jamk.fi

Kazakhstani nurses' knowledge of pain assessment and management in intensive care unit

Aidana Azhigul

Master's thesis
August 2020
Social services, Health and Sports
Degree Programme in Advanced Nursing Practice

Jyväskylän ammattikorkeakoulu
JAMK University of Applied Sciences

jamk.fi

Description

Author(s)	Type of publication	Date
Azhigul Aidana	Master's thesis	August 2020
		Language of publication: English
	Number of pages 43	Permission for web publication: x

Title of publication

Kazakhstani nurses' knowledge of pain assessment and management in intensive care unit

Degree programme

Degree Programme in Advanced Nursing Practice

Supervisor(s)

Heikkilä Johanna; Ospanova Dinara

Assigned by

Abstract

Background: Understanding pain and knowing how to treat it is an important part of nursing care. Pain requires a regular and reliable assessment for proper treatment. In intensive care units, patients experience critical illnesses and diagnostic and therapeutic interventions. Patients on mechanical ventilation cannot talk about their pain, and therefore, nurses have an important role in the effective assessment and treatment of their pain.

Objective: The purpose of this study was to explore Kazakhstani nurses' knowledge of pain assessment and management in the intensive care unit environment in order to improve the quality of care and pain management.

Methods: This quantitative research was conducted by using a Webropol online survey. The KASRP tool was used for data collection. The sample consisted of 115 nurses. The data were analyzed by using SPSS 26 and descriptive statistics.

Results: The results show that the level of knowledge about pain assessment is low. Nurses' correct responses to pain assessment questions were only 13.9% and 7.8%. Also, 87% of nurses did not know the usual duration of pain relief, 65.2% of nurses used placebo for pain relief, and 90.4% of the respondents mistakenly believed that patients cannot sleep when they are in severe pain.

Conclusion: The results of this study showed a significant lack of knowledge of Kazakhstani intensive care nurses in assessing and managing pain. This low outcome rate may be due to the fact that the nurses interviewed never attended long-term training courses in pain assessment and management. To ensure quality nursing care, intensive care nurses need to be able to assess and manage pain. Further efforts are needed in health care organizations, such as a quality improvement program, which may include various strategies aimed at increasing knowledge and improving pain management practices.

Keywords/tags:

nurse, pain assessment, pain management, intensive care unit, attitude

Miscellaneous (Confidential information)

Contents

Tables

1 Introduction

In intensive care units (ICUs), patients experience critical illness and diagnostic and therapeutic interventions. Patients on mechanical ventilation cannot talk about their pain. Therefore, in nursing, it is very important to evaluate and manage pain. (Gerber, Thevoz & Ramelet 2015.)

Patients are entitled to appropriate assessment and control of pain. Pain assessment can be done by a doctor or trained nurse using pain assessment sheets, depending on the particular patient group. A regular assessment of pain with an assessment of physiological parameters can provide sufficient information to make appropriate changes in inpatient care. In Kazakhstan, after assessing the level of pain, the nurse informs the attending doctor so that they decide on how to treat the pain. (Rules for assessing the level of pain from the "Republican Center for Health Development".)

Nurses' own knowledge and attitudes concerning pain are is an important part of nursing care, and it helps nurses to manage pain in the best possible way (Al-Shaer, Hill & Anderson 2011). Pain is the third most common problem in healthcare, and more debilitating than heart disease and cancer (Downey & Zun 2010). Pain in the intensive care unit is not adequately evaluated and treated in mechanically ventilated patients (Payen, Chanques, Mantz, Hercule, Auriant, Leguillou, Binhas, Genty, Rolland & Bosson 2007). Pain requires a regular and reliable assessment for proper treatment. Nurses have an important place in the effective treatment of pain, so nurses must be able to control and evaluate pain. In addition, nurses should be aware of the epidemiology of pain, the underlying pain mechanisms, and the response and perception of pain by patients. (Twycross, Quinn, Leegaard, Salvetti & Gordon 2018.) Pain is hard to evaluate when patients cannot talk (Gerber et al. 2015).

The knowledge of nurses in assessing and managing pain has been studied in several scientific studies (Issa, Awajeh, Khraisat, Rasheed, Amirah, Hussain & Alharthy 2019; Latina, Mauro, Mitello, D'Angelo, Caputo, Marinis & Baglio 2015; Rose, Smith, Gelinas, Haslam, Dale, Luk, & Watt-Watson 2012). In the fields of intensive, oncology, and postoperative care, there is a lack of special knowledge and the correct attitude to the most effective analgesia, which is an important obstacle. (Moceri & Drevdahl

2014; Xue, Schulman-Green, Czaplinski, Harris & McCorkle 2007). Regular pain assessment is an important component to ensure effective pain management. Evidence-informed practice is a key component in improving patient outcomes and clinical practice while ensuring high-quality, cost-effective care. (Prasun 2013.)

A study by Mueller, Tinguely, Tevaearai, Revelly, Chioléro and von Segesser (2000) shows that for cardiac patients, pain is caused by incisions in the surgical area, chest tubes, multiple intravascular cannulations, and invasive procedures. Patients who underwent heart surgery feel the intensity of pain on the sternum, and the pain decreases only on the second and third days after the operation. (Mueller et al. 2000.) Any surgical intervention is associated with the patient's perception of pain. Postoperative pain of cardiac surgery patients occurs due to intraoperative tissue damage. Accordingly, this pain is of high intensity, proportional to the type of procedure. Poorly effective analgesic therapy can cause significant upset, which is dangerous for the patient. (Zubrzycki, Liebold, Skrabal, Reinelt, Ziegler, Perdas & Zubrzycka 2018.)

Therefore, the purpose of this study is to study the knowledge of Kazakhstani nurses in the assessment and management of pain in the ICU in order to improve the quality of care and pain management. The target audience of this study are nurses practicing in the intensive care unit.

2 Pain and assessing pain in intensive care unit

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”. Furthermore, it is noted that “The inability to communicate verbally does not negate the possibility that an individual is experiencing pain and is in need of appropriate pain-relieving treatment”. Accordingly, pain is that experience we associate with actual or potential tissue damage. (International Association for the Study of Pain 1994.)

Pain in the ICU was associated with a number of adverse outcomes, such as an increase in the incidence of infections, prolonged mechanical ventilation, hemodynamic disturbances, delirium and weakened immunity (Georgiou,

Hadjibalassi, Lambrinou, Andreou & Papathanassoglou 2015). In the intensive care unit, patients express pain through behavioral reactions when turning, tracheal sanitation, central venous catheter insertion and wound care. The use of behavioral activities helps to effectively choose a method to reduce the degree of pain in patients. (Puntillo, Morris, Thompson, Stanik-Hutt, White & Wild 2004.) An important step in the treatment of pain is the diagnosis and assessment of pain, that is, a reliable pain assessment tool is needed to adequately treat pain. This helps to make the right decision in pain management. (Deldar, Froutan & Ebadi 2018.) There are enough guidelines that include guidelines and recommendations for assessing pain, but nurses do not use existing pain management tools (Rose et al. 2012).

High incidence of pain has been associated with bleeding, tachycardia, pulmonary complications, and increased stress response during thromboembolic complications. Poor treatment of pain in the ICU is a serious problem. An adequate assessment and treatment of pain improves the well-being of patients, reduces the length of stay in intensive care, reduces the duration of mechanical ventilation, and affects the quality of sleep. (Malchow & Black 2008.) But using too much analgesia can delay disconnection from the ventilator and complicate the assessment of neurological status and can cause cardiovascular instability. According to recommendations by Barr and colleagues (2013), pain in the ICU should be evaluated regularly in all patients. (Barr et al. 2013.)

According to Gelinas (2007), ventilated cardiac surgery patients in the intensive care unit responded to an endotracheal tube to report pain and discomfort. In addition, patients in intensive care waited a considerable time until the nurse asked them about their pain. To reduce patient suffering, nurses need to understand that they play an important role in regularly assessing and identifying patient pain. (Gelinas 2007.)

According to Bourbonnais, Malone-Tucker and Dalton-Kischel (2016), an important first step in the fight against pain is to evaluate the pain. In ICUs, many patients have difficulty transmitting pain due to mechanical ventilation. The use of behavioral pain measures is required for non-communicative critically ill patients. Pain monitoring tools are important, and they help the nurse in the intensive care unit to document the pain assessment. (Bourbonnais, Malone-Tucker & Dalton-Kischel 2016.)

In their study, Melia and colleagues (2019) conducted an audit to see how staff in the ICU completed the pain assessment tools that they already had and reported. The pain was assessed inadequately, and this is associated with the absence of a previous pain assessment or the previous assessment was equal to 0. Also, the pain assessment is not entirely consistent with the management and reassessment of patient pain. According to Melia and colleagues (2019), previous inadequate assessment of pain lead to the event, where the nurses did not conduct a reassessment of pain, and therefore they could not know whether the patient needed pain relief, nor if the previously given analgesia had been effective. In addition, inadequate control or lack of pain assessment affects the patient, prolonging the patient's stay in the intensive care unit. (Melia et al. 2019.) Pain in intensive care is not always adequately evaluated; as a result, resuscitated patients are at risk of irreversible pain, and this can lead to significant problems and stress (Barr et al. 2013; Gelinas 2007).

Evaluating pain is the main action to effectively manage pain. The Behavioral Pain Scale (BPS), Critical Care Pain Observation Tool (CPOT), and Adult Nonverbal Pain Scale (NVPS) are reliable tools for assessing pain in patients in the intensive care unit. (Pudas-Tähkä, Axelin, Aantaa, Lund, & Salanterä 2014.) Gelinas and colleagues (2006) developed a tool for monitoring intense pain called The Critical Care Pain Observation Tool (CPOT). The instrumentation of CPOT is designed to assess the pain of patients in the intensive care unit. Despite the level of consciousness, patients in serious condition in intensive care react to pain showing different behaviors. Patients are evaluated in each section from 0 to 2, giving a total score of 0 (no pain) to 8 (maximum pain). The CPOT tool was designed to monitor intense pain and consists of four sections: (a) facial expression, (b) body movement, (c) muscle tension, and (d) compliance with a ventilator for intubated patients or vocalization for non-intubated patients. All these indicators are evaluated when observing the patient. (Gelinas et al. 2006.) Gélinas, Arbor, Michaud, Vaillant and Desjardins (2011) studied the implementation of the (CPOT) for evaluating and treating pain in the ICU for nonverbal critical patients. As a result, CPOT was successfully implemented and had a good impact on the practice of nurses in evaluating and treating pain in intensive care. (Gélinas et al. 2011.) According to Phillips, Kuruvilla and Bailey (2018), the

introduction of CPOT in the ICU has led to frequent pain assessments. In addition, observational scores have increased, including CPOT for non-infectious patients. Nurses confidently determined the pain of patients, which reduces the adverse consequences for patients. (Phillips et al. 2018.) Nurses learned well to apply CPOT in the implementation study Gélinas et al. 2011 A clinical intensive care audit was conducted in the United Kingdom to find out if there are any service improvements in the assessment and documentation of patient pain. Pain assessments are usually not documented or performed properly (Melia et al. 2019).

One of the proven and reliable tools for assessing pain for patients unable to talk about their pain on their own is the Behavioral Pain Scale (BPS) (Kotfis, Zegan-Barańska, Szydłowski, Żukowski & Ely 2017). The pain scale was developed by Payen, Bru, Bosson, Lagrasta, Novel, Deschaux, Lavagne and Jacquot (2001). Payen and colleagues established the validity and reliability of the Behavioral Pain Scale (BPS) for adults with sedation. During the study, nurses performed sequential BPS assessments at standardized times (morning, afternoon, and night). According to the results of the study, the expression of pain can be reliably evaluated using BPS in patients with sedation and on an artificial pulmonary device. Using behavioral activity as a means of determining whether painkillers are needed or the effectiveness of interventions is an important way to ensure patient comfort. The Behavioral Pain Scale (BPS) includes three categories: facial expression, upper limb movement, and compliance with mechanical ventilation. The rating for each category varies from 1 to 4 with a total rating of 3 (no pain) to 12 (most pain). (Payen et al. 2001.) In the intensive care unit, non-intubated patients cannot independently speak of their pain due to delirium. In these intensive care patients, pain can be assessed using the BPS Behavioral Pain Scale, as this tool has good psychometric properties. (Chanques, Payen, Mercier, Lattre, Viel, Jung, Cissé, Lefrant & Jaber 2009.)

The Nonverbal Adult Pain Assessment Scale (NVPS) is a pain assessment tool and consists of five categories: face, activity (movement), guarding, physiological (vital signs), and respiratory (revised version) (Wegman 2005). The first version of the Nonverbal Adult Pain Assessment Scale (NVPS) included four categories. In the scale, assessment points vary from 0 to 2, respectively, and the total number of points is from 0 to 10 points. (Odhner, Wegman, Freeland, Steinmetz & Ingersoll 2003.)

According to a study by Kabes, Graves and Norris (2009), the revised version of NVPS is a reliable surveillance tool in the ICU for patients with mechanical ventilation (Kabes et al. 2009).

A regular assessment of pain intensity leads to improved outcomes and quality of life for patients in the intensive care unit. The optimal and high-quality standard for assessing pain is patient self-report using a visual analogue scale or a numerical rating scale. For patients who cannot report their pain, it is recommended to use CPOT or BPS behavioral scales. (Kotfis et al. 2017.)

A systematic review study by Cade (2008) shows that the pain assessment tools tested in the study recommend an appropriate and systematic approach that improves pain management in the ICU. According to the results of the study, the BPS instrument has good reliability and validity in a significant part of intensive care patients. BPS can improve pain management for patients in the ICU. The Behavioral Pain Scale (BPS), if a pain management protocol is included, improves pain assessment in patients who receive sciatica medication in the intensive care unit. (Cade 2008.) In the ICU, a significant proportion of nurses do not use pain assessment tools for patients who cannot speak. The reason for this is the lack of knowledge of practical recommendations for assessing and anesthetizing pain. (Rose et al. 2012.)

3 Non-pharmacological methods to relieve pain

According to the definition of a Cochrane review by Boldt, Eriks-Hoogland, Brinkhof, Bie and von Elm (2014), non-pharmacological interventions are treatments that do not include drugs or other active substances (Boldt et al. 2014). Non-pharmacological interventions can complement pharmacological interventions and may include other therapeutic actions to treat the symptoms of diseases, including pain (Bausewein, Booth, Gysels & Higginson 2009). Therefore, in normal practice, the use of the non-drug method is a non-drug intervention (Boldt et al. 2014)

In their study, Gélinas and colleagues in their study described nurses and patients regarding beneficial nonpharmacological interventions for treatment. The study showed that of the many non-pharmacological methods, four interventions were

relevant and beneficial. These key interventions include music therapy, distraction, simple massage, and emotional support from the patient's family. These non-drug interventions have reached a unanimous consensus in nurses and patients and, therefore, these interventions are relevant and useful as additional interventions for pharmacological treatment. (Gélinas, Arbour, Michaud, Robar & Côté 2012.)

Boitor and colleagues studied the effects of hand massage on pain in cardiac surgery patients in the intensive care unit. According to the study, after a hand massage, the intensity of pain decreases, and behavioral indicators and muscle tension decrease. (Boitor, Martorella, Arbour, Michaud & Gélinas 2015.) Massage of the hands and feet is a useful and effective method to reduce the level of pain in patients after cesarean section. In addition, massage is easy to use and does not require special skills. (Abbaspoor, Akbari & Najar 2014.)

Music therapy was one of the first non-pharmacological treatments studied for pain in the ICU. According to Henry (1995, as cited by Gélinas et al. 2013), music therapy reduces the intensity of pain and lengthens the period of time before patients need the next dose of analgesics. (Gélinas 2012.)

A study by Khalil (2018) shows the effectiveness of modern non-pharmacological approaches to the treatment of pain in the ICU. The study showed that the main attention of nurses in non-pharmacological methods of treating pain was to place the patient in a comfortable position. Nurses changed the position of patients and used convenient devices for patients. (Khalil 2018.)

Cold is another non-pharmacological treatment for pain, that is, the use of ice. Algafly and colleagues (2007) identified the effects of using cold on nerve conduction speed, pain threshold, and pain tolerance. The study showed that cold treatment has a clinical effect on reducing pain, possibly due to changes in the speed of nerve conduction in the tibial nerve. (Algafly, George & Herrington 2007.)

4 Nurses knowledge on pain management in ICU

The experience of pain is a complex and subjective phenomenon. The goal of pain management is to eliminate significant moments of pain and to provide sufficient

pain relief with minimal side effects. In care, effective pain management requires time, commitment and perseverance. (Latina et al. 2015.) Usually of all medical personnel, nurses spend more time near the patient, so they affect the outcome of effective treatment. Poor education of nurses in pain management is an absolute barrier to adequate pain management. (Latina et al. 2015.)

The Society for Critical Medicine recommends the use of pain, agitation and delirium protocols in the intensive care unit (Rozycki, Jarrell, Kruer, Young & Mendez-Tellez 2017). A study by Becj and Johnson (2008) shows that when correctly implemented, protocols for analgesia, sedation, and delirium can effectively allow ICU nurses to make quality of service decisions regarding sedation and analgesia in the intensive care unit (Beck & Johnson 2008). Pain relievers and sedatives, together with non-pharmacological methods, are part of the treatment to ease anxiety and pain of patients, improve ventilation synchronization, and help with patient care by keeping in touch with the patient. Excitation and untreated pain in the ICU can have harmful effects. (Barr et al. 2013.) In the ICU, a significant number of patients receive analgesia, as well as sedatives to help withstand uncomfortable nursing interventions and treatments, including mechanical ventilation of the lungs. The International Recommendations for Intensive Care recommend targeted pain management and light sedation. (Barr et al. 2013.) In terms of pain management, the right decision about pain medication plays a significant role. With regard to this situation, it is worthwhile to use pain management algorithms and protocols. (Dehghani, Keikhaei, Yaghoubinia, Keykha & Khoshfetrat 2018.)

Patients who cannot talk about their pain suffer a high risk of underestimation and inadequate treatment of pain. According to the moral, ethical, and professional obligations, nurses of the intensive care unit should protect the interests of patients, especially those patients who cannot talk about their pain. Pain management includes pain identification, a preliminary assessment of the pain, and actions taken to alleviate the pain. (Herr, Coyne, McCaffery, Manworren & Merkel 2011.) Pain management can be easily improved by continuous assessment and by using adequate analgesics. Sex and age do not affect the prevalence of pain, the intensity of pain or pain therapy. (Strohbuecker, Mayer, Evers & Sabatowski 2005.) Pain management is a decisive factor in the patient's recovery, so it's important and

necessary to know what the nurses are doing to relieve the pain of their patients in the ICU (Gosselin, Bourgault, Lavoie, Coleman & Méziat-Burdin 2014).

Research by Pretorius, Searle and Marshall (2015) shows that nurses have poor pharmacological knowledge, especially about opioids, including their use and/or abuse. Pain was considered as a complicating factor in critical illness. Only with a clear assessment of pain can effective management be achieved. (Blenkharn, Faughnan & Morgan 2002.)

According to Shoqirat, Mahasneh, Al-Khawaldeh and Al-Hadid (2018) in pain management, the problem is the poor knowledge and attitude of nurses. Knowledge of pain management and nurse relationships are related to the age of the nurse. Experienced and more educated nurses, compared to other colleagues, are more educated in pain management and have a positive attitude. (Shoqirat et al. 2018.)

A study by Wang and Tsai (2010) shows that the inappropriate knowledge of nurses in the ICU for pain management is mainly related to the level of education of nurses, the clinical competence of nurses, a specific intensive care unit, and hospital accreditation categories. Nurses noted such barriers in the treatment of pain in the ICU as the presence of alcoholism in the patient's history and the absence of a pain assessment form suitable for intensive care patients who cannot report their pain. (Wang & Tsai 2010.)

5 Purpose, Objectives, and Research Questions

The purpose of this study is to explore Kazakhstani nurses' knowledge of pain assessment and management in the intensive care unit environment in order to improve the quality of care and pain management. The objective of this study is to assess Kazakhstani nurses' knowledge of pain assessment and management in the ICU environment.

Research questions:

1. What is the level of knowledge of Kazakhstani nurses' concerning pain assessment in Intensive Care Unit?

2. What kind of knowledge Kazakhstani nurses' have concerning pain management in the Intensive Care Unit?

6 Methodology

6.1 Quantitative Research Approach

In the quantitative method researchers take a systematic, rigorous, and transparent approach to research, discovery, validation, and understanding (Topping 2015, 163). Quantitative research uses evidence-gathering methods that can be converted into numerical data and are based on a positivist position. Quantitative data can be statistically processed to confirm or refute underlying hypotheses or to investigate a problem. The results can be used to predict or indicate trends. The goal is to assure the researcher that any results are valid and reliable. The accuracy of the tools used to measure what is being investigated and their ability to reproduce results is fundamental to the ability to conduct quantitative research. Also, through quantitative research, researchers can compare, validate and question existing results. Another feature of quantitative research is that it seeks objectivity. No matter how well-designed a study is, the research tool may be reliable but it will not produce reliable results. This means that sometimes a study can measure something without answering research questions. It can therefore be more difficult to establish with evidence that the results are facts or truth about something than to construct an approach to measuring the phenomenon under study or part of it. (Topping 2015, 163.) A quantitative method was chosen to study the knowledge of Kazakhstani nurses in assessing and managing pain in the intensive care unit. The researcher is convinced that the chosen method will give reliable and accurate results about the knowledge of Kazakhstani nurses. In addition, the quantitative method will achieve the stated goal of the study.

The quantitative approach of the study produces clear and concrete results. The quantitative research method contains strategies for a representative sample to ensure that what was identified in the research sample was the same as in the broader target population to which the research results are intended to apply. This provision is fundamental to quantitative research, i.e. to obtain representative

samples for the target population. (Salway & Ellison 2015, 65.) Therefore, a quantitative method was chosen for this work to study the current state of knowledge of nurses in assessing and managing pain.

Descriptive design can be used to develop a theory, identify problems with current practice, and make and determine the judgment that they do in other similar situations. In the study, the variables remain unchanged. (Burns & Grove 2005, 232.) Descriptive design is used in research, which mainly requires information in a specific area about specific characteristics by providing a picture of the phenomenon in certain situations. These plans describe variables to answer a research question, but there is no intention of establishing a causal relationship. A descriptive design can be used to find problems with current practice, to argue current practice, to make judgments, or to determine what other experts are doing in similar situations, or to develop theories. Descriptive design involves collecting materials from a representative sample of the population. A comparative descriptive study is designed to describe the variables, as well as the differences between two or more groups, to see if there are differences between them. Descriptive statistics can be used to analyze differences. (Brink, Walt, Rensburg 2018, 96-97.) By describing the results of this study, it is possible to identify existing problems associated with the assessment and management of pain in Kazakhstan nurses. Also, according to the description of the results, recommendations are made to improve the quality of the nurse's work in the intensive care unit.

6.2 Data Collection instrument

Surveys allow us to collect data and draw conclusions about a wider population when the data are obtained from an appropriate sample of the population being studied. (Jones & Rattray 2015, 413.) The purpose of the survey is to measure attitudes, knowledge and how to collect information accurately. A descriptive survey is conducted to describe the population, and to examine relationships between variables. (Bowling 2014, 215.) The survey method collects data for the self-report, which would be difficult to collect in any other way (Jones & Rattray 2015, 414).

For this research the questionnaire was chosen as a method of information on nurses' knowledge of the intensive care unit on pain management and assessment. The main advantages are that questionnaires tend to be filled in relatively quickly, are reasonably inexpensive to produce, and are usually easy to analyze (Jones & Rattray 2015, 414).

In order to find a suitable tool to answer all research questions, various tools regarding nurses' knowledge of pain were analyzed. The literature was searched using the CINAHL database to determine the appropriate tool. There are many studies that evaluated nurses' knowledge and pain management skills in the intensive care unit using the KASRP questionnaire. This questionnaire was used to assess the knowledge and attitudes of nurses in the ICU to assessment and pain management (Issa et al. 2019). The tool was also used to assess sustainable practical improvements in nursing assessment and pain management (Allen,Williams, Jennings, Stomski, Goucke, Toye, Slatyer, Clarke & McCullough 2018). Francis and Fitzpatrick's research (2013) shows that the Knowledge and Attitudes Survey Regarding Pain tool was used to determine nurses' knowledge and attitudes to postoperative pain and patient experience. The KASRP survey tool was tested for many years by pain experts. (Milagros 2018.) It was used as a pre- and post-test to assess nurses and other health workers in the emergency departments to assess knowledge and attitudes to pain (Al-Hawaldeh, Al-Husam and Darawad, 2013). Pasero and McCaffery (2011 as cited by Milagros et al. 2018) described the value of this tool based on existing pain management standards such as the American Pain Society, the World Health Organization (WHO), and the National Integrated Cancer Guide (Milagros et al. 2018).

The Knowledge and Attitudes Survey Regarding Pain (KASRP) questionnaire was selected for a detailed review of the tools found. The content of the tool is based on current pain standards such as those of the American Pain Society, the World Health Organization and the National Comprehensive Cancer Network Guidelines for Pain Management. The KASRP, developed by Ferrell and McCaffrey (2008), has been used to measure nurses' knowledge and attitudes to pain management in the ICU. Permission to use KASRP was obtained from the developers of the questionnaire Ferrell and McCaffrey.

The KASPR questionnaire consists of 39 questions. With 1-22 questionnaire items are true/false questions, 23-37 are multiple-choice and 38-39 case study items. For this study, 7 items that did not fit the goals and issues of the study were excluded. These include questions related to children (2, 12) and questions regarding pain in cancer (5, 23, 25, 28, 30). The study used 32 items paragraphs of the original questionnaire. The results section describes the following items: attitude to pain (3, 4, 11, 13, 14, 15, 17, 27, 29, 31, 32, 33, 36); issues related to pain assessment (38, 39); pain management (1, 6, 7, 8, 9, 10, 16, 18, 19, 20, 21, 22, 24, 26, 34, 35, 37).

The questionnaire also included demographic questions, among others: 1) gender, 2) age, 3) place of employment, 4) level of education, 5) work experience, 6) length of service in the intensive care unit, 7) professional category, and 8) employment status. The questionnaire in this study includes 40 questions: 8 demographic questions and 32 questions of the KASRP questionnaire.

The adoption of an existing questionnaire or the formation of a new questionnaire is important for methodological rigor. Assimilating the questionnaire development process is important so that the researcher can understand the quality of the survey questionnaire. For nurses, it is important to understand the theoretical issues that are involved in questionnaire development so that nurses can interpret the results. The widely used questionnaire has good psychometric characteristics. The questionnaire should measure what the researcher is going to measure. This is called validation. (Jones & Rattray 2015, 417).

The questionnaire was translated and adapted so that the tool was equally natural and acceptable for similar functions. Emphasis was also placed on intercultural and conceptual equivalence. For the Knowledge and Attitudes towards Pain questionnaire to be an effective and useful tool for international research, it must be suitable for each cultural, linguistic and ethnic group being studied; it should take into account the same concepts in other languages and demonstrate conceptual and substantive equivalence, cultural significance, acceptability and psychometric comparability, allowing for the aggregation of data and comparison of results across countries. This requires the linguistic testing of language translations and the cross-cultural adaptation of the Knowledge and Attitudes towards Pain questionnaire for use in groups and cultures not represented in the development process. The

linguistic translation and validation process is necessary to ensure that the translated versions of the KASRP questionnaire contain conceptual, semantic and pragmatic equivalents to the original version, and that the translated content is culturally acceptable, relevant and relevant in Kazakhstan. The translation was done in accordance with the WHO guidance on process of translation and adaptation of instruments (2019).

The team consisted of a researcher and a professional translator with a medical background, as well as a leader who led the translation process (the process of translating and adapting tools). The purpose of the KASRP questionnaire translation is to obtain different language versions of the original questionnaire that are understandable and expressed in Kazakh and Russian. Each language version must be culturally significant, and acceptable and understandable to the population of Kazakhstan. The translation process consists of two stages: direct translation and expert group. The direct translation and was done by a researcher and a professional translator with medical education. In the process of translation, it is important to receive not a literal translation, but a translation that conveys the full meaning of the original questionnaire. The questionnaire has been translated into a simple and understandable language. The translation of the questionnaire into Kazakh and Russian does not contain unclear and offensive terms for the target audience. The expert group is also an important point in the translation process. The experts were the scientific supervisor and professional translator. At this stage, inappropriate expressions and any inconsistencies between direct translation and existing or comparable previous versions of the questions, if any, were identified and corrected. We compared two versions of the translation and created one version of the translation. After a direct translation and the verification process by experts, the tool is translated back into English by a professional translator. The reverse translation is limited to certain elements. Some words and phrases of the original instrument in English are not understood by the Kazakh culture. These words and phrases were discussed and reviewed by the leader. Some words were adapted to the Kazakh culture, so that nurses would understand when answering the questionnaire. The translation process resulted in the creation of a fully translated questionnaire.

6.3 Ethical Issues of the Research

Before beginning a study, the study protocol must be sent to the appropriate ethics committee for review, comment, recommendations, and approval (Jones & Rattray 2015, 422). The protocol should cover the ethical aspects of the study and contain information on how the principles of this Declaration are applied (World Medical Association Declaration of Helsinki 2013). Ethical considerations in this study were consistent with the Helsinki Declaration on Human Research. Ethical approval for the study was obtained by the local ethics committee of the Kazakh Medical University of Continuing Education.

After the approval of the study plan, cover letters were sent to the head and senior nurses of the intensive care unit in fourteen cardiac surgical centers of Kazakhstan. After the medical centers agreed to help, a link to the questionnaire was sent to nurses. The informed consent (Appendix 1), which was sent along with the questionnaire, indicated that the informed consent is expected when the questionnaire is completed and returned. Contact details of the researcher and managers were also included if the participants had any questions on the questionnaire. All study participants were provided with specific information about the purpose and progress of the study. In accordance with respect for the participants, all participants make individual decisions and were informed that they have the right to refuse to participate in the study. Respect for participants is based on the belief that everyone has a meaning and the right to respect (Johnson & Long 2015, 32). Participation in this study was voluntary, and participants were guaranteed confidentiality and secure storage of study data. The questionnaire was anonymous, so the results of the survey did not affect their work. From 20 to 25 minutes was enough to answer the questions. Concerning data storage, existing guidelines for the preservation of legislation in the field of research and data protection will be respected (Johnson & Long 2015, 36). Data is stored on the researcher's own computers, to which the researcher has an individual password. The researcher guarantees data security. The SPSS electronic database was located on a password protected computer. Once the study is completed, the data will be destroyed.

6.4 Data Collection

The respondents to this study were nurses of the intensive care unit of fourteen cardiac surgical centers in Kazakhstan. These fourteen cardiac surgery centers (see Table 1) were selected for the following reasons; the location of cardiac surgery centers in different regions of Kazakhstan, so the study will cover all of Kazakhstan; and the cardiosurgical intensive care unit nurse presents the parameters of the general population. An electronic questionnaire was sent to all nurses in the intensive care unit of cardiac surgery centers.

Table 1. List of Cardiac Surgery Centers

1. "National Scientific Cardiac Surgery Center, Nur-Sultan.
2. City Cardiology Center, Almaty.
3. "Regional Cardiac Surgery Center", Karaganda.
4. Regional cardiological center on the basis of ZKGMU named after Marat Ospanov, Aktobe.
5. "Regional cardiological center" Uralsk
6. "Kostanay Regional Hospital," Kostanay.
7. "Multidisciplinary Regional Hospital, Kyzylorda.
8. "City Cardiology Center," Shymkent.
9. "Pavlodar Regional Cardiology Center." Pavlodar.
10. Cardiology Center, Petropavlovsk.
11. "Atyrau Regional Cardiology Center," Atyrau.
12. "Scientific Clinical Center for Cardiac Surgery and Transplantology", Taraz.
13. East Kazakhstan Regional Hospital, Ust-Kamenogorsk
14. Cardiac surgery center in the structure of the "Mangistau Regional Hospital

For each organization, an informed request letter was sent. (Appendix 2) With the permission of the director of the organization and the senior nurse of the intensive care unit, an online survey was conducted with the participation of nurses of this medical organization. The online application was created on the platform of Webropol. The KASRP questionnaire was uploaded to the Webropol electronic platform. The WhatsApp messenger sent a link to the survey to the senior nurse, then to the senior nurse and intensive care unit nurses. The questionnaire contains

an informed letter for each respondent. (Appendix 1) With their informed consent, they can verify the purpose of the survey and the confidentiality of the information they provide.

Certain features are considered when selecting respondents. Exclusion criteria were nurses working in the department of pediatric cardiac surgery. It is important to collect reliable data for the examination so that the results can help improve the quality of care in the intensive care unit. In quantitative studies, the sample size should ensure maximum representativeness of the sample. Often in a quantitative study, the significance level (α) is set at 5%. That is, when the level α is set at 5%, a significant result means that we can be 95% sure that there is a real difference in the population, and there is a 5% chance that the detection was due only to chance. The sample size of the study was calculated using an online calculator that calculates the number of participants with a confidence interval of 95 ± 5% and a reliable interval. (Hunt & Lathlean 2015, 180.) As a result, the required sample size is 118. Electronic questionnaires in Kazakh and Russian were sent to all study participants. Data collection was conducted from February 18 to March 10, 2020 among nurses in the intensive care unit. The number of nurses in the intensive care unit is 170 in the fourteen cardiac surgical centers.

6.5 Data Analysis Method

Data must be encoded in numeric (Walters & Freeman 2015, 494). For each variable, the appropriate types and scales were selected. First, the data should be carefully checked for possible errors and omissions, and, if possible, they should be corrected either by checking the original questionnaire, or by re-measuring the variable. In the data verification process, you should initially verify that the values are logical and that there are no missing or manifestly implausible values. Values should never be removed from the dataset simply because they are higher or lower than would be expected, although the presence of these outgoing values may affect the choice of statistical technique (Walters & Freeman 2015, 493). We asked “how long have you been a nurse?” and “how long have you been in the intensive care unit?”. From the answers we identified seven answers that are logical do not coincide with each other and with age. In five cases, the answers of the respondents were corrected because

despite their young age, they answered that they have many years of work experience. Accordingly, these logical answers do not match their age. In two cases, the respondents' answers were corrected due to the discrepancy between the general work experience and work experience in the ICU. Accordingly, having a few years of general experience, he cannot have many years of experience in intensive care.

The data collected was verified, then encoded and exported from Webropol 3.0 online survey program to SPSS Version 26. Data were analyzed using descriptive statistics. To describe the data, percent, frequency, standard deviation, minimum, maximum, mode, mean, and median were used.

6.6 Validity and reliability

In quantitative research, it is important to determine the reliability and validity of the research. The reliability of the survey tools depends on the quality of the data collection tools. Standardized questionnaires should be used to demonstrate the validity and reliability of the questionnaire. In addition, questionnaires with proven reliability and validity should be used. (Jones & Rattray 2015, 413–415.) The questionnaire should measure what the researcher is going to measure. This is called validation. (Jones & Rattray 2015, 417). The questionnaire has been translated and adapted in such a way that the tool is equally natural and acceptable for similar functions. The translation was done in accordance with the WHO Guidelines for the Translation and Adaptation Process (2019).

The use of the KASRP tool made it possible to obtain conditionally reliable information about the knowledge of Kazakhstani nurses on pain assessment and management. All data are presented in the study results. A sample will be representative if it contains the same proportion of variables as the general population (Hunt & Lathlean 2015, 180). In our case, the sample size was calculated with 95% confidence and reliability. The sample was representative because the measurement for a particular parameter in that sample matches the known measurement for the general population, taking into account the margin of error. That is, the number of intensive care nurses surveyed coincides with the overall

measurement error of the population. Sufficient sampling allows the generalization and communication of the results to a wider audience. Therefore, the results can be generalized for the intensive care of all cardiac surgery centers in Kazakhstan.

In this study, questionnaires were sent via the WhatsApp app. Since Kazakhstani nurses have little experience of participating in participating in research the most convenient and fastest way to distribute the electronic questionnaire was chosen. Many nurses did not have email. During the survey, the nurses faced the problem of the Webropol electronic platform. During the survey, there were nurses who were afraid to answer the questionnaire. They asked questions: will you test our knowledge? and what if we answer incorrectly? In response to the survey, the nurses gave their opinion on the research topic. Despite the active distribution of the electronic questionnaire, many nurses did not respond the first time. Consequently, the researcher sent out questionnaire reminders, after which a significant number of nurses responded to the questionnaire.

The internal consistency of the questionnaire reveals how well related the elements are. An assessment of instrument reliability is achieved using the Cronbach alpha test. Cronbach's alpha (∝) reflects internal consistency, that is, the level of good association of elements with each other and whether the elements measure the same concept or design. The questionnaire is rated as having good internal consistency if ∝ is greater than 0.70 (Macnee & McCabe 2008, according to Jones & Rattray 2015, 416) Based on the reliability ratios of other studies, the KASRP tool is considered to be reasonably reliable. In a study by Issa and others (2019), internal consistency was found to be significant (α r> 0.70) (Issa et al. 2019). Alpha-Cronbach can be presented for the entire questionnaire or separately for each subscale (Jones & Rattray 2015, 416). In this study, alpha-Cronbach presented for 19 dichotomous questions using Kuder Richardson 20. In this study, the Kuder Richardson 20 result is 0.546. Since the KR-20 score does not reach 0.70, the questionnaire does not have very good internal consistency. This questionnaire was used for the first time in Kazakhstan. Although in other studies the questionnaire had good reliability with a Cronbach alpha of 0.7 and above, in this study it measured below.

7 Results

7.1 Demographic data of the respondents

The questionnaire was filled out by 115 nurses of the intensive care units of cardiac surgery centers. Most of the respondents (83.5%) were women. The mean age of the participants was 34.35 years, standard deviation (SD) was 10.73, and range between 20 and 57 years. Most of respondents were between 41–50 years old. One fifth of the respondents (20%) were from Ust-Kamenogorsk, 15 respondents (13%) answered from the Kostanay regional hospital, and from Nur-Sultan 13 (11.3%) respondents answered the questionnaire. There were only a few respondents from Petropavlovsk, Atyrau, and from Uralsk. Of the respondents, the majority (88.7%) had specialized secondary education, 7% had applied undergraduate studies, 4% had academic undergraduate studies, and 1 respondent had a master's degree. Almost two thirds of respondents (62.6%) had experience of working as a nurse up to 10 years. The majority of respondents (75.7%) had experience of the intensive care unit up to 10 years. Among respondents, 34.8% had the highest professional category whereas 44.3% did not have a professional category. Most nurses (93.9%) worked full-time (see Table 1).

Table 2. Sociodemographic and job characteristics of respondents (n = 115)

Variable	Frequency (n)	Percent (%)
Gender		
Female	96	83.5
Male	19	16.5
Age		
20–30	57	49.6
31–40	25	21.7
41–50	20	17.4
51–57	13	11.3
Current workplace		
East Kazakhstan Regional Hospital, Ust-Kamenogorsk	23	20.0
“Kostanay Regional Hospital”, Kostanay	15	13.0
"National Scientific Cardiac Surgery Center, Nur-Sultan	13	11.3
“Multidisciplinary Regional Hospital” Kyzylorda	11	9.6
City Cardiology Center, Almaty	8	7.0
“Pavlodar Regional Cardiology Center” Pavlodar	8	7.0
“Scientific Clinical Center for Cardiac Surgery and Transplantology”, Taraz	8	7.0
Cardiac surgery center in the structure of the "Mangistau Regional Hospital", Aktau	7	6.1
"Regional Cardiac Surgery Center", Karaganda	7	6.1
"City Cardiology Center", Shymkent	5	4.3
Regional cardiological center on the basis of ZKGMU named after Marat Ospanov, Aktobe	5	4.3
“Cardiology Center”, Petropavlovsk	2	1.7
“Atyrau Regional Cardiology Center”, Atyrau	2	1.7
"Regional cardiological center" Uralsk	1	0.9
Level of education		
Mid-Level specialist	102	88.7
Applied bachelor	8	7.0
Academic bachelor	4	3.5
Master’s degree	1	0.9
Work experience as a nurse		
0–4	48	41.7
5–14	46	40
Over 15	21	18.3
Work experience in the intensive care unit		
0–4	48	41.7
5–14	46	40
Over 15	21	18.3
Professional category		
No	51	44.3
Second category	11	9.6
First category	13	11.3
Highest category	40	34.8
Employment status		
Full-time	108	93.9
Part-time	7	6.1

7.2 Kazakhstani Intensive Care Unit nurses' knowledge and attitudes on pain assessment

Table 3 presents the results on the attitude of nurses to pain in the intensive care unit. Majority (88.7%) of the respondents knew the need to adjust the dose in accordance with the individual response of the patient after receiving an initial dose of opioid analgesic. More than half (72.2%) of the respondents knew that analgesics for postoperative pain should be presented around the clock according to a fixed schedule. In addition, 67.8% of nurses were aware that patients require an increase in the dose of pain medication when they experience increased pain. Almost half of the participants (48.7%) in the study believed that patients should be evaluated individually to determine cultural influences. 37.4% of nurses correctly answered that 5–15% of patients who develop pain probably already have a problem of alcohol and/or drug abuse.

However, some answers revealed nurses' incorrect attitude to pain assessment. The items which were most frequently answered incorrectly were the following: Only every tenth nurse (13%) knew that the patient determines the most accurate assessment of the pain intensity of a patient. Most respondents (88.7%) mistakenly thought that when the patient's source of pain is unknown, opioids should not be used during the examination for pain, as this may mask the ability to correctly diagnose the cause of the pain. In addition to this, most of the respondents (90.4%) did not know that patients can sleep despite severe pain. Thus, more than half of the respondents showed a low level of attitude to pain assessment in the intensive care unit. (See Table 3).

Table 3. Percentage and frequency of correct answers on nurses' attitudes on pain (n = 115)

Variable	**Correct answers**	
	Frequency (n)	**Percent (%)**
After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. **(True)**	102	88.7
Analgesics for post-operative pain should initially be given: **(Around the clock on a fixed schedule)**	83	72.2

The most likely reason a patient with pain would request increased doses of pain medication is: **(The patient is experiencing increased pain)**	78	67.8
Patients should be encouraged to endure as much pain as possible before using an opioid. **(False)**	78	67.8
Which of the following describes the best approach for cultural considerations in caring for patients in pain: **(Patients should be individually assessed to determine cultural influences)**	56	48.7
Patients' spiritual beliefs may lead them to think pain and suffering are necessary. **(True)**	54	47.0
Patients who can be distracted from pain usually do not have severe pain. **(False)**	45	39.1
How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? **(5-15%)**	43	37.4
Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. **(False)**	40	34.8
Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: **(sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued)**	28	24.3
The most accurate judge of the intensity of the patient's pain is: **(The patient)**	15	13.0
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. **(False)**	13	11.3
Patients may sleep in spite of severe pain. **(True)**	11	9.6

In order to evaluate nurses' knowledge in pain assessment (Appendix 4), two case studies were given, and nurses had to assess the pain and decide on medications. In the first part of the case study, respondents needed to evaluate the pain of the patient. In two cases, the case study informed about 25 year old patients on the first day after surgery on the abdominal cavity. In both cases, the nurse's score shows: BP = 120/80; HR = 80; R= 18.

1. In the case of Andrew, when a nurse comes into his room, he smiles and talks and jokes with a visitor. On a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he estimates his pain as 8.
2. In the case of Robert, when a nurse comes into his room, he lies quietly and frowns, turning in bed. On a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort), he rates his pain as 8.

In the second part of the case study, the respondent needed to make a decision about the drugs. The nurse's pain assessment in the first part was done two hours after the patients received 2 mg IV morphine. In the two cases, half hourly pain

ratings following the injection ranged from 6 to 8, and they had no clinically significant respiratory depression, sedation, or other untoward side effects. Patients rated 2/10 as an acceptable level of pain relief. In both cases, the physician's order for analgesia was "morphine IV 1–3 mg q1h PRN pain relief."

According to answers, nurses showed a low level of knowledge in items of pain assessment in two case studies 16 (13.9%) and 2 (1.7%). The questions regarding the decision on medicines after pain assessment also showed a low level of respondents' knowledge (see Table 4).

Table 4. Case study part, nurses' knowledge of pain assessment (n = 115)

Variable	**Correct answers**	
	Frequency (n)	**Percent (%)**
On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain: **(8)**	16	13.9
Your assessment, above, is made two hours after he 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." Check the action you will take at this time: **(Administer morphine 3 mg IV now)**	10	8.7
On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain: **(8)**	9	7.8
Your assessment, above, is made two hours after he 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." Check the action you will take at this time: **(Administer morphine 3 mg IV now)**	2	1.7

7.3 Kazakhstani nurses' knowledge concerning pain management in Intensive Care Unit

This section of the results describes the data regarding the knowledge of Kazakhstani nurses on pain treatment management in the intensive care unit. Most (89.6%) nurses knew that it is recommended to evaluate sedation during treatment with opioid pain, since excessive sedation with opioids is preceded by respiratory failure. Most (88.7%) of respondents correctly thought that drug/opioid dependence is defined as a chronic neurobiological disease. In addition, 81.7% of nurses correctly noted that benzodiazepines are not effective painkillers and are rarely recommended as part of an analgesic regiment. More than half (78.3%) of nurses knew that the time for intravenous morphine to reach the maximum effect is 15 minutes.

Nurses had several areas where they had serious deficiencies in knowledge about pain management in the intensive care unit. Only every fifth (21.7%) of the respondents knew that vital signs are not always reliable indicators of patient pain intensity. Most respondents (78.3%) did not know the time to achieve the maximum effect of orally administered morphine. 87% of the survey participants did not know the duration of anesthesia of 1–2 mg of intravenous morphine. More than half of the respondents (64.3%) mistakenly thought that opioids cannot be used to treat pain in patients with a history of drug addiction (see Table 5).

Table 5. Nurses' knowledge of pain management (n = 115)

Variable	**Correct answers**	
	Frequency (n)	**Percent (%)**
Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression. **(True)**	103	89.6
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. **(True)**	102	88.7
Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment. **(True)**	94	81.7
The time to peak effect for morphine given IV is: **(15min)**	90	78.3
Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in	86	74.8

better pain control with fewer side effects than using a single analgesic agent. **(True)**		
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. **(True)**	83	72.2
Elderly patients cannot tolerate opioids for pain relief. **(False)**	82	71.3
The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is: **(Intravenous)**	61	53.0
Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. **(True)**	55	47.8
Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. **(False)**	49	42.6
Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO. **(True)**	48	41.7
Opioids should not be used in patients with a history of substance abuse. **(False)**	41	35.7
A 30 mg dose of oral morphine is approximately equivalent to: **(Morphine 10 mg IV)**	33	28.7
Which statement is true regarding opioid induced respiratory depression? **(Obstructive sleep apnea is an important risk factor)**	26	22.6
Vital signs are always reliable indicators of the intensity of a patient's pain. **(False)**	25	21.7
The time to peak effect for morphine given orally is: **(1-2 hours)**	25	21.7
The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours. (**False)**	15	13.0

8 Discussion

The purpose of this study was to examine the knowledge of Kazakhstani nurses in assessing and managing the treatment of pain in the ICU in order to improve the quality of nursing care and pain management. The goal was achieved by examining the level of knowledge of intensive care nurses in assessing and managing pain. To achieve this, the KASRP tool was selected. This study was the first to examine the knowledge of nurses in assessing and managing pain in the intensive care unit in the Republic of Kazakhstan.

Firstly, regarding the first question of the study, it was found that Kazakhstani nurses showed a low knowledge of pain assessment. In case studies of pain assessment, nurses showed poor results in two cases. (See Table 4). These results support the

findings of Albaqawi, Maude, and Shawhan-Akl (2016) that nurses lack knowledge regarding pain assessment. Also, the low score in relation to the assessment of pain in a smiling patient is consistent with Zuazua-Rico, Maestro-González, Mosteiro-Díaz, and Fernández-Garrido (2019). It is also surprising that 87% of intensive care nurses believed that the most accurate estimate of the patient's pain intensity is determined by the attending physician and the patient's primary nurse, and not by the patient himself. These results differ from the results of the study by Yava, Çicek, Tosun, Özcan, Yildiz, and Dizer (2013), where a large number (76.4%) of the nurses answered correctly. The reasons for the lack of knowledge on pain assessment are a problem and are for discussion. In addition, Mackintosh-Franklin (2017) argues that there is a strong argument for a general lack of interest in pain and alleviation of suffering on the part of nurses since in studies nurses have expressed a lack of emotional interest in pain, instead they perceive pain as a natural part of a person's state (Mackintosh-Franklin 2017).

The most interesting result was that the majority (78.3) of intensive care nurses erroneously consider reliable indicators of patient pain to be the intensity of vital signs. Khalil (2019) also reported this in his study that 45% of nurses mistakenly believed that vital signs were always reliable indicators of pain intensity in patients. Nurses' confidence that changes in vital signs are an accurate reflection of patient pain is an obstacle to accurate pain assessment. If pain assessment and management skills based on scientific knowledge and research are systematically used in caring for patients, then patients can receive effective pain treatment, which, in turn, can protect against stress and dissatisfaction with patient care (Rahimi-Madiseh, Tavakol & Dennick 2010).

Secondly, with regard to the second research question, the results of this study show a low level of nursing knowledge about the use of opioids. This is a concern, as nurses play an important role in the treatment of pain. Also, the low score on opioid use is confirmed by Woldehaimanot and colleagues (2014), that nurses demonstrated delusions and lack of knowledge in many areas of basic pharmacological knowledge that are related to the effects of drugs, routes of administration, and use of opioids. (Woldehaimanot, Saketa, Zeleke, Gesesew & Woldeyohanes 2014.) Health professionals should be aware of pharmacological

approaches, but this turned out to be another area of nursing knowledge shortage. (Albaqawi, Maude & Shawhan-Akl 2016)

According to the results, 87% of nurses do not know the usual duration of analgesia for 1–2 mg of intravenous morphine. Another important finding was that 88.7% of intensive care nurses mistakenly believe that if the patient's source of pain is unknown, opioids should not be used during the pain assessment period, as this may mask the ability to correctly diagnose the cause of the pain. This was also reported by Issa and colleagues (2017) that nurses agree to keep patients in pain if the source of pain is unknown. These findings are alarming because intensive care unit nurses need to know that in order to determine the source of pain, there is no need to keep patients in pain. Also, one unexpected discovery was that more than half (64.3%) of the respondents believed that opioids should not be used in patients with a history of drug addiction, even if they experience pain. This conclusion is consistent with research by Issa, Awaje, and Khraisat (2017) which found that 71% of nurses in the intensive care unit believe that patients with a history of substance abuse should not use opioids. These answers from intensive care nurses may deprive some patients of their right to be free from pain. Despite the low level of knowledge about the use of opioids, in this study, nurses showed good results on the assessment of sedation during treatment of opioid pain, opioid dependence, and on the correction of the subsequent dose after the initial dose.

Third, it was found that 65.2% of nurses reported using a placebo as a pain reliever, which is an unethical practice for patients suffering from pain. Increased activation of placebo use in an earlier result is confirmed in this study (Issa, Awaje & Khraisat 2017). This study confirms previous observations regarding a lack of knowledge about placebo injections for pain management (Machira, Kariuki & Martindale 2013; Woldehaimanot, Saketa, Zeleke, Gesesew & Woldeyohanes 2014.). Also, this conclusion is consistent with the study by Yava and others (2013), who revealed inadequate nursing about the place of placebo when determining whether the pain is real. Placebo cannot be used to assess pain, as many patients who have an identifiable physical cause of pain, such as abdominal surgery, receive temporary relief from taking a placebo, so a response to a placebo does not indicate that the

pain is psychogenic or that the patient is simulating or lying down (Mccaffery & Robinson 2002).

Fourth, another important result was that the majority (90.4%) of the respondents in this study mistakenly think that patients cannot sleep when in severe pain. This finding also reflects the work of other researchers who found that, in the opinion of nurses, patients with severe pain cannot sleep or be distracted (Khalil 2019; Wang & Tsai 2010). Also, this result is consistent with the results of Kiekkas, Gardeli, Bakalis, Stefanopoulos, Adamopoulou, Avdulla and Konstantinou (2015), according to which Greek nurses have misconceptions about the ability to sleep. This result is may be due to the fact that nurses do not have enough knowledge about pain assessment. Perhaps these results regarding sleep may lead to proper management of pain in patients.

Fifthly, regarding the attitude of Kazakhstani nurses regarding pain management, this study showed that half (53%) of respondents mistakenly think that patients' spiritual beliefs can make them think that pain and suffering are necessary. This finding is consistent with the results of Khalil (2019) that revealed that 42% of nurses thought that patients' spiritual beliefs may make them think that pain and suffering are necessary. Also, spiritual beliefs about pain are different, and 69% of respondents believed that the patient's spiritual beliefs could influence his/her perception of pain (Albaqawi, Maude & Shawhan-Akl 2016). This study was not able to show a high level of correct answers regarding the spiritual beliefs of patients. According to Yava and colleagues (2013), the majority (80.1%) of Turkish nurses knew that spiritual beliefs could make them think about the pain and suffering being necessary. The treatment should take into account socio-economic, geographical, religious, and ethnic factors, as this affects the attitude and belief of people. Therefore, nurses should be aware of the distinctive cultural characteristics of a person that may affect the process of treating pain and its results. (Narayan 2010.)

This study raised many questions that require further study in the field of pain management during basic and continuing education for nurses. Such a low level of results may be due to the fact that the interviewed nurses never attended long-term training courses in pain assessment and management. As other studies show, educational programs for managing and evaluating pain have been successful in

improving the knowledge and attitudes of nurses in the intensive care unit (Issa, Awajeh, Khraisat, Rasheed, Amirah, Hussain & Alharthy 2019).

9 Conclusion

The results of this study showed a significant lack of knowledge of Kazakhstani intensive care nurses in assessing and managing pain. The knowledge and attitude of nurses in managing pain was poor. This is worrisome as nurses play a key role in assessing and treating pain. These findings are consistent with previously published studies that highlight a significant lack of knowledge and a poor attitude in pain management by nurses. Research contributes to our understanding that there is a knowledge gap in Kazakhstan's nurses.

A serious lack of knowledge and a negative attitude were identified, mainly related to the assessment of pain and the use of analgesics. Also, the results showed that nurses use a placebo as a pain reliever test, which is an unethical practice for patients suffering from pain.

Pain relief is necessary for holistic care, and it is unacceptable to endure ineffective practice among nurses in Kazakhstan or elsewhere. Therefore, these results should be taken into account in nursing education and continuous professional development in order to improve the knowledge and attitude of nurses in pain management, and therefore, their role in pain assessment.

10 Recommendations

To ensure quality nursing care, intensive care nurses need to be able to assess and manage pain. To this end, further efforts should be made in health organizations, such as a quality improvement program, which may include various strategies aimed at increasing knowledge and improving pain management practices. This can be achieved through training and pain management courses.

The results of this study confirmed the need for the development of pain assessment and management courses for medical colleges, university, and postgraduate education. However, it is extremely important and optimal to identify areas of

deficiency in nursing knowledge about pain and its management and to seriously incorporate these areas into nursing education.

Further extensive research is needed on nursing knowledge in relation to pain management and assessment. It is also recommended that studies be carried out after educational pain management training programs. For future research in the field of knowledge of nurses in pain management, it is recommended to conduct a study with a large number of nurses in the intensive care unit in all regions of Kazakhstan.

References

Abbaspoor, Z., Akbari, M., & Najar, S. 2014. Effect of Foot and Hand Massage In Post–Cesarean Section Pain Control: A Randomized Control Trial. *Pain Management Nursing,* 15(1), 132–136. doi:10.1016/j.pmn.2012.07.008

Albaqawi, H., Maude, P., & Shawhan-Akl, L. 2016. Saudi Arabian Nurses' Knowledge and Attitudes Regarding Pain Management: Survey Results Using the KASRP. *International Journal of Health Sciences & Research* https://www.semanticscholar.org/paper/Saudi-Arabian-nurses%27-knowledge-and-attitudes-pain-Albaqawi-Maude/eb532c102d2307c174dcbaa35f24506c12c66b6f

Al Darwish, Z., Hamdi, R., & Fallatah, S. 2016. Evaluation of Pain Assessment Tools in Patients Receiving Mechanical Ventilation. *AACN Advanced Critical Care, 27(2), 162–172.* doi:10.4037/aacnacc2016287

Al-Shaer, D., Hill, D., & Anderson, M. 2011. Nurses' Knowledge and Attitudes Regarding Pain Assessment and Intervention. *MEDSURG Nursing*, 20(1), 7–11. PMID: 21446289

Algafly, A. A., George, K. P., & Herrington, L. 2007. The effect of cryotherapy on nerve conduction velocity, pain threshold and pain tolerance * Commentary. *British Journal of Sports Medicine, 41(6), 365–369.* doi:10.1136/bjsm.2006.031237

Allen, E., Williams, A., Jennings, D., Stomski, N., Goucke, R., Toye, C., Slatyer, S., Clarke, T., & McCullough, K. 2018. Revisiting the Pain Resource Nurse Role in Sustaining Evidence-Based Practice Changes for Pain Assessment and Management. Worldviews on Evidence-Based Nursing, 15(5), 368–376. https://doi:2443/10.1111/wvn.12318

Barr, J., Fraser, G. L., Puntillo, K., Ely, E. W., Gélinas, C., Dasta, J. F., Davidson, J. E., Devlin, J. W., Kress, J. P., Joffe, A. M., Coursin, D. B., Herr, D. L., Tung, A., Robinson, B. R. H., Fontaine, D. K., Ramsay, M. A., Riker, R. R., Sessler, C. N., Pun, B., Skrobik, Y., & Jaeschke, R. 2013. Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit. *Critical Care Medicine*, 41(1), 263–306. doi:10.1097/ccm.0b013e3182783b72

Bausewein, C., Booth, S., Gysels, M., & Higginson, I. J. 2008. Non-pharmacological interventions for breathlessness in advanced stages of malignant and non-malignant diseases. *Cochrane Database of Systematic Reviews*. doi:10.1002/14651858.cd005623.pub2

Beck, L, & Johnson, C. 2008. Implementation of a nurse-driven sedation protocol in the ICU . *Dynamics,* 19(4), 25 – 28 .

Blenkharn, A., Faughnan, S., & Morgan, A. 2002. Developing a pain assessment tool for use by nurses in an adult intensive care unit. *Intensive and Critical Care Nursing*, 18(6), 332–341. doi:10.1016/s0964-3397(02)00071-x

Boitor, M., Martorella, G., Arbour, C., Michaud, C., & Gélinas, C. 2015. Evaluation of the Preliminary Effectiveness of Hand Massage Therapy on Postoperative Pain of Adults in the Intensive Care Unit after Cardiac Surgery: A Pilot Randomized

Controlled Trial*. Pain Management Nursing, 16(3), 354–366.* doi:10.1016/j.pmn.2014.08.014

Boldt, I., Eriks-Hoogland, I., Brinkhof, M. W., de Bie, R., Joggi, D., & von Elm, E. 2014. Non-pharmacological interventions for chronic pain in people with spinal cord injury. *Cochrane Database of Systematic Reviews.* doi:10.1002/14651858.cd009177.pub2

Bourbonnais, F. F., Malone-Tucker, S., & Dalton-Kischel, D. 2016. Intensive care nurses' assessment of pain in patients who are mechanically ventilated: How a pilot study helped to influence practice. *Canadian Journal of Critical Care Nursing*, 27(3), 23–29. Retrieved from PMID: 29461721

Bowling, A. 2014. Research Methods in health: Investigating health and health services. 4th edition. Open university press.

Brink, H., Walt, C., & Rensburg, G. 2018. Fundamentals of Research Methodology for Healthcare Professionals. 4th edition. Juta and Company (Pty) Ltd.

Burns, N., & Grove, S. K. 2005. The practice of nursing research: Conduct, Critique, and Utilization. 5th edition. USA Elsevier.

Cade, C. H. 2008. Clinical tools for the assessment of pain in sedated critically ill adults. *Nursing in Critical Care*, 13(6), 288–297. doi:10.1111/j.1478-5153.2008.00294.x

Chanques, G., Payen, J.-F., Mercier, G., de Lattre, S., Viel, E., Jung, B., Cissé , M., Lefrant, J-Y., & Jaber, S. 2009. Assessing pain in non-intubated critically ill patients unable to self report: an adaptation of the Behavioral Pain Scale*. Intensive Care Medicine, 35(12), 2060–2067.* doi:10.1007/s00134-009-1590-5

Chen, J., Lu, Q., Wu, X.-Y., An, Y.-Z., Zhan, Y.-C., & Zhang, H.-Y. 2016. Reliability and validity of the Chinese version of the behavioral pain scale in intubated and non-intubated critically ill patients: Two cross-sectional studies. *International Journal of Nursing Studies,* 61, 63–71. doi:10.1016/j.ijnurstu.2016.05.013

Dehghani, Z., Keikhaei, A., Yaghoubinia, F., Keykha, A., & Khoshfetrat, M. 2018. Impact of Pain Management Algorithm on Pain Intensity of Patients with Loss of Consciousness Hospitalized in Intensive Care Unit: A Clinical Trial. *Medical-Surgical Nursing Journal,* 7(4), 1–7. DOI :10.5812/msnj.90274

Deldar, K., Froutan, R., & Ebadi, A. 2018. Challenges faced by nurses in using pain assessment scale in patients unable to communicate: a qualitative study. *BMC Nursing*, 17, 1. doi:10.1186/s12912-018-0281-3

Downey, L. V., & Zun, L. 2010. Pain management in the emergency department and its relationship to patient satisfaction. *Journal of Emergencies, Trauma, and Shock,* 3(4), 326. doi:10.4103/0974-2700.70749

Ehieli, E., Yalamuri, S., Brudney, C. S., & Pyati, S. 2016. Analgesia in the surgical intensive care unit. *Postgraduate Medical Journal, 93(1095), 38–45.* doi:10.1136/postgradmedj-2016-134047

Ferrell, B. R., McCaffer, M., Rhiner, M. 1992. Pain and addiction: An urgent need for changing nursing education. *Journal of Pain and Symptom Management*, 7(2): 117-124.

Ferrell, B., & McCaffery, M. 2008. Knowledge and attitudes survey regarding pain. Retrieved on April 12, 2009, from City of Hope Web site: http://prc.coh.org.

Francis, L., & Fitzpatrick, J., J. 2013. Postoperative Pain: Nurses' Knowledge and Patients' Experiences. *Pain Management Nursing*, 14(4), 351–357. DOI: 10.1016/j.pmn.2012.05.002

Gélinas, C. 2007. Management of pain in cardiac surgery ICU patients: Have we improved over time? *Intensive and Critical Care Nursing*, 23(5), 298–303. doi:10.1016/j.iccn.2007.03.002

Gélinas, C., Arbour, C., Michaud, C., Robar, L., & Côté, J. 2012. Patients and ICU nurses' perspectives of non-pharmacological interventions for pain management. *Nursing in Critical Care*, 18(6), 307–318. doi:10.1111/j.1478-5153.2012.00531.x

Gélinas, C., Arbour, C., Michaud, C., Vaillant, F., & Desjardins, S. 2011. Implementation of the critical-care pain observation tool on pain assessment/management nursing practices in an intensive care unit with nonverbal critically ill adults: a before and after study. *International Journal of Nursing Studies, 48(12), 1495–1504.* doi:10.1016/j.ijnurstu.2011.03.012

Gélinas, C., Fillion, L., Puntillo, K.A., Viens, C., Fortier, M. 2006. Validation of the critical-care pain observation tool in adult patients. *American Journal of Critical Care;* 15: 420–427.

Georgiou, E., Hadjibalassi, M., Lambrinou, E., Andreou, P., & Papathanassoglou, E. D. E. 2015. The Impact of Pain Assessment on Critically Ill Patients' Outcomes: A Systematic Review. *BioMed Research International*, 2015, 1–18. doi:10.1155/2015/503830

Gerber, A., Thevoz, A.-L., & Ramelet, A.-S. 2015. Expert clinical reasoning and pain assessment in mechanically ventilated patients: A descriptive study. *Australian Critical Care*, *28*(1), 2–9. DOI: 10.1016/j.aucc.2014.06.002

Gosselin, E., Bourgault, P., Lavoie, S., Coleman, R.-M., & Méziat-Burdin, A. 2014. Development and Validation of an Observation Tool for the Assessment of Nursing Pain Management Practices in Intensive Care Unit in a Standardized Clinical Simulation Setting. *Pain Management Nursing*, 15(4), 720–730. doi:10.1016/j.pmn.2013.05.003

Herr, K., Coyne, P. J., McCaffery, M., Manworren, R., & Merkel, S. 2011. Pain Assessment in the Patient Unable to Self-Report: Position Statement with Clinical Practice Recommendations. *Pain Management Nursing,* 12(4), 230–250. doi:10.1016/j.pmn.2011.10.002

Hunt, K. & Lathlean, J. 2015. Sampling. In: The Research Process in Nursing. Edit. Lathlean, J. & Gerrish, K. Chichester, UK: John Wiley & Sons, Ltd. 173-184

Hweidi, I. M. 2007. Jordanian patients' perception of stressors in critical care units: A questionnaire survey. *International Journal of Nursing Studies*, 44(2), 227–235. doi:10.1016/j.ijnurstu.2005.11.025

International Association for the Study of Pain. 1994. "Part III: Pain Terms, A Current List with Definitions and Notes on Usage" (pp 209-214) Classification of Chronic Pain, Second Edition, IASP Task Force on Taxonomy, edited by H. Merskey and N. Bogduk, IASP Press, Seattle. Retrieved from https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698

Issa, R.M., Awaje, H.A.M., & Khraisat, F. S. 2017. Knowledge and Attitude about Pain and Pain Management among Critical Care Nurses in a Tertiary Hospital. *Journal of Intensive and Critical Care,* 03(01). doi:10.21767/2471-8505.100071

Issa, M. R., Awajeh, A. M., Khraisat, F. S., Rasheed, A. M., Amirah, M. F., Hussain, A., & Alharthy, A. 2019. Impact of an Educational Program on the Knowledge and Attitude About Pain Assessment and Management Among Critical Care Nurses. Dimensions of Critical Care Nursing, 38(5), 271–277. doi:10.1097/dcc.0000000000000375

Johnson, M. & Long, T. 2015. Research Ethics. In: The Research Process in Nursing. 7th edition.Edit. Lathlean, J. & Gerrish, K. Chichester, UK: John Wiley & Sons, Ltd. 31-40.

Jones M. & Rattray, J. 2015. Questionnaire Design. In: The Research Process in Nursing. 7th edition. Edit. Lathlean, J. & Gerrish, K. Chichester, UK: John Wiley & Sons, Ltd. 413- 425.

Kabes, A. M., Graves, J. K., & Norris, J. 2009. Further Validation of the Nonverbal Pain Scale in Intensive Care Patients*. Critical Care Nurse*, 29(1), 59–66. doi:10.4037/ccn2009992

Khalil, N. S. 2018. Critical care nurses' use of non-pharmacological pain management methods in Egypt. *Applied Nursing Research*, *44*, 33–38. DOI: 10.1016/j.apnr.2018.09.001

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.* doi:10.1016/j.pmn.2014.02.002

Kotfis, K., Zegan-Barańska, M., Szydłowski, Ł., Żukowski, M., & Ely, W. E. 2017. Methods of pain assessment in adult intensive care unit patients -- Polish version of the CPOT (Critical Care Pain Observation Tool) and BPS (Behavioral Pain Scale). *Anaesthesiology Intensive Therapy*, 49(1), 66–72. doi:2443/10.5603/AIT.2017.0010

Narayan, M. C. 2010. Culture's Effects on Pain Assessment and Management. *American Journal of Nursing*, 110(4), 38–47. doi:10.1097/01.naj.0000370157.33223.6d

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. DOI: 10.1016/j.pmn.2015.10.002

Malchow, R. J., & Black, I. H. 2008. The evolution of pain management in the critically ill trauma patient: Emerging concepts from the global war on terrorism. *Critical Care Medicine*, 36(Suppl), S346–S357. doi:10.1097/ccm.0b013e31817e2fc9

Machira, G., Kariuki, H., & Martindale, L. 2013. Impact of an educational pain management programme on nurses' pain knowledge and attitudes in Kenya. *International Journal of Palliative Nursing*, 19(7), 341–345. doi:10.12968/ijpn.2013.19.7.341

Mackintosh-Franklin, C. 2017. Pain: A content review of undergraduate pre-registration nurse education in the United Kingdom. *Nurse Education Today*, 48, 84–89. doi:10.1016/j.nedt.2016.08.035

Melia, R., Morrell-Scott, N., & Maine, N. 2019. A review of compliance with pain assessments within a UK ICU. *British Journal of Nursing*, 28(6), 382–386. DOI: 10.12968/bjon.2019.28.6.382

Milagros, T. 2018. Evaluation of Knowledge and Attitudes by HealthCare Providers Regarding Pain in the ED and ICU. *International Journal of Anesthesia and Relaxation,* 2-3, 19-32.

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. doi:10.1016/j.jen.2012.04.014

Mccaffery, M., & Robinson, E. S. 2002. Your patient is in pain — here's how you respond*. Nursing, 32(10), 36–45.* doi:10.1097/00152193-200210000-00042

Mueller, X. M., Tinguely, F., Tevaearai, H. T., Revelly, J.P., Chioléro, R., & von Segesser, L. K. 2000. Pain Location, Distribution, and Intensity After Cardiac Surgery. *Chest, 118(2), 391–396.*doi:10.1378/chest.118.2.391

Odhner, M., Wegman, D., Freeland, N., Steinmetz, A., & Ingersoll, G. L. 2003. Assessing Pain Control in Nonverbal Critically Ill Adults*. Dimensions of Critical Care Nursing, 22(6), 260–267.* doi:10.1097/00003465-200311000-00010

Olsen, B. F., Rustøen, T., Sandvik, L., Miaskowski, C., Jacobsen, M., & Valeberg, B. T. 2015. Implementation of a pain management algorithm in intensive care units and evaluation of nurses' level of adherence with the algorithm. *Heart & Lung: The Journal of Acute and Critical Care*, 44(6), 528–533. doi:10.1016/j.hrtlng.2015.08.001

Payen, J., Bru, O., Bosson, J., Lagrasta, A., Novel, E., Deschaux, I., Lavagne, P., & Jacquot, C. 2001. Assessing pain in critically ill sedated patients by using a behavioral pain scale. *Critical Care Medicine, 29(12), 2258–2263.* doi:10.1097/00003246-200112000-00004

Payen, J.-F., Chanques, G., Mantz, J., Hercule, C., Auriant, I., Leguillou, J.-L., Binhas, M., Genty, C., Rolland, C., & Bosson, J.-L. 2007. Current Practices in Sedation and Analgesia for Mechanically Ventilated Critically Ill Patients. *Anesthesiology*, 106(4), 687–695. doi:10.1097/01.anes.0000264747.09017.da

Phillips, M., Kuruvilla, V., & Bailey, M. 2018. Implementation of the Critical Care Pain Observation Tool increases the frequency of pain assessment for noncommunicative ICU patients*. Australian Critical Care.* doi:10.1016/j.aucc.2018.08.007

Prasun, M. A. 2013. Evidence-based practice. Heart & Lung: *The Journal of Acute and Critical Care*, 42(2), 84. doi:10.1016/j.hrtlng.2012.12.006

Pretorius, A., Searle, J., & Marshall, B. 2015. Barriers and Enablers to Emergency Department Nurses' Management of Patients' Pain. *Pain Management Nursing*, 16(3), 372–379. doi:10.1016/j.pmn.2014.08.015

Process of translation and adaptation of instruments. N.d. Page on the World Health Organization's website. Accessed on 27 February. Retrieved from https://www.who.int/substance_abuse/research_tools/translation/en/

Pudas-Tähkä, S., Axelin, A., Aantaa, R., Lund, V., & Salanterä, S. 2014. Translation and cultural adaptation of an objective pain assessment tool for Finnish ICU patients. *Scandinavian Journal of Caring Sciences,* 28(4), 885–894.

Puntillo, K. A., Morris, A. B., Thompson, C. L., Stanik-Hutt, J., White, C. A., & Wild, L. R. 2004. Pain behaviors observed during six common procedures: Results from Thunder Project II*. Critical Care Medicine, 32(2), 421–427.* doi:10.1097/01.ccm.0000108875.35298.d2

Puntillo, K., Pasero, C., Li, D., Mularski, R. A., Grap, M. J., Erstad, B. L., & Sessler, C. N. 2009. Evaluation of Pain in ICU Patients*. Chest, 135(4), 1069–1074.* doi:10.1378/chest.08-2369

Rahimi-Madiseh, M., Tavakol, M., & Dennick, R. 2010. A quantitative study of Iranian nursing students' knowledge and attitudes towards pain: Implication for education. *International Journal of Nursing Practice*, 16(5), 478–483.doi:10.1111/j.1440-172x.2010.01872.x

Rose, L., Smith, O., Gelinas, C., Haslam, L., Dale, C., Luk, E., & Watt-Watson, J. 2012. Critical Care Nurses' Pain Assessment and Management Practices: A Survey in Canada. *American Journal of Critical Care*, 21(4), 251–259. doi:10.4037/ajcc2012611

Rozycki, A., Jarrell, A. S., Kruer, R. M., Young, S., & Mendez-Tellez, P. A. 2017. Feasibility of a Nurse-Managed Pain, Agitation, and Delirium Protocol in the Surgical Intensive Care Unit. *Critical Care Nurse,* 37(6), 24–34. doi:10.4037/ccn2017528

Rules for assessing the level of pain from the "Republican Center for Health Development". №79 document. Available from: http://www.rcrz.kz/index.php/ru/glavnaya/22-informatsiya/1386-tipovye-pravila-standartnykh-operatsionnykh-protsedur-dlya-statsionarov

Salway, S. & Ellison, G. 2015. Research for a Multiethnic Society. In: The Research Process in Nursing. 7th edition. Edit. Lathlean, J. & Gerrish, K. Chichester, UK: John Wiley & Sons, Ltd. 57-69.

Shoqirat, N., Mahasneh, D., Al-Khawaldeh, O., & Al Hadid, L. 2018. Nurses' Knowledge, Attitudes, and Barriers Toward Pain Management Among Postoperative Patients in Jordan. *Journal of PeriAnesthesia* Nursing. doi:10.1016/j.jopan.2018.05.012

Strohbuecker, B., Mayer, H., Evers, G. C. M., & Sabatowski, R. 2005. Pain Prevalence in Hospitalized Patients in a German University Teaching Hospital. *Journal of Pain and Symptom Management,* 29(5), 498–506.doi:10.1016/j.jpainsymman.2004.08.012

Topping, A. 2015. The Quantitative-Qualitative Continuum. In: The Research Process in Nursing. 7th edition. Edit. Lathlean, J. & Gerrish, K. Chichester, UK: John Wiley & Sons, Ltd. 159- 171.

Twycross, A., Quinn, R., Leegaard, M., Salvetti, M., & Gordon, G. 2018. IASP Curriculum Outline on Pain for Nursing. Available from: https://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2052 [cited 9 may 2020]

Wang, H.L., & Tsai, Y.F. 2010. Nurses' knowledge and barriers regarding pain management in intensive care units. *Journal of Clinical Nursing*, 19(21-22), 3188–3196. doi:10.1111/j.1365-2702.2010.03226.x

Wegman, D., A. 2005. Tool for pain assessment. *Critical Care Nurse* 25: 14– 15. https://doi.org/10.4037/ccn2005.25.1.14-a

World Health Organization 2019. Process of translation and adaptation of instruments. https://www.who.int/substance_abuse/research_tools/translation/en/

World Medical Association Declaration of Helsinki. 2013. *JAMA, 310(20), 2191.* doi:10.1001/jama.2013.281053

Woldehaimanot, T. E., Saketa, Y. J., Zeleke, A. M., Gesesew, H. A., & Woldeyohanes, T.R. 2014. Pain knowledge and attitude: a survey among nurses in 23 health institutions in Western Ethiopia. *Gaziantep Medical Journal*. 0(3):254-260. DOI: 10.5455/GMJ-30-157196

Xue, Y., Schulman-Green, D., Czaplinski, C., Harris, D., & McCorkle, R. 2007. Pain Attitudes and Knowledge Among RNs, Pharmacists, and Physicians on an Inpatient Oncology Service. *Clinical Journal of Oncology Nursing*, 11(5), 687–695. doi:10.1188/07.cjon.687-695

Yaqoob, S. H., & Nasaif, H. A. 2015. Nurses' knowledge and attitudes toward pain assessment and management for adult sickle cell disease patients during sickling crisis. *Clinical Nursing Studies*, 3(4). doi:10.5430/cns.v3n4p36

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), 494–505.

Zuazua-Rico, D., Maestro-González, A., Mosteiro-Díaz, M. P., & Fernández-Garrido, J. (2019). Spanish Version of the Knowledge and Attitudes Survey Regarding Pain*. Pain Management Nursing.* doi:10.1016/j.pmn.2018.12.007

Zubrzycki, M., Liebold, A., Skrabal, C., Reinelt, H., Ziegler, M., Perdas, E., & Zubrzycka, M. 2018. Assessment and pathophysiology of pain in cardiac surgery*. Journal of Pain Research, Volume 11, 1599–1611.* doi:10.2147/jpr.s162067

Appendices

Appendix 1. Cover letter of the questionnaire

Dear nurse,

The purpose of this study is to study the knowledge of Kazakhstani nurses in assessing and treating pain in intensive care settings. It is important to obtain information on the knowledge of intensive care nurses in management and pain assessment to improve the quality of care in nursing and continuing education. The study aims to assess the knowledge of Kazakhstani nurses in assessing and treating pain in an intensive care environment. I would like to ask your consent to study your knowledge of pain management and assessment. Participation in the study is completely voluntary, and refusal will in no way affect you. A survey of nurses does not affect their work or lifestyle. All data received is confidential, and data is collected anonymously. The research material will be supplemented by a questionnaire. I ask you to answer the questionnaire. The questionnaire is held in electronic format, where nurses answer each question individually, which takes 20-25 minutes. With the help of the questionnaire, we want to receive information about the knowledge of nurses in assessing and managing pain in the intensive care unit. Research materials collected from nurses are classified according to a special program, so the information of one nurse is not visible at any time. The training material is on the computer, only the researcher has a password. The researcher agrees to abide by the current guidelines for the preservation of research materials and data protection laws. Based on the results of the study, master thesis will be prepared and articles published in scientific journals. Study material will be removed properly after the study is completed

Sincerely,

Azhigul Aidana, Master Degree student
e-mail:
Tel:

Supervisors:

Johanna Heikkilä, PhD
e-mail:
JAMK
Tel:

Dinara Ospanova, PhD
e-mail:
University of KazMUCE
Tel:

Appendix 2. Informed consent

Dear, full name!

The administration of Kazakh Medical University of Continuing Education JSC asks for your assistance in conducting a master's study on the topic: “Kazakh nurses’ knowledge of pain assessment and management in ICU” based on your medical organization. This study is carried out as part of a two-degree Kazakh-Finnish magistracy in the specialty "Nursing".

Objective: The purpose of this study is to explore Kazakh nurses’ knowledge of pain assessment and management in ICU environment in order to improve quality of care. The knowledge gained can be used to improve the quality of medical care in intensive care units.

To conduct a study, an online survey of nurses in the intensive care unit of your medical organization, which will be conducted by undergraduate, is necessary. The study is carried out on several bases, processing the data without specifying a medical organization. The results of the study will be preliminary available.

Sincerely,

Azhigul Aidana, Master Degree student

e-mail:

Tel:

Supervisors:

Johanna Heikkilä, PhD

e-mail:

Dinara Ospanova, PhD

e-mail:

Tel:

Appendix 3. Questionnaire

1. Gender

   A. Female

   B. Male

2. Age_____.
3. Where do you work? _____.
4. Which your level of education ?
   A. Mid-Level specialist
   B. Applied bachelor
   C. Academic bachelor
   D. Master degree
5. How long have you worked as a nurse? _____.
6. How long have you experienced in the intensive care unit? _____.
7. Do you have professional category?
   A. No
   B. Second category
   C. First category
   D. Highest category
8. Employment status
   A. Full-time
   B. Part-time
   C. Casual