involves not eating or drinking from dawn until sunset. Muslims fast in some months, particularly in the month of Ramadan – the holy month as referred to in Islamic principles. Islam allows the patient to break fasting and to do it later in order to take medications, injections or to do what is medically necessary but this is often not looked upon favourably by many Muslim patients, including for children.

Arabic is the official first spoken language in SA and other surrounding Arab countries. English is also an important language and is commonly used as a second language in various sectors, including health and education. This is because SA hosts a wide variety of nationalities, such as Indians, Filipinos, Malaysians, Americans, Australians, Canadians and South Africans. As there are many expatriate nurses and doctors, interpreters are commonly needed to simplify communication between non-Arabic health staff and Arabic patients (Al-Shahri, 2002).

1.6.2 Healthcare System

Over the last few decades, particularly with the increase in oil sales, there has been an enormous development in healthcare services due to the yearly annual budget allocated by the Saudi government to the health sector (Almalki, Fitzgerald, & Clark, 2011a). Currently, the country has a large number of general and specialised hospitals and healthcare centres, most of which are available and accessible in urban centres and cities,

such as Jeddah, Dammam and Riyadh. The healthcare system in SA is mainly operated and managed by the Ministry of Health (MOH), the largest government agency, which directly provides 60% of the total public healthcare services and regulates the remaining 40% that are privately owned (Aldossary, While, & Barriball, 2008; Almalki et al., 2011a). This agency holds many responsibilities, including formulating health policies, organising, monitoring and supervising health programmes and services, and setting strategic plans and guidelines for healthcare provision, including pain assessment and pharmacological and non-pharmacological interventions in pain management (Aldossary et al., 2008; Almalki et al., 2011a).

There are other agencies, both public and private, which perform similar functions and run other healthcare systems in SA. The public sectors include the Higher Education Ministry (teaching hospitals), the Defence and Aviation Ministry (armed forces hospitals), the Interior Ministry (security forces hospitals), and the National Guard Health Affairs (national guards hospitals). Such agencies provide comprehensive healthcare and have paediatric care facilities. However, their primary aim is to provide healthcare for employees and their dependants with an acceptance of some referrals, such as emergency and critical cases. The private health sector consists of all private establishments, such as hospitals, clinics and pharmacies. These services also contribute significantly to pain care in paediatric patients as well as to the provision of, and access to, general healthcare. These fall under the MOH's supervision and are based on its regulations and guidelines, including pain assessment and management, and the restrictions on the use and administration of opiod analgesics (Akerele & Al-Mazrou, 2002; Almalki et al., 2011a).

1.6.3 Nursing Profession

Nursing is not a new profession in the Arabian Peninsula, including SA. While historically, nurses existed in the early days of Islam, it became recognised as a career choice throughout the period of the Prophet Muhammad when a group of women, under the direction of Rufaida Al-Asalmiya (the first Muslim nurse) volunteered to take care of Muslim soldiers injured in the holy wars (Jan, 1996). Officially, the development of the nursing profession in SA started with the early establishment of public dispensaries and hospitals that were created by the MOH in 1954. Despite this history and development, nursing as a career has experienced a severe shortage of Saudi national nurses (n = 29,506, 29%, 2008 estimates) accompanied by a high rate of turnover due to numerous social and cultural factors (Aboshaiqah, 2016; Almalki et al., 2011b). For instance, nursing is generally regarded as a profession for females (Aboshaiqah, 2016). Consequently, many expatriate nurses (n = 71,792, 71%, 2008 estimates) from a wide variety of religious and cultural backgrounds have been recruited to work in SA to cover this shortage. At present, the nursing workforce depends heavily on expatriates, hence the Saudi government's establishment and implementation of the "Saudisation" (Saudi nationalisation scheme) policies in 1992. Saudisation aims to expand Saudi's healthcare workforce by attracting and recruiting Saudi males and females, especially in the field of nursing (Al-Mahmoud, Mullen, & Spurgeon, 2012). In response to this, many health institutes in SA offer professional nursing education programs for the development of nursing workforce. The aim is to increase the proportion of Saudi nurses and rebalance the national workforce (Al-Homayan, Shamsudin, Subramaniam, & Islam, 2013).

1.6.4 Nursing Education

Formal nursing education in SA began in 1958 due to co-operation between the MOH and the World Health Organization (WHO). The first training program for nurses commenced in Riyadh with 15 Saudi students who had an elementary school level education. This one-year program was established only for men. A few years later, two nursing programs of two-year's duration commenced in Riyadh and Jeddah for Saudi women. All men and women who graduated from these programs were then appointed as nursing aides with a certificate in nursing. In 1976, the first Bachelor of Science in Nursing (BSN) was offered at the College of Nursing, the University of King Saud in Riyadh, followed by other BSN programs being offered in Jeddah at the King Abdulaziz University in 1977, and in Dammam at the King Faisal University in 1987. A pre-requisite for entry to these BSN degrees was the completion of secondary school and the degree was extended from one to three years. In 1987, the Master of Science in Nursing (MSN) was introduced at King Saud University, Riyadh (Tumulty, 2001). A few years later, in 1994, a PhD program was established in King Abdulaziz University for female nurses who were unable to study abroad with a plan to offer this opportunity to both genders in the future (Almalki et al., 2011b). Further, in 2002, the Scientific Nursing Board (SNB) was established under the authority of the Saudi Commission for Health Specialties (SCFHS) as a professional licensing board. The principal aims of the SNB include professional and educational development, the definition of the nursing profession and its members, accreditation, registration and certification procedures. A prerequisite for nursing practice for all Saudi and non-Saudi nurses who currently care for patients in SA is that they are licensed and registered with the SNB (Abu-Zinadah, 2005; Saudi Commission for Health Specialties, 2009).

In 2010, the Diploma in Nursing programs were gradually closed and the government started a policy of requiring BSN as the minimum educational requirement entry level into the nursing practice. With this move, government universities and private higher education institutions began offering educational programs to prepare high school students to enter the BSN program. There are currently 25 government universities operating under the Ministry of Education that offer a BSN program. Government universities also opened bridging programs for diploma holders to offer them an opportunity to complete their BSN degrees. The BSN program in the country is offered over five years in ten semesters, with 50% theory and 50% practical courses. Courses include classroom contacts, clinical practice and laboratory work. The BSN program prepares students for general nursing practice and is offered on a full-time basis only. Depending on the university and its faculty and requirements, the curriculum design and the curriculum outline may have small variations between government and private institutions (Almadani, 2017). In terms of the curriculum content for pain management and related teaching hours for undergraduate nursing students, evidence shows that they were limited and inadequate (Alsaqri, 2018). For example, Alsaqri argued that a general singular course in Pharmacology (two hours a week) offered for nursing students is regarded as insufficient in relation to pharmacological pain management.

The first to fourth years of the BSN program are conducted in the university, while the fifth year is an intensive clinical practicum supervised by a hospital affiliated with the university. The first year is considered a preparatory year where students are required to complete preparatory courses, such as Preparatory English Language, Preparatory Biology, Preparatory Mathematics, Medical Physics, Preparatory Chemistry, Medical Foundations, Communication Skills, Islamic Culture and Arabic Language. The main nursing courses start in the second year of the program. Throughout the second to fourth

years of the program, students are required to take nursing courses, including Fundamentals of Nursing (theory and practice), Anatomy, Physiology, Biochemistry, Adult Health Nursing 1 and 2 (theory and practice), Pharmacology, Microbiology, Health Education, Paediatric Nursing (theory and practice), Maternal and Child Care Nursing (theory and practice), Mental Health Nursing (theory and practice), Community Health Nursing (theory and practice), Critical Care Nursing (theory and practice), Emergency Nursing (theory and practice), Nursing Leadership and Management (theory and practice), Nursing Research, and Evidence-Based Nursing Practice. For the fifth year, the students attend an intensive clinical placement where they are rotated through different practice areas in the hospital. After the completion of the internship year, the students are awarded the BSN degree and are required to take the licensure examination to qualify them to work as a general nurse in SA (Almadani, 2017).

1.7 Definition of Terms

Key terms used throughout this study are defined below.

Registered Nurse (RN)

The SNB has a qualifying exam for both international and local healthcare professionals. Nurses with a diploma or a bachelor's degree in nursing can have certification as a RN after passing this exam (Abu-Zinadah, 2005; Saudi Commission for Health Specialties, 2009). A nurse must meet several requirements for either registration or the renewal of registration, including the completion of an excellence year, attending 15 educational hours minimum every year related to the nursing profession and the provision of

healthcare to patients, including pain management (Almalki et al., 2011b; Saudi Commission for Health Specialties, 2009).

Notably, nurses who currently work in paediatric units in SA are not recruited or employed based on any particular paediatric nursing education or speciality. A nurse who has a registration in SA can provide care for both adult and paediatric patients.

The roles of the RN in SA regarding pain care include assessment, reassessment and the administration of pharmacological preparations and the use of non-pharmacological interventions. This does not include prescribing drugs or analgesics as this is a physician's responsibility.

Knowledge

According to the Oxford and Webster English dictionaries (Merriam-Webster, 2017; Oxford University Press, 2017), knowledge is (i) facts, information, or skills gained from experience or education; (ii) familiarity or awareness acquired through experience or learning; (iii) the sum of what is being known; and (iv) the fact or state of being knowledgeable about something or an idea.

There are many ways to define or describe nursing knowledge. Nursing practice involves using different types of knowledge (Barker, 2013). Carper (1978) identified four fundamental types of knowledge that form the body of nursing knowledge to guide and influence nursing practice and care, including pain assessment and management. These four types of knowledge are '*empirical*', '*ethical*', '*personal*' and '*aesthetic*', suggesting that nurses depend on multiple forms of knowledge when caring for their patients, including infants and children in pain.

All four types are central to nursing practice and no type of knowledge is superior or inferior to the others (Carper, 1978). A fifth type, '*emancipatory knowledge'*, added by Chinn and Kramer in 2008, builds on the four basic knowledge types. These seminal works emphasised the integration of all types of knowledge into clinical practice that is essential for effective and safe nursing care (Berman, Kozier, & Erb, 2012; Carper, 1978; Chinn & Kramer, 2011).

Empirical knowledge is the type of knowledge that is based on empirical or scientific evidence. This type of knowledge helps nurses to analyse and understand a specific problem in nursing (Carper, 1978). Chinn and Kramer (2011) clarified the conceptualisation of this knowledge type as the factual and descriptive knowledge that is learned or acquired by nurses from theory and evidence for practice. Using evidence-based practice represents an application of this type of knowledge.

Ethical knowledge is the moral component of nursing that provides guidance for nurses on how act or behave morally within their daily health practices (Carper, 1978). It involves making judgements on what is right and wrong in nursing care and acting on this basis (Chinn & Kramer, 2011). Dossey (2008) stated that it is the type of knowledge that constitutes nurses' ethics in practice, and encourages all moral actions, contacts, interactions and relationships between nurses and patients. Arnold and Boggs (2015) also argued that ethical knowledge is the knowledge type that guides nurses to 'do the right thing' and helps them provide appropriate care for patients, especially when there are challenges related to ethical issues in the healthcare field. It is "expressed through codes, standards, normative ethical theories as well as through descriptions of ethical decision making" (Mantzorou & Mastrogiannis, 2011, p. 254).

Personal knowledge relates to the self and the other in nursing (Chinn & Kramer, 2011). It involves being aware of self and how this influences interaction with others, such as patients and health professionals (Fulton, Lyon, & Goudreau, 2010). Carper (1978) describes personal knowledge as striving to know the self in relation to others. It is about developing self-awareness and making personal observations and reflections and increasing personal authenticity while providing care for patients (Chinn & Kramer, 2011). This type of knowledge develops when the nurse is involved in the therapeutic use of self in practice (Chinn & Kramer, 2011). In other words, it develops when a genuine therapeutic relationship is built between the nurse and patient (Arnold & Boggs, 2015).

Aesthetic knowledge entails the application of empathy, perception, and the acknowledgment of the importance of individual's lived experiences. It is described as the art of nursing (making nursing an art), and represents the ability of nurses to create communicative interactions and connections with patients (Carper, 1978). It is the process of perceiving or grasping aesthetic meanings to understand the human health condition and the lived experience, such as living with pain (Edwards, 2002). This type of knowledge can be expressed by nurses in different ways when delivering care for patients, including actions, attitudes and interactions (Chinn & Kramer, 2011).

Emancipatory knowledge is the praxis of nursing. It refers to nurses' critical analysis, reflection and action in the social, cultural and political contexts that influence their health care provision or contribute to patients' health issues (Chinn & Kramer, 2008). This type of knowledge helps nurses in practice to ask critical questions to identify the things that are wrong and need to be changed for the better (Chinn & Kramer, 2011).

For the purpose of this study, knowledge comprises the following five elements: *empirical*—the science of nursing; *ethical*—moral knowledge in nursing; *personal*

knowledge—the self and other in nursing; *aesthetic*—the art of nursing; and *emancipatory knowledge*—the praxis of nursing.

Attitude

In psychology, an attitude refers to a set of personal emotions, beliefs and behaviours directed toward a certain thing, such as a person or a situation (Stanhope & Lancaster, 2016). Many psychologists in their seminal writings proposed different definitions for attitude as a concept. For example, Hogg and Vaughan (2005) defined an attitude as “a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols” (p. 150). Eagly and Chaiken (1993) defined it as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (p.1). Moreover, Petty and Cacioppo (1996) referred to attitude as “a general and enduring positive or negative feeling about some person, object, or issue” (p.7). From these widely recognised definitions, an attitude consists of several different components. It is an overall favourable or unfavourable (positive/negative) evaluation of people, issues, objects or events.

Early researchers also proposed three interconnected components that comprise attitude (Ajzen & Fishbein, 1980; Rosenberg, 1960; Schafer & Tait, 1980). These components include ‘affect’ (feeling), ‘cognition’ (belief), and ‘behaviour’ (action). The affective component refers to a positive or negative emotional response or feeling held by the person towards something or someone. The cognitive component refers to a person’s thoughts, perceptions and beliefs about things (e.g. believing infants/children do not feel or remember pain). The behavioural component, representing both affective and cognitive components, refers to how one’s attitude is transformed into a certain action or activity

(e.g. ignoring the assessment of pain in young children who cannot verbalise pain) (Vaughan & Hogg, 2010; Weiten, 2007).

For the purpose of this study, attitude comprises feelings, beliefs and actions which implicate/moderate responses that are either positive or negative in relation to patients who are experiencing or reporting pain, and pain assessment and management.

Culture

Although culture has been defined differently across disciplines, cultural anthropologist Kenneth Guest presented an effective and useful culture framework when he defined culture as "a system of knowledge, beliefs, patterns of behaviours, artifacts, and institutions that are created, learned, shared, and contested by a large group of people" (Guest, 2017, p. 35). Many factors can shape a culture, such as religion, history, language, ethnic identity and nationality (Wunderle, 2008).

Culture is an important factor in relation to pain management (Chen, Miaskowski, Dodd, & Pantilat, 2008; Narayan, 2010). Pain perception, expression and management could be different across cultures. The impact of culture on individuals' beliefs has been well documented in the literature and was found to influence illness beliefs and decision making in clinical settings and healthcare practices (Lasch, 2000; McCarthy et al., 2004; Peacock & Patel, 2008). Miller (2015) argues that appropriate pain management requires cultural competence with a consideration of culture and its influences on pain and pain management. Cultural competence in nursing has been defined by Suh (2004) as "an ongoing process with the goal of achieving the ability to work effectively with culturally diverse groups and communities with a detailed awareness, specific knowledge, refined

skills and personal and professional respect for cultural attributes, both differences and similarities" (p. 96).

Children

The term 'children' includes different groups, generally categorised by age as infant (3 months –1 year of age), toddler (1–3 years of age), preschool child (3–5 years of age), and school–age child (6–12 years of age) (Scott & Fong, 2009). For this study, the term 'children' incorporates all four groups and refers to infants and children aged between 3 months to 12 years as this is the age group that is commonly cared for in the health settings of this study.

1.8 Outline of the Thesis

This thesis consists of six chapters. Chapter One comprises the introduction, background and significance of the study, aims of the study and its research questions, and an overview of the study setting and definition of terms.

Chapter Two presents an overview of pain and its assessment and management in infants and children along with the role of nurses and parents in caring for a child with pain. Also provided in this chapter is a review of the published research studies relating to the knowledge and attitudes of nurses, and the barriers and facilitators to pain assessment and management in infants and children.

Chapter Three addresses the methodology for mixed methods research, describes the sequential explanatory research design and methods used and provides a rationale for using this design. It also provides a detailed plan for the conduct of Phase 1 and Phase 2

of the study reported in this thesis. In addition, it includes a description of the settings for the study, the study population, sampling and recruitment, and the methods of data collection and analysis. The mechanisms used to ensure the study rigor and trustworthiness are also discussed along with the study's ethical considerations.

Chapters Four and Five, respectively, present the results from the Phase 1 cross-sectional survey and the Phase 2 qualitative study. These chapters also outline the demographic data of the participants within each of these two phases.

Chapter Six, the last chapter of the thesis, provides a discussion and conclusion to the thesis. Here the discussion addresses the research aims and questions, the integrated findings of the study's two data sets and provides a description of the strengths and limitations of the study as well as suggesting implications for education, practice and policy. The chapter also provides recommendations for future research studies. Lastly, the conclusion, derived from the two-phase findings of the present study, is presented in this chapter.

1.9 Summary

This chapter provided an introduction to this thesis including the background and significance of the study. An overview of the culture of SA, the healthcare system and the nursing profession and education are discussed. Also provided in this chapter are the aims of the study and its research questions as well as the definition of terms and the thesis outline. The next chapter, Chapter Two, provides a review of the relevant literature on pain assessment and management for children.

Chapter 2 **Literature Review**

2.1 Chapter Introduction

This chapter is divided into two sections. The first section presents a general overview of children's pain and its assessment and management, including types of pain and theories, the prevalence of pain among children and the role of nurses and parents in caring for a child with pain. The second section presents a critical review of the literature relating to the research and evidence from the published studies on the knowledge and attitudes of nurses, and the barriers and facilitators to pain assessment and management in infants and children. This section is based on the following publication:

Alotaibi, K., Higgins, I., Day, J., & Chan, S. (2018). Paediatric pain management: Knowledge, attitudes, barriers and facilitators among nurses - integrative review. *International Nursing Review, 65*(4), 524-533. doi:10.1111/inr.12465

The search strategy and outcomes are described, followed by the quality appraisal and methods of assessing the included studies. The chapter concludes with a chapter summary and a description of the research gaps based on the studies reviewed.

2.2 Overview of Pain

Pain is a unique and complex phenomenon that is experienced by everyone at some point in their lives. Children, in particular, are more vulnerable to pain than adults as it is a part of their daily lives (Croft, Blyth, & Windt, 2010). Understanding pain is an important aspect of assessing, managing and treating a child's pain. The following discussion

provides an overview of the history of and theories of pain, the types of pain, and the physiological, psychological and cultural aspects of pain.

2.2.1 The History of Pain

Pain, its nature and its many meanings dates back to antiquity. Pain has been viewed in most ancient cultures as more than an injury-related phenomenon but rather a test of faith or a punishment from the gods to clean the body from sins and acts of evil (Stimmel, 2014). This belief has carried over into a number of religions including Christianity, Islam and Hinduism and it prevails today (Jackson, 2002; Kittredge, 1992). Indeed, the word pain itself originates from the Greek *poine* and the Latin *poena*, meaning 'penalty' or 'punishment' (Jackson, 2002; Kittredge, 1992).

While there has been philosophical debate around the nature of pain and its origins, the ancient Greek philosophers were the first to distinguish pain, and they considered it a sensation rather than a feeling (Benzon et al., 2014). In particular, Plato and Aristotle during the 3rd to 5th centuries believed that pain was a sensory experience, increased by the sense of touch and they believed the heart to be the centre of all sensations, including pain (Koestler & Myers, 2002). During the Renaissance period, particularly in the mid-17th century, Descartes considered pain as a sensation that travels through nerves to the brain. This idea formed the basis of pain theories proposed later by Alfred Goldscheider and by Melzack and Wall (Arnstein, 2010). After Descartes, in the 18th century, the notion of pain further developed as scientists and physicians began to understand the importance of the nervous system and brain as the centre of all sensations.

As discoveries continued in the area of human anatomy and physiology, modern ideas of pain arose, contributing to the general acceptance and use of anaesthesia in the 19th century (Jackson, 2002; Kittredge, 1992; McGrath, Stevens, Walker, & Zempsky, 2014). By the 21st century, major developments in the study of pain and its mechanisms were occurring and many aspects of pain physiology and treatment were revealed. Yet unrelieved pain in many healthcare settings is common today, particularly in children, due to many misconceptions and myths (e.g. infants do not experience or expect pain) and a lack of information or concern over the potential adverse effects of pain treatment, including addiction and respiratory depression (Funnell, Koutoukidis, & Lawrence, 2009; Twycross et al., 2009).

2.2.2 Theories of Pain

Over time, three pain theories have been formulated in an attempt to understand and clarify the specific mechanisms and pathophysiological aspects of pain: the specificity theory, the pattern theory, and the gate control theory (Lippincott Williams & Wilkins., 2007). A brief explanation of each theory of pain follows.

Specificity Theory

In the 17th century, the philosopher Rene Descartes introduced the specificity theory to explain the sequence of experiencing pain. Descartes was the original illustrator of the popular image of a child whose foot was near a fire, depicting the subjective nature of pain and how individuals perceive it. The theory describes the pain transmission process being like a hollow tube with a cord beginning at the site of trauma or injury on the skin to a specific pain centre in the brain. In other words, the theory proposed that a system in

the body transmits the initial disturbance to the brain, resulting in the pain response. Despite the basic conceptualisation, this theory was incomplete as it only focused on the perception of pain, and not the psychological changes and differences in pain tolerance from person to person (Peterson & Bredow, 2009; Pudner, 2010).

Pattern Theory

Alfred Goldscheider proposed the pattern theory of pain in the 19th century, which hypothesises that the sensation of pain is only communicated to the brain when a summation of stimuli develop a specific combination or pattern. Hence, according to this theory, pain occurs as a result of certain peripheral impulses being stimulated. This produces a particular pattern that is combined at the spinal cord as a “sum” of pain, a process called "central summation”. Thus, it can account for the phantom limb phenomenon as it focuses on the mind rather than nerve receptors. Nevertheless, the pattern theory does not consider other issues including the placebo effect on pain perception. It also does not account for individual perceptual differences and how psychological factors may also play a vital role in experiencing pain (Marmo & D'Arcy, 2013). Although limited, the pattern theory led to the gate control theory that is the most commonly accepted pain theory in the field (Cheng, Foster, & Huang, 2003).

Gate Control Theory (Neuromatrix Theory)

This theory was developed by Ronald Melzack and Patrick Wall between 1962 and 1965. It is based on the specificity theory and pattern theory and assumes that the presence of a “gate” (gate mechanisms) in the dorsal horn of the spinal cord regulates the conduction of sensory communication. Starting from the primary afferent neurons, it transmits cells in the spinal cord and thus modulates the perception of pain. As such, when nociceptive

information reaches a threshold, which exceeds the inhibition, the gate opens and triggers pathways causing the perception of pain. These mechanisms are controlled by the activity in the large and small fibers. Large-fiber (A-delta) activity impinges the opening of the gate and inhibits the substantia gelatinosa, whereas small-fiber activity stimulates the gate to open (Berman & Kozier, 2008). The gate may also be regulated by the actions of descending fibers that originate in supraspinal regions and project the dorsal horn. Although the gate control theory provides a neural basis around pain, it fails to provide details about the idea of pain and the unceasing pain complications regarding the phantom limb syndrome (Moayedi & Davis, 2013).

2.2.3 Types of Pain

Pain is commonly classified into three types: (1) acute pain, (2) chronic pain and (3) cancer pain (World Health Organization, 2012). A brief description of each of these types of pain follows.

Acute Pain

Acute pain is the type of pain that has a sudden onset and is felt immediately at the time of tissue injury or as a result of a medical intervention (Ball et al., 2015; World Health Organization, 2012). It often occurs as a result of distinctive circumstances and/or events, such as an accidental cut or surgical incision, a fall resulting in a broken bone, or a medical procedure that invokes pain (Kyle & Carman, 2017). Procedural pain is typically acute; it is short-lived pain arising from medical interventions and treatments conducted for the purpose of health care (Carter & Simons, 2014). Based on a commonly used definition, acute pain lasts for a short period of time and disappears gradually when the injury starts

to heal (McGrath et al., 2014; World Health Organization, 2012). In most cases, this type of pain is accompanied by signs and symptoms, such as sweating and increased heart and respiratory rates (Brooker & Waugh, 2013). It also causes fear, distress and anxiety due to its severity. If this type of pain is not prevented or managed well, it may lead to chronic pain and other complications. As a result, the guidelines of the WHO (2012) assert careful consideration and adequate pain management to be taken into account when dealing with such type of pain and caring for paediatric patients.

Chronic Pain

Chronic pain is divided into two types: chronic non-malignant pain and malignant pain. Chronic pain of non-malignant origin is a continuous or recurrent pain that lasts for longer than three months, the normal time of tissue healing. This pain may begin as acute pain, but it does not have a particular ending time and may last for months or years. Although chronic pain can arise from well-recognised clinical conditions, such as arthritis or sickle cell disease, the cause of this pain cannot be simply linked to well-understood underlying pathology (Howard, 2011). “Chronic pain in children is the result of a dynamic integration of biological processes, psychological factors, and sociocultural factors considered within a developmental trajectory” (American Pain Society, 2012, p. 1). This pain is a complex mechanism that does not easily respond to medical treatment and interventions and because of this, it may result in serious effects such as weakness and depression over time. Chronic pain ranges from mild to severe. It is most commonly associated with sleep disturbances and emotional and psychological changes such as depression, fatigue and negative coping behaviour, all of which may have a severe impact on a child’s daily life, including physical activity and interactions with their family and others (American Pain

Society, 2012; World Health Organization, 2012). The impact of chronic pain in childhood is wide-ranging, suggesting effective care and management (Howard, 2011).

Cancer Pain

The third type of pain is cancer pain that initially develops from the cancer or tumour itself when it grows and spreads in the human body. With this pain, patients may experience both physical and psychological effects, such as fatigue, poor appetite and sleep problems (Bruera & Portenoy, 2010). According to the WHO (2012), most cancer pain in children arises from diagnostic and therapeutic procedures, medical interventions and treatment. This pain type is frequently severe, and when it is not treated well it usually spreads throughout the body causing bone pain and other complications (Wright, 2015).

2.2.4 Types of Pain in Children

Like adults, children can experience a variety of pain types during their lives. Chronic pain, or pain that persists beyond the course of an acute episode or reasonable time for healing - up to three months (Howard, 2011) or pain that is associated with a pathological disease process, is a significant health problem and prevalent during childhood (Friedrichsdorf et al., 2016). The abdomen, limbs and head are the most common sites for chronic pain reported in epidemiological research by Wolraich (2008) and is estimated to affect about 20% to 35% of the general paediatric population worldwide (Friedrichsdorf et al., 2016). For example, a study on the prevalence of pain in a group of Dutch children (n=5,424) showed that a quarter of them had experienced chronic pain for more than three months, concluding that this type of pain is common in childhood (Perquin et al., 2000). Another study conducted in Spain showed that 37.3% of children

(n=561) had experienced chronic pain problems at one or multiple anatomic sites (Huguet & Miró, 2008). Evidence also shows that more than 10% of hospitalised children experience chronic pain and its episodes (Friedrichsdorf et al., 2016).

Children can also experience acute pain and cancer pain. Acute abdominal pain has been shown as a common complaint during childhood, caused by a wide range of surgical and non-surgical conditions, such as appendicitis and gastroenteritis (Kim, 2013). Leukaemia is the most commonly diagnosed cancer, comprising up to 30% of the annually registered cancer cases amongst children aged between 0 and 14 years old in the UK and the United States of America (USA) (Ness, Armenian, Kadan-Lottick, & Gurney, 2011). Irrespective of cancer types, children with cancer often experience complex and uncontrollable pain caused by the disease itself and related treatment and procedures, as well as psychological distress arising from cancer (Twycross, Parker, Williams, & Gibson, 2015).

2.2.5 Physiological Aspects of Pain

Pain is a complex sensation that involves a sequence of physiological events in the nervous system, known as transduction, transmission, perception and modulation (Kyle & Carman, 2017). These events carry and modify pain and contribute to its sensation, perception and responses. Transduction occurs when the nociceptor converts noxious stimuli into electrical impulses that are then transmitted to the spinal cord to ultimately reach the central nervous system. Transmission occurs when noxious information is passed through the spinal cord to the brain by peripheral afferent nociceptive fibres (A - delta fibres & C fibres). Perception occurs when a person feels pain and becomes conscious of it. Modulation occurs at all levels of pain pathway (ascending and

descending mechanisms) and involves the structures of the spinal cord, the brain stem and the cerebral cortex (Kaplow, 2015; Urden, Urden, Stacy, & Lough, 2016).

It has been long established that premature babies and neonates, infants and children have nerve pain pathways and a nervous system. As a result, they can feel pain as adults do and respond to tissue injury, although there are differences in terms of pain threshold and perception (Hatfield, 2014; Loizzo, Loizzo, & Capasso, 2009; Potts & Mandleco, 2012).

2.2.6 Psychological Aspects of Pain

The experience of pain involves more than just a sensation caused by physical injury or disease (Van Griensven et al., 2014). It is a unique combination of several factors that shape human perception of, or response to pain. Pain is mostly a psychological phenomenon and many factors, such as emotional (e.g. anxiety, fear and depression) and situational factors, can influence it and may profoundly alter or modify how pain is experienced and perceived. In addition, these factors in turn determine an individual's behavioural response to pain, depending on personal experiences or history, beliefs, meanings and expectations about pain and its management (Linton & Shaw, 2011). A child for example, may avoid any interaction and refuse pain treatment due to a previous painful experience or event that may have happened during hospitalisation. Such psychological factors produce a complex interaction between the child and the situation when pain is experienced (Gatchel & Turk, 2002). Thus, it is important for all health professionals who care for children to recognise and understand this so as to manage pain and control the possible situational or emotional factors that may influence or modify the experience, perception and reaction to pain (Cleaver & Webb, 2007).

2.2.7 Cultural Aspects of Pain

Culture plays a significant role in shaping the overall experience and response to pain (Finley, Kristjánsdóttir, & Forgeron, 2009). Pain is experienced differently across cultures. It is moderated by ethnicity, religion and language. Culture also influences pain perception, tolerance, threshold, beliefs, communications, emotions and behaviours (Peacock & Patel, 2008). Based on a patient's culture, a person's psychological response to pain can be related to whether people are categorised as either stoic or emotional (Peacock & Patel, 2008). Stoic people are those who tend to endure in many situations and in relation to pain: characteristically they do not complain about or express pain; they do not ask for relief from pain; and/or they refuse pain relief measures. Often, they see pain as a form of punishment and suffering for their wrong doings in life (Aschenbrenner & Venable, 2009). Emotive people are more likely to respond emotionally to many situations by, for example verbalising their pain. They express and complain about having pain, they may cry or wail (Peacock & Patel, 2008; Perry, Ostendorf, & Potter, 2016). In support of this, Hispanic, Middle Eastern, and Mediterranean people have been shown to be more emotional and expressive to their pain and its experience when it comes to comparison with people from Northern European and Asian backgrounds (Galanti, 2004).

Because of an individual's cultural background and upbringing, patients and their families may also seek traditional or religious interventions whilst in hospital and undergoing treatment and healthcare (Miller, 2015; Rassool, 2015). For example, Islamic practices and interventions associated with the experience of pain are mostly an expression of authorising and leaving all matters to God/Allah, the creator of the universe, because Islam is linked to the formation of the basis of health beliefs (Lovering, 2006).

Additionally, the meaning of pain itself is different among individuals of different cultures, and this may influence the beliefs about what should be done regarding pain or what treatment is considered appropriate for pain. As with Christians, Muslims believe that pain and suffering are part of life and Allah's will, and therefore should be endured (Forgeron et al., 2006). People who endure pain, as noted above, are characteristically stoic.

A child's culture therefore, impacts how pain is perceived, expressed and interpreted, depending on what has been culturally transmitted and learned from their family and their society (Twycross et al., 2009). Children with the same pain level or who have similar medical conditions may respond to pain or behave differently because of variations in culture or cultural background (Incayawar & Todd, 2013). For example, research shows that compared to European-American children, African-American children were found to provide limited verbal responses to their pain (Finley et al., 2009). Similarly, Chinese children showed a tendency to provide more response to their pain, such as crying, when compared to Canadian children (Rosmus, Johnston, Chan-Yip, & Yang, 2000). Evidence also shows that Saudis and Filipinos are more likely to verbalise their pain compared to other nationalities, such as Indians (Gerdin, 2017; Lovering, 2006). However, emotional facial expressions of pain, such as grimacing and anger are less evident in a person from Saudi nationality and/or Islamic culture (Lovering, 2006). This may be because Islam encourages patience when dealing with pain and suffering for the reward of Allah (Choong, 2015).

Culture may also influence the beliefs, expectations and decision-making of family, parents and health professionals regarding pain and its management. Enduring pain, discomfort and suffering during life to receive rewards in the afterlife is a good example

of the influence of culture that is well known and well documented across different cultures, such as Islamic and Indian Hindu cultures (Lovering, 2006; Weber & Kelley, 2010). Based on a particular culture or the cultural meaning given to pain, parents may teach their child how to act or react to the pain experience that may ultimately complicate or prevent achieving effective pain relief (Bowden & Greenberg, 2010). Health professionals, including nurses, like their patients, learn about pain and the ways of expressing pain and how to respond during their childhood years. This may involve myths or misconceptions about pain; for example pain is normal in life, pain should be endured, pain should not be expressed. Such beliefs have the potential to affect their actions and interactions in relation to patients with pain and its treatment and management (Lovering, 2006; Narayan, 2010). It is therefore important for them to consider culture, to be aware of the patients' and family's culture, and also their own cultural beliefs, values, and perceptions about pain, to ensure culturally appropriate pain care (Narayan, 2010). The importance of culture in providing pain care should not be underestimated (Givler & Maani-Fogelman, 2019; Maier-Lorentz, 2008; Mawhirter, 2016).

2.2.8 Prevalence of Pain in Infants and Children

Despite published evidence-based standards and guidelines and significant improvements in our knowledge and pain management over the past few decades (American Academy of Pediatrics, 2001; World Health Organization, 2012), evidence reveals a high prevalence of pain (94%) among hospitalised children due to poorly managed pain (Birnie et al., 2014). Whilst the reasons for admission and types of pain are not provided, many studies revealed the high prevalence of unrelieved pain in children during their hospital stays. In a survey of 290 children, from medical and surgical units at a Canadian paediatric

teaching hospital, 77% experienced pain during their hospital stay. Of these, 64% had moderate or severe pain in the 24 hours to prior admission. Analgesia was given to only 42% of those experiencing pain and regular analgesia was provided to only 30% of those with moderate or severe pain (Taylor, Boyer, & Campbell, 2008). In two surveys conducted in the USA and Canada by Shomaker et al. (2015) and Harrison et al. (2014) respectively, the majority of children (72-84%) experienced moderate-to-severe pain during their hospitalisation. More recently in the USA, Walther-Larsen et al. (2016) carried out a cross-sectional survey of 570 children at four university hospitals. The authors reported 37% of children were in pain during the 24 hours preceding admission to the hospital and 24% experienced moderate-to-severe pain with no documented pain assessment or regular administration of pharmacological or non-pharmacological interventions for the relief of pain. Of particular concern, is that most of these children were admitted under well-resourced healthcare systems of paediatric tertiary referral hospitals, suggesting that it is a global problem.

In other countries around the world, children also reported experiencing significant pain during their hospital stays. For example, at six public hospitals in Brazil, Doca, Junior, Finley and Linhares (2017) conducted a cross-sectional study based on interviews, focusing on pain in children who were admitted to emergency or speciality surgical units. The authors found a significant number of children were in mild-to-severe pain: 47% self-reported, 37% reported by the child's family, and 39% as reported by physicians and nurses. Approximately a quarter of those children did not receive any analgesia or pain intervention, leaving them with unrelieved pain. In another survey of 121 paediatric patients and adolescents conducted at emergency and medical and surgical units of a Brazilian teaching hospital, 59% of hospitalised children (n=34) who were able to verbalise their feelings complained of pain in the 24 hours prior to data collection. About

half of them reported severe pain with some results indicating ineffective pain management (Linhares et al., 2012). Furthermore, in Jordan, a neighbouring country of SA, Forgeron et al. (2006) found almost half (n=35, 47%) of children were in mild-to-moderate pain at the time of data collection, 11% were in severe pain and only 22% received analgesia. Such statistics confirm that there is a significant number of children worldwide who continue to experience unrelieved pain needlessly whilst in hospital and under the care of health professionals. These statistics suggest a need for urgent attention to the management of pain in children.

2.2.9 Pain Experience and Perception in Infants and Children

The literature shows that there are widespread misbeliefs among nurses and other health professionals regarding pain in paediatric patients. For example, it is widely believed that an infant or a child does not experience pain or feels less pain than an adult. This misbelief amongst many healthcare professionals is upheld despite research that shows that children do experience pain (Twycross et al., 2009). Regardless of age, pain has been found to be mediated by specific nerve fibres that transmit the impulses of pain to the human brain (Ricci & Kyle, 2009). As with adults, children of all ages can experience different types and intensities of pain and demonstrate pain through behaviours such as crying, restlessness and facial grimacing to name a few. Children also can perceive and express pain like adults, but their pain is impacted or moderated by many factors including age, cognitive and developmental level, family, previous pain experiences and hospitalisations, as well as social and cultural factors. The aforementioned moderating factors influence a child's understanding of pain, expressions and words to describe pain and their evaluation of new pain experiences (Gatchel & Turk, 2002). Family and health

professionals need to consider these factors when caring for children in pain. Comprehensive assessment is essential with particular attention given to the child's age, developmental level, behaviours, type, location and history of pain, the intensity and duration of pain, the sociocultural context, cultural beliefs about pain and family influences and interaction with healthcare providers (Burns et al., 2017; Vakili et al., 2015).

2.2.10 Pain Assessment and Management in Infants and Children

Pain assessment is a key element of pain management in all patients. It is the first step in managing pain and guides pain management and its related interventions (Richardson & Glasper, 2010). Health professionals should therefore accurately and regularly assess all aspects of children's pain and evaluate their responses to treatment (Wong, Lau, Palozzi, & Campbell, 2012). The process of assessing paediatric pain needs active engagement with the child, and it involves the child, parents and healthcare providers. As noted above, the way the child perceives and responds to pain is an outcome of several factors that impact the child when presenting in pain. Therefore, assessing and understanding the factors that cause or exacerbate pain in children is essential for effective pain management, as recommended by the IASP (McGrath, 2005).

Three main measures are currently used to assess the intensity of pain in children: self-report (what the child says), behavioural observation (how the child behaves) and physiological measures (how the child's body reacts) (Twycross et al., 2009). These can be used separately or in combination. Combining these three approaches is known as multi-dimensional pain assessment and is considered the most reliable pain assessment method (Brand & Thorpe, 2016).

Self-report measure is the preferred approach in assessing children's or adults' pain, but it has to be used in conjunction with observation and not alone (Kyle & Carman, 2017). It is often considered the gold standard of pain assessment as it allows direct subjective reporting (Brand & Thorpe, 2016). The use of this approach depends on the child's age and maturation (Oakes, 2011) as it is complex and can only be used with children who are able to speak. Children between two and four years of age are usually able to report their pain. At five years old, the child can describe the presence of pain and differentiate the levels or intensities of pain (Wong et al., 2012).

Behavioural observation measure is considered a valid approach to determine pain in preverbal or non-verbal children. This approach involves assessing crying, facial expressions, body postures and movements. These indicators are commonly used in children under three years of age where self-report is limited or absent (Srouji, Ratnapalan, & Schneeweiss, 2010; Vakili et al., 2015). The success of this approach depends on the child's age and developmental stage, as well as their health condition. Behavioural observation measures pain indirectly. Children may demonstrate similar behavioural responses to pain, such as crying when hungry or in distress and these need to be taken into consideration. The absence of behavioural responses does not always indicate the absence of pain so attention should be paid to avoid underestimating pain in children (Vakili et al., 2015).

Physiological measure to pain assessment includes an assessment of the heart rate, blood pressure, respiration rate, oxygen saturation, palm sweating and sometimes endorphin concentration. These physiological signs however, should not be used in isolatio, as they do not always correlate with pain and may reflect stress responses instead (Srouji et al., 2010). There is no conclusive evidence supporting the use of such signs alone when

assessing pain as they may occur without the presence of pain (James et al., 2013; Twycross et al., 2009). Thus, a tool that incorporates physiological and behavioural signs along with self-report is an ideal methodology and should be used in assessment practice when possible (Glasper, Coad, & Richardson, 2014).

Many valid and reliable pain assessment tools are available for use and designed according to the age of the child and cognitive ability or maturational differences. These include self-report tools (e.g. Wong-Baker faces tool and numeric reporting tool) that measure pain in children of different ages, and observational and behavioural tools such as the FLACC (faces, legs, activity, cry, and consolability tool) that can be used to measure pain in children who cannot communicate, are asleep or have limited verbal communication (Ball et al., 2015; Herr, Coyne, McCaffery, Manworren, & Merkel, 2011; Macintyre, Rowbotham, & Walker, 2008; Wong et al., 2012). Such tools are recommended for use in practice and recognised as effective in assessing children's pain (Kahsay, 2017).

Pain management implies the application of nursing processes – assessment, planning, implementation and evaluation of pain treatments (Twycross et al., 2009). Assessment described above, is the first step to establish the presence, nature, type, location, intensity and duration of pain. Effective pain management involves judicious assessment of the child's pain; planning and selecting appropriate interventions to relieve pain; implementing these interventions; individualised treatment plans; and evaluating the effectiveness of the interventions implemented (Twycross et al., 2009). Pain management, whether in children or adults, includes pharmacological and non-pharmacological interventions. It is a multimodal therapy that involves the use of medications, interventional procedures and psychological and physical approaches to

achieve better pain control (Murnion, 2015). The WHO (2012) recommended an approach to optimal pain care and treatment that comprises the combination of these pain management interventions. Appropriate interventions depend on the determination of the medical team, including nurses when assessing the type, nature, location and intensity of the child's pain (James et al., 2013).

The international guidelines and recommendations for the use of pharmacological interventions to manage child's pain include administering doses at regular intervals; using the oral route if available as the appropriate route of administration; and using a two-step strategy involving the use of non-opioids for mild to moderate pain and opioids, such as morphine, 'the drug of choice', for moderate to severe pain. The guidelines and recommendations also advocate the use of non-pharmacological interventions and the integration of these into plans for pain management to optimise pain care (American Pain Society, 2016; World Health Organization, 2012).

Pharmacological Interventions

Pharmacological interventions are the primary approaches used in managing pain in children (Browne, 2013). They involve the administration of analgesic drugs, generally classified as opioid analgesics, non-opioids analgesics and adjuvants or co-analgesics (Perry et al., 2016). Opioid analgesics are traditionally called narcotics and regarded as the most suitable agents for managing moderate- to-severe pain (Perry et al., 2016). Non-opioid analgesics include a group of agents used to manage mild-to-moderate pain (Kahsay, 2017). Adjuvants are a range of drugs that are not analgesics but that provide analgesic activity and treat concurrent symptoms that contribute to pain or exacerbate it (Kahsay, 2017). Such drugs or drug groups are described below.

Opioid Analgesics: Opioid analgesics are frequently used for children with moderate- to-severe acute and chronic pain, such as post-operative pain, post-traumatic pain and cancer pain (James et al., 2013). Morphine, codeine, meperidine and fentanyl are some examples of opioid analgesics (Ball et al., 2015). The choice of opioids is made on the basis of pain intensity, a child's condition, available route, side-effects and environment (Browne, 2013). In managing children's pain, morphine is the most widely used opioid and it is considered the drug of choice for severe acute pain. Common side-effects associated with opioids include sedation, nausea and vomiting (Bowden & Greenberg, 2010). Opioid administration can be made via various routes – orally, rectally, intravenously or intramuscularly. However, the oral route is the preferred and recommended route for children who are able to take analgesia orally as it simple and does not involve needles or cannulation (Kyle & Carman, 2017; World Health Organization, 2012).

Non-opioid Analgesics: Non-opioid analgesics include the use of acetaminophen (paracetamol), salicylates, and Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) such as ibuprofen (Kyle & Carman, 2017). These drugs are recommended to be used for the treatment of mild to moderate pain in children, such as pain related to tissue injury (World Health Organization, 2012). It is also recommended that they be combined with opioid analgesics to treat moderate to severe pain and for better pain relief (Bowden & Greenberg, 2010; World Health Organization, 2012). In the management of children's pain, acetaminophen and ibuprofen are the most commonly used analgesic drugs (Kyle & Carman, 2017; McGrath et al., 2014).

Adjuvants: Adjuvants are analgesic drugs designed for non-pain related conditions but can be used in conjunction with opioid and non-opioid analgesics to enhance analgesic efficacy and to achieve better pain control (Lui & Ng, 2011; Peate & Wild, 2018). The

use of adjuvants has increased in the last few decades, particularly with cancer conditions and related pain (Mitra & Jones, 2012). Such drugs have been shown to be effective if combined with analgesia (Peate & Wild, 2018). The most commonly used adjuvants include anti-depressants (e.g. amitriptyline) and anticonvulsants (e.g. gabapentin) for neuropathic pain and pain syndromes (Kahsay, 2017). A multimodal approach that contains adjuvants, non-opioids, and opioids is recommended to optimise pain management (World Health Organization, 2012).

Non-pharmacological Interventions

Non-pharmacological interventions or complementary therapies do not involve the administration of drugs when managing pain. These are an integral part of pain management. A nurse caring for a child with pain should use such interventions in addition to pharmacological interventions as an adjunct therapy to enhance comfort, reduce fear, anxiety or stress associated with pain and decrease the amount of analgesia required (Ball et al., 2015; World Health Organization, 2012). Non-pharmacological interventions are generally classified as psychological such as holding, touching and comforting the child and providing reassurance; cognitive-behavioural such as the use of distraction as with toys or games, relaxation and guided imagery; and physical such as massage, thermal regulation and positioning (He et al., 2010; James et al., 2013). These have fewer side-effects and have also been shown to be effective in reducing pain intensity and promoting rest and comfort for the child in pain (Hockenberry & Wilson, 2015). The selection of these interventions however, should be based on the child's age, pain type, and health condition (James et al., 2013). For example, cognitive-behavioural interventions are effective in reducing anxiety and distress, particularly for children undergoing frequent painful procedures (Perry, Hockenberry, Lowdermilk, & Wilson,

2013). Psychological interventions, such as holding, is appropriate for infants and has been shown to result in decreased crying and promotes sleep (Perry et al., 2013). Involvement of parents in the treatment process and plans is essential as they may be familiar with the usual coping skills of their child (Perry et al., 2013). Assessing the effectiveness of either non-pharmacological or pharmacological interventions is an important aspect of healthcare (Ball et al., 2015).

2.2.11 Short- and Long-term Consequences of Poorly Managed Pain

The short-term consequences of poorly managed pain in hospitalised children include delayed recovery and well-being, impaired physical activity and mobility, interrupted sleep, altered/changed nutritional patterns and increased fear, anxiety and distress (Coyne, Timmins, & Neill, 2010; Parsons & Preece, 2010; Twycross et al., 2009).

Effective paediatric pain management has been shown to shorten hospital stays; enhance healing and the recovery process; facilitate early moblilisation; reduce suffering and anxiety; reduce the direct and indirect costs associated with health care; and it leads to positive perceptions and experiences relating to pain relief and hospitalisation (Ball et al., 2015; Burns et al., 2017; Stevens et al., 2014).

Evidence shows that early pain stimuli and experiences can result in long-term undesirable consequences, not only in relation to the child's perception or sensitivity to pain, but also in relation to their stress response, behaviour and learning and development (Burns et al., 2017; Srouji et al., 2010). Research studies also show that an infant or a child exposed to frequent pain is more likely to have long-lasting effects associated with perception and behavioural responses to pain. It also impacts treatment and hospitalisation, as well as the child's ability to cope with pain (Bowden & Greenberg,

2010; Twycross et al., 2009). Additionally, unrelieved and poorly managed pain may lead to hypersensitivity to future pain (Coyne et al., 2010; Twycross et al., 2009). It also may cause chronic pain in adulthood that commonly results in cognitive impairment and emotional distress (Brugnoli, 2014; Ismail, 2016).

2.2.12 Nurses' Role in Pain Assessment and Management

As a part of the healthcare team, nurses play a central and important role in the assessment and management of a child's pain. During hospitalisation, nurses have more frequent contact with children and their families and spend more time with them than other health carers including medical doctors (Carter & Simons, 2014). This unique position requires nurses to care effectively for children in pain and to possess the relevant necessary knowledge and skills to do so (Carter & Simons, 2014; Twycross et al., 2009).

Nurses are responsible for assessing, evaluating and documenting pain, planning and administering pharmacological and non-pharmacological interventions, including analgesic therapies, and monitoring and reporting on the effectiveness of pain management interventions (Ball et al., 2015; Stanley & Pollard, 2013). Nurses are also responsible for prioritising pain management, advocating for and on behalf of the child as needed, and providing education on pain and pain management for children and families (Ball et al., 2015). In addition, they have an obligation to keep up to date with scientific research and advances and use evidence-based practice guidelines whenever necessary for the child to receive optimal care and treatment (Kyle & Carman, 2017). Providing culturally sensitive care and pain management is an integral part of the nurses' role (Lange, 2012). In daily practice, nurses are more likely to encounter patients from different cultures or encounter cultural factors that influence nursing care, relationships

and patient's and family's reactions. They must therefore be aware of their own cultural values, beliefs and attitudes, and those of their patients. They must also realise, appreciate and understand how culture impacts nursing care and practice and mediates pain in order to deliver optimal care (Andrews & Boyle, 2008; Maier-Lorentz, 2008).

2.2.13 Parents' Role in Pain Assessment and Management

Parents may directly or indirectly influence the care provided to their child depending on their beliefs, attitudes, culture, awareness and education, and they are increasingly encouraged to be involved in care provision, particularly in the care provision and management of children's pain (Joanna Briggs Institute, 2012). Parents play a crucial role in the assessment and provision of pain management for their child during hospitalisation (James et al., 2013). Health professionals, such as nurses, will not be as familiar with the child as the parents (Joanna Briggs Institute, 2012). Parents are the primary source of information about their child's usual behaviours and responses to pain, as well as their pain history (Vakili et al., 2015). They can help monitor the child's pain and provide nurses with data that may be used in decision making and taking action (James et al., 2013). Because of their relationship with the child, parents know what comfort measures best suit their child when in pain and can distract the child using different non-pharmacological interventions, such as positioning, distraction, holding and touching (James et al., 2013). In addition, young children are usually unable to communicate their experience of pain or situation and localise their pain. Thus pain reporting may depend on parents as they are more likely to know better than others when their child is in pain and the child's responses to therapeutic approaches and treatments (World Health Organization, 2012). In hospital, children also usually feel more comfortable informing

their parents about their pain and discomfort (Ball et al., 2015). Thus, it is preferable that parents are involved in their child's care. They should be given support and education regarding their role in the pain management of their child (Burns et al., 2017). They should also be encouraged to actively participate in the assessment and management of their child's pain during hospitalisation as this may contribute to more accurate pain assessment and effective pain care (Walco & Goldschneider, 2008).

2.3 Knowledge and Attitudes, Barriers and Facilitators to Pain Care

As described above, this section is based on the publication below with permission from the publisher (Appendix L). The aims of the publication were to identify and synthesise evidence relating to (1) the knowledge and attitudes of nurses, and (2) the barriers and facilitators to effective pain assessment and management in infants and children. The section provides a discussion of the evidence relating to the knowledge and attitudes of nurses and barriers and facilitators to pain assessment and management in infants and children. It focuses on the key findings from the literature and the reviewed studies.

Alotaibi, K., Higgins, I., Day, J., & Chan, S. (2018). Paediatric pain management: Knowledge, attitudes, barriers and facilitators among nurses - integrative review. *International Nursing Review, 65*(4), 524-533. doi:10.1111/inr.12465

2.3.1 Search Strategy

A comprehensive search of CINAHL, PubMed, ProQuest, PsycINFO and Scopus was conducted to identify and retrieve relevant literature using the following keywords: nurs* knowledge or attitude*, pediatric* or paediatric*, and pain. Synonyms were generated for

each of these keywords, including information, understand*, perspective*, belief*, child*, infant*, pain management, pain assessment, postoperative pain, chronic pain, acute pain, cancer pain. Combinations of keywords were used with Boolean operators (AND, OR) to limit and focus the search results (Table 2.1). The inclusion criteria were: (i) published in English and in a peer-reviewed journal; (ii) published between January 2000 and May 2018; (iii) full-text primary research study of any research design; and (iv) a focus on nursing professionals and pain assessment and management when caring for infants and children. The exclusion criteria were: (i) non-English publications (due to the lack of translation resources); (ii) publications other than primary research studies: literature reviews, meta-analysis, dissertations and discussion or conference abstract papers; and (iii) a focus on health providers other than nurses.

Table 2.1. Search Strategy and Results

Search No	Search Terms	CINAHL	PubMed	ProQuest	PsycINFO	Scopus
S1	nurs* knowledge or information or understand* or attitude* or perspective* or belief*	41,252	21,108	14,806	6,666	62,272
S2	pediatric* or paediatric* or child* or infant*	663,725	1,253,393	94,703	707,623	8,936
S3	pain or pain management or pain assessment or postoperative pain or chronic pain or acute pain or cancer pain	203,400	641,403	149,292	83,715	2,211,838
S4	S1 and S2 and S3	351	66	20	68	103
S5	Limiters - Published Date: 20000101-20181231; English Language; Peer Reviewed; Human; Journal Article	138	39	10	41	64
#Met Inclusion Criteria (MIC)		15	4	1	4	3
Total		S5=292 MIC=33				

2.3.2 Search Outcomes

The initial search yielded 292 papers. After reviewing and screening the titles or abstracts for relevance, 237 papers were excluded based on the exclusion criteria described above. The remaining 56 papers were imported into Endnote Version 7. Duplicate entries were removed (n = 23) and a full-text quality screening of the remaining retrieved studies (n = 33) was conducted, resulting in no exclusion (n = 0). The search process and outcomes are illustrated in Figure 2.1

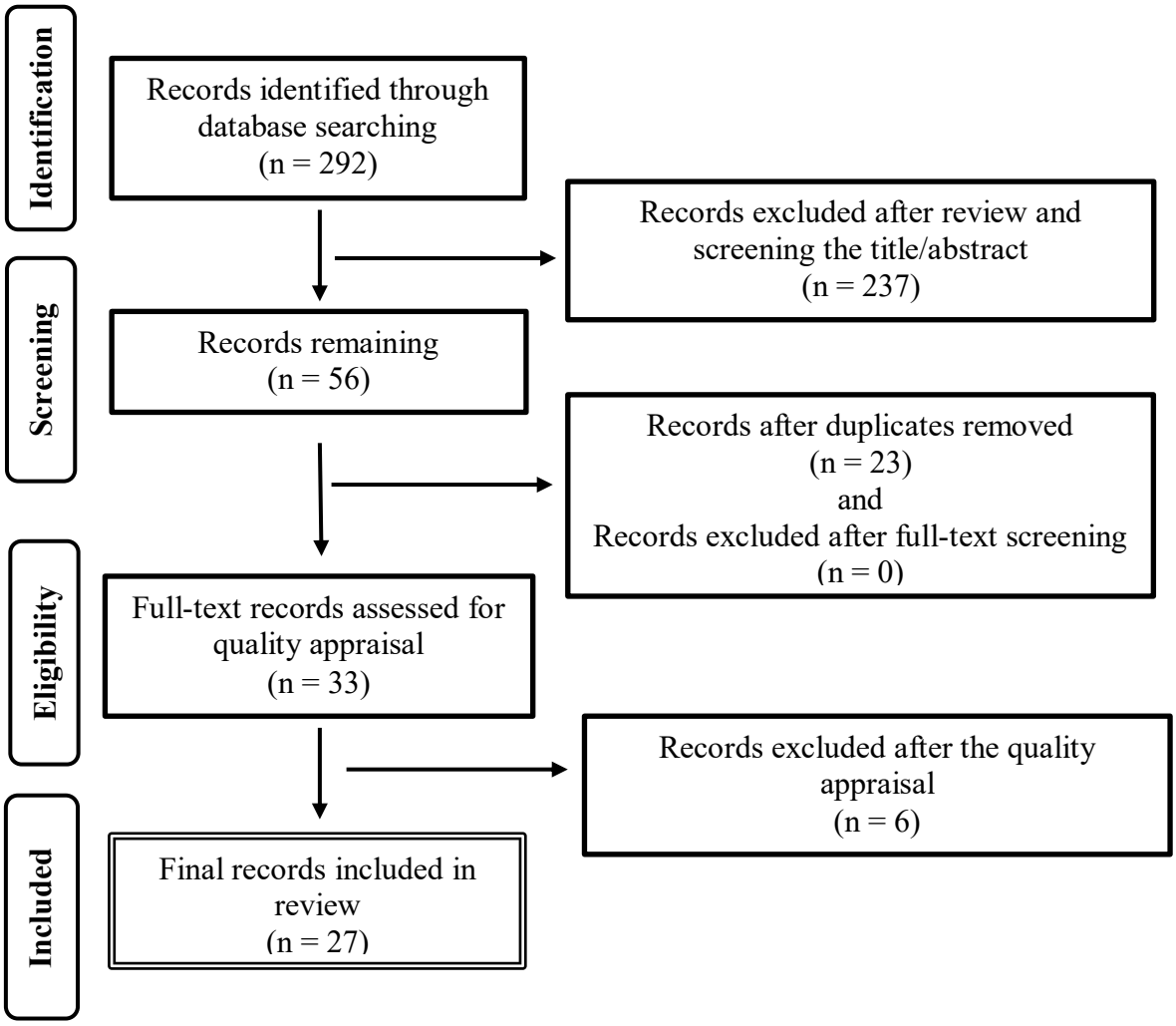

Figure 2.1 Flow Diagram for the Search Process and Outcomes

2.3.3 Quality Appraisal

The quality of the 33 studies was assessed using criteria from the Critical Appraisal Skills Programme (CASP 2013) for qualitative research studies, and the McMaster University checklist for quantitative research studies (Law et al., 1998). Mixed-methods studies were assessed using both criteria. All the selected studies were evaluated for data relevance and methodological quality including research design, sample, data analysis, validity, reliability and rigor. Papers were included if their appraisal score was two points or over (Conn et al., 2003). Following the appraisal, six studies were excluded due to their limited methodological rigor. A total of 27 papers were included in this review (Table 2.2).

Table 2.2. Quality Appraisal of Selected Studies

Article ID	Design description	Sample description	Data analysis description	Validity, reliability & rigor
$1	Y	Y	NC	Y
*2	Y	Y	NC	Y
#3	Y	Y	Y	N
#4	Y	Y	Y	N
*5	Y	Y	Y	Y
*6	Y	Y	Y	NC
#7	N	Y	Y	Y
*8	Y	Y	Y	NC
*9	Y	Y	Y	Y
*10	Y	Y	Y	Y
#11	Y	N	Y	Y
*12	N	Y	Y	Y
*13	Y	Y	Y	Y
*14	Y	Y	Y	Y
*15	Y	Y	Y	Y
*16	Y	Y	NC	Y
*17	Y	Y	Y	N
*18	Y	Y	Y	N
*19	Y	Y	NC	Y
$20	Y	Y	Y	NC
*21	Y	Y	NC	Y
*22	Y	Y	Y	N
*23	Y	Y	Y	Y

$24	Y	Y	Y	NC
*25	Y	Y	Y	Y
$26	Y	Y	NC	Y
$27	Y	NC	Y	Y

(*) McMaster University checklist (1998) employed for quantitative research studies, (#) CASP Checklist (2013) employed for qualitative research studies and ($) McMaster University (1998) + CASP (2013) employed for mixed method research studies. Key; Y refers to yes, Key: N refers to no and Key NC refers to not clear.

2.3.4 Data Extraction

Key findings of the reviewed studies were extracted and organised into a data summary table (Appendix A) that included the study's aim(s)/objective(s), design, methods, sample, setting and findings. The accuracy and relevance of all extracted data were discussed, examined and verified by research supervisors. Analysis of the extracted data was descriptive. Important aspects of the studies' findings relating to the knowledge and attitudes of nurses, and the barriers and facilitators to pain assessment and management in infants and children, were compared and contrasted.

2.3.5 Description of Studies

This review consists of 27 studies: 18 quantitative, five qualitative, and four mixed-methods. These studies were conducted in the USA (n = 12), Asia (n = 8), Europe (n = 5), Africa (n = 1) and Australia (n = 1). They were undertaken in paediatric hospitals (n = 12) and paediatric units in general hospitals (n = 15).

Eighteen studies addressed the knowledge and attitudes of nurses about pain assessment and management in infants and children. Eight studies identified the barriers and facilitators relating to the assessment and management of pain in infants and children. One study identified nurses' practices regarding pain assessment in infants and children.

A total of 3,325 nurses participated in the 27 studies identified. In the 21 studies that reported participants' gender, the majority (n = 2,833) were female. Twenty-two studies reported participants' ages, which ranged from 19 to 70 years. Seven reported educational qualifications: Diploma (n = 469), Bachelor's degree (n = 1,258) and Master's degree (n = 97). Across all studies, participants' work experience ranged from one month to 43 years.

2.3.6 Nurses' Knowledge, Beliefs and Attitudes towards Pain Management

The knowledge and attitudes of nurses towards the management of pain for children are now investigated together and separately in the published studies that were reviewed.

Nurses' Knowledge

As a result of the literature review as described above, 11 studies that showed that nurses continue to have poor knowledge about paediatric pain and its management with either pharmacological or non-pharmacological interventions (Dongara, Shah, Nimbalkar, Phatak, & Nimbalkar, 2015; Ekim & Ocakcı, 2013; Enskär et al., 2007; Lunsford, 2015; Manworren, 2000; Namnabati et al., 2012; Ortiz et al., 2015; Rieman & Gordon, 2007; Stanley & Pollard, 2013; Van Hulle Vincent & Gaddy, 2009; Vincent, 2005).

A survey of nurses in India using a modification of the Knowledge and Attitudes Survey Regarding Pain *(*KASRP) (Ferrell & McCafferey, 2008), showed that 97.6% of nurses (n = 42) were not aware of the time to peak effect of oral paracetamol (Dongara et al., 2015). In Mexico, using the Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS) (Manworren, 2001), researchers found that more than 55% of nurses (n = 111) were not aware of the recommended route for opioid administration for either prolonged

pain or acute severe pain (Ortiz et al., 2015). In the USA, a qualitative study using focus groups with 39 nurses explored paediatric nurses' understanding of pain assessment and administration of morphine for children after surgery. The findings revealed poor knowledge of the adverse effects and the duration of the action of morphine (Van Hulle Vincent & Gaddy, 2009).

Two other studies conducted in the USA (Manworren, 2000; Rieman & Gordon, 2007) one in Turkey (Ekim & Ocakcı, 2013), using the PNKAS, reported that over 70% of nurses (n = 274, 295 and 224 respectively) did not know about the potentiators of opioid analgesics, such as Promethazine (Phenergan). In the USA studies, over 79% of nurses lacked understanding of equivalent doses for opioids and non-opioids. In these three studies, more than 55% of nurses did not know about the risk of respiratory depression associated with the administration of opioids (Ekim & Ocakcı, 2013; Manworren, 2000; Rieman & Gordon, 2007).

Studies also showed that nurses have poor knowledge and understanding of the effectiveness of non-pharmacological pain management interventions, such as distraction, positioning and massage (Dongara et al., 2015; Ekim & Ocakcı, 2013; Manworren, 2000; Vincent, 2005). For example, in Vincent's (2005) study, 65.7% of nurses (n = 67) believed that non-pharmacological interventions are only effective for mild to moderate pain, rather than for all types of pain.

Significant differences were found between the knowledge and attitude scores of nurses and their level of education. Ekim and Ocakcı's (2013) study found nurses who had a bachelor's or master's degree scored significantly higher than nurses with an associate's degree and diploma (p = 0.03). In Manworren's (2000) study, nurses with a master's

degree scored significantly higher than all others who had a lower education level (p = 0.03).

Three studies analysed the correlation between years of experience as a paediatric nurse and level of knowledge (Ekim & Ocakcı, 2013; Rieman & Gordon, 2007; Stanley & Pollard, 2013). Stanley and Pollard's (2013) cross-sectional study of 25 nurses found a statistically significant correlation between these variables (r = 0.404, p = 0.05), however, the sample size was small. Rieman and Gordon (2007) and Ekim and Ocakcı (2013) sampled 224 and 295 nurses respectively and found no significant correlation between these two variables. This difference in results may be related to the difference in the sampling methods, sample size or settings in these studies. None of the reviewed studies however, reported any correlation between education levels and nurses' knowledge of paediatric pain management.

Nurses' Beliefs and Attitudes

Nurses' beliefs and attitudes are significant factors in the way pain is assessed and managed (Stanley & Pollard, 2013). Many of the studies showed that nurses have misbeliefs about pain in children and its management (Dongara et al., 2015; Ekim & Ocakcı, 2013; LaFond et al., 2016; Mathew, Mathew, & Singhi, 2011; Nimbalkar, Dongara, Ganjiwale, & Nimbalkar, 2013; Twycross, 2006; Vincent, 2005; Vincent & Denyes, 2004; Vincent, Wilkie, & Szalacha, 2010).

Nimbalkar et al. (2013) found that over 68% of nurses (n = 351) believed that repeated painful procedures on children increased their pain tolerance. Mathew et al. (2011) found that 50% of nurses (n = 56) believed that infants do not experience pain as it is in adults

and they also found that 78.6% of nurses believed infants forget pain quickly compared with adults.

In relation to assessment, Dongara et al.'s (2015) study found 61.9% of the nurses erroneously believed that their personal judgment about pain intensity experienced by children was more valid than children's self-report of pain. In addition, LaFond et al.'s (2016) study suggested 42.5% of nurses (n = 40) believed that children did not reliably report pain. Vincent et al. (2010) found that 91% of nurses (n = 87) often relied on children's behaviours rather than on children's self-reports when assessing pain and its intensity. Vincent (2005) also found that 82% of nurses trusted self-reports of pain only when they were associated with behavioural and physiological manifestations that they believed were evidence of pain.

Many studies showed that pain management in children was a low priority of care and that this had not changed over time (Czarnecki, Salamon, Thompson, & Hainsworth, 2014; Czarnecki et al., 2011; Vincent, 2005). According to Vincent's (2005) study, more than 77% of nurses reported that the management of pain in children was a low priority for both medical and nursing staff. A small mixed-methods study conducted in the UK reported that nine out of 13 paediatric nurses did not communicate with or consult other health professionals about pain management in children. Further, most nurses did not engage with, or communicate with either the children or their parents during pain assessment and management practices (Twycross, 2006).

Twycross's (2006) study also showed most nurses (11 out of 13) failed to routinely collect a pain history from children and their parents on admission to hospital, and only three were observed using a pain assessment tool, albeit inconsistently. In Ekim and Ocakcı's (2013) study, 82.6% of nurses reported that they had never used an assessment tool to

assess pain level in children. Consistent with these findings, in an audit of 107 nursing charts in a paediatric hospital in the USA, 60% lacked documentation of pain assessment (Reyes, 2003). Furthermore, a qualitative study of 30 nurses conducted in the USA regarding pain assessment and morphine administration for children after surgery, found that assessment data were not used to guide morphine administration (Van Hulle Vincent & Gaddy, 2009).

2.3.7 Barriers and Facilitators to Pain Management

The reviewed studies showed that there are many factors that serve as either barriers or facilitators to effective pain management in children. In the discussion that follows, these factors are considered in relation to children and their parents, health professionals and the workplace settings.

Children and their Parents

In two studies (Gimbler-Berglund, Ljusegren, & Enskar, 2008; Namnabati et al., 2012), children's behaviour was reported as a barrier to effective identification and management of pain. In Sweden, 20 nurses were interviewed about the factors influencing their abilities to assess and manage children's pain. Nurses said they were unable to judge accurately whether a child was in pain. For example, when a child continued to play at the same time as crying, nurses were unsure if the child was in pain (Gimbler-Berglund et al., 2008). In another qualitative study of 16 nurses in Iran, nurses said that assessment of pain in young children was problematic due to the child's limited verbal expressions and that their behavioural responses confounded pain (Namnabati et al., 2012). These findings concur with those of other studies (McInerney, Goodenough, Jastrzab, & Kerr, 2003; Twycross,

2013) which showed nurses had difficulty in accurately assessing pain based on children's behaviour.

Children's lack of cooperation or non-compliance is another reported barrier to effective pain care. In the UK, the findings of a study using focus-group interviews with 30 nurses revealed that children might refuse analgesia when offered (Twycross, 2013). In another Singaporean study designed to explore nurses' perceptions of the barriers to the use of non-pharmacological methods for postoperative pain management (n = 108), a child's inability to cooperate with nurses was a major barrier to best practice (He et al., 2010). The lack of parental support and cooperation in the use of non-pharmacological interventions to manage children's postoperative pain also hindered the nurses' management of pain (He et al., 2010). Twycross's (2013) and Vincent's (2005) studies also showed that parents were reluctant to inform nurses about their child's pain or for the child to be given analgesia. The reasons for their reluctance to report pain and their refusal of analgesics were not provided by the researchers.

Two studies explored facilitating factors for effective pain management in children. These factors were open communication between parents and medical staff about their child's pain; establishing the child's usual behaviours and past pain experiences; and the active involvement of parents in comfort and care activities (Pölkki, Laukkala, Vehviläinen-Julkunen, & Pietilä, 2003; Twycross, 2013).

Health Professionals

In several studies (Gimbler-Berglund et al., 2008; He et al., 2010; He, Polkki, Vehvilainen-Julkunen, & Pietila, 2005; McInerney et al., 2003; Twycross, 2013; Vincent, 2005), nurses reported that their limited knowledge and clinical experience of managing

pain in children was a barrier to providing effective care. Another important barrier was insufficient prescription of analgesia by physicians. In Vincent's (2005) study, this was reported by nearly all nurse participants (99%) as a top barrier. Studies by Czarnecki et al. (2011), Namnabati et al. (2012), Twycross (2013) and Czarnecki et al. (2014) also revealed insufficient or no prescription of analgesia by physicians as a barrier to providing effective management for children in pain.

Nurses themselves are identified as a facilitating factor in managing paediatric pain. For instance, when nurses establish a therapeutic relationship with the child by demonstrating trust, respect and effective communication, it fosters cooperation with care. It also helps the nurse's understanding of the child's pain and its origins (Gimbler-Berglund et al., 2008).

The Workplace Setting

Three studies showed that the ongoing worldwide shortage of nurses was a key barrier to pain management in children (He et al., 2005; Namnabati et al., 2012; Twycross, 2013). Heavy workloads and a lack of time for assessing and managing pain effectively were organisational barriers (He et al., 2010; Mediani, Duggan, Chapman, Hutton, & Shields, 2017; Pölkki et al., 2003; Twycross, 2013). Other workplace barriers included the absence of pain education, pain assessment tools and pain management policies, protocols and methods, such as pain medications (He et al., 2010; Mediani et al., 2017; Namnabati et al., 2012; Twycross, 2013).

Workplace facilitators to the management of paediatric pain include availability of pain assessment tools, pain management methods and resources, availability of analgesics and sufficient prescription of analgesics, as well as adequate staff and appropriate workloads

for nurses. Additionally, having professional in-service education and training on pain management methods facilitates better pain care (Gimbler-Berglund et al., 2008; Pölkki et al., 2003; Twycross, 2013).

The aforementioned review of the literature reveals several gaps in knowledge and understanding about the management of children's pain and the knowledge and attitudes of nurses. These gaps are summarised as follows:

- The majority of the reviewed studies in this chapter used survey design. The tools used included the Paediatric Nurses' Knowledge and Attitude Survey Regarding Pain (PNKAS) (Manworren, 2001) and modified versions of the Knowledge and Attitudes Survey Regarding Pain (Ferrell & McCafferey, 2008). Such tools measure nurses' understanding and focused on assessing their attitudes and knowledge of pain assessment and pharmacological and non-pharmacological management interventions. These reviewed studies did not give a detailed assessment of the situation, nor did they give an explanation as to why the nurses had poor pain knowledge and attitudes.
- The studies in this critical review did not provide information about the cultural backgrounds of the study participants. As a result, there was a lack of information regarding the knowledge, attitudes and practices of nurses from different cultures and with differing cultural backgrounds, especially in SA and neighbouring Arab countries with a similar situation regarding expatriate nurses and other health workers.
- The reviewed literature and the tools used did not pay sufficient attention to culture. As a result, there was a lack of data on the impact of culture and cultural factors on children's pain assessment and management.

Future research should seek to further explore pain management in children and nurses' knowledge and attitudes along with barriers and facilitators to enhance our understanding about this specific area. Future research should also consider culture and its impacts on general pain care for children.

2.4 Summary

This chapter outlined the history of pain, pain theories, the types of pain and its prevalence in children, the consequences of poorly managed pain, and the nurses' and parents' role in caring for or managing a child with pain. The impact of culture and the psychological aspects of pain were also discussed. Emotional and situational factors can influence pain and culture has been shown to affect the experience and responses to pain. This chapter reported an integrative literature review that identified and synthesised evidence regarding the knowledge and attitudes of nurses, and barriers and facilitators to effective pain assessment and management in infants and children. The review showed that nurses internationally continue to have poor knowledge of and attitudes to the basic principles of paediatric pain assessment and management. Barriers to effective pain management identified include a lack of pain education, a lack of assessment tools, parental resistance in reporting their child's pain, and insufficient prescription of analgesics by treating physicians. Facilitators include parental participation in their child's pain care, forming a trusting relationship with the child and an adequate nurse-patient ratio. There is a need to improve education for nurses, doctors, and children's families regarding paediatric pain management, communication and collaborations. There is also a need to maximise facilitators and overcome barriers, such as those identified in this review to ensure the quality of pain management for paediatric patients.

Chapter Three presents a description of the two-phase explanatory sequential mixed-method design that is used in this study. An outline of the methodological research paradigm is provided, along with the rationale for such a choice. Chapter Three also presents a description of the two phases used in this study.

Chapter 3 **Research Methodology, Research Design, Plan and Methods**

3.1 Chapter Introduction

This chapter describes the methodology, design, plan and methods used in this study. It revisits the aims of the study, the research questions and provides a discussion of the research methodology for the study and the rationale for using the mixed methods approach. This chapter also describes in detail the setting for the study, sampling methods and recruitment of participants, the instrument used to collect the quantitative data for the study and the processes used to collect the qualitative data. In addition, the strategies used to enhance the quality of the study including validity, reliability and rigor and the ethical considerations are outlined.

3.2 Aims

The specific aims of this study were to:

- examine the knowledge and attitudes of Saudi and non-Saudi nurses working in SA in relation to infants' and children's pain assessment and management;
- identify the barriers and facilitators to effective pain assessment and management for infants and children in SA; and,
- identify the cultural factors impacting pain assessment and management for infants and children in SA.

Research Questions

With specific reference to SA, this study was guided by the following research questions:

1. What knowledge and attitudes do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?
   - 1.1 What knowledge levels do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?
   - 1.2 What attitudes do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?
   - 1.3 Is there a relationship between nurses' knowledge and attitudes in relation to infants' and children's pain assessment and management?
   - 1.4 What are the differences between Saudi and non-Saudi nurses' socio-demographic characteristics and their knowledge level and attitudes?
2. What are the barriers and facilitators to effective pain assessment and management in infants and children?
   - 2.1 What are the barriers to effective pain assessment and management in infants and children?
   - 2.2 What are the facilitators to effective pain assessment and management in infants and children?
3. What cultural factors impact Saudi and non-Saudi nurses' pain assessment and management in infants and children?
   - 3.1 What aspects of culture impact Saudi and non-Saudi nurses' pain assessment?
   - 3.2 What aspects of culture impact Saudi and non-Saudi nurses' pain management?

To address the research aims and questions for this study, a combination of quantitative and qualitative research in one study, known as the mixed methods approach was selected (Creswell, 2014). This methodology was the most appropriate to establish the level of knowledge and attitudes of nurses and to better understand aspects of the problem of assessing and managing children's pain in SA (Morse & Niehaus, 2009). Of the definitions that have emerged for this approach, the most widely accepted definition is research that "focuses on collecting, analysing, and mixing both quantitative and qualitative data in a single study or a series of studies" (Creswell & Plano Clark, 2011, p. 5).

Mixed methodology was deemed appropriate for breadth and depth of understanding of the complex and multifaceted phenomena associated with assessing and managing children's pain (Creswell & Plano Clark, 2018). The basic logic of combining two methodologies in a single study is that it allows a more robust, complete, and synergistic use of data compared to separate quantitative and qualitative method. One of the strengths of using mixed methods rather than separate quantitative or qualitative methods is the two types of data provide validation for each other providing greater insights and a stronger foundation for drawing conclusions. Another strength of mixed methods is that the qualitative interview process allowed further exploration of the quantitative data that emerged in the study. In this situation, qualitative data can provide a more in-depth understanding of the results from the quantitative data. These strengths cannot be achieved using a single method. For example, the use of a survey approach involved a structured questionnaire with closed questions. The outcomes are limited because the respondents have limited pre-determined options to choose from. Furthermore, the survey approach does not allow for an in-depth and/or full understanding of the complexity of human experience. On the other hand, qualitative methods also have limitations, such as

the non-generalisability of the findings due to the relatively small sample size, and questions of reliability. With a mixed methods design, the methods are complementary, with the limitations of one, balanced by the strengths of the other (Bryman, 2006; Creswell & Plano Clark, 2018; Migiro & Magangi, 2011).

Establishing the knowledge base and attitudes of nurses about children's pain and its management in SA requires the use of a validated tool, such as the PNKAS-Shriners Revision (Manworren, 2001) described later in this chapter. Additionally, identifying the barriers and facilitators, as well as the cultural factors impacting on the assessment and management of children's pain in SA, required face-to-face interviews in order to gain in-depth data and to better understand the contextual influences and nuances of culture in the SA healthcare settings. As a result, a mixed methods sequential explanatory design was selected to conduct this study and investigate its phenomenon from multiple angles or perspectives (Creswell & Plano Clark, 2018).

To date, the mixed methods sequential explanatory design has not been used in relation to the study topic, either in SA or elsewhere, with the potential for useful insights that could guide improvement and change. Whilst validated surveys (Dongara et al., 2015; Manworren, 2000; Salantera, 1999; Salanterä, Lauri, Salmi, & Helenius, 1999; Vincent, 2005) have been used effectively in the past to understand the knowledge and attitudes of nurses on paediatric pain and its management, this study not only focuses on this area, it also focuses on identifying the barriers and facilitators and the cultural factors that impact children's pain assessment and management practices in SA. Using a survey method by itself was not sufficient to provide a complete picture and understanding of the problem of pain management in children in SA and the reasons behind it. Interviews were therefore needed and employed in this study to gain insights and better understand the barriers,

facilitators and cultural factors relating to the management of children's pain; to clarify and validate the survey results; and to provide meanings for them (Creswell & Plano Clark, 2018). Neither a qualitative approach nor a quantitative approach by itself was sufficient to provide a sufficient understanding of the phenomenon being studied (Doorenbos, 2014).

3.3 Pragmatism and Mixed Methods

The mixed methods approach to research first emerged in the 1950s with increasing interest among researchers in using more than one study method (Creswell & Plano Clark, 2018). The period from 1950 – 1980 is known as the formative period for the mixed methods approach (Creswell & Plano Clark, 2018). During this time, many studies were published in international journals proposing definitions and descriptions for the mixed methods approach (Ivankova, 2015). Several factors contributed to the development of the mixed methods from the1980s to the present time, such as the complexity of research problems which needed to be addressed and answered (Creswell & Plano Clark, 2011). It was argued that the use of quantitative and qualitative approaches in combination provides a more comprehensive understanding than the use of one approach only. In addition, it is important for researchers to collect sundry forms of evidence for a diverse audience, such as practitioners and policy makers in the applied areas. Furthermore, academics and research students need to utilise the mixed methods approach to increase the opportunity of their work being published (Creswell & Plano Clark, 2018).

Despite the arguments above, there has been continuing debates in relation to mixed methods research in terms of its philosophical basis and its actual place within research

approaches when it emerged as a third methodological paradigm. Scholars argued that qualitative and quantitative research methodologies could not be combined because each was linked to different philosophical assumptions (Creswell & Plano Clark, 2018). This argument was based on the belief that it is untenable to combine these research methodologies to investigate a specific issue due to the underlying differences in the methodologies and methods used in these two approaches. Debate revolved around the philosophical and methodological basis of the quantitative (deductive, experimental, statistical) approach which relates to a positivist paradigm, and the qualitative (inductive, observational, interpretive) approach which relates to the constructivist paradigm (Bazeley, 2018).

However, many, including Howe (1988) argued from a "pragmatic" perspective that there was no incompatibility between the qualitative and quantitative methods of research. A mixed methods approach within a single study is necessary and useful to address different aspects of knowledge relating to the same research problem. Mixed methods research is underpinned or linked to the philosophy of pragmatism, which is the most commonly accepted paradigm for this type of research (Creswell & Plano Clark, 2018; Tashakkori & Teddlie, 2003).

Pragmatism is a philosophical movement that emerged in the last decades of the 19th century, largely promulgated by an American philosopher, Peirce (18-39-1914). Others including James (1842-1910), Dewey (1859-1952), Mead (1863-1931) and Bentley (1870-1957) elaborated on Pierces' philosophy. They rejected the traditional assumptions about the nature of knowledge, truth and inquiry, and argued that there was no single approach or "scientific method" for accessing knowledge about the "real world" (Maxcy, 2003). "Pragmatism…is a philosophy rooted in common sense and dedicated to the

transformation of culture, to the resolution of conflicts that divide us" (Sleeper, 1989, as cited in Maxcy, 2003, p. 54). As a philosophy, it is interested in the development of knowledge and how it can be used for practical purposes. Methodologically, it is conceived as a method for selecting inquiry methods or a method of inquiry itself. Pragmatism emphasises the appropriateness and compatibility of mixing methods as an additional or third research approach to advocate for a better world and to help answer research questions that require such an approach (Creswell & Plano Clark, 2011). Thus pragmatism "supports the use of both qualitative and quantitative research methods in the same research study and within multistage research and rejects the incompatibility thesis" (Tashakkori & Teddlie, 2003, p. 21). It is an approach that is distinct from other approaches which are entirely quantitative or qualitative, and provides an alternative approach to research and knowledge development (Creswell & Plano Clark, 2011).

Pragmatism recognises the importance of the natural or physical world as an emergent world that involves language, culture, human institutions and subjective thoughts. Knowledge in this view is both constructed and based on the reality of human experience. Essentially, it offers the "pragmatic method" for solving traditional philosophical dualisms, qualitative versus quantitative, as well as making methodological choices; it rejects reductionism whereby culture, thoughts and beliefs are separate parts of the whole of experience (Johnson & Onwuegbuzie, 2004).

Although the philosophical debate about mixed methods research extended until the mid-to-late 1990s, there was acceptance of this research type and its methodology in various disciplines, including nursing (Teddlie & Tashakkori, 2009). Many philosophers and writers, such as Creswell and Plano, Bryman, Morse and Niehaus and Teddlie and Tashakkori whose first edition of the *Handbook of Mixed Methods in Social and*

Behavioural Research was published in 2003, asserted that mixing different research approaches is valuable: the two traditional forms of data, quantitative and qualitative, can be gathered efficiently at various stages of the research process to add meaning and enable the researcher to comprehensively understand a contemporary research problem (Bryman, 2006; Creswell & Plano Clark, 2007; Morse & Niehaus, 2009; Tashakkori & Teddlie, 2003). In the case of this present study this was to understand the knowledge and attitudes of nurses in SA towards children's pain and to explore the barriers and facilitators within the prevailing cultural milieu. At present, mixed methods is widely applied in many social, behavioural and health disciplines (Ivankova, 2015).

While mixed methods research is employed extensively through various disciplines, it has a number of design approaches that are used to either simultaneously/concurrently or sequentially combine quantitative and qualitative data during the research process. Such approaches should be taken into account by researchers during the process of design selection in order to appropriately answer their research questions (Fetters, Curry, & Creswell, 2013; Migiro & Magangi, 2011). The four major design approaches of mixed methods studies include explanatory, exploratory, triangulation and embedded.

Explanatory Design used in this study, is a two phase design whereby the quantitative data is collected and analysed first, followed by the qualitative data collection and analysis for the purpose of further explanation, elaboration and interpretation on the results.

Exploratory Design is also a two phase design whereby the qualitative data is collected and analysed first, followed by the collection and analysis of quantitative data to explore a phenomenon. The purposes of this approach include designing an instrument,

developing activities for an intervention or generating/identifying variables (Creswell & Plano Clark, 2007).

Triangulation Design involves concurrent collection of qualitative and quantitative data in one phase for the purpose of obtaining different but complementary data. The data in this design is analysed separately and then compared and/or combined (Creswell & Plano Clark, 2007).

Embedded Design involves one phase of data collection in which priority is given to the approach that guides the research project, while the other approach is embedded/nested into the project to provide support and address different research questions (Creswell & Plano Clark, 2007).

3.4 Rationale for Mixed Methods

For the purpose of this study, mixed methods approach was selected as the most appropriate research approach. According to Tashakkori and Teddlie (2003), the choice of a research methodology, whether mixed methods, qualitative or quantitative, depends primarily on the research problem and/or research question/s. Morse and Niehaus (2009) also state that the mixed methods approach is the most appropriate for researchers who have a set of questions that cannot be comprehensively or satisfactorily answered by simply using either quantitative or qualitative research. This study asked the following research questions;

1. What knowledge and attitudes do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?

2. What are the barriers and facilitators to effective pain assessment and management in infants and children?
3. What cultural factors impact Saudi and non-Saudi nurses' pain assessment and management in infants and children?

The choice of mixed methods approach in this study aimed to provide a comprehensive and culturally situated understanding of the phenomenon of children's pain management in SA. A singular approach, such as qualitative or quantitative alone could not provide comprehensive insight into the research topic. While nurses' knowledge and attitudes can best be established by the use of a quantitative research approach in the form of a survey, the barriers, facilitators and cultural factors in relation to effective pain assessment and management in children are best identified using a qualitative approach and the use of open-ended, face-to-face and in-depth interview questions with RNs in SA. In other words, quantitative and qualitative research provide different pictures and/or perspectives, and therefore data from each of these approaches provide insights that are not obtainable using a single method alone (Creswell & Plano Clark, 2018).

The complexity of the topic of this study – pain knowledge, attitudes, barriers and facilitators – also necessitated comprehensive evidence for deep understanding using a multiple and mixed methods approach. This research approach fitted well with the circumstances of this current study due to the absence of previous research and evidence in this area, as noted in Chapter One. Although the mixed methods approach is challenging, as multiple methods are used and different types of data are integrated in the analysis and interpretation, it enables exploring the phenomenon relating to the assessment and management of children's pain from multiple perspectives and angles. It also provides rich data for analysis and offers insights to expand understanding of the

topic which a single research approach would limit if used (Creswell, 2014). Additionally, it helps to overcome the possible weaknesses of either the qualitative or quantitative research (Tashakkori & Teddlie, 2003) and allows the strengths of these approaches to emerge together in a single research study (Grove, Burns, & Gray, 2013).

Mixed methods research approach facilitates the notion of complementarity. By using different methods to examine a research problem, different aspects of a phenomenon are investigated and explored simultaneously thus enhancing understanding and insights. The mixed-methods design in this study used a qualitative method in the form of semi-structured interviews in addition to a quantitative method in the form of a survey, to establish a more complete picture of the situation regarding the management of children's pain in SA. The use of a survey alone, the PNKAS-Shriners Revision (Manworren, 2001) would have reduced findings to pre-defined/predetermined/established limits of knowledge and attitudes about pain and pain management in children. These factors have been long established and linked to children's pain and pain management. What is not addressed in this survey are the barriers and facilitators and the cultural nuances that impact the pain care of children. Whilst ethnography (De Chesnay, 2014), a methodology that guides the study of people in their own environment through the use of participant observations and face-to-face interviews, allows for the exploration of the cultural aspects of pain management, this methodology alone was not sufficient to address the research problems or questions posed, as noted above. Face-to-face interviews with nurses in this study however, allowed for the exploration of a range of experiences, issues, concerns and cultural factors to emerge thus shedding light on the extent of the problem in SA. Furthermore, mixed methods as a research approach allows connection/integration or mixing findings after both quantitative and qualitative data are collected and analysed for

the purpose of gaining a better understanding from the two sets of findings (Morse & Niehaus, 2009).

3.5 Research Design

A two-phase, sequential explanatory mixed-methods design was chosen for this study to address the research aims and questions. This design, in which quantitative data were firstly collected followed by collection of the qualitative data, was ideal for examining the knowledge and attitudes of nurses and identifying the barriers, facilitators and cultural factors on children's pain management in order to gain better insights into these aspects. According to Creswell (2015), a sequential explanatory mixed-methods design is suitable for studies in which the researcher intends to use quantitative research as the first phase, followed by qualitative research as the second phase, as driven by the research problem, to help explain, elaborate and interpret quantitative results. To address the research aims and questions in this study: to examine knowledge and attitudes of Saudi and non-Saudi nurses in relation to children's pain, and to identify related barriers, facilitators and cultural factors, it was necessary to use an explanatory design. Survey findings relating to the knowledge and attitudes of nurses needed to be known in order to be able to engage nurses in explaining and elaborating on their experiences of caring for children in pain in SA. This design therefore was used in this study for this purpose (Tashakkori & Teddlie, 2003).

The sequential explanatory mixed-methods design employed in this study was as follows: Phase 1: quantitative data collection and analysis; and Phase 2: qualitative data collection

and analysis (Creswell & Plano Clark, 2018; Morse & Niehaus, 2009). Figure 3.1 shows the application of this research design to the conduct of this study.

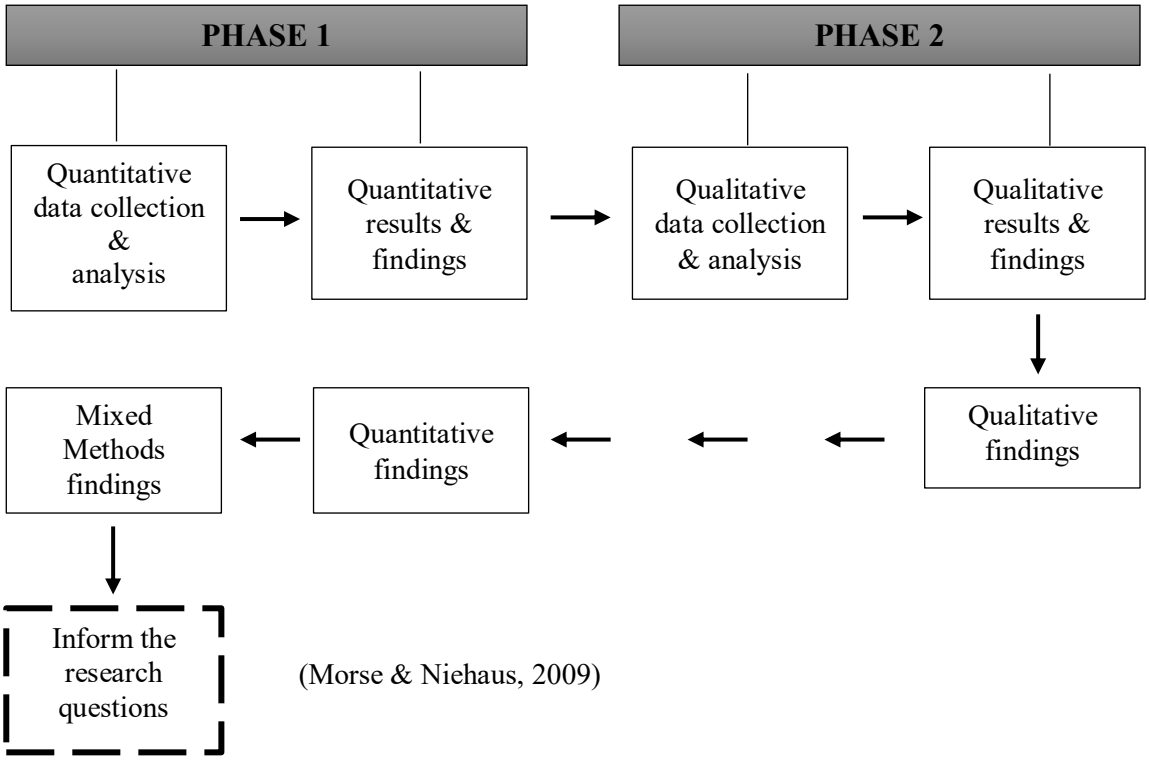

Figure 3.1. Sequential Explanatory Mixed-Methods Design Application

As previously discussed, this study comprised two phases. In Phase 1, a survey - the PNKAS-Shriners Revision (Manworren, 2001) - was given to the participants to examine the knowledge and attitudes of nurses in SA regarding the assessment and management of children's pain. In Phase 2, semi-structured interviews were conducted to identify barriers, facilitators and cultural factors relating to the assessment and management of pain for children.

3.6 Research Setting for the Study

This study was conducted at five government hospitals, three tertiary and two secondary hospitals, in Riyadh, the capital and largest city of SA and its surrounding regions. These hospitals are homogeneous in terms of paediatric services, provide a range of child medical, surgical and emergency services, and represent the Saudi central region's health care sector. They are under the administration of the Saudi Ministry of Health, the largest government agency, which provides 60% of the total public healthcare services (Aldossary et al., 2008; Almalki et al., 2011a). The total number of potentially accessible nurses caring for children was estimated to be between 1,000 and 1,500 (Ministry of Health, 2015).

For the purpose of confidentiality, each of the five hospitals is identified in the current study by an alphabetical letter. The details of the hospitals are follows.

3.6.1 Tertiary Hospitals

- Hospital A is one of the oldest and largest hospitals in SA. It is located in Riyadh city with approximately 1,500 beds. This hospital currently is referred to as a medical city because it comprises three major hospitals: the General Hospital, the Obstetrics and Gynaecology Hospital and the Children's Hospital, the latter having 250 beds. Hospital A provides various healthcare services for the people of Riyadh and receives emergency and critical cases from other hospitals in SA.
- Hospital B is also one of the largest hospitals in SA, located in Riyadh city with about 1,200 beds, 241 of which are specialised for paediatric patients. This hospital generally serves people living in Riyadh and receives exceptional cases

from other Saudi hospitals. The hospital is also referred to as a medical city as it comprises many independent hospitals, including the Children's Hospital.

- Hospital C is a tertiary hospital, located in Riyadh city with approximately 350 beds. This hospital specialises in childbirth and paediatric healthcare services. It provides comprehensive care for children generally and has many departments: emergency department, medical department, surgical department, intensive care unit and outpatient clinics.

3.6.2 Secondary Hospitals

- Hospital D is a 150-bed general hospital, located in the north-western region of Riyadh city. This hospital has many different departments and provides a wide range of emergency, medical and surgical services to the general public in the area, including children.
- Hospital E is a 200-bed general hospital, located in the south-western region of Riyadh City. This hospital includes emergency, medical, surgical and several other departments, offering a wide range of healthcare services for all people in the area and neighbouring areas, including children.

3.7 Phase 1: Cross-Sectional Survey

Phase 1 of this study was a cross-sectional survey. The knowledge and attitudes of nurses in SA in relation to pain assessment and management for children were investigated using the PNKAS-Shriners Revision (Manworren, 2001) described in detail below.

3.7.1 Sampling

A convenience sampling approach was used to recruit potential participants who represent the target population of interest to this study. This approach was used because the potential participants were selected according to their availability and willingness to participate. It is one of the most popular forms of non-probability sampling where participants are selected based on convenience in terms of accessibility and availability to the researcher (Houser, 2011; Wood & Kerr, 2011). The sampling for this study was conducted based on the following inclusion and exclusion criteria for participants:

Inclusion Criteria

- Saudi and non-Saudi registered nurses with a license from the Saudi Nursing Board;
- Provide direct care for children and be willing to participate in the study, regardless of gender, age, experience, education level, religion and cultural background; and
- Able to read and speak English. This was to ensure that nurses were able to articulate their experiences and be linguistically equipped to take part in the study with its two phases and to understand its related requirements.

Exclusion Criteria

- Nurses who are not registered or do not hold a Saudi Nursing Board license;
- Nurses who are not able to read and speak English;
- Nurses working in managerial positions, such as charge nurses, head nurses nursing directors because they were not providing direct care for children with pain; and

- Newly appointed nurses under training, orientation or preceptorship programs.

Sample Size

A power analysis was performed to estimate the sample size required for this study. In nursing research, the effect size often ranges from small to medium (Polit & Beck, 2004). With an effect size of 0.3 as Cohen's d, (standardised mean difference) in knowledge and attitudes for each group of nurses (Saudi & non-Saudi), a 5% significance level and 80% power level (Munro, 2005), 175 nurses per group were needed (a total of 350 nurses). Previous local studies suggested a response rate of 50% (Abudari, Zahreddine, Hazeim, Assi, & Emara, 2014; Al-Ahmadi, 2009). To achieve the desired sample size, surveys were distributed to 750 participants who met the inclusion criteria across the five participating hospitals to ensure an adequate return.

3.7.2 Research Instrument

The Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS-Shriners Revision) (Manworren, 2001) was used in this study, with permission (Appendix B). The PNKAS-Shriners Revision was used because of its established validity and reliability (see below) having been used in many studies around the world (Ekim & Ocakcı, 2013; Lunsford, 2015; Ortiz et al., 2015; Stanley & Pollard, 2013; Vincent et al., 2010). The survey consists of two sections. The first section sought the participants' demographic information including age, gender, nationality, religion, ethnicity, qualification, work experience, clinical area of practice, attendance at any pain-related course, and the nurses' self-evaluation of their knowledge of pain management. The second section was the PNKAS-Shriners Revision itself (Appendix C), which is a self-

administered survey with 40-items: 24 true/false statements, 12 multiple-choice questions and two patient case studies with two multiple-choice questions for each. This survey was designated to examine nurses' knowledge of and attitudes towards assessing and managing paediatric pain, including pharmacological and non-pharmacological interventions.

Validity and Reliability

This survey has an acceptable level of stability with a test-retest reliability of 0.67 (Manworren, 2001) and an acceptable level of internal consistency with a Cronbach's alpha of 0.72 to 0.82 (Manworren, 2001; Stanley & Pollard, 2013). Content validity was established by a panel of five nurse experts in paediatric pain, based on the standards and guidelines set by the Agency for Health Care Policy and Research, the American Pain Society and the WHO (Manworren, 2001; Rieman, Gordon, & Marvin, 2007).

The PNKAS-Shriners Revision has not previously been administered in the Arab world, specifically SA, which differs from many parts of the world in terms of its culture and health care system. As a consequence, four international experts from Singapore (n= 1), SA (n= 2) and Australia (n= 1), with extensive experience in paediatric pain management established its content validity for this study. Based on the comments of these experts, some items were reworded and/or rearranged. The overall content validity index was 0.97. The revised version of the survey was then completed on two separate occasions (test-retest) within two weeks by 25 RNs working in the paediatric units of the five participating hospitals who were later excluded from the main study. The Cronbach's alpha based on this test was 0.72. The test-retest correlation value was r= 0.73, p<.001, demonstrating that the PNKAS-Shriners Revision has acceptable validity and reliability for use in SA. The survey in its original English language format was used and distributed.

3.7.3 Site Access, Ethics Approval and Recruitment

Recruitment commenced after ethics approval was obtained from the Human Research Ethics Committee (HREC) at the University of Newcastle (H-2015-0466) and the Saudi Arabian Ministry of Health (H-01-R-012) (Appendix D). Written approvals to access the study sites were also obtained from each of the five participating hospitals. The researcher began the process of recruitment by arranging and conducting meetings with the directors of the nursing education departments and the head nurses of the paediatric areas of each participating hospital to seek permission and request their support. In these meetings, the researcher explained the purpose and benefits of the study to these senior staff. The researcher also discussed the nature of the study and the recruitment plan with them. All their questions or concerns relating to the study were answered in detail, in accordance with the ethics approvals and participation information statements. A copy of the ethics approval letters, the survey, participation information statements and consent form for the Phase 2 interviews were also provided in these meetings. The recruitment process then commenced. Flyers (Appendix E) which conveyed details of the study and its purpose, eligibility criteria for participation, information on how to participate and where to find full details, were posted on various notice boards in the areas where children receive care. Additionally, information sessions were held where all the requirements of participation were explained to the prospective participants. Their questions relating to the study were also answered during staff meetings to ensure the participation of as many nurses as possible. In these information sessions, the researcher gave opportunities for questions to be asked. Also, the researchers' contact details in SA were provided in these sessions and were on the flyers in case there were queries or concerns. The researcher was willing to receive phone calls or emails regarding the study and several calls and emails were received and all queries were answered transparently and clearly.

3.7.4 Data Collection

The data was collected between April and May, 2016. Packages which contained an information statement (Appendix F), a return self-addressed envelope and the PNKAS-Shriners Revision, in hard copy form, were distributed by the nurse educators in the nursing education departments in the participating hospitals to the potential participants who met the inclusion criteria. Notably, administering the survey online might have had many advantages, such as quick and easy data analysis. However, the weak and/or lack of Wi-Fi Internet services in some health institutions in SA precluded this possibility. The nurse educators who distributed the packages had all obtained a Master Degree in nursing, were educated in this role and in ways to manage the ethical aspects of this task. The packages were distributed after the recruitment flyers had been posted on notice boards for nurses and the information sessions had been held with the potential nurse participants. Those who wished to participate were asked to complete their surveys without assistance and return them within the specified timeframe to a locked box located in each nursing education department to ensure security and confidentiality. Consent was implied by the voluntary completion and return of the survey as explained on the participation information statement. In total, 430 of 750 surveys were returned. Of these, 20 surveys were incomplete and were removed prior to the analysis of data. Hence, 410 complete surveys were included and analysed.

3.7.5 Data Management

Before data entry, each returned survey was given a unique code and each variable was coded numerically across the participants' responses. The data were then entered by the researcher into the IBM Statistics Package for Social Sciences (SPSS), version 23 for

Windows. Next, the data were checked for coding errors, cleaned and then checked again by the researcher. Following this step, a random sample of 10% of the entered cases was selected and checked for accuracy against each original survey (MacDonald, 2015). Finally, since the study sample was large enough, the normality of single variables was assessed graphically with a histogram and normal probability plot of the standardised errors. On the basis of this information, the errors were noted to be normally distributed, suggesting that the distribution of the sample was normal (Marston, 2010).

3.7.6 Data Analysis

In Phase 1, descriptive statistics, which include frequencies, percentages, means, standard deviation, and ranges were used to describe and summarise the data. Parametric inferential statistics – Pearson correlation, Independent Samples *t*-test and one-way ANOVA tests – were also used whenever appropriate to determine relationships and compare the differences in the knowledge and attitudes scores according to the demographic characteristics of the study sample.

Using the authors' approach (Ferrell & McCafferey, 2008; Manworren, 2001) in relation to scoring the PNKAS-Shriners Revision, correctly scored items were assigned a score of one (1), whereas incorrect or unanswered items were scored zero (0). Correct scores for each participant were added for a total knowledge score (range= 0-31) or attitude score (range= 0-9) which was then expressed as a percentage of the correct answers.

The mean total scores for knowledge and attitude were analysed and calculated separately. In addition, an item by item analysis on the PNKAS-Shriners Revision was carried out to determine how many answers had been correctly given by both Saudi and

non-Saudi nurses, and the differences between these groups of nurses in relation to each individual item that they answered correctly were determined. A minimum of 70% was considered as an ideal or satisfactory passing score for this study. Nurses should be competent, knowledgeable and have supportive attitudes towards paediatric pain management so that children with pain can receive high quality care.

3.8 Phase 2: Semi-Structured Interviews

In Phase 2, individual and face-to-face semi-structured interviews and field notes of interviews were conducted to gain insights into clinical experiences in relation to the assessment and management of children's pain. As described previously, the aim of this phase was to address the barriers, facilitators and cultural factors impacting practices of pain assessment and management for children.

3.8.1 The Interview Method

Semi-structured interviews were conducted in Phase 2 of this study to collect rich interview data that would help to identify the barriers, facilitators and cultural factors that have an impact on the assessment and management of children's pain in SA. This data collection method was ideal for this mixed methods study as it allowed the interviewer the flexibility to follow up on the responses of the 17 interviewees in relation to their assessment and management of children's pain as the situation demanded. It also allowed the interviewer to take field notes, probe interviewees for further views and ask them additional questions for elaboration and in-depth exploration (Matthews & Kostelis, 2011). Additionally, this method gave opportunities for the interviewees to freely share

their clinical experiences of assessing and managing children's pain, and to describe or clarify their personal perceptions and meanings in relation to these experiences (Zohrabi, 2013).

3.8.2 Semi-Structured Interview Guide

The interview guide used in Phase 2 of this study (Appendix I) was developed based on a review of the related literature. The key questions for this guide were:

- 'Can you describe for me a situation that stands out for you in relation to caring for a child with pain?';
- 'Can you tell me about the things that help/assist you to care for children with pain?';
- 'Can you tell me about the things that hinder/impede your care for children with pain?';
- 'Can you tell me about the things that you believe affect/impact on your ability to; (1) provide effective pain assessment, (2) provide effective pain management?'; and
- 'What is it like for you as an expatriate/an international nurse caring for infants and children who are of Saudi nationality? Can you please tell me more about this?'.

As the interviews progressed, these questions were reviewed and revised to allow further exploration of what was revealed in previous interviews. Examples of further questions asked of participants were:

- ‘Can you please provide more information why this was difficult for you to care for children in pain?’;
- ‘For my understanding, can you please provide an example about this?’; and
- ‘What about other factors that assist or hinder your assessment and/or management for children in pain?’.

In keeping with the format of semi-structured interviews, the interview questions were used as a guide or a set of reminders rather than an exact script of questions (De Chesnay, 2015). Participants were invited to discuss their experiences freely and openly.

3.8.3 Recruitment

The recruitment of the participants for Phase 2 was conducted after the completion of the data collection for Phase 1, with a subset of Phase 1 participants. All Phase 1 participants were asked in the survey if they were willing to take part in Phase 2 of the study, the semi-structured interviews. The participants who wished to be interviewed were contacted and provided with an information statement on Phase 2 (Appendix G) and an interview consent form (Appendix H), both of which involved different information and aspects, including audio-recording, voluntary participation and ethics. Once the completed consent forms were received, arrangements were made for the interviews to be conducted, based on a convenient time chosen by each interviewee and scheduled by the researcher.

3.8.4 Sampling

Complying with the research design used in this study was challenging. The researcher set out to use purposive sampling in Phase 2 of the study to select participants according

to a number of variables, including nationality and high and low score responses to the survey. However, this was not achieved because some of the participants who returned their surveys and indicated willingness to participate in the semi-structured interviews later apologised for not being available for interview or they changed their minds, and some did not reply to the researcher's attempts to arrange a meeting. As a result, all those who responded (n = 17) were interviewed and data saturation (no additional data would have emerged by interviewing more participants) was reached (Polit & Beck, 2012). The Phase 2 participants' demographic characteristics are described in Chapter Five.

3.8.5 Data Collection

The individual semi-structured interviews were conducted by the researcher following the interview guide described previously. These interviews typically lasted between 30 and 60 minutes and were held between June and July 2016 in a private, comfortable and quiet room, allocated by each of the participating hospitals. Considering the religious and cultural norms in SA, the interviews with the Muslim participants were arranged and conducted outside prayer times. A third party, a female nurse educator, from the nursing education department at each hospital, was present for the interviews with female Muslim participants. All interviews were conducted in English as it the most commonly used language in SA healthcare facilities (Al-Shahri, 2002). All interviews were also digitally audio-recorded and handwritten field notes were taken for further information and/or to clarify aspects that were not clear for the researcher, such as religious issues encountered by nurses while caring for children with pain in SA (Polit & Beck, 2012).

3.8.6 Data Management and Analysis

To facilitate the process of analysing qualitative data, all interviews were audio recorded and transcribed verbatim by the researcher with the support of the field notes to ensure that the discussion, views and meanings of the interviewees were not missed or changed during the data transcription process (Polit & Beck, 2012). In addition, backups of the interviews and transcripts were saved in accordance with the HREC's guidelines to avoid losing data.

Following the transcription process, the researcher checked, read and re-read all transcripts, one-by-one and line-by-line for accuracy while listening attentively to the audio-recordings. The transcripts were then reviewed individually and approved by the researcher's supervisors. After this, the transcripts were hand-coded and analysed using content analysis and an inductive approach. This analytical method is an intellectual process of grouping qualitative data into clusters of similar conceptual or thematic categories to identify patterns and relationships among the data and the emergent themes (Given, 2008).

Content analysis comprises three analytic phases (Elo & Kyngäs, 2008). The first phase is preparation where the researcher is immersed in the data collected for the study. The second phase is the organising phase, which is divided into three steps: open coding, categorising, and abstracting. In the open coding step, the researcher reads the transcripts many times to gain knowledge of its content and highlights the significant relevant statements that support answering research questions, along with writing as many codes/comments as necessary about the transcribed content which serve as headings or labels relating to the research questions. Next, similar initial codes/comments/ideas are clustered together in an independent step and labelled using headings that reflect the

commonalities and content. Afterwards, the headings that are similar to each other are grouped and included under secondary and more comprehensive headings that constitute the organising phase. In the abstraction phase, the researcher creates broader categories and identifies main themes that encompass the previously generated headings until the research topic is described. The third or last analysis phase is reporting the results that emerged from the qualitative data analysis (Elo & Kyngäs, 2008). The qualitative content analysis and processes are summarised in Appendix J.

3.9 Ensuring the Quality of the Study

Quality is a necessary element of any research study (Tappen, 2011). Addressing quality has long been highlighted as an important aspect in mixed methods research (Creswell & Plano Clark, 2018). In this explanatory mixed methods study, the chronological data collection, analysis and the order of quantitative and qualitative research, as well as the integration of findings from both data sets, were strategies used that aimed to enhance the quality of the study and the findings (Ivankova, 2014).

Blending quantitative and qualitative research in this study and identifying and linking similarities, as well as integrating the results from these two study strands during the discussion part is another strategy used to ensure inference quality and credible findings. Inference quality is an important aspect in mixed methods research, as described by many authors, such as Clark and Ivankova (2015). Tashakkori and Teddlie (2003) suggested inference quality and introduced it as a criterion for assessing the quality of inferences and conclusions that are made based on findings from a mixed methods study. The integrated data and results in this present study followed an integrative framework for

inference quality of mixed methods studies by Tashakkori and Teddlie (2003) and Tashakkori and Teddlie (2008). The framework included the development of quantitative and qualitative inferences and integrative consistent inferences (Polio & Friedman, 2017). Thus, this study was guided by this framework to ensure quality of conclusions, interpretations and outcomes.

3.9.1 Phase 1 Survey Study: Validity and Reliability

The quality and credibility in quantitative research depend on establishing validity and reliability and is judged based on these two important traditional criteria (Markula & Silk, 2011). In general, validity refers to the "objectivity of the research instruments (they measure what they are meant to measure) and reliability refers to the objectivity of the researcher (how researcher's subjective influence has been minimised in the research project)" (Markula & Silk, 2011, p. 200). The quality of the data collected in Phase 1 of the present study can be established by the common types of validity which include internal validity, external validity and reliability. Internal validity is defined as credibility - whether the findings are credible to readers and participants (Waltz, Strickland, & Lenz, 2010). Thus, in order to ensure internal validity in the survey phase of this study, it is essential to utilise multiple sources of data (triangulation) to make a chain of evidence. This was applied and established throughout this study. As stated previously, the data were collected from different sources (survey and interviews) using multiple methods. In addition, the steps and processes of the study were clearly explained to help understand the research process (Waltz et al., 2010). External validity relates to the findings generalisability - whether the study findings and conclusion are generalisable or can be transferred to other settings and contexts (Waltz et al., 2010). This was enhanced in this

study by the use of PNKAS-Shriners Revision, which is a validated survey, as well as the rich description of the findings for the reader and the adequate sample size and response rate as explained previously in this chapter and later in Chapter Four. Additionally, replicating this study in similar settings and health contexts will enhance the external validity of this current study. Finally, reliability is concerned with consistency of a measuring instrument and replicability, stability and confirmability of results overtime across researchers and similar settings and contexts. In this study, reliability was established by test-retest and Cronbach Alpha undertaken for the PNKAS-Shriners Revision as noted previously in this chapter. In addition, it has been established and maintained in this study by objectivity and reducing errors and/or bias in preparation for researchers and research studies that will repeat or replicate this study in future (Whitehead, LoBiondo-Wood, & Haber, 2013).

3.9.2 Phase 2 Qualitative Study: Trustworthiness

Trustworthiness is a concept linked to quality and used to judge the quality or goodness of qualitative studies. Brown and Schmidt (2012) referred to trustworthiness as "the quality, the authenticity, and the truthfulness of findings from qualitative research" (p. 354). To ensure the trustworthiness of the current study, the necessary steps, discussed below, were taken when conducting, designing and then reporting on the study. In addition, efforts were made during the data collection and analysis of the semi-structured interviews to ensure accuracy, quality and rigour of the data. Lincoln and Guba's (1985) criteria for judging the trustworthiness of a qualitative research include credibility, confirmability and transferability (Polit & Beck, 2012). Each criterion is discussed in more detail below.

Credibility

Credibility refers to the measures that are taken to enhance the accuracy, credibility and believability of the findings. In other words, it refers to having confidence in the truth of the qualitative data and the researcher's interpretations of the data (Polit & Beck, 2010). Although member checking is an important qualitative technique for ensuring credibility of the findings, and whilst invited, it was not used in this study as only one participant responded to the invitation. The reasons for this poor response are unknown; that nurses were too busy to respond is likely in the light of the concerns raised about this during interviews. Credibility, however, was established in this study through several strategies, including the implementation of a logical research process, and audio recording interviews and transcribing verbatim each of the interviews. In addition, field notes were taken for the data collected. Peer debriefing was undertaken with the researcher's supervisors who were experienced qualitative and mixed methods researchers. The supervisors regularly followed up on all stages of the data collection, interview transcriptions and subsequent analysis including coding, clustering and reporting of emergent themes and subthemes (Given, 2008; Matthews & Kostelis, 2011).

Confirmability

Confirmability is a process that allows other researchers to trace a researcher's logic and audit the qualitative data and findings (Anney, 2014). It refers to the extent to which the findings are realistic and reflect the actual responses of the participants without any bias, motivation or perspective from the researcher (Polit & Beck, 2012). To ensure the confirmability of this study, a clear and objective description of the research process is discussed and presented in detail in this thesis. Additionally, the results, interpretations and conclusions were audited and confirmed by the research supervisors who had access

to the data at all stages of the research process. In addition, there has been regular supervision meetings and review and feedback on the reporting of the research (Polit & Beck, 2012).

Transferability

Transferability is defined as whether or not the qualitative findings can be transferred to or applied to other settings or groups in similar situations (Polit & Beck, 2012). In the present study, the researcher undertook the necessary steps to enable readers to adequately assess the degree of the findings' transferability to their setting, population or environment. However, it is the qualitative researchers' responsibility to judge whether findings can be transferred or not (Given, 2008). Two strategies were used in this study to better demonstrate its transferability to other contexts. The first was keeping detailed and appropriate descriptions of the participants and the methodological procedures used, the methods, the setting and the findings (Polit & Beck, 2010). The other strategy was to use verbatim quotes from the study interviewees/participants (Polit & Beck, 2008).

3.10 Data Integration and Management

There are several ways to integrate data in mixed methods studies. These include the notions of connecting, merging, and embedding. Connecting involves linking one type of data with the other one through sampling. Merging involves bringing the two sets of data together for analysis and for comparison. Embedding involves linking data collection and analysis at multiple points (Fetters, Curry, & Creswell, 2013). Using the connecting approach, in this study, the quantitative and qualitative data were connected/integrated at two levels. The first level occurred in the intermediate stage of the research process when

interview participants were selected from those who responded to the survey in Phase 1. The second level occurred when the quantitative and qualitative findings were connected/integrated at the interpretation phase of the research (Fetters, Curry, & Creswell, 2013).

After analysing the quantitative and qualitative data separately, the findings from both data sets were then integrated and synthesised during the interpretation phase. The researcher then used the "weaving approach" to report these integrated findings. This approach involves organising and writing the findings under themes or concepts (Fetters, Curry, & Creswell, 2013). The integration of findings is provided in Chapter Six, the discussion chapter.

3.11 Ethical Considerations - Phase 1 and Phase 2

This research study was approved and conducted in accordance with the ethical standards established by the Australian Research Council, the National Health and Medical Research Council (National Health and Medical Research Council, 2015) and addressed the four basic ethical principles of **autonomy**: treating participants as autonomous subjects with respect and the right to self-determination and the freedom to choose/decide whether or not to participate in research; **beneficence**: to do good and make protection from potential harms; **non-maleficence**: to not purposely cause hurt or harm; and **justice**: treating all participants fairly and equitably (Burns, Grove, & Gray, 2011).

3.11.1 Ethics Approvals

Prior to obtaining ethical approval for this research study, an application was submitted to the Human Research Ethics Committee (HREC) at the University of Newcastle (UoN) and from the Saudi Ministry of Health (MOH). Consequently, ethical approval (Appendix D) was granted by the UON (H-2015-0466) and the MOH (H-01-R-012), allowing this study to be conducted.

3.11.2 Autonomy and Justice

The ethical principles of autonomy and justice in this study were addressed using a range of strategies during the recruitment phase, ensuring voluntary participation and seeking informed consent. In each of the participating hospitals, nurses were recruited for the study by posting flyers (Appendix E) on nurses' ward notice boards requesting volunteers. The flyer invited nurses to collect an information package at the nurses' station on the ward and/or call the researcher for information. Several information sessions were also delivered by the researcher in each facility. At these sessions, information about the study was provided in detail, questions relating to the study were answered and nurses were given information packages with related documents in a sealed envelope. Nurses were invited to review the detail in the information packages in privacy and at their leisure. These processes allowed nurses the autonomy, freedom and time to consider whether or not they wanted to participate in the study.

Informed Consent

Addressing the principles above meant that in Phase 1 of this study, each eligible nurse was provided with an information statement (Appendix F) and a copy of the survey. The information statement detailed the rationale for the study, aims of the study, the nature of participation, time needed, that participation was voluntary, the benefits and risks, privacy and confidentiality measures, analysis of data, storage and use of data, and the researcher's contact details for questions or queries (Holloway & Galvin, 2016). In Phase 2, the nurses who completed the survey and indicated their interest/willingness to participate in the semi-structured interviews were provided with an information statement (Appendix G) and consent form (Appendix H). Nurses were also asked to read and re-read the information statement to ensure they understood it, then to sign and return the consent form if they agreed to the face-to-face interview as described in the information statement. Prior to commencing the interview, participants were reminded about the details of the study and asked if they had any questions or concerns. They were reminded of the voluntary nature of their participation and that they had the right to refuse or withdraw from Phase 2 of the study at any time by ending the interview, with no reason given or negative consequences. Interviews were conducted in a private room located in the hospital. In Phase 1 of this study, consent was implied by completion and return of the survey via a confidential locked box as mentioned earlier in this chapter. In Phase 2 of this study, written consent was obtained before conducting the face-to-face interviews. Consent was reconfirmed with participants verbally prior to starting the interviews and was checked throughout as needed.

Voluntary Participation

To ensure involvement or participation in this study was voluntary, all eligible nurses were invited to participate via recruitment posters/flayers for Phase 1. Nurses were provided with an information statement for Phase 2 after they indicated their willingness to participate in the study by a returned survey which also provided a space for indicating their interest in participating in Phase 2 interviews as previously explained in this chapter.

3.11.3 Beneficence and Non maleficence

The ethical principles of beneficence and non-maleficence were addressed in a range of ways including ensuring confidentiality and anonymity and ensuring data was stored securely. Nurses were protected from risk or potential harm in several ways: by ensuring the use of a secured box located in each hospital for the deposit of surveys and/or consent forms; by reassuring them that they could withdraw from the interview component of the study at any time without fear of reprisal; and by ensuring privacy was protected by de-identifying data, coding surveys and interview transcripts and research envelopes for returning completed or blank surveys. Additionally, interviews were transcribed by the researcher and all data, surveys, audio recordings and transcripts were stored securely to ensure privacy. Whilst there were no direct benefits from participation, it was noted that findings may help to inform and guide health and education polices in SA.

Confidentiality and Anonymity

Study participants have the right to have their confidentiality and anonymity respected, protected and maintained (Polit & Beck, 2012). To ensure confidentiality and anonymity,

a number of procedures were followed in this study. For example, potential participants were provided with a research study envelope in which to place their completed or blank surveys and drop them into a secured locked box located in each nursing education department of the participating hospitals, marked ‘Completed Surveys'. Furthermore, the names and contact details of the participants who agreed to participate in the interviews were removed from the surveys and stored separately and identification codes were assigned (Polit & Beck, 2012). These codes were only used in the audio-recordings and transcripts of the interviews and were altered later to unique pseudonyms for the purpose of presenting the Phase 2 study results (Polit & Beck, 2012). In addition, all the interviewees were interviewed in private rooms, allocated by the participating hospitals for research purposes to maintain the participants’ confidentiality. When a third person’s presence was required during interviews with females, a pledge form, ‘confidentiality and non-disclosure agreement’, was signed prior to this procedure to comply with the terms of ethics approvals for this study and ensure confidentiality. Further, no names were used either in the interview transcripts or data analysis. All participants were de-identified using a letter of the alphabet and given a pseudonym throughout this study. No names will be used when presenting or publishing the results or findings of this study (Polit & Beck, 2012).

Storage and Disposal of Data

All the materials relating to the collected data, such as surveys, field notes, interview consent forms, audio-recordings and transcripts were stored safely in a locked filing cabinet in the School of Nursing and Midwifery at the UoN. Electronic data were also securely stored on UoN’s secure cloud storage system. Additionally, only the primary researcher and research supervisors had access to copies of the data.

On the completion of the study, all the collected data will be again stored securely in a locked filing cabinet in the School of Nursing and Midwifery at the UoN for at least five years, then the data will be destroyed in accordance with the university's research data and materials management policy and procedure.

3.12 Summary

This chapter overviewed the methodology and mixed methods research design used in this study to answer its research questions. It also described and discussed in detail the two sequential explanatory phases of this study, along with the methods employed to collect and analyse the data in these phases. In addition, a description about the survey used - the PNKAS-Shriners Revision and the process of differentiating its knowledge items from attitude items was provided. The strategies used to ensure the quality of data were explained, as well as the ways in which validity, reliability and rigour were addressed. Furthermore, the ethical considerations and strategies that were taken into account and applied when conducting this study were described.

The results from Phase 1 of this study, the cross-sectional study and Phase 2, the semi-structured interviews are presented in next chapters; Chapters Four and Five, respectively.

Chapter 4 **Phase 1 Survey Results of Cross-Sectional Study Analysis**

4.1 Chapter Introduction

This chapter presents the survey results from Phase 1 cross sectional study. The Phase 1 of the study aimed to examine the knowledge and attitudes towards pain assessment and management for children amongst nurses working in SA. The participants were RNs recruited from five government hospitals located in the Riyadh region of SA. Data were collected using the PNKAS-Shriners Revision.

The publication below is part of this chapter, provided here with permission from the publisher (Appendix M).

> Alotaibi, K., Higgins, I., & Chan, S. (2018). Nurses' knowledge and attitude toward pediatric pain management: A cross-sectional study. *Pain Management Nursing, 20*(2), 118-125.. doi: 10.1016/j.pmn.2018.09.001

The knowledge and attitude concepts are treated as overlapping concepts in the PNKAS-Shriners Revision used in this study. In this thesis, however, knowledge and attitudes were differentiated conceptually because previous research has reported limitations associated with the use of undifferentiated concepts (Kheshti, Namazi, Mehrabi, & Firouzabadi, 2016; Vincent & Denyes, 2004). Vincent and Denyes (2004) argued that knowledge should be separated and measured independently from attitude to address the need for specific areas for improvement and/or change. To address the issue of overlap, the items of the survey that measure nurses' knowledge and attitudes were differentiated

and examined separately in this study in an attempt to capture and quantify nurses' knowledge and attitudes with respect to children's pain and pain management.

A panel of four nurses (Australia= 2, SA= 1 & Singapore= 1), who were experts in the management of pain in children, was nominated by the researcher and research supervisors, and invited via email to differentiate the items that related to knowledge and attitudes in the PNKAS-Shriners Revision. Following acceptance of the invitation, the PNKAS-Shriners Revision survey and a table containing its items with instructions on how to complete the differentiation task was provided. In addition, the five fundamental types of knowledge identified and defined by Carper (1978) and Chinn and Kramer (2008), and definitions of the concept "attitude" by Vaughan and Hogg (2010) and Weiten (2007), were sent to each of the panel members to guide their review/differentiation process. Definitions were described in Chapter One of this thesis. As a result of this process, 31 items out of a total of 40 items were identified by the majority of the panel as "knowledge" and nine were identified as related to the attitude domain (Appendix K).

4.2 Response Rate

A total of 750 surveys were distributed to eligible nurses caring for children in the study settings. There were 430 surveys returned, representing an overall response rate of 57.3%. After removing incomplete and/or blank surveys (n=20, 2.6%), 410 completed surveys were analysed. This represents an overall valid response rate of 54.7% which can be considered acceptable for analysis and reporting (Rubin & Babbie, 2010). Table 4.1 presents the response rate at each of the five participating hospitals. Hospital B had the lowest response rate and Hospital E had the highest.

Table 4.1. Response Rates for Participating Hospitals (n=410)

Hospital Code	Surveys Distributed (N=750)	Surveys Returned/Analysed (n=430/410)	Response Rate Based on Survey Analysed (%)
A	130	70/67	16.3
B	80	31/29	7.1
C	100	57/54	13.2
D	205	115/110	26.8
E	235	157/150	36.6

4.3 Socio-Demographic Characteristics

Table 4.2 presents the participants' socio-demographic characteristics. The majority of participants were women (91.5%, n=375) and non-Saudi nurses. The average age was 32 years (range 20-60). Less than half the participants (n=165, 40.2%) were within the 26-30 year age group. The Indian and Filipino participants (Asian ethnicity) (n=331, 80.7%) made up the largest proportion of participants, followed by Saudi and Jordanian participants (Arabic ethnicity) (n=79, 19.3%). The majority of participants were Christians (n=275, 67.1%), followed by Muslims (n=105, 25.6%) and Hindus (n=30, 7.3%).

Chi-square tests were conducted to determine if there were significant differences in socio-demographic data between Saudi and non-Saudi nurses. Results showed that there were significant differences between the two groups in gender, age, religion, and ethnicity (Table 4.2).

There were significantly more females in the non-Saudi nursing group (p=.003). The Saudi-nurses were significantly younger (age range 20-30 years) when compared with non-Saudi nurses (p=.000). There were more non-Saudi nurses with Christianity as their

religion compared to Saudi nurses who were mainly Muslims (*p*=.000). The Saudi nurses were all of Arabic ethnicity, compared to non-Saudi nurses who were mostly of Asian ethnicity (*p*=.000).

Table 4.2. Participants' Socio-Demographic Characteristics

Characteristic	**Saudi Nurses** N (%) 75 (18.3)	**Non-Saudi Nurses** N (%) 335 (81.7)	**Total** N (%) 410 (100)	**χ^2 (*p*-value)**
Gender				χ^2 =9.097 (.003)*
Male	13 (17.3)	22 (6.6)	35 (8.5)	
Female	62 (82.7)	313 (93.4)	375 (91.5)	
Age (y)				χ^2=63.792 (.000)*
(M=32.37; SD=7.23; range 20–60 y)				
20-25	25 (33.3)	18 (5.4)	43 (10.5)	
26-30	34 (45.3)	131 (39.1)	165 (40.2)	
31-35	13 (17.3)	92 (27.5)	105 (25.6)	
36-40	2 (2.7)	46 (13.7)	48 (11.7)	
≥ 41	1 (1.3)	48 (14.3)	49 (12.0)	
Religion				χ^2=266.63 (.000)*
Islam	75 (100)	30 (9.0)	105 (25.6)	
Hindu	0 (0.0)	30 (9.0)	30 (7.3)	
Christianity	0 (0.0)	275 (82.1)	275 (67.1)	
Ethnicity				χ^2=384.593 (.000)*
Arab	75 (100)	4 (1.2)	79 (19.3)	
Asian	0 (0.0)	331 (98.8)	331 (80.7)	

**p*-value < 0.005

4.4 Educational and Professional Characteristics

Table 4.3 presents the participants' educational and professional characteristics. The highest qualification attained by all participants was a bachelor degree in nursing (n=279, 68.0%). The remainder had obtained a nursing diploma. Nursing experience ranged from 1-36 years and most participants (n=153, 37.3%) had a working experience of 6-10 years (M=8.9; SD=6.3). The experience of working in paediatric settings ranged from 1-25

years (M=6.3; SD=5.0), with more than half of the participants (n=207, 50.5%) having worked for 1-5 years in paediatric contexts.

Table 4.3. Participants' Educational and Professional Characteristics

Characteristic	**Saudi Nurses** N (%) 75 (18.3)	**Non-Saudi Nurses** N (%) 335 (81.7)	**Total** N (%) 410 (100)	χ^2 (p value)
Highest Nursing Qualification				χ^2=27.199
Diploma	43 (57.3)	88 (26.3)	131 (32.0)	(.000)*
Bachelor	32 (42.7)	247 (73.7)	279 (68.0)	
Nursing Experience (y)				χ^2=62.209
(M= 8.94; SD=6.33; range 1–36)				(.000)*
1-5	55 (73.3)	88 (26.3)	143 (34.9)	
6-10	16 (21.3)	137 (40.9)	153 (37.3)	
11-15	3 (4.0)	60 (17.9)	63 (15.4)	
16-20	0 (0.0)	30 (9.0)	30 (7.3)	
≥21	1 (1.3)	20 (6.0)	21 (5.1)	
Paediatric Nursing Experience (y)				χ^2=46.550
(M=6.37; SD=5.02; range 1–25)				(.000)*
1-5	64 (85.3)	143 (42.7)	207 (50.5)	
6-10	11 (14.7)	125 (37.3)	136 (33.2)	
11-15	0 (0.0)	43 (12.8)	43 (10.5)	
16-20	0 (0.0)	15 (4.5)	15 (3.7)	
≥21	0 (0.0)	9 (2.7)	9 (2.2)	
Current Workplace/Hospital				χ^2=52.591
Hospital A	21 (28.0)	46 (13.7)	67 (16.3)	(.000)*
Hospital B	3 (4.0)	26 (7.8)	29 (7.1)	
Hospital C	17 (22.7)	37 (11.0)	54 (13.2)	
Hospital D	32 (42.7)	78 (23.3)	110 (26.8)	
Hospital E	2 (2.7)	148 (44.2)	150 (36.6)	
Current Area of Practice				χ^2=26.427
#OPD	7 (9.3)	3 (0.9)	10 (2.4)	(.000)*
#ED	5 (6.7)	24 (7.2)	29 (7.1)	
#PICU	28 (37.3)	136 (40.6)	164 (40.0)	
#PW	6 (8.0)	61 (18.2)	67 (16.3)	
#PMW	15 (20.0)	78 (23.3)	93 (22.7)	
#PSW	14 (18.7)	33 (9.9)	47 (11.5)	
Attended Pain Education Course				χ^2=037
Yes	32 (42.7)	147 (43.9)	179 (43.7)	(.848)
No	43 (57.3)	188 (56.1)	231 (56.3)	
Self-Rated Knowledge Competence				χ^2=4.105 (.250)
Excellent	17 (22.7)	50 (14.9)	67 (16.3)	
Good	39 (52.0)	204 (60.9)	243 (59.3)	
Fair	19 (25.3)	77 (23.0)	96 (23.4)	
Poor	0 (0.0)	4 (1.2)	4 (1.0)	

*p-value < 0.05, #Outpatient department (OPD), #Emergency department (ED), #Paediatric intensive care unit (PICU), #Paediatric ward (PW), #Paediatric Medical ward (PMW), #Paediatric Surgical ward (PSW)

The majority of the participants were employed at Hospital E (n=150, 36.6%), followed by Hospital D (n=110, 26.8%) and Hospital C (n=54, 13.2%). These three participating hospitals comprise the largest tertiary and specialised hospitals in the country, with large bed capacities. One hundred and sixty-four (40%) of the participants from all hospitals worked in the paediatric intensive care unit (PICU), while the remainder were from the Outpatient Department (OPD; n=10, 2.4%), Emergency Department (ED; n=29, 7.1%), Paediatric Ward (PW; n=67, 16.3%), Paediatric Medical Ward (PMW; n=93, 22.7%) and Paediatric Surgical Ward (PSW; n=47, 11.5%).

With respect to pain educational programs, less than half of the participants (n= 179, 43.7%) reported having attended some form of educational course on pain management. In terms of self-rated knowledge competence about children's pain and its assessment and management, nearly two-thirds of participants (n=243, 59.3%) rated themselves as having good knowledge, followed by those who rated themselves as having fair knowledge (n=96, 23.4%).

The results of Chi-square tests demonstrated that there were significant differences between the Saudi and non-Saudi nurses regarding nursing education level, nursing experience, paediatric nursing experience, current hospitals and current areas of practice. Compared with Saudi-nurses, significantly more non-Saudi nurses had a bachelor degree in nursing (p=.000). Non-Saudi nurses had significantly more nursing experience than Saudi nurses (p=.000). Non-Saudi nurses also had significantly more experience in paediatric nursing compared with Saudi nurses (p=.000). There were significantly more Saudi-nurses working in Hospitals A and D, and significantly more non-Saudi nurses

working in Hospital E (*p*=.000). There were significantly more Saudi nurses working in OPD and PSW areas, when compared to non-Saudi nurses. Non-Saudi nurses had significantly higher numbers working in PW area (*p*=.000) (Table 4.3).

4.5 Nurses' Knowledge of Pain Assessment and Management

The PKNAS-Shriners Revision was used. A total of 31 items measured nurses' knowledge in relation to the assessment and management of children's pain, and pharmacological and non-pharmacological interventions.

The number of correct answers among all participants (n=410) was normally distributed as indicated by the bell-shaped histogram below (Figure 4.1).

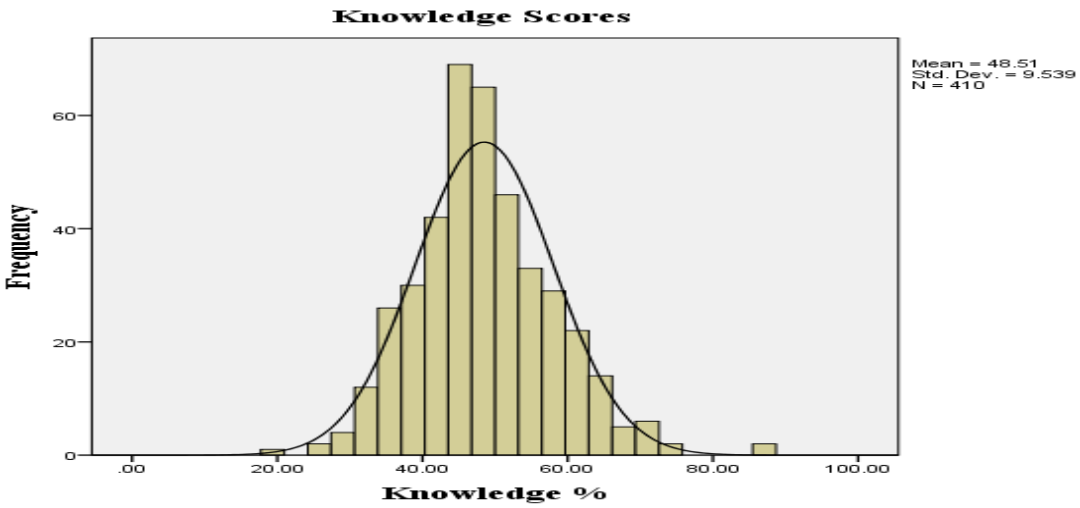

Figure 4.1. Frequency Distribution of Correct Answers - Knowledge (%)

The individual number and percentage of correctly answered items relating to nurses' knowledge are shown in Table 4.4.

Table 4.4. Participants' Correct Answers for Knowledge Items

Item No & Content	Correct answer rate N (%)		
	Saudi Nurse	Non-Saudi Nurse	Total
1. Changes in vital signs (severe pain)	9 (12.0)	44 (13.1)	53 (12.9)
2. Neurological system development at the age 2 years	46 (61.3)	173 (51.6)	219 (53.4)
3. Distracting an infant /child from his/her pain	31 (41.3)	131 (39.1)	162 (39.5)
4. A child being asleep despite severe pain	24 (32.0)	62 (18.5)	86 (21.0)
5. Intensity of pain in different people	37 (49.3)	241 (71.9)	278 (67.8)
6. Ibuprofen & other NSAID agents' effectiveness	41 (54.7)	213 (63.6)	254 (62.0)
7. Non-drug interventions effectiveness for severe pain	15 (20.0)	83 (24.8)	98 (23.9)
8. Enhance treatment of the first procedure	61 (81.3)	236 (70.4)	297 (72.4)
9. Respiratory depression as a side effect of opioid	39 (52.0)	223 (66.6)	262 (63.9)
10. Combination of analgesics & non-drug therapies	45 (60.0)	261 (77.9)	306 (74.6)
11. Duration of IV analgesia (morphine)	29 (38.7)	121 (36.1)	150 (36.6)
12. Benzodiazepines' potentiation (muscle spasms pain)	40 (53.3)	141 (42.1)	181 (44.1)
14. Opioids use with a history of opioid therapy	35 (46.7)	132 (39.4)	167 (40.7)
15. Dosage increases beyond a dosage of morphine	40 (53.3)	179 (53.4)	219 (53.4)
16. Opioids tolerance in young infants	47 (62.7)	217 (64.8)	264 (64.4)
17. Encouraging a child to endure pain	44 (58.7)	215 (64.2)	259 (63.2)
19. A child's pain & cultural/spiritual beliefs	48 (64.0)	149 (44.5)	197 (48.0)
20. Anxiolytics, sedatives & barbiturates appropriateness	22 (29.3)	92 (27.5)	114 (27.8)
21. Adjustment of opioid analgesic dosage	68 (90.7)	291 (86.9)	359 (87.6)
23. Effectiveness of placebo in determining pain	28 (37.3)	161 (48.1)	189 (46.1)
24. Definition of opioid/narcotic addiction	61 (81.3)	281 (83.9)	342 (83.4)
25. Opioid administration route (prolonged pain)	22 (29.3)	42 (12.5)	64 (15.6)
26. Opioid administration route (sever pain)	60 (80.0)	296 (88.4)	356 (86.8)
27. Analgesia of choice (moderate to severe pain)	57 (76.0)	248 (74.0)	305 (74.4)
28. Equivalent oral & IV dosages (morphine)	38 (50.7)	148 (44.2)	186 (45.4)
29. Analgesia schedule (post-operative pain)	54 (72.0)	257 (76.7)	311 (75.9)
30. Respiratory depression incidence (morphine)	21 (28.0)	85 (25.4)	106 (25.9)
31. Analgesia schedule (continuous, persistent pain)	26 (34.7)	198 (59.1)	224 (54.6)
33. A useful drug for treatment of pain in children	1 (1.3)	1 (0.3)	2 (0.5)
37-B. Correct dose of morphine (case study #1, part 2)	38 (50.7)	148 (44.2)	186 (45.4)
38-B. Correct dose of morphine (case study #2, part 2)	24 (32.0)	66 (19.7)	90 (22.0)

Out of the 31 items assessed, the overall mean score of correctly answered items achieved by all participants was 15.04 (SD = 2.95, range = 6–27), or 48% (SD = 9.53, range = 19.3%–87.1%). The mean total score achieved by Saudi nurses was 14.85 (SD = 2.70, range = 8–22), or 47% (SD = 8.70, range = 25.8%–70.9%), while that of non-Saudi nurses was 15.08 (SD = 3.01, range = 6–27), or 48% (SD = 9.72, range = 19.7%–87.1%). The mean correct answers for both groups were less than 50%. This indicates poor overall knowledge of children's pain assessment and management. None of the participants achieved a 100% score.

The results of the t-tests showed that there was no significant difference between Saudi and non-Saudi nurses in relation to their total mean knowledge score. However, when each item was analysed individually, statistically significant differences (p=.000) were found in nine of the thirty-one items (Table 4.5).

Table 4.5. Significant Difference in Knowledge Items

Item No & Content	**Correct answer rate N (%)**			
	Saudi Nurse	**Non-Saudi Nurse**	**Total**	**t- test (*p*-value)**
2. Neurological system at the age 2 years	46 (61.3)	173 (51.6)	219 (53.4)	t=1.54 (.000)
4. A child being asleep despite severe pain	24 (32.0)	62 (18.5)	86 (21.0)	t=2.31 (.000)
5. Intensity of pain in different people	37 (49.3)	241 (71.9)	278 (67.8)	t=-3.58 (.000)
8. Maximising treatment of the first procedure	61 (81.3)	236 (70.4)	297 (72.4)	t=2.10 (.000)
10. Combination of analgesics & non-drugs	45 (60.0)	261 (77.9)	306 (74.6)	t=-2.92 (.000)
23. Effectiveness of placebo in determining pain	28 (37.3)	161 (48.1)	189 (46.1)	t=-1.71 (.000)
25. Opioid administration route (prolonged pain)	22 (29.3)	42 (12.5)	64 (15.6)	t=3.00 (.000)
26. Opioid administration route (sever pain)	60 (80.0)	296 (88.4)	356 (86.8)	t=-1.68 (.000)
38-B. Correct dose of morphine- (case study #2, part 2)	24 (32.0)	66 (19.7)	90 (22.0)	t=2.10 (.000)
Total knowledge score				t=-0.59 (0.23)

Table 4.6 lists the knowledge items with a low percentage of connect answers (<50%). Several items (n=16) received a low percentage of correct answers by both the Saudi and non-Saudi participants. These items ranged from 2 (0.5%) for item 33 to 197 (48.0%) for item 19. Seven of the sixteen items referred to opioids, including side effects, dosages, administration and duration of action (11, 14, 25, 28, 30, 37-B and 38-B); three items concern pharmacological pain management knowledge (12, 20 and 33); one item concerned non-pharmacological pain management knowledge (7); and the reminder related to pain assessment knowledge (1, 3, 4, 19 and 23).

Table 4.6. Knowledge Items with Low Percentage of Correct Answers (<50%)

Item No & Content	**Correct answer rate N (%)**		
	Saudi Nurse	**Non-Saudi Nurse**	**Total**
33. A useful drug for treatment of pain in children	1 (1.3)	1 (0.3)	2 (0.5)
1. Changes in vital signs (severe pain)	9 (12.0)	44 (13.1)	53 (12.9)
25. Opioid administration route (prolonged pain)	22 (29.3)	42 (12.5)	64 (15.6)
4. A child being asleep despite severe pain	24 (32.0)	62 (18.5)	86 (21.0)
40. Correct dose of morphine (case study #2, part 2)	24 (32.0)	66 (19.7)	90 (22.0)
7. Non-drug interventions effectiveness	15 (20.0)	83 (24.8)	98 (23.9)
30. Respiratory depression incidence (morphine)	21 (28.0)	85 (25.4)	106 (25.9)
20. Anxiolytics, sedatives, & barbiturates	22 (29.3)	92 (27.5)	114 (27.8)
11. Duration of IV analgesia (morphine)	29 (38.7)	121 (36.1)	150 (36.6)
3. Distracting an infant /child from his/her pain	31 (41.3)	131 (39.1)	162 (39.5)
14. Opioids use with a history of opioid therapy	35 (46.7)	132 (39.4)	167 (40.7)
12. Benzodiazepines' potentiation	40 (53.3)	141 (42.1)	181 (44.1)
28. Equivalent oral & IV dosages (morphine)	38 (50.7)	148 (44.2)	186 (45.4)
37-B. Correct dose of morphine (case study #1, part 2)	38 (50.7)	148 (44.2)	186 (45.4)
23. Effectiveness of placebo in determining pain	28 (37.3)	161 (48.1)	189 (46.1)
19. A child's pain & cultural/spiritual beliefs	48 (64.0)	149 (44.5)	197 (48.0)

The items (n=15) that received a high percentage of correct answers (>50%) are summarised in Table 4.7, ranged from 359 (86.6%) for item 21 to 219 (53.4%) for item 2. Only three items out of the 15 items were answered correctly by at least 80% (n=328) of participants. These three items, which most participants were able to answer correctly, asked about adjustment of subsequent doses of opioid medication (item 21), definition of addiction of opioids (item 24), and the recommended route of administration of opioid for severe acute pain (item 26).

Table 4.7. Knowledge Items with High Percentage of Correct Answers (>50%)

Item No & Content	**Correct answer rate N (%)**		
	Saudi Nurse	**Non-Saudi Nurse**	**Total**
21. Adjustment of opioid analgesic dosage	68 (90.7)	291 (86.9)	359 (87.6)
26. Opioid administration route (sever pain)	60 (80.0)	296 (88.4)	356 (86.8)
24. Definition of opioid/narcotic addiction	61 (81.3)	281 (83.9)	342 (83.4)
29. Analgesia schedule (post-operative pain)	54 (72.0)	257 (76.7)	311 (75.9)
10. Combination of analgesics & non-drugs	45 (60.0)	261 (77.9)	306 (74.6)
27. Analgesia of choice (moderate to severe pain)	57 (76.0)	248 (74.0)	305 (74.4)
8. Enhance treatment of the first procedure	61 (81.3)	236 (70.4)	297 (72.4)
5. Intensity of pain in different people	37 (49.3)	241 (71.9)	278 (67.8)
16. Opioids tolerance in young infants	47 (62.7)	217 (64.8)	264 (64.4)
9. Respiratory depression as a side effect of opioid	39 (52.0)	223 (66.6)	262 (63.9)
17. Encouraging a child to endure pain	44 (58.7)	215 (64.2)	259 (63.2)
6. Ibuprofen & other NSAID agents' effectiveness	41 (54.7)	213 (63.6)	254 (62.0)
31. Analgesia schedule (continuous, persistent pain)	26 (34.7)	198 (59.1)	224 (54.6)
2. Neurological system at the age 2 years	46 (61.3)	173 (51.6)	219 (53.4)
15. Dosage increases beyond morphine dosage	40 (53.3)	179 (53.4)	219 (53.4)

4.6 Nurses' Attitudes towards Pain Assessment and Management

The number of correct answers among all participants (n=410) was normally distributed as indicated by the bell-shaped histogram below (Figure 4.2).

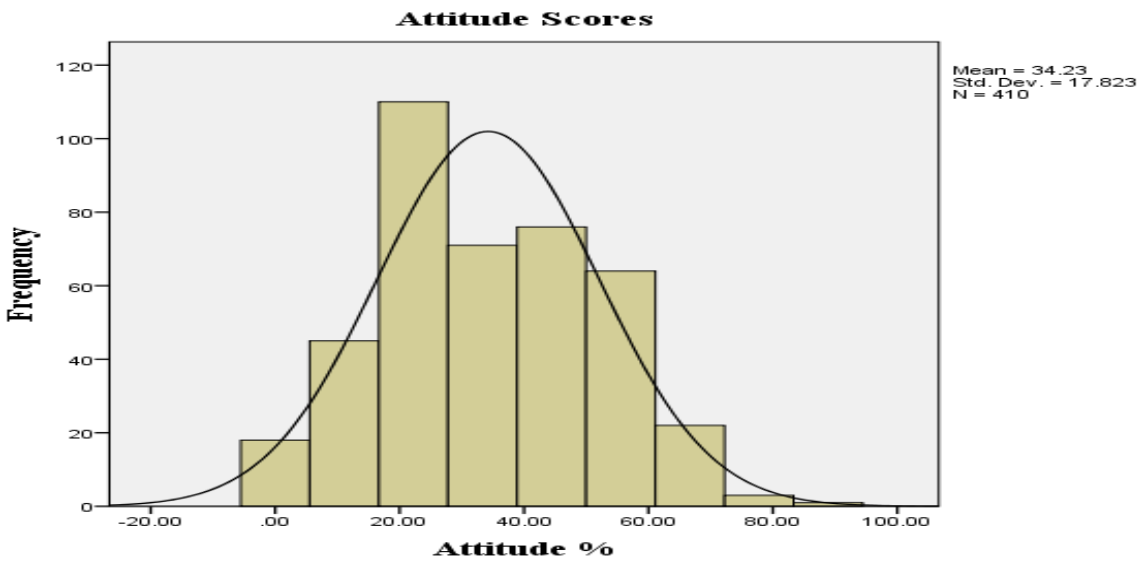

Figure 4.2. Frequency Distribution of Correct Answers - Attitude (%)

The individual number and percentage of correct answers to items relating to nurses' attitude are summarised in Table 4.8. A total of nine items measured nurses' attitudes toward pain and pain management in children. Out of these nine items assessed, the overall mean score of correct answers was 3.08 (SD = 1.60, range = 0–8), or 34% (SD = 17.82, range = 0.00%–88.9%). The Saudi nurses' mean total score was 2.57 (SD = 1.71, range = 0–6), or 28% (SD = 19.09, range = 0.00%–66.7%), while that of non-Saudi nurses was 3.19 (SD = 1.55, range = 0–8), or 35% (SD = 17.31, range = 0.00%–88.9%). No one in the two groups of nurses achieved complete correct answers. This suggests that nurses in SA have unsupportive attitudes towards pain assessment and management in the population of children, as less than half of the answers were correct.

A total of 31 items measured nurses' knowledge in relation to the assessment and management of children's pain, and pharmacological and non-pharmacological interventions.

Table 4.8. Participants' Correct Answers for Attitude Items

Item No & Content	**Correct answer rate N (%)**		
	Saudi Nurse	**Non-Saudi Nurse**	**Total**
13. Parental presence during painful procedures	42 (56.0)	223 (66.6)	265 (64.6)
18. Children's reliability for pain report	33 (44.0)	190 (56.7)	223 (54.4)
22. Advising a child to use non-drug techniques alone	14 (18.7)	86 (25.7)	100 (24.4)
32. A child requesting increased pain doses	28 (37.3)	207 (61.8)	235 (57.3)
34. A child is most accurate judge of his/her pain	28 (37.3)	144 (43.0)	172 (42.0)
35. Best approach for cultural considerations	26 (34.7)	136 (40.6)	162 (39.5)
36. Percentage of children over-reporting pain	11 (14.7)	61 (18.2)	72 (17.6)
37-A. Correct pain assessment (case study #1, part 1)	6 (8.0)	4 (1.2)	10 (2.4)
38-A. Correct pain assessment (case study #2, part 1)	5 (6.7)	19 (5.7)	24 (5.9)

There was no significant difference between Saudi and non-Saudi nurses with respect to their total mean attitude score as shown by t-test results (Table 4.9).

Table 4.9 Significant Difference in Attitude Items

Item No & Content	**Correct answer rate N (%)**			
	Saudi Nurse	**Non-Saudi Nurse**	**Total**	**t- test (*p*-value)**
22. Using non-drug techniques alone	14 (18.7)	86 (25.7)	100 (24.4)	*t*=-1.36 (.006)
37-A Correct pain assessment- (case study #1, part 1)	6 (8.0)	4 (1.2)	10 (2.4)	*t*=2.12 (.000)
Total attitude score				*t*=-3.06 (0.45)

Statistically significant differences (*p*=.000), however, were found in two of the nine items when each item was analysed separately.

Table 4.10 lists the attitude items with a low percentage of correct answers (<50%). As with knowledge items, many items (n=6) received a low percentage of correct answers by the Saudi and non-Saudi groups of nurses, ranging from 10 (2.4%) for item 37-A to 172 (42.0%) for item 34. Two of these six items asked who can accurately judge a child's pain intensity and children's over-reporting pain (34 and 36 respectively). In addition, two other items concerned clinical judgements relating to pain assessment in children (37-A; case study #1, part 1 and 38-A; case study #2, part 1), and the remainder related to managing a child's pain with non-pharmacological interventions alone (22) and the approach of choice for cultural considerations when caring for a child in pain (35).

Table 4.10 Attitude Items with Low Percentage of Correct Answers (<50%)

Item No & Content	**Correct answer rate N (%)**		
	Saudi Nurse	**Non-Saudi Nurse**	**Total**
37-A. Correct pain assessment (case study #1, part 1)	6 (8.0)	4 (1.2)	10 (2.4)
38-A. Correct pain assessment (case study #2, part 1)	5 (6.7)	19 (5.7)	24 (5.9)
36. Percentage of children over-reporting pain	11 (14.7)	61 (18.2)	72 (17.6)
22. Using non-drug techniques alone	14 (18.7)	86 (25.7)	100 (24.4)
35. Best approach for cultural considerations	26 (34.7)	136 (40.6)	162 (39.5)
34. A child is most accurate judge of his/her pain	28 (37.3)	144 (43.0)	172 (42.0)

The items (n=3) that received a high percentage of correct answers (>50%) are listed in Table 4.11. The item most participants (n=265, 64.6%) were able to answer correctly asked about the presence of parents during performing painful procedures for their child (13). One of the two remaining items (18) asked about the reliability of pain intensity

reported by children under the age of eight years and the other item asked about a specific explanation for a child who is in pain and requires an increase in doses of pain medication (32).

Table 4.11 Attitude Items with High Percentage of Correct Answers (>50%)

Item No & Content	Correct answer rate N (%)		
	Saudi Nurse	Non-Saudi Nurse	Total
13. Parental presence during painful procedures	42 (56.0)	223 (66.6)	265 (64.6)
32. A child requesting increased pain doses	28 (37.3)	207 (61.8)	235 (57.3)
18. Children's reliability for pain report	33 (44.0)	190 (56.7)	223 (54.4)

4.7 Correlation between Knowledge and Attitude Variables

Table 4.12 shows the correlation between the knowledge and attitude variables. Pearson correlation analysis was used to determine whether there was a correlation between the knowledge and attitudes scores. There was a statistically significant moderate correlation between these two variables (r=0.459, p= 0.000). That means participants who had high scores in knowledge also scored high in attitude.

Table 4.12 Correlation between Knowledge and Attitude Variables

Variable		N	Mean	SD	*r*	p
Knowledge & Attitude	Knowledge	410	15.04	2.957	0.459**	.000
	Attitude	410	3.08	1.604		

**. Correlation significant at the 0.01 level (2-tailed).

4.8 Difference in Knowledge and Attitudes Scores by Socio-Demographic Characteristics

Nurses' socio-demographic characteristics, which include age, years of nursing experience, years of paediatric nursing experience and self-rated knowledge competence, were compared with their total mean scores of knowledge and attitude to determine whether any of these demographic characteristics correlated with the scores (Table 4.13). There was no significant correlations between the ages of nurses in relation to their knowledge and attitude mean scores. A significant negative correlation, however, was found between nurses' years of paediatric experience and their mean score of knowledge (r=-0.12, p= .013), meaning that nurses with longer paediatric experience had higher levels of knowledge. There was a significant positive correlation between nurses' self-rated knowledge competence and their mean total score of attitudes (r=0.11, p=.021). Nurses who rated themselves as having a high level of pain knowledge also had a high level of correct answers in the measures relating to attitudes.

Table 4.13 Correlation between Knowledge and Attitude Mean Scores and Socio-Demographic Characteristics

Characteristic		**Mean (SD)**	**Knowledge Test (Sig)**	**Attitude Test (Sig)**
Age (y)	20 – 60	32.37 (7.22)	r=-0.07 (.145)	r=-0.57 (.250)
Nursing experience (y)	1 – 36	8.94 (6.33)	r=-0.08 (.076)	r=- 0.00 (.938)
Paediatric Nursing experience (y)	1 – 25	6.37 (5.02)	r=-0.12* (.013)	r=-0.07 (.118)
Self-rated knowledge competence		2.09 (0.65)	r=0.03 (.599)	r=0.11* (.021)

Note: (r) Pearson's test, *Significant at 0.05.

Inferential analysis using Independent t-test and one-way Analysis of Variance (ANOVA) were conducted to determine any differences in Saudi and non-Saudi nurses' mean scores of knowledge and attitude by their socio-demographic characteristics, such as gender, age, religion, ethnicity, highest nursing qualification, nursing experience years, paediatric nursing experience years, current workplace/hospital, and current area of practice. Additionally, Tukey's post-hoc tests were applied to compare subgroups of nurses and characteristics.

Significant differences in the mean total scores of knowledge and attitude were found in only three characteristics. Non-Saudi nurses who had paediatric experience between one and five years scored significantly higher on knowledge (F=2.84, p=.038), and attitude (F=3.47, p=.016) than the other age groups. In addition, Saudi nurses who worked in Hospital C had higher attitude scores (F=5.24, p=.001) than those who worked in the other four hospitals, while non-Saudi nurses who worked in this hospital scored higher on knowledge (F=4.46, p=.002) and attitude (F=10.02, p=.000) than those working in hospital A, B, D and E. Moreover, Saudi nurses who worked in ED scored higher on knowledge (F=2.68, p=.028) than those working in any of the other five working areas, while non-Saudi nurses who worked in PICU had a higher knowledge score (F=2.27, p=.047). Furthermore, non-Saudi nurses who worked in PSW had higher attitude score (F=4. 12, p=.001) than those working in PICU and other areas of practice (Table 4.14).

Table 4.14 Mean Knowledge and Attitude Scores by Socio-Demographic Characteristics

Characteristic		**Knowledge**			**Attitude**		
		Saudi Nurses	**Non-Saudi Nurses**	**Both Groups**	**Saudi Nurses**	**Non-Saudi Nurses**	**Both Groups**
		M (SD) **Test (Sig)**	**M (SD)** **Test (Sig)**	**M (SD)** **Test (Sig)**	**M (SD)** **Test (Sig)**	**M (SD)** **Test (Sig)**	**M (SD)** **Test (Sig)**
Gender	Male	14.77 (3.37)	15.32 (2.39)	15.11 (2.76)	3.46 (1.50)	3.73 (1.60)	3.63 (1.55)
	Female	14.87 (2.57)	15.06 (3.05)	15.03 (2.98)	2.39 (1.71)	3.16 (1.55)	3.03 (1.60)
		t=-0.12 (.109)	t= 0.38 (.253)	t= 0.16 (.787)	t=2.09 (.741)	t=1.66 (.928)	t=2.12 (.983)
Age (y)	20-25	14.32 (2.91)	14.56 (3.46)	24.42 (3.12)	1.96 (1.59)	2.89 (1.53)	2.35 (1.62)
	26-30	14.97 (2.69)	15.57 (3.11)	14.45 (3.03)	2.91 (1.62)	3.26 (1.58)	3.19 (1.59)
	31-35	16.15 (1.72)	14.85 (3.00)	15.01 (2.90)	3.15 (1.77)	3.07 (1.49)	3.08 (1.52)
	36-40	13.50 (2.12)	14.98 (2.71)	14.92 (2.69)	2.00 (2.82)	3.24 (1.52)	3.19 (1.56)
	≥ 41	10.00 (0.00)	14.46 (2.75)	14.37 (2.79)	0.00 (0.00)	3.33 (1.68)	3.27 (1.73)
		F=2.05 (.095)	F=1.68 (.153)	F=1.94 (.103)	F=2.25 (.071)	F=0.49 (.743)	F=2.68 (.031)
Religion	Islam	0.00 (0.00)	14.87 (2.48)	14.86 (2.62)	0.00 (0.00)	3.00 (1.48)	2.70 (1.66)
	Hindu	0.00 (0.00)	14.93 (2.77)	14.93 (2.78)	0.00 (0.00)	3.20 (1.66)	3.20 (1.66)
	Christianity	0.00 (0.00)	15.12 (3.09)	15.12 (3.09)	0.00 (0.00)	3.21 (1.55)	3.21 (1.56)
		F=0	F=0.13 (.878)	F=.311 (.733)	F=0	F=0.25 (.775)	F=4.13 (.017)
Ethnicity	Arab	14.85 (2.70)	16.00 (2.82)	14.91 (2.69)	2.57 (1.71)	3.75 (2.63)	2.63 (1.77)
	Asian	0.00 (0.00)	15.07 (3.01)	15.07 (3.02)	0.00 (0.00)	3.19 (1.54)	3.19 (1.54)
		t=0	t=0.61 (.745)	t=-0.42 (.263)	t=0	t= 0.71 (.175)	t= -2.78 (.162)
Highest Nursing Qualification	Diploma	14.44 (2.52)	14.45 (2.83)	14.45 (2.72)	2.12 (1.65)	2.81 (1.46)	2.58 (1.56)
	Bachelor	15.41 (2.86)	15.30 (3.05)	15.31 (3.02)	3.19 (1.65)	3.33 (1.56)	3.32 (1.57)
		t=-1.54 (.557)	t=-2.27 (.403)	t=-2.78 (.200)	t=-2.79 (.609)	t=-2.74 (.490)	t= -4.42 (.704)
Nursing Experience (y)	1-5	14.89 (2.86)	15.42 (3.36)	15.22 (3.18)	2.62 (1.79)	3.36 (1.51)	3.08 (1.66)
	6-10	15.00 (2.06)	15.07 (2.88)	15.06 (2.81)	2.75 (1.43)	3.17 (1.59)	3.12 (1.58)
	11-15	15.00 (2.00)	15.12 (3.15)	15.11 (3.09)	1.67 (1.52)	3.10 (1.67)	3.03 (1.68)
	16-20	0.00 (0.00)	14.47 (2.60)	14.47 (2.60)	0.00 (0.00)	3.00 (1.31)	3.00 (1.31)
	≥21	10.00 (0.00)	14.45 (2.32)	14.24 (2.47)	0.00 (0.00)	3.20 (1.57)	3.05 (1.69)
		F=1.10 (.353)	F= 0.81 (.519)	F= 0.81 (.523)	F=1.10 (.355)	F=0.43 (.781)	F=0.64 (.993)

Table 4.14 continued

Characteristic		Knowledge			Attitude		
		Saudi Nurses	**Non-Saudi Nurses**	**Both Groups**	**Saudi Nurses**	**Non-Saudi Nurses**	**Both Groups**
		M (SD) Test (Sig)	**M (SD) Test (Sig)**	**M (SD) Test (Sig)**	**M (SD) Test (Sig)**	**M (SD) Test (Sig)**	**M (SD) Test (Sig)**
Paediatric Nursing Experience (y)	1-5	15.02 (2.78)	15.62 (3.22)	15.43 (3.10)	2.70 (1.72)	3.50 (1.51)	3.26 (1.62)
	6-10	13.91 (2.02)	14.74 (2.63)	14.67 (2.59)	1.82 (1.53)	2.98 (1.55)	2.88 (1.58)
	11-15	0.00 (0.00)	14.72 (3.26)	14.72 (3.27)	0.00 (0.00)	2.86 (1.58)	2.86 (1.58)
	16-20	0.00 (0.00)	14.29 (2.72)	14.29 (2.73)	0.00 (0.00)	3.08 (1.55)	3.08 (1.56)
		F=1.58 (.211)	F=2.84 (.038**)	F= 2.62 (.050)	F=2.54 (.115)	F=3.47 (.016**)	F=1.79 (.147)
Current Workplace/ Hospital	Hospital A	14.29 (1.55)	15.35 (2.26)	15.01 (2.11)	1.57 (1.50)	3.24 (1.35)	2.72 (1.59)
	Hospital B	13.00 (4.58)	13.42 (1.36)	13.38 (1.78)	2.00 (1.00)	2.50 (1.06)	2.45 (1.05)
	Hospital C	15.76 (2.96)	16.51 (4.68)	16.28 (4.21)	3.82 (1.59)	4.35 (1.68)	4.19 (1.66)
	Hospital D	14.97 (2.96)	15.13 (2.26)	15.08 (2.47)	2.56 (1.56)	2.64 (1.34)	2.62 (1.40)
	Hospital E	14.00 (1.41)	14.90 (3.10)	14.89 (3.08)	3.50 (2.12)	3.30 (1.58)	3.31 (1.58)
		F=1.14 (.344)	F=4.46 (.002***)	F= 4.94 (.001)	F=5.24 (.001***)	F=10.02(.000***)	F=12.73 (.000)
Current Area of Practice	#OPD	12.86 (2.03)	12.00 (1.00)	12.60 (1.77)	2.00 (1.00)	1.67 (0.57)	1.90 (0.88)
	#ED	16.20 (1.30)	15.25 (2.21)	15.41 (2.09)	4.00 (1.58)	3.92 (1.28)	3.93 (1.31)
	#PICU	15.50 (2.30)	15.58 (2.64)	15.57 (2.58)	2.14 (1.77)	2.95 (1.68)	2.81 (1.72)
	#PW	12.33 (3.14)	15.08 (2.29)	14.84 (2.47)	2.83 (2.56)	3.15 (1.30)	3.12 (1.43)
	#PMW	15.13 (3.33)	14.44 (3.96)	14.55 (3.86)	2.73 (1.62)	3.17 (1.48)	3.10 (1.50)
	#PSW	14.86 (2.34)	14.67 (3.29)	14.72 (3.02)	2.93 (1.43)	3.97 (1.48)	3.66 (1.52)
		F=2.68 (.028**)	F=2.27 (.047**)	F= 3.27 (.007)	F= 1.40(.232)	F=4.12 (.001***)	F=5.120 (.000)

#Outpatient department (OPD), #Emergency department (ED), #Paediatric intensive care unit (PICU), #Paediatric ward (PW), #Paediatric Medical ward (PMW), #Paediatric Surgical ward (PSW)

Note: (t) t-test, (F) one-way ANOVA
**Significant at 0.01.
***Significant at 0.001

4.9 Summary

This chapter has presented the results from Phase 1 of the study. Most of the participants were women and non-Saudi nurses. The overall mean scores of knowledge and attitudes among Saudi and non-Saudi nurses were generally low. The participants had the highest scores (87.6%) on item 21which related to the adjustment of subsequent doses of opioid medication, and the lowest (0.5%) on item 33 which asked about a useful drug for treatment of pain in children. There was a statistically significant positive correlation between knowledge and attitude scores. A statistically significant positive correlation was also found between years of paediatric experience and mean score of nurses' knowledge.

In the following chapter the results from Phase 2 of the study are reported, where consenting nurses, largely expatriate nurses, discussed their experiences when caring for children with pain.

Chapter 5 Phase 2 Qualitative Analysis of Interview Data and Presentation of Results

5.1 Chapter Introduction

This chapter presents the results from the Phase 2 of the study based on the data analysis of semi-structured interviews, as reported in Chapter Three of this thesis. The aims of Phase 2 study were to identify (1) the barriers and facilitators to effective pain assessment and management in infants and children in SA, and to identify (2) cultural factors impacting Saudi and non-Saudi nurses' pain assessment and management in infants and children in SA. Following is a description of the participants for this part of the study. Exemplars are used throughout to illustrate the three main themes and subthemes that emerged during the analysis.

5.2 Overview of Participants

The participants for Phase 2 were 17 RNs who also participated in Phase 1 and who consented to participate in the Phase 2 comprising face-to-face interviews. The participants worked in the paediatric medical and surgical wards or the emergency departments of three of the participating hospitals in the Riyadh region of SA. All participants were female whose ages ranged from 24 and 50 years. Only one participant was from SA, the rest were expatriate nurses from India (n= 7) and the Philippines (n= 9). The length of their nursing experiences ranged from 1 to 24 years, while their work

experience with paediatric patients varied between 1 and 20 years. Table 5.1 presents the demographic information relating to the participants who were interviewed.

Table 5.1 Participant's Demographic Information

Participant (code)	Gender	Age	Nationality	Qualification	NEY	PNEY
A (0043)	Female	29	Filipino	Bachelor	8	6
B (0046)	Female	44	Indian	Bachelor	21	3
C (0068)	Female	48	Filipino	Diploma	20	10
D (0078)	Female	50	Filipino	Bachelor	24	20
E (0080)	Female	28	Indian	Bachelor	7	7
F (0082)	Female	25	Saudi	Bachelor	1	1
G (0106)	Female	27	Indian	Bachelor	5	1
H (0111)	Female	32	Filipino	Bachelor	8	1
I (0125)	Female	24	Filipino	Bachelor	3	1
J (0261)	Female	27	Filipino	Bachelor	5	3
K (0270)	Female	29	Filipino	Bachelor	5	2
L (0298)	Female	40	Filipino	Diploma	17	10
M (0309)	Female	32	Indian	Bachelor	10	10
N (0314)	Female	29	Indian	Bachelor	6	6
O (0327)	Female	25	Indian	Bachelor	4	1
P (0352)	Female	27	Indian	Bachelor	5	5
Q (0391)	Female	31	Filipino	Bachelor	7	1

*NEY=Nursing experience years

5.3 Themes and Sub-themes

Following analysis of the interview data, several themes and sub themes emerged. The emergent themes and sub-themes are summarised in Table 5.2. The text following this summary table illustrates each theme and its sub-themes in detail with the support of exemplars from the transcribed interviews.

Table 5.2 Interview Data Analysis: Theme Structure

Theme	Subtheme
Children's Pain: A Low Priority	Lack of supply of pharmacological and non-pharmacological pain management methods. Nursing staff shortage and higher patient loads impact pain assessment. A low priority given by physicians to children's pain.
Culture, Religion, Mistrust, and Pain	Beliefs/misbeliefs: Religion, rituals, culture, and differences. Language differences, communication and understandings/misunderstandings. Parents' distrust of expatriate nurses' expertise.
Understanding/Misunderstanding childhood pain behaviour	Detecting and assessing childhood and cultural expressions of pain. Understanding pain through helpful parent/child relationship. Uncooperative parents and families, misunderstandings and pain. Nurses' limited knowledge and experience with childhood pain. Lack of educational opportunity.

5.3.1 Children's Pain: A Low Priority

The theme "Children's pain: A low priority" illustrates how pain in children was not considered to be a high priority of care by either nurses, doctors or hospital administrators. Pharmaceutical and non-pharmaceutical supplies to support the relief of pain through the administration of prescribed analgesia, adjuvants or alternative approaches for children in pain were unavailable, or limited in the participating hospitals. For this reason, family members and sometimes nurses, purchased supplies externally. Additionally, the participants complained of huge demands on their time, a shortage of nursing staff and of

being overwhelmed by their heavy patient loads. They did not have time to assess pain or use the tools that were provided for this task. The nurses indicated that, for these reasons, they could not provide optimal care to children who were in pain. Furthermore, the treating physicians did not routinely conduct comprehensive assessments for pain in children and nor did they routinely prescribe analgesia. This low priority of care and attention given to children's pain is captured in the following three sub-themes.

Lack of supply of pharmacological and non-pharmacological pain management methods

Providing effective care for children in pain was hampered by the hospitals where the participants worked. A range of pain management methods were not readily at hand and available on the ward/unit because they were not supplied regularly or routinely. The lack of immediacy and availability of supplies impacted nurses' attempts to manage a child's pain. Indeed, it inevitably led to delayed analgesic relief when prescribed. Delayed analgesia leads to uncontrolled and unrelieved pain. As one participant reported:

> *The other thing is medications which should be supplied regularly and made available to us when necessary. If the patient is in pain, analgesics need to be here in advance because if they are not available, this may result in delays in our attempts to control a child's pain.* (Participant N)

As with supplies of medications, non-pharmacological pain management methods, such as heat and cold compress packs, were also in limited supply or unavailable to the ward staff. Pain management methods, such as hot-cold packs could take many weeks to be supplied when nurses made a formal request. In the absence of an immediate supply, family members were asked to purchase supplies from external pharmacies or other

sources. Nurses argued that the lack of availability of supplies and/or their delayed delivery hindered their ability to care for children. As another participant stated:

> *Sometimes we need something but it is not available here in our hospital. Our hospital does not routinely provide us with what we need to manage pain and this hinders us. For example, if a patient has swelling and this swelling is associated with pain, then we need a cold or warm compress pack to manage the pain, but these things are not available here at all times. Sometimes, we need to write a request and this takes weeks to be supplied or sometimes we need to ask the family to buy them from outside. This hinders us as nurses when caring for patients.* (Participant A)

Moreover, an inefficient supply system for pain medications ordered from hospital pharmacies was highlighted. The nurses' ability to manage a child's pain in a timely fashion was affected by delays in processing and delivering prescribed pain medications by the hospital pharmacy. The prescription of medication via an intravenous route suggests the need for immediate attention by the prescribing medical doctor. As Participant N reported:

> *There were usual delays in getting medications from pharmacy… the patient was in pain and the doctor ordered I.V. medication, but the pharmacy delivered it too late. Such a situation hindered the effectiveness of our health care.*

Nursing staff shortage and higher patient loads impact pain assessment

Nurses felt that they were unable to focus on caring for children in pain and to address all their related needs due to inadequate staffing levels and high patient care loads. The following example demonstrates this:

> *We could not attend to the patient regularly because only two nurses were working on every shift and sometimes we had more than 17 patients. On every shift, there is a maximum number of three nurses who care for the whole paediatric ward, that's the maximum, but sometimes, like today, only two nurses and caring for more than 12 patients. Each nurse has six patients or more; some of them have surgery, so the only way that we can do is to prioritise between them.* (Participant A)

Another participant concurred over this problem, explaining that it was difficult to see or attend to each patient regularly for assessing, reassessing or managing pain:

> *The shortage of nurses here and the heavy work and heavy duties really affect my practice in relation to pain assessment and management. A lack of time, because here we have more patients to take care of. This means that it is difficult to attend to each patient regularly to assess, reassess and manage pain.* (Participant F)

Despite the availability of pain assessment tools, nurses did not routinely use these in practice to assess a child's pain level and intensity. As one participant put it:

> *We use assessment tools in practice, but not all the time, because usually there is no time to do that as we have many patient responsibilities and duties here and we cannot use the tools every time.* (Participant E)

A similar response was given by another participant who reported a lack of regularity in the use of tools when assessing pain in children due to the large number of patients and work overload:

> *For me, I don't use pain assessment tools regularly because most of the time we are very busy with patients, so I do not have time to use them regularly*. (Participant F)

A low priority given by physicians to children's pain

The participants also noted that their ability to optimally manage a child's pain was hindered by physicians who delayed their assessment of the child, seemingly ignored the distress of a child or did not believe that a child was in pain. As a result, analgesic medication was either not prescribed or the prescription was delayed, and often to the detriment of the child whose pain invariably escalated. One participant said:

> *We called the doctor two to three times and each time he said the same, I would come, but he actually came late, after around one hour, and then analgesia was ordered and administered to the child who had experienced and suffered so much pain because of this delay. Sometimes, doctors do not order analgesic for children. They think that their pain will subside and sometimes they ignore children as a child usually cries. This is a belief, so we face difficulties in managing pain in children because of some doctors here.* (Participant B)

Another participant commented that physicians did not see or assess the child themselves. In these cases nurses relied on phone orders from doctors who were unfamiliar with the child's medical history:

> *Doctors, because they are not directly caring for the patients. They only come for about one hour per day. They usually relay on phone order and we nurses have to manage the patients. Sometimes, doctors are unfamiliar with the child's case and order analgesics without seeing him or assessing his pain*. (Participant I)

Further to this, some physicians dismissed or underrated nurses' concerns. Some physicians did not return calls from nurses regarding their concerns about the care of a child. Others did not wait to hear the nurses concerns:

> *Some doctors did not call back when we contacted them or when they called us they did not listen to our report. There was a child with severe pain and because it was severe, I needed to inform the doctor to come to see the child, but when I contacted the doctor, he said I have already prescribed analgesia for the child then he hung up the phone without listening to what I had to say*. (Participant Q)

This theme shows that the ability of the nurse participants to effectively manage children's pain was greatly inhibited by the low priority given to pain and its management. This is reflected by the lack of available pain management methods and poor pharmaceutical and non-pharmaceutical supplies, staffing concerns, and the physicians' lack of responses to nurses' concerns and the low priority they give to children's pain. Some nurses also give a low priority to children's pain.

5.3.2 Culture, Religion, Mistrust and Pain

Culture, religion, mistrust and pain shows how the cultural differences/diversities of the expatriate nursing workforce impacts nursing care and the management of children's pain within the health context of SA. This theme shows the challenges faced by some expatriate nurses who could not provide the necessary pain care and management for children in SA because of the parents' mistrust of them and their differing religious values and beliefs. This theme also shows how care provision by nurses was complicated by language differences, understanding Arabic and Arabic traditions which influenced the communication processes, mitigated pain relief for children and the quality of pain care. In addition, in the face of the many cultural differences, medical doctors expected nurses alone to mediate with parents in relation medical treatment prescriptions. These are captured in the following three-subthemes.

Beliefs/misbeliefs: Religion, Rituals, Culture, and Differences

There were a range of differences in relation to religious beliefs, cultural traditions and rituals among the Christian and Hindu expatriate nurses and the Muslim parents of the Saudi children for whom they cared. These differences were obstacles to the care of children in pain as described by many participants. The differences in culture, religion and traditional beliefs were a source of tension between the parents and nurses, as well as doctors; the latter expected nurses to resolve any misbeliefs or disagreements over treatment or to act as directed regardless of the parents' preferences or wishes for their child. One participant described her experience as follows:

> *I'm an international nurse and because of this, I faced difficulties. Some parents who were Muslim asked me about my religion and when I said Christianity, they did not allow me to care for their children.* (Participant B)

It was also clear from the responses of the participants that they encountered difficulties within their workplace due to the religious and cultural beliefs of Muslims who might reject nursing care if certain religious rituals were not expressed before giving care. Nurses argued that beliefs and religious rituals need to be fully understood by non-Muslim nurses and incorporated into their routine nursing care and approaches to patients in order to ensure there is no rejection of or objection to care of children. For example, one participant said:

> *As Christian nurses caring for Muslim patients, we need to understand their religious beliefs and everything, for example, before we do anything for them, we need to say Bismillah (by the name of God). They are very religious people and we need to say that because if we do not say it, they will not allow us to care for them. Sometimes also*

> *they ask, are you reading the Holy-Quran? If I say no, they will not cooperate with us.* (Participant H)

Another participant was aware of the religious differences between themselves as Christian nurses and their Muslim patients, recognising the importance of understanding patients' cultural and religious mores to support the delivery of appropriate health care, although no elaboration was given on how or why this was an issue:

> *Muslims are different from Christian people in terms of religion, beliefs, values and culture. That is why we face challenges during working hours. I know that while treating them, I have to look after them, I have to provide them with good care possible, but in order to do so, I need to understand their difficult culture or to be one of them.* (Participant J)

Some of the participants also encountered constraints and challenges from some families who were using religious or traditional approaches with their child while in hospital. For example, the Islamic culture and tradition involves several spiritual and religious healing practices which are derived from the Islamic doctrine. These practices include drinking Zamzam water (a holy water from the Zamzam well in Makkah), reading verses of the Quran or saying prophetic supplications on liquids, such as oils and then using them (Abudari et al., 2016; AlYateem & Al-Yateem, 2014). Such practices were adhered to by some Muslims whilst in hospital, and resulted in tension between parents and nurses and hindered the provision of appropriate care to children who were in pain. Two participants remarked on this as follows:

> *Families here have particular religious beliefs. Based on these beliefs, they put oil on the child's body, expecting that it is better than treatment and medication. These*

beliefs and practices hindered the care we could give to children because some families believed in them and refused or did not adhere to [medical] treatment. (Participant L)

Some patients used pieces of paper written from the QURAN and they put these in water and drank the water. But that's scientifically wrong for us. The doctor was angry because of this and said 'why did you allow the child to have this?' We asked the parents not to do this while in hospital, but we faced huge opposition from them. We are from a different culture and therefore it's difficult to prevent them from what they are doing or thinking because that's correct from their perspectives. (Participant A)

Whilst the expatriate nurses were challenged by some of the traditional practices and the beliefs of parents of children, they were also mindful of the need for respect for these traditions and beliefs. Nurses expressed some tension in these aspects of care as they were equally aware of the lack of scientific evidence for these practices and that the medical officers might remonstrate them for allowing traditional practice to prevail. Nurses also experienced pressure from the medical doctors who expected them to mediate with parents about the treatments they prescribed. Exacerbating these tensions were the challenges associated with language and communication.

Language differences, communication and understandings/ misunderstandings

As previously explained in Chapter One, the majority of healthcare providers in SA are expatriates and English is their second language. As a result, English is the most widely used language of communication and documentation in health settings in SA along with Arabic native language when necessary (Al-Shahri, 2002). However, most Saudi patients and their families cannot speak English or have limited ability to speak English; Arabic

is their primary language (Aboshaiqah, 2016). This complicated the situation for the nurses who were not competent in Arabic or could not speak this language.

During the interviews, a wide variety of responses were provided regarding the lack of ability to speak with patients in their Arabic language and understand what they were saying. The participants, who were largely multilingual and English speaking, were dissatisfied because of their inability to understand the Arabic language. This limited understanding and the conversations they could have with the children and their families. It increased the challenges that are inherent in conducting a pain assessment, evaluating the pain and finding the most appropriate approaches to pain management. This was best described by Participant A:

> *The first thing is the language difference which is the most difficult barrier that I encountered here. I cannot communicate with mothers and children as they are all Arabic speakers. I just know a little in the Arabic language. So sometimes we cannot fully understand each other. I want to help them, I want to alleviate the child's pain, but sometimes I could not do this because of this barrier.*

Not being able to explain a treatment process to the child or the child's family in the Arabic language was an important concern. It inhibited the participants' ability to obtain or exchange information and to convey details about what they would like to do or what the parent and child should do. It meant that nurses and parents did not understand each other. According to a participant:

> *The language barrier; sometimes I want to do something for the child, but I cannot explain this in the Arabic language. The reason is that my Arabic language is not really perfect. Sometimes we cannot adequately explain to the child what we want to*

give them or do, or even what we want him to do. It's very difficult, this language barrier. (Participant H)

Another non-Arabic speaking participant concurred and commented on how often misinterpretation and misunderstandings arose due to the language barrier and related difficulties when communicating with the child's family regarding the child's pain and its related complains:

For example, sometimes mothers tell us something about their children in pain and we do not always understand them. Sometimes we also incorrectly interpret what they say to us about their child's complain of pain or we misunderstand them. (Participant P)

Learning how to speak with patients in their own language was highlighted as essential in delivering adequate healthcare for patients with a different first language:

I think caring for infants or children of Saudi nationality is quite difficult because of the language barrier, so it is important for us to learn their language and apply it in practice to provide them with adequate care and treatment. (Participant C)

In addition to the language barrier, the participants indicated that the provision of good management for children in pain was impeded by the ineffective communication of some nurse colleagues. Misunderstandings also occur between nurses not only because of communication but also because some nurses do not know how to explain the child's health status. This was stated clearly by Participant E:

One more thing is my colleagues. Some nurses did not communicate effectively with us regarding patients' care. Because of this, we could not provide effective pain management. There was also misunderstandings because some nurses did not know

how to give us full details or how to appropriately explain the patient's pain status and experience.

Another participant shared similar sentiments regarding the ineffective communication and collaboration in providing healthcare by some nursing colleagues. The absence of an adequate assessment of pain on admission means that subsequently nurses are left without important base line information:

I think my colleagues sometimes affected me because some of them did not help or did not correctly assess patients. For instance, when there was a new admission, some nurses did not make an accurate assessment and simply said that the patient has pain, without identifying the location, nature, level, intensity or what helps. What if the patient has too much pain? This sometimes confused and hindered us to deal with pain. (Participant C)

Parents' distrust of expatriate nurses' expertise

Parents' behaviours were identified as a barrier to effectively dealing with or responding to children in pain. As noted by some participants, some parents distrusted their ability to provide good nursing care, thinking that they did not understand how to care for children in pain or that ineffective care might be provided to their child. For instance, one participant said:

Some fathers and mothers thought that we did not understand pain or we wouldn't provide proper care for their child. They did not trust us as nurses and they thought that we did not have the ability to take care of patients. (Participant E)

This, however, went beyond mere distrust and unwillingness to accept the nursing care provided to the child, resulting in conflicts and demands, such as asking for analgesics even when the child was not in pain:

> *We usually had difficulty in assessing pain due to what the parents thought. There were conflicts. For example, a child was not in pain, but the parents were concerned and said the opposite. They asked for medication even though the child was not in pain. I think the children's family needs to be educated, not only us as nurses, but also parents, so that they will be more inclined to cooperate with us and we can give the best care to their children*. (Participant J)

Emphasising the level of mistrust of expatriate nurses, Participant L was unable to convince a parent that their child had been given analgesia despite her best efforts. This nurse emphasised the importance of educating parents about pain and its treatments and stated:

> *Education is important for mothers. Some mothers asked us to give pain relief to their children, but we had already administered that. We could not convince them until we called the doctor and then he explained to them*.

In some cases, nurses were also discouraged and actively prevented by parents from being able to assess or observe and manage their child who was in pain. This was best stated by one participant as follows:

> *Mothers did not like us to be with their child. Some mothers said, 'sister I will manage that by myself, you can go'. They were uncooperative with us when we wanted to provide pain care and treatment. They said 'no sister, no need, no need', that's what they usually said.* (Participant M)

The above exemplars suggest that the nursing care provided by expatriate nurses to children in pain in SA was thwarted by the cultural, religious and traditional beliefs of parents and that the expatriate nurses could not speak Arabic. Differences in culture, religion, traditional beliefs, misbeliefs, and language and communication acted as barriers to their ability to provide optimal pain care and achieve effective pain relief for the children in their care.

5.3.3 Understanding/Misunderstanding Childhood Pain Behaviours

Understanding/misunderstanding childhood pain behaviours shows how participants were unable to provide effective care for children in pain because of a child's inability to communicate pain. For children who are not verbal or cognitively able, communicating pain may be evidenced in a range of behaviours that needed astute observations from nurses and parents and the cooperation and understanding of parents in order to detect pain, and assess and evaluate its course. Parental cooperation and participation in interpreting and understanding the pain behaviours of each individual child and establishing a trusting relationship with the child was essential to pain management. In the absence of this, caring for children in pain was all the more challenging for nurses.

Detecting and Assessing Childhood and Cultural Expressions of Pain

The majority of participants argued that caring for children in pain was challenging because children often do not communicate verbally that they are in pain. Children may frequently cry, and this may be for pain or a range of other reasons, or they may be very still and quiet despite pain. Determining or establishing pain and assessing it was a vexing task. Many nurses did not trust a child's expression of pain; the child's behaviour was

interpreted/misinterpreted by the nurse to determine the veracity of pain. The following statements are typical examples of these:

> *Some children around the age of eight avoid informing us or do not react to or show their pain because they do not want to take medicines or they are afraid of needles and treatment. This was a barrier for us in providing good care for them*. (Participant J)

I found it difficult to care for children in pain, especially those who were silent, not talking or their behaviour was like this. (Participant G)

> *She started crying, crying, crying and she did not stop until I took my hands off. It was confusing for me because if a child cries, it could mean that the child is hungry, thirsty or wants their mother. This was one of the things that affected me when caring for some children.* (Participant H)

Pain in children was assessed and evaluated based on the nurse's judgement, rather than on the child's related experience, as described by a participant who said:

> *Children do not understand pain. They also cannot tell an exact pain level. For this reason, we depend on our assessment and we inform the doctor of a score from our assessment for pain.* (Participant N)

With children who were verbal and able to express pain, nurses did not believe the child's pain score. They continue to exercise their own judgement about the level of pain the child experiences. Nurses believed that there were differences in children's tolerance levels which they argued meant their pain may not be as high as stated. One participant said:

If the child indicates a score for their pain on an assessment scale, we do not believe this because each child has a different pain tolerance. Some children actually have a pain level of only 3 out of 10 but when we ask them, they say 8 or 9. (Participant O)

Some participants attributed the nationality of the child to the differences they observed in behaviours they related to pain tolerance. They asserted SA children had a low tolerance for pain compared to children from their own and other cultures:

Some differences were noted. I think Saudi children have a low tolerance for pain, unlike children in my home country, who have a high pain tolerance. (Participant H)

Another participant concurred on the subject, stating that children of Saudi nationality always expressed a high level of pain and did not tolerate severe pain, compared to other children who were from different parts of the world:

Saudi children are always in high pain. They do not tolerate much pain. I have cared for many children from different nationalities; from Egypt, India and Sudan, but Saudi children do not tolerate as much pain when compared to them. (Participant B)

With regard to pain experience, some participants commented on this area, stating that when some children cry, this does not necessarily indicate that they are in pain. They believe that children lie or pretend to be in pain; that they seek parental attention and affection. For example, two participants stated:

Sometimes we care for children and we give pain medicines to them. Sometimes it is normal for children to cry but we faced problems with some parents regarding this. I think some children like to cry but their fathers or mothers think that they are in pain. Sometimes there is no pain; children are like that, just lying or pretending to be in

pain. A child who is in real pain struggles and moves a lot on the bed, but this was not observed on many occasions. (Participant B)

Some children say that there is pain, but maybe they pretend to be in pain or want attention from their parents. (Participant M)

Another participant also commented that a child's expression of pain is doubted. The child is prone to changing his/her mind. In this way they argue that the child is not like an adult whose expression of pain is more reliable and can be trusted:

If children say that they have too much pain, we usually do not take any action. We just wait for a while to check it out. If the patient is an adult, yes we take action, but for children we cannot because they change their mind. For example, if you ask children later how you feel now, they will say no more pain. (Participant O)

In contrast, another participant believed a child's expression of pain to be true. She suggested that placebo was only effective to adults and not appropriate for a child:

Children do not pretend to be in pain. They tell the truth, so I think we cannot say a placebo is effective for them, maybe for adults only. There is no need to give children a placebo as children usually do not lie. This is what I have observed; they tell the truth if there is pain. (Participant D)

Additionally, children are more active than adults and if they are experiencing pain, they will not be inclined to play, rather, they will remain quiet in bed, as another participant described:

Children don't usually stay in bed for a long time. They are more active than adults and most of the time, they are playing. If they are not feeling well or have pain, they may not play and will stay quiet. (Participant G)

Understanding Pain through Helpful Parent/Child Relationship

Several participants noted that some parents were cooperative and helped them to understand the child in pain which helped them in practice. These cooperative parents were regarded as a supporting factor in caring for children in pain and enabled the nurse to assess children's pain. Parents provided information that helped them when assessing pain before and after surgery and with details about the child's history. The following examples are illustrative:

The pain history that we get from the parents on admission helps us to care for the child, especially after surgery. We can use this information to compare pain levels, before and after surgery. (Participant Q)

The other thing is parents, because children usually listen more to them than us. So we need parents here to provide us with the necessary details and information about their child's pain and its meaning and history. (Participant C)

Establishing a trusting relationship with a child facilitated nurse–child communication, cooperation and pain management, as described by one participant:

For me, I talk more to paediatric patients. I usually communicate with them and joke with them to make them happier. As nurses, we seem strange to some children. Because of this, I usually introduce myself and joke around with them to develop a relationship with them. These things encourage children to cooperate and share their feelings of pain. (Participant G)

Further, children who understood pain and were able to adequately express their feelings and discomfort relating to pain were highlighted as a significant factor that helped in making decisions and assessing and managing pain. For example, one participant said:

> *If the child has the ability to clearly express and explain his feelings, then it is easy for us to assess and manage pain.* (Participant P)

Uncooperative Parents and Families, Misunderstandings and Pain

Some participants stated that the parents lacked knowledge in situations where a parent did not cooperate with nurses when they were assessing and managing pain. Parents did not understand that preventing the attention of a nurse when their child was distressed meant their child might not receive timely pain relief. Participant G for example said:

> *Parents sometimes would not allow us to effectively assess their child's pain. If the child started to cry when we were assessing pain, they asked us to stop or to come later. This delayed the management and treatment of a child's pain. This may be due to the parents' lack of knowledge. They were not thinking about what was good or helpful, their concern was only about pain and their children when they cried.*

Another participant claimed that some parents stayed with their hospitalised children but they did not interact with nurses nor did they notify them when their children were in pain:

> *Some parents stayed with their children, but they were not interested as they did not report to us when their children were in pain.* (Participant A)

The assessment and management of pain in children was hampered at times by parents and/or relatives who did not seem to want to be involved in the care of their child:

The other thing is that mothers sometimes did not provide information when we were assessing pain of their children and remained uninvolved. (Participant I)

During visiting time, some relatives did not allow us to assess pain or give care for their child and asked 'sister can you do it later; not now please'. (Participant C)

Parents might refuse care due their lack of knowledge about pain relief measures. They did not understand that the pain of an IM or IV injection might also assist in the relief of pain. They did not want injections for pain relief. They demanded treatment alternatives. Pain inflicted through an injection given to the child was distressing for some parents, as described by Participant B:

Parent; sometimes when we go to the child, the mother says 'no, I do not like that, then she refuses what we need to give. Some parents do not have knowledge and should be educated. Parents refused treatment because they did not want their child to experience pain. For this reason, they asked us to change injections to oral medication.

Nurses' Limited Knowledge and Experience with Childhood Pain

The participants themselves felt that their provision of quality nursing care for children in pain was inhibited by some of their own limitations. They readily acknowledged that they were unable to meet the children's care needs regarding pain management because of their lack of knowledge and limited professional nursing experience, which influenced their actions and decisions towards managing a child's pain. A good example of this is as follows:

Well, I think my knowledge about children's pain is limited. My experience also may not be sufficient to care for children and effectively manage their pain. I do not have enough knowledge and experience in the speciality area of paediatrics or paediatric

pain, or in the care of children. I only have a general BSN in nursing and I think this adversely affects me sometimes when looking after children with pain. (Participant E)

Others stated that professional nursing experience regarding paediatrics may vary among nurses, affecting their confidence in their nursing care when dealing with children in pain. Participant A said:

A lack of nursing experience was one of the barriers that we faced here. Our hospital has new nurses. Around two-thirds of nursing staff here are new. Most of them have limited experience or no experience. This means that they may not know how to care for critical cases and patients in pain.

To support this above acknowledgement, pain was not assessed when parents notified the nurses in charge about their child who had discomfort and pain:

Sometimes parents say that their child is suffering pain but when we go to the child, we find him asleep, and then the parent says that the child was crying a while ago because of pain. This causes confusion for us and we constantly face this situation. (Participant Q)

Many participants expressed fears, concerns, caution and resistance to using opioids in their pain management practices. They were concerned about the possibility of addiction and respiratory depression when administering an opioid to children in pain. This is illustrated in the statements below:

The pharmacologic methods that we use here include pethidine and morphine. We give these medications but you know these can affect the child's respiratory rate and may result in addiction. So we use them with caution. (Participant I)

Pharmacological interventions, such as morphine, are administered based on the doctor's order. But I think it is better to avoid it because of the high risk of addiction and that's really a problem. (Participant G)

Some children do not need opioids as their pain will subside without these medications. This is what I think so I usually do not give opioids on first request. I just wait to check the child's pain, because it is not good to give them opioids; they are children. (Participant M)

Some nurses offered excuses to avoid giving opioids to children who had been assessed as needing such medications:

*If the child is assessed and an opioid medication needs to be given, the nurse says ooh, maybe he is hungry, or the child wants his mother to be around; nurses usually say things like this. They do not like to give opioids. (*Participant O)

Related to the concerns about opioids, children who cried or expressed pain were also seen as being addicted to opioid analgesics. As one participant stated:

The child was ready to be discharged, but she was crying. At that time, the nurse who was looking after her said to me that the child is crying because she is addicted to narcotics. (Participant K)

Another participant expressed a similar belief about children requesting analgesics:

The child was crying and screaming 'I need a pain killer', 'I need a pain killer'. I think he was addicted to narcotic medications. (Participant L)

This problem regarding the lack of knowledge and understanding about pain in children was stressed by a participant who said:

Some nurses here have incorrect information and beliefs. They think that children do not feel pain. This is what I have noted; some nurses need education. They think that children can tolerate much pain, unlike adults. They also think that children who suck their thumb is free of pain. I'm not agree with them. (Participant O)

The aforementioned exemplars depict a range of poor knowledge and misbeliefs about pain in children and its management. These included the ongoing fears and concerns about the use of opioids and the risks of addiction, placebo uses and pain tolerance and behavioural responses to pain in children. Nurses realised the limitations that they have in relation to their own knowledge, understanding and professional nursing experience with children in pain.

Lack of Educational Opportunity

In striving to overcome the lack of knowledge, some participants emphasised the need for professional education and training on paediatric pain and its management. This was because the hospitals in which they worked did not routinely provide this for them. The participants recommended that educational opportunities should be offered to them as they were the predominant group involved in patient care. They expressed their motivation and willingness to attend in-service education and reinforced their desire to keep themselves up to date and gain the necessary knowledge and skills as a way to optimal health outcomes for children in pain. Participant J, for example, said:

I have been working here for eight months. I have not attended any educational activities on children's pain. This is because our hospital does not conduct these. It is important for this hospital to offer education and training for us because we on the

front line of patient care. We need to gain knowledge not only to help children with pain, but also to help their families and parents.

Additionally, it was felt that continuing in-service education and training could improve knowledge and enable the nurses to provide better healthcare for their patients in pain. Emphasis was placed on pharmacological interventions and medication administration:

I think we have training and seminars here, but they are rare. This hospital should provide us with ongoing effective education and training about paediatric pain and pain assessment and management, particularly pharmacology and giving medications. This would help us to update our knowledge and give better healthcare to our patients. (Participant A)

This theme highlights the nurses' lack of understanding of childhood pain and its related behaviours. Nursing care was hampered not only by the child and the child's family, but also by the nurses themselves. Parental involvement and participation in the diagnosis and management of pain was useful for the participants in addition to other factors, such as establishing a trusting relationship with the child during hospitalisation.

5.4 Summary

This chapter has presented the results from the Phase 2 study which comprised three main themes relating to children's pain as a low priority, the impact of differences in culture and religion that lead to mistrust, and understanding/misunderstanding childhood pain behaviours. The results indicated that the ability of expatriate nurse participants to care for or respond to a child in pain was inhibited by the low priority given to children's pain

and its management by nurses, doctors and hospital administrators. This limitation includes a lack of or unavailability of pharmacological and non-pharmacological methods and supplies to support relieving pain, lack of pain prescriptions for analgesia, and ignorance to child and pain. The results also indicated that nurse participants were hindered in their care by the language difference, mistrust and religious rituals, practices, values and beliefs that they faced in the SA health context. Other inhibitory factors included poor intra-professional communication, lack of knowledge and professional experience among nurses regarding children's pain and its management, and parental misunderstandings, refusals and poor knowledge and cooperation in relation to their child pain care and treatment.

In the following chapter, the key findings that emerged from Phase 1 and Phase 2 of this study are described and discussed in light of the research questions and previously published works.

Chapter 6 **Discussion and Conclusion**

6.1 Chapter Introduction

This final chapter provides a discussion of the study and conclusion to the thesis. The research aims and questions are revisited with the findings discussed in light of the relevant published literature. The chapter is divided into three main sections. The first section discusses the main key findings of this study and the study thesis. The second section discusses the study strengths, limitations, the implications of the study and recommendations for education, clinical practice and nursing and health policy and future research studies. The third and final section of this chapter presents a conclusion to the thesis.

6.2 Aims and Research Questions

The main aims of this study reported in this thesis were to examine the knowledge and attitudes of nurses working in SA in relation to pain assessment and management for children, and identify barriers, facilitators and cultural factors relating to the management of children's pain in this setting. The aims of the study were addressed using mixed methodology, specifically a two-phase sequential explanatory mixed-methods design was used. Phase 1 of the study involved a cross sectional survey of 410 nurses using the PNKAS-Shriners Revision (Manworren, 2001), as described in Chapter Four. Phase 2 of the study used face-to-face semi-structured interviews with 17 nurses who were recruited

from the Phase 1 survey participants. The analysis and results of these two phases were presented in Chapters Four and Five respectively.

With specific reference to SA, the research questions that guided the study were:

1. What knowledge and attitudes do Saudi and non-Saudi nurses have in relation to infants' and children's pain assessment and management?
2. What are the barriers and facilitators to effective pain assessment and management for infants and children?
3. What cultural factors impact Saudi and non-Saudi nurses' pain assessment and management for infants and children?

6.3 Key Findings

As described in Chapter Four - the Phase 1 survey results - previous research about the knowledge and attitudes of nurses relating to paediatric pain management, measures knowledge and attitudes as undifferentiated concepts (Kheshti et al., 2016; Vincent & Denyes, 2004). The authors of these studies report limitations relating to the interpretation of the results because of the conceptual overlap. In the study reported in this thesis, the items of the PNKAS-Shriners Revision that measure knowledge were differentiated from others related to attitude. The differentiation of knowledge and attitude items was an attempt to mitigate the limitations identified in previous research with a view to ensuring clarity and understanding of knowledge and attitude as separate concepts (Appendix K). By avoiding the conceptual overlap between knowledge and attitude reported in the literature, the aim was to capture and quantify nurses' knowledge, separate from their attitudes, in relation to children's pain and its management.

In response to the first research question: What knowledge and attitudes do nurses have in relation to infants' and children's pain assessment and management, the results showed that both Saudi and non-Saudi nurses (who are expatriates) had poor overall knowledge and attitudes about the basic principles of paediatric pain assessment and management. The overall score for knowledge and attitudes as a single measure was 45% out of the maximum possible score of 100%. This score was alarmingly low when compared with other studies conducted in the USA: 66%, 74%, and 76% (Manworren, 2000; Rieman & Gordon, 2007; Vincent, 2005 respectively). The score, however, was comparable to the lower scores reported in studies conducted in India, Turkey and Mongolia: 45%, 38% and 47% (Dongara et al., 2015; Ekim & Ocakcı, 2013; Lunsford, 2015 respectively). This indicates that the knowledge and attitudes of nurses in SA with regards to children's pain management is inconsistent with international standards for developed countries (Peirce et al., 2018; Smeland, Twycross, Lundeberg, & Rustøen, 2018; Stanley & Pollard, 2013).

When differentiating the concepts, the results show poor knowledge and unsupportive attitudes. Out of the 31 items assessed that were specific for knowledge, the overall mean score achieved by all nurses was 15.04 (SD = 2.95, range = 6–27), or 48% (SD = 9.53, range = 19.3%–87.1%) out of 100%. For the nine items that measured attitudes in this study, the overall mean score was 3.08 (SD = 1.60, range = 0–8), or 34% (SD = 17.82, range = 0.00%–88.9%) out of 100%. Whilst these results cannot be compared with other studies because of the lack of differentiation of knowledge and attitude items, in the present, the scores obtained by the nurses were clearly low. The areas of attitude that were particularly very low were related to pain and its assessment and evaluation in children, while the areas of knowledge included both pain assessment and management with pharmacological (e.g. uses, actions, dosing regimens, and side effects of opioids) and non-pharmacological approaches, such as distraction.

Nurses' knowledge and attitudes towards pain management have an influence on the way pain is assessed and managed (Manwere, Chipfuwa, Mukwamba, & Chironda, 2015). The low scores in the present study indicated poor knowledge and unsupportive attitudes which may lead to poor quality pain assessment and management for children in SA.

Despite the lower scores in knowledge and attitude, the majority of participants (59.3%) perceived that they had good knowledge about the management of children's pain. This suggests that they were not fully aware or unsure of their knowledge. While it is possible that they did have some knowledge, they believed they had sufficient information about the assessment and management of pain in children.

There may be several possible reasons for the poor knowledge and attitudes of participating nurses. To begin with, 81.7% of the participants were expatriates from the Philippines or India (Chapter Four) where there is likely to be differing standards of undergraduate nursing education and vastly different cultural backgrounds from those in SA that impacted children's pain and its assessment and management. In terms of knowledge, and in spite of the significant difference in knowledge between Saudi and non-Saudi nurses, it has been well documented that there is limited content about pain and its assessment and management in pre and post-registration nursing curricula in developing countries, including SA (Mackintosh-Franklin, 2017; Twycross & Roderique, 2013; Watt-Watson et al., 2009). From the researcher's experience, the cost and availability of textbooks on this topic may also be a significant factor in their poor knowledge and practices. Furthermore, there is limited access to continuing professional education and training, and updates on paediatric pain management for nurses in SA (Eid et al., 2014; Samarkandi, 2018). This is supported by the results of this study which showed that over half of the survey participants (55.4%) had not attended any pain-related

courses at their workplace in SA. The low correct scores in this study are similar to those reported in other studies conducted in SA (Alqahtani & Jones, 2015; Eid et al., 2014) and elsewhere in the Middle East (Al Qadire & Al Khalaileh, 2014; Yaqoob & Nasaif, 2015).

The results of Phase 1 survey and Phase 2 interviews are integrated into six main key findings:

1. Nurses had poor pharmacological knowledge and tended to not administer opioids, fearing opioids' side effects and overestimating the incidence of addiction and respiratory depression.
2. A child's pain self-report was not trusted or accepted by nurses as a reliable indicator during assessment practice. In addition, there were misbeliefs and lack of information about pain in children, as well as infrequent or inconsistent pain assessment.
3. Nurses had a lack of knowledge and understanding about behaviours and responses to pain by children.
4. Nurses were often unable to deal effectively with children in pain due to the low priority given to a child's pain and other related several barriers.
5. There were facilitating factors that helped nurses provide pain care: parental involvement and participation in a child' pain care, and having a trusting relationship with children.
6. Nurses were often challenged by cultural and language difference and religious practices by parents and family of children during hospitalisation.

Table 6.1 below presents the relationship of these key findings with the three research questions and the alignment of the key findings from Phase 1 and Phase 2 of the study. These six main key findings are discussed in the following sections.

Table 6.1 Key Findings related to Research Questions and Study Phases

Key finding	Applicable to			Align with	
	Research Q 1	**Research Q 2**	**Research Q 3**	**Phase 1**	**Phase 2**
1. Use of opioid analgesics.	x			x	x
2. Assessment of children's pain.	x			x	x
3. Pain experience in children.	x			x	x
4. Barriers to achieving optimal pain care.		x			x
5. Facilitators to achieving optimal pain care.		x			x
6. Cultural impact on children's pain assessment and management.			x		x

6.3.1 Key Finding 1: Use of Opioid Analgesics

The findings of Phases 1 and 2 show that nurses had concerns and fears, and were unclear about the use of opioids for children in pain. An exaggerated misperception of opioid side-effects, such as addiction and respiratory depression, was prevalent among the nurses in both phases, despite the wealth of information and increasing evidence that indicated that opioids are generally safe and effective once used as prescribed and directed by physicians (Cherny, Fallon, Kaasa, Portenoy, & Currow, 2015; Fraser, Waters, Forster, & Brown, 2014; Jo, 2014; Twycross et al., 2009; Volkow & McLellan, 2016). The IASP also strongly supports the use of opioids to relieve pain, asserting that opioid addiction or respiratory depression rarely emerges once opioids are used for short-term treatment,

except among few highly vulnerable people (International Association for the Study of Pain, 2018).

The majority of nurses obtained correct responses to the adjustment of opioids and their administration route for severe pain and understood respiratory depression as an opioid side effect. However, most of the incorrectly answered items related to pharmacological interventions, particularly those about opioids and their dosages, administration and actions and their conversions, showing that nurses' knowledge is variable. For instance, 63.4% of nurses provided an incorrect response to the item concerning the usual duration of action of morphine, and 54.9% incorrectly responded to the item assessing basic calculation and conversation of morphine doses from IV to oral administration. Although the majority of nurses (83.4%) correctly identified the definition of addiction, they were unaware of the distinctions between addiction, physical dependence, and tolerance. The findings were consistent with those of a similar study, conducted in SA, on nurses caring for adult patients with pain (Eid et al., 2014) and those of other international studies (Dongara et al., 2015; Ekim & Ocakcı, 2013).

Phase 1 survey results showed that the majority of nurses (59.3%) were not keen to administer opioids to an infant or a child with a history of opioid treatment. The majority (74.1%) also overestimated the incidence of respiratory depression with the use of opioids. This was corroborated by Phase 2 findings, that suggested nurses would not administer prescribed opioids or they avoided administering them, fearing the incidence of respiratory distress and addiction. These results concurred with previous research conducted in both developed and developing countries, such as India, Turkey, Zimbabwe, Australia and the USA (Dongara et al., 2015; Ekim & Ocakcı, 2013; Manwere et al., 2015; Peirce et al., 2018; Vincent, 2005). The literature review showed that fear of

addiction or respiratory depression is a common reason for nurses to administer lower doses of opioids or not administer them at all (Manwere et al., 2015; Rundio & Lorman, 2015). Knowledge of pharmacology in pain management is of increasing importance for nurses as medication administration is mainly the nurses' responsibility (Ndosi & Newell, 2009). Nurses in the present study had poor pharmacological knowledge of the medications that they frequently administer to children with pain. The vital role nurses play in demystifying opioids and ensuring that they understand the benefits and side effects of such medications is clearly articulated in international guidelines on pain management (American Society for Pain Management, 2011)

Effective pain management relies on a strong pharmacological knowledge and the ability of nurses to apply it in practice to meet patients' needs and rights with respect to health care (Eid et al., 2014; Ung, Salamonson, Hu, & Gallego, 2016). Poor knowledge about pain and analgesic agents may affect nurses' confidence and prevent them from administering opioids as prescribed or managing a child's pain as required of them (Manwere et al., 2015; Ndosi & Newell, 2009). This may be a possible reason for most nurses (75.6%) in the present study preferring to use non-pharmacological interventions alone, rather than in conjunction with pharmacological interventions, as recommended by international best practice standards for optimal pain care (WHO, 2012).

The present findings indicated that nurses' knowledge was not empirically strong, flagging the critical need for expanding empirical knowledge through continuous education for nurses. These findings suggested that due to the lack of empirical knowledge on the safe use of opioids for pain management of infant and children, their judgement as well as their decision-making towards administration of prescribed opioid analgesics was clouded. This could lead to additional suffering for infants and children

with pain. Furthermore, the inadequacy of empirically sound knowledge on this aspect of pain management could contribute to nurses' judgment on what was right and wrong nursing care for infants and children in pain, thereby affecting the moral judgment of nurses. That is, nurses might face dilemma on deciding which action is ethical or unethical. According to Carper (1978), the four patterns of knowing are separate but are interrelated and interdependent with each other. Hence, the lack of empirical knowledge might also lead to poor ethical knowledge among nurses. The knowing process and complexity of nursing practice requires depth and breadth of empirical knowledge to know pharmacological pain management approaches and other related aspects (Mantzorou & Mastrogiannis, 2011).

Literature suggests that when patients, including children, are in pain and demand analgesics, sometimes they were being labelled by nurses and other health professionals as addicted or drug-seekers, which may lead to mistrust of the patient's complaint of pain and eventually result in unrelieved pain (Pasero & McCaffery, 2011). The current study survey found many nurses (>41%) incorrectly believed that a child who demands increased doses of pain medication, such as an opioid, does so for a reason other than increased pain, possibly addiction. The interview findings supported this finding. The participants regarded children who were crying or seeking analgesia as narcotic addicted. Such an erroneous belief could be related to many factors, including cultural differences and limited knowledge and understanding about pharmacology and the use of opioid analgesics in pain management (Darawad, Alnajar, Abdalrahim, & El-Aqoul, 2017; Pasero & McCaffery, 2011; Tollison, Tollison, & Satterthwaite, 2002).

Labelling a child who sought pain relief as addicted or drug seeker clearly demonstrated poor empirical, ethical, aesthetic and emancipatory knowledge among nurses in SA. Their

attitudes, beliefs and feelings towards children with pain and opioid administration were consistent with their poor knowledge. Clearly, the findings suggested that poorly informed empirical knowledge among nurses might lead to unnecessary labelling, such as labelling children as addicted to opioid when they cried. Moreover, labelling a child as addicted to opioid is morally inaccurate, which could put in question the ethical knowledge of nurses. Also, this situation might hinder the development of a genuine therapeutic relationship between the nurse and the patient, and could eventually hinder the development of personal knowledge among nurses. Pharmacological interventions and using opioids in the context of managing pain require different coexisting forms or patterns of knowledge to achieve effective pain relief goals (Hansk, 2011). However, in relation to the findings from this study, offering regular in-service education using scientific or empirical evidence may help to improve nurses' knowledge and change their attitudes, beliefs and feelings towards opioids and their uses in the management of pain. Institutional commitment towards establishing interventions, plans, and consistent use of protocols and evidence-based guidelines on pain management, pharmacological interventions and/or administering opioids are also urgently needed (McGrath et al., 2014).

6.3.2 Key Finding 2: Assessment of Children's Pain

The second key finding of the present study relates to the assessment of children's pain. Phase 1 survey study found more than half the nurses (53.9%) believed that a sterile water injection (placebo) was an acceptable approach to assess whether the child's pain was real or not. The findings were similar to those found elsewhere in the world (Kheshti et al., 2016; Ying Ge et al., 2013). This was also confirmed by the Phase 2 interviews, that showed lack of ethical knowledge and understanding regarding the use and effectiveness

of a placebo. Although a placebo can be used in some conditions, it is widely regarded as an unethical practice, particularly with children because it involves deception, misinformation and dishonesty (Clayton, Stock, & Cooper, 2017; Kisaalita, Staud, Hurley, & Robinson, 2014; Oakes, 2011; Yaqoob & Nasaif, 2015). The American Society for Pain Management and other reputable health organisations consistently denounce the practice of a placebo in managing pain because of the ethical issues involved in its administration and the possible harm to patient and the impact on trust in the nurse-patient relationship (Arnstein, Broglio, Wuhrman, & Kean, 2011). The Code of Ethics for Nurses, first adopted by the American Nurses Association in 1950 and upheld today, requires the nurse to work and practice with compassion and respect for the inherent dignity, worth, and uniqueness of everyone (American Nurses Association, 2015). With this in mind, nurses require a sound ethical knowledge to help in knowing what is right and wrong or help in making ethical decisions or resolving ethical/moral dilemmas in clinical situations (Chinn & Kramer, 2011). As with other patterns of knowing, ethical knowledge is essential for providing nursing care and for day-to-day practice (Smith & Parker, 2015). The findings clearly showed that nurses had inadequate ethical knowledge on children's pain management; hence, interventions to enhance such knowledge should be planned and implemented.

Evidence suggests that children as young as three years of age have been shown to reliably use self-report tools to indicate their severity of pain (Herr et al., 2011). Self-report is regarded as central to pain assessment and the single most reliable indicator of pain and its intensity (Browne, Flanigan, McComiskey, & Pieper, 2008; Potter, Perry, Stockert, & Hall, 2016). Children are considered as the best sources of information relating to their pain, although there are associated challenges (Ebert & Kerns, 2011). The survey results of the present study, however, showed that over half of the nurses (58%) did not believe

that the child was the most accurate judge of their intensity of pain, although many of them (54.4%) obtained correct answers to the reliability of children's pain report. The findings were similar to those found by Ekim and Ocakcı's (2013) and Issa and Khraisat's (2017) studies, suggesting that a child's self-reported pain was not trusted or accepted by nurses as a reliable indicator in assessment practice. Such erroneous beliefs about pain and pain assessment in children could result in negative outcomes and help to marginalise them without appropriate care and treatment.

These findings were further supported by the participants' responses to the two patient case studies (items 37-A and 38-A) in the Phase 1 survey to determine whether children's behaviour and self-reported pain would influence nurses' decision making on pain assessment. In these two case studies, most of the nurses (>90%) did not believe or consider the self-report of pain for either smiling or grimacing children who provided the same score for their pain intensity, indicating that neither self-reports nor facial expressions would elicit a response from the nurse for pain assessment. The Phase 2 interviews support these findings which identified a belief that children do not know what pain is or cannot self-report pain and that the assessment of their pain and its identification should only be determined by the nurse. Such misbeliefs may hamper nurses assessing pain effectively when children indicate, localise, or report their pain and its intensity. Despite the growing importance of self-report ("gold standard") in pain management, similar findings were also found in other studies (Dongara et al., 2015; Vincent, 2005). This, in itself, suggests that misbeliefs about children's pain and its assessment is a persistent problem.

In addition, the survey results showed that more than 80% of the nurses believed that children over-reported their intensity of pain and also about half (45.6%) agreed that

children cannot give a reliable report for their pain intensity, both of which are consistent with those of other international studies (Dongara et al., 2015; Smeland et al., 2018). The findings from the interviews of Phase 2 provided support for these aspects. For example, children were believed to pretend pain, seek attention by reporting pain, or unlike adults, self-report pain inaccurately. Thus, children were not trusted or believed in reporting pain, particularly when their behaviours did not correspond to the presence of pain. Under these circumstances, the nurses would wait before taking any action or administering prescribed pain medication. It is clear from the above findings that nurses' knowledge, beliefs and attitudes on children's pain self-report were a barrier to achieving quality pain care and management. Nurses have an obligation to appreciate, understand and believe children's self-reported pain in the light of developmentally appropriate tools, and work with them toward managing the pain effectively (Potts & Mandleco, 2012). To do so, the body of nurses' knowledge needs to involve patterns of knowledge, such as ethical knowledge which provides direction towards the right and good things, and empirical knowledge which enables knowing the science of nursing including actual theories, facts, concepts, principles and research findings (Smith & Parker, 2015).

Phase 1 survey of the present study showed that 87.1% of the nurses assumed that changes in vital signs are indicators for increasing pain intensity. The participants might primarily rely on physiological changes in vital signs when assessing pain in children. Changing vital signs have been shown to correlate poorly with the intensity of pain and therefore were not supported to be used alone in detecting the presence of pain (Arbour & Gelinas, 2010; Lord & Woollard, 2011). This suggested that in addition to nurses' poor empirical knowledge, they also had poor emancipatory knowledge about children's pain assessment. The emancipatory knowledge process, through practice enables critical

analysis and asking questions in different contexts and situations, is inadequate among nurses in SA.

Regarding pain management practice, as previously mentioned, pain is complex and multidimensional experience that requires careful consideration regarding its identification and assessment (Emanuel, Emanuel, & Librach, 2011). Effective pain management cannot be accomplished without an effective assessment of pain (Forgeron et al., 2009). It was, however, consistent across the two phases of this study that pain assessment tools were not used routinely when assessing pain in children. The survey results, for example, showed that only 40% of the nurses consistently used a standard tool when assessing pain, while the rest never used a tool (11%) or only used it irregularly (29%) or rarely (20%). This inconsistency in assessment practice was confirmed in the study interviews. Some nurses explained that it was related to children not being able to reliably self-report. Others stated it was because of a lack of time, which both in turn constituted barriers to optimal pain assessment. The literature suggested that the inconsistencies and variations in assessment practices could be related to some factors, including nurses' poor knowledge and skills about the use of pain assessment tools and their perceived importance in clinical practice (Smeland et al., 2018). The present study found nurses in SA had inadequate empirical, ethical or emancipatory knowledge in relation to pain assessment, and the use of assessment tools in practice. These could be the major causes of inadequate pain management.

To enhance the effectiveness of pain management in SA hospitals, it is essential to help nurses to understand that children's self-report of pain is reliable and also to understand the importance of using standardised pain assessment tools in daily practice to ensure effective care provision and pain management. Nevertheless, nurses' limited use of

assessment tools in the present study concurred with many other works conducted internationally (Forgeron et al., 2009; Rose et al., 2012; Simons & MacDonald, 2004; Smeland et al., 2018; Zisk-Rony et al., 2015). The findings suggest that this issue needs to be addressed globally by educating nurses and emphasising the importance of pain assessment and the use of standardised approaches and tools in routine practice.

6.3.3 Key Finding 3: Pain Experience in Children

The survey of the present study showed that many nurses (60.5%) incorrectly thought that if a child can be distracted from pain it is not severe. In addition, 79% erroneously believed that children with severe pain are unable to sleep. These findings were in line with previous studies (Dongara et al., 2015; Ekim & Ocakcı, 2013; Stanley & Pollard, 2013), indicating that nurses were not well equipped with either empirical, personal or emancipatory knowledge on pain in children in addition to their unsupportive attitudes which were shaped by different misbeliefs. Going back to the earlier discussed concept of attitudes (Chapter One), this particular attitude of nurses could be explained by a component of attitudes. The nurses' belief that a child who could be distracted does not experience severe pain or being unable to sleep means severe pain clearly reflects the cognitive component of attitudes. These beliefs may result in nurses ignoring the severity of pain, that could lead to more suffering for the patients.

The findings from the Phase 2 further provided insights into these aspects. For example, nurses expressed the opinion that children who were asleep or involved in play or fun activities were not experiencing pain. Additionally, there was a belief that a child who was in real pain suffered a lot and moved extensively while staying on the bed. Nurses in this study expected overt behavioural manifestations of pain in children, such as crying.

Such findings suggested that nurses had limited knowledge of childhood behaviours and responses to pain. Such findings also suggested that nurses continued to believe that distraction is unlikely to mediate pain despite research and scientific evidence which showed that children in pain can be distracted, as in play, or they might sleep even though they were in pain (Bowden & Greenberg, 2010; Potts & Mandleco, 2012). This may mean that nurses in this study were unaware of this research evidence. This assumption, however, needs to be tested in future studies.

The findings of the present study also suggested that nurses might not understand pain pathways (peripheral and central nervous system) and mechanisms in which pain is processed and felt (James et al., 2013). Understanding the mechanisms of pain and its pathways may help nurses to assess and manage a child's pain more effectively (Richardson & Glasper, 2010).

Another important aspect which influenced practice of pain management was related to nurses' knowledge about children's pain tolerance/thresholds. Pain threshold (perception) is the minimum amount of pain that can be recognised or perceived by a person. Pain tolerance, on the other hand, is the maximum intensity or amount of pain that a person is able to endure (Brooker & Waugh, 2013). Although the extant literature has not identified pain thresholds and tolerance of Saudi children, the participants in the present study had several beliefs regarding this matter. For example, there was a belief among the non-Saudi nurse participants that children of Saudi nationality had a lower tolerance for pain than children of different nationalities. There was also a belief among these nurses that Saudi children exaggerated their pain level, suggesting lack of knowledge and cultural understanding and awareness.

From a perspective of transcultural nursing practice, appropriate and safe nursing care requires the nurse to be culturally competent and have sufficient knowledge about their own and their patients' culture (Elliott, Aitken, & Chaboyer, 2007). Nevertheless, while the survey results of the present study showed that nurses had misbeliefs and poor knowledge about paediatric pain assessment and management, the findings from the interviews showed that nurses recognised the need for continuing education and training to enhance their knowledge and competency. However, they did not realise the full nature of their knowledge deficits and that much of their care for children was shaped by misbeliefs and lack of understanding of the SA culture.

Collectively, the above findings showed that the knowledge of nurses working in SA was generally poor regarding children's pain and pain management, a finding consistent with many studies undertaken internationally. This poses a concern as poor knowledge has a significant impact on nurses' ability and competency when caring for children with pain. The attitudes of nurses were also evident in this study to be unsupportive and poor as with numerous previously reported studies focusing on assessing nurses' attitudes (Melhuish & Payne, 2006; Pölkki et al., 2010). It has been argued that attitudes have a major impact on the way pain care is provided by nurses (Manwere et al., 2015).

6.3.4 Key Finding 4: Barriers to Achieving Optimal Pain Care

In response to the second research question: What are the barriers and facilitators to effective pain assessment and management for infants and children, the interview data in Phase 2 of the study identified several barriers to achieving optimal paediatric pain management. The low priority given to children's pain by hospitals where the participants were employed was one of these barriers. The participants would have liked to prioritise

child pain and have organisational support to achieve effective pain management for hospitalised paediatric patients. However, the healthcare system in SA imposed barriers to the provision of good pain care, such as the lack of pharmacological and non-pharmacological approaches. This finding was similar to that found in the Middle East and other parts of the world (Batiha, 2014; McCarthy et al., 2004; Namnabati et al., 2012; Twycross, 2013; Zuccaro et al., 2012).

Another barrier identified by the participants was the lack of care and low priority given to children's pain by physicians with inconsistent assessment for pain and failure to respond when necessary. These findings were consistent with previous studies by Barry et al. (2010) and Tjia et al. (2009) who also found a lack of physicians' willingness, interest and motivation regarding pain management. Insufficient medication orders were barriers to the management of pain by nurses in this study. A recent study in SA also found that in addition to the lack of or insufficient analgesic prescriptions by physicians, they were often unavailable or did not regularly attend patients who had cancer and were in pain (Alqahtani, Jones, & Holroyd, 2016). The reasons for this were not offered. However, a lack of cultural knowledge or the impact of culture may be one of the reasons for such negligence (Choong, 2015). Nonetheless, the findings from the present study in SA clearly showed that children's pain and its management was not a priority in many ways by both health professionals and hospitals.

Shortage of nurses and patient overload were other barriers identified in the present study. These findings are in accordance with those of previous studies (Batiha, 2014; Kassa & Kassa, 2014; Rejeh, Ahmadi, Mohammadi, Kazemnejad, & Anoosheh, 2009). The ratio of nurses to patients in SA have been shown to be low at 36-40 nurses per 10,000 patient population, compared with other countries, such as Japan (95/10,000), Canada

(100/10,000), and the UK (101/10,000) (AlYami & Watson, 2014). Inadequate nurse staffing levels and imbalanced workloads have been shown to impact patient safety and outcomes. It also regarded as a major factor in providing poor quality of nursing care. Cho, Chin, Kim, and Hong (2016) for example, found a significant positive relationship between a higher number of patients per nurse and patient adverse events, such as medication errors and overdoses. These findings suggested that an adequate nursing workforce in hospitals is an important factor that could improve the quality of care provided by nurses to patients. Nursing staff shortages and high patient loads might contribute to the lack of timely pain assessments and responses to pain in children in this study.

Although there is no clear evidence on the ideal ratio of nurses to patient, optimal staffing levels, or related strategies that are widely recommended for quality and safety care for patients (Clarke & Donaldson, 2008; Driscoll et al., 2018; Glasper & Richardson, 2010). A legislative approach, for example, has been introduced by the American Nurses Association to help nurse leaders and managers create a staffing plan that meets the demands of departments/units and patients. This approach allows a flexible staffing plan that can be adjusted based on key factors such as the number of admissions, discharges and transfers on each single shift (Murray, 2017). A legislative approach to nursing staffing and patient ratios in SA may help to mitigate poor pain care in children.

Further to the above barriers, children's developmental age and behaviour were identified as barriers to effective nursing pain care. Nurses in the present study found it difficult to distinguish a child's pain behaviour from other distress forms, such as anxiety, hunger and thirst. These findings were consistent with previous studies, such as those conducted by Murphy et al. (2014) and Gunnvall, Augustsson, Lindström, and Vicente (2018).

These studies reported challenges with the pain assessment in young children and in recognising their related behaviours. The findings from this study suggested that some nurses might lack knowledge on the characteristics of childhood development and associated pain expressions and behaviours. Some nurses might also lack the ability or skills to read or interpret children's communications about pain that impacts effective pain management. To effectively care for children with pain, nurses need to shift to a child-focused approach to pain care with an understanding of childhood development. There are a range of child development theories which could guide this knowledge including psychosocial developmental theory and cognitive developmental theory (Charlesworth, 2010). The ethics of practice suggest that nurses should "do the right thing" with patients at all times (American Nurses Association, 2015). An understanding of ethical principles applied to practice in the context of children pain would ensure that children with pain are not ignored. Acquiring patterns of knowing, such as aesthetic knowing, is important, enabling nurses to decide what to do at a given moment or help them to make sense and meaning for practical observations and situations.

The complexity of pain and its identification in children has been confirmed by the WHO (2012). The WHO recommended the routine use of pain assessment tools in practice to support assessing and identifying children's pain. The IASP also recommended pain assessment tools to be used in routine practice to facilitate assessing and managing a child's pain effectively (International Association for the Study of Pain, 2005). By adopting routine approaches to pain assessment using age appropriate tools, nurses can help improve pain outcomes for children.

Family members were also identified as a barrier to providing effective pain care. The participants in the present study found it difficult to advocate or care for a child in pain

because some parents/relatives did not understand or appreciate the role they played in helping nurses assessing and managing pain. As described in Chapter Two, the role of parents is important in relation to the assessment and management of children's pain. During hospitalisation, parents have a unique position in providing information, reporting pain and/or supporting comfort measures. Nurses play a major role in educating parents about pain and pain care. Nurses are considered the health care professionals who have frequent contact with children and family during hospitalisation (Wright, 2015), suggesting that the notion of the therapeutic relationship should be understood to ensure that the child and his or her parent are the focus of care when assessing or managing pain.

These findings are consistent with many previous reports (Czarnecki et al., 2014; Gimbler-Berglund et al., 2008; He et al., 2010; Vincent, 2005). A previous study conducted in SA and assessing the mother's knowledge of their child's health-related matters, found that a number of mothers did not seek medical advice or help for a child who cried constantly, did not sleep or was experiencing pain with any body movement (Al-Ayed, 2010). This poor knowledge of Saudi mothers about seeking medical information and assistance when a child is in pain may hinder proper assessment and management by nurses for their child's pain. Educating parents about their child's pain and its experience and management has been highlighted as an important factor in in increasing their knowledge and helping them to actively communicate, cooperate and/or engage in pain care provision (Chng et al., 2015; LeMay et al., 2010). Parents should be given empirical knowledge regarding infant/child pain, how to identify the pain, how to assess the pain, what pain management is available, and how can they support the pain management of their child. However, educating Saudi parents by non-Saudi nurses may be challenging due to language barriers. A variety of strategies to educate parents about pain have been suggested and used (Walco & Goldschneider, 2008). For example, print

materials or videos, developed in Arabic language could be used as a good strategy to educate parents in SA about their child's pain and its management (McGrath et al., 2014).

6.3.5 Key Finding 5: Facilitators to Achieving Optimal Pain Care

With respect to facilitators for pain management, parents' presence and involvement in the process of diagnosing and providing pain care for their child was identified as a facilitating factor. Nurses in the current study stated that when parents asked and provided the necessary information regarding their child's pain, this helped the nurse during the assessment process. Previous studies have similar findings (Aziznejadroshan, Alhani, & Mohammadi, 2016; Twycross, 2013). The importance of parental involvement in the provision of nursing care and children's pain management is widely recognised and well documented in the literature (Bowden & Greenberg, 2010). Parental involvement has increasingly been emphasised because a parent may significantly contribute to the assessment and care of the child's pain by providing the necessary information, reporting pain or planning care and treatment with medical staff (Chng et al., 2015). It is therefore important to encourage and teach or educate parents about their role, as well as empower them in decision-making, so as to enhance parental presence and involvement in taking care of hospitalised children (Clarke et al., 2012; James et al., 2013).

The present study also found one of the facilitators supporting nurses in pain management was building up trusting relationship with the child. Evidence shows that the process of caring for children and young people requires nurses to be approachable and to develop a relationship based on trust and respect to enhance cooperation and openness in dealing and communication (Thurston, 2013). Young children often do not trust, avoid, or fear strangers, so a good therapeutic relationship and appropriate communication needs to be

developed while they are in hospital so they come to accept and trust nursing and medical staff (Perry et al., 2013). Developing trusting relationships with children requires nurses and other health professionals to possess supportive attitudes and personal knowledge, such as knowing the self and understanding others. Therapeutic or trusting relationships with patients can be achieved when this form of knowledge is developed (Chinn & Kramer, 2011).

6.3.6 Key Finding 6: Cultural Impact on Children's Pain Assessment and Management

In response to the third research question: What cultural factors impacted nurses' pain care delivery for infants and children, several cultural factors were identified in the Phase 2 interviews. These factors included cultural and language differences, religious reasons, differing beliefs and values, as well as faith practices and traditional restrictions. Previous research studies conducted in other countries (McCarthy et al., 2004; Schlemmer & Mash, 2006) and in SA (Abudari et al., 2016; Almutairi, 2015; AlYateem & Al-Yateem, 2014; Halligan, 2006) have also reported similar findings, suggesting that the issue of culture in providing pain care and practice remains an inhibitory factor.

As described previously in this thesis, the culture of people in SA is initially rooted in Arabic traditions and Islamic religion. It is recognised by spiritual healing practices that are mostly derived from Islamic teachings and law, such as the Quran (the Holy Book revealed to Allah's last messenger) and the Sunnah (sayings, deeds, and sanctions of the Prophet Mohammad) (Al-Shahri, 2002, p. 134). The influence of spirituality and religion which both are interrelated in the Islamic context, was evident in participants' narratives. The participants perceived children's family in SA as very religious in terms of adherence

to their Islamic religion and some related practices whilst in a hospital. Religion plays an important role in shaping values and beliefs of individuals. Many patients and their families may view religion as a significant part of their daily lives. They may also strictly adhere to it in sickness, suffering and treatment while staying in hospital for the purpose of healing and achieving wellness (Abudari et al., 2016; AlYateem & Al-Yateem, 2014).

The findings from the Phase 2 interviews identified that the provision of nursing care to children in pain was sometimes hindered by the differences in cultural, religious and traditional values and beliefs of Muslim parents and the nurses who were providing care for their children. Many participants found it difficult to understand the cultural requirements in SA or to deliver culturally effective care for children in pain for a range of reasons including language and communication barriers, and religious and traditional rituals and expectations. For example, parents/families did not accept nursing care unless it was associated with certain religious rituals, such as Bismillah (by the name of Allah-God). In addition, they found it difficult because of the cultural religious practices, such as holy water and other similar liquids that were used during hospitalisation. This is not surprising given that expatriate nurses were from different religious and cultural backgrounds.

Culture is an important aspect of providing nursing care. Nurses must have a rich knowledge of different cultural beliefs and traditions that may affect the patient care. It was revealed in the findings that nurses found it challenging to provide nursing care for children in pain due to cultural issues. This further signified that the nurses in the present study lacked the cultural knowledge that is necessary to provide culturally competent nursing care. Hence, it is evident that expatriate nurses working in SA need education and training about the cultural issues concerning the pain management of Saudi patients. This

will ensure the development of well-informed cultural knowledge among nurses and quality pain management for Saudi children. This echoes the importance of having emancipatory knowledge. Emancipatory knowledge is necessary for nurses to critically examine situations, reflect on cultural contexts and ask critical questions in nursing practice (Chinn & Kramer, 2011).

Despite nurses' attempts to care effectively for children in pain, their care was sometimes rejected by parents/families because of their lack of understanding of the SA culture and religious beliefs. Cultural awareness and religious education of expatriate nurses is urgently needed to redress this situation. Current educational and orientation programs therefore need to be revised and updated in the light of these findings to meet the cultural awareness needs of expatriate nurses in SA. Topics on cultural aspects that may affect pain management among infants and children should be incorporated in all cultural awareness or educational sessions. For example, topics relating to how Saudi infants or children respond to pain, Saudi religious and cultural beliefs about pain, Saudi family response to situations where a family member suffers pain, and religious or traditional pain management of Saudis should be considered and discussed during these educational interventions. Nurses need to understand the religious and cultural values, beliefs and customs of Saudi people so that they can meet the health needs of patients according to their culture. Hospitals need to develop relevant policies and adapt a cultural competence model to guide nurses in their practice in SA.

Cultural competence of nurses working in culturally diverse health contexts, such as in SA is a key factor in providing nursing care (Abudari et al., 2016; Al Mutair et al., 2013; Almutairi, 2015; Rassool, 2015). Suh's theoretical model proposes that cultural competence can be developed through five essential components of nursing care and

practice. These are **cultural awareness**: appreciative and sensitive to patients' culture; **cultural knowledge**: obtaining knowledge base about different cultures; **cultural sensitivity**: recognition or perception of cultural diversity; **cultural skill**: relevant cultural data assessment; and **cultural encounter**: engaging in cross cultural interactions with patients from different cultures (Suh, 2004). Such components are consistently reported in the literature as the basic requirements for achieving cultural competence and providing culturally competent nursing care (Hannawa & Spitzberg, 2015; Shen, 2015; Stein-Parbury, 2009).

Consideration of cultural and religious aspects are essential in caring for Saudi patients who are experiencing pain. In a previous study conducted in SA, Saudi patients attributed pain to their predestination and a belief that illness or pain is the will of God. Enduring pain was viewed as reparation for sins and a chance to achieve greater rewards in the afterlife. Furthermore, a belief that supernatural spirits cause pain was also reported, and must be taken into consideration when caring for Saudi patients (Lovering, 2006). Similar findings were reported by a study exploring expatriate nurses' experiences in relation to caring for Muslim patients in SA (Abudari et al., 2016). Another study by AlYateem and Al-Yateem (2014) reported similar findings in which expatriate nurses in SA faced challenges with some religious practices of their Muslim patients, such as daily prayers, fasting in Ramadan month and using water of Zamzam. The issues that expatriate nurses should be aware of when caring for Arab Muslim patients and their families, whether in SA or another country, have been highlighted by the work of Al-Shahri (2002), Al Mutair et al. (2013), Rassool (2015) and Marrone (2017). These include language, daily prayers five times (dawn, mid-day, mid-afternoon, sunset, night), Ramadan and fasting, diet and Halal food (Islamic dietary restrictions), privacy and dress, and religious healers and practices, such as reciting Quran and meditation.

Nurses today may care for patients from cultures and faith traditions that differ from their own (Blankinship, 2018). Therefore, they are expected to be culturally competent and have adequate knowledge and understanding of their patients' culture in order to provide safe and optimal care and treatment. Respecting and understanding spiritual practices has been reported as a factor that enhances cooperation, strengthens the relationship with patients and family, and facilitates healthcare provision (Al-Shahri, 2002; AlYateem & Al-Yateem, 2014). However, the findings of the present study which were similar to those of previous works (Abudari et al., 2016; AlYateem & Al-Yateem, 2014; Sidumo, Ehlers, & Hattingh, 2010) showed that expatriate nurses working in SA lacked knowledge and understanding about their patients' Islamic culture and religious practices.

Not only was the culture of nurses different from the children and their family in this study, but language difference was also a barrier for communicating, understanding and providing effective pain care. This is not surprising because these nurses were culturally and linguistically different from their patients whose first language for communication is Arabic and not all of them were able to speak or understand the English language (Almutairi, 2015). Although expatriate nurses in the present study acknowledged the importance of verbal communication with children and their family, being a non-Arab speaker was identified by the nurse participants as a limiting factor in dealing with or caring for a child in pain, suggesting that the issue of language may also place limitations on the ability of children and family to articulate and convey pain details and information, as found elsewhere in the world (Levin, 2006). Previous research conducted in SA confirmed this problem in which expatriate nurses experienced miscommunication, misunderstandings, frustration and other challenges because of language differences (Abudari et al., 2016; AlYateem & Al-Yateem, 2014; Halligan, 2006). The effect of language barriers has also been explored in a study conducted in South African hospitals

which revealed misunderstandings, dissatisfaction with the provision of health care, poor quality of care and negative attitudes among healthcare providers and patients (Schlemmer & Mash, 2006). Evidence suggests that poor quality and safety of patient care and unnecessary medical errors, are more likely to occur with language and communication barriers (Almutairi, 2015; Van den Berg, 2016).

Language proficiency is an important aspect that is needed for effective communication and understanding (Ali & Watson, 2018). Effective communication is crucial to the safety and quality of nursing care, enabling nurses to correctly convey pain management details and information to their patients (Eid et al., 2014; Schyve, 2007). Regardless of the knowledge and experience of nurses in relation to pain and its management, in the absence of effective communication, the intended message with valuable and important information may be lost for this reason, as argued by Eid et al. (2014). Where language is problematic, some participants in the present study expressed their desire to learn Arabic and use it in practice to be able to communicate with patients and understand them clearly. Several useful strategies have been proposed to bridge the language barrier encountered by expatriate health professionals in SA (Abudari et al., 2014; Almutairi, 2015). These strategies include interpreting services, bilingual clinical providers, bilingual written materials, communication boards and education, and orientation programmes on culture and language. Overcoming language barriers is a significant step in providing culturally competent care, as asserted by Ali and Watson (2018), and in the present study, would enhance the pain care given to children.

The barriers identified in this study including the low priority for children's pain, uncooperative parents and family, and culture and language differences, contribute to poor management practices and under-treatment of pain. Overcoming these barriers is

necessary for accomplishing quality care and pain management. Multiple initiatives could be implemented by hospitals in SA to overcome such barriers. These include prioritising children's pain in policy and clinical practice, increasing the availability of pain management approaches and offering continuing education centered on culture and pain management for family and all health professionals involving in child pain care.

To date, this is the first study conducted on children's pain management and nurses' knowledge and attitudes within the context of SA. This study highlights the challenges encountered by expatriate nurses in caring for patients in a country where all walks of life are strictly guided by Islamic principles. Whilst there is existing evidence on the influence of culture on pain sensitivity and pain management (Al-Harthy, Ohrbach, Michelotti, & List, 2016; Lovering, 2006), the present study highlights the cultural and religious beliefs of the parents and families in SA and how this hinders the provision of quality pain assessment and management for children by expatriate nurses. This area needs to be considered in developing and reviewing health policies and guidelines for effective pain management of children in the country. It is also one of the first studies that differentiates between knowledge and attitude concepts on the PNKAS-Shriners Revision. In addition, using a two-phase, sequential explanatory mixed-methods design, allowed for exploration of aspects of cultural differences and its impact on pain management in SA. Prior to this study, it was given little focus by previous research, despite its importance to nursing practice and care today (Maier-Lorentz, 2008).

6.4 Conclusion

This study, with its two-phase sequential explanatory mixed-methods design, helped to establish knowledge and understanding about the knowledge, attitudes of nurses working in SA and the barriers, facilitators and cultural impacts on pain management in children. Overall, the six key findings in this study identified several issues of concern relating to children's pain and pain management. The knowledge and attitudes of nurses caring for children in SA were generally poor and consistent with nurses in other countries around the world; these included basic pain management principles, such as pain assessment, pharmacological interventions and the use of opioids in relieving pain. Nurses were unable to effectively care for children in pain due to several barriers that they encountered in their workplace environments including the lack of priority given to a child's pain by nurses, physicians and the hospital as an organisation. In addition, cultural and language differences and misunderstandings, and parents' religious beliefs and practices were identified as barriers to achieving effective pain care for children. Facilitators to pain care included parental participation in caring for their hospitalised child and trusting nurse-child and parental relationships when established during hospitalisation.

This study has added to national and international understanding about the knowledge and attitudes of nurses in relation to paediatric pain management in the context of SA. It has also highlighted a range of culturally mediated issues and concerns. This thesis has identified areas for improvement and provided evidence to inform clinical practice and education, as well as research about paediatric pain management within the context of SA. To date, this study is the first of its kind with no previous studies identified that focus on the knowledge and attitudes of nurses and barriers and facilitators towards children's pain care in SA. These findings should be considered with urgency and used to inform

and guide SA policies, procedures and practices designed to support improving nursing care and pain management for paediatric patients. This thesis highlights several strategies for addressing barriers and the sub-optimal nature of paediatric pain management in SA. Implementing such strategies has the potential to not only improve care and alleviate children's pain and suffering, but also to improve communication, collaboration and the overall quality of care of paediatric pain.

6.5 Strengths and Limitations

As with other research studies, this study has strengths and limitations. These are discussed in detail under the following two sections.

6.5.1 Strengths

This study has several strengths. This is the first study that distinguished the items of knowledge from others related to attitude on the PNKAS-Shriners Revision survey. This study also is the first of its kind on this specific topic in the Middle Eastern Gulf Arab region where an expatriate workforce predominates. To date, and to our knowledge, it is the only study on the knowledge and attitudes of nurses and barriers and facilitators regarding the children's assessment and management of pain in SA. In addition, this study was carried out at five hospitals where all nurse participants had a similar practice in relation to the management children's pain. This study has provided unique insights and important information on children's pain knowledge, attitudes, barriers and facilitators, and is consistent with the findings of many international studies. The study findings could be used as a reference for similar studies and could also be used to improve pain

management practices within the health context of SA and other contexts across the world where expatriate nurses were employed in a similar situation.

The large sample size (n=410) was also a strength in this study and provided adequate power to support transferring the findings to other similar contexts. The use of mixed method research approach was another important strength in the present study, allowing the researcher not only to examine nurses' knowledge and attitudes, but also to identify barriers, facilitators and cultural impacts in relation to children's pain and its management. Further, through mixing quantitative and qualitative data, the researcher was able to detect the links, similarities and correspondences between the data sets which contributed to a better understanding of the given study problem than if one research approach was used alone. This also strengthens the rigor of the work in this study. An additional strength in this study is that the concepts of knowledge and attitude on the PNKAS-Shriners Revision have been differentiated in the present study - the first to do so to date.

6.5.2 Limitations

Despite these strengths, this study has limitations. The SA healthcare system comprises public and private healthcare services, as described in Chapter One. The present study recruited participants in public hospitals that administered by the MOH, other public or private hospitals administered by other health agencies were not included. Thus, the findings of this study may not be generalised to those settings. Culture and cultural aspects were not prominent in the PNKAS-Shriners Revision, therefore they were not assessed in Phase 1 of this study. Nevertheless, the qualitative part of the study focused on this aspect which fills this gap in the PNKAS-Shriners Revision. The survey used also focused

largely on empirical knowledge with little focus on other fundamental types of knowing or knowledge (Appendix K) despite their widely recognised importance for professional nursing practice and education (Barker, 2009; Moyer & Wittman-Price, 2008). A further limitation related to this phase was that the clinical practice of participants was not explored as the focus of this study and the survey used was mainly on knowledge and attitudes, and therefore this may not directly reflect or correlate with the actual nursing pain management practices of these participants.

The interviews in Phase 2 of this study involved participants with one-year professional nursing experience. The interviews also involved one Saudi nurse participant while the rest were expatriate nurses. A possible reason for this may be that the proportion of Saudi nurses was small compared to expatriates who make up the largest proportion of the nursing workforce in SA, as noted in Chapter One of this thesis. The other reason is that it could be that the Saudi nurses have never had the experience of being involved in a research interview because research studies are limited compared to other countries, such as Australia. This limits the generalisability of the findings to nurses of Saudi nationality. It also did not allow further exploration and comparison between the two groups of nurse participants in this study. Another possible limitation was that purposive sampling was not used in this phase. As mentioned in Chapter Three, some volunteers apologised for not being available or for changing their minds, or they did not respond when contacted, despite the researcher's efforts and attempts to recruit interview participants purposively. This made it impossible to apply purposive sampling in this study.

6.6 Implications and Recommendations

This study contributed to the existing knowledge base by providing insights about the management of children's pain and the knowledge and attitudes of nurses, and barriers, facilitators and cultural impacts. It has provided evidence and baseline data that may be used to improve the practice of pain management in SA and other countries worldwide with similar situation. The findings of this study have important implications and recommendations for education, practice, policy and also for future research. These are discussed in the following sections.

Education

The findings of this study support the need for extensive education and evidence-based information on children's pain management. This should be an essential element in both undergraduate and postgraduate medical and nursing curricula and programs. Knowledge areas in the undergraduate nursing degrees and postgraduate studies need to comprehensively focus on children's pain physiology and its mechanisms and assessment and management with opioids, non-opioids and non-pharmacological interventions. Knowledge areas also need to cover all fundamental types/patterns of knowledge: empirical, personal, ethical, aesthetic and emancipatory knowledge (Carper, 1978; Chinn & Kramer, 2008).

There is an urgent need to provide continuing in-service education activities for all nurses, doctors and other health professionals involving in child pain care in order to enable them to provide care that adequately meets the child's needs and rights in relation to best pain care and practice. Emphasis should be placed on children's developmental stages and manifestations of their pain and its anatomy and physiology. It should also be placed on

pain assessment with the use of standardised tools and pain management with both pharmacological and non-pharmacological approaches. Dosage, actions, interactions, side effects and administration of analgesics should also be among the areas of the education initiatives or activities. Misbeliefs about pain and its management in children should be an integral part of the educational programs as a mechanism for dispelling these in any population and in particular in relation to children. Equally important in the light of the findings from this study, is that many aspects of the SA culture including traditional, historical, cultural and religious beliefs, practices, and common languages or terms used by patients and family in SA in describing pain, should be an integral part of orientation and educational programs for non-Saudi nurses and other health professionals.

Nursing leaders and managers in practice should grasp opportunities to establish strategies such as encouraging self-directed learning and critical reflection to improve nurses' knowledge and attitudes and promote ethical, emancipatory other patterns of knowing in relation to paediatric pain. Families of children also need to be educated about pain management, including demystifying the use of opioids, and their role in assisting with pain relief for their child. Importantly, the language differences and misunderstanding barriers need to be addressed by carrying out special courses for expatriate nurses to provide language support and teach them basic Arabic language, along with the use of formal professional interpreters and bilingual health workers in routine care to establish nurse-patient effective interaction and communication and improve attitudes towards pain in children and its management (Abudari et al., 2016).

Practice

Although education is an important strategy, on its own it may not be enough to achieve a significant change or improvement in clinical practice of pain management for children

(Al-Shaer, Hill, & Anderson, 2011; Bell & Duffy, 2009). Therefore, health professionals, such as nurses and doctors need to be encouraged to routinely assess the pain of children using standardised tools. They also need to be encouraged and supported to effectively manage and prioritise children's pain in routine care and clinical practices. Further, hospitals need to give a high priority to patients' pain, particularly in paediatric patients, and implement evidence-based guidelines on all pain care practices (McGrath et al., 2014). Other existing barriers, such as cultural and language problems, need to be considered in relation to clinical practice. Cultural practices should be reflected to ensure culturally competent care for patients and their families in SA. Additionally, shortage of nurse staff that may lead to lack of time for attention to pain needs to be addressed by providing more nurses and balancing nurse-patient ratios to ensure an appropriate working environment and quality and safety care.

Furthermore, the lack of pain management approaches in health settings for children should be addressed by providing regular supplies and improving hospitals' supply systems and pharmacy delivery systems for prescribed medications. The availability of analgesics for all pain intensities and types is important and therefore weekly checks and regular supplies could be a useful strategy for addressing the lack of such medications. Facilitators, such as those identified in this study, should be enhanced to facilitate providing pain care for children.

Interdisciplinary collaborative practice is essential for quality and effectiveness of health care (Gordon et al., 2014). Teamwork in the provision of healthcare has long been used and is now recognised as an important model (Babiker et al., 2014). Hence, a teamwork approach to pain management that involves medical, nursing and pharmacology experts should be developed in which decision-making and responsibility about pain and care

plans can be shared together during practice. Such an approach is important for improving nurses' and other health professionals' communication, coordination and collaboration in relation to the provision of care and management of children's pain (McGrath et al. 2014). Finally, regular meetings with nurse managers and other administrators should be conducted to discuss concerns, seek support and provide suggestions for change and/or improvement.

Policy

Pain management is crucial, particularly in paediatric patients. Thus, hospital and nursing policy should mandate the prioritisation of children's pain and its management in daily routine care and practice. The policy should also consider that children have the right to receive the best pain care. In addition, policy should mandate professional roles and responsibilities and address the implementation of evidence-based guidelines regarding the use of non-pharmacological approaches and analgesics, particularly opioids, as well as behavioural clues and psychological indicators of pain. Consistent pain assessment practice should also be part of the policy as a strategic propriety to support achieving effective pain care and positive outcomes for hospitalised children. Furthermore, policy makers and regulators should consider these recommendations and pay attention specifically to child's care and pain and its management. They should regularly revise and update pain management policies based on evidence-based practice and recent guidelines to help improving pain management practices. Cultural influences and related challenges, such as those identified in this study, should be addressed by policy. Specific policies and regulations for the recruitment of nurses and cultural education should be developed and mandated to ensure better paediatric pain care and positive outcomes.

Future Research

Research on this topic, focusing on the private and other public hospitals that were excluded from this study is required to provide a more inclusive insight into other health settings and determine the validity or confirm the applicability of the findings of the current study to the entire context of SA. Observing the actual pain assessment and management practices of nurses, along with an examination of their knowledge and attitudes is another key area where future research may focus in order to gain a more complete and accurate view of how nurses provide pain care for children in the health context of SA and other similar parts of the Middle East. The types of knowing as described above in this thesis are also an important area to be considered by future surveys and research studies to inform clinical practice and guide the improvement of general pain education for nurses. Further to that, pain management is a multidisciplinary responsibility, thus those health staff involved in assessing and managing children' pain, such as physicians, need to be considered by future research to enhance our understanding about the phenomenon of pain in children from a broader perspective. Future research also needs to focus on the impact of educational efforts and workshops aimed to improve practice of paediatric pain management.

PNKAS-Shriners Revision

Despite the extensive use of the PNKAS-Shriners Revision in the past, this survey does not contain sufficient items on either attitude or fundamental types of knowledge, such as personal, ethical, aesthetic and emancipatory knowledge (see Chapter One). It also does not have sufficient items on cultural impacts and barriers and facilitators. Therefore, in the future it is worthwhile to develop a new survey or to further improve the PNKAS-Shriners Revision by adding items on these aspects so that it can be used generically in

any part of the world when the plan is to examine knowledge and attitudes, and explore factors that hinder or facilitate providing management of pain for children. The following are some recommended items for future research to include after a validation process:

Knowledge items

- Play therapy is a useful way in managing children's pain? True/False
- Hospitalised children have a right for their pain to be managed effectively? True/False
- Pain in children cannot be totally alleviated by communication aimed for relaxation? True/False
- Unrelieved pain in hospitalised children is a significant health problem that needs to be addressed? True/False

Attitude items

- It is acceptable to perform minor painful procedures, such as cannula insertion without analgesia? True/False
- Pain caused by diagnostic tests or procedural interventions is unnecessary and should not therefore be experienced by hospitalised children whenever possible? True/False

Cultural items

- Cultural beliefs and religion are unlikely to influence children's and parents'/family's perception and reaction or response to pain and its management? True/False
- Depending on culture and religious beliefs, a child and parents/family may turn to traditional and/or religious treatment and practices during therapeutic and hospitalisation period? True/False

- Understanding the child's culture who has acute pain is not important because it does not affect care delivery and management interventions? True/False

Barriers and facilitators items

- Establishing a trusting relationship and communicating with hospitalised children is an important aspect of nursing care in relation pain management? True/False
- What factors affect your intention/decision to provide culturally pain management for children/family during hospitalisation? (Open-ended question).
- What factors hinder/impede you to provide optimal pain management for hospitalised children/family during hospitalisation? (Open-ended question).
- What factors help/assist you to provide optimal pain management for children/family hospitalised? (Open-ended question).

6.7 Summary

This chapter discussed the significant findings of this study. The findings derived from the Phase 1 survey and Phase 2 interviews identified poor knowledge and attitudes among both Saudi and non-Saudi nurses in relation to children's pain assessment and management. Barriers have been identified in this study, including lack of adequate supply of analgesics and other methods for managing pain, lack of family and parental support, lower nurse staffing levels, and cultural and language barriers. Facilitators to managing pain included parents' involvement and participation in the pain care provided to their child and developing a trusting relationship with the child during hospitalisation.

References

Abazari, P., & Namnabati, M. (2017). Nurses' experiences from pain management in children in Iranian culture: A phenomenology study. *Journal of Education and Health Promotion, 6*, 74-74. doi:10.4103/jehp.jehp_1_16

Aboshaiqah, A. (2016). Strategies to address the nursing shortage in Saudi Arabia. *International Nursing Review, 63*(3), 499-506. doi:10.1111/inr.12271

Abu-Zinadah, S. (2005). *The inspection of nursing regulation in Saudi Arabia*. Paper presented at the 3rd International Nursing Conference, Muscat, Sultanate of Oman.

Abudari, G., Hazeim, H., & Ginete, G. (2016). Caring for terminally ill Muslim patients: Lived experiences of non-Muslim nurses. *Palliative & Supportive Care, 14*(6), 599-611. doi:10.1017/s1478951516000249

Abudari, G., Zahreddine, H., Hazeim, H., Assi, M. A., & Emara, S. (2014). Knowledge of and attitudes towards palliative care among multinational nurses in Saudi Arabia. *International Journal of Palliative Nursing, 20*(9), 435-441. doi:10.12968/ijpn.2014.20.9.435

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Upper Saddle River, NJ: Prentice Hall.

Akerele, T. M., & Al-Mazrou, Y. Y. (2002). Organization of the Saudi health system. *Eastern Mediterranean Health Journal, 8*(4-5), 645-653.

Al-Ayed, I. H. (2010). Mothers' knowledge of child health matters: Are we doing enough? *Journal of Family and Community Medicine, 17*(1), 22-28. doi:10.4103/1319-1683.68785

Al-Harthy, M., Ohrbach, R., Michelotti, A., & List, T. (2016). The effect of culture on pain sensitivity. *Journal of Oral Rehabilitation, 43*(2), 81-88. doi:10.1111/joor.12346

Al-Homayan, A. M., Shamsudin, F. M., Subramaniam, C., & Islam, R. (2013). Analysis of health care system-resources and nursing sector in Saudi Arabia. *Advances in Environmental Biology, 7*(9), 2584-2592.

Al-Mahmoud, S., Mullen, P., & Spurgeon, P. (2012). Saudisation of the nursing workforce: Reality and myths about planning nurse training in Saudi Arabia. *Journal of American Science, 8*(4), 369-379.

Al-Shaer, D., Hill, P. D., & Anderson, M. A. (2011). Nurses' knowledge and attitudes regarding pain assessment and intervention. *MEDSURG Nursing Journal, 20*(1), 7-11.

Al-Shahri, M. Z. (2002). Culturally sensitive caring for Saudi patients. *Journal of Transcultural Nursing, 13*(2), 133-138. doi:10.1177/104365960201300206

Al-Ahmadi, H. (2009). Factors affecting performance of hospital nurses in Riyadh region, Saudi Arabia. *International Journal of Health Care Quality Assurance, 22*(1), 40-54. doi:doi:10.1108/09526860910927943

Al Mutair, A. S., Plummer, V., O'Brien, A. T., & Clerehan, R. (2013). Providing culturally congruent care for Saudi patients and their families. *Contemporary Nurse Journal, 46*(2), 254-258. doi:10.5172/conu.2013.2747

Al Qadire, M., & Al Khalaileh, M. (2014). Jordanian nurses knowledge and attitude regarding pain management. *Pain Management Nursing, 15*(1), 220-228. doi:10.1016/j.pmn.2012.08.006

Albertyn, R., Rode, H., Millar, A., & Thomas, J. (2009). Challenges associated with paediatric pain management in Sub Saharan Africa. *International Journal of Surgery, 7*(2), 91-93. doi:10.1016/j.ijsu.2009.01.005

Aldossary, A., While, A., & Barriball, L. (2008). Health care and nursing in Saudi Arabia. *International nursing review, 55*(1), 125-128. doi:10.1111/j.1466-7657.2007.00596.x

Ali, P. A., & Watson, R. (2018). Language barriers and their impact on provision of care to patients with limited English proficiency: Nurses' perspectives. *Journal of Clinical Nursing, 27*(5-6), e1152-e1160. doi:10.1111/jocn.14204

Almadani, N. (2017). *The implications of nursing degree education for future workforce planning in Saudi Arabia: A case study.* (Doctoral dissertation), University of Salford. Retrieved from http://usir.salford.ac.uk/id/eprint/42222

Almalki, M., Fitzgerald, G., & Clark, M. (2011a). Health care system in Saudi Arabia: An overview. *Eastern Mediterranean Health Journal, 17*(10), 784-793.

Almalki, M., FitzGerald, G., & Clark, M. (2011b). The nursing profession in Saudi Arabia: An overview. *International nursing review, 58*(3), 304-311. doi:10.1111/j.1466-7657.2011.00890.x

Almutairi, K. M. (2015). Culture and language differences as a barrier to provision of quality care by the health workforce in Saudi Arabia. *Saudi Medical Journal, 36*(4), 425-431. doi:10.15537/smj.2015.4.10133

Alqahtani, M., & Jones, L. K. (2015). Quantitative study of oncology nurses' knowledge and attitudes towards pain management in Saudi Arabian hospitals. *European Journal of Oncology Nursing, 19*(1), 44-49. doi:10.1016/j.ejon.2014.07.013

Alqahtani, M., Jones, L. K., & Holroyd, E. (2016). Organisational barriers to effective pain management amongst oncology nurses in Saudi Arabia. *Journal of Hospital Administration, 5*(1), 81. doi:doi.org/10.5430/jha.v5n1p81

Alsaqri, S. H. (2018). Nursing student's knowledge and attitudes toward pain management at Hail University, Saudi Arabia. *International Journal of Advanced and Applied Sciences, 5*(3), 75-81. doi:10.21833/ijaas.2018.03.011

Alshammary, S. A., Abdullah, A., Duraisamy, B. P., & Anbar, M. (2014). Palliative care in Saudi Arabia: Two decades of progress and going strong. *Journal of Health Specialties, 2*(2), 59. doi:10.4103/1658-600X.131749

Alsirafy, S. A., & Farag, D. E. (2016). A shortage of oral morphine in Egypt. *Bulletin of the World Health Organization, 94*(1), 3. doi:10.2471/BLT.15.156240

AlYami, M. S., & Watson, R. (2014). An overview of nursing in Saudi Arabia. *Journal of Health Specialties, 2*(1), 10. doi:10.4103/1658-600X.126058

AlYateem, S., & Al-Yateem, N. (2014). The experience of overseas nurses caring for Muslim patients in Kingdom of Saudi Arabia and UAE: A qualitative study. *International Journal of Research in Nursing, 5*(1), 17. doi:10.3844/ijrnsp.2014.17.24

American Academy of Pediatrics. (2001). The assessment and management of acute pain in infants, children, and adolescents. *Pediatrics, 108*(3), 793. doi:10.1542/peds.108.3.793

American Nurses Association. (2015). *Guide to the code of ethics for nurses with interpretive statements* (2nd ed.). Silver Spring; Maryland: American Nurses Association.

American Pain Society. (2012). Assessment and management of children with chronic pain: A position statement from the American Pain Society. Retrieved from

American Pain Society. (2016). Guidelines on the management of postoperative pain. *The Journal of Pain, 17*(2), 131-157.

American Society for Pain Management. (2011). American Society for Pain Management Nursing guidelines on monitoring for opioid-induced sedation and respiratory depression. *Pain Management Nuring, 12*(3), 118-145.e110. doi:10.1016/j.pmn.2011.06.008

Andrews, M. M., & Boyle, J. S. (2008). *Transcultural concepts in nursing care* (5th ed.). Philadelphia: Wolters Kluwer Health.

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies, 5*(2), 272-281

Arbour, C., & Gelinas, C. (2010). Are vital signs valid indicators for the assessment of pain in postoperative cardiac surgery ICU adults? *Intensive and Critical Care Nursing, 26*(2), 83-90. doi:10.1016/j.iccn.2009.11.003

Arnold, E., & Boggs, K. U. (2015). *Interpersonal relationships: Professional communication skills for nurses* (7th ed.). St. Louis, Missouri: Elsevier.

Arnstein, P. (2010). *Clinical coach for effective pain management*. Philadelphia: F.A. Davis Company.

Arnstein, P., Broglio, K., Wuhrman, E., & Kean, M. B. (2011). Use of placebos in pain management. *Pain Management Nursing, 12*(4), 225-229. doi:10.1016/j.pmn.2010.10.033

Aschenbrenner, D. S., & Venable, S. J. (2009). *Drug therapy in nursing* (3rd ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Aziznejadroshan, P., Alhani, F., & Mohammadi, E. (2016). Experiences of iranian nurses on the facilitators of pain management in children: A qualitative study. *Pain Research and Management, 2016*(6), 1-7. doi:10.1155/2016/3594240

Babiker, A., El Husseini, M., Al Nemri, A., Al Frayh, A., Al Juryyan, N., Faki, M. O., . . . Al Zamil, F. (2014). Health care professional development: Working as a team to improve patient care. *Sudanese Journal of Paediatrics, 14*(2), 9-16.

Ball, J. W., Bindler, R. C., Cowen, K., & Shaw, M. R. (2015). *Principles of pediatric nursing: Caring for children* (6th ed.). Boston: Pearson.

Barker, A. M. (2009). *Advanced practice nursing: Essential knowledge for the profession*. Boston, MA: Jones and Bartlett Publishers.

Barker, J. H. (2013). *Evidence-based practice for nurses* (2nd ed.). London: SAGE.

Barry, D. T., Irwin, K. S., Jones, E. S., Becker, W. C., Tetrault, J. M., Sullivan, L. E., . . . Fiellin, D. A. (2010). Opioids, Chronic Pain, and Addiction in Primary Care. *The Journal of Pain, 11*(12), 1442-1450. doi:10.1016/j.jpain.2010.04.002

Batiha, A.-M. (2014). Pain management barriers in critical care units: A qualitative study. *International Journal of Advanced Nursing Studies, 3*(1), 1-5. doi:10.14419/ijans.v3i1.1494

Bazeley, P. (2018). *Integrating analyses in mixed methods research*. London: SAGE.

Bell, L., & Duffy, A. (2009). Pain assessment and management in surgical nursing: A literature review. *British Journal of Nursing, 18*(3), 153. doi:10.12968/bjon.2009.18.3.39042

Benzon, H., Rathmell, J. P., Wu, C. L., Turk, D., Argoff, C. E., & Hurley, R. W. (2014). *Practical management of pain* (5th ed.). Philadelphia, PA: Elsevier/Mosby.

Berman, A., & Kozier, B. (2008). *Kozier & Erb's fundamentals of nursing: Concepts, process, and practice* (8th ed.). Upper Saddle River, N.J.: Pearson Prentice Hall.

Berman, A., Kozier, B., & Erb, G. (2012). *Kozier and Erb's fundamentals of nursing* (9th ed.). Boston: Pearson

Brennan, F., Lohman, D., & Gwyther, L. (2019). Access to pain management as a human right. *American Journal of Public Health, 109*(1), 61. doi:10.2105/AJPH.2018.304743

Brooker, C., & Waugh, A. (2013). *Foundations of nursing practice: Fundamentals of holistic care* (2nd ed.). Oxford: Mosby.

Birnie, K. A., Chambers, C. T., Fernandez, C. V., Forgeron, P. A., Latimer, M. A., McGrath, P. J., . . . Finley, G. A. (2014). Hospitalized children continue to report undertreated and preventable pain. *Pain Research and Management, 19*(4), 198-204. doi:10.1155/2014/614784

Bissonnette, B. (2011). *Pediatric anesthesia: Basic principles, state of the art, future*. Shelton, Connecticut: PMPH-USA.

Blankinship, L. A. (2018). Providing culturally sensitive care for Islamic patients and families. *Journal of Christian Nursing, 35*(2), 94-99. doi:10.1097/cnj.0000000000000418

Bond, M. (2011). Pain education issues in developing countries and responses to them by the International Association for the Study of Pain. *Pain Research & Management: The Journal of the Canadian Pain Society, 16*(6), 404-406.

Bowden, V. R., & Greenberg, C. S. (2010). *Children and their families: The continuum of care*. London: Lippincott Williams & Wilkins.

Brand, K., & Thorpe, B. (2016). Pain assessment in children. *Anaesthesia & Intensive Care Medicine, 17*(6), 270-273. doi:10.1016/j.mpaic.2016.03.007

Brant, J. M., Newton, S., & Maurer, M. A. (2017). Pain management in the Middle East: Building capacity with global partners. *Oncology Nursing Forum, 44*(4), 403-405. doi:10.1188/17.Onf.403-405

Brennan, F., Carr, D. B., & Cousins, M. (2007). Pain management: A fundamental human right. *Anesthesia & Analgesia, 105*(1), 205-221. doi:10.1213/01.ane.0000268145.52345.55

Briggs, E. V., Carr, E. C., & Whittaker, M. S. (2011). Survey of undergraduate pain curricula for healthcare professionals in the United Kingdom. *European Journal of Pain, 15*(8), 789-795. doi:10.1016/j.ejpain.2011.01.006

Brown, J., & Schmidt, N. (2012). *Evidence-based practice for nurses: Appraisal and application of research*. Boston, MA: Jones & Bartlett Learning.

Browne, N. T. (2013). *Nursing care of the pediatric surgical patient* (3rd ed.). Burlington, Mass.: Jones & Bartlett Learning.

Browne, N. T., Flanigan, L. M., McComiskey, C. A., & Pieper, P. (2008). *Nursing care of the pediatric surgical patient*. Boston, MA: Jones & Bartlett Publishers.

Bruera, E., & Portenoy, R. K. (2010). *Cancer pain: Assessment and management* (2nd ed.). Cambridge; New York: Cambridge University Press.

Brugnoli, M. P. (2014). *Clinical hypnosis in pain therapy and palliative care : A handbook of techniques for improving the patient's physical and psychological well-being*. Springfield, Illinois, U.S.A.: Charles C Thomas Publisher, Ltd.

Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research, 6*(1), 97-113. doi:10.1177/1468794106058877

Buchholz, M., Karl, H. W., Pomietto, M., & Lynn, A. (1998). Pain scores in infants: A modified infant pain scale versus visual analogue. *Journal of Pain and Symptom Management, 15*(2), 117-124. doi:10.1016/S0885-3924(98)80009-2

Burns, C. E., Dunn, A. M., Brady, M. A., Starr, N. B., Blosser, C. G., & Garzon, D. L. (2017). *Pediatric primary care* (6th ed.). Philadelphia, PA: Elsevier.

Burns, N., Grove, S. K., & Gray, J. (2011). *Understanding nursing research: Building an evidence-based practice* (5th ed.). Maryland Heights, MO: Elsevier/Saunders.

Carper, B. A. (1978). Fundamental patterns of knowing in nursing. *Advances in Nursing Science, 1*(1), 13-24.

Carter, B., & Simons, J. (2014). *Stories of children's pain: Linking evidence to practice*: SAGE Publications Ltd.

Charlesworth, R. (2010). *Understanding child development* (8th ed.). Clifton Park, NY ; United Kingdom: Thomson Delmar Learning.

Chen, L.-M., Miaskowski, C., Dodd, M., & Pantilat, S. (2008). Concepts within the Chinese culture that influence the cancer pain experience. *Cancer Nursing, 31*(2), 103-108. doi:10.1097/01.NCC.0000305702.07035.4d

Cheng, S.-f., Foster, R. L., & Huang, C.-y. (2003). Concept analysis of pain. *Tzu Chi Nursing Journal 2*, 20-30.

Cherny, N. I., Fallon, M., Kaasa, S., Portenoy, R. K., & Currow, D. C. (2015). *Oxford textbook of palliative medicine*. Oxford, UK: Oxford University Press.

Chinn, P. L., & Kramer, M. K. (2008). *Integrated theory and knowledge development in nursing* (7th ed.). St. Louis: Mosby Elsevier.

Chinn, P. L., & Kramer, M. K. (2011). *Integrated theory and knowledge development in nursing* (8th ed.). St. Louis, MO: Mosby/Elsevier.

Chng, H. Y., He, H. G., Chan, S. W., Liam, J. L., Zhu, L., & Cheng, K. K. (2015). Parents' knowledge, attitudes, use of pain relief methods and satisfaction related to their children's postoperative pain management: A descriptive correlational study. *Journal of Clinical Nursing, 24*(11-12), 1630-1642. doi:10.1111/jocn.12764

Cho, E., Chin, D. L., Kim, S., & Hong, O. (2016). The relationships of nurse staffing level and work environment with patient adverse events. *Journal of Nursing Scholarship, 48*(1), 74-82. doi:10.1111/jnu.12183

Choong, K. A. (2015). Islam and palliative care. *Global Bioethics, 26*(1), 28-42. doi:10.1080/11287462.2015.1008752

Clark, V. L. P., & Ivankova, N. V. (2015). *Mixed methods research: A guide to the field*. Los Angeles: SAGE.

Clarke, S., Corkin, D., & Liggett, L. (2012). *Care planning in children and young people's nursing*. Chichester, West Sussex, UK: Wiley-Blackwell.

Clarke, S. P., & Donaldson, N. E. (2008). Nurse staffing and patient care quality and safety. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. Rockville (MD).

Clayton, B. D., Stock, Y. N., & Cooper, S. E. (2017). *Basic pharmacology for nurses* (17th ed.). St. Louis, Mo.: Mosby/Elsevier.

Cleaver, K., & Webb, J. (2007). *Emergency care of children and young people*. Oxford, UK: Blackwell.

Cohen, A. L., Rivara, F., Marcuse, E. K., McPhillips, H., & Davis, R. (2005). Are language barriers associated with serious medical events in hospitalized pediatric patients? *Pediatrics, 116*(3), 575-579. doi:10.1542/peds.2005-0521

Coyne, I., Timmins, F., & Neill, F. (2010). *Clinical skills in children's nursing*. Oxford, UK: Oxford University Press.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4. ed.). Thousand Oaks: SAGE Publications.

Creswell, J. W. (2015). *A concise introduction to mixed methods research*. Los Angeles: SAGE.

Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, Calif.: SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Los Angeles: SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (Third Edition. ed.). Los Angeles: SAGE.

Croft, P., Blyth, F., & Windt, D. v. d. (2010). *Chronic pain epidemiology: From aetiology to public health*. Oxford, New York: Oxford University Press.

Czarnecki, M. L., Salamon, K. S., Thompson, J. J., & Hainsworth, K. R. (2014). Do barriers to pediatric pain management as perceived by nurses change over time? *Pain Management Nursing, 15*(1), 292-305. doi:10.1016/j.pmn.2012.12.003

Czarnecki, M. L., Simon, K., Thompson, J. J., Armus, C. L., Hanson, T. C., Berg, K. A., . . . Malin, S. (2011). Barriers to pediatric pain management: A nursing perspective. *Pain Management Nursing, 12*(3), 154-162. doi:10.1016/j.pmn.2010.07.001

Daher, M. (2010). Pain relief is a human right. *Asian Pacific Journal of Cancer Prevention, 11*(suppl 1), 97-101.

Darawad, M., Alnajar, M. K., Abdalrahim, M. S., & El-Aqoul, A. M. (2017). Cancer pain management at oncology units: Comparing knowledge, attitudes and perceived barriers between physicians and nurses. *Journal of Cancer Education*. doi:10.1007/s13187-017-1314-4

Davies, R., & Davies, A. (2011). *Children and young people's nursing: Principles for practice*. London, UK: Hodder Arnold.

Doca, F. N.P., Costa Junior, Á. L., Finley, G. A., & Linhares, M. B. M. (2017). Pain in pediatric inpatients: Prevalence, characteristics, and management. *Psychology & Neuroscience, 10*(4), 394. doi: 10.1037/pne0000094

De Chesnay, M. (2014). *Nursing research using ethnography: Qualitative designs and methods in nursing*. New York, NY: Springer Publishing Company.

De Chesnay, M. (2015). *Nursing research using grounded theory: Qualitative designs and methods in nursing*. New York, NY: Springer Publishing Company.

Dongara, A. R., Shah, S. N., Nimbalkar, S. M., Phatak, A. G., & Nimbalkar, A. S. (2015). Knowledge of and attitudes regarding postoperative pain among the pediatric cardiac nursing staff: An indian experience. *Pain Management Nursing, 16*(3), 314-320. doi:10.1016/j.pmn.2014.08.009

Doorenbos, A. Z. (2014). Mixed methods in nursing research : An overview and practical examples. *Japanese Journal of Nursing Research, 47*(3), 207-217.

Dossey, B. M. (2008). Theory of integral nursing. *Advances in Nursing Science, 31*(1), E52-E73. doi:10.1097/01.ANS.0000311536.11683.0a

Driscoll, A., Grant, M. J., Carroll, D., Dalton, S., Deaton, C., Jones, I., . . . Astin, F. (2018). The effect of nurse-to-patient ratios on nurse-sensitive patient outcomes in acute specialist units: A systematic review and meta-analysis. *European Journal of Cardiovascular Nursing, 17*(1), 6-22. doi:10.1177/1474515117721561

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.

Ebert, M. H., & Kerns, R. D. (2011). *Behavioral and psychopharmacologic pain management*. Cambridge, UK Cambridge University Press.

Edwards, S. (2002). Nursing knowledge: Defining new boundaries. *Nursing Standard, 17*(2), 40-44. doi:10.7748/ns2002.09.17.2.40.c3272

Eid, T., Manias, E., Bucknall, T., & Almazrooa, A. (2014). Nurses' knowledge and attitudes regarding pain in Saudi Arabia. *Pain Management Nursing, 15*(4), e25-e36. doi:10.1016/j.pmn.2014.05.014

Ekim, A., & Ocakcı, A. F. (2013). Knowledge and attitudes regarding pain management of pediatric nurses in Turkey. *Pain Management Nursing, 14*(4), e262-267. doi:10.1016/j.pmn.2012.02.004

Elliott, D., Aitken, L., & Chaboyer, W. (2007). *ACCCN's critical care nursing*. Marrickville, N.S.W.: Elsevier Australia.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107-115. doi:10.1111/j.1365-2648.2007.04569.x

Emanuel, L. L., Emanuel, L. L., & Librach, S. L. (2011). *Palliative care: Core skills and clinical competencies* (2nd ed.). Philadelphia: Saunders.

Enskär, K., Ljusegren, G., Berglund, G., Eaton, N., Harding, R., Mokoena, J., . . . Moleki, M. (2007). Attitudes to and knowledge about pain and pain management, of nurses working with children with cancer: A comparative study between UK, South Africa and Sweden. *Journal of Research in Nursing, 12*(5), 501-515. doi:10.1177/1744987107080455

Ferrell, B. R., & McCafferey, M. (2008). Knowledge and attitudes survey regarding pain. Retrieved from http://prc.coh.org/

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—principles and practices. *Health Services Research, 48*(6pt2), 2134-2156. doi:10.1111/1475-6773.12117

Finley, G. A., Kristjánsdóttir, Ó., & Forgeron, P. A. (2009). Cultural influences on the assessment of children's pain. *Pain Research and Management, 14*(1), 33-37.

Forgeron, P. A., Finley, G. A., & Arnaout, M. (2006). Pediatric pain prevalence and parents' attitudes at a cancer hospital in Jordan. *Journal of Pain and Symptom Management, 31*(5), 440-448. doi:10.1016/j.jpainsymman.2005.09.003

Forgeron, P. A., Jongudomkarn, D., Evans, J., Finley, G. A., Thienthong, S., Siripul, P., . . . Boonyawatanangkool, K. (2009). Children's pain assessment in northeastern Thailand: Perspectives of health professionals. *Qualitative Health Research, 19*(1), 71-81. doi:10.1177/1049732308327242

Fraser, J., Waters, D., Forster, E., & Brown, N. (2014). *Paediatric nursing in Australia: Principles for practice*. Cambridge ; Port Melbourne, Vic.: Cambridge University Press.

Friedrichsdorf, S. J., Giordano, J., Desai Dakoji, K., Warmuth, A., Daughtry, C., & Schulz, C. A. (2016). Chronic pain in children and adolescents: Diagnosis and treatment of primary pain disorders in head, abdomen, muscles and joints. *Children, 3*(4), 42. doi:10.3390/children3040042

Fulton, J. S., Lyon, B. L., & Goudreau, K. A. (2010). *Foundations of clinical nurse specialist practice* (2nd ed.). New York, NY: Springer Publishing Company.

Funnell, R., Koutoukidis, G., & Lawrence, K. (2009). *Tabbner's nursing care: Theory and practice*. New York: Churchill Livingstone Elsevier.

Galanti, G.-A. (2004). *Caring for patients from different cultures* (3rd ed.). Philadelphia: University of Pennsylvania Press.

Gatchel, R. J., & Turk, D. C. (2002). *Psychological approaches to pain management: A practitioner's handbook* (2nd ed.). New York The Guilford Press.

Gerdin, J. A. (2017). *Health careers today* (6th ed.). St. Louis, Missouri: Elsevier.

Ghodse, H. (2016). *International drug control into the 21st century*. New York: Routledge.

Gimbler-Berglund, I., Ljusegren, G., & Enskar, K. (2008). Factors influencing pain management in children. *Paediatric Nursing, 20*(10), 21-24. doi:10.7748/paed2008.12.20.10.21.c6901

Given, L. M. (2008). *The Sage encyclopedia of qualitative research methods*. Los Angeles: Sage Publications.

Givler, A., & Maani-Fogelman, P. A. (2019). The importance of cultural competence in pain and palliative care. In *StatPearls [Internet]*: StatPearls Publishing. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK493154/

Glasper, A., Coad, J., & Richardson, J. (2014). *Children and young people's nursing at a Glance*. Oxford, UK: Wiley Blackwell.

Glasper, E. A., & Richardson, J. (2010). *A textbook of children's and young people's nursing* (2nd ed.). Edinburgh: Churchill Livingstone.

Gordon, R. M., Corcoran, J. R., Bartley-Daniele, P., Sklenar, D., Sutton, P. R., & Cartwright, F. (2014). A transdisciplinary team approach to pain management in inpatient health care settings. *Pain Management Nursing, 15*(1), 426-435. doi:10.1016/j.pmn.2013.01.004

Goucke, R., & Morriss, W. (2012). Pain management in low and middle income countries (lmic) just put up with it? *Egyptian Journal of Anaesthesia, 28*(1), 1-2. doi:10.1016/j.egja.2011.11.005

Grove, S. K., Burns, N., & Gray, J. (2013). *The practice of nursing research : appraisal, synthesis, and generation of evidence* (7th ed.). Philadelphia, Pa. ; London: Saunders.

Gunnvall, K., Augustsson, D., Lindström, V., & Vicente, V. (2018). Specialist nurses' experiences when caring for preverbal children in pain in the prehospital context in Sweden. *International Emergency Nursing, 36*, 39-45. doi:10.1016/j.ienj.2017.09.006

Guest, K. J. (2017). *Cultural anthropology: A toolkit for a global age*: WW Norton & Company.

Halligan, P. (2006). Caring for patients of Islamic denomination: Critical care nurses' experiences in Saudi Arabia. *Journal of Clinical Nursing, 15*(12), 1565-1573. doi:10.1111/j.1365-2702.2005.01525.x

Hannawa, A. F., & Spitzberg, B. H. (2015). *Communication competence*. Berlin; Boston: Walter de Gruyter GmbH & Co KG.

Hansk, G. W. C. (2011). *Oxford textbook of palliative medicine* (4th ed.). Oxford, New York Oxford University Press.

Harrison, D., Joly, C., Chretien, C., Cochrane, S., Ellis, J., Lamontagne, C., & Regis, V. (2014). Pain prevalence in a pediatric hospital: Raising awareness during pain awareness week. *Pain Research and Management, 19*(1), e24-e30. doi:10.1155/2014/737692

Hatfield, L. A. (2014). Neonatal pain: What's age got to do with it? *Surgical Neurology International, 5*(Suppl 13), S479-S489. doi:10.4103/2152-7806.144630

He, Jahja, R., Lee, T., Ang, E. N. K., Sinnappan, R., Vehviläinen-Julkunen, K., & Chan, M. F. (2010). Nurses' use of non-pharmacological methods in children's postoperative pain management: Educational intervention study. *Journal of Advanced Nursing, 66*(11), 2398-2409. doi:10.1111/j.1365-2648.2010.05402.x

He, H.-G., Polkki, T., Vehvilainen-Julkunen, K., & Pietila, A.-M. (2005). Chinese nurses' use of non-pharmacological methods in children's postoperative pain relief. *Journal of Advanced Nursing, 51*(4), 335-342. doi:10.1111/j.1365-2648.2005.03505.x

Herr, K., Coyne, P. J., McCaffery, M., Manworren, R., & Merkel, S. (2011). Pain assessment in the patient unable to self-report: Position statement with clinical practice recommendations. *Pain Management Nursing, 12*(4), 230-250. doi:10.1016/j.pmn.2011.10.002

Hockenberry, M. J., & Wilson, D. (2015). *Wong's nursing care of infants and children* (10th ed.). St. Louis, Missouri: Elsevier.

Hogg, M. A., & Vaughan, G. M. (2005). *Social psychology* (4th ed.). London: Prentice Hall.

Holloway, I., & Galvin, K. (2016). *Qualitative research in nursing and healthcare* (4th ed.). Chichester, West Sussex ; Ames, Iowa: Wiley-Blackwell.

Houser, J. (2011). *Nursing research : Reading, using, and creating evidence* (2nd ed.). Sudbury, MA: Jones & Bartlett Learning.

Howard, R. F. (2011). Chronic pain problems in children and young people. *Continuing Education in Anaesthesia, Critical Care & Pain, 11*(6), 219-223. doi:10.1093/bjaceaccp/mkr042

Huguet, A., & Miró, J. (2008). The severity of chronic pediatric pain: An epidemiological study. *The Journal of Pain, 9*(3), 226-236. doi:10.1016/j.jpain.2007.10.015

Incayawar, M., & Todd, K. H. (2013). *Culture, brain, and analgesia: Understanding and managing pain in diverse populations*. Oxford, New York Oxford University Press.

International Association for the Study of Pain. (2018). IASP Statement on Opioids. Retrieved from pain.org/Advocacy/ Content.aspx? ItemNumber=7194

International Association for the Study of Pain. (2011). Managing acute pain in the developing world. *IASP: Pain Clinical Updates, 19*(3), 1-7.

International Association for the Study of Pain. (2005). Why children's pain matters. *IASP: Pain Clinical Updates, 13*(4), 1-6.

Ismail, A. (2016). The challenges of providing effective pain management for children in the pediatric intensive care unit. *Pain Management Nursing, 17*(6), 372-383. doi:10.1016/j.pmn.2016.08.005

Issa, M. R., & Khraisat, F. S. (2017). Knowledge and attitude about pain and pain management among critical care nurses in a tertiary hospital. *Journal of Intensive and Critical Care, 3*(1). doi:10.21767/2471-8505.100071

Ivankova, N. V. (2014). Implementing quality criteria in designing and conducting a sequential quan → qual mixed methods study of student engagement with learning applied research methods online. *Journal of Mixed Methods Research, 8*(1), 25-51. doi:10.1177/1558689813487945

Ivankova, N. V. (2015). *Mixed methods applications in action research: From methods to community action*. Thousand Oaks, California: SAGE Publications.

Jackson, M. (2002). *Pain: The fifth vital sign* (1st ed.). New York: Crown Pub.

Jacob, E., & Puntillo, K. A. (1999). A survey of nursing practice in the assessment and management of pain in children. *Pediatric nursing, 25*(3), 278-286.

James, S. R., Nelson, K. A., & Ashwill, J. W. (2013). *Nursing care of children: Principles & practice* (4th ed.). St. Louis, Mo.: Elsevier/Saunders.

Jan, R. (1996). Rufaida Al-Asalmiya, the first Muslim nurse. *Image: Journal of Nursing Scholarship, 28*(3), 267-268. doi:10.1111/j.1547-5069.1996.tb00362.x

Jeffreys, A. (2010). *The report: Emerging Saudi Arabia 2007*: Oxford Business Group.

Jo, D. (2014). *Confronting Chronic Pain: A Pain Doctor's Guide to Relief*: Taylor & Francis.

Joanna Briggs Institute. (2012). Parental involvement in their children's postoperative pain management in hospital. *JBI Best Practice, 16*(3), 1-4.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Kahsay, H. (2017). Assessment and treatment of pain in pediatric patients. *Current Pediatric Research, 21*(1), 148-157.

Kaplow, R. (2015). *Cardiac surgery essentials for critical care nursing*: Jones & Bartlett Publishers.

Kassa, R. N., & Kassa, G. M. (2014). Nurses' attitude, practice and barrier s toward cancer pain management, Addis Ababa, Ethiopia. *Journal of Cancer Science and Therapy, 6*(12), 483-487. doi:10.4172/1948-5956.1000312

Kattan, M. W., & Cowen, M. E. (2009). *Encyclopedia of medical decision making*. Thousand Oaks, Calif.: SAGE Publications.

Kepel, G. (2004). *The war for Muslim minds: Islam and the West*. Cambridge, Mass.: Harvard University Press.

Kheshti, R., Namazi, S., Mehrabi, M., & Firouzabadi, D. (2016). Health Care Workers' Knowledge, Attitude, and Practice About Chronic Pain Management, Shiraz, Iran. *Anesthesiology and Pain Medicine, 6*(4), e37270. doi:10.5812/aapm.37270

Kim, J. S. (2013). Acute abdominal pain in children. *Pediatric Hastroenterology, Hepatology & Nutrition, 16*(4), 219-224. doi:10.5223/pghn.2013.16.4.219

Kisaalita, N., Staud, R., Hurley, R., & Robinson, M. (2014). Placebo use in pain management: The role of medical context, treatment efficacy, and deception in determining placebo acceptability. *Pain, 155*(12), 2638-2645. doi:10.1016/j.pain.2014.09.029

Kittredge, M. (1992). *Pain*. New York: Chelsea House Publishers.

Koenig, H. G. (2014). *Health and well-being in Islamic societies: Background, research, and applications*. New York: Springer Publishing Company.

Koestler, A. J., & Myers, A. (2002). *Understanding chronic pain*. Jackson: University Press of Mississippi.

Kozlowski, L. J., Kost-Byerly, S., Colantuoni, E., Thompson, C. B., Vasquenza, K. J., Rothman, S. K., . . . Monitto, C. L. (2014). Pain prevalence, intensity, assessment and management in a hospitalized pediatric population. *Pain Management Nursing, 15*(1), 22-35. doi:doi.org/10.1016/j.pmn.2012.04.003

Kunnumpurath, S., Julien, N., Kodumudi, G., Kunnumpurath, A., Kodumudi, V., & Vadivelu, N. (2018). Global supply and demand of opioids for pain management. *Current Pain and Headache Reports, 22*(5), 34. doi:10.1007/s11916-018-0689-1

Kyle, T., & Carman, S. (2017). *Essentials of pediatric nursing* (3rd ed.). Philadelphia: Wolters Kluwer.

LaFond, C. M., Van Hulle Vincent, C., Oosterhouse, K., & Wilkie, D. J. (2016). Nurses' beliefs regarding pain in critically ill children: A mixed-methods study. *Journal of Pediatric Nursing, 31*(6), 691-700. doi:10.1016/j.pedn.2016.08.002

Lange, J. W. (2012). *The nurse's role in promoting optimal health of older adults: Thriving in the wisdom years*. Philadelphia: F.A. Davis Co.

Lasch, K. E. (2000). Culture, pain, and culturally sensitive pain care. *Pain Management Nursing, 1*(3, Supplement 1), 16-22. doi:10.1053/jpmn.2000.9761

LeMay, S., Johnston, C., Choiniere, M., Fortin, C., Hubert, I., Frechette, G., . . . Murray, L. (2010). Pain management interventions with parents in the emergency department: A randomized trial. *Journal of Advanced Nursing, 66*(11), 2442-2449. doi:10.1111/j.1365-2648.2010.05408.x

Levin, M. E. (2006). Language as a barrier to care for Xhosa-speaking patients at a South African paediatric teaching hospital. *South African Medical Journal, 96*(10), 1076-1079.

Linhares, M., Doca, F., Martinez, F., Carlotti, A., Cassiano, R., Pfeifer, L., . . . Finley, G. (2012). Pediatric pain: Prevalence, assessment, and management in a teaching hospital. *Brazilian Journal of Medical and Biological Research, 45*(12), 1287-1294. doi:10.1590/S0100-879X2012007500147

Linton, S. J., & Shaw, W. S. (2011). Impact of psychological factors in the experience of pain. *Phys Ther, 91*(5), 700-711. doi:10.2522/ptj.20100330

Lippincott Williams & Wilkins. (2007). *Fundamentals of nursing made incredibly easy*. Ambler: Lippincott Williams & Wilkins.

Lohman, D., Schleifer, R., & Amon, J. J. (2010). Access to pain treatment as a human right. *BMC Medicine, 8*(1), 8. doi:10.1186/1741-7015-8-8

Loizzo, A., Loizzo, S., & Capasso, A. (2009). Neurobiology of pain in children: An overview. *The Open Biochemistry Journal, 3*, 18-25. doi:10.2174/1874091X00903010018

Lord, B., & Woollard, M. (2011). The reliability of vital signs in estimating pain severity among adult patients treated by paramedics. *Emergency Medicine Journal, 28*(2), 147-150. doi:10.1136/emj.2009.079384

Lovering, S. (2006). Cultural attitudes and beliefs about pain. *Journal of Transcultural Nursing, 17*(4), 389-395. doi:10.1177/1043659606291546

Lui, F., & Ng, K. F. (2011). Adjuvant analgesics in acute pain. *Expert Opin Pharmacother, 12*(3), 363-385. doi:10.1517/14656566.2011.521743

Lunsford, L. (2015). Knowledge and attitudes regarding pediatric pain in Mongolian nurses. *Pain Management Nursing, 16*(3), 346-353. doi:10.1016/j.pmn.2014.08.007

MacDonald, S. (2015). *Essentials of statistics with SPSS*. Canada: Lulu Press.

Macintyre, P., Rowbotham, D., & Walker, S. (2008). *Clinical pain management second edition: Acute pain* (2nd ed.): CRC Press.

Mackintosh-Franklin, C. (2017). Pain: A content review of undergraduate pre-registration nurse education in the United Kingdom. *Nurse education today, 48*, 84-89. doi:10.1016/j.nedt.2016.08.035

Maier-Lorentz, M. M. (2008). Transcultural nursing: Its importance in nursing practice. *Journal of Cultural Diversity, 15*(1), 37-43.

Mantzorou, M., & Mastrogiannis, D. (2011). The value and significance of knowing the patient for professional practice, according to the Carper's patterns of knowing. *Health Science Journal, 5*(4), 251-261.

Manwere, A., Chipfuwa, T., Mukwamba, M. M., & Chironda, G. (2015). Knowledge and attitudes of registered nurses towards pain management of adult medical patients: A case of Bindura hospital. *Health Science Journal, 9*(4), 1-6.

Manworren. (2000). Practice applications of research. Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain. *Pediatric Nursing, 26*(6), 610-614.

Manworren. (2001). Development and testing of the Pediatric Nurses' Knowledge and Attitudes Survey Regarding Pain. *Pediatric Nursing, 27*(2), 151-158.

Markula, P., & Silk, M. L. (2011). *Qualitative research for physical culture*. New York: Palgrave Macmillan.

Marmo, L., & D'Arcy, Y. M. (2013). *Compact clinical guide to critical care, trauma, and emergency pain management: An evidence-based approach for nurses*. New York: Springer Publishing Company.

Marrone, S. R. (2017). The art of knowing: Designing a nursing professional development program based on American nurses' experiences of providing care to Arab Muslims. *Journal of Nursing Education and Practice, 7*(7), 104.

Marston, L. (2010). *Introductory statistics for health and nursing using SPSS*. Los Angeles: SAGE.

Mathew, P. J., Mathew, J. L., & Singhi, S. (2011). Knowledge, attitude and practice of pediatric critical care nurses towards pain: Survey in a developing country setting. *Journal of Postgraduate Medicine, 57*(3), 196-200. doi:10.4103/0022-3859.85203

Mathews, L. (2011). Pain in children: Neglected, unaddressed and mismanaged. *Indian Journal of Palliative Care*, S70-73. doi:10.4103/0973-1075.76247

Matthews, T. D., & Kostelis, K. T. (2011). *Designing and conducting research in health and human performance* (1st ed.). San Francisco: Jossey-Bass.

Mawhirter, D. A. (2016). Culturally competent pain management: A need to change nursing education. *Pain Management Nursing, 17*(2), 97-98. doi: 10.1016/j.pmn.2016.02.021

Maxcy, S. J. (2003). Pragmatic threads in mixed methods research in the social sciences: The search for multiple modes of inquiry and the end of the philosophy of formalism. In A. Tashakkori & Teddlie, 2003 (Eds.), *Handbook of mixed methods in social and behavioral research*(pp. 51-90) Thousand Oaks, Calif.: SAGE Publications.

McCaffery, M. (1968). *Nursing practice theories related to cognition, bodily pain, and man-environment interactions*. Los Angeles: UCLA Students' Store.

McCarthy, P., Chammas, G., Wilimas, J., Alaoui, F. M., & Harif, M. (2004). Managing children's cancer pain in Morocco. *Journal of Nursing Scholarship, 36*(1), 11-15. doi:10.1111/j.1547-5069.2004.04005.x

McGrath, Stevens, B. J., Walker, S. M., & Zempsky, W. T. (2014). *Oxford textbook of paediatric pain*. Oxford, UK: Oxford University Press.

McGrath, P. A. (2005). Children—Not simply ‘‘little adults’’. In H. Merskey, J. D. Loeser, & R. Dubne (Eds.), *The paths of pain* (pp. 433-446). Seattle, WA: IASP Press.

McInerney, M., Goodenough, B., Jastrzab, G., & Kerr, S. (2003). Paediatric nurses' knowledge and attitudes concerning suboptimal pain management for children. *Neonatal, Paediatric & Child Health Nursing, 6*(2), 15-23.

Mediani, H. S., Duggan, R., Chapman, R., Hutton, A., & Shields, L. (2017). An exploration of Indonesian nurses' perceptions of barriers to paediatric pain management. *Journal of Child Health Care, 21*(3), 273-282. doi:10.1177/1367493517715146

Melhuish, S., & Payne, H. (2006). Nurses' attitudes to pain management during routine venepuncture in young children. *Paediatric Nursing, 18*(2), 20-23.

Merriam-Webster. (2017). Merriam-Webster online dictionary. Retrieved from https://www.merriam-webster.com/dictionary/knowledge

Migiro, S., & Magangi, B. (2011). Mixed methods: A review of literature and the future of the new research paradigm. *African Journal of Business Management, 5*(10), 3757-3764.

Miller, G. A. (2015). *Learning the language of addiction counseling* (4th ed.). Hoboken, New Jersey: John Wiley & Sons, Inc.

Ministry of Health. (2015). *Health statistical year book*. Riyadh, Saudi Arabia: Ministry of Health.

Mitra, R., & Jones, S. (2012). Adjuvant analgesics in cancer pain: A review. *Am J Hosp Palliat Care, 29*(1), 70-79. doi:10.1177/1049909111413256

Moayedi, M., & Davis, K. D. (2013). Theories of pain: From specificity to gate control. *Journal of neurophysiology, 109*(1), 5-12. doi:10.1152/jn.00457.2012

Morse, J. M., & Niehaus, L. (2009). *Mixed method design: Principles and procedures*. Walnut Creek, CA: Left Coast Press.

Motoyama, E. K., Davis, P. J., & Cladis, F. P. (2011). *Smith's anesthesia for infants and children* (8th ed.). St. Louis, Mo. ; London: Mosby.

Moyer, B. A., & Wittman-Price, R. A. (2008). *Nursing education: Foundations for practice excellence*. Philadelphia: FA Davis Company.

Munro, B. H. (2005). *Statistical methods for health care research* (5th ed.). Philadelphia: Lippincott Williams & Wilkins.

Murnion, B. (2015). Pain Education Curriculum in Medical Schools. In N. el-Guebaly, G. Carrà, & M. Galanter (Eds.), *Textbook of Addiction Treatment: International Perspectives* (pp. 2473-2479). Milano: Springer Milan.

Murphy, A., Barrett, M., Cronin, J., McCoy, S., Larkin, P., Brenner, M., . . . O'Sullivan, R. (2014). A qualitative study of the barriers to prehospital management of acute pain in children. *Emergency Medicine Journal 31*(6), 493-498. doi:10.1136/emermed-2012-202166

Murray, E. (2017). *Nursing leadership and management: For patient safety and quality care*. Philadelphia: FA Davis.

Namnabati, M., Abazari, P., & Talakoub, S. (2012). Identification of perceived barriers of pain management in Iranian children: A qualitative study. *International Journal of Nursing Practice, 18*(3), 221-225. doi:10.1111/j.1440-172X.2011.01981.x

Narayan, M. C. (2010). Culture's effects on pain assessment and management. *American Journal of Nursing, 110*(4), 38-47. doi:10.1097/01.NAJ.0000370157.33223.6d

National Health and Medical Research Council. (2015). *National statement on ethical conduct in human research*. Canberra, ACT: NHMRC.

Ndosi, M. E., & Newell, R. (2009). Nurses' knowledge of pharmacology behind drugs they commonly administer. *Journal of Clinical Nursing 18*(4), 570-580; discussion 620. doi:10.1111/j.1365-2702.2008.02290.x

Ness, K. K., Armenian, S. H., Kadan-Lottick, N., & Gurney, J. G. (2011). Adverse effects of treatment in childhood acute lymphoblastic leukemia: General overview and implications for long-term cardiac health. *Expert Review of Hematology, 4*(2), 185-197. doi:10.1586/ehm.11.8

Nimbalkar, A. S., Dongara, A. R., Ganjiwale, J. D., & Nimbalkar, S. M. (2013). Pain in children: Knowledge and perceptions of the nursing staff at a rural tertiary care teaching hospital in India. *Indian Journal of Pediatrics, 80*(6), 470-475. doi:10.1007/s12098-012-0848-z

Nuessle, S., Gray, A., Lambert, G., Boyar, A., Ba-Hatheq, A., Adloni, S., & Al Khayyal, M. (1996). Pain control with morphine: Evaluation of prescriptions for oral

morphine for outpatients at King Faisal Specialist Hospital and Research Centre. *Annals of Saudi Medicine, 16*(4), 371-376. doi:10.5144/0256-4947.1996.371

Oakes, L. L. (2011). *Compact clinical guide to infant and child pain management: An evidence-based approach for nurses*. New York: Springer Publishing Company.

Olmstead, D. L., Scott, S. D., & Austin, W. J. (2010). Unresolved pain in children: A relational ethics perspective. *Nursing Ethics, 17*(6), 695-704. doi:10.1177/0969733010378932

Ortiz, M. I., Ponce-Monter, H. A., Rangel-Flores, E., Castro-Gamez, B., Romero-Quezada, L. C., O'Brien, J. P., . . . Escamilla-Acosta, M. A. (2015). Nurses' and nursing students' knowledge and attitudes regarding pediatric pain. *Nursing Research and Practice, 2015*, 210860. doi:10.1155/2015/210860

Oxford University Press. (2017). English Oxford Living Dictionaries. Retrieved from https://en.oxforddictionaries.com/definition/knowledge

Parsons, G., & Preece, W. (2010). *Principles and practice of managing pain: A guide for nurses and allied health professionals*. Berkshire, England: McGraw-Hill Education (UK).

Pasero, C., & McCaffery, M. (2011). *Pain assessment and pharmacologic management*. St. Louis, Mo.: Mosby/Elsevier.

Peacock, S., & Patel, S. (2008). Cultural influences on pain. *Reviews in Pain, 1*(2), 6-9. doi:10.1177/204946370800100203

Peate, I., & Wild, K. (2018). *Nursing practice knowledge and care* (2nd ed.). Chichester, West Sussex, UK: John Wiley & Sons.

Peirce, D., Corkish, V., Lane, M., & Wilson, S. (2018). Nurses' knowledge and attitudes regarding pediatric pain management in western Australia. *Pain Management Nursing*. doi:10.1016/j.pmn.2018.03.002

Perquin, C. W., Hazebroek-Kampschreur, A. A., Hunfeld, J. A., Bohnen, A. M., van Suijlekom-Smit, L. W., Passchier, J., & van der Wouden, J. C. (2000). Pain in children and adolescents: A common experience. *Pain, 87*(1), 51-58. doi:10.1016/S0304-3959(00)00269-4

Perry, A. G., Ostendorf, W., & Potter, P. A. (2016). *Nursing interventions & clinical skills* (6th ed.). St. Louis, Missouri: Elsevier Mosby.

Perry, S. E., Hockenberry, M. J., Lowdermilk, D. L., & Wilson, D. (2013). *Maternal child nursing care*. St. Louise, Mo.; London: Mosby.

Peterson, S. J., & Bredow, T. S. (2009). *Middle range theories: Application to nursing research* (2. ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Petty, R. E., & Cacioppo, J. T. (1996). *Attitudes and persuasion: Classic and contemporary approaches*. Boulder, Colo: Westview Press.

Polio, C., & Friedman, D. A. (2017). *Understanding, evaluating, and conducting second language writing research*. New York Routledge, Taylor & Francis Group.

Polit, D. F., & Beck, C. T. (2004). *Nursing research: Principles and methods* (7th ed.). Philadelphia Lippincott Williams & Wilkins.

Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). Philadelphia: Lippincott Williams & Wilkins.

Polit, D. F., & Beck, C. T. (2010). *Essentials of nursing research: Appraising evidence for nursing practice* (7th ed.). Philadelphia: Lippincott Williams & Wilkins.

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Philadelphia: Lippincott Williams & Wilkins.

Pölkki, T., Korhonen, A., Laukkala, H., Saarela, T., Vehviläinen-Julkunen, K., & Pietil, A. (2010). Nurses' attitudes and perceptions of pain assessment in neonatal intensive care. *Scandinavian Journal of Caring Sciences, 24*(1), 49-55. doi:10.1111/j.1471-6712.2008.00683.x

Pölkki, T., Laukkala, H., Vehviläinen-Julkunen, K., & Pietilä, A. (2003). Factors influencing nurses' use of nonpharmacological pain alleviation methods in paediatric patients. *Scandinavian Journal of Caring Sciences, 17*(4), 373-383. doi:10.1046/j.0283-9318.2003.00239.x

Potter, P. A., Perry, A. G., Stockert, P., & Hall, A. (2016). *Fundamentals of nursing* (9th ed.). St. Louis, Mo: Elsevier/Mosby.

Potts, N. L., & Mandleco, B. L. (2012). *Pediatric nursing: Caring for children and their families* (3rd ed.). Clifton Park, NY: Delmar Cengage Learning.

Pudner, R. (2010). *Nursing the surgical patient* (3rd ed.). New York: Baillière Tindall.

Ramira, M. L., Instone, S., & Clark, M. J. (2016). Quality improvement. Pediatric pain management: An evidence-based approach. *Pediatric Nursing, 42*(1), 39-49.

Rassool, G. H. (2015). Cultural competence in nursing Muslim patients. *Nurs Times, 111*(14), 12-15.

Rejeh, N., Ahmadi, F., Mohammadi, E., Kazemnejad, A., & Anoosheh, M. (2009). Nurses' experiences and perceptions of influencing barriers to postoperative pain management. *Scandinavian Journal of Caring Sciences, 23*(2), 274-281. doi:10.1111/j.1471-6712.2008.00619.x

Reyes, S. (2003). Nursing assessment of infant pain. *Journal of Perinatal & Neonatal Nursing, 17*(4), 291-303.

Ricci, S. S., & Kyle, T. (2009). *Maternity and pediatric nursing*. Philadelphia: Lippincott Williams & Wilkins.

Richardson, J., & Glasper, E. A. (2010). *A textbook of children's and young people's nursing* (2nd ed.): Churchill Livingstone Elsevier

Rieman, M. T., & Gordon, M. (2007). Pain management competency evidenced by a survey of pediatric nurses' knowledge and attitudes. *Pediatric nursing, 33*(4), 307-312.

Rieman, M. T., Gordon, M., & Marvin, J. M. (2007). Pediatric nurses' knowledge and attitudes survey regarding pain: A competency tool modification. *Pediatric nursing, 33*(4), 303-306.

Rose, L., Smith, O., Gelinas, C., Haslam, L., Dale, C., Luk, E., . . . Watt-Watson, J. (2012). Critical care nurses' pain assessment and management practices: A survey in Canada. *American Journal of Critical Care, 21*(4), 251-259. doi:10.4037/ajcc2012611

Rosenberg, M. J. (1960). *Attitude organization and change: An analysis of consistency among attitude components*. New Haven: Yale University Press.

Rosmus, C., Johnston, C. C., Chan-Yip, A., & Yang, F. (2000). Pain response in Chinese and non-Chinese Canadian infants: Is there a difference? *Social Science & Medicine, 51*(2), 175-184. doi:10.1016/S0277-9536(99)00447-5

Rubin, A., & Babbie, E. R. (2010). *Essential research methods for social work* (2nd ed.). Belmont, CA: Brooks/Cole, Cengage Learning.

Rundio, A., & Lorman, B. (2015). *Core curriculum of addictions nursing: Official publication of the International Nurses Society on Addictions* (3rd ed.): Wolters Kluwer Health.

Saini, S., & Bhatnagar, S. (2016). Cancer pain management in developing countries. *Indian Journal of Palliative Care, 22*(4), 373-377. doi:10.4103/0973-1075.191742

Salantera, S. (1999). Finnish nurses' attitudes to pain in children. *Journal of Advanced Nursing, 29*(3), 727-736.

Salanterä, S., Lauri, S., Salmi, T. T., & Helenius, H. (1999). Nurses' knowledge about pharmacological and nonpharmacological pain management in children. *Journal of Pain and Symptom Management, 18*(4), 289-299. doi:10.1016/S0885-3924(99)00065-2

Samarkandi, O. A. (2018). Knowledge and attitudes of nurses toward pain management. *Saudi Journal of Anaesthesia, 12*(2), 220-226. doi:10.4103/sja.SJA_587_17

Saudi Commission for Health Specialties. (2009). *Professional registration classification manual for health practitioners (5th ed.)*. Riyadh: SCFHS.

Saudi National Comission for Childhood. (2014). National Comission for Childhood. Retrieved from http://www.ncc.gov.sa/

Schafer, R. B., & Tait, J. L. (1980). *A guide for understanding attitudes and attitude change*: Cooperative Extension Service, Iowa State University.

Schlemmer, A., & Mash, B. (2006). The effects of a language barrier in a South African district hospital. *South African Medical Journal, 96*(10), 1084-1087.

Schyve, P. M. (2007). Language differences as a barrier to quality and safety in health care: The Joint Commission perspective. *Journal of General Internal Medicine, 22*(Suppl 2), 360-361. doi:10.1007/s11606-007-0365-3

Scott, A. S., & Fong, E. (2009). *Body structures & functions* (11th ed.). Australia ; Clifton Park, N.Y.: Delmar/Cengage Learning.

Shen, Z. (2015). Cultural competence models and cultural competence assessment instruments in nursing: A literature review. *Journal of Transcultural Nursing, 26*(3), 308-321.

Shomaker, K., Dutton, S., & Mark, M. (2015). Pain prevalence and treatment patterns in a us children's hospital. *Hospital Pediatrics, 5*(7), 363-370. doi:10.1542/hpeds.2014-0195

Sidumo, E. M., Ehlers, V. J., & Hattingh, S. P. (2010). Cultural knowledge of non-Muslim nurses working in Saudi Arabian obstetric units. *Curationis, 33*(3), 48-55.

Silbermann, M. (2010). Opioids in middle eastern populations. *Asian Pacific Journal of Cancer Prevention, 11 Suppl 1*, 1-5.

Silbermann, M., Arnaout, M., Daher, M., Nestoros, S., Pitsillides, B., Charalambous, H., . . . Oberman, A. (2012). Palliative cancer care in Middle Eastern countries: Accomplishments and challenges *Annals of Oncology, 23*(suppl_3), 15-28. doi:10.1093/annonc/mds084

Simons, J. M., & MacDonald, L. M. (2004). Pain assessment tools: Children's nurses' views. *Journal of Child Health Care, 8*(4), 264-278. doi:10.1177/1367493504047317

Smeland, A. H., Twycross, A., Lundeberg, S., & Rustøen, T. (2018). Nurses' knowledge, attitudes and clinical practice in pediatric postoperative pain management. *Pain Management Nursing*. doi:10.1016/j.pmn.2018.04.006

Smith, M. C., & Parker, M. E. (2015). *Nursing theories and nursing practice* (4th ed.). Philadelphia, PA: FA Davis Company.

Sorrentino, S. A., & Remmert, L. N. (2012). *Mosby's textbook for nursing assistants* (8th ed.). St. Louis, Mo.: Elsevier/Mosby.

Srouji, R., Ratnapalan, S., & Schneeweiss, S. (2010). Pain in children: Assessment and nonpharmacological management. *International Journal of Pediatrics, 2010*, 474838. doi:10.1155/2010/474838

Stair, N. L. (2003). *A historical atlas of Saudi Arabia* (1st ed.). New York: The Rosen Publishing Group, INC.

Stanhope, M., & Lancaster, J. (2016). *Public health nursing: Population-centered health care in the community* (9th ed.). St. Louis, Mo: Elsevier Mosby.

Stanley, M., & Pollard, D. (2013). Relationship between knowledge, attitudes, and self-efficacy of nurses in the management of pediatric pain. *Pediatric Nursing, 39*(4), 165-171.

Stein-Parbury, J. (2009). *Patient & person: Interpersonal skills in nursing* (4th ed.). Chatswood, NSW: Churchill Livingstone Elsevier.

Stevens, B. J., Yamada, J., Estabrooks, C. A., Stinson, J., Campbell, F., Scott, S. D., & Cummings, G. (2014). Pain in hospitalized children: Effect of a multidimensional knowledge translation strategy on pain process and clinical outcomes. *Pain (03043959), 155*(1), 60-68. doi:10.1016/j.pain.2013.09.007

Stimmel, B. (2014). *Pain and its relief without addiction: Clinical issues in the use of opioids and other analgesics*. New York: Routledge.

Suh, E. E. (2004). The model of cultural competence through an evolutionary concept analysis. *Journal of Transcultural Nursing, 15*(2), 93-102. doi:10.1177/1043659603262488

Tappen, R. M. (2011). *Advanced nursing research: From theory to practice*. Sudbury, MA: Jones & Bartlett Learning.

Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, Calif.: SAGE Publications.

Tashakkori, A., & Teddlie, C. (2008). Quality of inferences in mixed methods research: Calling for an integrative framework. In M. M. Bergman (Ed.), *Advances in mixed methods research* (pp. 101-119). London: SAGE Publications

Taylor, E. M., Boyer, K., & Campbell, F. A. (2008). Pain in hospitalized children: A prospective cross-sectional survey of pain prevalence, intensity, assessment and management in a Canadian pediatric teaching hospital. *Pain Research and Management, 13*(1), 25-32. doi:10.1155/2008/478102

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks: Sage Publications.

Thota, R. S., Jain, P. N., Bakshi, S. G., & Dhanve, C. N. (2011). Opioid-prescribing practices in chronic cancer pain in a tertiary care pain clinic. *Indian Journal of Palliative Care, 17*(3), 222-226. doi:10.4103/0973-1075.92340

Thurston, C. (2013). *Essential nursing care for children and young people: Theory, policy, and practice* (1st ed.). London; New York: Routledge, Taylor & Francis Group.

Tjia, J., Mazor, K. M., Field, T., Meterko, V., Spenard, A., & Gurwitz, J. H. (2009). Nurse-physician communication in the long-term care setting: Perceived barriers

and impact on patient safety. *Journal of Patient Safety, 5*(3), 145-152. doi:10.1097/PTS.0b013e3181b53f9b

Tollison, C. D., Tollison, J. W., & Satterthwaite, J. R. (2002). *Practical pain management* (3rd ed.). Philadelphia: Lippincott Williams & Wilkins.

Tumulty, G. (2001). Professional development of nursing in Saudi Arabia. *Journal of Nursing Scholarship, 33*(3), 285-290. doi:10.1111/j.1547-5069.2001.00285.x

Twycross, A. (2006). What is the impact of theoretical knowledge on children's nurses' post-operative pain management practices? An exploratory study. *Nurse Education Today, 27*(7), 697-707. doi:10.1016/j.nedt.2006.10.004

Twycross, A. (2007). Children's nurses' post-operative pain management practices: An observational study. *International Journal of Nursing Studies, 44*(6), 869-881. doi:10.1016/j.ijnurstu.2006.03.010

Twycross, A. (2013). Nurses' views about the barriers and facilitators to effective management of pediatric pain. *Pain Management Nursing, 14*(4), e164-172. doi:10.1016/j.pmn.2011.10.007

Twycross, A., Dowden, S., & Bruce, E. A. (Eds.). (2009). *Managing pain in children: A clinical guide*. London: Blackwell Publishing Ltd.

Twycross, A., Parker, R., Williams, A., & Gibson, F. (2015). Cancer-related pain and pain management: Sources, prevalence, and the experiences of children and parents. *Journal of Pediatric Oncology Nursing, 32*(6), 369-384. doi:10.1177/1043454214563751

Twycross, A., & Roderique, L. (2013). Review of pain content in three-year preregistration pediatric nursing courses in the United Kingdom. *Pain Management Nursing, 14*(4), 247-258. doi:10.1016/j.pmn.2011.05.002

Ung, A., Salamonson, Y., Hu, W., & Gallego, G. (2016). Assessing knowledge, perceptions and attitudes to pain management among medical and nursing students: A review of the literature. *British Journal of Pain, 10*(1), 8-21. doi:10.1177/2049463715583142

Urden, L. D., Urden, L. D., Stacy, K. M., & Lough, M. E. (2016). *Priorities in critical care nursing* (7th ed.). St. Louis, Missouri: Elsevier.

Vakili, R., Ajilian Abbasi, M., Ghazizadeh Hashemi, A., Khademi, G., Alipour Anbarani, M., & Saeidi, M. (2015). Pain management in children with collaborative parents and healthcare team. *International Journal of Pediatrics, 3*(2.2), 561-573. doi:10.22038/ijp.2015.4261

Van den Berg, V. (2016). Still lost in translation: Language barriers in South African health care remain. *South African Family Practice, 58*(6), 229-231. doi:10.1080/20786190.2016.1223795

Van Griensven, H., Strong, J., & Unruh, A. M. (2014). *Pain: A textbook for health professionals* (2nd ed.). Oxford: Churchill Livingstone Elsevier.

Van Hulle Vincent, C. (2007). Nurses' perceptions of children's pain: A pilot study of cognitive representations. *Journal of Pain and Symptom Management, 33*(3), 290-301. doi:10.1016/j.jpainsymman.2006.08.008

Van Hulle Vincent, C., & Gaddy, E. J. (2009). Pediatric nurses' thinking in response to vignettes on administering analgesics. *Research in Nursing & Health, 32*(5), 530-539. doi:10.1002/nur.20337

Vaughan, G. M., & Hogg, M. A. (2010). *Essentials of social psychology*. Frenchs Forest, N.S.W.: Pearson Australia.

Vincent, C. V. (2005). Nurses' knowledge, attitudes, and practices regarding children's pain. *American Journal of Maternal Child Nursing, 30*(3), 177-183. doi:10.1097/00005721-200505000-00005

Vincent, C. V., & Denyes, M. J. (2004). Relieving children's pain: Nurses' abilities and analgesic administration practices. *Journal of Pediatric Nursing, 19*(1), 40-50. doi:10.1016/j.pedn.2003.09.006

Vincent, C. V., Wilkie, D. J., & Szalacha, L. (2010). Pediatric nurses' cognitive representations of children's pain. *Journal of Pain, 11*(9), 854-863. doi:10.1016/j.jpain.2009.12.003

Vittinghoff, M., Lonnqvist, P. A., Mossetti, V., Heschl, S., Simic, D., Colovic, V., . . . Morton, N. S. (2018). Postoperative pain management in children: Guidance from the pain committee of the European Society for Paediatric Anaesthesiology (ESPA Pain Management Ladder Initiative). *Pediatric Anesthesia, 28*(6), 493-506. doi:10.1111/pan.13373

Volkow, N. D., & McLellan, A. T. (2016). Opioid abuse in chronic pain — misconceptions and mitigation strategies. *New England Journal of Medicine, 374*(13), 1253-1263. doi:10.1056/NEJMra1507771

Walco, G. A., & Goldschneider, K. R. (2008). *Pain in children: A practical guide for primary care*. Totowa, NJ: Humana Press.

Walther-Larsen, S., Pedersen, M. T., Friis, S. M., Aagaard, G. B., Romsing, J., Jeppesen, E. M., & Friedrichsdorf, S. J. (2016). Pain prevalence in hospitalized children: A prospective cross-sectional survey in four Danish university hospitals. *Acta Anaesthesiologica Scandinavica, 61*(3), 328-337. doi:10.1111/aas.12846

Waltz, C. F., Strickland, O., & Lenz, E. R. (2010). *Measurement in nursing and health research* (4th ed.). New York: Springer Publishing Company.

Wang, H. L., & Tsai, Y. F. (2010). Nurses' knowledge and barriers regarding pain management in intensive care units. *Journal of Clinical Nursing, 19*(21-22), 3188-3196. doi:10.1111/j.1365-2702.2010.03226.x

Watt-Watson, J., McGillion, M., Hunter, J., Choiniere, M., Clark, A. J., Dewar, A., . . . Webber, K. (2009). A survey of prelicensure pain curricula in health science faculties in Canadian universities. *Pain Research & Management: The Journal of the Canadian Pain Society, 14*(6), 439-444.

Weber, J., & Kelley, J. (2010). *Health assessment in nursing* (4th ed.). Philadelphia: Wolters Kluwer Health.

Weiten, W. (2007). *Psychology: Themes and variations* (7th ed.). Belmont, Calif: Thomson/Wadsworth.

Whitehead, D., LoBiondo-Wood, G., & Haber, J. (2013). *Nursing and midwifery research: Methods and critical appraisal for evidence-based practice* (4th ed.). London: Mosby/Elsevier.

Wolraich, M. (2008). *Developmental-behavioral pediatrics: Evidence and practice*. Philadelphia: Mosby/Elsevier.

Wong, C., Lau, E., Palozzi, L., & Campbell, F. (2012). Pain management in children: Part 1 — pain assessment tools and a brief review of nonpharmacological and pharmacological treatment options. *Canadian Pharmacists Journal, 145*(5), 222-225. doi:10.3821/145.5.cpj222

Wood, M. J., & Kerr, J. C. (2011). *Basic steps in planning nursing research: From question to proposal* (7th ed.). Sudbury, Mass.: Jones and Bartlett.

World Health Organization. (2012). WHO guidelines on the pharmacological treatment of persisting pain in children with medical illnesses. Retrieved from http://whqlibdoc.who.int/publications/2012/9789241548120_Guidelines.pdf?ua=1

Wright, S. (2015). *Pain management in nursing practice*. Washington, D.C. London IASP ; SAGE.

Wunderle, W. (2008). *A manual for American servicemen in the Arab Middle East: Using cultural understanding to defeat adversaries and win the peace*. New York: Skyhorse.

Yaqoob, S. H., & Nasaif, H. A. (2015). Nurses' knowledge and attitudes toward pain assessment and management for adult sickle cell disease patients during sickling crisis. *Clinical Nursing Studies, 3*(4), 36. doi:10.1016/j.pmn.2014.06.007

Ying Ge, T., Konstantatos, A. H., Cai Fang, Z., Ying, H. J., Ai Fen, Y., & Boyd, D. (2013). A cross-sectional exploratory survey of knowledge, attitudes and daily self-reported pain assessment practice among nurses in Mainland China. *Pain Medicine, 14*(10), 1468-1476. doi:10.1111/pme.12156

Zisk-Rony, R. Y., Lev, J., & Haviv, H. (2015). Nurses' report of in-hospital pediatric pain assessment: Examining challenges and perspectives. *Pain Management Nursing, 16*(2), 112-120. doi:10.1016/j.pmn.2014.05.003

Zohrabi, M. (2013). Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and Practice in Language Studies, 3*(2), 254-262. doi:10.4304/tpls.3.2.254-262

Zuccaro, S. M., Vellucci, R., Sarzi-Puttini, P., Cherubino, P., Labianca, R., & Fornasari, D. (2012). Barriers to pain management: Focus on opioid therapy. *Clinical Drug Investigation, 32*(1), 11-19. doi:10.2165/11630040-000000000-00000

Zunino, C., Notejane, M., Bernadá, M., Rodríguez, L., Vanoli, N., Rojas, M., . . . Mimbacas, I. (2018). Pain in children and adolescents hospitalized in a center of reference. *Revista chilena de pediatria, 89*(1), 67-73.

Appendices

Appendix A. Data Summary Table

Article ID	Author/year/ country	Aim	Design	Method/instrument	Method of analysis	Sample	Key findings
1	Vincent et al. (2010), US	To describe paediatric nurses' cognitive representations (CRs) of the assessment and management of children's pain and to determine the relationships between their CRs and their choices about pain assessment and morphine administration.	Mixed method study using exploratory design.	Interviews and the Paediatric Nurses' Knowledge and Attitude Survey Regarding Pain (PNKAS), developed by Manworren (2001).	- Content analysis method. - SPSS. - t-tests. - Correlation analysis.	87 nurses caring for children were recruited from 4 units at a major urban children's hospital.	• Complexity in the assessment and management of children's pain. • 91% of nurses relied on a child's behaviour as an important assessment sign rather than self-report when assessing the severity of children's pain. • Gaps in nurses' knowledge were found in relation to analgesic drugs. • 46.5% of the participants indicated pharmacological treatment is the most important strategy for managing pain. • 87.4% of the participants included both strategies of pharmacological and non-pharmacological treatment.
2	Vincent & Denyes. (2004), US	To examine relationships among nurses' knowledge and attitudes about	Quantitative descriptive study.	A modified version of the Knowledge and Attitude Survey Regarding Pain	- SPSS. - Descriptive statistics.	67 nurses were recruited from 7 units in a Midwestern	• 52% of nurses believed that respiratory depression occurs more frequently than infrequently in children.

		children's pain relief, nurses' abilities to overcome barriers to optimal pain management, nurses' analgesic practices, and pain levels of hospitalised children.		(KASRP), developed by Ferrell and McCaffery (1997).	- Correlation analysis.	children's hospital.	• 54% of nurses viewed the risk of addiction as a reason for not managing pain well. • Two important barriers to pain management were identified by nurses; (1) insufficient prescription of analgesia by doctors and (2) medical staff's lack of interest in pain management.
3	Van Hulle Vincent & Gaddy. (2009), US	To examine paediatric nurses' thinking—in response to case study vignettes—about pain assessment and morphine administration for children experiencing postoperative pain.	Qualitative descriptive study.	Semi-structured interviews in response to case study vignettes with items adapted from the PNKAS, developed by Manworren (2001).	- Content analysis method.	30 nurses from four units in a large Midwestern children's hospital.	• There was a reluctance to administer prescribed analgesia (morphine, 3 mg) due to sedation and respiratory depression concerns. • Nurses demonstrated a lack of knowledge about morphine and its duration of action and effects.
4	Twycross, A (2013), UK	To ascertain nurses' views about barriers and facilitators to effective pain management.	Qualitative descriptive study.	Focus groups.	- Content analysis approach.	30 nurses working in a hospital located in the south of England.	Barriers to effective pain management were identified as follows: • Lack of knowledge among nurses and other health providers about pain management. • Shortage of nursing staff. • Heavy workload and lack of time. • Inadequate orders for analgesic drugs. • Lack of parental support in assessing and managing children's pain.
5	Pölkki et al. (2003), Finland	To describe the factors promoting and hindering nurses' use of non-	Quantitative descriptive study.	A questionnaire developed by the authors.	- SPSS. - Descriptive statistics.	162 (99%) nurses recruited from one surgical ward in	• Five factors promoting the use of non-pharmacological pain relief methods were nurses' competence, use of pain relief methods,

		pharmacological methods in children's surgical pain relief, and demographic variables related to this.			- Factor analysis. - Correlation analysis.	five university hospitals.	workload/time, child's age or ability to cooperate, and parents' participation. • Five factors hindering the use of non-pharmacological pain relief methods were nurses' insecurity, beliefs about parental roles/children's capacity to describe or express pain, heavy workload and lack of time, limited use of pain relief methods and organisational structure/ turnover rate among patients. • Approximately 98% of participants wished to learn a variety of pain management approaches, while 47% were happy about their education regarding these approaches.
6	Nimbalkar et al. (2013), India	To assess the knowledge and perception of nursing staff regarding pain and to determine whether varying clinical exposure to painful procedures in children had any association with their perception of pain.	Quantitative descriptive study.	A questionnaire developed by the authors.	- SPSS. - Descriptive statistics. - Chi-square test.	351 nurses (83.37%) working at a rural tertiary care hospital in western India.	• 92.5% of nurses believed that pain might be minimized by using different methods. • Nurses in general had incorrect perceptions about children's pain. • 68.9% of nurses believed that repeating painful procedures increased pain tolerance in children. • 89.4% of nurses believed that unconscious or drowsy children feel less pain. • 94.5% of nurses believed that pain always causes changes in a child's vital signs.

7	Namnabati et al. (2012), Iran	To gain an understanding of the barriers to effective pain management experienced by nurses in Iran.	Qualitative study.	Semi-structured interviews.	- Thematic analysis was used according to Colaizzi method (Streubert-Speziale & Carpneter, 2007).	16 nurses from paediatric wards in an Iranian hospital.	• Organisational barriers include absence of analgesics and pain assessment tools and charts; nursing staff shortage and lack of pain protocols. • Barriers associated with children: young children cannot adequately express or describe their pain and its intensity. • Barriers associated with health professionals: doctors do not follow a routine plan when prescribing opioids. • Disease and treatment barriers e.g. arterial puncturing which causes the child to shout or scream.
8	McInerney et al. (2003), Australia	(1) To examine the nurses' perceptions of the extent to which suboptimal pain management outcomes were attributable to: the knowledge levels of fellow nursing staff; the knowledge level of medical staff; patient behaviours that confused nurses about their pain states; and the side effects of medications.	Quantitative descriptive study.	A questionnaire developed by the authors.	- SPSS. - Descriptive statistics. - Correlation analysis.	136 nurses (49%) from a paediatric tertiary teaching hospital in Sydney.	A number of factors were found to be attributable to suboptimal pain management in children which include: • Inadequate knowledge of both nursing and medical staff. • Children's behaviour/appearance. • The side effects of medications for pain management.

		(2) To gauge the extent to which nurses consider themselves or their colleagues to be sufficiently skilled to assess and manage pain in patients whose age differs markedly to those in the nurses' usual clinical area.					
9	Manworren (2000), US	To determine paediatric nurses' current attitudes and knowledge regarding pain.	Quantitative descriptive study.	The PNKAS survey (Manworren, 2001).	- SPSS. - Descriptive statistics. - ANOVA. - Pearson correlation tests.	274 (35.7%) nurses from a large paediatric hospital in the US.	• Pain management knowledge deficits in both pharmacological and non-pharmacological interventions. • Knowledge deficits were found in nurses' assessment of pain (89.9%), the calculation and conversion of analgesic drugs (79%) and the use of analgesic drugs (66%) with a concern of respiratory depression and addiction (60.8%). • Nurses who had master's degree scored significantly higher than those with other educational levels (p = 0.03).
10	He et al. (2010), Singapore	To examine the impact of an educational intervention in pain management on nurses' self-reported use of non-pharmacological methods for children's postoperative pain	Pre- and post-test study.	A questionnaire developed by Polkki et al (2001).	- SPSS. - Descriptive statistics. - Wilcoxon Signed Rank test. - McNemar test.	108 nurses (86%) working in two public hospitals.	• All nurses reported that they had never attended any training on non-pharmacological pain relief methods. • Three barriers to the use of non-pharmacological methods to relief children's post-operative pain were found; (1) heavy workload and lack of time (60%), (2) the inability of a child to cooperate (70%), and (3) lack

		relief and their perceptions of barriers that limited their use of these methods.					of parental support and cooperation (54%).
11	Gimbler-Berglund et al. (2008), Sweden	To identify factors that influence nurses' pain management in children.	Qualitative descriptive study.	Semi-structured interviews.	- Content analysis approach.	20 nurses working in one paediatric department at a Swedish hospital.	The factors that affected nurses to manage pain in children were identified as follows: • Lack of cooperation among nurses and physicians. • Children's behaviour, diagnosis and age. • The nurses indicated that their relationship with children is a facilitating factor that helps in understanding their pain and also an important factor in assessing and managing pain.
12	Enskär et al. (2007), UK, South Africa & Sweden	To identify and describe the knowledge and attitudes to pain and pain management of nurses working with children with cancer in three countries: UK, South Africa and Sweden.	Quantitative correlational study.	A questionnaire developed by Salantera et al. (1999).	- SPSS. - Descriptive statistics. - Wilcoxon two. - ANOVA. - Spearman's correlation coefficient.	106 nurses working with children with cancer in hospitals in the UK, South Africa and Sweden.	• All nurses across the three countries have good levels of knowledge and positive attitudes; however Swedish nurses' have higher levels of knowledge and more positive attitudes than the others. • The nurses were aware of the importance of pain assessment. • Little understanding about non-pharmacological pain relief methods was found.
13	Ekim & Ocakcı (2013), Turkey	To determine the level of knowledge and attitudes of paediatric	Quantitative descriptive study.	The PNKAS survey (Manworren, 2001).	- SPSS. - Descriptive statistics.	224 nurses, recruited from five Turkish	• Paediatric nurses had severe knowledge deficits regarding pain management in children with a total mean score of 38.2%.

		nurses regarding children's pain.			- t-test, Kruskal-Wallis analysis. - Pearson correlation test.	paediatric hospitals.	• Most incorrectly answered items were related to pharmacological pain management interventions and analgesics. • 75% of nurses believed that young infants cannot tolerate opioids. • 74.6 of nurses did not believe that the most accurate judge of pain intensity is the child. • 185 respondents (82.6%) never used a pain assessment tool in practice. • Nurses who had a bachelor's or master's degree scored significantly higher than those who had an associate's degree and diploma (p = 0.03).
14	Dongara et al. (2015), India	To assess nurses' knowledge and attitudes regarding postoperative pain in children and to determine the factors associated with their knowledge and attitudes.	Quantitative cross-sectional study.	A modification of Knowledge and Attitudes Survey Regarding Pain (Ferrell, & McCaffery, 2008).	- SPSS. - Descriptive statistics. - t-test. - Multiple regression.	42 nurses (93.3%) employed in an Indian cardiac center.	• Poor knowledge and attitudes among nurses in relation to children's pain and its management. • The average total score was 16.74 out of a possible score of 33. • Poor knowledge about pain mechanics and its identification or causations and behavioural signs. • 97.6% of nurses did not know the time to peak effect of oral paracetamol. • 65.3% of nurses incorrectly responded to the item relating to the addiction potential of opioids. • 61.9% of nurses believed that their pain estimation is a more valid method than a child's self-report.

							• 97.6% of nurses believed that children may not sleep if they experience severe pain. • 71.4% believed that children under the age of 2 years have low pain sensitivity and limited memory in relation to painful procedures.
15	Czarnecki et al. (2014), US	To reassess barriers to optimal pain management perceived by RNs and describe any changes over time.	Quantitative cross-sectional study.	Adapted survey (Van Hulle Vincent, 2005).	- SPSS. - Descriptive statistics. - ANOVA tests. - One-sample t-tests.	3 years following the initial assessment, 442 nurses responded (38%) to the study. They were from a paediatric teaching hospital in south-eastern Wisconsin.	Three years after the initial assessment, the study found that the most significant barriers continued to be the same, which include delays in drugs delivery from the pharmacy, insufficient analgesic prescriptions by physicians and low priority given to children's pain management.
16	Stanley & Pollard. (2013), US	To examine the level of knowledge of paediatric pain management, the attitudes of nurses, and the level of self-efficacy of a group of paediatric nurses in North Carolina.	Quantitative study using cross-sectional, correlational design.	The PNKAS survey (Manworren, 2001).	- SPSS. - Descriptive and inferential statistics. - Pearson correlation test. - t-test.	25 paediatric nurses (43.3%) from two regional hospitals in North Carolina.	• There was a significant relationship between the level of knowledge and the years of paediatric experience (r = 0.404, p = 0.05). • The top10 questions answered incorrectly by nurses were related to pharmacology, analgesic drugs and paediatric pain assessment and management.
17	Ortiz et al. (2015), Mexico	To investigate the knowledge and attitudes regarding paediatric pain in two	Descriptive cross-sectional study.	The PNKAS survey (Manworren, 2001).	- SPSS. - Descriptive and inferential statistics.	111 paediatric nurses from a paediatric regional	• Nurses' knowledge about paediatric pain and its management was low.

		different populations: (1) paediatric nurses in a paediatric regional hospital (Mexico) and (2) nursing students in a Mexican university.			- t-test	hospital in Mexico.	• Knowledge deficiency was found in relation to opioid uses, medication administration and pain assessment. • 93.7% of nurses believed that changes in vital signs could be used to verify whether a child has severe pain.
18	Mathew et al. (2011), India	To study the knowledge, attitude and practice of nursing personnel caring for critically ill children in a developing country.	Quantitative descriptive study.	A questionnaire developed by the authors.	- SPSS. - Descriptive statistics. - Logistic regression analysis.	56 nurses (69.1%) from three paediatric critical care units in an Indian teaching hospital.	• Across the three paediatric critical care units, knowledge deficits and misconceptions were found. • Of the three critical care units, no objective scoring system or tool was used to assess a child's pain. • 50% of nurses had inaccurate information about pain in children, believing that they do not feel pain the same way as adults do. • 78.6% of nurses believed that infants quickly forget pain compared to adults.
19	Czarnecki et al. (2011), US	To understand the barriers paediatric RNs perceive as impeding their ability to provide optimal pain management.	Quantitative study using a cross-sectional design.	Adapted survey (Van Hulle Vincent and Denyes, 2005).	- Descriptive statistics. - Correlation analysis.	272 nurses (28%) from a paediatric teaching hospital in southeast Wisconsin.	The five major barriers identified were: • Insufficient analgesia by physicians. • Inadequate time to pre-medicate children before procedures. • Low priority given to pain management in children. • Parents' reluctance to have children take their pain medications.
20	Reyes, S (2003), US	To compare how nurses in an intensive care unit perceive infant pain assessment	Mixed method study using an exploratory	- The Intensive Care Pain Questionnaire (ICPQ), and the Partial-Modified Infant Pain Scale (P-	- SPSS. - Descriptive statistics. - Comparative analysis.	24 nurses (47%) from a regional paediatric hospital in a large	• Incongruity between what nurses believe about infant pain assessment and their actual documentation practices was found.

		and how the pain was actually documented.	descriptive design.	MIPS), developed by Buchholz, Karl, Pomietto, and Lynn (1998). - Observation.		metropolitan area.	• 62.9% of pain assessment charts were completed on the day shifts whereas 56.2% of the charts were not completed on night shifts. • 25% of nurses reported that they rarely document pain assessment. • 83% of nurses disagreed that nurses regularly document their pain assessment.
21	Vincent, C.V. (2005), US	To describe nurses' knowledge and attitudes about relieving children's pain, perceived barriers to optimal pain management, and analgesics administered by nurses in relation to levels of children's pain.	Quantitative descriptive study.	A modified version of the KASRP survey (Ferrell & McCaffery, 1997).	- Descriptive statistics. - Correlation analysis.	67 nurses from 7 paediatric units in a Midwestern children's hospital.	• Most nurses were knowledgeable and had positive attitudes regarding children's pain; however, they lacked knowledge about the incidence of respiratory depression, children's pain report and non-pharmacological interventions. • 37.9% of available morphine and 22.8% of available total analgesia were administered by nurses to children who reported pain. • 55% of nurses thought that children over-reported their pain. • 49% of nurses relied on a child's behavioural manifestations to judge pain. • 34.3% of nurses believed that children under the age of 2 years are less sensitive to pain and have limited memories of painful procedures. • The top four perceived barriers to optimal pain management in children were insufficient physician's analgesic prescription, as identified by 99% of nurses, children's

							hesitancy to report pain, parents' hesitancy to help children take medications, and children's hesitancy to take pain medications.
22	Lunsford, L. (2015), Mongolia	To assess the current knowledge of paediatric pain and to assess the effectiveness of educational intervention on improving knowledge and attitudes of paediatric nurses working at a major children's hospital in Mongolia.	Pre-and post-survey study.	A modification of the PNKAS-Shriners revision (Manworren, 2001).	- SPSS. - One way ANOVA. - t-test.	155 (30%) paediatric nurses from a major paediatric hospital in Mongolia completed the pre- and post-survey.	• The pre-test scores show insufficient knowledge among nurses regarding paediatric pain. • The mean score obtained by nurses on the pre-survey was 12.7 out of a possible total score of 35.
23	He et al. (2005), China	To describe Chinese nurses' use of non-pharmacological methods for relieving 6- to 12-year-old children's postoperative pain and the factors related to this.	Quantitative descriptive study.	Adapted survey (Polkki et al, 2001).	- Descriptive statistics. - Cronbach's alpha test. - ANOVA tests. - Chi-square test.	178 (98%) nurses working in five Chines hospitals.	• Different non-pharmacological methods (comforting, distraction, positioning & preparatory information) to relieve children's post-operative pain were most commonly used. • Nurses' lack of knowledge and nursing staff shortage were found to be factors preventing nurses from using non-pharmacological methods for children's pain postoperatively. • Nurses who were more educated, with 10-20 years' experience in child care, used non-pharmacological methods more than those who did not have this experience.

24	Twycross, A (2006), UK	To compare nurses' theoretical knowledge levels to observational data to ascertain whether there is a relationship between individual nurses' theoretical knowledge and the quality of their pain management practices.	Exploratory mixed method study.	- A modified version of the Pain Management Knowledge Test (PMKT), developed by Salantera et al. (1999). - Adapted observational tool (Gold 1958; Spradley 1980).	- Comparative analysis of data obtained by both observations and questionnaires.	The observational phase involved 13 nurses from a teaching hospital in the English Midlands, while the survey phase involved 12 (92%) registered nurses.	• Nurses did not routinely take a pain history on admission to hospital. • Nurses did not routinely consult other health professionals about children' pain. • Nurses did not routinely engage and communicate with children and their parents. • Nurses did not routinely use pain assessment tools. • Nurses did not routinely use non-pharmacological pain relief methods. • Nurses did not administer analgesic drugs until a child has much pain.
25	Rieman & Gordon. (2007), US	To evaluate knowledge in pain management and assessment among nurses from eight paediatric hospitals as evidenced by a survey of paediatric nurses' knowledge and attitudes regarding pain.	Quantitative descriptive study.	The PNKAS-Shriners revision (Manworren, 2001).	- Descriptive statistics. Student's t-test. -ANOVA.	295 (44%) paediatric nurses working in eight paediatric hospitals.	• The survey was modified for nurses looking after non-cancer children. • The top 10 questions answered incorrectly by most of the nurses were related to analgesics and the potential incidence of respiratory depression.
26	LaFond et al. (2016), US	To provide a current and more comprehensive evaluation of PICU nurses' beliefs regarding the assessment and management of children's pain.	Mixed-methods study using convergent parallel design.	Semi-structured interviews and the Pain Beliefs and Practices Questionnaire (Vincent et al.'s, 2011).	- Content analysis. - SPSS. - Descriptive statistics. - t-tests. - ANOVA.	40 nurses employed in a paediatric intensive care unit of two paediatric hospitals.	• 45% of nurses incorrectly answered half or more of the items relating to opioid kinetics. • 42.5% of nurses believed that children are not reliable pain reporters. • 25% of nurses believed that children who have sickle cell disease are used

							to experiencing pain and because of this, they are less likely to show pain behaviours. • 35% of nurses had concerns about the administration of opioids. • 70% of nurses did not respond correctly to one item relating to hydromorphone duration of action.
27	Mediani et al. (2017), Indonesia	To explore Indonesian nurses' perceptions of and experiences with pain management of hospitalised children.	Qualitative descriptive study.	Semi-structured interviews	Constant comparative method.	37 nurses working at two Indonesian general teaching hospitals.	A number of barriers identified as: • Lack of resources to effectively manage a child's pain, including assessment tools and management guidelines. • Lack of paediatric pain management education and training. • Imbalance nurse–patient ratios and high workload.

Appendix B. Permission Letter to use the PNKAS

From: Rmanworren@connecticutchildrens.org

To: Khalaf.Alotaibi@uon.edu.au

Sent: Fri 23/10/2015 12:15 PM

Subject: PNKAS permission

Dear Alotaibi,

Thank you for your recent request regarding the use of the Pediatric Nurses' Knowledge and Attitude Survey Regarding Pain. This e-mail serves as permission to use and duplicate the survey for clinical, educational, and research purposes. There is no fee, but I do ask that you forward results and statistical analysis to me so I can further refine the tool.

Please find attached both the original and a downloaded copy of the updated Shriner's versions of the survey.

In addition to your request, permission for use of this tool has been granted in over a hundred organizations in the United States, as well as institutions in the United Kingdom, Ireland, Australia, South Africa, Canada, & New Zealand. The tool has also been translated by researchers in China, Taiwan, Israel, Qatar, Switzerland, Indonesia, Malaysia, Mongolia, Korea, Norway, Peru, Portugal, and Italy for use with healthcare professionals in these countries.

The tool was further modified for use at pediatric facilities that do not care for pediatric patients with cancer. This modification is labeled as the Shriner's version and is also attached for your use.

Please do not hesitate to contact me at this e-mail address or my mail address and phone below so I can further assist in your efforts.

Renee

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Appendix C. PKNAS-Shriners Revision

Section 1: Socio-demographic data

Please fill in the blank or tick (√) one box to indicate the appropriate response:

1. **What is your gender**? □1 Male □ 2 Female
2. **What is your age?** ……...…..years
3. **What is your nationality?** □1 Saudi □2 Other, please specify:…….
4. **What is your religion?** □1 Islam □ 2 Buddhist □ 3 Hindu
   □4 Christian □ 5 Other, please specify: …….....
5. **What is your ethnicity?** □1 Arab □2 Asian □3 African
   □4 European □5 Other, please specify:-…….
6. **What is your highest nursing qualification?**
   □1 Diploma □2 Bachelor degree
   □3 Master degree □4 Doctoral degree
   □5 Other, please specify:-……..……..…
7. **In which country did you obtain your nursing degree?**
   □1 Saudi □2 Philippines □3 India
   □4 UK □5 US □6 Australia
   □7 Other, please specify:-..…….…….
8. **Years of Nursing Experience**:-……year/s and .....month/s
9. **Years of Paediatric Nursing Experience**: - …….....year/sand……month/s
10. **Current workplace (hospital):-**……..…….
11. Current working area (department/unit):-……..…….
12. **Current nursing position:-** □1 Staff Nurse (RN) □2 Other, please specify:-. ….....
13. **Do you currently provide direct nursing care for infants /children?**
    □1 Yes □2 No

If so, please estimate the percentage of your day that is spent caring for infants/children with pain:-……..…%

14. **Do you have a pain assessment tool for infants/children on your ward/unit?**
    □1 Yes □2No

If so, what tool or tools do you have access to?

a) ……
b) ……
c) …….....

15. How often do you refer to a pain assessment tool when assessing infants'/children's pain?

☐1 Always ☐2 Often
☐3 Sometimes ☐4 Rarely
☐5 Never

16. Have you ever attended any courses, workshops or conferences in the past 2 years about pain assessment or management?

☐1 Yes ☐2 No

If so, please specify what you attended and month/ year

…….....month/year
…….....month year
…….....month year
…….....month year
…….....month/year

17. Was paediatric pain management included in your undergraduate nursing degree?

☐1 Yes ☐2 No

18. Do you read professional journals relating to pain assessment-management?

☐1 Yes ☐2 No

If so, please indicate how many times approximately: -……per year

19. How would you rate your knowledge about pain and pain assessment and management?

☐1 Excellent ☐2 Good
☐3 Fair ☐4 Poor

Section 2: True/False – Circle the correct answer.

1. Observable changes in vital signs must be relied upon to verify a child's statement that he has severe pain. **T F**
2. Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences. **T F**
3. If the infant/child can be distracted from his pain this usually means that he is not experiencing a high level of pain. **T F**
4. Infants/children may sleep in spite of severe pain. **T F**
5. Comparable stimuli in different people produce the same intensity of pain. **T F**

6. Ibuprofen and other non-steroidal anti-inflammatory agents are NOT effective analgesics for bone pain. **T F**
7. Non-drug interventions (e.g. guided imagery, biofeedback, transcutaneous electrical nerve stimulation (TENS) etc.) are very effective for mild- moderate pain control but are not helpful for more severe pain. **T F**
8. Infants/children who will require repeated painful procedures (i.e. blood draws), should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures. **T F**
9. Respiratory depression rarely occurs in infants/children who have been receiving stable doses of opioids over a period of months. **T F**
10. Combining analgesics and non-drug therapies that work by different mechanisms (e.g. using acetaminophen, topical anaesthetics, sucrose, and non-nutritive sucking) may result in better pain control with fewer side effects than using a single analgesic agent. **T F**
11. The usual duration of analgesia of Morphine IV is 4-5 hours. **T F**
12. Benzodiazepines do not reliably potentiate the analgesia of opioids unless the pain is related to muscle spasms. **T F**
13. Parents should not be present during painful procedures. **T F**
14. Infants/children with a history of opioid therapy should not be given opioids for pain because they are at high risk for addiction occurrence. **T F**
15. Beyond a certain dosage of morphine increases in dosage will NOT provide increased pain relief. **T F**
16. Young infants, less than 6 months of age, cannot tolerate opioids for pain relief. **T F**
17. The child with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure. **T F**
18. Children less than 8 years cannot reliably repot pain intensity and therefore, the nurse should rely on the parents' assessment of the child's pain intensity. **T F**
19. Based on one's cultural/spiritual beliefs a child may think that pain and suffering is necessary. **T F**
20. Anxiolytics, sedatives, and barbiturates are appropriate medications for the relief of pain during painful procedures. **T F**
21. After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response. **T F**
22. The child should be advised to use non-drug techniques alone rather than concurrently with pain medications. **T F**
23. Giving infants/children sterile water by injection (placebo) is often a useful test to determine if the pain is real. **T F**
24. Opioid/narcotic addiction is defined as a chronic neurobiological disease, characterized by impaired control over drug use, compulsive use, continued used despite harm, and craving. It may occur with or without the physiological changes of tolerance to analgesia and physical dependence (withdrawal). **T F**

Section 3: Multiple Choice - choose the correct answer.

25. The recommended route of administration of opioid analgesics to infants/children with background (continuous, persistent) pain is

a. intravenous
b. intramuscular
c. subcutaneous
d. oral
e. rectal
f. I don't know

26. The recommended route of administration of opioid analgesics to infants/children with brief, severe pain of sudden onset, e.g. trauma or postoperative pain, is

a. intravenous
b. intramuscular
c. subcutaneous
d. oral
e. rectal
f. I don't know

27. Of the following analgesic medications, which is considered the drug of choice for the treatment of prolonged moderate to severe pain for children?

a. acetaminophen
b. codeine
c. morphine
d. meperidine (Demerol)
e. I don't know

28. Which of the following IV doses of morphine administered would be equivalent to 10 mg of oral morphine.

a. Morphine 3 mg IV
b. Morphine 5 mg IV
c. Morphine 10 mg IV
d. Morphine 15 mg IV

29. Analgesics for post-operative pain should initially be given

a. around the clock on a fixed schedule
b. only when the infant/child needs pain relief
c. only when the nurse determines that the child has moderate or greater discomfort

30. A child with background (continuous, persistent) pain has been receiving daily opioid analgesics for 2 months. The doses increased during this time period. Yesterday the child was receiving morphine 5 mg/hour intravenously. Today he

has been receiving 10 mg/hour intravenously for 3 hours. The likelihood of the child developing clinically significant respiratory depression is

a. 1-10%
b. 11-20%
c. 21-40%
d. > 41%

31. Analgesia for background (continuous, persistent) pain should be given

a. around the clock on a fixed schedule
b. only when the infant/child needs pain relief
c. only when the nurse determines that the child has moderate or greater discomfort

32. The most likely explanation for why a child with pain would request increased doses of pain medication is

a. The child is experiencing increased pain
b. The child is experiencing increased anxiety or depression
c. The child is requesting more staff attention
d. The child's requests are related to addiction.

33. Which of the following drugs are useful for treatment of pain in children?

a. non-steroidal anti-inflammatory drugs (NSAIDs)
b. opioid analgesics
c. anti-depressants
d. anti-convulsants
e. All of the above

34. The most accurate judge of the intensity of the child's pain is

a. the treating physician
b. the child's primary nurse
c. the child
d. the pharmacist
e. the child's parent

35. Which of the following describes the best approach for cultural considerations in caring for children in pain:

a. There are no longer cultural influences in Saudi Arabia due to the diversity of the population.
b. Nurses should use knowledge that has defined clearly the influence of pain on culture (e.g. Asians are generally stoic, Hispanics are expressive and exaggerate their pain, etc.).
c. Children should be individually assessed to determine cultural influences on pain.
d. Nurses should base care on their own pain beliefs.

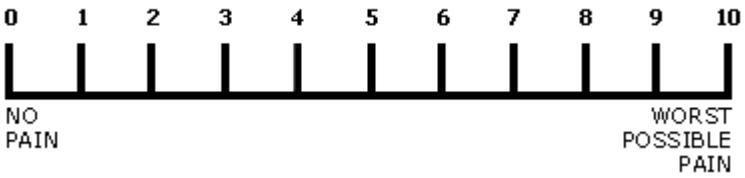
36. What do you think is the percentage of children who over report the amount of pain they have? Choose the correct answer.

0 10 20 30 40 50 60 70 80 90 100%

37. Case Studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication.
Directions: Please select one answer for each question.
Patient A: Andrew is 8 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP =105/65; HR = 80; R = 20; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he rates his pain as 8. On the patient's record you must mark his pain on the scale below.

Choose the number that represents your assessment of Andrew's pain.



Patient A continued:

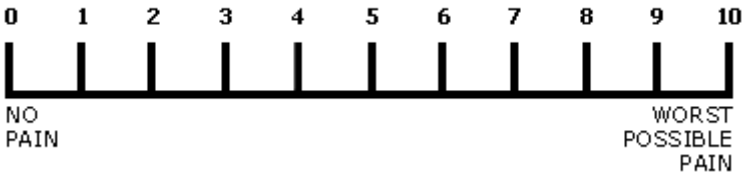
Your assessment, above, is made two hours after he received morphine 2 mg IV. After he received the morphine, his pain ratings every half hour ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q2 h PRN pain relief."

Check the action you will take at this time:

a. Administer no morphine at this time.
b. Administer morphine 1 mg IV now.
c. Administer morphine 2 mg IV now.
d. Administer morphine 3 mg IV now.

Patient B: Robert is 8 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 105/65; HR = 80; R = 20; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below.

Choose the number that represents your assessment of Robert's pain:



Patient B continued:

Your assessment, above, is made two hours after he received morphine 2 mg IV. After he received the morphine, his pain ratings every half hour ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q2 h PRN pain relief."

Check the action you will take at this time:

a. Administer no morphine at this time.
b. Administer morphine 1 mg IV now.
c. Administer morphine 2 mg IV now.
d. Administer morphine 3 mg IV now.

Appendix D. Human Research Ethics Approvals

HUMAN RESEARCH ETHICS COMMITTEE

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Notification of Expedited Approval

To Chief Investigator or Project Supervisor:	**Professor Isabel Higgins**
Cc Co-investigators / Research Students:	**Mr Khalaf Alotaibi** **Professor Sally Chan** **Doctor Jenny Day**
Re Protocol:	**Pain assessment and management in infants and children: A mixed methods study of the knowledge, attitudes and cultural influences of nurses working in Saudi Arabia.**
Date:	**07-Mar-2016**
Reference No:	**H-2015-0466**
Date of Initial Approval:	**07-Mar-2016**

Thank you for your **Response to Conditional Approval (minor amendments)** submission to the Human Research Ethics Committee (HREC) seeking approval in relation to the above protocol.

Your submission was considered under **Expedited** review by the Ethics Administrator.

I am pleased to advise that the decision on your submission is **Approved** effective **07-Mar-2016**.

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Approval will remain valid subject to the submission, and satisfactory assessment, of annual progress reports. *If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.*

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal *Certificate of Approval* will be available upon request. Your approval number is **H-2015-0466**.

If the research requires the use of an Information Statement, ensure this number is inserted at the relevant point in the Complaints paragraph prior to distribution to potential participants You may then proceed with the research.

Conditions of Approval

This approval has been granted subject to you complying with the requirements for *Monitoring of Progress*, *Reporting of Adverse Events*, and *Variations to the Approved Protocol* as detailed below.

PLEASE NOTE:
In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, or a Renewal of approval, you will apply to the External HREC for approval in the first instance and then Register that approval with the University's HREC.

- ***Monitoring of Progress***

Kingdom of Saudi Arabia
Ministry of Health
King Fahad Medical City
(162)

المملكة العربية السعودية
وزارة الصحة
مدينة الملك فهد الطبية
(١٦٢)

IRB Registration Number with KACST, KSA: H-01-R-012
IRB Registration Number with OHRP/NIH, USA: IRB00008644
Approval Number Federal Wide Assurance NIH, USA: FWA00018774

December 10, 2015
IRB Log Number: 15-481E
Department: External
Category of Approval: EXEMPT

Dear Khalaf Alotaibi,

I am pleased to inform you that your submission dated November 24, 2015 for the study titled '**Pain assessment and management in infants and children: A mixed methods study of the knowledge, attitudes and cultural influences of nurses working in Saudi Arabia**' was reviewed and was approved. Please note that this approval is from the research ethics perspective only. You will still need to get permission from the head of department or unit in KFMC or an external institution to commence data collection.

We wish you well as you proceed with the study and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown above.

Please be advised that regulations require that you submit a progress report on your research every 6 months. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

If you have any further questions feel free to contact me.

Sincerely yours,

Prof. Omar H. Kasule
Chairman Institutional Review Board–IRB.
King Fahad Medical City, Riyadh, KSA.
Tel: + 966 1 288 9999 Ext. 26913
E-mail: okasule@kfmc.med.sa

Appendix E. Recruitment Flyer

Version [1.1], dated 3rd February 2016

Research Study

Volunteers Required

Details:

- **A PhD student of the University of Newcastle NSW Australia, Khalaf Alotaibi, is conducting a research** study which aims to examine the knowledge and attitudes of nurses caring for infants and children with pain in Saudi Arabia. It also aims to explore the barriers and facilitators to effective pain assessment and management and cultural factors impacting nurses when assessing and managing pain.

Who can participate?

We are looking for both Saudi and non-Saudi registered nurses who:

⇒ can read and speak in English .

⇒ hold a license with the Saudi Nursing Board.

⇒ have completed both their orientation and preceptorship period.

⇒ provide direct healthcare to infants and children.

How can I participate?

⇒ If you think you are eligible, please go to the nursing station in your unit/ward and collect a study information package.

⇒ If you are willing to participate follow the instruction for participation in the Information Statement.

How do I find out more information?

Interested participants can contact Khalaf Alotaibi on 0505455332 or Khalaf.Alotaibi@uon.edu.au for further information and to find out if you are eligible to participate.

Complaints about this research:

This project has been approved by the University's Human Research Ethics Committee, Approval No **H-2015-0466**. And the Ministry of Health's Research and Studies Affairs, Approval No **15-431E**. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Ministry of Health, Research and Studies Affairs, telephone 0114735038, email: *research@moh.gov.sa* **OR** to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Appendix F. Participant Information Statement (Phase 1, Survey)

THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Mr Khalaf Alotaibi, PhD candidate,
Email: Khalaf.Alotaibi@uon.edu.au
Phone: 0505455332 (SA), +61431799866 (AU),
Professor Isabel Higgins, Primary supervisor,
Email: Isabel.Higgins@newcastle.edu.au
Phone: +6124921 6144.
Professor Sally Chan, Co supervisor,
Email: Sally.Chan@newcastle.edu.au
Phone: +6124921 7873.
School of Nursing and Midwifery
Faculty of Health & Medicine
University of Newcastle
Callaghan NSW 2308

Information Statement for Research Project:

Pain assessment and management in infants and children: A mixed methods study of the knowledge, attitudes and cultural influences of nurses working in Saudi Arabia

Version [1.2], dated 25th February 2016

You are invited to participate in the research identified above. This research project is being conducted as part of the requirements for a Doctor of Philosophy which is being undertaken by Khalaf Alotaibi and supervised by Professors Isabel Higgins, Sally Chan and Dr Jennifer Day from the School of Nursing and Midwifery at the University of Newcastle (UON), Australia.

Why is the research being done?

Recent research has shown that many infants and children around the world suffer unnecessarily from unrelieved pain during their hospital stay due to ineffective pain assessment and management. This project aims to: (1) examine the knowledge and attitudes of nurses who work with infants and children in relation to pain assessment and management, (2) explore the barriers and facilitators to effective pain assessment and management, and (3) explore the aspects of culture that impact the assessment and management of pain in infants and children. This study comprises two phases: Phase 1 uses a modified version of the Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS-Shriners survey) (Rieman, Gordon, & Marvin, 2007), a validated tool, designed to explore aspects of care when assessing and managing pain in infants and children. Phase 2 comprises face to face interviews with up to 20 nurses who

consent to be part of this part of the study. The interviews are designed to explore aspects of culture that impact assessing and managing pain and the things that help or hinder this process with infants and children.

Who can participate in the research?
We are seeking registered nurses (RNs) who are able to read and speak in English, who hold a license with the Saudi Nursing Board, who have completed their orientation and preceptorship period, and who provide direct healthcare for infants and children in a Saudi Arabian Ministry of Health hospital to participate in this research project.

What choice do you have?
Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you in any way and will not place you in any risks or affect your relationship with the doctors, nurses and other health professionals in your workplace. If you do decide to participate, you may withdraw from Phase 1 of the research project, up to the point of submitting your completed survey into the sealed or secure box (described later) without giving a reason and without negative consequences to you or your employment status. You will not be able to withdraw once you have submitted your survey unless you take part in Phase 2 of the research project.

What would you be asked to do and how much time will it take?
If you agree to participate, you are invited to complete the enclosed survey questionnaire to this Information Statement, whether during or after your working hours. The survey questionnaire is not a test or examination. Each survey questionnaire is given a code number. Your name and personal contact details are not required unless you agree to participate in Phase 2 of this study. It is anticipated that this survey questionnaire will take up to 30 minutes of your time to complete. The return of a completed survey questionnaire in the envelope enclosed will be considered as your informed and voluntary consent to participate in this part of the research project.

If you wish to participate in Phase 2 of this project, you should indicate this at the end of the survey questionnaire form noted on page 10 which is an expression of your interest to participate in this phase. In order to be eligible to participate in an interview during Phase 2 of the study you will need to provide; a) your name and contact details, b) agree to being contacted by the researcher using your details in order to gain consent for an interview and c) agree to the researcher having access to your survey questionnaire responses and score prior to the interview.

If you are approached for an interview during Phase 2 you will be provided with a detailed information letter about this part of the study. If you agree to this you will be asked to return your letter of consent to the researcher. On receipt of your consent you will be invited to attend a face-to-face interview with the researcher Khalaf Alotaibi, which will be conducted during working hours in your workplace, in non-prayer times (Islam), and in a private area or private area of your choice to ensure you confidentiality. Considering Saudi culture, if you are female participant, a female research assistant will attend and sit in on the interview, who is working outside your workplace and who will also sign a request for confidentiality. Prior to the interview, the researcher will review the information about the purpose of Phase 2, check whether or not you have any questions about this part of the study and then proceed with the interview.

During the interview, you will be asked to talk about the things that help you when assessing and managing pain in infants and children and the things that you find unhelpful. Because many nurses come from foreign countries to work in Saudi Arabian, we are also interested in aspects of culture, either Saudi culture or your own culture that might impact on how you care for infants and children with pain. The interview will be audio-recorded and transcribed for analysis and you have the option to review and edit your interview transcript. Field notes will also be taken to help with the interview, data collection and data analysis later. It is estimated that the interview will last for 30-60 minutes. If you change your mind about the study and do not wish to participate in the interview or the survey questionnaire your data will be removed from the study. The survey questionnaire and audio transcript will be returned to you. Your data will be erased from the audio file and records.

What are the risks and benefits of participating?
There are no expected direct benefits to the research participants, nor are there any anticipated potential risks from taking part in this project. However, your participation may help to inform and guide health and education policy regarding assessing and managing pain in infant and children within the context of the Middle East which is represented by Saudi Arabia. In addition, the potential knowledge gained from this study could be used to guide and improve the quality of nursing care and pain assessment and management practices in multicultural healthcare settings similar to that of Saudi Arabia and neighbouring Arab nations, across the globe.

During the interview, and because of the nature of the study relating to pain in children, you may become emotionally distressed when sharing your experiences or concerns. If this is observed or you feel that while interviewing you, please feel free to inform the researcher so as to stop both the interview and audio recording to check to see whether or not you wish to proceed. If this occurs, you are invited to access the healthcare services provided freely for all employees at your workplace for counselling and support.

How will your privacy be protected?
Please be assured that all information you provide for this research, will at all times, be treated as strictly private and confidential. No names or any direct identifiable data will be used during the study unless you have agreed to this as noted above. Interview audio-recording transcriptions will be de identified; your name will not be used, your survey questionnaire code and demographic data (age, sex, religion, nationality etc) will be used instead. A confidential transcriptionist will be engaged to assist with the transcription of interview data. The transcriptionist will sign a confidentiality agreement as per university policy. Publications and presentations related to this project will not directly identify participants' identity in any way. During data collection, all completed documents and materials, such as survey questionnaires and interviews' consent forms and recorded data will be stored safely in a locked personal bag and in also a separate locked filling cabinet. Electronic data will be securely stored on the UON's own Cloud secure storage system. All copies of the collected data will only be accessed by the researcher and the research supervisors named above. On the completion of data collection, all data will be transferred and stored again securely in a locked filing cabinet in the School of Nursing and Midwifery; the UON, Australia for at least five years after completion of the research, then the data will be destroyed in accordance with the UON Research Data and Materials Management policy and procedure.

How will the information collected be used?
The information collected in this research project will be reported in a formal PhD thesis to be submitted for assessment for the degree and in professional academic journals to be published and at professional conferences or seminars. There will be no direct information that could lead to your identification in any reports associated with this project. If you would like to receive a summary of the results before they are published, please contact the researcher or the research supervisors on the aforementioned contact details after 14-18 months from the time of data collection.

What do you need to do to participate?
Please read this Information Statement and be sure you understand its contents before you consent to participate in this research. If there is anything you do not understand, or if you have any questions, please contact the researcher Khalaf Alotaibi whose contact details can be found at the top of this Information Statement. If you would like to participate, please complete the enclosed survey questionnaire, addressing all of the questions to the best of your ability, and place it in the envelope provided then drop it into the sealed box located in the nursing education department at (will be arranged later) marked 'Completed Surveys'. Before dropping the survey questionnaire, if you are interested in participating in a face to face interview and agree to the conditions described previously, please provide your name and contact details at the end of the survey questionnaire form noted on page 10. The researcher, Khalaf Alotaibi will contact you and send you the Information Statement for Phase 2 along with the consent form. After receiving your completed consent form, the researcher Khalaf will then contact you again to negotiate and arrange a time (non-prayer times, Islam) during working hours and place that is convenient to you within your workplace to conduct the interview. You will also receive a confirmation of your interview appointment.

*Please keep this Information Statement for your future reference.

What do you need to do if you decide not to participate?

If you decide not to participate, you do not need to do anything further.

Further information

If you would like further information about the project, please contact the researcher Khalaf Alotaibi identified above at the top of this Information Statement.

Thank you for considering this invitation.

Yours Sincerely,

Chief Investigator: Professor Isabel Higgins

Student researcher: Mr Khalaf Alotaibi

Complaints about this research

This research has been approved by the Human Research Ethics Committee at the University of Newcastle, Australia, (Reference No H-2015-0466) and the Ministry of Health in Saudi Arabia (Log No 15-431E).

Should you have concerns about your rights as a participant in this research, or if you have a complaint about the manner in which the research is conducted, these may be communicated to the researcher, or, if an independent person is preferred, to Research and Studies Affairs at the Ministry of Health, Saudi Arabia, telephone: 0114735038, email: Research@moh.gov.sa OR to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone +61 249216333, email: Human-Ethics@newcastle.edu.sa

Appendix G. Participant Information Statement (Phase 2, Interviews)

THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Mr Khalaf Alotaibi, PhD candidate,
Email: Khalaf.Alotaibi@uon.edu.au
Phone: 0505455332 (SA), +61431799866 (AU),
Professor Isabel Higgins, Primary supervisor,
Email: Isabel.Higgins@newcastle.edu.au
Phone: +6124921 6144.
Professor Sally Chan, Co supervisor,
Email: Sally.Chan@newcastle.edu.au
Phone: +6124921 7873.
School of Nursing and Midwifery
Faculty of Health & Medicine
University of Newcastle
Callaghan NSW 2308

Information Statement for Research Project:

Pain assessment and management in infants and children: A mixed methods study of the knowledge, attitudes and cultural influences of nurses working in Saudi Arabia

Version [1.1], dated 3rd February 2016

You are invited to participate in the research identified above. This research project is being conducted as part of the requirements for a Doctor of Philosophy which is being undertaken by Khalaf Alotaibi and supervised by Professors Isabel Higgins, Sally Chan and Dr Jennifer Day from the School of Nursing and Midwifery at the University of Newcastle (UON), Australia. You have been sent this Information Statement and consent form because you have completed the Paediatric Nurses' Knowledge and Attitudes Survey Regarding Pain (PNKAS-Shriners survey) (Rieman, Gordon, & Marvin, 2007) in Phase 1 of this study and expressed an interest in participating in Phase 2 with face to face interviews.

Why is the research being done?

Recent research has shown that many infants and children around the world continue to suffer unnecessarily from pain during their hospital stay due to ineffective pain assessment and management. This project aims to: (1) examine the knowledge and attitudes of nurses who work with infants and children in relation to pain assessment and management, (2) explore the barriers and facilitators to effective pain assessment and management, and (3) explore the aspects of culture impacting the assessment and management of pain in infants and children. This phase 2 comprises face to face

interviews with up to 20 nurses who consent to be part of this part of the study. The interviews are designed to explore aspects of culture that impact assessing and managing pain and the things that help or hinder this process with infants and children.

Who can participate in the research?
We are seeking participants who have already completed Phase 1 of this research project, the PNKAS, and are willing to take part in Phase 2. If you are a registered nurse (RN), reading and speaking in English with a license from the Saudi Nursing Board, your orientation and preceptorship period have been completed and providing direct healthcare for infants and children in a Saudi Arabian Ministry of Health hospital, and completed the PNKAS survey, you are eligible to be involved in Phase 2 of this research.

What choice do you have?
Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you in any way and will not place you in any risks or affect your relationship with the doctors, nurses and other health professionals in your workplace. If you do decide to participate, you may withdraw from the research project at any time before results fully reported without giving a reason and without negative consequences to you or your employment status. If you withdraw from the study you also have the option of withdrawing any identifiable data belonging to you without giving a reason.

What would you be asked to do and how much time will it take?
If you agree to participate in Phase 2 of this research project, you will be invited to attend a face-to-face interview with the researcher Khalaf Alotaibi which will be conducted in your workplace, in non-prayer times (Islam) and in a private area or private area of your choice to ensure your confidentiality. Respecting Saudi culture, if you are female participant, a female research assistant will attend and sit in on the interview, who from outside your workplace and who also signed a request for confidentiality. Prior to the interview, the researcher will review the information that need to be known and the purpose of Phase 2 of the study with you, check whether or not you have any questions about this part of the study and then proceed with the interview. During the interview, you will be asked to talk about the things that help you when assessing and managing pain in infants and children and the things that you find unhelpful. Because many nurses come from foreign countries to work in Saudi Arabia, we are also interested in aspects of culture, either Saudi culture or your own culture that might impact on how you care for infants and children with pain. The interview will be audio-recorded and transcribed for analysis and you have the option to review and edit your interview transcript. Field notes will also be taken to help with the interview, data collection and data analysis later. It is estimated that the interview will last for 30-60 minutes. If you change your mind about the study and do not wish to participate in the interview your data will be removed from the study. The audio transcript will be returned to you. Your data will be erased from the audio file and records.

What are the risks and benefits of participating?
There are no expected direct benefits to the research participants, nor are there any anticipated potential risks from taking part in this project. However, your participation may help to inform and guide health and education policy regarding assessing and managing pain in infant and children within the context of the Middle East which is represented by Saudi Arabia. In addition, the potential knowledge gained from this study

could be used to guide and improve the quality of nursing care and pain assessment and management practices in multicultural healthcare settings similar to that of Saudi Arabia and neighbouring Arab nations, across the globe.

During the interview, and because of the nature of the study relating to pain in children, you may become emotionally distressed when sharing your experiences or concerns. If this is observed or you feel that while interviewing you, please feel free to inform the researcher so as to stop both the interview and audio recording to check to see whether or not you wish to proceed. If this occurs, you are invited to access the healthcare services provided freely for all employees at your workplace for counselling and support.

How will your privacy be protected?
Please be assured that all information you provide for this research, will at all times, be treated as strictly private and confidential. No names or any direct identifiable data will be used during the study unless you have agreed to this as noted in Phase 1 Information Statement. Interview audio-recording transcriptions will be de identified; your name will not be used, your survey questionnaire code and demographic data (age, sex, religion, nationality etc) will be used instead. A confidential transcriptionist will be engaged to assist with the transcription of interview data. The transcriptionist will sign a confidentiality agreement as per university policy. Publications and presentations related to this project will not directly identify participants' identity in any way. During data collection, all completed documents and materials, such as survey questionnaires and interviews' consent forms and recorded data will be stored safely in a locked personal bag and in also a separate locked filling cabinet. Electronic data will be securely stored on the UON's own Cloud secure storage system. All copies of the collected data will only be accessed by the researcher and the research supervisors named above. On the completion of data collection, all data will be transferred and stored again securely in a locked filing cabinet in the School of Nursing and Midwifery; the UON, Australia for at least five years after completion of the research, then the data will be destroyed in accordance with the UON Research Data and Materials Management policy and procedure.

How will the information collected be used?
The information collected in this research project will be reported in a formal PhD thesis to be submitted for assessment for the degree and in professional academic journals to be published and at professional conferences or seminars. There will be no direct information that could lead to your identification in any reports associated with this project. If you would like to receive a summary of the results before they are published, please contact the researcher or the research supervisors on the aforementioned contact details after 14-18 months from the time of data collection.

What do you need to do to participate?
Please read this Information Statement and be sure you understand its contents before you consent to participate in this research. If there is anything you do not understand, or if you have any questions, please don't hesitate to contact the researcher, Khalaf Alotaibi whose contact details can be found at the top of this Information Statement. If you would like to participate, please sign the consent form that you have received with this Information Statement and return it via email to the researcher Khalaf. Once the completed consent form is received, the researcher Khalaf will then contact you to negotiate and arrange a time (non-prayer times, Islam) during working hours and place that is convenient to you within your workplace to conduct the interview. You will also receive a confirmation of your interview appointment.

*Please keep this Information Statement for your future reference.

*Please contact the researcher Khalaf at least 48 hours before the interview in case you are unable to attend the interview.

Further information

If you would like further information about the project, please contact the researcher Khalaf Alotaibi identified above at the top of this Information Statement.

Thank you for considering this invitation.

Yours Sincerely,

Chief Investigator: Professor Isabel Higgins

Student researcher: Mr Khalaf Alotaibi

Complaints about this research

This research has been approved by the Human Research Ethics Committee at the University of Newcastle, Australia, (Reference No H-2015-0466) and the Ministry of Health in Saudi Arabia (Log No 15-431E).

Should you have concerns about your rights as a participant in this research, or if you have a complaint about the manner in which the research is conducted, these may be communicated to the researcher, or, if an independent person is preferred, to Research and Studies Affairs at the Ministry of Health, Saudi Arabia, telephone: 0114735038, email: Research@moh.gov.sa OR to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone +61 249216333, email: Human-Ethics@newcastle.edu.au

Appendix H. Interview Consent Form

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Interview Consent Form for Research Project:

Pain assessment and management in infants and children: A mixed methods study of the knowledge, attitudes and cultural influences of nurses working in Saudi Arabia

Version [1.1], dated 3rd February 2016

I agree to participate in the above research project and give my consent freely.

I understand that the project will be conducted as described in the Information Statement (Phase 2), a copy of which I have read and retained.

I understand I can withdraw from the project at any time before results fully reported and do not have to give any reason for withdrawing.

I consent to participate in a face-to-face interview for 30-60 minutes and having it audio-recorded.

I understand that I can review and edit my interview transcript.

I understand that my personal details and my workplace will remain confidential to the researchers, except as required by law.

I have had the opportunity to have questions answered to my satisfaction.

Print Name: _____

Signature: _____ Date: _____

Appendix I. Interview Guide

Time: _____ Date: _____

Location: _____

Pre-interview script

- Thank the participant for his/her agreement to be interviewed.
- Introduce myself to the participant.
- Explain my research study and its purposes in lay terms. Check that the person has seen the information letter regarding the study. Ask if they have any questions relating to the study.

Following the script

Before we begin, I would like to clarify some aspects of today's interview.

- This interview will last for 30-60 minutes and with your consent, the interview will be audio-recorded and transcribed later for analysis. I will take brief field notes to help me during the interview.
- Your participation in this interview, your name, and any details from the interview and transcript will be kept strictly confidential. The transcribed interview will not contain any direct identifying information; this will be removed.
- You have the option to stop the interview/the recorder at any time or refuse to answer any questions without giving a reason and without being subjected to any a penalty or a negative effect.
- You also have the option to review and edit the transcription of your interview.
- Before we proceed, do you have any questions you would like to ask? Are you happy to proceed?

**Please make sure that your cell phone is on silent to ensure there is no interruption during the interview.*

Can you describe for me a situation that stands out for you in relation to caring for a child with pain?

Can you describe why this situation is significant to you?

Can you tell me about the things that help/assist you to care for children with pain?

Can you tell me about the things that hinder/impede your care for children with pain?

Can you tell me about the approaches/strategies/methods that you used when (1) assessing pain in infants/children, (2) managing pain in infants and children?

Can you tell me about the things that you believe affect/impact on your ability to (1) provide effective pain assessment, (2) provide effective pain management?

What is it like for you as an expatriate/an international nurse caring for infants and children who are of Saudi nationality? Can you please tell me more about this?

Can you tell me about a time when you believe your own cultural values/beliefs/expectations impacted; (1) pain assessment and (2) pain management? How? What about religious beliefs?

Concluding and closing the interview.

- Is there anything else you would like to share with me?
- Are there any comments you would like to add?
- Do you have any questions you would like to ask me?
- Many thanks for your participation in today's interview.

Appendix J. Summary for Qualitative Content Analysis

Meaning Units	Codes	Categories	Sub-Themes	Themes
• Sometimes we need something but it is not available here in our hospital. Our hospital does not routinely provide us with what we need to manage pain and this hinders us. For example, if a patient has swelling and this swelling is associated with pain, then we need a cold or warm compress pack to manage the pain, but these things are not available here at all times. Sometimes, we need to write a request and this takes weeks to be supplied or sometimes we need to ask the family to buy them from outside. This hinders us as nurses when caring for patients. (Participant A) • The other thing is medications which should be supplied regularly and made available to us when necessary. If the patient is in pain, analgesics need to be here in advance because if they are not available, this may result in delays in our attempts to control a child's pain. (Participant N) • There were usual delays in getting medications from pharmacy… the patient was in pain and the doctor ordered I.V. medication, but the pharmacy	• Pain management methods, such as warm/cold compress not stocked. • Some pain items have to be purchased by family, patients, nurses privately from outside the hospital when not available. • No PRN/analgesic medication stock available in ward. • Lack of pain medications in ward may delay or hinder providing care for children with pain. • Delay in IV medications delivery from pharmacy.	• Pain in children is not prioritised.	Lack of supply of pharmacological and non-pharmacological pain management methods.	1. Children's Pain: A Low Priority.

delivered it too late. Such a situation hindered the effectiveness of our health care. (Participant N)				
• We could not attend to the patient regularly because only two nurses were working on every shift and sometimes we had more than 17 patients. On every shift, there is a maximum number of three nurses who care for the whole paediatric ward, that's the maximum, but sometimes, like today, only two nurses and caring for more than 12 patients. Each nurse has six patients or more; some of them have surgery, so the only way that we can do is to prioritise between them. (Participant A) • The shortage of nurses here and the heavy work and heavy duties really affect my practice in relation to pain assessment and management. A lack of time, because here we have more patients to take care of. This means that it is difficult to attend to each patient regularly to assess, reassess and manage pain. (Participant F)	• Nurses could not meet patients' health needs due to staff shortage. • Shortage of nurses and heavy workload impact nurses to assess and manage pain.		Nursing staff shortage and higher patient loads impact pain assessment.	
• We called the doctor two to three times and each time he said the same, I would come, but he actually came late, after around one hour, and then analgesia was ordered and administered to the child who had experienced and suffered so much pain because of	• Doctor contacted two to three times and he promised to come, but arrived late,			

this delay. Sometimes, doctors do not order analgesic for children. They think that their pain will subside and sometimes they ignore children as a child usually cries. This is a belief, so we face difficulties in managing pain in children because of some doctors here. (Participant B) • Doctors, because they are not directly caring for the patients. They only come for about one hour per day. They usually relay on phone order and we nurses have to manage the patients. Sometimes, doctors are unfamiliar with the child's case and order analgesics without seeing him or assessing his pain. (Participant I)	after one hour – the child experienced much pain. • Doctors do not order pain killers or medications, thinking that pain will stop. • Doctors ignore children as they believe that children often cry. • Doctors normally depend on phone order and prescribe analgesia without direct assessment for children in pain. • Doctors do not call back once contacted or do not listen once they call nurses regarding a child's care.		A low priority given by physicians to children's pain.	
• I'm an international nurse and because of this, I faced difficulties. Some parents who were Muslim asked me about my religion and when I said Christianity, they did not allow me to care for their children. (Participant B) • As Christian nurses caring for Muslim patients, we need to understand their religious beliefs and everything, for example, before we do anything for them, we need to say Bismillah (by the name of God). They are very religious people and we need to say that because if we do not say it, they will not	• Muslim parents do not allow nurses who are not Muslims to take care of their children with pain. • Christian nurse must say the name of God (Allah) before approaching a child with pain. If they do not say that, parents and their children do not allow them to do their job or provide health care.	• Cultural and language differences, conflicts and misunderstandings.	Beliefs/misbeliefs: Religion, rituals, culture, and differences.	2. Culture, Religion, Mistrust, and Pain.

allow us to care for them. Sometimes also they ask, are you reading the Holy-Quran? If I say no, they will not cooperate with us. (Participant H) • Muslims are different from Christian people in terms of religion, beliefs, values and culture. That is why we face challenges during working hours. I know that while treating them, I have to look after them, I have to provide them with good care possible, but in order to do so, I need to understand their difficult culture or to be one of them. (Participant J) • Families here have particular religious beliefs. Based on these beliefs, they put oil on the child's body, expecting that it is better than treatment and medication. These beliefs and practices hindered the care we could give to children because some families believed in them and refused or did not adhere to [medical] treatment. (Participant L) • Some patients used pieces of paper written from the QURAN and they put these in water and drank the water. But that's scientifically wrong for us. The doctor was angry because of this and said 'why did you allow the child to have this?' We asked the parents not to do this while in hospital, but we faced huge opposition from them. We are from a different culture and therefore it's difficult to prevent them from what they are doing or thinking because that's correct from their perspectives. (Participant A)	• Nurses face difficulties because of religious and cultural differences between them and parents and their children. • Islamic culture needs to be understood in order to provide care for Muslim patients. • Families use oil as a religious treatment and believed that it is better than any medical intervention. • Patients use papers written from QURAN and drink their water. • Nurses faced difficult situations, particularly with parents providing traditional and religious treatment to their children during hospitalisation. • Nurses could not prevent parents from what they did regarding cultural or religious treatment.			

• The first thing is the language difference which is the most difficult barrier that I encountered here. I cannot communicate with mothers and children as they are all Arabic speakers. I just know a little in the Arabic language. So sometimes we cannot fully understand each other. I want to help them, I want to alleviate the child's pain, but sometimes I could not do this because of this barrier. (Participant A) • The language barrier; sometimes I want to do something for the child, but I cannot explain this in the Arabic language. The reason is that my Arabic language is not really perfect. Sometimes we cannot adequately explain to the child what we want to give them or do, or even what we want him to do. It's very difficult, this language barrier. (Participant H) • For example, sometimes mothers tell us something about their children in pain and we do not always understand them. Sometimes we also incorrectly interpret what they say to us about their child's complain of pain or we misunderstand them. (Participant P) • I think caring for infants or children of Saudi nationality is quite difficult because of the language barrier, so it is important for us to learn their	• Language difference is a difficult barrier hindering pain care to be delivered by nurses. • Being a foreign nurse, it is hard to explain to the child and his family when caring or managing pain. • Due to the barrier of language differences, the nurse could not appropriately manage children's pain. • Being foreign nurse, her Arabic language is not strong. • Being from another country, the nurse could not explain to the child what she wanted to do. • The mother tells or asks for something and the nurse does not understand her or interpret her message wrongly.		Language differences, communication and understandings/misunderstandings.	

language and apply it in practice to provide them with adequate care and treatment. (Participant C) • One more thing is my colleagues. Some nurses did not communicate effectively with us regarding patients' care. Because of this, we could not provide effective pain management. There was also misunderstandings because some nurses did not know how to give us full details or how to appropriately explain the patient's pain status and experience. (Participant E) • I think my colleagues sometimes affected me because some of them did not help or did not correctly assess patients. For instance, when there was a new admission, some nurses did not make an accurate assessment and simply said that the patient has pain, without identifying the location, nature, level, intensity or what helps. What if the patient has too much pain? This sometimes confused and hindered us to deal with pain. (Participant C)	• Being from a different country and caring for Saudi infants and children is a difficult task due to language barrier. • Learning Arabic language is important. • Some nurses do not communicate effectively or give full information about patients in pain.			
• Some fathers and mothers thought that we did not understand pain or we wouldn't provide proper care for their child. They did not trust us as nurses and they thought that we did not have the ability to take care of patients. (Participant E) • We usually had difficulty in assessing pain due to what the parents thought. There were conflicts. For	• Parents do not trust the nurses when they care for their child in pain. • Parents expect that the nurse does not understand pain or she/he will provide ineffective pain care.		Parents' distrust of expatriate nurses' expertise.	

example, a child was not in pain, but the parents were concerned and said the opposite. They asked for medication even though the child was not in pain. I think the children's family needs to be educated, not only us as nurses, but also parents, so that they will be more inclined to cooperate with us and we can give the best care to their children. (Participant J) • Education is important for mothers. Some mothers asked us to give pain relief to their children, but we had already administered that. We could not convince them until we called the doctor and then he explained to them. (Participant L)	• Parents/family ask to give pain medication even when the child does not have pain. • Parents/family need to be educated about pain in children. • Mothers ask nurses to give pain medication even if that has already been given to their children.			
• Some children around the age of eight avoid informing us or do not react to or show their pain because they do not want to take medicines or they are afraid of needles and treatment. This was a barrier for us in providing good care for them. (Participant J) • She started crying, crying, crying and she did not stop until I took my hands off. It was confusing for me because if a child cries, it could mean that the child is hungry, thirsty or wants their mother. This was one of the things that affected me when caring for some children. (Participant H) • Children do not understand pain. They also cannot tell an exact pain level. For this reason, we depend on our assessment and we inform the	• Some children do not show their pain or express it to nurses because they do not like to take medication or have a fear of the side effects of treatment and management. • Children who keep crying while caring for them make confusion for the nurse and affect nursing care. • Children may cry due to several reasons including hungry, thirsty or want	• Challenges and facilities with childhood pain.	Detecting and assessing childhood and cultural expressions of pain.	3. Understanding/ Misunderstandings childhood pain behaviour.

doctor of a score from our assessment for pain. (Participant N) • If the child indicates a score for their pain on an assessment scale, we do not believe this because each child has a different pain tolerance. Some children actually have a pain level of only 3 out of 10 but when we ask them, they say 8 or 9. (Participant O) • Some differences were noted. I think Saudi children have a low tolerance for pain, unlike children in my home country, who have a high pain tolerance. (Participant H) • Saudi children are always in high pain. They do not tolerate much pain. I have cared for many children from different nationalities; from Egypt, India and Sudan, but Saudi children do not tolerate as much pain when compared to them. (Participant B) • Sometimes we care for children and we give pain medicines to them. Sometimes it is normal for children to cry but we faced problems with some parents regarding this. I think some children like to cry but their fathers or mothers think that they are in pain. Sometimes there is no pain; children are like that, just lying or pretending to be in pain. A child who is in real pain struggles and moves a lot on the bed, but this was not observed on many occasions. (Participant B)	mother, means difficult to identify their pain. • Children do not understand pain or cannot express it. • Nurses do not believe children when they express or indicate their pain level. • Compared children in other countries, Saudi children have low pain tolerance. • Saudi children always in a high level of pain; they cannot tolerate any pain level. • Children may lie or pretend pain when crying. • Nurses do not take any action of the child expresses or indicates pain as children change their minds when compared to adults. • Placebo is not effective for children, perhaps for adults because children do not pretend pain and can tell the truth about it.			

• If children say that they have too much pain, we usually do not take any action. We just wait for a while to check it out. If the patient is an adult, yes we take action, but for children we cannot because they change their mind. For example, if you ask children later how you feel now, they will say no more pain. (Participant O) • Children do not pretend to be in pain. They tell the truth, so I think we cannot say a placebo is effective for them, maybe for adults only. There is no need to give children a placebo as children usually do not lie. This is what I have observed; they tell the truth if there is pain. (Participant D) • Children don't usually stay in bed for a long time. They are more active than adults and most of the time, they are playing. If they are not feeling well or have pain, they may not play and will stay quiet. (Participant G)	• Children are active and if with pain they will not stay on bed.			
• The pain history that we get from the parents on admission helps us to care for the child, especially after surgery. We can use this information to compare pain levels, before and after surgery. (Participant Q) • The other thing is parents, because children usually listen more to them than us. So we need parents here to provide us with the necessary	• Pain history provided by parents upon admission helps nurses to care for children, mainly after surgery. • Children are more likely to listen to their parents.		Understanding pain through helpful parent/child relationship.	

details and information about their child's pain and its meaning and history. (Participant C) • For me, I talk more to paediatric patients. I usually communicate with them and joke with them to make them happier. As nurses, we seem strange to some children. Because of this, I usually introduce myself and joke around with them to develop a relationship with them. These things encourage children to cooperate and share their feelings of pain. (Participant G) • If the child has the ability to clearly express and explain his feelings, then it is easy for us to assess and manage pain. (Participant P)	• Parents are needed as they help in providing nurses with information about their child's pain status, meaning and history. • Taking and communicating with the child frequently helps in understanding the origin of pain. • The child who is able to clearly express pain can help nurses in assessment practice.			
• Parents sometimes would not allow us to effectively assess their child's pain. If the child started to cry when we were assessing pain, they asked us to stop or to come later. This delayed the management and treatment of a child's pain. This may be due to the parents' lack of knowledge. They were not thinking about what was good or helpful, their concern was only about pain and their children when they cried. (Participant G) • Some parents stayed with their children, but they were not interested as they did not report to us when their children were in pain. (Participant A)	• Parents do not allow nurses to assess pain and to do their job. • Parents stop nurses to continue assessing pain when their child cries. • Parents do not report their child's pain to nurses • Parents do not participate or inform nurses about pain in their children when they present.		Uncooperative parents and families, misunderstandings and pain.	

• The other thing is that mothers sometimes did not provide information when we were assessing pain of their children and remained uninvolved. (Participant I) • During visiting time, some relatives did not allow us to assess pain or give care for their child and asked 'sister can you do it later; not now please'. (Participant C) • Parent; sometimes when we go to the child, the mother says 'no, I do not like that, then she refuses what we need to give. Some parents do not have knowledge and should be educated. Parents refused treatment because they did not want their child to experience pain. For this reason, they asked us to change injections to oral medication. (Participant B)	• Mothers do not provide information when assessing their child's pain. • Relatives prevent nurses from assessing pain in children. • Mothers refuse treatment. • Parents refuse treatment and ask for specific treatment.			
• Well, I think my knowledge about children's pain is limited. My experience also may not be sufficient to care for children and effectively manage their pain. I do not have enough knowledge and experience in the speciality area of paediatrics or paediatric pain, or in the care of children. I only have a general BSN in nursing and I think this adversely affects me sometimes when looking after children with pain. (Participant E)	• Lack of knowledge and limited experience on paediatric pain are limiting factors. • Lack of or limited experience is a hindering factor for providing effective pain care for children. • Pain was not assessed when a parent notified the nurse		Nurses' limited knowledge and experience with childhood pain.	

• A lack of nursing experience was one of the barriers that we faced here. Our hospital has new nurses. Around two-thirds of nursing staff here are new. Most of them have limited experience or no experience. This means that they may not know how to care for critical cases and patients in pain. (Participant A) • Sometimes parents say that their child is suffering pain but when we go to the child, we find him asleep, and then the parent says that the child was crying a while ago because of pain. This causes confusion for us and we constantly face this situation. (Participant Q) • The pharmacologic methods that we use here include pethidine and morphine. We give these medications but you know these can affect the child's respiratory rate and may result in addiction. So we use them with caution. (Participant I) • Pharmacological interventions, such as morphine, are administered based on the doctor's order. But I think it is better to avoid it because of the high risk of addiction and that's really a problem. (Participant G) • Some children do not need opioids as their pain will subside without these medications. This is what I think so I usually do not give opioids on first request. I just wait to check the child's pain,	about their child who had pain. • Opioids can cause respiratory depression and addiction. • Nurses use opioids with caution. • Better to avoid giving morphine as claimed by the nurse due its side effects, such as addiction. • An opioid that ordered was not given on first request as pain may subsided without administering it. • Opioids are not good to be administered to children. • If the child assessed and he/she deserves an opioid medication, nurses avoid administering such medication and say it is not pain or because of pain. • The child was addicted to narcotics as claimed by the nurse.			

because it is not good to give them opioids; they are children. (Participant M) • If the child is assessed and an opioid medication needs to be given, the nurse says ooh, maybe he is hungry or the child wants his mother to be around; nurses usually say things like this. They do not like to give opioids. (Participant O) • The child was ready to be discharged, but she was crying. At that time, the nurse who was looking after her said to me that the child is crying because she is addicted to narcotics. (Participant K) • The child was crying and screaming 'I need a pain killer', 'I need a pain killer'. I think he was addicted to narcotic medications. (Participant L) • Some nurses here have incorrect information and beliefs. They think that children do not feel pain. This is what I have noted; some nurses need education. They think that children can tolerate much pain, unlike adults. They also think that children who suck their thumb is free of pain. I'm not agree with them. (Participant O)	• The child was crying because of addiction to narcotic medications. • Nurses have incorrect thoughts and have also several misbeliefs as said by one nurse.			
• I have been working here for eight months. I have not attended any educational activities on children's pain. This is because our hospital does not conduct these. It is important for this hospital to offer education and training for us because we on the	• Hospital does not offer educational and training activities on children's pain and its management.		Lack of educational opportunity	

front line of patient care. We need to gain knowledge not only to help children with pain, but also to help their families and parents. (Participant J) • I think we have training and seminars here, but they are rare. This hospital should provide us with ongoing effective education and training about paediatric pain and pain assessment and management, particularly pharmacology and giving medications. This would help us to update our knowledge and give better health care to our patients. (Participant A)	• Nurses want to update and improve their knowledge on paediatric pain. • Education and training about pain in children are rare. • Nurses believe that the hospital where they work should provide them with continuing education and training on paediatric pain.			

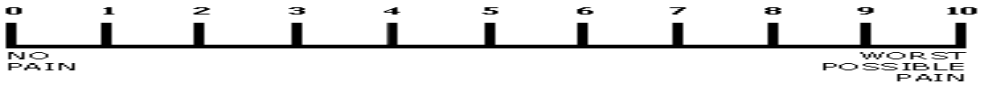
Appendix K. Item Analysis–PNKAS (Shriners Revision)

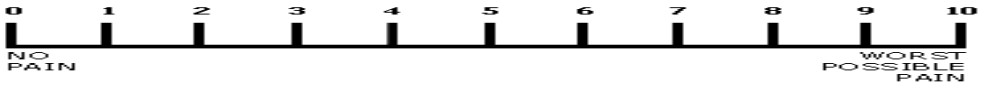
Item No	Item Content	Rater (1)	Rater (2)	Rater (3)	Rater (4)
1	Observable changes in vital signs must be relied upon to verify a child's statement that he has severe pain.	EMP	EMN	EMP	EMP
2	Because of an underdeveloped neurological system, children under 2 years of age have decreased pain sensitivity and limited memory of painful experiences.	EMP	EMP	EMP	EMP
3	If the infant/child can be distracted from his pain this usually means that he is not experiencing a high level of pain.	P	EMP	EMP, P	EMP
4	Infants/children may sleep in spite of severe pain.	P	EMP, P	EMP	EMP
5	Comparable stimuli in different people produce the same intensity of pain.	EMP	EMP	EMP	EMP
6	Ibuprofen and other non-steroidal anti-inflammatory agents are NOT effective analgesics for bone pain.	EMP	EMP	EMP	EMP
7	Non-drug interventions (e.g. guided imagery, biofeedback, transcutaneous electrical nerve stimulation (TENS) etc.) are very effective for mild-moderate pain control but are not helpful for more severe pain.	EMP	EMP	EMP	EMP
8	Infants/children who will require repeated painful procedures (i.e. blood draws), should receive maximum treatment for the pain and anxiety of the first procedure to minimize the development of anticipatory anxiety before subsequent procedures.	EMP, ETH	EMP, ETH	EMP	EMP
9	Respiratory depression rarely occurs in infants/children who have been receiving stable doses of opioids over a period of months.	EMP	EMP	EMP	EMP
10	Combining analgesics and non-drug therapies that work by different mechanisms (e.g. using acetaminophen, topical anaesthetics, sucrose, and non-nutritive sucking) may result in better pain control with fewer side effects than using a single analgesic agent.	EMP, P	EMP	EMP	EMP
11	The usual duration of analgesia of Morphine IV is 4-5 hours.	EMP	EMP	EMP	EMP

12	Benzodiazepines do not reliably potentiate the analgesia of opioids unless the pain is related to muscle spasms.	EMP	EMP	EMP	EMP
13	Parents should not be present during painful procedures.	ETH, B, EMP	B	B	B
14	Infants/children with a history of opioid therapy should not be given opioids for pain because they are at high risk for addiction occurrence.	EMP	EMP	B	EMP
15	Beyond a certain dosage of morphine increases in dosage will NOT provide increased pain relief.	EMP, P	EMP, P	EMP	EMP
16	Young infants, less than 6 months of age, cannot tolerate opioids for pain relief.	EMP	EMP	EMP	EMP
17	The child with pain should be encouraged to endure as much pain as possible before resorting to a pain relief measure.	EMP, ETH	EMP	B	EMP
18	Children less than 8 years cannot reliably repot pain intensity and therefore, the nurse should rely on the parents' assessment of the child's pain intensity.	EMP, B	B, EMP, AE	B	EMP
19	Based on one's cultural/spiritual beliefs a child may think that pain and suffering is necessary.	EMP	EMP, EMN	EMN	EMN
20	Anxiolytics, sedatives, and barbiturates are appropriate medications for the relief of pain during painful procedures.	EMP	EMP	EMP	EMN
21	After the initial recommended dose of opioid analgesic, subsequent doses should be adjusted in accordance with the individual patient's response.	EMP	EMP	EMN	EMN
22	The child should be advised to use non-drug techniques alone rather than concurrently with pain medications.	ETH, B	B	B	B
23	Giving infants/children sterile water by injection (placebo) is often a useful test to determine if the pain is real.	ETH	EMP	ETH	ETH
24	Opioid/narcotic addiction is defined as a chronic neurobiological disease, characterized by impaired control over drug use, compulsive use, continued used despite harm, and craving. It may occur with or without the physiological changes of tolerance to analgesia and physical dependence (withdrawal).	EMP	EMP	EMP	EMP
25	The recommended route of administration of opioid analgesics to infants/children with background (continuous, persistent) pain is intravenous intramuscular	EMP	EMP	EMP	EMP

	subcutaneous oral rectal I don't know				
26	The recommended route of administration of opioid analgesics to infants/children with brief, severe pain of sudden onset, e.g. trauma or postoperative pain, is: intravenous intramuscular subcutaneous oral rectal I don't know	EMP	EMP	EMP	EMP
27	Of the following analgesic medications, which is considered the drug of choice for the treatment of prolonged moderate to severe pain for children? acetaminophen codeine morphine meperidine (Demerol) I don't know	EMP	EMP	EMP	EMP
28	Which of the following IV doses of morphine administered would be equivalent to 10 mg of oral morphine. Morphine 3 mg IV Morphine 5 mg IV Morphine 10 mg IV Morphine 15 mg IV	EMP	EMP	EMP	EMP
29	Analgesics for post-operative pain should initially be given: around the clock on a fixed schedule only when the infant/child needs pain relief only when the nurse determines that the child has moderate or greater discomfort	EMP	EMP, ETH	EMP	EMP
30	A child with background (continuous, persistent) pain has been receiving daily opioid analgesics for 2 months. The doses increased during this time period. Yesterday the child was receiving morphine 5 mg/hour intravenously. Today he has been receiving 10	EMP	EMP	EMP	EMP

	mg/hour intravenously for 3 hours. The likelihood of the child developing clinically significant respiratory depression is: 1-10% 11-20% 21-40% > 41%				
31	Analgesia for background (continuous, persistent) pain should be given: around the clock on a fixed schedule only when the infant/child needs pain relief only when the nurse determines that the child has moderate or greater discomfort	EMP	EMP, ETH	EMP	EMP
32	The most likely explanation for why a child with pain would request increased doses of pain medication is: The child is experiencing increased pain The child is experiencing increased anxiety or depression The child is requesting more staff attention The child's requests are related to addiction	B	B	B	B
33	Which of the following drugs are useful for the treatment of pain in children? non-steroidal anti-inflammatory drugs (NSAIDs) opioid analgesics anti-depressants anti-convulsants All of the above	EMP	EMP	EMP	EMP
34	The most accurate judge of the intensity of the child's pain is: the treating physician the child's primary nurse the child the pharmacist the child's parent	B	EMP, B	B	B
35	Which of the following describes the best approach for cultural considerations in caring for children in pain: There are no longer cultural influences in Saudi Arabia due to the diversity of the population.	B	B	EMP	B

	Nurses should use knowledge that has defined clearly the influence of pain on culture (e.g., Asians are generally stoic, Hispanics are expressive and exaggerate their pain, etc.). Children should be individually assessed to determine cultural influences on pain. Nurses should base care on their own pain beliefs.				
36	What do you think is the percentage of children who over-report the amount of pain they have? Choose the correct answer. 0 10 20 30 40 50 60 70 80 90 100%	B, P	B	B	B
37	Case Studies Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication. Case study # 1 Directions: Please select one answer for each question. Patient A: Andrew is 8 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP =105/65; HR = 80; R = 20; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he rates his pain as 8. Patient A continued: Select the number that represents your assessment of Andrew's pain.  Patient A continued: Your assessment, above, is made two hours after he received morphine 2 mg IV. After he received the morphine, his pain ratings every half hour ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q2h PRN pain relief." Check the action you will take at this time: Administer no morphine at this time. Administer morphine 1 mg IV now.	B EMP	B EMP	B EMP	B EMP

	Administer morphine 2 mg IV now. Administer morphine 3 mg IV now.				
38	Case study # 2 Patient B: Robert is 8 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 105/65; HR = 80; R = 20; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. Patient B continued: Select the number that represents your assessment of Robert's pain.  Patient B continued: Your assessment, above, is made two hours after he received morphine 2 mg IV. After he received the morphine, his pain ratings every half hour ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His orders for analgesia are "morphine IV 1-3 mg q2h PRN pain relief." Check the action you will take at this time: Administer no morphine at this time. Administer morphine 1 mg IV now. Administer morphine 2 mg IV now. Administer morphine 3 mg IV now.	B EMP	B EMP	B EMP	B EMP

Empirical knowledge (EMP), Ethical knowledge (ETH), Personal knowledge (P), Aesthetic knowledge (AE), Emancipatory knowledge (EMN), Feeling (F), Belief (B)

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