QATAR UNIVERSITY

COLLEGE OF HEALTH SCIENCES

NURSES' KNOWLEDGE AND ATTITUDES ABOUT ADULT POST-OPERATIVE PAIN

ASSESSMENT AND MANAGEMENT: A CROSS SECTIONAL STUDY IN QATAR

BY

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ABSTRACT

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Title: Nurses' Knowledge and Attitudes About Adult Post-Operative Pain Assessment and Management: a Cross Sectional Study in Qatar.

Supervisor of Thesis: Lily O'Hara.

Background: Pain has been described by clinicians, patients, and researchers alike as a complex and challenging phenomenon. People have different experiences of pain. Nurses' negative attitudes and lack of knowledge are major impediments to effective pain management.

Aim: The study aimed to assess the knowledge and attitudes of nurses in Qatar about adult post-operative patients' pain assessment and management and the factors that may be associated with such knowledge and attitudes.

Methods: The study was a cross-sectional online survey using a self-administered questionnaire for post-operative registered nurses working in Hamad Medical Corporation. The dependent outcome was the number of correct answers on the Knowledge and Attitudes Survey Regarding Pain.

Results: A total of 151 post-operative nurses participated in the study. The mean knowledge and attitudes (K&A) score was 19.6 (SD 4.5) out of 41 (48%), indicating a huge deficit in the nurses' knowledge and attitudes about adult post-operative pain. No sociodemographic or other variables were associated with the K&A score. There was no statistically significant difference in mean K&A scores by gender (males vs females, mean difference=-1.6, P=0.06, 95%CI: -3.35, 0.12) or nationality (non-Qatari vs Qatari, mean difference=5.04, P=0.05, 95%CI: -0.14, 10.22). K&A scores increased with

higher levels of education, but these differences were not statistically significant (F=2.08, P=0.13). There were no statistically significant differences in the mean K&A scores of participants based on marital status (F=0.35, P=0.78), the workplace facility (F=0.82, P=0.55), current job designation (F=0.88, P=0.51) or hours of pain education (F=1.01, P=0.40). There were weak but not statistically significant inverse correlations between K&A scores and years of experience (r=-0.03, P=0.79) and age (r=-0.01, P=0.88).

Conclusion: There is a significant deficit in post-operative nurses' knowledge and attitudes about pain in Hamad Medical Corporation. Appropriate pain assessment is vital to achieving adequate pain management. Pragmatic research and evidence-based nursing educational courses focused on pain assessment and management are required to enhance nurses' knowledge and attitudes and improve patients' care.

DEDICATION

All praise to Allah, all the mighty, the Lord of this World.

To my Mom, Dad, my husband, my loving kids, and all family and friends who supported me and prayed for me.

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ABBREVIATIONS

ACC	Ambulatory Care Center
AKH	Alkhor Hospital
AWH	Al Wakra Hospital
DON	Director of Nursing
HGH	Hamad General Hospital
HMGH	Hazem Mubiereek General Hospital
HMC	Hamad Medical Corporation
IRB	Institutional Review Board
KASRP	Knowledge and Attitude Survey Regarding Pain
K&A	Knowledge and Attitude
MRC	Medical Research Council
PI	Principal Investigator
TCH	The Cuban Hospital
WWRC	Women's Wellness Research Center

CHAPTER 1: INTRODUCTION

Pain has been described by clinicians, patients, and researchers alike as a complex and challenging phenomenon. People may have different experiences of pain, such as acute, chronic, or a combination of both (Eaton, Meins, Mitchell, Voss, & Doorenbos, 2015). Based on the 1964 definition by Harold Merskey (1968), the International Association for the Study of Pain (IASP) declared that pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Dames et al., 2016). Alternatively, pain can also be defined as the patient's reported experience (Dames et al., 2016). In this definition, pain is considered subjective, indicating that pain is ambiguous; each person feels it and reports it differently.

Despite the latest advances in medical and nursing care, some patients cannot accurately describe their pain (Aljumah et al., 2018). Taking care of a patient complaining of pain is a challenging task that requires up-to-date knowledge, skilled interventions, and an attitude that ensures trust, care, and a genuine belief in what the patient says and reports (Aljumah et al., 2018).

Worldwide, pain is considered a health problem. It has been estimated that one in five adults worldwide will suffer from acute pain each year and that further, one in 10 adults has chronic pain (Kahsay, 2017). However, It is unknown precisely what contributes to individual cases of acute pain (Treede, 2018).

Various short- and long-term consequences have been reported due to pain, including but not limited to depression, work loss, and impaired social relationships (Bartoszczyk & Gilbertson-White, 2015; Eaton et al., 2015). There are many ways to classify pain; however, pain is most commonly classified by its duration or physiology. In terms of duration, pain is classified as acute or chronic (Whitten & Cristobal, 2005).

Acute pain has a limited or short period, while chronic pain lasts longer than three months and is generally more challenging than acute pain in terms of treatment (Karriem-Norwood, 2012). Pain can be devastating and can affect and be affected by a person's state of mind (Whitten & Cristobal, 2005).

Recent onset and limited pain duration are usually evident in the post-operative phase (Mahama & Ninnoni, 2019). Fifty percent of post-operative patients expect to complain of pain within 24 hours after surgery if not assessed and managed well; usually, this pain decreases gradually after a few days (Bartoszczyk & Gilbertson-White, 2015; Eaton et al., 2015). As a result of procedures, surgical interventions, or diseases, 50% to 80% of patients report pain during hospitalization (Goldberg & Morrison, 2007; Gregory & McGowan, 2016). Accurate assessment of pain is considered the foundation for effective pain management.

Negative attitudes and lack of knowledge about pain management are the major impediments to implementing prompt and effective pain management among nurses (Zhang et al., 2008). Nurses' attitudes strongly influence pain assessment, patients' personal beliefs, and behaviors that impact nurses' pain assessment (Bucknall, Manias, & Botti, 2007). Knowledge and attitudes (K&A) about pain assessment and management are lacking (Samarkandi, 2018). One study indicated that more than 57% of the nurses have significantly insufficient knowledge regarding the use of pain tools (Mahama & Ninnoni, 2019).

The relationship between pain education for nurses and improved pain assessment and knowledge is controversial; some studies show a positive association while others show no clear relationship (Ying Ge et al., 2013). Although nurse's knowledge about pain is known to be inadequate, studies that identify whether improving knowledge and attitude about pain can influence results are lacking

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(Samarkandi, 2018). Millions of people worldwide suffer from acute and chronic pain at some point in their lives, and it is a leading cause of disability in both developed and developing countries (Rice, Smith, & Blyth, 2016). Pain management is expensive not only for the patients and their families but also for the healthcare system and government officials (Rice et al., 2016). To the author's knowledge, nurses' knowledge and attitudes towards pain have not been studied in Qatar.

This study investigated the current K&A among post-operative nurses related to pain assessment and management. Study findings and recommendations will provide vital information for educators, employers, policymakers, and researchers to ensure that the best recommended practices about K&A of nurses about pain are adopted. The study will equip healthcare policy makers and nursing leadership with the latest insights on current levels of K&A to develop appropriate educational programs that bridge this gap, enhance nursing knowledge, provide safe training, and promote critical thinking, decision-making. Moreover, findings will ensure that culturally competent pain assessment and management is provided. Investing in nurses' knowledge and attitudes about pain assessment and management will enhance patient care, wellbeing and quality of life. This will lead to improvements in the health care system, which could be seen through decreased lengths of hospitalization, more efficient use of resources and lessening the financial burden of the ineffective pain management consequences on the patients, their families and the health care system. Moreover, pain may interfere with activity of daily living which could lead to an increased risk of mortality. (Hirsh, Jensen, & Robinson, 2010; Rice et al., 2016).

This thesis reviewed the literature related to nurses' knowledge and attitudes about pain assessment and management and highlighted the literature gaps. The aims, objectives, and research questions of the study are presented, followed by the research

design used to answer the research questions. The results and the significance and implications of the study findings are also reported, followed by the study's recommendations and conclusions.

1.1 Definition of Terms

The below terms are defined for this study:

• Pain: "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage" (Rosen & Gallagher, 2011).

• Chronic pain: "Pain has a distinct pathology, causing changes throughout the nervous system that often worsen over time. It has psychological and cognitive correlates and can constitute a serious, separate disease entity" (Heaney & Holick, 2011).

Conceptual Definitions:

Attitude: "This is relatively an enduring organization of beliefs around an object or situation predisposing one to respond in some preferential manner" (Oishi, Schimmack, Diener, & Suh, 1998).

Knowledge: "Belief that meets two conditions: (a) the truth of what is believed and (b) the justification someone has for believing it (Oishi et al., 1998). Hypothetically, knowledge and attitude regarding pain must impact the management of pain behaviors (Oishi et al., 1998).

• Nursing knowledge: "Knowledge is a complex, multifaceted concept. Knowledge is acquired in a variety of ways and is expected to be an accurate reflection of the real world" (Burns & Grove, 2010).

• Nursing attitude: "Nurses attitude can be viewed as either positive or negative. Positive attitude refers to those that enhance the quality and dignity of the nurse and the profession, while negative attitudes denigrate and belittle them both" (Tennyson et al., 2017).

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter introduces the research issue and then reviews the literature related to nurses' knowledge and attitudes about post-operative pain assessment and management. It concludes by highlighting the gaps identified in the literature.

2.1 Search strategy

The literature review was compiled from a literature search in the databases MEDLINE, Elsevier, Google Scholar, ProQuest, and Cochrane Library utilizing the following keywords: pain management, post-operative, adults, knowledge, nurses, attitude, pain assessment, education programs.

2.2 Pain associated consequences

Pain is a major stressor faced by hospitalized patients (Kahsay, 2017). There is a developing recognition of the etiology of pain and the advancement in the pharmacological management of pain. However, despite this attention and pharmacological advancement, patients still experience intolerable pain, which hampers the physical, emotional, and religious dimensions of their health (Dames et al., 2016; Eaton et al., 2015).

Nurses play a critical role in assessing and managing postoperative pain, particularly in the first few days after surgery. A significant number of patients experience unfavorable postoperative pain. In a 2016 cross-sectional retrospective study of over 15000 United Kingdom surgery patients, 11% reported extreme pain and 37% complained of moderate pain in the first 24 hours post-operation (Walker, Bell, Cook, Grocott, & Moonesinghe, 2016).

Faisal et al. conducted a study looking at how nurses in a resource-strapped Ghanaian hospital assessed and treated post-operative pain. A semi-structured interview guide was used to collect data. Since there is no specific tool for measuring post-

operative pain, some nurses have never used any pain assessment tool. The majority of nurses said that using medicine to manage pain was common practice, particularly in the first 24 hours after surgery (Mahama & Ninnoni, 2019). Authors concluded that, while participants may have some knowledge of evaluating and treating post-operative pain, this knowledge was not effectively applied to the management of post-operative pain as a whole, owing to resource constraints. As such, proper training is required, along with the availability of services, and the use of standardized pain assessment scales is essential (Mahama & Ninnoni, 2019).

The assessment of the patient's discomfort is the first step in the recovery process. In the post-operative phase, numerical rating scores are simple to use and provide accurate and reliable data (Topham & Drew, 2017). However, Eriksson, Wikström, Restedt, Fridlund, & Broström (2014) found that a simple numerical rating is restrictive in reflecting the patients overall pain experience. The numerical rating scale only captures one aspect of the patient's overall pain experience, the severity level, which may lead to poor patient outcomes (Eriksson, Wikström, Årestedt, Fridlund, & Broström, 2014), as pain management entails more than just treating the tissue injury (Wikström, Eriksson, Årestedt, Fridlund, & Broström, 2014). This shows that pain treatment can be influenced by the multiple aspects of a patient's pain experience rather than just a single-dimensional pain rating. A proper pain assessment is a clinical interpersonal transaction between the patient and the nurse during which the nurse observes the patient's ability to move, breathe deeply, and cough (van Boekel et al., 2017).

Nurses have shown to be unaware to their behaviors toward pain control and therefore unable to add improvement for their patients. As a result, it is critical that nurses' behaviors be discussed (Hirsh et al., 2010). Despite increased understanding of

pain control and scientific advancements, evidence suggests that pain is undertreated in the post-operative environment, raising questions about nurses' awareness and attitudes toward pain and their ability to provide quality care to patients.

While most patients who undergo surgical procedures experience acute postoperative pain, evidence indicates that approximately only half of them receive sufficient pain relief. For minimizing and managing post-operative pain, a variety of preoperative, intraoperative, and post-operative therapies and treatment strategies are accessible. The American Pain Society commissioned an interdisciplinary advisory panel to create a clinical practice guideline to support evidence-based, efficient, and safer post-operative pain management in children and adults, with input from the American Society of Anesthesiologists. The American Society for Regional Anesthesia eventually accepted the guideline (Chou et al., 2016).

Patients express anxiety about post-operative pain. The intensity and duration of pain experienced increase the likelihood of patients developing chronic or persistent postsurgical pain (Kehlet, Jensen, & Woolf, 2006). Resulting in longer-term psychological, social, and economic adversity (Sinatra, 2010). On both humanitarian and efficiency grounds, prevention and relief of post-operative pain is essential (Hirsh et al., 2010).

2.3 Nurses' knowledge and attitudes about pain assessment and management

Nurses spend a significant amount of their tasks and time with patients. Therefore, they have an indispensable role in the management of patients' pain. The combination of nurses' negative attitudes and lack of knowledge about the pain experience have been demonstrated in the inadequate administration of patients' pain medications by nurses (Bartoszczyk & Gilbertson-White, 2015). Nurses must be well organized and knowledgeable about pain assessment and should not hold harmful opinions and beliefs about pain management (Alhage, 2018). The lack of K&A results

in an unacceptable delay in patient's pain intervention according to an ethnographic study done by Yassin et al. The study's key results showed that there is a socially orchestrated mechanism of pain management delays built into nurses' work (Yassin, Rankin, & Al-Tawafsheh, 2015).

Many studies have evaluated the association between pain-related knowledge and attitudes and pain assessment and management. A study published by Sherrill in 2013 assessed the level of knowledge and attitudes about pain in nurses and explored if there was a relationship between nurses' pain knowledge and attitudes and the potential predictor variables of years of experience, education level, and expertise level. The study used two instruments to assess nurses' knowledge and attitudes: The Pain Management Principles Assessment Tool (PMPAT) and the Nurses' Pain Management Attitude Survey. Results depicted a positive correlation between nurses' level of expertise and their positive attitudes about pain assessment and management. However, no correlation between any of the possible predictor variables and nurses' knowledge about pain assessment and management was found (Sherrill, 2013). Smeland et al. concluded that nurses possessed knowledge deficits about pediatric pain management and did not always utilize their knowledge in clinical practice, particularly in pain assessment (Smeland, Twycross, Lundeberg, & Rustøen, 2018).

In Florida, USA, McMillan et al. used an exploratory, descriptive study with 85 nurses from medical and surgical wards in two prominent veterans' hospitals to assess nurses' knowledge and attitudes about pain management. The sample was a convenience sample of self-selected nurses, and as such, the study may have suffered from response bias. However, the study results indicated that nurses lacked knowledge and had negative attitudes about pain management despite the availability of published pain guidelines. This then negatively affected their patients' pain management (McMillan,

Tittle, Hagan, Laughlin, & Tabler, 2000).

A cross-sectional study conducted in China described nurses' knowledge and attitudes and the self-reported quality of practice in pain assessment. The study aimed to explore associations between the available pain policies in their hospital and the continuing education. The study found that nurses who undertook continuous education had higher levels of knowledge and more positive attitudes regarding pain assessment. Despite this, the study demonstrated no improvement in the nurses' quality of practice. The authors concluded that improving pain knowledge is essential (Ying Ge et al., 2013).

A cross-sectional multicenter study conducted in Ethiopia about the knowledge and attitudes of Ethiopian nursing staff regarding post-operative pain management showed that 56.5% of respondents had adequate knowledge, and 8.9% of them had positive attitudes towards post-operative pain management. Higher level of education [AOR=8.2; CI= (2.51–26.83)], access to journals [AOR =1.83; CI= (1.01–3.30)], and taking post-operative pain management training [AOR=8.63; CI= (3.67–20.28)] were statistically associated with adequate knowledge (Dessie, Asichale, Belayneh, Enyew, & Hailekiros, 2019).

A similar study conducted in Nepal revealed that 85.1% of nurses had a low level of knowledge, 55.4% had a satisfactory level of attitude, and 52.7% had a low level of practice. A statistically significant association was found between the level of practice and age (P=0.010) of nurses, and professional qualification (P=0.002) (Thapa & Gurung, 2020).

In a descriptive cross-sectional study conducted in Ghana to determine nurses' knowledge and attitudes towards pain management among post-operative patients in surgical units, the findings revealed that most nurses (79.1%) had inadequate knowledge. Only 20.9% had adequate knowledge, and the average nurses' knowledge of post-

operative pain management was inadequate (Adams, Varaei, & Jalalinia, 2020).

Education plays a significant part in enhancing nurses' knowledge in pain management and assessment. Adams et al., 2020, suggested that inadequate knowledge might be because most participants in their study were diploma nurses. As a result, pain control was not covered in their training. Thus, the participants learn about pain control solely from their senior colleagues and physicians (Adams et al., 2020). In another study in Ghana, Menlah et al. found that nurses had good attitudes toward post-operative pain management. However, most nurses (97.6%) relied on routine basic nursing skills, with only a few resorting to pharmacological intervention. (Menlah et al., 2018).

A study with Bangladeshi nurses showed that what the nurses know about the pharmacological management of the pain patients was inadequate (Basak & Sathyanarayana, 2010). These results were in line with the study in Saudi Arabia by Issa et al. (2019), which indicated that Intensive Care Unit (ICU) nurses showed inadequate knowledge regarding opioid pain management. Moreover, Issa et al. revealed that patients' spiritual beliefs could affect the severity of pain (Issa, Rasmussen, Petersen, Schantz, & Brorson, 2019).

A cross-sectional study conducted in Riyadh included 274 nurses from Saudi Arabia who worked in different settings like oncology, medical and surgical wards, burn units, emergency room, operation theatres, and intensive care units. The study identified Saudi nurses' pain management knowledge and assessed nurses' strengths and weaknesses in managing pain. The study response rate was 82%, and 50% of the study nurses reported no pain education in the last five years. There was a significant difference in the results based on gender (t = 2.55, P = 0.011), with females having a higher mean score of pain K&A (18.7, SD 5.4) than males (15.8, SD 4.4). The study also found that Saudi nationals had lower levels of pain knowledge than expatriate nurses

and recommended adding pain management education to nursing curricula (Samarkandi, 2018).

A descriptive survey conducted in Jordan used the Knowledge and Attitude Survey Regarding Pain (KASRP) to measure 202 Jordanian nurses' knowledge and attitudes about pain management. The overall study findings aligned with previous studies and concluded that nurses have inadequate knowledge and negative pain attitudes. The authors concluded that focusing on the barriers is vital for effective pain management (D'emeh, Yacoub, Darawad, Al-Badawi, & Shahwan, 2016).

Al Qadire et al. also investigated nurses' knowledge and attitudes regarding pain in Jordan. The study recruited 211 nurses from 4 different hospitals in Jordan. The Knowledge and Attitudes Survey Regarding Pain (KASRP) was used to measure the nurses' pain management knowledge and attitudes (Al Qadire & Al Khalaileh, 2014b). In this study, male nurses made up 51.7% of participants, and the average age was 27.2 (SD 4.7) years. The majority of the nurses had a bachelor's degree (90.5%) and worked mainly in medical and surgical wards. Nurses who attained higher educational levels had statistically significantly higher K&A scores than nurses with lower education levels ($t = -3.64$; $df = 195$; $p < .001$). More than half (52%) of the nurses reported they had not received pain education in the previous five years, but there was no statistically significant association between this and nurses' knowledge and attitudes score. Despite this null finding, the study's recommendations were for more continuous education on pain (Al Qadire & Al Khalaileh, 2014b).

2.7 Factors affecting nurses' knowledge and attitudes

A descriptive study investigating and comparing the knowledge and attitudes of senior nursing students and practicing registered nurses regarding pain management was conducted in two universities and two educational hospitals in the Midwest, USA. The study recruited registered nurses ($n = 121$) and senior nursing students ($n = 100$) utilizing

a convenience sample method. The scores indicated poor performance by both groups, with neither group reaching the predetermined passing score of 80%. The practicing nurses' score was 74.0% compared to the student nurses' mean score of 69.5%. The student nurses' scores did not significantly differ from those of the practicing nurses through attitude measurement tools. Results showed no association between the K&A of the practicing nurses regarding pain management and the level of education or the age of the participants. The study also revealed a weak positive association between years of experience and knowledge regarding pain management, but no relationship with attitudes was shown. The study findings also indicated that the nursing profession has the responsibility to fulfil its promise to societies to deliver safe, competent, and compassionate care to communities. The authors argue that there should be strategies and well-studied methods for improving the quality of pain management, and also emphasize that affective and cognitive education are essential components to (Messmer, 2009).

Multiple studies have found that higher education levels have associated with better knowledge and attitudes to pain (Gretarsdottir, Zoëga, Tomasson, Sveinsdottir, & Gunnarsdottir, 2017; Keen et al., 2017; Lewthwaite et al., 2011; Yava et al., 2013). Moceri and Drevdahl concluded that there was a weak positive association between higher education levels and the K&A score levels (Moceri & Drevdahl, 2014). However, Latina et. al. reported no statistical association between level of education and nurses' knowledge and attitudes to pain (Latina et al., 2015).

Pain education has been proposed as a logical determinant of nurses' knowledge and attitudes about pain (Gretarsdottir et al., 2017; Keen et al., 2017; Lewthwaite et al., 2011; Yava et al., 2013). An educational program for nurses, with an interdisciplinary approach, used simulated realistic situations to engage participants to improve nurses'

knowledge and attitudes has been used (Keen et al., 2017). Nurses' knowledge and attitudes are most effective immediately after an education session (McNamara, Harmon, & Saunders, 2012). In a study by Lewis et al., (2015) small group discussions significantly increased nurses mean knowledge scores. These results are promising, however not all studies have demonstrated improvement in nurses' knowledge and attitudes towards pain.

A recent study by Salim et al. (2019) assessed the effect of delivering a nursing-specific educational program regarding pain management in a governmental hospital in Dubai, United Arab Emirates. The experimental study used a random assignment design with a pre-test/post-test and was conducted over a two-month period between February and April 2019. Two hundred participants were randomly selected from different hospital units. The experimental group had a pain education program for 5 hours, while the control group did not receive any special education on pain management. The KASRP was used to assess changes in nurses' knowledge and attitudes. Results showed that the mean K&A score increased after the pain education program from 61.36 (SD 11.60) to 69.94 (SD 7.74), while in the control group, the mean K&A score slightly decreased in the post-test (mean $\pm$ SD, 60.99 $\pm$ 11.53%) comparing to the pre-test (mean $\pm$ SD, 61.00 $\pm$ 11.60%), though this small mean decrease of 0.01 was not statistically significant (t(99)=1.41, P>0.05). The study concluded that nurses who received the education program improved their level of K&A compared to the control group who did not receive any educational programs (Salim, Joshua, AbuBaker, Chehab, & Jose, 2019).

2.8 Barriers to effective pain management

Numerous studies have described the barriers that may affect the delivery of effective pain management. Limited knowledge in nurses about pain management has been reported as a significant obstacle in implementing effective pain management. Additionally, nurses may have negative perceptions, attitudes, and misconceptions about

pain management. Major misconceptions include the belief that patients tend to seek attention rather than reporting real pain, the administration of opioids results in quick addiction, and that vital signs are the only way to reflect the presence of pain. Several interventions have been attempted to address these provider-related barriers. Significant improvement in healthcare team attitudes and practice regarding pain management was evident following addressing these barriers (Samarkandi, 2018).

According to a literature review by Wooldridge & Branney, inconsistency between nurses' and patients' assessments of post-operative pain is still an issue worldwide (Wooldridge & Branney, 2020). One study assessed Sri Lankan nurses' attitudes, beliefs, and knowledge about cancer pain management and showed that poor behavior toward pain management was mainly related to lack of knowledge and deficiency in authority (De Silva & Rolls, 2011). Bernhofer et al. also attempted to establish if nurses' values affected their pain management decisions. They also examined nurses' experiences who participated in educational activities, including values and decision-making in pain management (Bernhofer, Hosler, & Karius, 2016). Using qualitative analysis, nurses stated that they were aware of the need for pain management education; more importantly, nurses mentioned that there is an urgency to understand both patients and themselves better to allow them to provide the best pain management (Bernhofer et al., 2016).

Consistent findings across different health care professionals, ranging from students, nurses, and educators, demonstrated a widespread deficit in knowledge and attitudes, in particular to knowledge related to pain medications and pharmacology. The reason behind this deficit is unknown. However, as postulated by Hunink et al. (2003), nurses' attitudes will overlap with their knowledge, and eventually, their attitude will influence the way they use their knowledge, hence, affect the way they deal with their

patients when they complain of pain (Brant, Mohr, Coombs, Finn, & Wilmarth, 2017; Kiekkas et al., 2015; Moceri & Drevdahl, 2014; Vickers, Wright, & Staines, 2014). A widespread deficit in knowledge and attitudes is perhaps due to the nurses' personal attitudes rather than their professional attitudes (Brant et al., 2017; Kiekkas et al., 2015; Moceri & Drevdahl, 2014; Vickers et al., 2014).

Additionally, Carr et al., 2014 concluded that student nurses' attitudes to pain are informed by their value system, which eventually gets developed over time as part of their personal development. Their K&A originated from their cultural practices, social networks, age, gender, religion, and personal experiences, and later this will be transferred into their nursing practice (Carr et al., 2014). On the other hand, as stated by DiCuccio, 2015, attitudes can be learned by being a preceptee so that the preceptee will learn from the preceptors and peers and imitate what they do. However, this can positively and negatively affect the nursing care provided, depending on the attitudes that are being imitated. Moreover, this attitude will directly impact the nurses' management of patients' pain (DiCuccio, 2015).

Other influences on nurses' attitudes were examined by Tanner (2006) in conducting a review of nearly 200 studies. The study discovered that nurses' clinical judgments were influenced by their own culture and the nursing unit's culture (Tanner, 2006). Ho and Johnson demonstrated that cultural differences influence people's perception of pain (Ho & Johnson, 2013). Nurses' pain assessment can also be influenced by the nurses' own cultural beliefs and attitudes about the meaning of pain and the characteristics of the patients (Tait & Chibnall, 2014). This can affect how the nurse perceives and responds to the patients' expressions of pain (Bernhofer et al., 2016) and can ultimately influence the patients' pain management. Nurses, therefore, may project their own attitudes about pain onto patients (Tait & Chibnall, 2014).

Nurse's personal opinions about patients may influence their decisions about pain treatment (C. P. Lewis et al., 2015; McCaffery, Ferrell, & Pasero, 2000; McCaffery, Pasero, & Ferrell, 2007; Schreiber et al., 2014; Vickers et al., 2014). Furthermore, several studies have illustrated that nurses did not administer adequate doses of opioids to the patient experiencing pain (Moceri & Drevdahl, 2014; Morley, Briggs, & Chumbley, 2015; Vickers et al., 2014) and the consequence of this was the patients' pain being undertreated.

The cultural traditions of patients may also affect the nurses' responses to pain assessment and management. For example, part of Chinese cultural practices towards pain is not to show that they have pain; they would encourage their youth to endure pain which may enhance a reluctance to report pain or seek medical attention. Hence, compromised care will be delivered (G. N. Lewis & Upsdell, 2018). Cultural variations exacerbate the inherent difficulties in communication in pain response. Although almost everyone experiences pain in the same way, studies show significant variations in how people convey their pain and expect others to respond to their discomfort. There are also cultural differences in attitudes toward pain medication use. It is essential to recognize the effects of culture on the pain experience to provide efficient and culturally responsive medical care (Fortier, Anderson, & Kain, 2009).

To date, numerous studies addressing nurses' knowledge and attitudes to pain have continued to demonstrate that nurses are more likely to respond to patients who show overt, non-verbal expressions of pain, compared with the more stoic patient (Brant et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014; Zhang et al., 2008). This influences the nurses' professional responses and decisions regarding the patient's pain. This will then further impact nurses' concerns regarding using opioids for pain management (Brant et al., 2017).

Practice and attitude exist in a state of incongruity; studies suggest that nurses may have positive attitudes about pain management but are not equipped with adequate knowledge to manage pain correctly. Furthermore, nurses who have low salaries and have role confusion in pain management usually have insufficient knowledge of pain management (Samarkandi, 2018). A socially organized system of delays built into nurses' work to manage pain was the main findings in a study done in Qatar (Yassin et al., 2015). Nurses are subject to time-consuming processes of securing, handling, and administering opioids, such as a complicated dispensing and medication administration process (Yassin et al., 2015).

2.9 Conclusion

This chapter reviewed the literature related to nurses' knowledge and attitude about pain assessment and management. Studies conducted in Western countries and the Arabian Gulf region have identified gaps in nurses' knowledge and attitudes about pain assessment and management. Researchers have used various research methods and tools to determine nurses' knowledge and attitudes to pain. Nurses' knowledge is based on education, and personal and professional experiences. Nurses' attitudes are shaped by the nurses' value system, cultural beliefs, social groups, religion, lived experiences, age, and gender. Professional attitudes can be learned from the clinical environment, imitating other nurses, preceptorship, mentorship, and nurses imitating their peers. In order to ensure patient care and wellbeing, including in the post-operative setting, it is vital to understand nurses' level of knowledge and attitudes towards pain. To date, there are no studies of nurses' knowledge and attitudes in the post-operative setting in Qatar. This study addressed that gap in the literature. The next chapter outlines the research aim, objective, questions, and hypothesis.

CHAPTER 3: RESEARCH AIM, OBJECTIVES, QUESTIONS AND HYPOTHESES

3.0 Introduction

This chapter presents the aim, objectives, research questions, and hypotheses for the study.

3.1 Aim

This study aimed to assess the knowledge and attitudes of nurses in Qatar about adult post-operative patients' pain assessment and management and the factors that may be associated with such knowledge and attitudes.

3.2 Objectives

The research study's first objective was to determine the level of nurses' knowledge and attitudes about adult post-operative patients' pain assessment and management.

The second objective of the study was to determine the association between nurses' knowledge and attitudes about adult post-operative patients' pain assessment and management and sociodemographic factors.

The third objective of the study was to determine the association between previous attendance at pain education programs and the level of knowledge and attitudes about adult post-operative patients' pain assessment and management.

3.3 Research questions

Q1: What is the level of knowledge and attitudes about adult post-operative pain assessment and management of nurses in Hamad Medical Corporation hospitals in Qatar?

Q2: What are the associations between nurses' sociodemographic factors and the level of knowledge and attitudes about adult post-operative pain assessment and management of nurses in Hamad Medical Corporation hospitals in Qatar?

Q3: What are the associations between nurses' previous attendance at pain education programs and nurses' level of knowledge and attitudes in Hamad Medical Corporation hospitals in Qatar?

3.3 Research hypotheses

There is no research hypothesis for research question 1. For research questions 2 and 3, the null and alternative hypotheses are as follows.

Q2: Null Hypothesis

H0: There are no associations between the nurses' sociodemographic factors and their knowledge and attitudes about adult post-operative pain assessment and management.

Q2: Non-directional Alternative Hypothesis

H1: There are associations between the nurses' sociodemographic factors and their knowledge and attitudes about adult post-operative pain assessment and management.

Q3: Null Hypothesis

H0: There is no association between the nurses' previous attendance at pain education programs and their knowledge and attitudes about adult post-operative pain assessment and management.

Q3: Non-directional Alternative Hypothesis

H1: There is an association between the nurses' previous attendance at pain education programs and their knowledge and attitudes about adult post-operative pain assessment and management.

3.4 Conclusion

This chapter presented the aim, objectives, research questions, and hypotheses for the study. The following chapter will describe the methods employed to address these.

CHAPTER 4: METHODS

4.0 Introduction

The previous chapter identified the aim, objectives, research questions, and hypotheses for the study. This chapter describes the methods used in this study, starting with the study design, then the study participants, followed by the data collection and data analysis methods. The data storage strategy and ethical considerations are also described.

4.1 Study design

The study used a quantitative cross-sectional online survey design using a self-administered questionnaire.

4.2 Study population

Study participants were registered nurses working in Hamad Medical Corporation (HMC) hospitals caring for adult patients in post-operative care areas. The inclusion criterion was nurses currently providing bedside care in HMC adult post-operative areas. The exclusion criteria were nurses in adult post-operative areas not providing direct patient care and administrative staff in the post-operative areas not providing care to patients.

4.3 Sampling and sample size determination

The sample was a census or universal sample. All eligible nurses providing bedside care in adult post-operative areas in HMC were included in the study. In Qatar, HMC is a group of governmental health care facilities under one umbrella that provides all levels of care to the Qatar population. It is considered one of the Middle East's leading healthcare providers organizations. The total number of nurses providing adult post-operative care was estimated to be 150 registered nurses from different countries and cultures and are equipped with different levels of education. The study recruited 151 nurses, which yielded an excellent response rate.

4.4 Data collection method

After approval from the HMC Medical Research Council (MRC) ethics review board, the PI collected the email addresses of all eligible nurses from the perioperative network listserv. This list includes nurses employed at the seven HMC hospitals that provide post-operative care for patients. The PI sent an email to all potential participants that provided information regarding the study and a hyperlink to the online questionnaire, which was open from November to December 2020.

Potential participants in the study were screened based on a question at the start of the online questionnaire related to the inclusion and exclusion criteria. Nurses not meeting the inclusion criterion were thanked for their interest and asked to exit the survey. Only participants meeting the eligibility criteria were asked to proceed.

On the first page of the online questionnaire, participants were asked to check a box indicating that they had read the study's information, understood its purpose, and consented to enroll in the study. Participants were assured about the confidentiality and anonymity of their participation and that their participation was completely voluntary. Respondents were asked to complete the questionnaire once only. The estimated time of the survey completion was about 15 minutes. The researcher left her information clearly stated in the email for any concerns or further clarification from the participants. After sending the email with the survey link, participants had an active survey link for one month. The PI sent reminders to the nurses in the 2nd and 3rd weeks after the original email invitation as a gentle reminder to complete the questionnaire.

4.5 Data collection instrument

The Knowledge and Attitudes Survey Regarding Pain tool (KASRP) (Ferrell & McCaffery, 2008) was used to collect data on the knowledge and attitudes of participants regarding pain assessment and management (Appendix A).

The study population (nurses in post-operative areas) was defined as accessible

in terms of their language, literacy, and availability in HMC, and as such, the English language KASRP tool was considered appropriate without the need for translation.

4.6 Quality assessment

The KASRP is a validated instrument developed in 1987 to assess knowledge and attitudes at several levels of expertise. This tool is the most frequently used tool that measures nurses' knowledge, attitudes, and practices regarding pain assessment and management. Since its development, the KASRP has been used extensively in research, and as such, its use in this study enables comparison of results with other studies. It is a self-administered questionnaire with 41 items that include 22 true/false statements, 15 questions as multiple choice and two scenarios about patient care; each of them asks two questions about pain assessment and appropriate pain treatment that are scored as correct or not. The instrument deliberately avoids differentiation between the knowledge questions from the attitudes questions because the instrument's novelists argued that many items measure both. For example, one item focusing on the occurrence of addiction is measuring the two domains of K&A about addiction at the same time. Therefore, the authors recommend calculating a single overall score from the instrument. Any correctly answered questions are given a score of 1, and incorrect or unanswered items are given a score of 0. The total score, known as the K&A score, ranges between 0 and 41, with higher scores indicating a higher number of correct responses. For ease of interpretation and comparison, the score is converted to a percentage, and 70% is regarded as the minimum satisfactory score (Oishi et al., 1998). In addition to the K&A score, the authors recommend analyzing the responses to each item individually and exploring items with the lowest and highest proportion of correct responses (Ferrell & McCaffery, 2008).

Instrument authors allowed its use for research without the requirement for permission. It was administered in English, as English is the official communication

language in HMC. Before using the tool, the questionnaire was tested on 10% of the sample to ensure the question's clarity with the study population. If any items were unclear, the tool was planned to be modified accordingly, and the tested responses were included in the study as no changes took place (Salim et al., 2019).

The KASRP tool had been used in many studies in Western and Arabic countries. It measured some elements that were used to assess the K&A of the post-operative nurses in HMC. According to Ferrell and McCaffery (2008), this tool can be used to assess nurses' knowledge and attitudes regarding pain at different levels of expertise from diploma to Ph.D. Since 1987, the tool has been continuously revised to reflect changes in the practice of pain management. This study used the latest version that was published in 2014. The reliability of the KASRP was established (r>.80) by repeat testing in a continuing education class of staff nurses (N = 60) (Ferrell & McCaffery, 2008). Internal consistency was established (alpha r > .70) with items reflecting both knowledge and attitude domains (Ferrell & McCaffery, 2008). A review of the tool by pain experts had also confirmed the content validity. The tool content is derived from up-to-date standards of pain management such as the American Pain Society, the World Health Organization, and the National Comprehensive Cancer Network Pain Guidelines (Ferrell & McCaffery, 2008). Construct validity has been established by comparing scores of nurses at various levels of expertise such as new graduates, oncology nurses, students, junior and senior pain experts. The KASRP is freely available online (http://prc.coh.org) (Alnazly & Abojedi, 2018).

4.7 Data entry and storage

Data were coded automatically in the online survey platform. When the data collection phase was completed, the data were exported as a Microsoft Excel file and then imported into Stata15 for analysis. Responses were checked for missing data. Downloaded data were stored in a file that is password protected on a password-

protected computer for the PI. Data will be kept for at least five years.

4.8 Data analysis

Descriptive statistics were used to describe the characteristics of the participants, including frequencies and percentages for the categorical variables and means, ranges, and standard deviations for the continuous variables.

Research Question 1: Descriptive statistics were used to summarize the current level of knowledge and attitudes of nurses, including the percentages of correct responses for each item in the KASRP, the mean, SD, and percentage of the overall K&A score.

Research Questions 2 and 3: Two-sample t-tests and One-way Analysis of Variance (ANOVA) were employed to determine if there were any significant associations between the K&A score and the sociodemographic variables and the number of hours spent in pain education.

Covariates of interest (P <0.05) were considered statistically significant. Multivariable regression method was used to adjust for multiple potential confounders such as continuous variables (age, years of experience) and categorical variables (highest education level, gender, number of hours spent in pain education, and nationalities). There was no significant change of coefficients (β) of more than 10-20% with the univariate coefficients and the adjusted coefficient models.

4.9 Ethical approval

The study was conducted in full conformance with principles of the Declaration of Helsinki, Good Clinical Practice (GCP), and within the Ministry of Public Health laws and regulations in Qatar. The investigator obtained approval for conducting the study from Hamad Medical Corporation Medical Review Committee (Approval number MRC-01-20-796-DSA, Appendix C) and Qatar University Institutional Review Board (QU-IRB) (Approval number QU-IRB 1451-EA/21, Appendix C).

No foreseeable risks were imposed on participants, it was entirely voluntary, and participants were able to withdraw from the study at any time. Any refusal to enroll did not involve any harmful consequences or losses. An adequate provision in protecting the privacy of participants and confidentiality of the data has been undertaken.

4.10 Conclusion

This chapter described the study design, study participants, data collection and data analysis methods, data storage strategy, and ethical considerations. The next chapter describes the study results.

CHAPTER 5: RESULTS

5.1 Demographic characteristics of participants

This chapter presents a description of the study participants and the participants'
responses to the K&A questions. This is followed by the results of inferential statistical
analysis investigating the association between K&A scores and other variables.

A total of 151 post-operative nurses responded to the questionnaire, with females
making up 70% of the respondents. The majority of the respondents were married (71%)
and non-Qatari (97%), of which 42.18% were Filipino, and 28.57% were Indian. The
mean age was 37 years (SD 7.8), and the mean years of experience as a nurse was 13.5
years (SD 7.1). Most of the respondents had a bachelor's degree (77%) and had received
one to two hours (37%) or three to five hours (27%) of pain education in the last two
years. Over half the respondents worked at Hazem Mubiereek General Hospital
(HMGH) (27%) or Hamad General Hospital (HGH) (26%), and most respondents were
staff nurses (76%). Regarding the number of hours received in pain education in the last
two years, 5.3% did not receive any, 37.1% received one to two hours, 26.5% received
three to five hours, 14.6% received six to eight hours, and 16.6% received nine hours or
more (Table 1).

Table 1. Characteristics of the Study Participants

Characteristics		Total N=151 (%)
Gender	Female	105 (69.5%)
	Male	46 (30.5%)
Age in years mean (SD)		37.0 (7.8)
Education (highest level achieved)	Bachelor	116 (76.8%)
	Diploma	19 (12.6%)
	Master	16 (10.6%)
Years of experience mean (SD)		13.5 (7.1)
Marital status	Divorced	3 (2. 0%)
	Married	106 (70.7%)
	Single	40 (26.7%)
	Widow	1 (0.7%)

Characteristics		Total N=151 (%)
Nationality	Non-Qatari	147 (97.4%)
	Indian	42 (28.57%)
	Filipino	62 (42.18%)
	Others	43 (26.65%)
	Qatari	4 (2.6%)
Number of hours of pain education in the last 2 years	0 hours	8 (5.3%)
	1-2 hours	56 (37.1%)
	3-5 hours	40 (26.5%)
	6-8 hours	22 (14.6%)
	9 hours or more	25 (16.6%)
Facility	ACC	22 (14.6%)
	AKH	5 (3.3%)
	AWH	14 (9.3%)
	HGH	39 (25.8%)
	HMGH	41 (27.2%)
	TCH	6 (4.0%)
	WWRC	24 (15.9%)
Job designation	Acting Charge Nurse	1 (0.7%)
	Charge Nurse	15 (9.9%)
	Director of Nursing	1 (0.7%)
	Head Nurse	11 (7.3%)
	Nurse Educator	5 (3.3%)
	Patient Care Assistant	3 (2%)
	Staff Nurse	115 (76.2%)

The distribution of the K&A score was tested for assumptions of normality and found to be slightly negatively skewed (Mean=19.6, Median=20, Kurtosis=2.88, Skewness= -.14) (Figure 1). Normality assumption was then examined using the Shapiro-Wilk test, with the result showing that the data were considered to be normally distributed (P=0.95). As such, no transformation of data took place and original data were used for analysis.
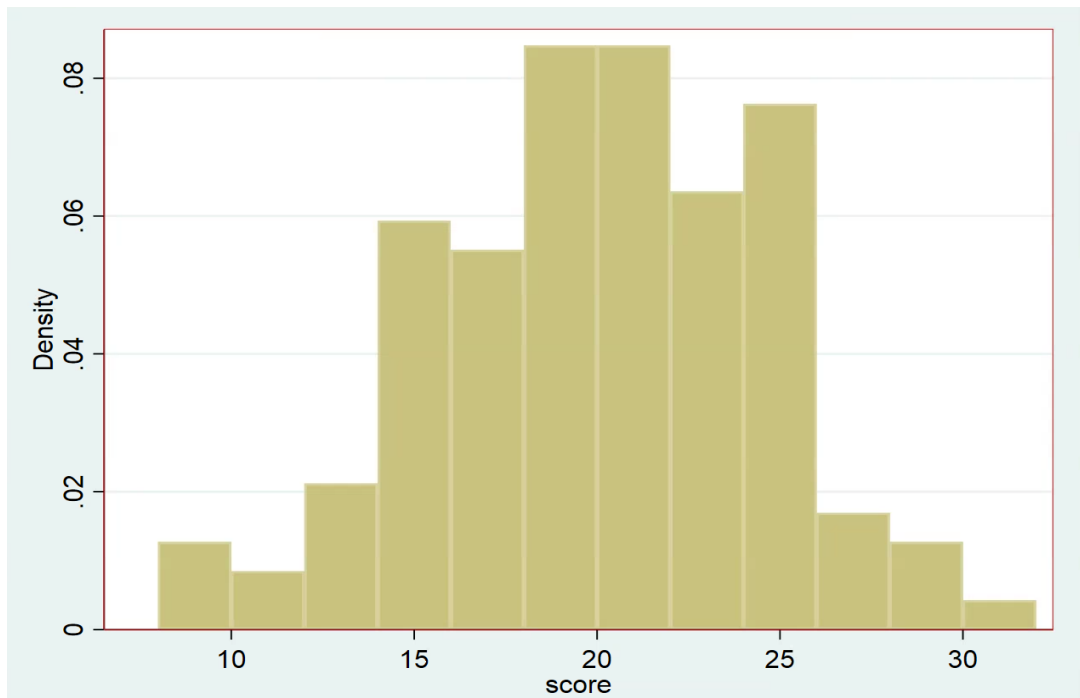
Figure. 1 Normality assumption of the dependent variable K&A score

Some questionnaires had incomplete responses. The first part of the questionnaire was the sociodemographic items, which were almost complete. However, many questions in the second part had incomplete responses (Table 2). Upon analysis of missingness, more than 22% of the individual responses were found to be missing. Therefore, sensitivity analysis for the missingness was undertaken and compared against the complete case analysis. Missingness in the second part was mainly observed in the opinion questions.

Table 2. Percentage of Missing Responses for Each Variable

Variable	Missing	Total	Percent Missing
Gender	0	151	0.00
Age in Years	2	151	1.32
Highest level of Education	0	151	0.00
Years of Experience	0	151	0.00
Marital Status	1	151	0.66
Nationality	0	151	0.00

Variable	Missing	Total	Percent Missing
Hour in Pain Education	0	151	0.00
Facility	0	151	0.00
Designation	0	151	0.00
1. **Vital signs are always reliable indicators of the intensity of a patient's pain.**	33	151	21.85
2. **Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences**	33	151	21.85
3. **Patients who can be distracted from pain usually do not have severe pain.**	33	151	21.85
4. **Patients may sleep in spite of severe pain.**	33	151	21.85
5. **Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.**	33	151	21.85
6. **Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.**	33	151	21.85
7. **Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.**	33	151	21.85
8. **The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.**	33	151	21.85
9. **Opioids should not be used in patients with a history of substance abuse.**	33	151	21.85
10. **Elderly patients cannot tolerate opioids for pain relief.**	33	151	21.85
11. **Patients should be encouraged to endure as much pain as possible before using an opioid.**	33	151	21.85
12. **Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.**	33	151	21.85
13. **Patients' spiritual beliefs may lead them to think pain and suffering are necessary.**	33	151	21.85
14. **After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.**	33	151	21.85
15. **Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.**	33	151	21.85
16. **Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.**	33	151	21.85
17. **If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.**	33	151	21.85
18. **Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.**	33	151	21.85
19. **Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.**	33	151	21.85
20. **Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.**	33	151	21.85

Variable	Missing	Total	Percent Missing
21. The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide the same amount of pain relief.	33	151	21.85
22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.	33	151	21.85
23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is:	48	151	31.79
24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or post-operative pain is:	48	151	31.79
25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?	48	151	31.79
26. A 30 mg dose of oral morphine is approximately equivalent to:	48	151	31.79
27. Analgesics for post-operative pain should initially be given:	48	151	31.79
28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is:	48	151	31.79
29. The most likely reason a patient with pain would request increased doses of pain medication is:	48	151	31.79
30. Which of the following is useful for treatment of cancer pain?	48	151	31.79
31. The most accurate judge of the intensity of the patient's pain is:	48	151	31.79
32. Which of the following describes the best approach for cultural considerations in caring for patients in pain?	48	151	31.79
33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem?	48	151	31.79
34. The time to peak effect for morphine given IV is:	48	151	31.79
35. The time to peak effect for morphine given orally is:	48	151	31.79
36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following	48	151	31.79
37. Which statement is true regarding opioid induced respiratory depression?	48	151	31.79
38. A. On the patient's record you must mark his pain on the scale below. Select the number that represents your assessment of Andrew's pain.	52	151	34.44
38 B. Your assessment above was made two hours after Andrew received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you take at this time?	52	151	34.44
39. A On the patient's record you must mark his pain on the scale below. Select the number that represents your assessment of Robert's pain:	52	151	34.44
Variable	Missing	Total	Percent Missing

| 39. | B Your assessment above is made two hours after Robert received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you take at this time | 52 | 151 | 34.44 |

5.2 Nurses' knowledge and attitudes regarding pain management

Research question 1 for this study asked, what is the level of knowledge and attitudes about adult post-operative pain assessment and management of nurses in Hamad Medical Corporation hospitals in Qatar? The percentages of respondents who correctly answered each item in the KASRP are shown in Table 3. The total score (total number of correct answers) and percentage for each of the participants were computed. The mean K&A score was 19.6 (SD 4.5) out of 41 (48%) with a range of 8 to 32 (19.5% to 78.0%). Using the 70% pass mark used in other studies (Abdalrahim et al. 2011; McCaffery & Robison 2002), 48.3% of participants achieved the passing score.

The items with the highest percentages of participants with correct answers related to the definition of narcotic/opioid addiction (item 20, 93.2%), the adjustment of opioid dose following the individual patient's response and sedation assessment during opioids administration (items 14 and 22, 92.4%), and identification of pain management as 'equianalgesia' (item 21, 90.7%).

Overall, the study found a low level of knowledge about pharmacological interventions, particularly regarding the appropriate opioid selection, dosing, and converting between different types of opioids and the assessment/ reassessment of pain after opioid administration. There was a discrepancy in the responses to related items about opioids, with 60.2% correctly identifying that patients should not be encouraged to endure pain before using an opioid. In contrast, only 22.9% correctly identified if the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to diagnose the cause of pain correctly.

The most likely reason a patient may require pain medication was correctly identified by only 17.5% of participants. Although 76.7% of nurses correctly identified that the patient is the most reliable source for determining pain, 55.9% of nurses would encourage their patients to tolerate the pain before giving them any pain medications. Most nurses (82%) failed to acknowledge the pain score that the nurse should document if the patient's vital signs are stable, and their facial expressions are relaxed (item 39.A). In terms of the nurse's knowledge about the equianalgesia, most nurses, 90.7%, were aware of it; however, only 41.7% correctly identified the conversion of oral morphine doses (item 26). Less than half (46.6%) were able to identify the use of sterile water (placebo injection) as a helpful way to determine if the patient's pain is real.

The items with the highest proportion of participants with incorrect answers were those related to assessing and reassessing pain after receiving opioids analgesia and taking the appropriate decision on the opioid's doses, with 93% of participants answering these questions incorrectly. These items explored nurses' knowledge and decisions about pain assessment and reassessment. Specifically, these items described the inconsistency between self-reported pain ratings and nonverbal cues given by patients. Examples of scenarios can be found in items 38A and 39A. In the 38A scenario, the nurse enters the room and noted that the patient smiles at the nurse and continuously talking and joking with his visitor. In 39A, the nurse noted that the patient is lying quietly in bed and demonstrated grimaces as he turns. In both scenarios, the patient self-reported their pain as a rating of 8 on a scale from 0 to 10, with 0 representing no pain and 10 the worst imaginable pain/or discomfort. The nurse was then asked to assess the patient's pain level. In both scenarios, the correct answer is 8 because this is what the patient has self-reported. However, in both scenarios, the overwhelming majority of nurses ignored the patient's self-reported score and assigned a score based on their interpretation of the

patient's behavior.

Other topics with very high rates of incorrect answers included the recommended route of opioids administration for brief but severe post-operative pain, the identification of side effects of opioids, and the identification of signs and symptoms of addiction, tolerance, and physical dependency.

Table 3. Percentage of Correct and Incorrect Responses for Items of the Knowledge and Attitudes Survey Regarding Pain Among Nurses

Questions	Correct Responses N (%)	Incorrect Responses N (%)
1. **Vital signs are always reliable indicators of the intensity of a patient's pain.**	48 (40.7%)	70 (59.3%)
2. **Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.**	60 (50.8%)	58 (49.2%)
3. **Patients who can be distracted from pain usually do not have severe pain.**	51 (43.2%)	67 (56.8%)
4. **Patients may sleep in spite of severe pain.**	31 (26.3%)	87 (73.7%)
5. **Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.**	40 (33.9%)	78 (66.1%)
6. **Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.**	71 (60.2%)	47 (39.8%)
7. **Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.**	100 (84.7%)	18 (15.3%)
8. **The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.**	58 (49.2%)	60 (50.8%)
9. **Opioids should not be used in patients with a history of substance abuse.**	37 (31.4%)	81 (68.6%)
10. **Elderly patients cannot tolerate opioids for pain relief.**	91 (77.1%)	27 (22.9%)
11. **Patients should be encouraged to endure as much pain as possible before using an opioid.**	71 (60.2%)	47 (39.8%)
12. **Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.**	81 (68.6%)	37 (31.4%)
13. **Patients' spiritual beliefs may lead them to think pain and suffering are necessary.**	87 (73.7%)	31 (26.3%)
14. **After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.**	109 (92.4%)	9 (7.6%)
15. **Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.**	55 (46.6%)	63 (53.4%)
Questions	Correct Responses N (%)	Incorrect Responses N (%)

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	Correct Responses N (%)	Incorrect Responses N (%)
16. **Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.**	63 (53.4%)	55 (46.6%)
17. **If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.**	27 (22.9%)	91 (77.1%)
18. **Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.**	52 (44.1%)	66 (55.9%)
19. **Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.**	78 (66.1%)	40 (33.9%)
20. **Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.**	110 (93.2%)	8 (6.8%)
21. **The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.**	107 (90.7%)	11 (9.3%)
22. **Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.**	109 (92.4%)	9 (7.6%)
23. **The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is:**	24 (23.3%)	79 (76.7%)
24. **The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or post-operative pain is:**	12 (11.7%)	91 (88.3%)
25. **Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?**	71 (68.9%)	32 (31.1%)
26. **A 30 mg dose of oral morphine is approximately equivalent to:**	43 (41.7%)	60 (58.3%)
27. **Analgesics for post-operative pain should initially be given:**	58 (56.3%)	45 (43.7%)
28. **A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is:**	12 (11.7%)	91 (88.3%)
29. **The most likely reason a patient with pain would request increased doses of pain medication is:**	18 (17.5%)	85 (82.5%)
30. **Which of the following is useful for treatment of cancer pain?**	63 (61.2%)	40 (38.8%)
31. **The most accurate judge of the intensity of the patient's pain is:**	79 (76.7%)	24 (23.3%)
32. **Which of the following describes the best approach for cultural considerations in caring for patients in pain?**	64 (62.1%)	39 (37.9%)
33. **How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem?**	58 (56.3%)	45 (43.7%)
34. **The time to peak effect for morphine given IV is:**	77 (74.8%)	26 (25.2%)
35. **The time to peak effect for morphine given orally is:**	58 (56.3%)	45 (43.7%)
36. **Following abrupt discontinuation of an opioid, physical dependence is manifested by the following**	16 (15.5%)	87 (84.5%)
37. **Which statement is true regarding opioid induced respiratory depression?**	60 (58.3%)	43 (41.7%)
38. A **On the patient's record you must mark his pain on the scale below. Select the number that represents your assessment of Andrew's pain.**	21 (20%)	79 (80%)
38. B **Your assessment above was made two hours after Andrew received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you take at this time?**	8 (7%)	92 (93%)
Questions	Correct Responses N (%)	Incorrect Responses N (%)

39. A On the patient's record you must mark his pain on the scale below. Select the number that represents your assessment of Robert's pain:	19 (18%)	81 (82%)
39.B Your assessment above is made two hours after Robert received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you take at this time?	17 (17%)	82 (83%)

5.3 Relationship between knowledge and attitudes and sociodemographic variables

Research question 2 for this study asked what are the associations between nurses' sociodemographic factors and the level of knowledge and attitudes about adult post-operative pain assessment and management of nurses in Hamad Medical Corporation hospitals in Qatar? Means and standard deviations for all participants are provided in (Table. 4).

Table 4. Means and Standard Deviations of K&A Scores for Participants

Variable name	Mean	SD
Nationality		
Indian	20.43	4.1
Filipino	19.27	5.13
Qatari	14.66	0.33
Other (including Qatari)	19.57	4.1
Education		
Bachelor	19.86	4.0
Diploma	17.4	4.64
Master	20.25	6.84
Marital Status		
Divorced	20.33	6.35
Married	19.44	4.53
Single	20.03	4.57
Widow	16	0
Hours of pain education in last 2 years		
0 Hours	16.75	4.03
1-2 Hours	18.93	5.00
3-5 Hours	20.19	4.43
Variable name	**Mean**	**SD**

6-8 Hours	19.58	4.67
9 Hours or more	20.6	3.35
Facility		
ACC	19.69	4.33
AKH	16.50	5.91
AWH	21.37	5.04
HGH	19.35	4.87
HMGH	19.97	4.32
TCH	17.33	4.54
WWRC	19.79	4.07
Job designation		
Acting Charge Nurse	19	0
Charge Nurse	20.08	4.52
Director of Nursing	21.77	7.54
Head Nurse	22.5	2.12
Nurse Educator	14	0
Patient Care Assistant	19.28	4.19
Staff Nurse	22	0

Two-sample t-test was used to determine the association between K&A scores and gender and nationality (Table 5). Females (19.05 SD 0.49) had a slightly lower mean score than males (20.66 SD 0.75), however, this difference was not statistically significant (t=-1.8431, P=0.06, 95%CI: -3.35,0.12). Non-Qatari nurses (19.71 SD 0.42) had a higher mean score compared to Qatari nurses (14.66 SD 0.33). However, this difference was not statistically significant (t=1.92, P=0.056, 95%CI: -0.14,10.22). Indian nurses (20.43 SD 4.1) had higher scores than Filipino nurses (19.27 SD 5.13) and other nationalities (including Qatari nurses) (19.57 SD 4.1). An ANOVA test revealed that these differences were not statistically significant (F=1.69, P=0.17) (Table 6).

Table 5. T-test to determine the association between K&A score and gender and nationality

Variable	Mean Difference	d.f	P value	95%CI
Gender (Females vs Males)	-1.6	116	0.060	-3.35, 0.12
Variable	**Mean Difference**	**d.f**	**P value**	**95%CI**
Nationality (Qatari vs Non-Qatari)	5.04	116	0.056	-0.14,10.22

One-way ANOVA tests were used to determine the relationship between K&A score and education level, marital status, facility, and nurse's designation. Although K&A scores increased with higher levels of education, these differences were not statistically significant (F=2.08, P=0.13) (Table 6). There were no statistically significant differences in the K&A scores of participants based on marital status (F=0.35, P=0.78) (Table 6). The facility that the participant worked at was not significantly associated with K&A score (F=0.82, P=0.55) (Table 6). Likewise, there was no significant association between job designation and K&A score (F=0.88, P value=0.51) (Table 6).

Pearson's correlation tests were used to determine the relationship between K&A score and age and years of experience. There was no statistically significant correlation with age (r=-0.01, P=0.88) or years of experience (r=-0.03, P=0.79).

Table 6. One-way ANOVA to determine the association between K&A score and nationality, education level, marital status, facility, nurse's designation and hours spent on pain education.

	Source	SS	Df	MS	F	P value
Nationality	Between groups	102.043019	3	34.0143395	1.69	0.17
	Within groups	2294.60952	114	20.1281837		
Education	Between groups	83.6596852	2	41.829842	2.08	0.13
	Within groups	2312.99286	115	20.1129814		
Marital status	Between groups	22.17	3	7.39	0.35	0.78
	Within groups	2374.14	113	21.01		
Facility	Between groups	101.78	6	16.96	0.82	0.55
	Source	SS	Df	MS	F	P value
	Within groups	2294.87	111	20.67		
Designation	Between groups	109.02	6	18.17	0.88	0.51
	Within groups	2287.62	111	20.61		

Hours spent on pain education	Between groups	82.80	4	20.70	1.01	0.40
	Within groups	2313.84	113	20.47		

5.4 Relationship between knowledge and attitudes and levels of pain education

Research question 3 for this study asked what are the associations between nurses' previous attendance at pain education programs and the level of knowledge and attitude of nurses in Hamad Medical Corporation hospitals in Qatar? The one-way ANOVA test was used to determine the mean difference between the number of hours spent in pain education and the K&A score. There was no statistically significant association between the K&A score and the number of hours spent in pain education (F=1.01, P=0.40) (Table 6).

5.5 Multiple linear regression to determine associations between knowledge and attitudes and potential predictor variables

In an attempt to control for the potential confounding effect of the other variables on the association with the K&A score, multiple linear regression model was used (Table 7). To account for missing data, sensitivity analysis was employed using a logistic regression model. The K&A score (dependent variable) was categorized into a binary variable; the missing values of the outcome (K&A score) was coded as 1 and non-missing coded as 0. In the logistic regression we have calculated the coefficients and predicted the probability. The weighting was calculated based on missing and non-missing values. Table 7 displays the linear regression model with the K&A score adjusted with age, gender, education, years of experience, nationality and hours of pain education. The output of sensitivity analysis was not different from the complete case analysis. Complete case analysis is therefore reported and considered for the analysis (Table.7)

After controlling for all other variables, males had higher K&A score than females, but this difference was not statistically significant (mean difference 0.78, P=0.48 95%CI: -1.39,2.93). For each 1-year increase in age, the K&A score increased by 0.1, but this was not statistically significant (P=0.43 95%CI: -0.15,0.35). In terms of the highest level of education, nurses with diploma had 2.57 lower mean score of K&A than nurses with bachelor's degree (mean difference 2.57, P=0.06 95%CI: -5.25, 0.11) and it was not statistically significant. Nurses with a master's degree had higher level of K&A compared to Bachelor trained nurses but this difference was not statistically significant (Mean difference=0.16, P=0. 91 95%CI: -2.79,3.11). For each year increase in nursing experience the level of K&A decreased by 0.07 but this was not statistically significant (P=0.61 95%CI: -0.36,0.21). With respect to nationality, Indian nurses had higher K&A scores than Filipino nurses (Mean difference=0.51, P=0.65 95%CI: 1.73,2.73). Nurses from all other nationalities combined (including Qataris) had lower K&A scores than Filipino nurses but this was not statistically significant (Mean difference=-0.2, P=0.85 95%CI: -2.27,1.87). There was variation in K&A scores based on hours of pain education in the last two years, but none of these differences were statistically significant. Participants who stated that they attended one to two hours of pain education had a higher score of K&A compared to those who did not attend any pain education (Mean difference=2.22, P=0.36 95%CI: -2.6,7.05). Those who attended three to five hours had a higher K&A score compared to those who didn't attend any (Mean difference=3.39, P=0.17 95%CI: -1.53,8.31). Participants who attended six to eight hours had a higher K&A score compared to those who didn't attend any education (Mean difference= 2.55, P=0.32 95%CI: -2.52,7.63). Participants who received 9 hours or more had a higher K&A score than those who did not attend any education (Mean difference=3.57, P=0.16 95%CI: -1.48, 8.62).

Table 7. Multiple Linear Regression using Complete Case Analysis and Sensitivity Analysis

Score	Complete Case Analysis (N=118)		Sensitivity Analysis (N=151)	
	Coeff. (95%CI)	P value	Coeff. (95%CI)	P value
Gender				
Female	Ref			
Male	0.78 (-1.39,2.95)	0.477	-0.54 (-2.58,1.5)	0.602
Age in years	0.1 (-0.15,0.35)	0.433	0.03 (-0.08,0.14)	0.559
Highest level education				
Bachelor	Ref			
Diploma	-2.57 (-5.25,0.11)	0.06	-3.09 (-6, -0.19)	0.037
Master	0.16 (-2.79,3.11)	0.915	-0.78 (-3.81,2.24)	0.609
Years of experience as a nurse	-0.07 (-0.36,0.21)	0.612	-0.01 (-0.31,0.29)	0.926
Nationality				
Filipino	Ref			
Indians	0.51 (-1.71,2.73)	0.651	0.34 (-1.92,2.6)	0.764
Others	-0.2 (-2.27,1.87)	0.846	-1.52 (-3.72,0.67)	0.172
Hours of pain education				
0 Hours	Ref			
1-2 Hours	2.22 (-2.6,7.05)	0.363	3.09 (-3.03,9.2)	0.319
3-5 Hours	3.39 (-1.53,8.3)	0.175	4.04 (-2.12,10.2)	0.196
6-8 Hours	2.55 (-2.52,7.63)	0.321	3.18 (-3.05,9.41)	0.314
9 Hours or more	3.57 (-1.48,8.62)	0.163	4.37 (-1.8,10.54)	0.163

CHAPTER 6: DISCUSSION

6.1 Summary and interpretation of findings

The aim of this study was to investigate the post-operative nurses' knowledge and attitudes regarding pain management. This was achieved by addressing three research questions: (1) What is the current level of nurses' knowledge and attitudes regarding post-operative pain management? (2) What is the association between the level of K&A and sociodemographic factors? (3) What is the association between the number of hours nurses received in pain education and the level of nurses' knowledge and attitudes? The sample frame was from post-operative areas in HMC; 151 nurses completed the KASRP tool and the sociodemographic questions. This chapter discusses the study findings, limitations of the study, the implications on nursing practice, and recommendations for additional research.

This study demonstrated that the surveyed nurses had limited knowledge of pain assessment and management and poor attitudes toward pain assessment and management. This is consistent with other studies on nurses in both the Middle East and Western countries. (Samarkandi, 2018; Sherrill, 2013). The average K&A score in this study was 47.8%, with a range of 19.5% to 78.05 %. Less than half (48.3%) of participants scored at or above the pass mark of 70%.

Few studies have reported nurses achieving the minimum recommended mean score of 70%: Brant et al. (2017) recorded 72%, Gretarsdottir et al. (2017) 68.8%, and Vickers et al. (2014) 65.7% (Brant et al., 2017; Gretarsdottir et al., 2017; Moceri & Drevdahl, 2014; Vickers et al., 2014). The score of 48% in this study is similar to other studies using the KASRP tool with nurses in the Middle East. In one study on nurses in Saudi Arabia, the average K&A score was 46% (Samarkandi, 2018). In Jordan, studies reported average scores of 48% (Al Qadire & Al Khalaileh, 2014a), 43% (oncology nurses), 42% (non-oncology nurses) (Omran, Al Qadire, Ali, & Al Hayek, 2014), 41%

(Alnazly & Abojedi, 2018), 34% (nursing students) (Al-Khawaldeh, Al-Hussami, & Darawad, 2013) and 19% (Alhage, 2018). The score in this study was higher than that found in nurses in Turkey, where the mean K&A score was 39.65% (Yava et al., 2013), and in China, where the mean score was 27% (Ying Ge et al., 2013). Using Ferrell and McCaffery's benchmark of 70%, it appears as though nurses from various parts of the world do not demonstrate adequate level of knowledge and attitudes about pain management (Ferrell and McCaffery 2014). Applying this to the practice perspective suggests that patients' pain management may be adversely affected.

There was no correlation between nurses' pain assessment and management knowledge and attitudes and any potential predictor variables in this study, before or after controlling for potential confounding variables. This was partially consistent with a study done in Jordan, which found no significant differences between gender and the level of education but a significant correlation between the score of K&A and previous attendance at pain education (Al Qadire & Al Khalaileh, 2014a). Similarly, Latina et al., reported no statistical association related to the level of education regarding nurses' knowledge and attitudes to pain (Latina et al., 2015). In contrast, Moceri and Drevdahl concluded that there was a weak positive association between higher education levels and the K&A score levels (Moceri & Drevdahl, 2014) and multiple other authors found that higher education levels have resulted in increased knowledge and attitudes to pain (Gretarsdottir et al., 2017; Keen et al., 2017; Lewthwaite et al., 2011; Yava et al., 2013).

In Palestine, a cross-sectional study examined the level of K&A in the high acuity units such as the medical and surgical wards. The study found no statistically significant differences between the K&A score and demographic characteristics, except for the level of education (Salameh, 2018). These studies might help explain the low scores or differences in scores (Alhage, 2018). In Qatar, a study with oncology nurses

found no significant differences in knowledge and attitudes based on sex, age, and educational level (Yassin et al., 2020).

This study found a low level of knowledge about pharmacological interventions, particularly regarding the appropriate opioid selection, dosing, and converting between different types of opioids and the assessment/reassessment of pain after opioid administration. Addiction and opioids overdose are considered one of the most common opioid-related fears for nurses. Nurses across the globe share a belief that patients who take opioids have an increased risk of becoming addicted. On the other hand, patients who are hospitalized can receive opioids safely for a short period without becoming addicted. Additionally, those patients can continue receiving their opioids even after discharge for several days if they are not cancer patients. Consequently, low levels of knowledge and negative attitudes among nurses would seem to rule their administration of opioids and affect their ability to manage patients' pain.

Effective strategies such as frequent pain assessment to overcome the nurses' fear of addiction should be employed by nurses to help them understand the effects of opioids and their side effects. The latest pain management strategies are to have a proactive approach to prevent pain rather than taking a reactive approach in treating it (Liao, Henceroth, Lu, & LeRoy, 2016). Hence, patients are encouraged to speak about their pain, and nurses are encouraged to thoroughly assess and reassess pain. A patient who receives opioids should be constantly evaluated. Evaluation should include a person's quality of life, activities of daily living, adequacy of the pain management regimen, and any reported side effects following opioids administration (Liao et al., 2016).

Studies recommend the process of offering continuous educational programs for nurses to enable them to appropriately maintain theoretical and clinical knowledge for

the sake of improving their practice (Alzghoul & Abdullah, 2016; Lokapur, Vasani, & Page, 2018; Wood, 1998). There is a heterogeneity amidst the recruited nurses in the post-operative areas in HMC with units comprising of nurses from a range of different countries. Having many different nationalities and cultural diversities may directly or indirectly affect culturally competent patient care. People by their nature are cultural beings and very strongly influenced by their cultural beliefs, as well as their ethnicity, religious practices, geographic, and socioeconomic factors. All of these areas affect how people think and how they act. Cultural paradigms map out the "correct" ways to think and behave in various circumstances (Liao et al., 2016).

Beliefs on how to avoid and manage disease and what constitutes good treatment are informed by the culture and the traditions we believe in. Culture impacts how each person feels and reacts to pain, as well as when and how to seek care (Liao et al., 2016). Each of us has a different cultural experience as a result of belonging to multiple cultural groups. In order to provide patients with culturally appropriate pain relief, nurses must embrace this vital point. Nurses should be aware of the cultural factors such as beliefs, values, and behaviors that affect their own and their patients' pain responses (Liao et al., 2016). Simultaneously, it is important not to stereotype patients by believing they will follow a certain culture's traditional pain patterns. Rather than trying to catalog specific cultural groups' pain beliefs and behaviors, it is important to understand how culture affects the way patients react to and talk about their pain.

This study did not assess the effect of culture, ethnicity, and religious background on participants' knowledge and attitudes towards post-operative pain management. The study included a range of nationalities, and therefore the lack of K&A could have been influenced by the cultural aspects of the different nationalities of nurses and the other health care providers in HMC. Additionally, the different nationalities of the served

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patients in HMC could lead to a more challenging assessment and management that is underpinned by lack of K&A. This lack of knowledge has been influenced by a gap in the standardization of nursing education programs offered to HMC post-operative nurses upon arrival to Qatar. Addressing the cultural competence of staff will assist in this vital aspect of pain assessment and management. Additionally, unclear policies and procedures on patients' pain assessment and management strongly suggest the need to offer more detailed programs that address the nurses' capacity to assess and manage patients' pain promptly and competently.

Over a third of the nurses (37%) had only attended one to two hours of education on pain in the last two years. This could be an indicator of the shortage of continuing nursing education courses on topics such as pain management and the delivery of upskilling programs that are tailored to address pain K&A in post-operative care. The study results emphasize the need for further training and education on pain management among senior and junior nurses.

In this study, K&A scores were not significantly associated with years of experience. This is in contrast to the findings by Al-Shaer et al. in which nurses who worked for 16 years or more in their unit scored significantly higher K&A than nurses who worked for one to five years in their units (Al-Shaer, Hill, & Anderson, 2011).

Regarding the highest educational level, both studies found no statistically significant association. However, our study inconsistent with other studies Al Qadire et al. study (2014c), where they concluded that nurses with higher educational background levels had statistically significantly higher scores than nurses with lower education levels.

This study found no correlation between pain education in the previous 2 years and the nurses' score of knowledge and attitudes about pain. This was consistent with

the findings by Al Qadire and Al Khalaileh (2014c). In contrast, Brant and colleagues found that working as a nurse for five years and receiving recent pain education in the last year was predictive of a higher score amongst participants (Brant et al., 2017).

Participants in this study were predominantly from the Philippines and India. There were no statistically significant differences between K&A scores based on nationality. The small percentage of Qatari participants in the study may have meant the study was underpowered to detect a significant difference in Qatari nurses' K&A scores from other nationalities. The nationalities of nurses in this study are typical of the nursing workforce in Qatar. Although there was no statistical association between nationality and K&A score in this study, further studies could assess the effect of culture, ethnicity, and religious background of nurses on their level of K&A of pain management.

In the current study, similar to other studies (Aljumah et al., 2018), participants stated that if the patients in the post-operative phase have changes in vital signs, this could indicate the intensity of the experienced pain level. This is another essential belief that is demonstrated by nurses' attitudes regarding pain assessment and management, and it is not only on the level of Qatar rather, it is a universal issue (Aljumah et al., 2018). More than half (59.3%) the participants in our study believed that pain has a positive correlation between pain intensity and changes in vital signs; a finding similar to that in Coulling's study (2005). It is emphasized in the studies that the importance of assessing nonverbal cues and behavioral manifestations is crucial as an indicator of pain, for instance, physiological changes in vital signs (Aljumah et al., 2018). In this sense, nurses may have thought that pain interferes with the desire to sleep. Surveyed nurses stated that patients could sleep even if they have severe pain due to misunderstanding of the behavioral cues of pain. The limited knowledge concerning this element was evident, with 74% of the participants incorrectly answering this item (Aljumah et al., 2018).

One of the highest areas of concern was related to the most likely reason a patient complaining of pain would request increased doses of pain medication and the accurate assessment of nurses to this particular concern. Nurses believe that vital signs assessment and facial expressions are a manifestation of behavioral cues to pain.

Although McCaffery and Farrell 1997 did not designate a "passing score," Brown, Bowman, and Eason (1999) demonstrated that nurses who scored lower than 80% had lower levels of ability to effectively and adequately care for patients complaining of pain (Keen et al., 2017; Kiekkas et al., 2015; Latina et al., 2015; Moceri & Drevdahl, 2014; Vickers et al., 2014; Yava et al., 2013). Given that the average score in our study was 47.8% and only 48.3% of the staff had a passing score of 70%, this suggests there is a strong and urgent need for well-structured educational activities and programs that are aligned with nurses deficits in order to improve nurses' pain knowledge and attitudes. Studies that have done so have demonstrated improvements in KASRP scores (Abdalrahim, Majali, Stomberg, & Bergbom, 2011; McCaffery & Robinson, 2002).

Overall, the study results suggested a significant deficit in post-operative nurses' knowledge and attitudes regarding pain assessment and management. The study undertook a thorough examination of the information that nurses have about pain assessment and management, mainly regarding pharmacological management, particularly regarding analgesic types, opioids dosages, and side effects of opioids. The study findings supported the existence of uncertainties identified in the literature about knowledge deficits of pharmacology and insufficient pain assessment and management skills among nurses. Nevertheless, the study results are similar to other previous studies that highlighted that pain management pharmacology is the nurses' weakest knowledge and attitudes (El-Rahman, Al Kalaldeh, & Muhbes, 2013; Hu et al., 2014; Lewthwaite

& Wiebe, 2014; Omran, Al Qadire, Ali, & Al Hayek, 2014).

Vickers et al. (2014) found only 12.8% respondents answered correctly with regard to the dose of morphine which should be administered to the smiling patient (Vickers et al., 2014). Whereas Brant et al. (2017) had slightly more favorable results of 39%(Brant et al., 2017), and Gretarsdottir et al. (2017) had the highest score of 48.9% respondents answered correctly to administering the correct dose of morphine to the smiling patient (Gretarsdottir et al., 2017).

As nurses spend most of their time with the patients and are the ones who respond to patients' needs in collaboration with the other healthcare providers, nurses should be equipped with an improved level of knowledge, particularly on pharmacological management way beyond the drug routes of administration, dosing, duration, and peak effects. The latest studies shed light on applying strategies in pain management to prevent drug-seeking behaviors and customization of the treatment based on patients' physiologic and psychologic needs of analgesics so that effective pain control through efficient pain assessment is achieved. Equally important is clear and effective communication between all healthcare providers, particularly between pharmacists and medical teams, who are privileged to prescribe pain medication. By applying such strategies, adequate pain management will be ensured (Barkin et al., 2010).

6.2 Strengths and limitations

This study has some limitations that were considered during the interpretation of the results. The primary limitation is that the study assessed associations but cannot demonstrate causal relationships. The results represent the knowledge and attitudes of HMC post-operative nurses specifically, and cannot be generalized to all nurses in the healthcare system of Qatar or beyond. A number of items on the KASRP had some missing responses; the time constraint of nurses' workflow and the length of the tool may be one explanation for this.

The nurses who did not respond may have had a different response to those nurses that did respond. However, the response rate was higher than the total number of nurses estimated to work in post-operative care, so response bias may not be a concern. Recall bias may have impacted on nurses responses to the item about hours of pain education undertaken in the last two years.

A strength of this study is that it was simple for participants and therefore a relatively low burden for busy nurses. Based on the estimated number of nurses working in post-operative care, the response rate may have been close to 100%. The findings are likely to be an accurate representation of the true state of pain related K&A in post-operative nurses in HMC.

6.4 Recommendations

To the author's knowledge, this study was the first of its kind in Qatar. Overall, the results echo previous studies that revealed nurses in HMC have poor knowledge and attitudes regarding pain. The findings of the study serve as a baseline from which potential strategies to sustain and strengthen nurses' knowledge and attitudes toward pain in Qatar could be established.

This study will provide educators and policy stakeholders with an understanding of the deficits of nurses' pain knowledge and attitudes. Appropriate and prompt pain assessment is hugely important because inadequate pain assessment can result in ineffective pain management (Breivik et al., 2008). Researchers have started to identify the nursing experience of addiction and nursing knowledge deficits (Aljumah et al., 2018). There have been some developments in the direction of nurses' pain assessment knowledge, but attitudes toward pain have remained unchanged. One idea for future research in this area is to look at current procedures, especially those involving the use of opioids rather than focusing solely on educational programs. It can be more beneficial to also promote empathetic behavior so that we can gain a greater understanding of the

patients' suffering.

Given the very low level of knowledge and attitudes found in this study, further research is urgently required to develop and test strategies to enhance nurses' pain knowledge and attitudes to impact patients' pain and quality of life positively. Pragmatic research is crucial to understanding nurses' assessments of pain, and their judgments based on their knowledge and the patients' nonverbal cues. The findings emphasize the need to enhance clinical practice competence by developing educational programs that address the most significant areas of knowledge and attitudes deficiencies. Nursing education courses and programs related to nurses' assessment and management of pain should be tailored to nurses' characteristics and settings. This will require positive institutional culture changes and make pain management a top priority for nurses through settings leaders.

The use of the KASRP tool provided quantitative results. As such the researcher was unable to capture any subjective opinions from participants and participants were unable to offer any justifications for their decisions. It is recommended that further qualitative research be conducted to explore the nurses' perceptions of pain, their personal views, beliefs, the facilitators and barriers that may influence their knowledge, attitudes, and practice towards post-operative pain assessment and management. An important starting point is understanding the need of nurses and tailor programs that address the gaps to understand patients' pain better and work towards providing quality pain management.

It is recommended that culturally sensitive education be provided to recruited nurses who will work in HMC to enhance the understanding of multidimensional patients' needs in Qatar.

6.5 Conclusion

This chapter discussed the study's results with respect to the literature, the

strengths and limitations of the study, recommendations for future research, and the implications of the study for practice.

REFERENCES

Abdalrahim, M. S., Majali, S. A., Stomberg, M. W., & Bergbom, I. (2011). The effect of postoperative pain management program on improving nurses' knowledge and attitudes toward pain. *Nurse education in practice, 11*(4), 250-255.

Adams, S.-D. M., Varaei, S., & Jalalinia, F. (2020). Nurses' Knowledge and Attitude towards Postoperative Pain Management in Ghana. *Pain Research and Management, 2020*.

Al-Khawaldeh, O. A., Al-Hussami, M., & Darawad, M. (2013). Knowledge and attitudes regarding pain management among Jordanian nursing students. *Nurse Education Today, 33*(4), 339-345.

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

Al Qadire, M., & Al Khalaileh, M. (2014a). Effectiveness of educational intervention on Jordanian nurses' knowledge and attitude regarding pain management. *Journal of Advances in Medicine and Medical Research*, 1460-1472.

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

Al Qadire, M., & Al Khalaileh, M. (2014c). Jordanian nurses knowledge and attitude regarding pain management. *Pain Management Nursing, 15*(1), 220-228.

Alhage, M. M. N. (2018). *Knowledge and Attitude of Nurses toward pain Management at Omdurman Military Hospital.* Sania Ahmed Mohamed Salih,

Aljumah, M. I., Aboshoushah, E. F., Coric, D., Alaithan, A. M., Almulhim, A. A. A., AlOtaibi, N. M., . . . Alharthi, A. B. (2018). Assessment and Management of Pain in the Intensive Care Unit. *The Egyptian Journal of Hospital Medicine, 73*(4), 6439-6445.

Alnazly, E. K., & Abojedi, A. A. (2018). Jordanian Nurses' Knowledge and Attitudes Regarding Pain Management Principles for Hospitalized Patients. *Al-Balqa Journal for Research and Studies* البلقاء للبحوث والدراسات, 21(1), 6.

Alzghoul, B. I., & Abdullah, N. A. C. (2016). Pain management practices by nurses: an application of the knowledge, attitude and practices (KAP) model. *Global journal of health science, 8*(6), 154.

Bartoszczyk, D. A., & Gilbertson-White, S. (2015). *Interventions to nurse-related barriers in cancer pain management.* Paper presented at the Oncology nursing forum.

Basak, S. C., & Sathyanarayana, D. (2010). Pharmacy education in India. *American Journal of Pharmaceutical Education, 74*(4).

Bernhofer, E. I., Hosler, R., & Karius, D. (2016). Nurses' written responses to pain management values education: A content analysis. *Pain Management Nursing, 17*(6), 384-391.

Brant, J. M., Mohr, C., Coombs, N. C., Finn, S., & Wilmarth, E. (2017). Nurses' knowledge and attitudes about pain: Personal and professional characteristics and patient reported pain satisfaction. *Pain Management Nursing, 18*(4), 214-223.

Breivik, H., Borchgrevink, P., Allen, S., Rosseland, L., Romundstad, L., Breivik Hals, E., . . . Stubhaug, A. (2008). Assessment of pain. *BJA: British Journal of Anaesthesia, 101*(1), 17-24.

Brown, S. T., Bowman, J. M., & Eason, F. R. (1999). Assessment of nurses' attitudes and knowledge regarding pain management. *The Journal of Continuing Education in Nursing, 30*(3), 132-139.

Bucknall, T., Manias, E., & Botti, M. (2007). Nurses' reassessment of postoperative pain after analgesic administration. *The Clinical journal of pain, 23*(1), 1-7.

Burns, N., & Grove, S. K. (2010). *Understanding nursing research-eBook: Building an evidence-based practice*: Elsevier Health Sciences.

Carr, E. C., Meredith, P., Chumbley, G., Killen, R., Prytherch, D. R., & Smith, G. B. (2014). Pain: A quality of care issue during patients' admission to hospital. *Journal of Advanced Nursing, 70*(6), 1391-1403.

Chou, R., Gordon, D. B., de Leon-Casasola, O. A., Rosenberg, J. M., Bickler, S., & Brennan, T. (2016). Guidelines on the management of postoperative pain. *J Pain, 17*(2), 131-157.

Coulling, S. (2005). Nurses' and doctors' knowledge of pain after surgery. *Nursing standard, 19*(34).

D'emeh, W. M., Yacoub, M. I., Darawad, M. W., Al-Badawi, T. H., & Shahwan, B. (2016). Pain-related knowledge and barriers among Jordanian nurses: A national study. *Health, 8*(06), 548.

Dames, L. J. P., Alves, V. H., Rodrigues, D. P., de Souza, R. R. B., Medeiros, F. d. V. A., & Paiva, E. D. (2016). Nurses' practical knowledge on the clinical management of neonatal pain: a descriptive study. *Online Brazilian Journal of Nursing, 15*(3), 393-403.

De Silva, B. S. S., & Rolls, C. (2011). Attitudes, beliefs, and practices of Sri Lankan nurses toward cancer pain management: An ethnographic study. *Nursing & Health Sciences, 13*(4), 419-424. doi:10.1111/j.1442-2018.2011.00635.x

Dessie, M., Asichale, A., Belayneh, T., Enyew, H., & Hailekiros, A. (2019). Knowledge and attitudes of ethiopian nursing staff regarding post-operative pain management: A cross-sectional multicenter study. *Patient related outcome measures, 10*, 395.

DiCuccio, M. H. (2015). The relationship between patient safety culture and patient outcomes: a systematic review. *Journal of patient safety, 11*(3), 135-142.

Eaton, L. H., Meins, A. R., Mitchell, P. H., Voss, J., & Doorenbos, A. Z. (2015). Evidence-based practice beliefs and behaviors of nurses providing cancer pain management: a mixed-methods approach. *Oncology nursing forum, 42*(2), 165-173. doi:10.1188/15.onf.165-173

Eriksson, K., Wikström, L., Årestedt, K., Fridlund, B., & Broström, A. (2014). Numeric rating scale: patients' perceptions of its use in postoperative pain assessments. *Applied nursing research, 27*(1), 41-46.

Ferrell, B., & McCaffery, M. (2008). Knowledge and attitudes survey regarding pain. *City of Hope Available from: http://prc. coh. org. Accessed May, 4*, 2010.

Fortier, M. A., Anderson, C. T., & Kain, Z. N. (2009). Ethnicity matters in the assessment and treatment of children's pain. *Pediatrics, 124*(1), 378-380.

Goldberg, G. R., & Morrison, R. S. (2007). Pain management in hospitalized cancer patients: a systematic review. *Journal of Clinical Oncology, 25*(13), 1792-1801.

Gregory, J., & McGowan, L. (2016). An examination of the prevalence of acute pain for hospitalised adult patients: a systematic review. *Journal of clinical nursing, 25*(5-6), 583-598.

Gretarsdottir, E., Zoëga, S., Tomasson, G., Sveinsdottir, H., & Gunnarsdottir, S. (2017). Determinants of knowledge and attitudes regarding pain among nurses

in a university hospital: A cross-sectional study. *Pain Management Nursing, 18*(3), 144-152.

Heaney, R. P., & Holick, M. F. (2011). Why the IOM recommendations for vitamin D are deficient. *Journal of Bone and Mineral Research, 26*(3), 455-457.

Hirsh, A. T., Jensen, M. P., & Robinson, M. E. (2010). Evaluation of nurses' self-insight into their pain assessment and treatment decisions. *The Journal of Pain, 11*(5), 454-461.

Ho, P. C., & Johnson, M. H. (2013). Behaviours and beliefs about pain and treatment among Chinese immigrants and New Zealand Europeans. *NZ Med J, 126*(1370), 10-22.

Issa, Z., Rasmussen, J. V., Petersen, J. K., Schantz, K., & Brorson, S. (2019). Patient-reported outcome after stemmed versus stemless total shoulder arthroplasty for glenohumeral osteoarthritis: a patient-blinded randomized clinical trial. *Trials, 20*(1), 1-8.

Kahsay, H. (2017). Assessment and treatment of pain in pediatric patients. *Current Pediatric Research*.

Karriem-Norwood, V. (2012). Treating heart failure with digoxin. In.

Keen, A., McCrate, B., McLennon, S., Ellis, A., Wall, D., & Jones, S. (2017). Influencing nursing knowledge and attitudes to positively affect care of patients with persistent pain in the hospital setting. *Pain Management Nursing, 18*(3), 137-143.

Kehlet, H., Jensen, T. S., & Woolf, C. J. (2006). Persistent postsurgical pain: risk factors and prevention. *The Lancet, 367*(9522), 1618-1625.

Kiekkas, P., Gardeli, P., Bakalis, N., Stefanopoulos, N., Adamopoulou, K., Avdulla, C., . . . Konstantinou, E. (2015). Predictors of nurses' knowledge and attitudes toward postoperative pain in Greece. *Pain Management Nursing, 16*(1), 2-10.

Latina, R., Mauro, L., Mitello, L., D'Angelo, D., Caputo, L., De Marinis, M. G., . . . Baglio, G. (2015). Attitude and knowledge of pain management among Italian nurses in hospital settings. *Pain Management Nursing, 16*(6), 959-967.

Lewis, C. P., Corley, D. J., Lake, N., Brockopp, D., & Moe, K. (2015). Overcoming barriers to effective pain management: the use of professionally directed small group discussions. *Pain Management Nursing, 16*(2), 121-127.

Lewis, G. N., & Upsdell, A. (2018). Ethnic disparities in attendance at New Zealand's chronic pain services. *New Zealand Medical Journal, 131*(1472), 21-28.

Lewthwaite, B. J., Jabusch, K. M., Wheeler, B. J., Schnell-Hoehn, K. N., Mills, J., Estrella-Holder, E., & Fedorowicz, A. (2011). Nurses' knowledge and attitudes regarding pain management in hospitalized adults. *The Journal of Continuing Education in Nursing, 42*(6), 251-257.

Liao, K. Y.-H., Henceroth, M., Lu, Q., & LeRoy, A. (2016). Cultural differences in pain experience among four ethnic groups: a qualitative pilot study. *J Behav Health, 5*(2), 75-81.

Lokapur, M. A., Vasani, P. P., & Page, N. D. (2018). Evaluation of knowledge, attitude, and practices of nurses regarding pain management in tertiary care hospitals of Pune, India. *Indian Journal of Pain, 32*(1), 30.

Mahama, F., & Ninnoni, J. P. (2019). Assessment and Management of Postoperative Pain among Nurses at a Resource-Constraint Teaching Hospital in Ghana. *Nursing research and practice, 2019*.

McCaffery, M., Ferrell, B. R., & Pasero, C. (2000). Nurses' personal opinions about patients' pain and their effect on recorded assessments and titration of opioid doses. *Pain Management Nursing, 1*(3), 79-87.

McCaffery, M., Pasero, C., & Ferrell, B. R. (2007). Nurses' decisions about opioid dose. *AJN The American Journal of Nursing, 107*(12), 35-39.

McCaffery, M., & Robinson, E. S. (2002). Your patient is in pain—here's how you respond. *Nursing2020, 32*(10), 36-45.

McNamara, M. C., Harmon, D. C., & Saunders, J. (2012). Effect of education on knowledge, skills and attitudes around pain. *British Journal of Nursing, 21*(16), 958-964.

Menlah, A., Garti, I., Amoo, S. A., Atakro, C. A., Amponsah, C., & Agyare, D. F. (2018). Knowledge, attitudes, and practices of postoperative pain management by nurses in selected district hospitals in Ghana. *SAGE Open Nursing, 4*, 2377960818790383.

Merskey, H. (1968). Psychological aspects of pain. *Postgraduate Medical Journal, 44*(510), 297.

Messmer, S. (2009). Pain management: Knowledge and attitudes of senior nursing students and practicing registered nurses.

Moceri, J. T., & Drevdahl, D. J. (2014). Nurses' knowledge and attitudes toward pain in the emergency department. *Journal of Emergency Nursing, 40*(1), 6-12.

Morley, G., Briggs, E., & Chumbley, G. (2015). Nurses' experiences of patients with substance-use disorder in pain: a phenomenological study. *Pain Management Nursing, 16*(5), 701-711.

Oishi, S., Schimmack, U., Diener, E., & Suh, E. M. (1998). The measurement of values and individualism-collectivism. *Personality and Social Psychology Bulletin, 24*(11), 1177-1189.

Omran, S., Al Qadire, M., Ali, N. A., & Al Hayek, M. F. (2014). Knowledge and attitudes about pain management: a comparison of oncology and non-oncology Jordanian nurses. *Nurs Health, 2*(4), 73-80.

Rice, A. S., Smith, B. H., & Blyth, F. M. (2016). Pain and the global burden of disease. *Pain, 157*(4), 791-796.

Rosen, C. J., & Gallagher, J. C. (2011). The 2011 IOM report on vitamin D and calcium requirements for North America: clinical implications for providers treating patients with low bone mineral density. *Journal of clinical densitometry, 14*(2), 79-84.

Salameh, B. (2018). Nurses' knowledge regarding pain management in high acuity care units: A case study of Palestine. *International Journal of Health Sciences, 12*(3), 51.

Salim, Nezar A., Joshua, R., AbuBaker, Noora A., Chehab, F., & Jose, A. (2019). Effect of a Nursing In-Service Education Program on Nurses' Knowledge and Attitudes towards Pain Management in a Governmental Hospital in the United Arab Emirates: Experimental Random Assignment Study. *Dubai Medical Journal, 2*, 1-7. doi:10.1159/000503560

Samarkandi, O. (2018). Knowledge and attitudes of nurses toward pain management. *Saudi Journal of Anaesthesia, 12*(2), 220-226. doi:10.4103/sja.SJA_587_17

Schreiber, J. A., Cantrell, D., Moe, K. A., Hench, J., McKinney, E., Lewis, C. P., . . . Brockopp, D. (2014). Improving knowledge, assessment, and attitudes related to pain management: Evaluation of an intervention. *Pain Management Nursing, 15*(2), 474-481.

Sherrill, R. J. (2013). *Assessment of Nurses' Knowledge and Attitudes toward Pain Management: Novice to Expert.* (Master of Science in Nursing). Gardner Webb University, Retrieved from https://digitalcommons.gardner-webb.edu/nursing_etd/85 (Nursing Theses and Capstone Projects. 85.)

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

Smeland, A. H., Twycross, A., Lundeberg, S., & Rustøen, T. (2018). Nurses' knowledge, attitudes and clinical practice in pediatric postoperative pain management. *Pain Management Nursing, 19*(6), 585-598.

Tait, R. C., & Chibnall, J. T. (2014). Racial/ethnic disparities in the assessment and treatment of pain: psychosocial perspectives. *American Psychologist, 69*(2), 131.

Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education, 45*(6), 204-211.

Tennyson, J., Rahimi, S., Hill, C., Tse, L., Vibhakar, A., Akello-Egwel, D., . . . Jaksch, D. (2017). QDB: a new database of plasma chemistries and reactions. *Plasma Sources Science and Technology, 26*(5), 055014.

Thapa, R. D., & Gurung, G. (2020). Nurses' Knowledge, Attitude and Practice Regarding Postoperative Pain Management at Selected Hospitals, Bharatpur, Nepal. *Journal of Chitwan Medical College, 10*(1), 64-68. doi:https://doi.org/10.3126/jcmc.v10i1.28074

Topham, D., & Drew, D. (2017). Quality improvement project: replacing the numeric rating scale with a clinically aligned pain assessment (CAPA) tool. *Pain Management Nursing, 18*(6), 363-371.

Treede, R.-D. (2018). The International Association for the Study of Pain definition of pain: as valid in 2018 as in 1979, but in need of regularly updated footnotes. *Pain reports, 3*(2).

van Boekel, R. L., Vissers, K. C., van der Sande, R., Bronkhorst, E., Lerou, J. G., & Steegers, M. A. (2017). Moving beyond pain scores: Multidimensional pain assessment is essential for adequate pain management after surgery. *PloS one, 12*(5), e0177345.

Vickers, N., Wright, S., & Staines, A. (2014). Surgical nurses in teaching hospitals in Ireland: understanding pain. *British Journal of Nursing, 23*(17), 924-929.

Walker, E., Bell, M., Cook, T., Grocott, M., & Moonesinghe, S. (2016). Patient reported outcome of adult perioperative anaesthesia in the United Kingdom: a cross-sectional observational study. *BJA: British Journal of Anaesthesia, 117*(6), 758-766.

Whitten, C. E., & Cristobal, K. (2005). Chronic pain is a chronic condition, not just a symptom. *The Permanente Journal, 9*(3), 43.

Wikström, L., Eriksson, K., Årestedt, K., Fridlund, B., & Broström, A. (2014). Healthcare professionals' perceptions of the use of pain scales in postoperative pain assessments. *Applied nursing research, 27*(1), 53-58.

Wood, I. (1998). The effects of continuing professional education on the clinical practice of nurses: a review of the literature. *International Journal of Nursing Studies, 35*(3), 125-131.

Wooldridge, S., & Branney, J. (2020). Congruence between nurses' and patients' assessment of postoperative pain: a literature review. *British Journal of Nursing, 29*(4), 212-220.

Yassin, K., Al Bulushi, A., Ali, N., Idris, Z., Abuessa, Z., Yassin, M., & Mahfoud, Z. (2020). The Knowledge and Attitude Regarding Cancer Pain Management Among Nurses Working In Cancer Center; An Experience From Qatar. *Middle East Journal of Nursing, 14*(2), 3-11. doi:10.5742/MEJN2020.93788

Yassin, K., Rankin, J., & Al-Tawafsheh, A. (2015). The Social Organization of Nurses' Pain Management Work in Qatar. *Pain Management Nursing, 16*(5), 759-769.

Yava, A., Çicek, H., Tosun, N., Özcan, C., Yildiz, D., & Dizer, B. (2013). Knowledge and Attitudes of Nurses about Pain Management in Turkey. *International Journal of Caring Sciences, 6*(3).

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.

Zhang, C.-H., Hsu, L., Zou, B.-R., Li, J.-F., Wang, H.-Y., & Huang, J. (2008). Effects of a pain education program on nurses' pain knowledge, attitudes and pain assessment practices in China. *Journal of pain and symptom management, 36*(6), 616-627.

APPENDICES

Appendix A: Questionnaire

Nurses Knowledge and Attitudes about Adult Post-operative Pain Assessment and Management

Dear Colleague,

I am in the process of completing my thesis in order to complete my master's degree in public health from Qatar University (QU), Qatar. Your cooperation and participation in this study as a post-operative care unit nurse is significant to accomplish this study.

This study will provide information about nurses' knowledge and attitudes toward post-operative pain assessment and management in Qatar. The study involves responding to a questionnaire and completing a socio-demographic data that has been approved by the appropriate authorities in HMC and the review board at Hamad Medical Corporation and QU. The study procedures involve no foreseeable risks or harm to you. Your participation in this study is voluntary. It will require approximately 15 minutes of your time.

Your name is not needed for the survey as it is completely anonymous. Your individual completed survey is confidential information and will not be revealed individually at any time. You may withdraw from the study at any time. Please return the information by one week of receipt and do not answer more than one questionnaire.

Your return of the survey will be regarded as your informed consent to utilize the information.

If you have any questions at any time, please contact me at mobile # 50712807 or email me at: hsamara@hamad.qa

Thank you for participation in this study.

Sincerely,

Haya Samara

Part A: Socio-demographic Data

Please select the appropriate answer:

1. Gender:

    a. Female

    b. Male

2. Age in years: _____

3. Education (highest level achieved):

    a. Diploma

    b. Bachelor

    c. Master

    d. PhD/ Doctorate

4. Years of nursing: _____

5. Marital status:

    a. Single

    b. Married

    c. Widow

    d. Divorced

6. Nationality:

   a. Qatari

   b. Non- Qatari, please indicate your nationality: _____

7. What is the estimated number of hours of pain education you received in the last two

years?

   a. 0 hours

   b. 1-2 Hours

   c. 3-5 hours

   d. 6-8 hours

   e. 9 hours or more

8. What is your current facility?

   a. HGH

   b. AWH

   c. HMGH

   d. TCH

   e. AKH

   f. ACC

   g. WWRC

9. What is your current job designation?

   a. Staff Nurse

   b. Charge Nurse

   c. Head Nurse

   d. Other, please specify

Part B: This section includes some questions about pain assessment and management

Select **"True"** if you believe the statement is true, and **"False"** if you believe the statement is false.

	Statements	True	False
1.	Vital signs are always reliable indicators of the intensity of a patient's pain.		
2.	Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.		
3.	Patients who can be distracted from pain usually do not have severe pain.		
4.	Patients may sleep in spite of severe pain.		
5.	Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.		
6.	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.		
7.	Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.		
8.	The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.		
9.	Opioids should not be used in patients with a history of substance abuse.		
10.	Elderly patients cannot tolerate opioids for pain relief.		
11.	Patients should be encouraged to endure as much pain as possible before using an opioid.		
12.	Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.		

13.	Patients' spiritual beliefs may lead them to think pain and suffering are necessary.		
14.	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.		
15.	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.		
16.	Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.		
17.	If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.		
18.	Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.		
19.	Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.		
20.	Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.		
21.	The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.		
22.	Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.		

Multiple Choice Questions

Select the response you believe is true.

23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is:

   a. intravenous

   b. intramuscular

   c. subcutaneous

   d. oral

   e. rectal

24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or post-operative pain is:

   a. intravenous

   b. intramuscular

   c. subcutaneous

   d. oral

   e. rectal

25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?

   a. codeine

   b. morphine

   c. meperidine

   d. tramadol

26. A 30 mg dose of oral morphine is approximately equivalent to:

a. Morphine 5 mg IV

b. Morphine 10 mg IV

c. Morphine 30 mg IV

d. Morphine 60 mg IV

27. Analgesics for post-operative pain should initially be given:

a. around the clock on a fixed schedule

b. only when the patient asks for the medication

c. only when the nurse determines that the patient has moderate or greater discomfort

28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is:

a. less than 1%

b. 1-10%

c. 11-20%

d. 21-40%

e. > 41%

29. The most likely reason a patient with pain would request increased doses of pain medication is:

  a. The patient is experiencing increased pain.

  b. The patient is experiencing increased anxiety or depression.

  c. The patient is requesting more staff attention.

  d. The patient's requests are related to addiction.

30. Which of the following is useful for treatment of cancer pain?

  a. Ibuprofen (Motrin)

  b. Hydromorphone (Dilaudid)

  c. Gabapentin (Neurontin)

  d. All of the above

31. The most accurate judge of the intensity of the patient's pain is:

  a. the treating physician

  b. the patient's primary nurse

  c. the patient

  d. the pharmacist

  e. the patient's spouse or family

32. Which of the following describes the best approach for cultural considerations in caring for patients in pain:

  a. There are no longer cultural influences in the U.S. due to the diversity of the population.

  b. Cultural influences can be determined by an individual's ethnicity (e.g., Asians are stoic, Italians are expressive, etc.).

  c. Patients should be individually assessed to determine cultural influences.

d. Cultural influences can be determined by an individual's socioeconomic status (e.g., blue collar workers report more pain than white collar workers).

33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem?

    a. < 1%

    b. 5 – 15%

    c. 25 - 50%

    d. 75 - 100%

34. The time to peak effect for morphine given IV is:

    a. 15 minutes

    b. 45 minutes

    c. 1 hour

    d. 2 hours

35. The time to peak effect for morphine given orally is:

    a. 5 minutes

    b. 30 minutes

    c. 1 – 2 hours

    d. 3 hours

36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:

    a. Sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued.

    b. Impaired control over drug use, compulsive use, and craving.

    c. The need for higher doses to achieve the same effect.

    d. a and b

37. Which statement is true regarding opioid induced respiratory depression?

    a. More common several nights after surgery due to accumulation of opioid.

    b. Obstructive sleep apnea is an important risk factor.

    c. Occurs more frequently in those already on higher doses of opioids before surgery.

    d. Can be easily assessed using intermittent pulse oximetry.

Case Studies:

Two patient case studies are presented below. For each patient you are asked to make decisions about pain and medication. Please select **one** answer for each question.

38. A Patient A: Andrew is 25 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 = 120/80; HR = 80; R = 18; 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. Select the number that represents your assessment of Andrew's pain.

0   1   2   3   4   5   6   7   8   9   10

No pain/discomfort   Worst Pain/Discomfort

38. B Your assessment above was made two hours after Andrew received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had
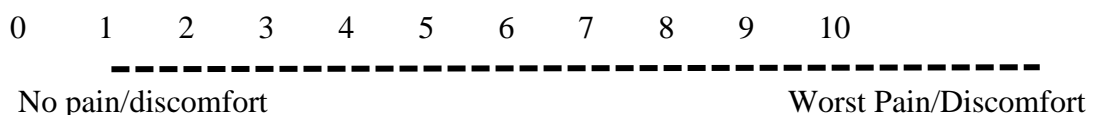
no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you take at this time?

   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

39.A. Patient B: Robert is 25 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 = 120/80; HR = 80; R = 18; 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. Select the number that represents your assessment of Robert's pain:

```
0    1    2    3    4    5    6    7    8    9    10
 ------------------------------------------------
 No pain/discomfort                    Worst Pain/Discomfort
```

39.B Your assessment above is made two hours after Robert received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for

analgesia is "morphine IV 1-3 mg q1h PRN pain relief." What action will you 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 B. Types of Variables

Variable	Type of variable
Gender	Categorical
Age	Continuous
Highest education level achieved	Categorical
Years of experience in nursing	Continuous
Marital status	Categorical
Nationality	Categorical
Number of hours of pain education in the last two years	Categorical
0 hours	
1-2 Hours	
3-5 hours	
6-8 hours	
9 hours or more	

Appendix C. QU-IRB Approval Letter

Qatar University Institutional Review Board QU-IRB
QU-IRB Registration: IRB-QU-2020-006, QU-IRB, Assurance: IRB-A-QU-2019-0009

Dr. Lily O'Hara
College of Health Sciences
Qatar University
Phone: 4403 6018
Email: lohara@qu.edu.qa

Dear Dr Lily O'Hara,

Sub.: Research Ethics Expedited Approval
Project Title: "Nurses' Knowledge and Attitudes about Adult Post-Operative Pain Assessment and Management: analysis of data collected in a study by Hamad Medical Corporation"

We would like to inform you that your application along with the supporting documents provided for the above project, has been reviewed by the QU-IRB, and having met all the requirements, has been granted research ethics **Expedited Approval** based on the following category(ies) listed in the Policies, Regulations and Guidelines provided by MOPH for Research Involving Human Subjects. Your approval is for one year effective from January 3rd, 2021 till January 2nd, 2022.
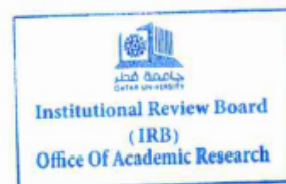
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1) present no more than minimal risk to human subject, and
2) involve only procedures listed in the following category(ies).
Category 7: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Documents Reviewed: QU-IRB Application LOH 3-1-2021, Questionnaire final, MRC-01-20-796-DSA, HMC Research Protocol amended, HMC Research information sheet, HMC amendment approval notice, HMC amendment approval letter, QU-IRB Review Forms, responses to IRB queries and updated documents.

Please note that expedited approvals are valid for a period of **one year** and renewal should be sought one month prior to the expiry date to ensure timely processing and continuity. Moreover, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

Your Research Ethics Expedited Approval Number is: **QU-IRB 1451-EA/21**. Kindly state this number in all your future correspondence to us pertaining to this project. In addition, please submit a closure report to the QU-IRB upon completion of the project.

Best wishes,
Dr. Ahmed Awaisu
Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

Qatar University-Institutional Review Board (QU-IRB), P.O. Box 2713 Doha, Qatar
Tel +974 4403-5307 (GMT +3hrs) email: QU-IRB@qu.edu.qa

Appendix D. Amendment Approval Letter (MRC)

مؤسسة حمد الطبية
Hamad Medical Corporation
HEALTH · EDUCATION · RESEARCH

AMENDMENT APPROVAL LETTER

MEDICAL RESEARCH CENTER

HMC, DOHA-QATAR

Ms. Haya Ahmed Abdul-Fattah Samara	Date:29th October 2020
045827	
Nursing Educator-II (CF)	
Nursing Research	
Hamad Medical Corporation	
Doha-Qatar	
Protocol No:	MRC-01-20-796
Study Title:	Nurses' Knowledge and Attitudes About Adult Post-operative Pain Assessment and Management across HMC in Qatar
Team Member List:	Dr. Lily OHara , Ms. Haya Ahmed Abdul-Fattah Samara
Review Type :	Expedited
Subject:	Amendment 01 Approval

The Medical Research Center hereby acknowledges the Amendment Approval Notice 01 dated 22/10/2020. Please note that your request for amendment have been reviewed and approved.

The requested amendments do not affect the review status of this study and are hence approved based on the justifications provided.

Please always ensure that you are using the stamped approved versions of the documents for your research, These documents are always accessible through Abhath,

We wish you all success and await the results in due course.

Yours sincerely,

Prof. Michael Paul Frenneaux
Chief of Scientific, Academic and Faculty Affairs
Hamad Medical Corporation

Date: 29th October 2020

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