



Pain Management in Acute Care Nursing: A Nursing Perspective

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Abstract

The research has studied the current pain management techniques in acute care nursing and has identified the systemic and individual challenges that nurse face when they deliver patient-centred care. This studied has reviewed 12 peer-reviewed articles which were published between 2014 and 2024 from the database like PubMed, CINAHAL and Medline. These papers have been used to address two research question, the first question was to discuss the current pain management techniques in acute care while the challenges related to pain management in acute care. The PICO framework has been used in this study to synthesise finding from different database.

The key findings showed that pharmacological interventions like the use of fentanyl and morphine is important for acute pain which has been supported by the protocol-driven tools like CPOT and BPS. However, the concerns about opioid dependence and side effects have highlighted the need for balanced approaches. The non-pharmacological strategies like virtual reality, guided imagery and physical comfort measures shows significant potential to lower the intensity of pain and anxiety but due to the institutional and training gaps, the use of such strategies is not common. The multimodal approaches have emerged as the best practice for holistic care as it integrates the methods of non-pharmacological as well as pharmacological. The systemic challenges, psychosocial issues and shortage of knowledge and training have shortage of knowledge and training have seen to compromise and the patient-centred communication and the quality of care.

The study has concluded that effective pain management is required to reform the institutional policies, standardised the training programs and work on interdisciplinary teamwork. It has been recommended to revise those policies that let the nurse make independent decision on the protocol-driven intervention. It is also recommended to invest in virtual reality and digital assessment tools while the cultural competency training should also be included into the curricula. The healthcare system can enhance the quality of outcomes, lower the dependence on opioid and improve the overall well-being of the nurses as soon as the barriers have been addressed.

Keywords: Pain management, acute care nursing, pharmacological interventions, non-pharmacological techniques, systemic barriers, psychosocial issues.

Contents

Abstract.....	2
Chapter 1: Introduction	6
1.1 Overview of the Topic	6
1.2 Importance of pain management in acute care.....	6
1.3 Role of nurse in pain management in acute care.....	7
1.4 Nursing perspective on Patient-Centred pain management.....	7
2. Background.....	8
2.1 Prevalence and impact of the acute pain.....	8
2.2 Evolving role of pain management in acute care nursing.....	9
2.3 Barriers of knowledge and resources	10
2.4 Research gap	10
2.5 Significance of the research	11
Chapter 3: Purpose, Aims and Questions.....	11
Chapter 4: Methodology and method.....	12
4.2 Research philosophy.....	12
4.3 Research approach.....	12
4.4 Research method	13
4.5 Research strategy.....	14
4.7 Data collection method	14
Secondary.....	14

PICO framework	15
Data Search	15
Prisma Flow Chart.....	16
Inclusion and Exclusion Criteria	17
4.8 Data analysis	18
Chapter 5: Results	21
5.1 Summary of the selected data	21
5.2 Pain Management Techniques in Acute Care	21
5.2.1 Pharmacological Interventions	22
5.2.2 Non-Pharmacological Interventions	24
5.2.3 Multimodal approaches.....	25
5.3 Challenges related to Pain Management in Acute Care	27
5.3.1 Systemic barriers	27
5.3.2 Knowledge and training shortage.....	28
5.3.3 Psychosocial and workload challenges	30
Chapter 6: Discussion	32
Chapter 7: Ethics and validity.....	35
Chapter 8: Conclusion and recommendations	36
References	40
Appendix	45
Appendix 1: Description of data analysis for research question 1	45

Appendix 2: Description of data analysis for research question 2..... 49

Chapter 1: Introduction

1.1 Overview of the Topic

Pain is a complex experience and one of the most common reasons where patients look for high-quality healthcare services (Meissner et al. 2018). Its effective management is essential to improve the condition of the patients and reduce their sufferings. An acute pain is mainly a sudden and short-term pain which may arise from injury, surgery or any illness while requires an immediate intervention. Its effective management is the responsibility of the nurses in the acute care settings to not only provide the patient comfort but also to prevent future complications associated with the unrelieved pain. The management of pain from a nursing perspective in acute care settings involves a systematic assessment, intervention and evaluation of the pain control measures that make sure the physical as well as emotional well-being of the patients (Nawai, 2019).

1.2 Importance of pain management in acute care

According to the World Health Organisation (WHO), pain is a common symptom of both chronic and acute conditions (WHO, 2023). In the acute care settings, if the pain is not managed properly then it can lead to a series of physiological responses that may complicate the recovery, for example acute pain can trigger stress responses that can increase heart rate, blood pressure and respiratory rates which can result in complications like myocardial ischemia or respiratory disease. It has been observed that effective pain management can improve the overall clinical outcomes, the patients who experience adequate pain control have more chances to participate in rehabilitation which overall reduces the risk of complications like deep vein thrombosis and pneumonia (Rawal, 2016). An effective pain management improves the satisfaction of the patients as highlighted by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) which in turn changes the perception of patients towards pain (Mehta, 2015). The management of pain is essential to address the physiological and emotional aspects of patient care. As pain can be associated with fear, anxiety, and helplessness it often requires a holistic approach by the nurses to improve the physical sensation as well as the emotional impact of the pain. The American Society for Pain Management Nursing shows that pain should be treated as the 'fifth vital sign' which requires constant and systematic assessment (Scher, Meador, Van Cleave and Reid, 2018). Despite its importance, the barriers of pain management include inadequate assessment practices, misconceptions about the pain

as well as its management, and different pain relief treatments provided by the healthcare professionals.

1.3 Role of nurse in pain management in acute care

The nurses are the primary caregivers and have a vital role in acute pain management for those patients who are experiencing pain. Their responsibilities are to assess the pain levels, implementation of the pain control measures, educating the patients about the pain relief options, collaborating with the interdisciplinary teams to develop a comprehensive pain management plans and evaluation of its effectiveness (Glowacki, 2015). The assessment of pain is the first step where the registered nurses utilise various tools like the Numeric Rating Scale or Wong-Baker Faces Pain Rating Scale to quantify the intensity of the pain (Ford, 2024). Apart from the assessment of the pain, nurses also consider the psychological and emotional stage of the patients while the quality, location and duration of the pain is also assessed. Once the pain has been assessed, the nurses are responsible for the implementation of evidence-based interventions which may include non-pharmacological methods like heat/cold therapy, relaxation strategies or distraction techniques. The nurses have the key role to monitor the effectiveness of these interventions and to make necessary adjustments based on the clinical observations and feedback of the patient (Himmelfarb, Commodore-Mensah and Hill, 2016). They also deliver pharmacological pain management interventions in the acute care settings through administration of analgesics like nonsteroidal anti-inflammatory drugs, opioids and local anaesthesia. The nurses understand the pharmacokinetics, appropriate dosage level and potential side effects of these medications so as to administer them safely.

1.4 Nursing perspective on Patient-Centred pain management

From a nursing perspective, effective pain management is more than just clinical practices as it involves patient-centred approach that respect the subjective experience of the pain. The patient-centred care focuses on understanding the values, preferences and specific situations of the patient which lead to more personalised pain management plans (Lin et al. 2020). This approach aligns with the principles of holistic nursing where not only the physical aspect of the pain is addressed but the emotional, psychological and social dimensions are also considered. The nurses have to actively listen and maintain open communication with the patients to implement patient-centred pain management. They create a safe environment where the patients comfortably express their pain experiences and concerns. The patients are also

involved in the decisions regarding their pain management strategies which promotes a healthy environment (Makris, Abrams, Gurland and Reid, 2014). The nurses are trained to recognise that pain is a unique experience which is influenced by the factors like previous pain experiences, cultural beliefs and psychological states. The management of pain in acute care must integrate the nursing model of care which not only address the physical aspect of pain but also considers the spiritual, emotional and social factors. The cultural competence is important in the patient-centred care where the nurses recognise the cultural backgrounds to provide care that respects the values of the patient (Sharp, McAllister and Broadbent, 2016).

2. Background

Acute pain often arises from surgical interventions, traumatic injuries or any medical conditions which requires intensive treatment for recovery and comfort of the patient (Small and Laycock, 2020). It has been seen that pain is the most distressing symptoms reported by the patients in hospital, especially in the acute care environment. This frequent presence of pain in acute care makes it important for the nurses to have comprehensive knowledge and skills required to provide effective and timely relief to the patients. This section will provide a background on the prevalence and impact of pain, the evolution of the pain management and the barriers in the effective pain management in acute care.

2.1 Prevalence and impact of the acute pain

Pain is a prevalent and an undertreated issue in acute care settings which affects millions of people in the world. The studies across healthcare systems have found that up to 70% of the patients in the acute care settings experiences moderate to severe pain at some point during their stay in hospital (Woo, Lee and Tam, 2017). In the surgical and trauma units, the prevalence of acute pain is even higher which means that around 80% of postoperative patients experience significant pain despite the availability of the different pain relief options (Rawal, 2016). The report on acute pain market shows that The United States has the largest market size of acute pain, and it is increasing as compared to Japan, UK, Spain, Germany, Italy and Spain (IMARC, 2023). The below graph shows that from 2020 to 2034 the expected acute pain market size in these seven countries will be increasing.

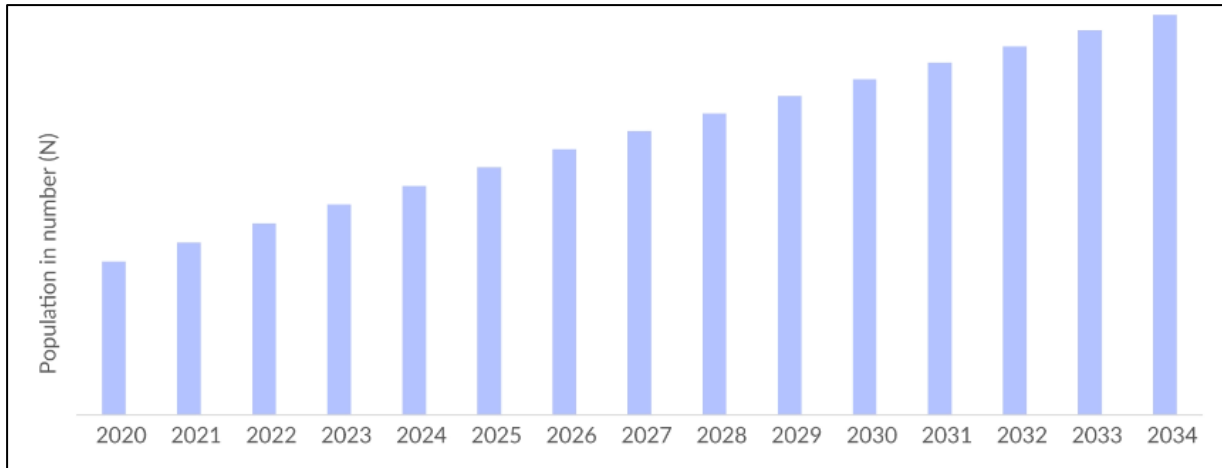


Figure 1: Acute Pain market size from 2020 to 2034

(Delve Insight, 2024)

The impact of unmanaged pain on the patient is significant, for example is acute pain triggers a stress response then it can increase the cortisol levels and heart rates. These stress responses if not managed properly can deteriorate the medical condition of the patient and the recovery would be slow. It has been observed that unmanaged acute pain could prolong the stay in hospitals by 3-4 days on average which results in higher healthcare costs (Miclescu, Butler and Karlsten, 2017). The patient who experiences inadequate pain relief has higher levels of anxiety, depression and stress which can affect their willingness to engage in rehabilitation activities. The higher satisfaction level of patient is a critical metric as it is related to effective pain management. The HCAHPS survey shows that many hospitals use this to evaluate the experience of the patients where they ask specific questions on the pain management (Adams, Bledsoe and Armstrong, 2016). It has been seen that hospitals which has high HCAHPS score often has better reputation as compared to those with poor scores.

2.2 Evolving role of pain management in acute care nursing

The pain management in acute care nursing has evolved significantly over the past years as it has shifted from a medicated focuses approach to a more multimodal approach that include the pharmacologic and non-pharmacologic methods. At first, the acute pain was managed primarily through opioid analgesics but as the concerns about the opioid dependence and its side effects emerged the healthcare providers adopted multimodal approaches towards pain management. This evidence-based approach combines various therapies like non-opioid medications, physical therapy and psychological support to provide a more comprehensive

approach to manage the pain (Hargett, Criswell and Palokas, 2022). The use of non-opioid medications such as acetaminophen, nonsteroidal anti-inflammatory drugs and even some anticonvulsants as well as antidepressants are effective alternatives to opioids. It has been shown that these methods can reduce the requirement of opioid by up to 30% which minimises the risk of adverse effects (Encinosa, Bernard and Selden, 2022). The integration of the technology in pain management has introduced new approaches to pain assessment and treatment, for example the digital assessment tools allow the nurses to monitor the level of pain in real time while the virtual reality and other digital therapies provides non-invasive alternatives that patients can use to manage their pain on their own. It has been found that patients who use virtual reality as part of their pain management has less pain which shows the potential of non-traditional approaches in acute care.

2.3 Barriers of knowledge and resources

Despite the above evolution in the pain management practices, acute care nurses have to face challenges in getting sufficient knowledge and resources to provide comprehensive pain relief. The nurses could not explore the full range of interventions due to the knowledge gap, particularly in the non-pharmacological pain relief techniques and pain assessment methodologies (Mohamed Bayoumi, Khonji and Gabr, 2021). There are many nurses who lack confidence in their training due to which they do not have knowledge about the alternative pain relief methods like guided imagery, relaxation techniques and other non-drug-based options. Due to this knowledge gap, nurses rely more on pharmacological interventions which may not always align with the needs of the patients. The limitation of resources further affects the efforts of pain management in acute care settings (Rawal, 2016). Due to the financial and institutional limitations in non-pharmacological resources the nurses are not able to provide quick care as they may not have access to relaxation facilities or physical therapy tools. The ratio of patient-to-nurse is high in acute care which also limits the time that nurses can spend with each patient, this can result in ineffective pain assessments and treatment. It is important to address these knowledge and resources barrier to deliver high quality care.

2.4 Research gap

There is a gap in comprehensive research which are mainly focused on effective and nurse-driven pain management strategies. The present literature has studies on the pharmacological methods with limited non-pharmacological techniques and multimodal approaches that can

address the pain more holistically. The nurses are responsible for the continuous assessment and management of pain, but many studies have not fully covered all the challenges that nurses faces. Another significant gap is the insufficient focus on the patient-centred care in pain management. The subjective nature of pain is influenced by the factors like psychological state, cultural background and individual pain tolerance so nurses have to modify their interventions as per the patients, however, current research lacks the practical information about the effective incorporation of patient-centred approach within the acute care settings. So, this research aims to examine and describe the current pain management techniques that are used in acute care nursing. The focus will be to identify effective practices and to address the challenges that limits the delivery of high-quality care to fill the literature gap.

2.5 Significance of the research

The study of pain management techniques in acute care nursing holds a substantial significance for patients and in the field of healthcare. Pain is a type of symptom which affect the majority of the patients who are admitted for trauma, sudden illness or surgical recovery. Thus, effective pain management is not only essential to relieve the suffering of the patients but results in fast recovery, reduces the chance of developing chronic pain and improves the overall experience within the healthcare facilities. This research can contribute to improve the patient's outcomes, lower the length of stays in the hospitals, and can decrease the healthcare costs related to any complications from unmanaged pain. The nurses are primary caregivers in acute settings, so their knowledge and application of the pain management strategies have a direct impact on the satisfaction level of the patients (Chi et al. 2020). This study aims to identify the gaps in knowledge and practical application which could guide the nursing for their education, policy improvements, and resource allocation for better pain management practices. This study can inform the development of patient-centred and evidence-based pain management strategies as per the patient's needs, cultural background and safety.

Chapter 3: Purpose, Aims and Questions

Purpose: The purpose of this study is to describe the current pain management techniques in acute care.

Aim: The aim of the study to improve nurses' knowledge and understanding of pain management in an acute care

Research Questions

1. What are the current pain management techniques in acute care?
- 2 What are the challenges related to pain management in acute care?

Chapter 4: Methodology and method

4.2 Research philosophy

The research philosophy which will be used in this study is interpretivism which focuses on the subjective experiences and meaning that an individual experiences related to a situation (Ryan, 2018). This approach is particularly suitable to explore complex topics like pain management in acute care nursing where the perceptions, experiences, and practices of the nurses play a key role. The positivism approach identifies truths through objective measurements while interpretivism focuses on the value of human experience and the social constructs that shapes the behaviours. In this research, interpretivism will provide a framework to understand how acute care nurses perceive pain management, the challenges that they face and the strategies that they utilise. The pain is a subjective phenomenon which varies from person to person and is influenced by emotional, cultural, and situational factors. The approaches of nurses to pain management are also shaped by their training, workplace environment, and their personal experiences. So, interpretivism allows the study to explore such subjective factors of pain management and highlights the diverse perspectives (Alharahsheh and Pius, 2020).

So, with the adoption of interpretivist philosophy the study aims to provide an in-depth analysis of the current pain management techniques and their implications on the nursing practices. This philosophy aligns well with the qualitative methods as it highlights to understand the meaning through thematic pattern.

4.3 Research approach

The study will use an inductive research approach in which the theories are built from the specific data rather than testing the pre-existing theories. The deductive approach starts with a theory and then test it through observation but in inductive approach the new patterns and concepts emerges directly from the data (Kumar and Ujire, 2024). In this study, the inductive

approach will allow the researcher to study the existing literature on the pain management techniques without the predefined theories. The investigators can generate new understanding or identify overlooked factors of pain management with the help of this approach. This approach aligns well with the qualitative nature of the study as it focuses on the subjective experience of the nurses in the acute care settings. The inductive approach is beneficial for this study as it can capture the complex and variability of the nursing practices. This flexibility will ensure that the findings of this research are based on the evidenced based data which makes it highlight relevant (Azungah, 2018).

4.4 Research method

The study will use a qualitative research method which will be suitable to study the complex and subjective experiences like pain management in acute care nursing. The quantitative methods focus on numerical data and statistical analysis while the qualitative methods focus on understanding experiences, perceptions as well as behaviours in natural settings. This approach allows for an in-depth analysis of those factors that influences pain management practices and the challenges which are faced by the nurses in the acute care environments. In this study, the qualitative method has been chosen as it provides a base to examine the multilayered nature of pain management from a nursing perspective. This method considers research studies, reports and journals to understand the patterns and themes of the current pain management techniques as well as their efficacy (Hennink, Hutter and Bailey, 2020). It also helps to understand the subjective experiences of the nurses and enables the researcher to identify the potential areas for improvement in their practice. The qualitative research would be particularly helpful in addressing the aims and research questions of this study as it allows to gather diverse viewpoints and perspectives of different researchers. This method aligns with the interpretivist research philosophy as it focuses on contextual understanding rather than generalised conclusions.

So, with the utilisation of qualitative techniques the study aims to generate detailed findings that can inform nurse education, develop policy, and can help in the implementation of more effective pain management strategies in the acute care settings. The flexibility of qualitative methods will ensure that the research remains adaptable during the data analysis process.

4.5 Research strategy

The chosen research strategy for this study is a systematic literature review which is a structured approach to identify, evaluate and collect existing research on a specific topic. This strategy is particularly appropriate for the exploration of the pain management in the acute care settings as it allows the researcher to study the scholarly work of other investigators which in turn would provide a detailed understanding of current practices, challenges and opportunities for improvement. The systematic nature of the review would ensure that the research is transparent and unbiased (Snyder, 2019). The papers will be selected as per the inclusion and exclusion criteria and will systematically search multiple databases like PubMed, CINAHL, Medline for relevant literature. This structured approach reduces the risk of the selection biasness and make sure that the study covers a diverse range of perspectives. For this study, the systematic review will identify qualitative as well as quantitative studies to review the acute pain management techniques and nursing practices.

The systematic literature review is highly valuable in healthcare research as it allows to collect existing knowledge which shows the gaps and inform about the future practices (Xiao and Watson, 2019). So, in this study a detailed examination of current pain management strategies, the effectiveness of various approaches and the challenges faced by nurses will be done. It will also provide information about the best practices while the findings from the systematic review will contribute to provide well-researched stud

4.7 Data collection method

Secondary

This study will use secondary data collection methods where the previously published research will be used to address the research objectives (Ruggiano and Perry, 2019). The systematic review of existing literature will ensure that the pain management techniques in acute care nursing have been explored thoroughly as it will allow the researcher to identify the current practices and challenges in this area. The sources of secondary data include peer-reviewed journal articles from PubMed, CINAHL, Medline platforms. The use of secondary data is efficient and cost effective as well as will analyse a broad range of research findings. It will allow to integrate the knowledge from multiple perspectives and will address the research questions of this study comprehensively.

PICO framework

The PICO framework (Population, Intervention, Comparison, Outcome) guides the data collection process and make sure that only the relevant studies are identified and included in the systematic review (Eriksen and Frandsen, 2018). The below components of PICO will help to define the scope as well as direction of this research.

Elements	Description
Population	The nurses in acute care settings who have the role in pain management and the specific challenged they face in these settings.
Intervention	The pain management techniques such as the pharmacological and non-pharmacological strategies as well as their implementation in the acute care nursing practices.
Comparison	The different approaches to pain management will be compared where its differences in effectiveness, nurse adaptability, and patient outcomes will be analysed.
Outcome	The result of improved pain management practices, nurse practices, and better patient outcomes in acute care settings will be discussed.

So, this framework makes sure that the research remains systematically aligned with the objectives and address the research questions.

Data Search

The data search will be conducted systematically by using databases like PubMed, CINHALL, Medline. These databases are widely recognised for their use in healthcare related literature where high-quality studies on pain management in acute care are available. The search terms will be developed with the combination of keywords and Boolean operators such as "acute care," "pain management," "nursing," and "techniques." The search strategy table is:

Data bases	Search terms	Number of hits	Selected based on title	Selected based on abstract	Selected based on whole text
PubMed	"Acute care pain management nursing," AND "techniques,"	550	110	75	6

	OR "strategies"				
CINAHL	"Nursing interventions for pain in acute care," AND "patient care"	420	99	60	4
Medline	"Pain management nursing acute care," AND "outcomes," OR "practices"	340	105	50	2
Total		1310	314	185	12

Prisma Flow Chart

The PRISMA flow chart visually represents the step-by-step process of selecting the studies (Agrawal et al., 2024). It maintains transparency on how the studies will be identified, screened and included in the review.

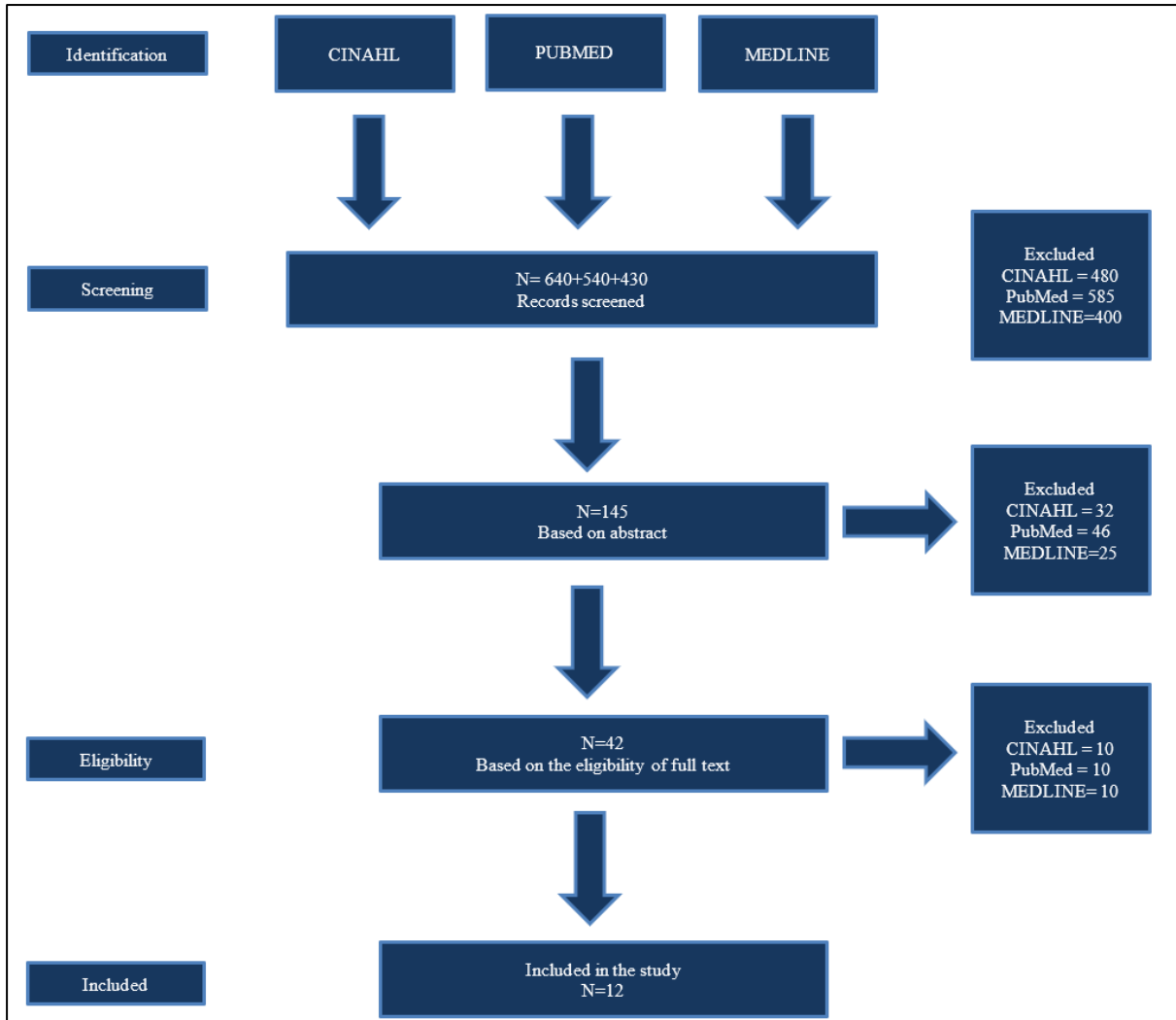


Figure 2: Prisma Flow Chart

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria would ensure that only the relevant and high-quality studies are selected while outdated literature is excluded.

Inclusion criteria	Exclusion criteria	Rationale
The studies that focus on acute care pain management	The studies that are unrelated to acute care or pain management	This maintains alignment with the objectives of the study.
Articles published between 2014 and 2024	Articles published before 2014	It ensures that the study reflects only the modern practices in pain management.
The articles should be written in English.	The articles in languages other than English	It maintains the accessibility of the study's findings.

Peer-reviewed journal articles	Non-peer-reviewed articles, editorials, or blogs	It keeps the academic accuracy and reliability of the findings.
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4.8 Data analysis

The inductive analysis is the chosen method which has been used to analyse the data in this study. This qualitative approach is highly effective to systematically identify, analyse and interpret the codes in the relation of systematic literature review. It enables the researcher to thoroughly understand how the pain management practices can be applied in the acute care nursing and what are the challenges that nurses face. The analysis process starts when the researcher thoroughly reads the selected articles. The key relevant data are highlighted and organised systematically while coding is performed where the data are labelled with descriptive terms that represents the main concept. The codes are then grouped into broad themes that align with the research questions. The approach is particularly suitable for this research it allows the investigator to understand the content and draw meaning. It also helps in comparing the findings across studies and identifies common patterns between them which allow the researchers to draw comprehensive conclusions about the pain management techniques and the challenges faced by the nurses in the acute care settings. This process brings credibility and accuracy as it involves a reflective approach (Castleberry and Nolen, 2018). The themes are cross verified against the original data to make sure that they present accurate findings.

The inductive content analysis has been used in this study to analyse the data of the selected papers. The main categories, generic categories and subcategories has been done this process to address both of the research questions. The inductive content analysis will be done on the basis of 12 articles which has divided into two main categories. The two categories are Pain Management Techniques and Challenges in the Pain Management Techniques is made below under which different 3 generic categories have been made. The generic category for 1st main category is Pharmacological Interventions, Non-Pharmacological Interventions and Multimodal Approaches. These 3 generic categories are further divided into subcategories that will answer the research question 1. The generic category for 2nd main category will be Systemic Barriers, Knowledge and Training shortage and Psychosocial and challenges related to Workload. These 3 generic categories have been further divided below into subcategories that will answer the 2nd research question.

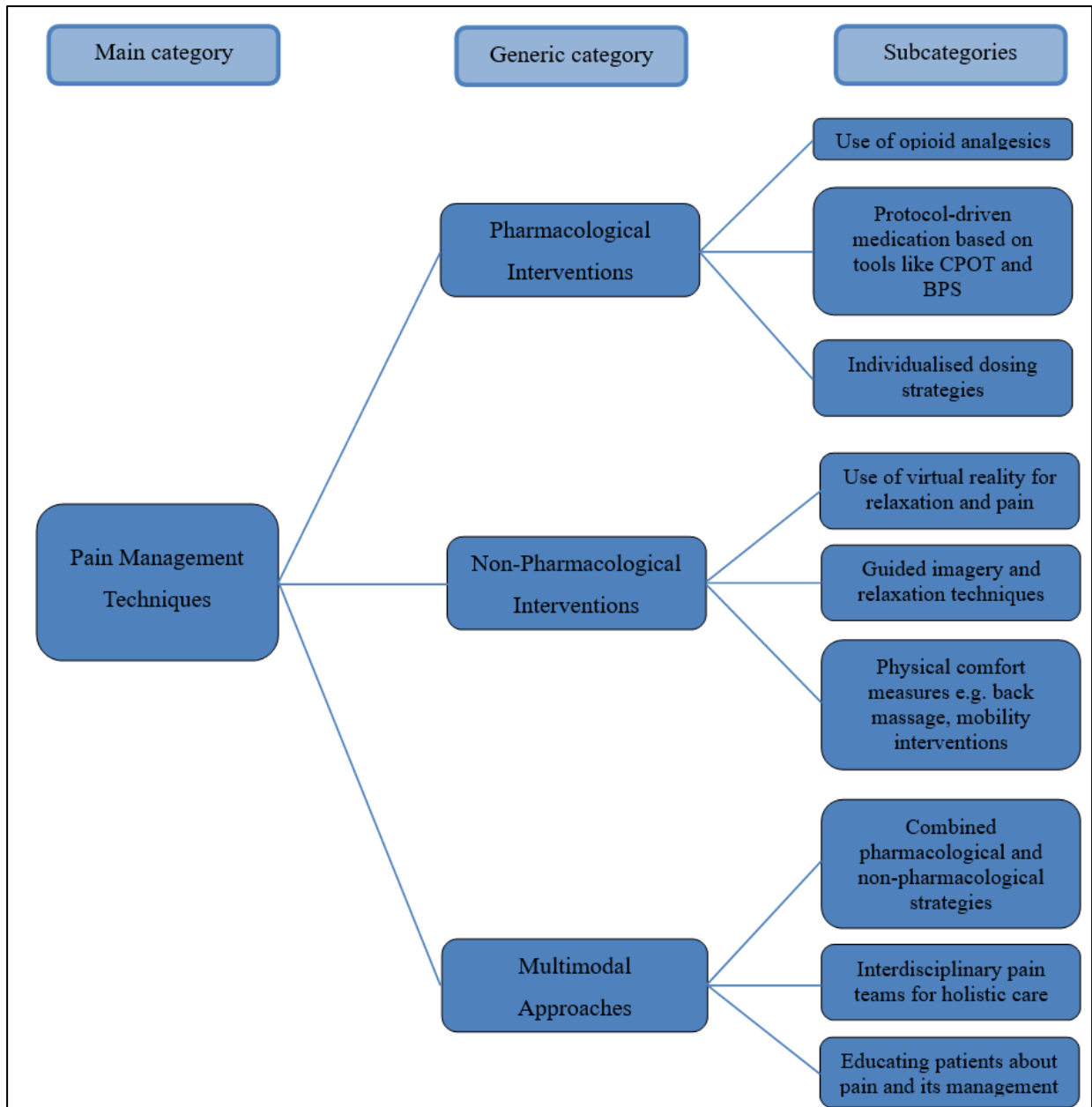


Figure 3: Results of Content Analysis for Research question 1

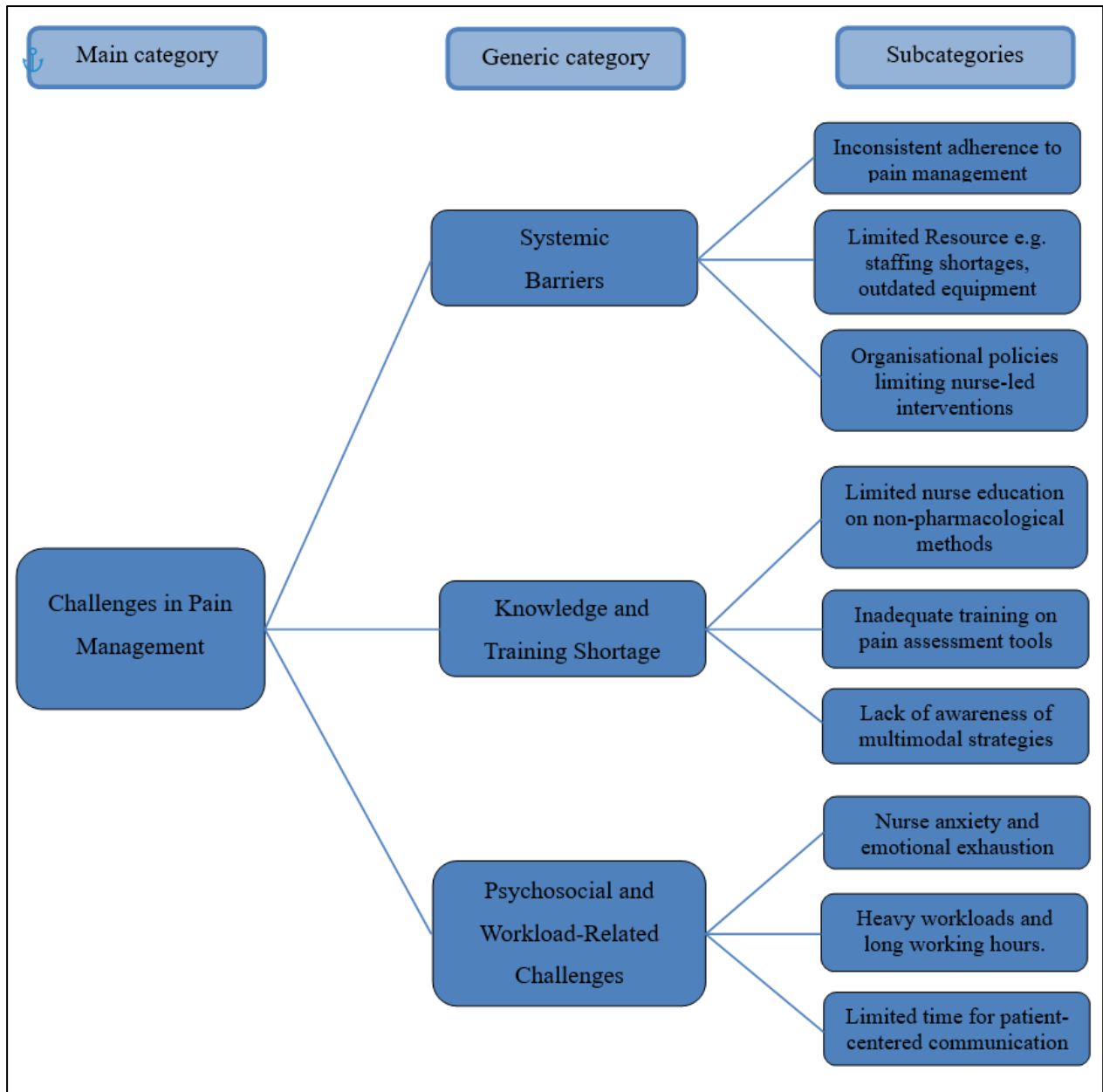


Figure 4: Results of Content Analysis for Research question 2

The textual explanation of above figures is attached in appendix.

Chapter 5: Results

5.1 Summary of the selected data

12 articles have been selected as per the inclusion and exclusion criteria to understand the pain management techniques and the challenges in the acute care settings. The chosen articles are in English and are after 2014 from PubMed, CINHALL, Medline platforms. The data collection methods were different in the selected papers as several studies used quantitative methods while some used qualitative and mixed methods for collecting the data.

The selected studies highlight the importance of both the pharmacological and the non-pharmacological approaches while some shows the systemic, organizational and individual barriers that are being faced by the nurses in acute care settings. The pharmacological pain management has been studied in many papers to show the used of opioids and protocol-driven medications. Kouhi, Froutan and Moghaddam (2023) highlights the effectiveness of the Critical Care Pain Observation Tool (CPOT) that helps to guide the analgesic dosage for those patients who are mechanically ventilated. Similarly, Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) shows the role of pain, delirium protocols and sedation for the adherence of pain management interventions. However, Chiu et al. (2020) identified some variation in the pharmacological intervention use. There are few papers that studied the non-pharmacological interventions as an adjunctive measure to get the relief from pain. Kissel, Soo and Bennett (2021) showed the potential of virtual reality as a nurse-led intervention while Funda Büyükyılmaz (2014) highlighted the techniques like back massage, guided imagery, and relaxation strategies for the orthopaedic patients. The integration of pharmacological, non-pharmacological methods into the multimodal approach is studied by Bérubé (2019) who highlighted their role to prevent acute and chronic pain. Despite these there are some challenges which have been studied by Slatyer, Williams and Michael (2015), Song, Chae and Yoo (2023), Glowacki (2015) and Fitzgerald, Tripp and Halksworth-Smith (2017). These have shown the systemic, psychosocial, individual barriers and workload related challenges which are faced by nurses.

5.2 Pain Management Techniques in Acute Care

There are many pain management techniques which have been found in the selected papers. The articles have showed that different pharmacological interventions, non-pharmacological interventions and multimodal approaches can be used to treat acute pain.

5.2.1 Pharmacological Interventions

Use of Opioid Analgesics

The most pivotal medications in acute care environment are the opioid analgesics which include the fentanyl and morphine that helps to manage severe pain in the critically ill patients. The mentioned medications are effective as they provide the rapid and significant relief in pain which makes them indispensable in environments like the intensive care units (ICUs) and surgical recovery wards. Among 12 paper some of them emphasises about the widespread use of opioids in pain management protocols especially for those mechanically ventilated patients who usually cannot verbally communicate about the pain.

Kouhi, Froutan and Moghaddam (2023) highlights the manner in which the fentanyl dosage adjustments are supported by the Critical Care Pain Observation Tool (CPOT) that ascertain required pain relief during the procedures like the endotracheal suctioning. The approach alleviated the pain as well as minimised the overall opioid dosage which reduces the risks that are associated with the usage of opioid like the respiratory depression and dependency. Similarly, Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) found that the compliance with the nurse-led protocols significantly reduced the total consumption of fentanyl and also achieves the goals of pain management. However, the dependence on opioids also presents challenges as highlighted in the studies of Chiu et al. (2020) and Bérubé (2015) that discusses concerns about the long-term implications of the opioid usage which include the potential reliance and side effects like the sedation and respiratory depression.

Protocol-driven medications

The protocol-driven pain management strategies that uses tools like the CPOT and Behavioural Pain Scale (BPS) are pivotal in the standardisation and optimisation of the pharmacological interventions. The highlighted tools enable the healthcare providers to objectively assess pain even in those patients who are non-verbal or sedated which ascertain the timely and appropriate adjustments in the dosages of medication. The studies conducted by Kouhi, Froutan and Moghaddam (2023), Chiu et al. (2020) and, Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) provide strong evidence that support the utility of these protocols in the acute care settings.

The effectiveness of CPOT is demonstrated in paper of Kouhi, Froutan and Moghaddam (2023) as it guides the administration of analgesic for the mechanically ventilated patients. The CPOT through correlation of pain intensity with the fentanyl dosage adjustments ascertains that the patients received the adequate relief during the invasive procedures. The study found that there is significant reduction in pain levels which showcases the cruciality of objective tools in the improvisation of patient outcomes. Similarly, the results of Chiu et al. (2020) highlighted that half of the ICUs in British Columbia have utilised the standardised pain management algorithms in which they incorporated the tools like CPOT and BPS. The study conducted by Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) also match this finding in which it emphasised that compliance with the structured protocols brings more consistent and effective outcomes in pain management.

Individualized dosing strategies

It is crucial to customise the pain management interventions according to the different needs of each patient in the acute care because the pain experiences and their response to medications can significantly change. The strategies of individualised dosing include factors like the patient physiology, medical history, and the nature of the pain that is being treated. The use of CPOT as shown in study by Kouhi, Froutan and Moghaddam (2023) facilitated the real-time adjustments to fentanyl dosages on the basis of observed pain levels which ascertains that the patients receive sufficient pain relief without the fear of overmedication. The highlighted personalised approach improved the patient results as well as minimised the risks that are associated with the excessive usage of opioid. The need for individualised dosing strategies in ICUs has also been showcased in the study by Chiu et al. (2020) in which the patients often have the complex and variable needs for pain management. The study found that there are many units which utilised the standardised protocols by the individualised adjustments according to the patient-specific factors were important for the achievement of optimal health outcomes. Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) reported that those patients whose pain management was supported by the individualised protocols required less fentanyl as compared to those patients who were treated through the generalised approaches. However, the implementation of individualised dosing strategies also has challenges which include the need for advanced training and decision-making skills in the healthcare providers.

5.2.2 Non-Pharmacological Interventions

Use of Virtual Reality

The virtual reality is considered as an innovative non-pharmacological intervention to improve the pain and to increase the relaxation in acute care settings. The virtual reality helps the patient to sense the virtual environment which provides such an immersive experience that has the ability to distract the patients from their pain. The efficacy of the virtual reality as a nurse-led intervention has been emerged as a comfort measure which can be provided in the critical care units (Kissel, Soo and Bennett, 2021). The patients who participated in the virtual reality sessions reported that the intensity and discomfort of the pain got reduced. The patients also reported that that there were significant improvements in the level of relaxation. The use of also decreases the physiological factors like the respiratory rate which shows that it has the potential to manage the stress and pain. The key advantage of virtual reality is its adaptability which has been seen in postoperative pain to chronic discomfort in care. The role of virtual reality has been found to improve the self-reported pain by the patients. Kissel, Soo and Bennett (2021) found that the pain level virtual reality of post virtual reality decreased, the relaxation increased, and general discomfort reduced. So, virtual reality is an effective and reliable adjunctive comfort measure for pain.

Guided imagery and relaxation techniques

The guided imagery and relaxation techniques are some of the evidenced based interventions that uses mental visualization as well as relaxation exercises to manage the pain and stress level of the patients. Funda Büyükyılmaz (2014) highlights the effectiveness of guided imagery as it reduces the intensity of the pain among the orthopaedic patients. The patients have been seen to redirect their focused form the pain with the visualization of calm scenes, music or with the engagement of the structured relaxation exercises. The relaxation techniques like deep breathing and muscle relaxation have been seen to lower the pain as well as improve the psychological well-being. These methods are mainly beneficial for those patients who has musculoskeletal pain as such methods allow the patient to actively participate in their own pain management. Despite these benefits, the implementation of such techniques in the acute care settings require proper training and time from the nurses. Fitzgerald, Tripp and Halksworth-Smith (2017) showed that nurses should have educational programs so that they can effectively guide the patients through these interventions. Funda Büyükyılmaz (2014) concluded that

these methods are safe non-pharmacological interventions for orthopaedic patients, but some more interventions need to be investigated for better nursing practices.

Physical comfort measures

The physical comfort measures like back massage and therapeutic mobility interventions have a major role in the non-pharmacological pain management because these types of techniques not only address the physical discomfort but also promotes the emotional wellbeing as well as promote relaxation. The impact of the nurse-led interventions in the management of pain and fatigue among the mechanically ventilated patients has been studied by Winkelman et al. (2019). The study found out that even low-intense activities like in-bed exercises could lower the pain level without significant increase in the level of fatigue. It was seen that 39% of the patients had neither fatigue nor pain before and after the intervention while four patients reported that the pain got lower, and one patient reported that the level of fatigue got less. Similarly, Funda Büyükyılmaz (2014) found that back massage was an effective way to reduce the intensity of the pain in the orthopaedic patients. It has been observed that massage stimulates circulation, lowers the tension in muscle as well as helps in the release of endorphins which overall gives relief in the pain. However, the use of physical discomfort measures requires adequate staff and proper resources.

5.2.3 Multimodal approaches

Combined pharmacological and non-pharmacological strategies

The multimodal approach involves the integration of pharmacological as well as non-pharmacological strategies to manage the pain more effectively. The aim of this method is to maximise the effectiveness of the pain relief methods while at the same lower all the risks which can be due to excessive dependence on opioids. Bérubé (2019) highlights the significance of the multimodal interventions to prevent that pain which gets when there is a transition from acute to chronic pain. This is specifically seen in the ill patients as well as in those patients who wants post-intensive care. The integration of the medications like opioids with the techniques like relaxation exercises and physical therapies can provide a holistic pain relief approach to the patients. Kissel, Soo and Bennett (2021) show the role of non-pharmacological methods like virtual reality in the addition to the medication. The patients reported significant improvements in their pain level and got relaxed when such methods are provided along with the traditional pharmacological treatments. Similarly, Funda

Büyükyılmaz (2015) highlights the effectiveness of the guided imagery and self-management programs as a part of a multimodal approach in the orthopaedic care. The implementation of the multimodal strategies in the acute care settings require proper planning, collaboration and access to the resources.

Interdisciplinary teams for holistic care

The interdisciplinary teams are an important part of multimodal approaches as it brings together the expertise from different healthcare professionals to address the pain from the perspectives of various experts. Glowacki (2015) highlighted the value of such teams as well as their role to improve the outcomes of the pain management through collaborative care planning. These teams mainly include the nurses, physicians, psychologists and physiotherapists who contributes their role to develop some patient-centred pain management strategies. The study shown that the interdisciplinary teams are highly effective to manage complex pain condition that requires the pharmacological as well as non- pharmacological interventions. It has been seen that the team-based approaches allow the integration of the medicine treatments with the physical therapy, psychological support and adequate education to make sure that all the aspects of the pain are addressed. Song, Chae and Yoo (2023) identifies the gaps in the interdisciplinary communication which act as a barrier to provide effective pain management in the intensive care units, so the importance of collaboration has been seen major. With better teamwork and communication, the healthcare organisations can increase the implementation of the multimodal strategies and can provide effective care.

Educating patients about pain

The most important component of multimodal pain management is to educate the patients about such strategies as this will empower them to actively participate in their care and through this, they will adhere to the treatment plans. The role of patient education has been shown by Glowacki (2015) who found that education can improve the perception of the pain and can increase the level of satisfaction in the patients. The educated patients are seen to better understand the purpose as well as the benefits of different pain management strategies which enable them to engage more actively in their care. Similarly, Fitzgerald, Tripp and Halksworth-Smith (2017) identified the importance of education in the older patients. It was seen that when older patients were educated about the pain assessment and management then it helped to bridge the gap between the needs of the patients and nursing interventions. Proper education

helps the patients to clearly understand how the pharmacological and non-pharmacological strategies work collectively to manage the pain. Funda Büyükyılmaz (2014) reported that proper education can teach the patients about the relaxation techniques and guided imagery which would allow them to take active role in the management of their discomfort.

5.3 Challenges related to Pain Management in Acute Care

There are several challenges related to pain management which have been found in the selected papers. The articles have showed that systemic barriers, training and knowledge shortage, and psychosocial as well as workload are some challenges which are faced by the nurses in acute care settings.

5.3.1 Systemic barriers

Inconsistent adherence to pain management protocols

If the pain management protocols are not adhered consistently then it creates significant systemic barriers in the acute care settings. The protocols like CPOT and BPS have been designed to standardise the assessment as well as treatment of the pain. Santos, Toscano, Batista and Bohomol (2021) noted that 30% of the patients in the emergency department received pain management based on those protocols that are initiated by the nurses even though this group responded better with pain relief as compared to those who were managed conventionally. Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) also highlighted that only 70% of the pain assessments adhere to the protocol interventions and even few sedation interventions meet their goals. This shows that there is a variability in the adherence despite of the available guidelines. Chiu et al. (2020) studied that there are some facilities in the intensive care units in British Columbia that depends on the standardised pain algorithms while others depend on the decisions of clinicians. This inconsistency is due to a lack of training, awareness and different level of adherence. There are some inconsistencies in the available tools like CPOT which has to be addressed.

Limited resources

Song, Chae and Yoo (2023) and Fitzgerald, Tripp and Halksworth-Smith (2017) discussed how limited staff, outdated equipment and insufficient access to resources can have a direct impact on the ability of the nurses to provide comprehensive care. Fitzgerald, Tripp and Halksworth-

Smith (2017) showed that shortage in staff does not provide nurses enough time to perform thorough pain assessments or to give non-pharmacological interventions which in turn result in poor care. These limitations also increase the workload and stress among the nursing staff which further affects their ability to adhere to the best practices in the pain management. The availability of the modern equipment and tools are very important to provide effective pain management practices. Chiu et al. (2020) highlighted the differences in the use of standardised assessment tools as some facilities depends on the outdated and inconsistent practices. Similarly, Winkelman et al. (2019) reported that limited resources can restrict the access of the supportive measures like therapeutic mobility interventions which are highly beneficial in giving relief to those ill patients who are suffering from pain. So, allocation of adequate resources of the pain management is important as it would ensure that the nurses have time, tools and support to deliver patient-centred care.

Organisational policies that limit nurse-led interventions

The significant barrier for the optimal pain management in acute care settings are those organisational policies that limit the nurse-led interventions. Among the 12 selected paper there are some studies that shows the manner in which the restrictive policies usually prevent the nurses to initiate or adjust the strategies for pain management without the prior approval of the physicians even after being well-trained. The study conducted by Santos, Toscano, Batista and Bohomol (2021) highlights that compliance was low despite the demonstration of effectiveness of nurse-initiated protocol in the management of pain because of the reluctance by organisation that prevent the nurses to fully participate in the decision-making processes.

Similarly, the exploration by Song, Chae and Yoo (2023) presents the manner in which the institutional and hierarchical practices restrict the effective practice of nursing. The nurses usually do not have the autonomy to administer the non-pharmacological interventions or adjust the analgesic dosages on the basis of real-time assessments. The highlighted issues in policies delay the interventions as well as undermine the role that nurses play as the frontline providers of patient care.

5.3.2 Knowledge and training shortage

Limited nurse education on non-pharmacological methods

Limited knowledge and training of nurses on non-pharmacological methods are the most critical challenge that degrades the quality of the pain management. The interventions like guided imagery, relaxation techniques and physical comfort measures are some proven methods that complement the pharmacological approaches. Funda Büyükyılmaz (2014) and Fitzgerald, Tripp and Halksworth-Smith (2017) highlights the gap which is present in the training process of the nurses. The importance of self-management programs, relaxation techniques and back massage for pain relief have been proved but these methods are overlooked due to the lack of formal training as well as awareness among the nursing staff (Funda Büyükyılmaz, 2014). Fitzgerald, Tripp and Halksworth-Smith (2017) identified a significant gap which exist in the ability of the nurses to provide non-pharmacological interventions in acute care. The study highlighted the systemic issues like limited education on non-pharmacological therapies that limits the nurses to effectively implement such techniques. To address this gap, it is necessary to integrate the non-pharmacological techniques into the training programs and education of nurses.

Inadequate training on pain assessment tools

The tools like CPOT and BPS are important to assess the pain of those patients who are not able to communicate verbally. The effectiveness of CPOT has been shown by Kouhi, Froutan and Moghaddam (2023) which optimises the dosage of analgesic for the mechanically ventilated patients but due to less training the nurses are not able to utilise these tools confidently. Chiu et al. (2020) highlights the variability that exists in the implementation of the pain assessment tools when it's applied in the intensive care units. It has been seen that some facilities daily use CPOT and BPS while other depend on clinician decisions which ultimately result in inconsistent pain management practices. Song, Chae and Yoo (2023) also identified gaps in the knowledge which come when the nurses apply the evidence-based assessment tools. The nurses could not interpret the assessment results properly which results in delayed or poor interventions. It is important to provide standardised training to the nurses on pain assessment tolls to bridge the gap. The incorporation of simulations as well as practical sessions into the training sessions of nurses can improve the proficiency of the nurses as per these authors.

Lack of awareness for multimodal strategies

It is important to improve the awareness of the nurses for multimodal strategies with proper education, professional development opportunities and collaboration among the interdisciplinary teams.

5.3.3 Psychosocial and workload challenges

Nurse anxiety and emotional exhaustion

The emotional wellbeing of the nurses plays a crucial role to provide and effective pain management relief. However, due to anxiety and unbalanced emotions of the nurses the quality of the care gets affected. Slatyer, Williams and Michael (2015) have studied this issue where they found out that the nurse experience the feelings of disempowerment when they are not able to lighten the pain of the patients effectively. It has been seen that the registered nurses educated the patients about their pain management option and act as a bridge between patients and the healthcare team to ensure that the issues related to pain have been communicated but due to anxiety and emotional exhaustion the state of mind is further stressed by seeing the persistent pain of the patients as it creates a sense of helplessness.

The researchers have also described some coping mechanisms like to build stronger connections with the patients and to look for the alternative ways to provide comfort to the patients beyond pharmacological intervention. This psychological strain not only affects the mental health programmes for the nurses so that they can manage their psychological needs

Heavy workloads and long working hours

It has been seen that heavy workloads and long shifts are significant barriers of effective pain management. Fitzgerald, Tripp and Halksworth (2017) highlighted that high patient-to-nurse ratios and long working hours makes the time available for pain assessment less. The registered nurses are often required to manage their multiple tasks because of which there are delays in the management of pain or the non-pharmacological strategies are not able to be provided. This area requires a through understanding of the pain physiology, evidence-based interventions and the ability to modify the pain management strategies based on the specific needs. Song, Chae and Yoo (2023) further showed the impact of the workload on the

implementation of the evidence-based pain management practices. The nurses have reported that there is a high pressure to manage multiple patients simultaneously which makes it difficult to stick to the pain management protocols because of which they cannot focus on the unique needs of each patient. This not only affects the quality of the care but also results in burnout. The healthcare institutions must consider some strategies to level up the staff and lower the workload of nurses. The implementation of such policies that can provide enough work time and manageable shift time can provide patient-centred care.

Limited time for patient-centred communication

The patient-centred communication has been considered as an effective pain management strategy which allow the registered nurses to understand as well as address the unique pain experience of the patients. The key nursing skills used in this approach are active listening, empathy and open communication to satisfy the patients. However, the demands of acute care multiple due to which the nurses do not have enough time to engage in any meaningful conversation with their patients. Fitzgerald, Tripp and Halksworth (2017) showed that the organisational factors such as the environment of the workplace as well as the workforce planning influences the type of care the nurse will provide to any patient. So, pressure of heavy workload reduces the opportunities for the registered nurses to establish their connection and understand the concerns of the patient in depth. The lack of the time for patient-centred communication is especially problematic in the management of pain because here it is very important to understand the level of pain.

Slatyer, William and Micheal (2015) also showed that the inability of the nurses to engage in empathetic communication arises the feelings of disempowerment and frustration. The nurses may provide standardised approaches, but they fail to address the deep pain experience of the patients because they have less time to listen or explain about the treatment plans in detail. The healthcare organisation should allocate sufficient time and should provide training on communication so that the registered nurses can interact with the patients effectively. The strategies to lower the non-clinical administrative tasks and to streamline the work can free up the time for patient-centred care.

Chapter 6: Discussion

The results of this study have helped to understand about the pain management techniques in acute care nursing as well as the challenges that nurses face when they deliver different methods to lower the pain. The findings from this study highlight various techniques which are used in pain management like pharmacological and non-pharmacological approaches as well as multimodal strategies which incorporates both are methods. The results highlight various codes that have emerged from the analysis such as opioid analgesics, protocol-driven medications, guided imagery, virtual reality, physical comfort measures, multimodal approaches, interdisciplinary teams, patient education, inconsistent adherence to protocols, limited resources, organisational policies, nurses 'anxiety, heavy workloads and inadequate training. These codes show the complexity of the pain management techniques and shows that there is a need for patient-centred approach.

The use of opioid analgesics like morphine and fentanyl is one of the primary pharmacological interventions for pain relief for acute care. The aligns with the studies of Kouhi, Froutan and Moghaddam (2023) and Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) who showed that opioid are provided for quick relief in the highly stressful environments like ICUs. However, studies by Berube (2019) and Chiu et al. (2020) also showed concerns about the heavy dependence as well as side effects of opioid. The use of protocol-driven medications with the help of the tools like CPOT shows the role of structured Guidelines as these can optimise the dose of opioid where the risk is also less. These protocols not only help to standardise the care but also empower the nurses to make data-based adjustments. This has been showed by Kouhi, Froutan and Moghaddam (2023) who reduced the consumption of fentanyl for those patients who are in the ventilators. Nonetheless, the variability in the adherence of the protocols as per Chiu et al. (2020) across facilities suggests that there are systemic inconsistencies that undermine standardised care.

The individualised dosing strategies further shows the need for personalised approaches in the acute care. As these protocols require a framework, the nurses are responsible for the factor like comorbidities, pain tolerance and recovery. This aligns with Glowacki (2019) who suggested that the patient-centred care require flexibility which can be done within the structured guidelines. However, the implementation of such strategies demands advances training which many nurses lack due to insufficient education on pharmacokinetics and pain physiology. So, these findings align with the previous research which showed the role of

standardised pain assessment tools to lower the opioids. Rozycki, Jarrell, Kruer, Young and Mendez-Tellez (2017) have found that individualised protocols required less fentanyl but when the patient were treated through the generalised approaches then the strategy of pain management got changed.

The non-pharmacological methods like guided imagery, virtual reality and physical comfort measure are some of the methods that have emerged as an effective adjunct to methods related to traditional pain management. The success of virtual reality in the reduction of pain and for the promotion of relaxation has been reported by Kissel, Soo and Bennett (2021) which aligns with those evidence that supports such immersive technologies for acute care. Similarly, guided imagery and relaxation techniques have been studied by Funda Buyukyilmaz (2014) who showed that cognitive-behavioural strategies can not only lower the physical discomfort but also the emotional distress. These findings support the holistic nursing model where prioritises have been given to the psychological as well as the emotional wellbeing along with the physical relief. Despite their efficiency, there are some barriers like inadequate training, less time and limited institutional support due to which non-pharmacological interventions are not fully utilised, for example, the nurses in the study done by Fitzgerald, Tripp and Halksworth (2017) reported that they are not familiar with the techniques like guided imagery which shows that educational gaps affect the adoption of evidenced-based practices. The heavy workloads and high ratio of patients-to-nurse forces the nurses to prioritise the pharmacological interventions which leaves no space for the complementary therapies. This highlights the need for systemic changes like advanced training programme and resources for proper integration of the non-pharmacological methods into daily care.

The integration of pharmacological and non-pharmacological strategies into the multimodal approaches represents a shift in the practices of acute pain management. The studies by Kissel, Soo and bennet (2021) and Berube (2019) supports the effectiveness of multimodal approaches because the combination of opioids with the therapies like virtual reality or physicals therapy with the Scher, Meador, Van Cleave and Reid (2018) who highlighted that pain should be treated as the 'fifth vital sign' which requires patient-centred care. The role of interdisciplinary teams further strengthens the usages of multimodal strategies because the nurses, physiotherapists, psychologists and physicians may work together to address the multidimensional nature of pain (Glowacki 2019). However, Song, Chae and Yoo (2023) identified that communication gaps and hierarchical barriers does not allow them to work as a

team in ICUs. The institutes must maintain a cultural of collaboration through joint training sessions so that they can freely work together and can make decisions. The role of education is important for patients as it has been shown in the findings that it empowers the individuals to actively participate in their treatment plans. Funda Buyukyykmaz (2014) highlighted that educated patients are more satisfied because they have the ability to adhere to the therapies which strengthen the link between knowledge and outcomes.

The systemic challenges like limited resources and when nurses do not fully adhere to their protocols it significantly affects to the pain management strategies. Santos, Toscano, Batista and Bohomol (2021) found that only few emergency department nurses consistently followed the protocols of pain managements] due to which the results were suboptimal. The nurses are not allowed to evaluate the pain and provide analgesics on their own which means that the conventional approaches do not have a standardised pain protocol. This inconsistency is mainly due to the fragmented training, lack of responsibility and outdated institutional policies. Song, Chae and Yoo (2023) found that organizational policies that require the approval of physicians delays the care while the independence of nurses is also affected. The limited staff as well as inadequate access to the modern tools have increased these issues. The high ratio of patient-to-nurse forces the nurses to prioritise urgent tasks over detailed evaluation due to which the type of care becomes reactive rather than proactive. Similarly, Winkelman et al. (2019) noted that therapeutic mobility interventions are beneficials, but they are not often used because of limited time. These challenges need to be addressed by proper staff adjustments, technologies and revised policies which would empower the nurses to provided effective pain management initiatives.

The result of this study highlights critical gaps in the education of nurses especially in the area of non-pharmacological methods as well as pain assessment tools. There are many nurses that have less confidence on the techniques like guided imagery or they cannot interpret the scores of CPOT more confidently (Fitzgerald, Tripp and Hawksworth, 2017 and Chiu et al, 2020). This gap is further intensified by the changes pain management practices, for example the use of digital assessment tools and virtual reality has gained attention because few nursing programs have incorporated these technologies into their training modules. Kissel, Soo and Bennet (2021) have prioritised education as well as simulation-based learning as these could enhance the proficiency of the nurses to provide both pharmacological interventions.

Additionally, the interdisciplinary workshop could make the nurse more familiar with the tools like CPOT and can promote the use of collaborative care models.

As per the above results, the emotional wellbeing of the nurses is an important component to provide effective pain management. Slatyer, Williams and Micheal (2015) showed that the nurses become anxious and emotionally exhausted if they are not able to lighten the pain of the patients. This stress is further increased by heavy workloads and long hours shift as it reduces the capacity of the nurses to engage in empathetic communication and patient-centred care. Fitzgerald, Tripp and Halksworth (2017) linked these challenges to institutional factors because the similar number of staff and high administrative burden divides the attention of the nurses due to which they are not able to directly interact with the patient.

There are various codes in this study like administration of opioid, interdisciplinary collaboration techniques, education, shortage of resources, protocols-driven medications, guided imagery, inconsistent protocols compliance, organisational policies, emotional wellbeing of nurses, and multimodal approaches that shows the complexities of pain management in acute care settings. The findings of this study have few implications on nursing practices as it is important to standardise the pain management protocols, enhance the education of nurses, encourage the use of multimodal approaches and address the systemic barrier so that the pain management practices can be improved and the overall outcomes for patients can be enhanced in acute care settings. The results of this research were analysed by inductive content analysis while all the results of the papers have been reported accurately. This study has provided information about the holistic and patient-centred approaches in the acute care which can form a base for future studies in pain management.

Chapter 7: Ethics and validity

Although this study is based on an inductive content analysis which will use secondary data, but considerations of ethics are important, particularly during the selection and interpretation of the data. All the studies which will be used in this research are peer-reviewed and publicly available which ensure that the used data adheres to the ethical standards of the research publications. The papers will be properly cited to avoid plagiarism and the intellectual property rights of the authors will be fully respected (Abad-García, 2019). The selected studies will be

based on the inclusion criteria and will ensure that the original papers are downloaded from the appropriate platforms.

To maintain the ethical standards of the research, the researcher will maintain transparency in the reporting process where the positive as well as negative findings of the selected research will be written accurately. The study aims to provide a balanced approach where the limitation and the possible biases of the papers will also be reflected. It is important to maintain validity in the qualitative research so that the findings are credible and trustworthy (Ahmed and Ishtiaq, 2021). The validity of this research will be strengthened through strong inclusion and exclusion criteria as it will ensure that only high-quality and relevant studies are selected. This study will perform cross-study validation which will compare the findings of different studies to check for consistency.

Chapter 8: Conclusion and recommendations

This dissertation has studied the current pain management techniques for the acute care and the challenges that nurses face while delivering effective care. The research objective of this study has been met with the help of systematic literature review of peer-reviewed studies which were published between 2014 and 2024. The findings of this study highlight the multidimensional nature of the pain management where the relationship between the pharmacological interventions, non-pharmacological strategies, systemic barriers and psychological challenges have been discussed. This study had used an inductive approach where the secondary data and systematic literature review have been used to develop recommendations based on the evidence because the main goal is to improve the pain management practices in acute care settings.

The first research question was to describe the current pain management techniques in acute care. This was achieved through a detailed examination of both non-pharmacological as well as pharmacological strategies like the use of opioid analgesic have emerged as the primary method for the management of pain. However, the study also highlighted the role of protocol-driven medication which are supported by the assessment tools like the CPOT and BPS as these make sure that the amount of dose is correct. The study also identified the non-pharmacological interventions like guided imagery, relaxation techniques, virtual reality and physical comfort, measure such as back massage and mobile interventions. These play an essential role in the

management of pain because they have the capability to reduce stress, enhance the comfort of patients and minimise the dependence of opioid. The multimodal approaches for pain management where the combination of non-pharmacological as well as pharmacological strategies are used were found to improve the outcomes and has prevented the progression of acute pain to chronic pain. These findings align with the evidenced-based pain management approaches of above discussed studies.

The second research question was to analyse the challenges related to the pain management in acute care. This was addressed by the categorisation of barrier into systemic, psychosocial and educational. The inconsistent adherence to the pain protocols, shortage of staff and the limited organisational policies have been identified as some systematic challenges which does not allow the nurses to provide effective pain relief methods. The psychosocial factors like emotional state of nurses, high workloads and limited patient-centred care further creates barrier. Additionally, the lack of knowledge interventions as well as pain assessment tools were found to be some other barriers. The findings of this study highlights that the management of acute pain needs a range of pain management techniques while the above identified challenges and gaps in competency needs to be addressed.

This study strengthens the idea of combining the non-pharmacological and pharmacological strategies so that practical support can be provided from the use of CPOT and virtual reality. The study shows that there is a need to reform the structure and fulfil the gaps which are present in institutions. The findings also highlight the need to address the emotional wellbeing of the nurses as this area is often overlooked.

Based on the findings of this study, it has been recommended to revise the organisational policies so that the nurses can work and adjust the pain management initiatives independently. The protocols like CPOT or BPS should allow the registered nurses to administer analgesic without the approval of physician as it would reduce the delays that occur when the nurses are dependent on the approval of physicians. The institutes are recommended to invest in modern technologies of virtual reality or digital pain assessment tools while the ratio of staff should be adequate. The institute should ask for funds so that the relaxation therapy kits as well as the mobility aids can be prioritized. The standardised and evidence-based protocols should be developed across the healthcare facilities while the institute should conduct regular audits so that the compliance rate can be measured. The nursing programme should be integrated with the training on advanced non-pharmacological interventions and pain assessment tools. The

role of simulation-based learning and workshop should be provided to the nurses so that their practical skills can be improved. The hospitals should offer regular workshops on new pain management technologies as well as interdisciplinary collaboration. They should provide certification programme for the management of advanced pain as it could enhance the skills and confidence of the nurse. The nurse should be educated about the role of culture as the needs of some culturally distinct patients can only be influenced by the cultural and language difference.

The hospitals are recommended to establish interdisciplinary pain management teams where nurses, physiotherapists can work together because regular conference and joint training sessions can maintain communication. The families and patients should be provided educational session on their care plan where they can learn about the tools like pain diaries or mobile apps which can empower the patients to communicate their pain more freely. For the wellbeing of the nurses, the workplace wellness initiatives like counselling services, stress management workshops and peers support groups should be implemented so that the issue of burnout and emotional exhaustion can be addressed. The administrative tasks should be streamlined with the help of automated documentation systems so that the nurses have enough time to directed interact with the patients. The schedules of nurses should be flexible while proper breaks should be provided. The future studies should understand the long-term effects of the non-pharmacological interventions in different population of the patients. The impact of nurse-led pain management protocols can be studied to lower the dependence of opioids in acute care. The strategies related to interdisciplinary collaboration can be studied so that the level of teamwork can be improved across healthcare professionals. The comparative studies between hospitals with high adherence and those that have low adherence can be studied in the future so that the best practices can be identified. The scalability of immersive technology like AI-driven pain assessment can be examined in different healthcare settings.

So, this study has highlighted the role of nurses who manages the pain as a primary caregiver in acute care. Though pharmacological interventions are essentials, this study has supported the integration of non-pharmacological strategies as well as the patient-centred care that integrated empathy, collaboration and innovation. The healthcare system can address the identified systemic barriers and should invest in the education as well as wellbeing of the nurses for better outcomes.

Limitations

Though this study has provided valuable information about the pain management techniques and challenges in acute care but there are few limitations which must be acknowledged. The research has relied on secondary data which may not fully capture the real-time clinical challenges which are faced by nurses in different healthcare settings. The inductive content analysis was limited to 12 selected studies which shows that the generalisability of the results got limited across different acute care environments. The study has not included any data from interviews or surveys with nurses so due to the lack of primary data the firsthand experiences of the nurses have not been included. The variation in hospital policies, different staff and available resources may have influenced the practices of pain management which may have made it difficult to provide standardised recommendations.

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Appendix

Appendix 1: Description of data analysis for research question 1

Meaning Unit	Codes	Sub-category	Category	Main category
<p>The administration of opioids for those patients who has severe pain (Article 35)</p>	<p>Fentanyl and morphine are the primary opioids that are used for the management of severe pain in critically ill patients.</p>	<p>Administration of opioids</p>	<p>Highlights the key role of the opioids like fentanyl and morphine to manage the severe pain in the ICU settings.</p>	<p>The pain management techniques in acute care nursing.</p>
	<p>The use of opioids during mechanical ventilation and invasive procedures.</p>			
	<p>Opioids control acute and post-operative pain.</p>			
<p>The protocol-driven approaches are used like CPOT and BPS to optimise the analgesic dosages as well as to improve the consistency (Article 25)</p>	<p>CPOT and BPS are frequently used to assess pain and guide the medicine dose.</p>	<p>Pain assessment tools that guide medication adjustments</p>	<p>Standardised pain management protocols that will ensure that dose of medication is precise and patient outcomes are consistent.</p>	<p>The pain management techniques in acute care nursing.</p>
	<p>Improve consistency in the pain relief outcomes.</p>			

	These protocols help to balance the pain relief with less use of opioid.			
Virtual reality is a nurse-led intervention that significantly reduces the intensity of the pain and promotes relaxation (Article 24)	Reduces pain intensity as it distracts the patients through immersive visual and auditory experiences.	Technology-driven non-pharmacological intervention	Implementation of innovative, technology-based non-pharmacological interventions for the pain relief as well as relaxation.	The pain management techniques in acute care nursing.
	Improves the relaxation and lowers stress levels in the patients with acute pain.			
	Effective pharmacological pain management strategy.			
The relaxation techniques like guided imagery to improve the pain in orthopaedic patients (Article 17)	The patients visualise calming scenarios which reduces their perception for pain.	Cognitive and emotional pain management techniques	Use of relaxation and visualisation techniques to manage the pain and promote the emotional well-being.	The pain management techniques in acute care nursing.
	Lower anxiety and improve the emotional well-being.			

<p>The physical comfort measures such as back massage and mobility interventions to reduce the pain without more fatigue (Article 47 and 17)</p>	<p>Back massage reduced muscle tension and stimulated circulation.</p>	<p>Tactile and mobility-based pain relief strategies</p>	<p>Non-invasive physical interventions with the aim to lower discomfort and improve the comfort of the patients.</p>	<p>The pain management techniques in acute care nursing.</p>
	<p>Therapeutic mobility interventions lowered discomfort.</p>			
	<p>Easily integrated the into standard nursing practices.</p>			
<p>The combination of pharmacological and non-pharmacological strategies that prevents the transition from acute to the chronic pain (Article 7)</p>	<p>Use of the multiple methods.</p>	<p>Multimodal pain management techniques</p>	<p>Integration of the multimodal strategies for more effective pain prevention and management.</p>	<p>The pain management techniques in acute care nursing.</p>
	<p>Synergistic effects of combining opioids with non-pharmacological techniques.</p>			
<p>Interdisciplinary teams that manage the pain with multiple perspectives (Article 18)</p>	<p>Nurses, physicians, physiotherapists, and other healthcare professionals works together.</p>	<p>Involvement of the interdisciplinary teams</p>	<p>Shows collaborative and team-based approaches to make sure that patient-centred pain</p>	<p>The pain management techniques in acute care nursing.</p>

	Focus on communication, coordination, and shared decision-making.		management is provided.	
Educating the patients about the pain management strategies to improve their perceptions and to keep them adhere to their treatment plans (Article 17)	Educate patient about pharmacological and non-pharmacological interventions.	Patient empowerment through education	The patient-focused educational interventions to comply with the pain management practices.	The pain management techniques in acute care nursing.
	Improve perceptions of care quality.			
	Empower patients to actively participate in their treatment.			

Appendix 2: Description of data analysis for research question 2

Meaning Unit	Codes	Sub-category	Category	Main category
Inconsistent pain protocols that result in different patient outcome (Article 38 and 35)	Lack of adherence to the evidence-based pain management protocols.	Non-compliance with evidence-based guidelines	Shows the variability in pain management protocols that results in inconsistent outcomes.	The pain management challenges in acute care nursing.
	Insufficient pain relief interventions.			
	Limits awareness and training among the staff.			
Shortages in the staff due to which the nurses have less time to assess as well as manage the pain effectively (Article 15 and 44)	Insufficient time for thorough pain management assessments.	Resource-related challenges	Discusses how shortage in staff and insufficient resources lowers the performance of assessments and interventions.	The pain management challenges in acute care nursing.
	Heavy patient loads.			
	Nurses face burnout and fatigue.			

<p>The policies restrict the nurse-led interventions which affects the pain relief methods (Article 38 and 35)</p>	<p>Regulatory limitations lower the quality of pain management strategies in acute care.</p>	<p>Limited autonomy for nurse-led care</p>	<p>Shows how restrictive policies delays the interventions.</p>	<p>The pain management challenges in acute care nursing.</p>
	<p>Institutional policies restrict the nurses to adopt innovative pain relief measures.</p>			
	<p>Rigid protocols limit the flexibility of nurses.</p>			
<p>Nurses are emotionally exhausted when they are unable to lighten the pain of patients (Article 41)</p>	<p>Emotional distress and feelings of helplessness among the nurses.</p>	<p>Psychological strain due to the unresolved pain</p>	<p>How the mental health of the nurses gets affected by seeing the constant pain of the patients.</p>	<p>The pain management challenges in acute care nursing.</p>
	<p>Lack of institutional support.</p>			
<p>Heavy workloads which prevent the nurses to adhere with the</p>	<p>Reduce the opportunities for nurses to engage in meaningful conversations.</p>	<p>Time limitations for comprehensive pain care</p>	<p>Discusses how heavy workload prevent adherence as well as reduces</p>	<p>The pain management challenges in acute care nursing.</p>

pain management protocols (Article 15 and 44)	Limited communication time affects to understand the level of pain.		the opportunities for patient-centred care.	
	Need to streamline the workflow.			
Lack of time for patient-centred communication which reduces the effectiveness of the pain management strategies (Article 15 and 41)	The cultural and emotional sensitivity gaps.	Barriers to understand the pain needs of the patients.	Highlights the impact of poor communication.	The pain management challenges in acute care nursing.
	More dependence on generalised approaches rather than individualised care.			
Nurses have less training in the non-pharmacological pain management techniques (Article 15 and 17)	Insufficient knowledge so nurse requires some structured training programs.	Knowledge gaps related to the alternative approaches	How lack of training in non-pharmacological pain management techniques affect interventions.	The pain management challenges in acute care nursing.
	Challenges to manage the pain in non-verbal or critically ill patients.			

<p>Inadequate training on the tools like CPOT which limits the ability of nurses to assess as well as manage the pain accurately (Article 11 and 25)</p>	<p>Limited familiarity with the pain assessment protocols and tools that delays the pain relief interventions.</p>	<p>Unable to use evidence-based assessment tools</p>	<p>Shows how less training on tools limits the nurses to accurately assess the pain.</p>	<p>The pain management challenges in acute care nursing.</p>
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