BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN EMERGENCY CENTERS

YOLANDE NERISSA MAGERMAN

Thesis submitted in fulfilment of the requirements for the degree
Doctor of Philosophy (Nursing)

in the
Department of Nursing and Midwifery

at the
Faculty of Medicine and Health Sciences

at
Stellenbosch University

Supervisor: Professor P.J. Jordan

Co-supervisor: Dr M.M Van Der Heever

Date: March 2023

Stellenbosch University https://scholar.sun.ac.za

DECLARATION

By submitting this dissertation electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2023

Copyright © 2023 Stellenbosch University
All rights reserved

Stellenbosch University https://scholar.sun.ac.za

ABSTRACT

Background

Pain is a universal, common symptom experienced by patients admitted to the emergency center (EC). The global burden of pain includes trauma-related pain, which is a natural consequence of injury.

Guidelines are necessary tools in evidence-based practice for the implementation of standardised nursing care with a common, efficient approach to patient care. The absence of a guideline for the assessment and management of acute trauma-related pain creates the opportunity for nurses to practice variantly and inconsistently leading to possible negative patient outcomes.

Aim

The purpose of the study was to contextualise a best practice guideline for the assessment and management of acute trauma-related pain in emergency centers in the Western Cape, South Africa.

Methods

The research was conducted in three phases.

Phase one comprised of two quantitative studies: professional nurses in sub-study one, and the patients in sub-study two.

Phase two consisted of a scoping review to identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.

Phase three included the synthesis of the extracted recommendations and the drafting of the best practice guideline.

Results

Data was collected from 118 professional nurses and 529 patients in the ECs of five hospitals in the Western Cape, South Africa. The findings indicated that approximately half of the nurses displayed adequate knowledge, while half have good knowledge and 4% have poor knowledge related to pain assessment and pain management. Attitudes and self-reported practices on pain assessment and management were congruent with the knowledge levels of nurses. Most of the nurses (n=63, 54%) did not consider their level of knowledge on the assessment and management of acute trauma-related pain to be up to date according to best practice nursing.

Stellenbosch University https://scholar.sun.ac.za

Patient data findings indicated that the nurses did not consistently practise assessment and management of acute trauma-related pain in the ECs. The findings confirmed the need for base practices on the best available evidence.

Six best practice guidelines on pain assessment and pain management were identified by means of the scoping review and 114 recommendations were extracted from them. The contextualised guideline was validated by nine external reviewers, who appraised the guideline using the AGREE II tool. An algorithm was developed as an evidence summary and supporting document for ease of reference for professional nurses in the EC.

Conclusion

The need for a best practice guideline in the EC for professional nurses, as the end-users, was evident by the variation in practice, lack in knowledge, attitudes, and practices of nurses. A contextualised best practice guideline was developed as the end-product of this research study. Further research is recommended to implement and test the feasibility, appropriateness, meaningfulness, and effectiveness of the best practice guideline for professional nurses in the EC in a South African context.

Key words

Acute trauma-related pain, pain assessment, pain management, emergency center, professional nurses, best practice guidelines, evidence-based practice.

Stellenbosch University https://scholar.sun.ac.za

OPSOMMING

Agtergrond

Pyn is ‘n universele, algemene simptoom wat ondervind word deur pasiënte wat in die Ongevalle-Eenheid (OE) opgeneem word. Die globale probleem onder pyn, sluit in trauma-verwante pyn wat ‘n natuurlike oorsaak is.

Riglyne is noodsaaklike instrumente in bewys gebaseerde praktyke vir die implementering van gestandaardiseerde verpleegsorg met ‘n effektiewe benadering vir die versorging van pasiënte. Die afwesigheid van riglyne vir die assessering en behandeling van akute trauma-verwante pyn, skep die geleentheid vir verpleegsters om onbestendige en inkonsekwente behandeling toe te dien wat kan lei tot negatiewe uitkomste vir pasiënte.

Doel

Die doel van hierdie navorsingstudie is om ‘n praktyk met die beste riglyne vir die assessering en behandeling van akute trauma-verwante pyn in die Ongevalle-Eenhede (OEe) in die Wes-Kaap, Suid-Afrika te kontekstualiseer.

Metodes

Die navorsing is in drie fases uitgevoer:

Fase een bestaan uit twee kwantitatiewe studies wat professionele verpleegsters insluit as substudie een en pasiënte as substudie twee.

Fase twee bestaan uit ‘n omvang-resensie wat die beste beskikbare riglyne vir die assessering en behandeling van volwasse pasiënte in die ongevalle-sorg eenhede te identifiseer, die waarde te bepaal en die inhoud op te som.

Fase drie sluit in die sintese oor die uittreksel van aanbevelings en die opstel van die beste praktyk vir riglyne.

Resultate

Data van 118 professionele verpleegsters en 529 pasiënte in die OE van vyf hospitale in die Wes-Kaap, Suid-Afrika is ingesamel. Die bevindinge het aangedui dat ongeveer helfte van die verpleegsters voldoende kennis weerspieël, terwyl daar (helfte oor goeie kennis) en 4% nie oor genoegsame kennis wat verband hou met pyn-assessering en -behandeling beskik nie. Houdings-en selfgerapporteerde praktyke oor pyn-assessering en -behandeling is ooreenstemmend met betrekking tot die kennisvlakke van verpleegsters. Meeste van die verpleegsters (n=63, 54%) het nie hulle vlak van kennis in ag geneem oor die assessering en

Stellenbosch University https://scholar.sun.ac.za

behandeling van akute trauma-verwante pyn wat op hoogte gebring moes word vir die beste verplegingspraktyk nie

Data bevindinge van pasiënte het aangedui dat die verpleegsters nie konsekwent pyn-assessering en -behandeling van akute trauma-verwante pyn in die OEe gepraktiseer het nie. Die bevindinge het bevestig dat daar ‘n behoefte is om praktyke op die beste beskikbare bewyse te baseer.

Ses beste praktykriglyne oor pyn-assessering en -behandeling is geïdentifiseer by wyse van die omvang-resensie en 114 aanbevelings is daaruit saamgevat. Die gekontekstualiseerde riglyne is gevalideer deur nege eksterne resensente wat die waardebepaling gedoen het, deur die gebruik van die AGREE II instrument. ‘n Algoritme was ontwikkel as ‘n opsomming en ondersteunende dokumente vir professionele verpleegsters in die OE wat as ‘n maklike verwysing is.

Gevolgtrekking

Die behoefte vir die beste praktykriglyne in die OEe wat deur professionele verpleegsters as die eindverbruikers gebruik word, is voor die handliggend deur die variasiepraktyke, gebrek aan kennis, houdings in praktyke van verpleegsters. ‘n Gekontekstualiseerde beste praktykriglyn is ontwikkel as die eindproduk van hierdie navorsingstudie. Verdere navorsing word aanbeveel om die uitvoerbaarheid, gepastheid, betekenisvolheid en effektiwiteit van die beste praktykriglyne vir professionele verpleegsters in die OE in ‘n Suid-Afrikaanse konteks te implementeer en te toets.

Sleutelwoorde

Akute trauma-verwante pyn, pyn-assessering, -behandeling, Ongevalle-Eenheid, professionele verpleegsters, beste praktykriglyne, bewys gebaseerde praktyk.

Stellenbosch University https://scholar.sun.ac.za

ACKNOWLEDGEMENTS

I would like to acknowledge and express my sincere gratitude:

- Our heavenly father who has given me the strength and endurance to complete this journey.
- My supervisor Professor PJ Jordan for her calm approach and continuous support, extensive knowledge, and wisdom.
- My co-supervisor, Dr MM van der Heever for her continuous encouragement, serenity, and faith in me.
- My husband, Edgar for his patience, support and being so proud of me.
- My son, Uldriaan for his love and support always.
- My amazing sisters Charmaine, Tracey, and Joan for their continuous love, support, and encouragement through this journey. They are the best sisters ever.
- My parents who believed in me unconditionally. Mum and dad are not here to share this achievement, but I believe they are with me in spirit.
- Nazma Vajat, thank you for walking a very long road with me patiently and for being so supportive.
- A special thank you to everyone who contributed to this study, to everyone who believed in me and supported me.

Stellenbosch University https://scholar.sun.ac.za

TABLE OF CONTENTS

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

LIST OF APPENDICES

Stellenbosch University https://scholar.sun.ac.za

LIST OF TABLES

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

LIST OF FIGURES

Stellenbosch University https://scholar.sun.ac.za

LIST OF BOXES

Stellenbosch University https://scholar.sun.ac.za

LIST OF ABBREVIATIONS

AGREE II	Appraisal of Guidelines, Research and Evaluation
EC	Emergency center
BPGs	Best practice guidelines
EBP	Evidence-based practice
EBHC	Evidence-based health care
FAME	Fame, Appropriate, Meaningful, Effective
GDG	Guideline development group
HREC	Health Research Ethics Committee
JBI	Johanna Briggs Institute
KAP	Knowledge, Attitude, and Practice
LMIC	Low-middle- income countries
RNAO	Registered nurses' association of Ontario
RSA	Republic of South Africa
SANC	South African Nursing Council
SA	South Africa
UHC	Universal Health Coverage
WC	Western Cape
WHO	World Health Organisation

Stellenbosch University https://scholar.sun.ac.za

LIST OF DEFINITIONS

For the purpose of this study, the following key definitions have been identified:

Acute pain

Pain experienced for a duration of fewer than six weeks, subacute is between 6 to 12 weeks (Geurts, Willems, Lockwood, *et al.*, 2017:1203). The context of the study will focus on acute trauma-related pain of patients in the ECs.

Acute trauma-related pain

The word "trauma'' depicts physical injury or a wound to the living tissue resulting in pain (Gerber & Gerber, 2019:4). Acute trauma-related pain results from trauma or injury which can be classified as nociceptive pain, resulting from tissue damage or neuropathic pain, resulting from nerve damage (Meyr & Steinberg, 2008:317; Parker & Rodgers, 2015:18). This study focused on acute-trauma related pain in the EC.

Pain assessment

Pain assessment is an exchange of the meaning of pain. A comprehensive assessment of pain can help determine the type of pain, e.g., neuropathic, visceral, somatic, muscle spasms; how the pain affects function, what interventions are required and what has been effective and patient fears and misconceptions about pain management (Gordon, 2015:567). This study explored the assessment of acute trauma-related pain in adult patients as performed by professional nurses in the EC.

Pain management

Pain management is the use of pharmacological and nonpharmacological interventions to control pain that has been identified in patients. Pain management encompasses the patient's quality of life, the ability to function productively at work and in the family and society (Board of Nursing, 2010:7). Nurses play a pivotal role in assessing and managing pain to assist patients in obtaining the best possible outcomes. For this study, pain management refers to the implementation of pain management interventions by professional nurses, in the ECs for the management of acute trauma-related pain.

Professional nurse

A person who has completed and complied with the programme objectives referred to in Regulation 425 leading to registration as a nurse (General, Psychiatric and Community) and Midwife (SANC,1985); and Regulation 683 leading to registration as a general nurse according to the South African Nursing Council (SANC) (South African Nursing Council, 1997), since

Stellenbosch University https://scholar.sun.ac.za

they are accountable for overseeing patient care. In this study, professional nurses working in the EC in the WC, was the population for sub-study one. All professional nurses working in the EC were included. This also included departmental managers, operational managers and clinical mentors working in the EC.

Emergency center (EC)

Emergency centers are healthcare facilities where patients most often seek urgent care. Care provided in these centers is diverse such as life-threatening emergencies, acute illness and injury, and complications associated with chronic conditions. Furthermore, care is also provided for non-urgent situations, as an alternative to primary care (Moore, Stocks & Owens, 2017:10; Mierendorf & Gidvani, 2014:77). The EC in health facilities in the Cape Metropole district in the Western Cape was the setting to conduct the primary research in this study. An EC is the current correct term for what is commonly referred to as an emergency/accident and emergency/casualty unit or a trauma and emergency unit (Hardcastle, 2008:1). In the Western Cape, the central hospitals refer to the term as emergency departments or trauma units. The regional hospitals, district hospitals, and community health centers refer to the term as emergency centers. For the purpose of this study, the term emergency center was used.

Best practice guidelines

Best practice guidelines (BPGs) are developed systematically using the best available evidence to support clinical and management decision making and practice. It provides nurses with the best evidence and informed recommendations that support clinical practice and guide practitioners in health care in specific clinical practice settings and circumstances to improve patient outcomes. BPGs must be developed from a credible source (Registered Nurses' Association of Ontario, 2013). In this study, a best practice guideline was contextualised for professional nurses for the assessment and management of acute trauma-related pain for adult patients in the EC.

Stellenbosch University https://scholar.sun.ac.za

ETHICAL APPROVAL

The study was approved by the Health Research Ethics Committee of Stellenbosch University in December 2020 (SU) S20/08/214 (PhD) (Appendix A). The HREC approval was updated in November 2021, S20/08/214 (PhD) (Appendix B). Permission to conduct the study in the EC of the two tertiary hospitals, Hospital A (Appendix C) and Hospital B (Appendix D) were granted by the hospital ethical committees. The Department of Health coordinated the ethical approval of the regional hospital (Appendix E), one district hospital for the pilot test (Appendix F) and two district hospitals (Appendix G and Appendix H) for the main study, WC_202101_024.

Permission to participate in the study was obtained from professional nurses (Appendix I) in sub-study one and patients admitted to the EC with trauma-related pain (Appendix J) in sub-study two. Furthermore, permission was obtained from fieldworkers (Appendix K) who assisted with data collection in sub-study one.

Permission was also obtained from expert review members (Appendix L) who were invited to be on the panel for the review of the best practice guideline.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 1: OVERVIEW AND INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

Pain is a universal, common symptom experienced by patients admitted to the emergency center (EC). The global burden of pain includes trauma-related pain (Morriss & Roques, 2018:265), which is a natural consequence of injury, resulting from mild to severe injuries and is a reported factor in the development of persistent pain (Accardi-Ravid, Dyer, Sharar, *et al.*, 2018:699). Despite medical advances in pain management, acute pain is often still undertreated and inadequately assessed and managed in the EC (Accardi-Ravid *et al.*, 2018:698; Dale & Bjørnsen, 2015:1; Zubairi & Dixit, 2018:1).

Oligoanalgesia, the inadequate treatment of pain, is a commonly recognised issue in the EC (Cakir, Cete, Yigit, *et al.*, 2018:909; Samcam & Papa, 2016:2), where 60% to 80% of patients report acute pain, yet pain remains inadequately managed. Factors contributing to oligoanalgesia in the EC include the following: healthcare facilities extending over large catchment areas, limited resources in terms of both healthcare providers and equipment, increased workload, and protocols and practices that are not standardised (Hardcastle, Oosthuizen, Clarke, *et al.*, 2016:181; Wolf, Brysiewicz, Lobue, *et al.*, 2012:175).

Nurses are the frontline healthcare workers in the EC and they play a pivotal role in communicating with EC patients and providing care to improve patient satisfaction by means of effective and adequate pain assessment and management (DeVore, Clontz, Ren, *et al.*, 2017:23; Parnass, Greenbaum, Glick, *et al.*, 2016:1). A nurse's knowledge and attitude towards pain will determine how he/she will assess and manage a patient's pain (Moceri & Drevdahl, 2014:6). Inadequate knowledge and poor attitudes are key barriers to the assessment and management of pain (Morriss & Roques, 2018:267).

Engaging patients in the pain assessment and management process leads to increased patient satisfaction and is the first step to effective pain management (Tawil, Iskandar & Salameh, 2018:7; Vuille, Foerster, Foucault, *et al.*, 2018:670). A study conducted by Fallon, Fung, Rubal-Peace, *et al.* (2016:120), reported that higher patient satisfaction was associated with patients reporting that they received enough analgesia and that healthcare workers were helpful. Patients perceive nurses as directly communicating with them and doctors indirectly, while conveying prescription requirements for analgesia (Gorawara-Bhat, Wong, Dale, *et al.*, 2017:231). Findings in a study conducted by Pathmawathi, Beng, Li, *et al.* (2015:1), reported that nursing care regarding pain management was rated the highest in patient satisfaction feedback. Patient satisfaction was significantly related to the quality of nursing care delivered

Stellenbosch University https://scholar.sun.ac.za

(Pathmawathi *et al.*, 2015:6). In addition, findings in a study conducted in the United States of America concluded that patient satisfaction was also linked to patient education and pain management (Best, Musgrave, Pratt, *et al.*, 2018:459). Zoëga, Sveinsdottir, Sigurdsson, *et al.* (2015:237), further added in their findings that patient consultation regarding their treatment plan, resulted in improved pain relief and better patient satisfaction.

There is a need for evidence-based care, deliverance of cost-effective care and a time-efficient pain assessment and pain management plan in the acute trauma setting. Evidence-based practice (EBP) involves making clinical decisions using current knowledge to improve patient outcomes (Fineout-Overholt, Melnyk, Stillwell, *et al.*, 2010:53; Stevens, 2013:3). EBP is the mapping of three concepts: current best evidence, clinician's expertise, and the patient's values to improve clinical care and patient outcomes (Fineout-Overholt *et al.*, 2005:335). To manage pain effectively in any setting, best recommendations in the form of clinical practice guidelines or best practice guidelines are advocated (Registered Nurses' Association of Ontario, 2013:6). Best practice guidelines (BPGs) are developed systematically using the best available evidence to support clinical and management decision making and practice (Registered Nurses' Association of Ontario, 2013). BPGs are tools for the translation of EBP into clinical practice (Sciarra, 2012:84).

The use of healthcare recommendations that are informed by the best available research evidence is supported by the World Health Organisation (WHO) (Oxman, Schünemann & Fretheim, 2006a:1). Gagliardi, Brouwers, Palda, *et al.* (2011:1), concur that the use of best available evidence synthesised in guidelines is the underpinning for decision making on pain management by nurses, managers, and policy makers to provide quality nursing care. Existing guidelines allude to the assessment and management of both acute and chronic pain (Dries, 2005; SASA Acute Pain Guideline Committee, 2015), but do not provide a specific guideline for the assessment and management of acute trauma-related pain for nurses working in the EC, which is the focus of this study. A guideline for the assessment and management of acute trauma-related pain in the EC for nurses will promote an organised, systematic patient-centred pathway for pain management of trauma patients.

At the time of writing this research project, there appeared to be no known guidelines available to guide nurses, specifically, on the assessment and management of acute trauma-related pain in the EC in the Republic of South Africa (RSA). Considering this background, it was cardinal to contextualise a best practice guideline for nurses, for the assessment and management of acute trauma-related pain for the South African EC. The focus of this study was to contextualise a best practice guideline to meet the needs of the ECs in the Western

Stellenbosch University https://scholar.sun.ac.za

Cape. In addition, an algorithm was developed for quick and easy reference on pain assessment and management for professional nurses in the EC.

1.2 BACKGROUND

Globally, approximately 5 million people die each year because of traumatic injuries, of which 90% occur in low-income (LI) and middle-income (MI) countries (Dijkink, Nederpelt, Krijnen, *et al.*, 2017:917). Haagsma, Graetz, Bolliger, *et al.* (2016:6), estimated in 2013 that 973 million people sustained injuries that required health care of some type and 4, 8 million people died from injuries globally. In 2019, the incidence of injury in Europe injury was 109.7 million and 458,669 people died from injuries (Haagsma, Charalampous, Ariani, *et al.*, 2022:4).

Acute trauma-related pain represents a large proportion of admissions globally, with the European Union (EU) reporting an estimated 38 million recorded injuries, of which there are approximately 37.8 million admissions to the EC and approximately 5.3 million hospital admissions (Giustini, Rogmans, Turner, *et al.* 2021:11), to ECs across Europe and is the most prevalent complaint among trauma patients in ECs (Ahmadi, Bazargan-Hejazi, Heidari Zadie, *et al.*, 2016:179; Dißmann, Maignan, Cloves, *et al.*, 2018:179). Trauma-related morbidity is a rapidly increasing health problem globally, resulting in many patients who are left injured and disabled (Balasubramanian, Mohan, Whelan, *et al.*, 2016:45; Diamond, Dalal, Adebamowo, *et al.*, 2018:6).

Sub-Saharan Africa has a unique injury profile compared to global statistics due to war, conflict, human rights violation and gender base violence (Smigelsky, Aten, Gerberich, *et al.*, 2014: 127) and is considered to have one of the highest road traffic-related mortality rates at an epidemic proportion, with an 84% increase since 1990, nearly twice the global growth (Mitra, Turner, & Mbugua, 2021:3). The Western and Southern sub-Saharan regions have the highest reported road accident-related deaths, more than any other region globally. Furthermore, over 8 million non–fatal injuries were reported with 885 000 warranting hospital admission. Collectively, the burden of non-fatal road injuries in sub-Saharan Africa exceeded 14 million healthy life years lost. Africa has the highest road traffic-related mortality rates equating to 14 times more than the United Kingdom (Mitra et al., 2021:5; Peter, Pandit, Le, *et al.* 2016:1128). South Africa has a large trauma burden with road traffic injuries and interpersonal violence being the major contributors to the burden of trauma. The Western Cape accounts for 23.9% of the trauma burden of disease in South Africa (Möller, Hunter, Kurland, *et al.*, 2018:2; Zaidi *et al.*, 2019:515).

Physical injuries most often occur in the context of traumatic events that may be intentional (motor vehicle collisions, falls, drowning, exposure to smoke, fire, or flames poisoning and

Stellenbosch University https://scholar.sun.ac.za

sport-related injuries) or unintentional injuries (injury to the self or others) (Zazzera, 2020:13). A combination of these injuries presents to the EC with acute trauma-related pain as the presenting symptom. Traumatic injuries are the impetus for acute trauma-related pain, yet pain remains undertreated (Mura, Serra, Marinangeli, *et al.*, 2017:2781). Acute pain as a consequence of trauma is a prevalent, common presentation in the EC, yet one of the least studied areas (Mota, Cunha, Santos, *et al.*, 2019:2483). Acute trauma-related pain is experienced by up to 90% of patients in the EC globally, with pain often either untreated or not prioritised (Chew & Shaharudin, 2017:601; Porter, Siddiqui, Sharma, *et al.*, 2018:18).

A study conducted in Iran reported that no plans for the assessment and management of pain were in place for the majority of patients and that only 13, 3% of patients with severe pain received analgesics almost one hour after admission to the EC (Masoudi Alavi, Aboutalebi & Sadat, 2017:55). Findings in a study conducted in the Western Cape on pre-hospital acute trauma assessment and management practices revealed that less than a fifth, *n*=435 (18.1%) of the patients with traumatic injuries had their pain assessed with a pain assessment tool. Additionally, 78.6% of these patients assessed with a pain score reported moderate-to-severe pain (Lourens, Parker & Hodkinson, 2020:6; Matthews, McCaul & Smith, 2017:27). Studies conducted in pre-hospital settings in the Western Cape concur that the assessment and management of acute pain, including acute trauma-related pain, are not adequately assessed and managed (Lourens, Hodkinson & Parker, 2020:2; Matthews *et al.*, 2017:25; Vincent-Lambert & De Kock, 2015:141).

Pain incapacitates patients, altering their ability to perform routine functions, which can also lead to medical, physical, and psychological complications, such as depression (Pierik, Berben, IJzerman, *et al.*, 2016:3). To prevent these effects, assessment, and management of acute trauma-related pain, specifically in the context of the EC, is important. The primary aim of assessment and management of acute trauma-related pain in patients admitted to the EC is to reduce pain, to improve function and increase the quality of life for patients (Adam, Mršić, Matolić, *et al.*, 2013:136). Furthermore, assessment and management of acute trauma-related pain is imperative to improve patient outcomes, patient satisfaction, minimise and prevent the adverse effect of inadequate pain management, ensuring quality patient care and patient satisfaction, as well as preventing adverse physiological effects and improving the rapport between the patient and the nurse in the EC (Masoudi Alavi, *et al.*, 2017:53; Scholten, Berben, Westmaas, *et al.*, 2015:799; Gregory, 2017:5; Pierik *et al.*, 2016:3). A study conducted by Sturesson, Falk, Castrén, *et al.* (2016:35), concur that patients' perceptions on the administration of analgesia and implementation of pain control measures in the EC were associated with better patient satisfaction.

Stellenbosch University https://scholar.sun.ac.za

The assessment and management of acute trauma-related pain in the EC is a vital part of trauma care (Paydar, Farhadi, Ghaffarpasand, *et al.*, 2014:170). Even though all healthcare workers share the responsibility of pain assessment and management, it ultimately remains the primary role of the nurse (Germossa, Hellesø & Sjetne *et al.*, 2019:2). Nurses are directly involved in providing patient care and therefore have an indispensable opportunity to improve patient satisfaction with adequate pain assessment and management (DeVore *et al.*, 2017:23; Ucuzal & Doğan, 2015:75). The principal role of nurses in the assessment and management of pain should thus be recognised.

Due to the close proximity and time spent with patients it is often the nurse who makes the observation and decision regarding the need for pain management (Jonsdottir & Gunnarsson, 2021:2). Nurses interact with patients throughout their shift and are thus able to assess and monitor the patient's acute trauma-related pain iteratively and the response to pain management. A normal shift in Singapore EC is 8-9 hours, where a 12-hour shift is considered to be a contributing factor to staff fatigue, psychological distress, performance reduction and increased risk of errors in an EC with a high turnover of patients (Pothiawala, Lau & Annathurai, 2020:468; Min *et al.*, 2019:885). In Eritrea, North Africa, nurses play a major role in caring for patients in the emergency centers, including initiating pain management without a doctor's prescription (Kahsay & Pitkäjärvi, 2019:2). In the Western Cape, South Africa, nurses work 12-hour shifts in the public sector ECs where they are in direct contact with patients and patient care. The nursing staff spends more time with patients than any other healthcare professional, making it more accessible for patients to discuss pain with nurses more than doctors. Therefore, the pivotal role nurses play in pain assessment and management in the EC cannot be overemphasised (Holl & Carmack, 2015:378).

To assess and manage pain effectively, nurses should have a sufficient level of knowledge of pain, and the assessment and management thereof (Gretarsdottir, Zoëga, Tomasson, *et al.*, 2017:144; Latina, Mauro, Mitello, *et al.*, 2015:960). Holl and Carmack, (2015:378) concur that the complexity of pain requires nurses to be knowledgeable to be able to critically assess patients and be able to understand the patients' needs regarding pain management.

A lack of knowledge of pain amongst nurses is however associated with a poor attitude regarding pain management (Angeletti, Guetti, Paesani, *et al.*, 2018:2). A narrative review of the literature on the knowledge and attitudes of pain of nursing students worldwide revealed that knowledge of pain is generally inadequate in all spheres of nursing, and attitudes regarding pain management are inappropriate (Chow, Chan, *et al.*, 2014:371). According to Alqahtani and Jones (2015:47), nurses may have negative perceptions, attitudes, and misconceptions toward pain management. The lack of awareness of pain management,

Stellenbosch University https://scholar.sun.ac.za

inaccurate pain assessment, nurses' knowledge and attitudes of pain assessment and management were further highlighted by various authors (Germossa *et al.*, 2019:3; Masoudi Alavi *et al.*, 2017:53; Sampson, Goodacre & O'Cathain, 2014:9; Tawil *et al.*, 2018:5). Furthermore, the lack of nursing knowledge regarding the assessment and management of acute trauma-related pain, the inadequate administration of analgesics continue to be barriers to effective pain assessment and management in the EC (DeVore *et al.*, 2017:23).

Nurses can positively influence the assessment and management of pain for patients with acute trauma-related pain in the EC by increasing their knowledge, displaying positive attitudes, and practising according to best available evidence. Evidence-based practice supports the systematic approach to clinical decision making, using the best available data, which includes research, clinical expertise, and patient preference. Best practice guidelines provide evidence-based recommendations to nurses to deliver quality nursing care (Registered Nurses' Association of Ontario, 2013:6). Guidelines are necessary tools in evidence-based practice for the implementation of standardized nursing care with a common, efficient approach to patient care (Buccheri & Sharifi, 2017:464). Guidelines are the bedrock for the implementation of standardised, synthesised evidence-based nursing practice in the busy EC environment (McCaul, Ernstzen, Temmingh, *et al.*, 2020: 193). Synthesised evidence-based literature gives credibility to recommendations in a guideline (Dizon, Machingaidze & Grimmer, 2016:2).

There is a need for evidence-based, cost-effective, and time-efficient pain assessment and management strategies within the ECs in the South African context. The use of best practice guidelines will contribute towards the effective assessment and management of acute-trauma related pain in the ECs. The aim of this study was to contextualise a guideline document to meet the needs of the ECs in the Western Cape. This is a feasible and cost-effective method of guideline development for a limited resource setting like South Africa.

1.3 SIGNIFICANCE OF THE STUDY

It has been observed anecdotally, in the context of the study, that the assessment and management of acute trauma-related pain by nurses in ECs is not conducted consistently and adequately. This anecdotal evidence is supported by literature as indicated above from studies conducted in other countries.

It is a human right for the patient's pain to be treated, and the rights of the patient are violated when the assessment and management of acute pain do not meet the patient's needs (Vijayvargiya, Panchal, Asawale, *et al.*, 2021:38). This is a contravention to the Republic of South Africa's Batho Pele Principles and Human Rights Charter, which states that consultation

Stellenbosch University https://scholar.sun.ac.za

should take place to provide quality services to address the needs of the patients, thus providing value for money (Department of Public Service and Administration, 2014). Pain assessment and management of acute trauma-related pain by nurses in the EC, thus need to be addressed. Nurses need to base their practices on the best available evidence, which can be in the form of best practice guidelines.

To date, there seems to be no guidelines available for the assessment and management of acute-trauma related pain for professional nurses in ECs within the Western Cape context. The focus of this study was to contextualise a best practice guideline for ECs in the Western Cape. It is envisaged that the contextualisation of a guideline will contribute to the body of knowledge, research, and practice in the assessment and management of acute trauma-related pain, in the context of the study. A BPG for the assessment and management of acute trauma-related pain in the EC will make it necessary for nurses to assess pain strategically and consistently. The adoption of pain assessment regimes would inevitably lead to improved pain management. Engaging with the patient throughout the pain assessment and pain management encounter would further improve patient satisfaction. Ultimately, the patient's pain experience would be tolerable, and the hospital stay would be shortened. In addition, it is postulated that improved patient outcomes, patient satisfaction, quality, and cost-effective care, will be achieved, thereby promoting a sustainable healthcare system.

1.4 PROBLEM STATEMENT

Acute trauma-related pain is a prevalent problem in ECs in the Western Cape. Furthermore, to date there is a paucity of studies regarding the assessment and management of acute trauma-related pain in ECs by professional nurses in the WC. Pain assessment and the management are the responsibility of the professional nurse (Pretorius, Searle & Marshall, 2015:373). Yet, anecdotal evidence and observations indicated that the assessment of acute trauma-related pain is not monitored iteratively and there was no evidence that a validated pain assessment tool was used in ECs in the Western Cape. Moreover, the management of acute trauma-related pain was a concern since the time to analgesia was delayed until the patient was examined by a doctor. Long waiting times are a common occurrence in WC ECs, due to the unique patient admission turnover and increased workload. The lack of continuous assessment and management of acute trauma-related pain is a concern, since the quality of nursing is compromised (Kahsay & Pitkäjärvi, 2019:2). Pain should be assessed iteratively, and pain management should be adjusted according to the level of pain by administering prescribed pharmacological agents and the use of appropriate and available nonpharmacological interventions.

Stellenbosch University https://scholar.sun.ac.za

It is important to consider the patients' experience of acute trauma-related pain by engaging them in the assessment and management of acute trauma-related pain. Objective assessment of pain is very challenging, and therefore, the individual patient's description of the pain experience is more reliable. However, anecdotal evidence and observations revealed that the patient had minimal input in the assessment and management of their pain. Involving patients in their care is a major measurement of quality care and patient satisfaction (Van Zanden, Wagenaar, Ter Maaten, *et al.*, 2018:2). Anecdotally, it is unclear on what ground nurses base their current clinical decision-making skills, but it can be assumed that they rely on experience, discussions with colleagues, and doctors' prescriptions.

Guidelines for pain management are available, for example, in high income countries- American College of Surgeons: Best Practices Guidelines for Acute Pain Management in Trauma Patients (American College of Surgeons, the committee on trauma & American Society of Anesthesiologists, 2020); Australian and New Zealand College of Anaesthetists and Faculty of Pain Medicine: Acute Pain Management: Scientific Evidence (Schug, Palmer, Scott, *et al.*, 2016), European Society of Emergency Medicine (Hachimi-Idrissi, Coffey, Dobias, *et al.*, 2020): Guidelines for the management of acute pain in emergency situations; Low and middle income countries: Guidelines for the Management of Pain in Nigeria (Ministry, 2018); Medical Care Quality Section Ministry of Health Malaysia Ministry (Ministry of Health Malaysia, 2020); Pain Management in Emergency & Trauma Department and South African Society of Anaesthesiologists SASA (SASA Acute Pain Guideline Committee, 2015). Regardless of all the guidelines available, there are no updated guidelines specific for nurses in the EC for the assessment and management of acute-trauma related pain. Many of these guidelines combine pain assessment and management for non-trauma pain, post-operative pain, chronic pain but no specific guideline addresses acute trauma-related pain alone. There are no known studies conducted by professional nurses on the assessment and management of acute pain in the EC in the Western Cape. Further research did not reveal scoping reviews or systematic reviews conducted specifically on the assessment and management of acute trauma-related pain in the EC in the Western Cape. The absence of a best practice guideline to guide nurses in the EC in the Western Cape on the assessment and management of acute trauma-related pain is a critical motivation for this study.

The de novo development of a guideline for nurses in the assessment and management of acute trauma-related pain would have been a challenge, due to lack of financial support, time constraints, and limited resources. No guidelines were found in low to middle income countries that were suitable to adopt for implementation in the WC, SA EC context. It would not have been appropriate to adopt a guideline from a high-income country, due to the context of the

Stellenbosch University https://scholar.sun.ac.za

EC settings and patient profiles. Contextualisation seems more appropriate in developing a best practice guideline for the EC.

1.5 RESEARCH AIM

The study aimed to contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain in the EC, Western Cape.

1.6 RESEARCH QUESTIONS

What best practice guideline should be contextualised for professional nurses for the assessment and management of acute trauma-related pain in ECs?

The research questions that further guided this study were:

- What is the knowledge, attitudes and practices of professional nurses related to the assessment and management of acute trauma-related pain of patients in ECs?
- What is the adult patient's understanding regarding the assessment and management of acute trauma-related pain as rendered by professional nurses in the EC?
- What is the recommended evidence for the assessment and management of acute trauma-related pain of adult patients in the EC.?
- What best-practice guideline can be contextualised for professional nurses for the assessment and management of acute trauma-related pain in the EC?

1.7 RESEARCH OBJECTIVES

The following research objectives guided this research study:

- To explore and describe the knowledge, attitudes, and practices of professional nurses on the assessment and management of acute trauma-related pain of adult patients in ECs.
- To explore and describe the patient's understanding regarding the assessment and management of acute trauma-related pain rendered by nurses in the ECs.
- To identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.
- To contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adults in ECs.

1.8 PHILOSOPHICAL STANCE OF THE STUDY

The philosophical stance of the study is described in terms of the research paradigm, and the three dimensions that support the paradigm.

Stellenbosch University https://scholar.sun.ac.za

1.8.1. Overview of the research paradigm

Anecdotal observations in the ECs in the Western Cape regarding inadequate pain assessment and pain management by nurses inspired this research study. Despite the reporting of inadequate pain management for decades, internationally ECs are faced with this dilemma (Sampson, O'Cathain & Goodacre, 2020:85). This study was grounded in a post-positivism paradigm that supported knowledge growth by identifying and assessing causes to determine outcomes (Creswell & Creswell, 2018:6). Post positivism relies on multi-methods to extrapolate information and patterns (Moon & Blackman, 2014:1169). Post positivism in this study was applied by generating evidence from two surveys, by exploring nurses' knowledge, attitudes and practices regarding the assessment and management of acute trauma-related pain in the EC and the patient's understanding, regarding the care rendered. In addition, a scoping review was conducted to determine the best evidence available to assess and manage acute trauma-related pain by nurses amongst adult patients in the ECs. Three philosophical dimensions, supporting the research paradigm, namely ontology, epistemology and methodology directed the nature of enquiry into the research process.

1.8.2 Ontology

Ontology refers to the nature of existence and what knowledge can be obtained from observations (Moon & Blackman, 2014:1170). Anecdotal observations of trauma patients experiencing acute pain, and nurses lack of prioritising acute pain in the EC motivated the researcher to undertake this study. There was a notable lack of guidance and tools for pain assessment in the EC. Pharmacological pain management was prescribed by the doctors but there was also a notable lack of the use of nonpharmacological pain interventions especially whilst waiting for analgesia to be prescribed. The researcher envisaged that a standardised BPG for pain assessment and pain management would make it mandatory for nurses to follow a specific regime. By accomplishing this, EBP in the EC would be ensured.

1.8.3 Epistemology

Epistemology refers to the 'study of knowledge' and includes concepts such as validity, scope and methods of acquiring knowledge (Moon & Blackman, 2014:1171). In this study a scoping review was conducted to map the available evidence on guidelines pertaining to the assessment and management of acute trauma-related pain in adult patients.

1.8.4 Methodology

Methodology provides an overarching framework of the design phase of the research study (Creswell & Creswell, 2018:18; Moon *et al.*, 2019:1173). The ontological and epistemological stances guided the researcher to adopt a multi-phased research approach. Phase one followed a quantitative research paradigm. During phase one, data was collected by means

Stellenbosch University https://scholar.sun.ac.za

of a survey from professional nurses in the EC on their knowledge, attitudes and practices on pain assessment and pain management for acute trauma-related pain in the EC. The second survey allowed for data collected from patients in the EC on their understanding regarding the assessment and management of acute trauma-related pain rendered in the ECs.

Phase two comprises a scoping review, of which the methodology is explained in the scoping review protocol (Appendix R) and a detailed overview of the scoping review is provided in chapter three and five.

Phase three comprises of the contextualisation and validation of the best practice guideline for nurses in the EC. Findings from phase one and extracted recommendations from phase two are synthesised and then contextualised recommendations relevant to the review questions are compiled in the BPG. This process was overseen by a guideline development group. An expert review panel reviewed the draft BPG. The feedback was integrated into the final BPG. Based on the BPG, an algorithm is developed to ease the translation of the information to the professional nurses in the EC.

The methodology related to the three phases is further discussed in chapter three, chapter five (scoping review) and chapter six (process of guideline development) respectively.

1.9 THEORETICAL FRAMEWORK

This research study is guided by the JBI Model of Evidence-Based Healthcare (EBHC). The Joanna Briggs Institute (JBI) Model for Evidence-Based Health Care was first published in 2005 and since then it is widely referred to in the literature. It conceptualised EBP as clinical decision-making that considers the best available evidence; the context in which the care is delivered, patient preference and the professional judgment of the health professional (Pearson, Wiechula, Court, *et al.*, 2005:209). EBP helps nurses determine an effective course of action for care delivery. EBP involves the following five steps:

1. Form a clinical question to identify a problem.
2. Gather the best evidence.
3. Analyse the evidence.
4. Apply the evidence to clinical practice.
5. Assess the result.

EBP in nursing is an integration of research evidence, clinical expertise, and a patient's preferences. This problem-solving approach to clinical practice encourages nurses to provide individualised patient care. The JBI Model closely links to the application of EBP, which further links to this study, thus promoting nurses as custodian of evidenced-based practice.

Stellenbosch University https://scholar.sun.ac.za

The JBI-Model was re-examined a decade later for relevancy and to evaluate its reflection to the current evidence-based movement (Jordan, Lockwood, Munn, *et al.*, 2018:228). The original model had a central component, the 'pebble of knowledge', which had a ripple effect on the remaining components in the model, highlighting the evidence- based approach: Global health, Evidence generation, Evidence synthesis, Evidence transfer and Evidence utilisation (Pearson *et al.*, 2005:209). The updated JBI Model maintains the integrity of the original Model.

The JBI Model of EBHC was considered ideal for this study as it concisely guides the guideline contextualisation process in an eloquent manner. It further articulates well with each segment and component of the JBI Model, making it appropriate for this study. Therefore, no other models, theories or frameworks were considered. This model, as depicted in Figure 1.1, comprises the following six components: 'pebble of knowledge' (central component), global health, evidence generation, evidence synthesis, evidence transfer and evidence implementation (Jordan, Lockwood & Munn *et al.,* 2019:58). The overarching principles of the updated model include concepts like culture, capacity, communication, and collaboration. The inner segments provide the conceptualisation of the major steps involved in the process of achieving an EBP approach to clinical-decision making, whereas the outer segments operationalise the component parts of the model and articulate how they might be actioned in a pragmatic way (Jordan, *et al.*, 2019:61).

In the updated model the 'pebble of knowledge' is still in the centre, relating to Feasibility, Appropriate, Meaningful and Effective (FAME) which are now also in the centre. The FAME framework is the golden thread that is pulled throughout all the segments. Healthcare professionals base their clinical decisions by considering if their approach is Feasible, Appropriate, Meaningful, and Effective (Jordan *et al.*, 2019:61). Feasibility refers to the extent to which an activity or intervention is practical. Appropriateness refers to the extent to which an intervention or activity fits in with a particular situation. Meaningfulness refers to the extent to which an intervention or activity is positively experienced by the patient. Effectiveness refers to the extent to which an intervention is used appropriately by achieving the intended effect or outcome (Pearson *et al.*, 2005:210). By following this approach, the JBI FAME framework links to the delivery of evidence-based practices and health care. Sackett, Rosenberg, Gray, *et al.* (1996:71), defined EBP as the integration of the best available evidence, clinical expertise and the patients' values and prefers these when making clinical decisions.

Stellenbosch University https://scholar.sun.ac.za

Figure 1.1: JBI Model of Evidence-Based Health Care

(Jordan, Lockwood, Munn & Aromataris, 2019:60)

1.9.1 Components of the JBI Model and application to the study

1.9.1.1 Global health

Global health is a collaboration of transnational research and action which prioritises improving health and achieving health equity for all people worldwide (Jordan *et al.*, 2019:62). The model highlights global health as the movement of global knowledge into local practice. Three components of this wedge of the updated model were introduced and include sustainable impact, engagement, and knowledge need. In order to have sustainable global healthcare, meticulous consideration must be done when making decisions about improvements in health care so that it is viable, feasible and lasting (Jordan *et al.*, 2019:63). Sustainable impact can only be achieved when there is collective conceptual clarity around the motivation and

Stellenbosch University https://scholar.sun.ac.za

perceived benefits of an evidence-based approach to healthcare decision making and the strategies for operationalising it. Engagement is crucial to make informed decisions, both locally and internationally, which will ensure that the context is driven by individuals and groups who understand their specific healthcare environments. Knowledge is needed to determine what people need, what resources are available and what limits constrain their choices to provide an evidence-based approach to the delivery of healthcare (Jordan *et al.*, 2019:63).

The assessment and management of acute trauma-related pain is a global concern that needs attention in healthcare settings. South Africa shares the same concern regarding the assessment and management of acute trauma-related pain, particularly in ECs. This study addressed this phenomenon in the EC with specific reference to acute trauma-related pain. Anecdotal observations on pain assessment and pain management practices and engagement with nursing personnel in the ECs in WC was the motivational factor for this study and the contextualisation of a best practice guideline. Evidence obtained globally regarding pain assessment and management was applied and used in local practice, namely in the EC in the Western Cape.

1.9.1.2 Evidence generation

Evidence generation is obtaining knowledge through well-designed research studies grounded in any methodological position, anecdotes or opinion and experience (Jordan *et al.*, 2019:63). The three components of evidence generation are research, expertise, and discourse. Research generation of new knowledge occurs through primary and secondary research. The results from well-grounded research are credible evidence. Expertise refers to one's clinical judgement and experience, as well as taking the patient's experience into consideration. Discourse can be defined as a written communication or debate based on personal anecdote or experience. Literature elaborates on two types of discourse, 'little d' and 'big D'. 'Little d' discourse refers to talk and text in local social interaction and 'big D' discourse (or Discourse) refers to culturally standardised ways of understanding a priori phenomenon (Alvesson Karremann, 2000:1134). Evidence was generated by conducting primary research where a knowledge, attitude, and practices (KAP) study on professional nurses on the assessment and management of acute trauma-related pain in ECs was explored. This research study thus obtained information from clinical experts in the field of trauma nursing in the EC. Furthermore, evidence was sourced from patient surveys in the EC of the patient's experience and understanding of the assessment and management of acute trauma-related pain rendered by the nurse. This focused on patients' experiences and preferences.

Stellenbosch University https://scholar.sun.ac.za

1.9.1.3 Evidence synthesis

Evidence synthesis is the collation, evaluation, and analysis of research evidence and opinion on a specific topic to aid in decision-making healthcare (Jordan *et al.*, 2019:65). The three components reconceptualised in the updated evidence synthesis are systematic review, evidence summary and guidelines. Systematic reviews are the core for evidence synthesis, which is a form of research (secondary research), with an increasingly stronger relevance to practice. Systematic review methodology is rapidly evolving with all types of reviews that can be conducted (Jordan *et al.*, 2019:66). Evidence summaries streamlined the approach to synthesizing international evidence in a timely manner (Munn, Lockwood & Moola, 2015:132). Evidence summaries offer new and potentially valuable syntheses repertoire in a way that better addressed the need of policy makers, stakeholders and knowledge users (Jordan *et al.*, 2019:66). Guidelines are statements that include recommendations intended to optimise patient care that are informed by a systematic review of evidence. The integration of not only secondary research, but also clinical expertise and patient experiences are important to consider in guidelines. In this study a scoping review was conducted in phase two to map the best available evidence in guidelines on pain assessment and pain management. The synthesis of evidence from phase one and phase two culminated to the contextualisation of a best practice guideline for the assessment and management of acute trauma-related pain in ECs, in phase three. An algorithm is included in the BPG, depicting a typology of evidence summary.

1.9.1.4 Evidence transfer

Evidence transfer is the act of transferring knowledge to individual health professionals, health facilities and health systems globally by means of journals, other publications, electronic media, education, and training and decision-support systems. The revised components in evidence transfer, incorporates active dissemination, education and clinical integration (Jordan *et al.*, 2019:65). The purpose of evidence informed decision-making is to disseminate information to healthcare workers in practice settings at geographical locations globally. Active dissemination uses active methods such as email, and social media to disseminate information (Jordan *et al.*, 2019:66). Systems integration is the inclusion of evidence-based approach in clinical decision-making support systems, electronic medical records, or quality systems. Broader systems, policies and procedures may also be included (Jordan *et al.*, 2019:67). Educational programmes are the channels for evidence transfer. Educational programs may be multi-fold, including evidence related to an intervention or practice, it could involve continuing professional development or broader programmes to achieve evidence-informed approaches to clinical decision-making methods for evidence synthesis or practical, realistic strategies for implementation (Jordan *et al.*, 2019:67). For the scope of this study,

Stellenbosch University https://scholar.sun.ac.za

evidence transfer will be done in the form of publishing the findings of the scoping review, guidelines, and the developed algorithm. In-service training, in the form of workshops will be done for nurses on the guideline content, use in practice and benefits of basing their practices on the best available evidence.

1.9.1.5 Evidence implementation

Evidence implementation is defined as purposeful and enabling setting of activities intended to engage key stakeholders with research evidence to inform decision making and generate sustained improvement in the quality of healthcare delivery (Jordan *et al.*, 2019:67). The three components in the evidence implementation segment are context analysis, facilitation of change and evaluation of process and outcome. Context analysis is a diagnostic process undertaken to understand the issues at hand within a local setting and to identify factors that may impact the envisaged change. For change to occur successfully, skillful facilitation is required to empower others, to engage with the relevant stakeholders and to identify potential organisational barriers that must be managed (Jordan *et al.*, 2019:68). Monitoring and evaluating the changes implemented in the professional practice setting are critical. The JBI conceptual model for practice change includes a focus on the structures, processes and outcomes related to global healthcare delivery (Jordan *et al.*, 2019:68). While it is recognised that evidence in this case, the best practice guideline must be implemented, it will not apply to the study, due to the scope of the work. However, post-doctoral work in this area will be pursued.

1.10 CONCEPTUAL MAP

The study is underpinned by the Johanna Briggs Institute Model (JBI Model). Accordingly, the conceptual map for the study, illustrating the underpinning of the JBI Model is reflected in Figure 1.2. The research design and method related to each phase are comprehensively discussed in chapter three, as well as the respective chapters.

Stellenbosch University https://scholar.sun.ac.za

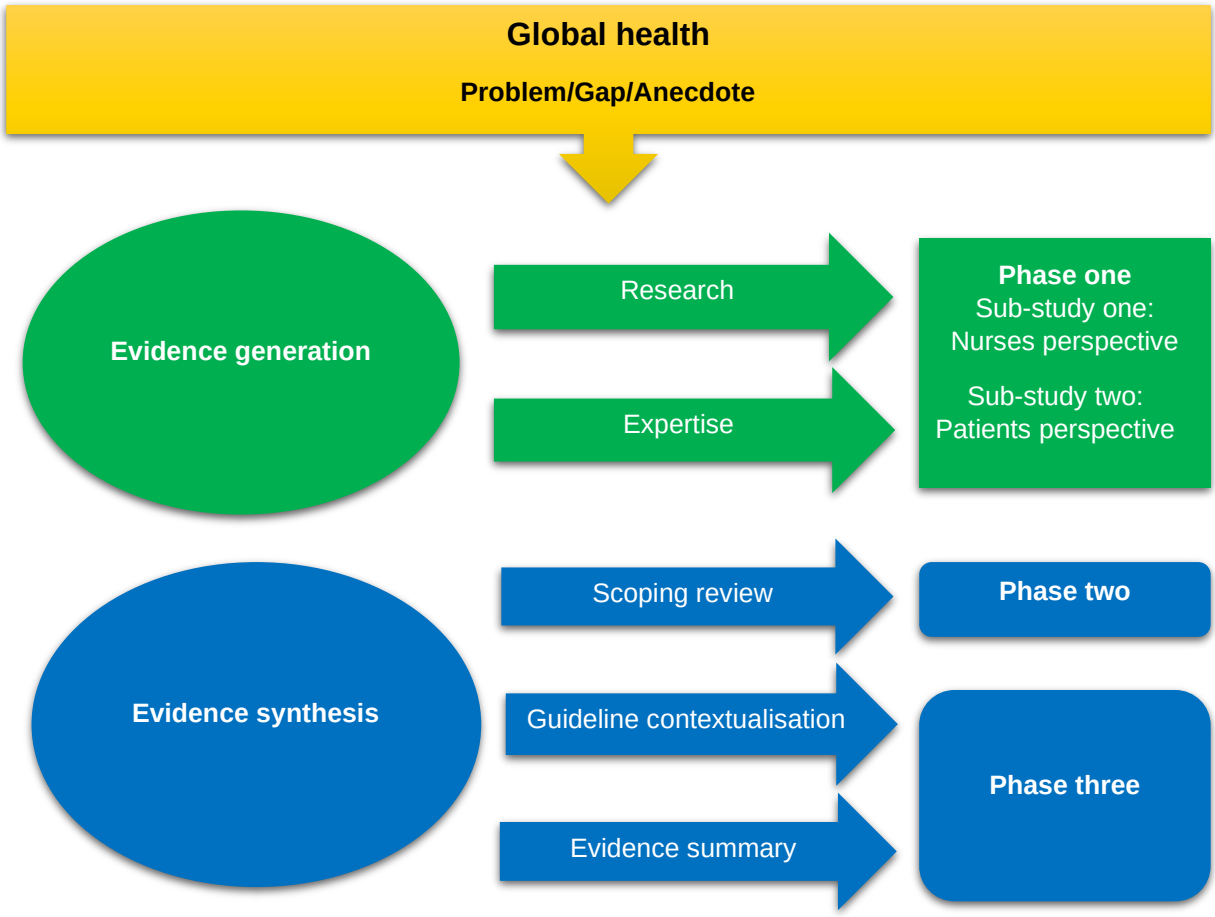


Figure 1.2: Conceptual Map for the study illustrating the underpinning of the JBI Model

1.11 RELIABILITY AND VALIDITY OF THE STUDY

Reliability in this study was done in each phase. For phase one, a pilot test was done for sub-study one and sub-study two. The Cronbach's alpha for the Likert scale items in the survey indicated an overall score of .801, which proved that the instrument was reliable. Reliability in phase two was ensured by doing a critical appraisal, using the AGREE II tool in appraising the methodological quality of the six guidelines included in the review. For phase three an external review panel was consulted to validate and review the guideline process and recommendations. The expert panel used a validated tool to appraise the guideline that was developed.

Validity was done to ensure the integrity of the research design. The supervisor and co-supervisor of this study, two nurse experts in emergency nursing and a pain manager were recruited to review the survey tools for content and face validity. A detailed discussion on reliability and validity is provided in chapter three.

Stellenbosch University https://scholar.sun.ac.za

1.12 ETHICAL CONSIDERATIONS

Ethical approval was approved by the Health Research Ethics Committee (HREC) at Stellenbosch University (S20/08/214 (PhD) (Appendix A). Permission to conduct the research was obtained from the Provincial Health Research Committee of the Department of Health in the Western Cape, reference number WC_202012_019. Permission was also obtained from the ethical committees of the participating hospitals. The managers of the ECs were furthermore informed of the purpose of the study. Letters were provided with all the information. Participants for sub-study one and two were provided with information letters (Appendix I and Appendix J) to explain the purpose of the research and to provide them with adequate information. Written informed consent was obtained from professional nurses and patients who agreed to participate in the study (Appendix I and Appendix J).

This research study was underpinned by the Belmont Report of 1978, which provides a conduit for Ethical Principles and Guidelines for the Protection of Human Subjects of Research (United States of America Department of Health, Education, 1979).

1.12.1 Respect for a person

There are two convictions that are incorporated under respect for a person. Firstly, all participants should be treated as autonomous agents where they should have the right to self-determination (Brink, Van der Walt & Van Rensburg, 2018:35; United States of America Department of Health, Education, 1979:4). Self-determination is based on respect for the participant to voluntarily consent to participate, to ask questions or to refuse to participate (Polit & Beck, 2021:140). Participation in this study was voluntary, and no one was coerced to complete the surveys. The participants had full disclosure regarding the purpose of the study, which was included in a covering letter (Appendix I and Appendix J) of the survey tool. All questions were answered to clarify the purpose of the study when required. Fieldworkers were informed to encourage participants (Appendix K) to complete the survey on their own and not to collude with colleagues. Their right to refuse or decline participation was respected.

1.12.2 Beneficence

It is the responsibility of the researchers to minimise harm and maximise benefits for participants (Polit & Beck, 2021:141). Beneficence was maintained to ensure that the participants were not exploited in any way. Participants were provided with all the details of the study and the average time required for completing the survey. The participant's decision to participate or decline participation was respected. Participants were approached when no medical or nursing interventions were being done, to prevent any delays in the management of the participant. For phase one, participating hospitals were not identified but were coded (Hospital A, B, C, D, E) as a measure to protect both the hospital and the participants.

Stellenbosch University https://scholar.sun.ac.za

1.12.3 Non-maleficence

It was important that participants were not exposed to any discomfort and that harm was prevented or minimised (Polit & Beck, 2021:141). The researcher did not foresee any risks or danger in this study that could harm the participants both in sub-study one and sub-study two. However, in sub-study two patients that were emotional, either due to the pain they were experiencing or the traumatic event, were reported to the operational manager (middle nursing manager). Where necessary these participants would have been referred to a counsellor or psychologist, with the support of the operational manager, if they required any support or need to be debriefed. On follow-up the operational managers reported that no referral was necessary and that patients were coping well.

1.12.4 Justice

Justice refers to the act of selecting and addressing all participants fairly and equally (Brink *et al.*, 2018:30). Fairness was assured by allowing all professional nurses to participate in this research study. A recruitment poster, in the form of a flyer, was advertised on the notice board in the ECs, informing all nursing staff of the research study and inviting them to participate (Appendix M). Furthermore, since the operational manager was on duty every day, she/he was also requested to remind all staff of the research study and to also hand over to the night staff. All participants were treated equally, since there was no discrimination against age, gender, position, or race. All the professional nurses in the ECs were invited to participate in this research study. For survey two, patients were treated fairly, equally and in a dignified manner. This research study was not supported by any funding. However, the researcher compensated participants in sub-study one and sub-study two with a small token of appreciation. A health snack and a pen were given to participants in sub-study one and participants in sub-study two received a health snack. The fieldworkers were compensated with a gift bag, which included stationary and a health snack.

1.12.5 Informed consent process

It is the right of prospective participants to receive adequate information to allow them to make an informed decision to participate voluntarily in the study or to decline (Brink *et al.*, 2018:32; Polit & Beck, 2021:143). A detailed written description of the purpose of the study and the intended outcomes were included in both the surveys. Any further questions pertaining to the purpose of the study were clarified by the researcher. Therefore, the researcher's contact details were on the letters (Appendix I and Appendix J). Details of data collection were specified on the letter with regard to the completion of the survey and placed in a sealed envelope before handing it over to the identified fieldworker for sub-study one. The researcher personally administered the survey tools to patients in sub-study two, explaining to them the

Stellenbosch University https://scholar.sun.ac.za

purpose of the study. No names were required in the survey to participate in this study. The participants were required to sign a consent form which was managed only by the researcher to protect the identity of the participant. The consent forms are stored safely in a locked cupboard for a period of five years by the researcher. Thus, the confidentiality and anonymity are ensured (Appendix I and Appendix J).

1.13 CHAPTER LAYOUT

Chapter 1: Overview of the study: An overview of the prevalence of acute pain is provided.

Chapter 2: Narrative Literature Review: Narrative literature regarding pain assessment and pain management is presented according to the data in surveys for sub-study one and sub-study two.

Chapter 3: Research Methodology: The processes of phases one, two and three are outlined including the ethical considerations.

Chapter 4: Data Findings and Discussion: Quantitative Surveys. The quantitative findings from phase one is presented followed by a discussion.

Chapter 5: Scoping Review: The identification, mapping, appraisal, and summary of best practice evidence and the processes leading to the final guidelines are outlined.

Chapter 6: Contextualisation process: The methodology of the contextualisation of the BPG is described.

Chapter 7: Best Practice Guideline: The final BPG is provided in this chapter.

Chapter 8: Conclusion. Limitations and recommendations: A summary of the conclusions, limitations and recommendations of the study is presented in the last chapter.

1.14 SUMMARY

Nurses play a vital role in the assessment and management of acute trauma-related pain in ECs. It is evident from anecdotal observation that there is a lack of application of knowledge, attitude and practices in the assessment and management of acute trauma-related pain in ECs. A post-positivist paradigm approach was adopted where attention was directed at addressing the underlying issue of the assessment and management of acute trauma-related pain in ECs. The philosophical view of ontology underpins the problem of inadequate assessment and management of acute trauma-related pain by nurses in ECs. The epistemological perspective explored the knowledge, attitudes, and practices of nurses in the EC regarding acute trauma-related pain, the patient's understanding regarding the

Stellenbosch University https://scholar.sun.ac.za

assessment and management of acute trauma-related pain rendered by nurses and literature that exists globally by conducting a scoping review that explored the best-recommended evidence on the assessment and management of acute trauma-related pain of adult patients in the EC. This study aimed to collect data that resulted in the contextualisation of a best practice guideline for nurses for the assessment and management of acute trauma-related pain in ECs.

In the following chapter a narrative literature review on acute trauma-related pain in the EC is explored and presented.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In chapter one an introduction, overview and ethical considerations of the study was provided. In this chapter the narrative literature review and the related processes are described which was undertaken as a preliminary to the study. A narrative literature is conducted as it is important to obtain a comprehensive synthesis of the current knowledge and trends of the assessment and management of acute pain. This will allow analysing, critique, and summarising the patterns, trends, and gaps in a body of knowledge of pain assessment and pain management in ECs globally. Whilst the narrative review in this study broadly looks at the assessment and management of acute pain, the scoping review focuses on answering a specific review question using a systematic, rigorous methodology: The scoping review is presented in chapter five. The literature reviewed, as presented in this chapter, narratively forms the underpinning for the data collection instruments and is used as literature support for the quantitative data findings.

Search

Search engines used to obtain literature included Google Scholar. Databases included PubMed, SAGE Journals, EBSCHOhost, and ClinicalKey. Additionally, reference lists were searched to obtain more literature and primary sources. The following keywords were used to search the databases: acute pain, trauma, emergency centers/departments, nurses, pharmacological, nonpharmacological interventions.

2.2 DEFINING PAIN

The International Association for the Study of Pain defines pain as a biopsychosocial experience, an unpleasant sensory and emotional experience which is associated with actual or potential tissue damage (Adam, Mršić, Matolić *et al.*, 2013:135; Blumstein & Barkley, 2015:381; Gordon, 2015 567). Cohen, Quintner & Van Rysewyk (2018:643) proposed a revised definition of pain: “Pain is mutually recognizable somatic experience that reflects a person’s apprehension of threat to their bodily or existential integrity”. However, this was criticized by Treede (2018:2), arguing that the revised definition ignores the multidimensional nature of pain and takes away the focus of the patient.

Pain can be described as acute and chronic pain. Acute pain is experienced for a duration of fewer than six weeks, subacute is between 6 to 12 weeks, and chronic pain persists for three months and longer (Geurts *et al.*, 2017:1203). The presence of pain is often associated with

Stellenbosch University https://scholar.sun.ac.za

pathology (Walters & De Williams, 2019:4). Painful stimuli because of acute injury activates the nociception process. When an injury occurs, there is tissue damage leading to the initiation of the transmission of pain, from a starting point to an end point known as the acute pain trajectory pathway (Meyr & Steinberg, 2008:643). Two main fibers, A delta and C fibers are transmitted to the spinal cord. This message is projected to different areas in the brain where the pain is interpreted (Steeds, 2016:57; Vijayvargiya *et al.*, 2021:38).

Patients admitted to the emergency center (EC) predominantly present with acute pain, which is mainly due to excessive nociception secondary to noxious stimuli: an inflammatory reaction, trauma or visceral lesion and are often the impetus for seeking medical help (Germossa, Hellesø & Sjetne, 2019:3; Holl & Carmack, 2015:377; Meyr & Steinberg, 2008:306; Spilman, Lechtenberg, Hahn, *et al.*, 2016:2018).

2.2.1 Trauma as the burden of injury

Trauma is a significant contributor to the global burden of disease (Nicol, Knowlton, Schuurman, *et al.*, 2014:550) and is defined as intentional or unintentional injury ranging from mild to major injuries (Hardcastle, Oosthuizen, Clarke, *et al.*, 2016:180). Traumatic injury is a global health problem resulting in many patients who are left injured and disabled (Balasubramanian *et al.*, 2016:2016). Haagsma, Graetz, Bolliger, *et al.* (2016:6), estimated in 2013 that 973 million sustained injuries that required health care of some type and 4, 8 million people died from injuries. Globally low-middle and middle-income countries (LMIC) have a disproportionally greater burden of disease resulting from injuries compared to high-income countries (Diamond *et al.*, 2018:6; Peter *et al.*, 2016:1128). In India, acute traumatic injuries are a common cause of acute pain in the EC which may be a symptom of an underlying condition (Vijayvargiya *et al.*, 2021:38). Africa has the highest road traffic-related mortality rates equating to 14 times more than the United Kingdom

South Africa (SA) is considered to be a low to middle income country where trauma is a major contributor to the quadruple burden of disease (Hardcastle *et al.*, 2016:180; Lutge, Moodley, Tefera, *et al.*, 2016:136). In South Africa, road traffic injuries and interpersonal violence are the major contributors to the burden of trauma and trauma-related pain, straining the resources of the healthcare system (Möller *et al.*, 2018:2; Zaidi *et al.*, 2019:515). The burden of disease in the Western Province is a unique problem in comparison to the rest of the world's violence (Zaidi *et al.*, 2019:515).

Globally there is a need to provide quality acute care. Understanding the burden of disease is crucial for the planning and implementation of quality acute care in the ECs (Clark, Rao, Chen, *et al.*, 2020:38). It is significant to consider the burden of injury in South Africa, since ECs are

Stellenbosch University https://scholar.sun.ac.za

faced with a large volume and range of trauma patients, and the assessment and management of acute trauma-related pain in the EC is thus important (Nicol *et al.*, 2014:50).

2.2.2 Acute trauma-related pain and its consequences

Trauma-related pain represents a large proportion of admissions to ECs across Europe and is considered to be the most prevalent complaint among trauma patients in ECs (Ahmadi *et al.*, 2016:89; Dißmann *et al.*, 2018:180). Physical injuries most often occur in the context of traumatic events that may be accidental (motor vehicle collisions, falls, drowning, exposure to smoke, fire, or flames poisoning and sport-related injuries) or unintentional injuries (injury to the self or others), (Zazzera, 2020:13). A combination of these injuries presents to the EC with acute trauma-related pain as the presenting symptom. Acute pain as a consequence of major and minor trauma is a prevalent, common presentation in the EC, yet one of the least studied areas (Mota *et al.*, 2019:2483). Acute pain is dynamic and complex in nature presenting with a heterogeneous patient response. Accordingly, the assessment and management of pain should be evaluated iteratively (Marchand, 2008:285; Pierik, Berben, Ijzerman *et al.*, 2016:9).

Acute trauma-related pain is experienced by up to 90% of patients in the EC (Chew & Shaharudin, 2017:601; Porter *et al.*, 2018:18). Injuries are a leading cause of health consequences that can lead to temporary or permanent disabilities, resulting in an estimated 6% of people living with disabilities (Balasubramanian *et al.*, 2016:45; WHO, 2014:5). The ineffective treatment of acute pain can result in an escalating cascade of health issues for example chronic pain with irreversible changes in the nervous system. This may eventually become the responsibility and sometimes a burden to the family and society (Lippe, Brock, David, *et al.*, 2010:1447).

Acute trauma-related pain is a common presentation to the EC, due to the high incidence of trauma in the Western Cape, SA. Pain control is a vitally important goal because untreated pain has detrimental impacts on the patients as hopelessness, impeding their response to treatment, and negatively affect their quality of life (Prempeh, Duys, De Vaal, *et al.*, 2020:2). Pain incapacitates patients, altering their ability to perform routine functions, which can also lead to medical, physical and psychological complications (Pierik *et al.*, 2016:3).

Inadequate assessment and management of acute trauma-related pain may have both physiological and psychological consequences that can escalate to further complications (Gan, 2017:2289). Physiologically, there may be an increase in catecholamines release leading to tachycardia, raising blood pressure, and increased myocardial oxygen consumption. In extreme circumstances ventricular dysfunction and myocardium ischemia may result (Oliveira, Pereira, Santos, *et al.*, 2016:2). Furthermore, the inadequate treatment

Stellenbosch University https://scholar.sun.ac.za

of acute pain can stimulate the production of hormones such as cortisol and glucagon, making the patient susceptible to immunological resistance to insulin, hyperglycaemia, hypercoagulability, and dysfunctions (Dunwoody, Krenzischek, Pasero, *et al.*, 2008:23; Oliveira *et al.* 2016:2:2). Psychological effects may include emotional instability, demoralization, and anxiety (Gan, 2017:2289). The above can escalate resulting in a conundrum, further complicating the patient's condition. Adequate pain assessment and pain management ensure quality patient care and patient satisfaction, as well as the prevention of adverse events (Pierik *et al.*, 2016:3).

Delays in the assessment and management of acute pain in the EC is a consequence of a lack of standardisation and cognisance of acute pain and inadequate education programmes. Acute pain, if not treated adequately and promptly following trauma, may progress chronic pain with adverse effects (Keene, Rea & Aldington, 2011:168). Conversely, prompt pain management leads to early and uncomplicated healing with an ultimate reduced duration of hospitalisation and decreased costs (Ahmadi *et al.*, 2016:90). Wazzan, Albeladi, Altaifi, *et al.* (2021:2), confirm that the most common complaint of trauma patients is pain and therefore, it is crucial that acute pain management should be prioritised by healthcare workers (Dißmann *et al.*, 2018:180).

2.3 THE ROLE OF NURSES IN PAIN ASSESSMENT AND MANAGEMENT

Healthcare workers, including nurses, are involved in pain assessment and pain management daily. Consequently, it is important for nurses to have a broad knowledge of pain (Gretarsdottir *et al.*, 2017:144; Holl & Carmack, 2015:378; Latina *et al.*, 2015:960), for example the burden of injury, epidemiology of pain, and the pathophysiological processes of pain, to be able to understand the importance of pain management and to approach the assessment and management of acute trauma-related pain efficiently. Based on the principles of human rights, nurses have an obligation to prioritise pain assessment and pain management, thereby complying to the Universal Health Coverage (UHC) which is an integral objective of the World Health Organisation (WHO) (Brennan, Lohman & Gwyther, 2019:61).

Nurses play a pivotal role in the assessment of acute pain in the EC. As early as 1999, it has been advocated that the role of nurses be intensified, since it is the bedside nurse who inevitably executes pain management strategies, both pharmacological and nonpharmacological (Rawal, 1999:68). The first interaction the patient has in the EC is with the triage nurse, making this the ideal opportunity to initiate pain assessment and pain management strategies (Vuille *et al.*, 2018:670). In the Western Cape public ECs, nurses work 12-hour shifts where they are in direct contact with patients and patient care. The nursing staff spend more time with patients than any other healthcare provider, making it more accessible

Stellenbosch University https://scholar.sun.ac.za

for patients to discuss pain issues with nurses more than with doctors. Therefore, the pivotal role nurses play, cannot be overemphasised (Holl & Carmack, 2015:378). Underestimating the role of the nurse will delay the quality of pain management delivered to patients with acute trauma-related pain in emergency centers. They, therefore, have an indispensable role and responsibility to manage pain effectively by demonstrating knowledge, dedicated patient care and advocacy (Kaur, 2017:5). Furthermore, nurses are directly involved in providing patient care and therefore have an indispensable opportunity to improve patient satisfaction with adequate pain assessment and management (DeVore *et al.*, 2017:23; Latina *et al.*, 2015:960; Ucuzal & Doğan, 2015:75). Assessment and management of acute trauma-related pain is imperative in the improvement of patient outcomes in the EC and will improve the rapport between patient and nurse (Dißmann *et al*., 2018:180; Gregory, 2017:5).

2.3.1 Knowledge, attitudes, and practices of nurses on pain assessment and management

The complexity of pain requires nurses to be knowledgeable, to be able to critically assess patients, and be able to understand patients who are fearful, anxious, and hurting because of pain (Holl & Carmack, 2015:378). However, Latina *et al.* (2015:960), highlighted in their study, that it is a concern that some nurses lack knowledge on pain assessment and pain management. Nurses' inadequate knowledge of pain assessment and pain management can significantly delay the management of acute trauma-related pain. Inaccurate pain assessment and inadequate pain management are prevalent in patients with severe injuries because the focus is on transport of patients and diagnosis (Poprawska, Dyl & Liniarski *et al.*, 2017:29).

A cross sectional study conducted in Jordan on the knowledge, attitudes and practices of healthcare workers (doctors, nurses and pharmacists) reported that the overall knowledge score was 29% with nurses scoring the lowest (24.1%, 95/394), (Nuseir, Kassab & Almomani, 2016:3). A similar exploratory, cross sectional study conducted in Saudi Arabia supported these findings where nurses' scores (mean and median 40, 31, and 39) on pain knowledge were lower than doctors (mean and median 48, and 46), (Al-Quliti & Alamri, 2015:134). Nurses with previous training on knowledge and attitudes on pain scored significantly higher compared to nurses with no previous training (95% CI = 1.82–8.99; p = 0.003) as reported in a study conducted in North Africa (Kahsay & Pitkäjärvi, 2019:5). In the study conducted by Ho, Ho, Pang Yuen, *et al.* (2013:218), in Malaysia, they concluded that registered nurses had a good level of knowledge and attitudes toward pain management.

Lack of knowledge of pain is associated with a poor attitude regarding pain management (Angeletti *et al.*, 2018:2; Kahsay & Pitkäjärvi, 2019:2). Similarly, it was reported that limited knowledge and negative attitudes toward pain management were some of the obstacles to

Stellenbosch University https://scholar.sun.ac.za

implement effective pain management among nurses in Saudi Arabia. Saudi Arabian nurses showed a lower level of pain knowledge compared with nurses from other regional and worldwide countries (Samarkandi, 2018:3). Another study conducted in Saudi Arabia concurred, that nurses may have negative perceptions, attitudes, and misconceptions and beliefs toward pain management. In this study nurses predominantly answered questions incorrectly, pertaining to value judgement (Alqahtani & Jones, 2015:47).

Knowledge deficit and poor attitudes were directly related to an inadequate pain assessment and pain management components in the curriculum in nursing schools. The teaching of pain and pain management is fragmented across different subjects and different disciplines, resulting in gaps in knowledge and thereby abating good pain management practices (Ung, Salamonson, Hu, *et al.*, 2016:11). A study conducted in Tanzania reported that the assessment of pain was well documented in the EC, yet only half of these patients were actually treated for pain (Dilunga, Sawe, Kulola, *et al.*, 2018:5).

The findings of a study conducted in Ethiopia concluded that nurses (95% CO; 52-62%) reflected inadequate pain assessment practices. They further reported that their findings were lower compared to research findings done in 2017, in Rwanda and in 2015, in Uganda. They attributed this to the recent emphasis on pain assessment and pain management programmes in developing countries (Negese, Zeleke, Assefa, *et al.*, 2020:6). Recommendations from a study in Malaysia included the training of healthcare workers regarding pain assessment and pain management, so that pain care is maximised without compromising the management of life-threatening conditions (Ho *et al.*, 2013: 218).

A study conducted in China implemented an education programme with a pre-test and a post-test. Results from the pre-test revealed that nurses' knowledge level was so low that there was a need to conduct an education programme. This education programme included multidimensional nature of pain, pain assessment, pharmacological and nonpharmacological management, and knowledge application. Findings concluded that there were important practice changes and improved patient outcomes (Liu, Li, Wang, *et al.*, 2021:55). Education and training are considered to be important enablers to improve pain assessment and pain management (Sampson *et al.*, 2020:92). Therefore, more emphasis should be invested in training programmes in emergency centers.

The findings of a study conducted in India on the attitudes of nurses towards pain management concluded that 74% of the respondents demonstrated negative attitudes (Kaur, 2017:6). Similar findings were concluded in a study conducted in Jordan where nurses had negative attitudes towards addiction and expressed that the prescription and administration of opioids

Stellenbosch University https://scholar.sun.ac.za

should be delayed. Further findings in this study revealed that a low percentage of nurses considered the patient's self-report to be an accurate judgement of pain. Such negative attitudes to pain management can be attributed to lack of knowledge (Alkhatib, Al Qadire & Alshraideh, 2020:5) and constitutes a need for training. Jonsdottir and Gunnarsson (2021:1), concur that failure to understand and attach meaning to the patient's observed behaviour and self-report is a barrier to pain management. In addition, the nurse's perception of pain may be negative, due to their fragmented interaction with the patient about their pain. Therefore, communication between the nurse and the patient is encouraged to improve pain management and to obtain the co-operation of the patient (Henry & Matthias, 2018:2154).

Findings in a study conducted in pre-hospital settings in the Western Cape on pre-hospital acute-trauma assessment and management practices reveal that the assessment and management of acute pain, including acute trauma-related pain, are not adequately assessed, and managed (Lourens *et al.*, 2020:2; Matthews *et al.*, 2017:25; Vincent-Lambert & De Kock, 2015:141). It is further reported that less than a fifth of the patients with traumatic injuries had their pain assessed with a pain assessment tool (Lourens, Hodkinson, *et al.*, 2020:6; Matthews *et al.*, 2017:27). The findings of a study conducted in a South African tertiary academic hospital concluded that nurses do not demonstrate a standard approach when assessing pain. A further concern is that a pain assessment tool is not used (Klopper, *et al.*, 2006:15). An audit conducted on pain assessment in a tertiary hospital in the Western Cape, South Africa reported similar findings more than a decade later (Prempeh *et al.*, 2020:6).

There is a dearth of data available on the reporting of acute pain assessment in the hospital setting, including South Africa (Prempeh *et al.*, 2020:2). It is reported that there is a lack of compliance to international pain management guidelines in Jordan and that pain assessment tools are not routinely used (Nuseir *et al.,* 2016:2). Gordon, De Leon-Casasola, Wu, *et al.* (2016:8), advocated the following quality indicators to improve the quality of pain management: using a numeric rating scale or verbal descriptor scale at regular levels to document the severity of pain, the use of other treatment methods other than intramuscular injection, regular pain management and pain relief, implementing pain management to facilitate the quality of the patient's life and updating patients about their pain management.

Barriers that might influence the knowledge, attitudes and practices of nurses on pain assessment and knowledge include: nurse-patient ratios, shortage of nurses, increased workload, high patient acuity, limited organisational support and resources, lack of pain assessment tools, lack of implementation of analgesic protocols, limited training or knowledge of evidence-based practice and BPGs that provide best recommendations for pain assessment and pain management (Ramsey, Palter, Hardwick, *et al.*, 2018:497; Vuille *et al.*,

Stellenbosch University https://scholar.sun.ac.za

2018:672; Kahsay & Pitkäjärvi, 2019:7). Gaakeer, Van Lieshout and Bierens (2010:288), reported that acute pain management protocols were lacking in ECs in Netherlands. They further added that protocols that were available did not comply with their current standard of practice. They advocated the development of a standardised protocol for the management of acute pain in the EC. This was furthermore supported by Pierik *et al.* (2016:9), who concluded in their study that a nurse-initiated pain protocol improved the management of pain in the ECs in Netherlands. Protocols, evidence summaries and other supporting documents should however be informed by the latest and best available evidence. Recommendations for clinical decision-making and care for acute-trauma related pain in the EC should be informed by BPGs.

2.4 ASSESSMENT OF ACUTE TRAUMA- RELATED PAIN

Effective pain assessment is the basis for effective pain management in the EC as pain management is guided by the assessment of pain (Mahama & Ninnoni, 2019:1; Sullivan, Lyons, Montgomery, *et al.*, 2016:362). Adequate pain assessment and pain management improve patient satisfaction, prevent adverse effects and the development of chronic pain (Masoudi Alavi *et al.*, 2017:53; Scholten *et al.*, 2015:799). It is an infringement on the patient's basic human right if the patient's pain is not adequately assessed and managed by the healthcare professionals, including the nurses in the EC (Manwere, Chipfuwa, Mukwamba, *et al.*, 2015:5). The planning, monitoring and evaluation of pain management strategies rely on iterative pain assessment (Hall & Gregory, 2016:25; Poprawska *et al.*, 2017:29).

Pain as the fifth vital sign has been advocated for as early as 2005 and is still supported (Baharuddin *et al.*, 2010:21; Williamson & Hoggart, 2005:801). Integrating pain as the fifth vital sign compels nurses to assess pain and to listen to their patients (Campbell, 2016:3). Acute trauma-related pain is an early and important presentation of traumatic injuries and should therefore be included in the initial assessment of the trauma patient as the fifth vital sign (Zou, Ransom & Freeman, 2017:1).

The cornerstone to precise and systematic pain assessment is a structured, multidimensional approach that involves the use of pain assessment scales, non-verbal signs, a stepwise approach, the use of pharmacological management and agents, the use of nonpharmacological methods and the documentation of pain. A qualitative descriptive study was conducted in Florida, USA to examine the attitudes, social norms, and behaviours of a cohort of nurses of various ethnic and cultural backgrounds regarding pain, pain assessment and pain management. Nurses reported that their assessments focused on a visual assessment of a patient, and the patient's rating of pain on the pain assessment scale. They did not report conducting a physical examination such as inspection and palpation of the pain

Stellenbosch University https://scholar.sun.ac.za

site (Ayaz & Sherman, 2022:8). The misunderstanding, misuse and misreporting of pain assessment is a common occurrence in the EC clinical setting, reiterating the importance of a structured plan (Loadsman & Craigie, 2019:411). Pain assessment is thus multi-fold and must be addressed as such. In a pre-post intervention design study, the comprehensive assessment of patients improved significantly after the intervention (Sepahvand *et al*., 2019:646). Reassessment of pain must be followed after the initial assessment to determine the effectiveness of the pain management rendered and to further guide the management thereof (Ministry of Health Malaysia, 2018:8; Samcam & Papa, 2016:3). A comprehensive pain assessment consists of various components: pain intensity, characteristic of pain (e.g., sharp, dull, aching, cramping burning), pattern (e.g., radiating, intermittent), duration, location, and behavioural responses (Sullivan *et al.*, 2016:362).

Pain assessment should be done to identify that the patient has pain (Baharuddin *et al.*, 2010:18). Prior to implementing analgesia, pain should first be identified and this process should start pre-hospitalisation (Poprawska *et al.*, 2017:29). Recognition and assessment of pain are important aspects in patient care to be considered (Ministry of Health Malaysia, 2018:8) to plan for pain management. Since pain is perceived by the patient, only the patient can give an accurate report of his/her pain (Givler & Maani-Fogelman, 2019:1).

The golden standard for the assessment of acute pain is the use of validated pain assessment tools and whenever possible the use of self- reported tools (Prempeh *et al.*, 2020:2). Findings in a study conducted in Iran recommended that the assessment of acute pain in trauma patients should include the use of a pain assessment scale, preferably a verbal rating scale (VRS) such as PQRST (provocative, quality, region, severity, timing) or any other validated pain assessment tools (Ahmadi *et al.*, 2016:90). There is a dearth of studies conducted to determine pain assessment tools (Abudari, Aljawi, Almass, 2021:88; Admassie *et al.*, 2022:2) that are applicable and appropriate for the patient presenting with acute trauma-related pain in the EC. Choosing an appropriate pain assessment tool in the emergency setting is challenging due to the high turnover of patients, and level of consciousness of trauma patients. Unidimensional pain assessment tools are utilised as they are simple to use, cost-effective and user-friendly to the patients (Mura *et al.*, 2017:3). Nurses are reluctant to accept the patient's pain rating, regarding it as aberrant when it deviates from their opinion (Vuille *et al.*, 2018:673). Similar reports substantiate that nurses often assign lower pain scores than the patient's reported score which do not correspond to the patient's presenting injuries (Spilman *et al.*, 2016:2018). Focus group interviews were conducted in a qualitative study in the Netherlands and it was reported that some participants questioned patient's self-report

Stellenbosch University https://scholar.sun.ac.za

about their pain experiences and considered it to be exaggerated (Berben, Meijs, Van Grunsven, *et al.*, 2012:1400).

Apart from the assessment tools and methods used, it is important that the cultural aspects and considerations thereof be noted by nurses. A patient's experience of health, illness and pain is framed by their social and cultural upbringing, and therefore nurses must show empathy and be able to recognize and incorporate the views and values of culturally diverse patients (Brady, Veljanova & Chipchase, 2017:1). Culture is defined as a set of values, beliefs, attitudes, experiences and learned patterns of behaviour shared by the members of a particular cultural group or society (Free, 2002:143). Taking the cultural features of a patient into consideration, will help to understand how the patient perceives their pain and to consider their needs (Prosen, 2019:2). Understanding the patient's convictions of pain will guide the nurse to plan the pain management regime and need for patient education. The perception that Hispanic communities have certain beliefs about pain that influence their reluctance to accept pain management was confirmed in a study conducted by Torres, Thorn, Kapoor, *et al.* (2017: 2065). A patient-centred pain care movement is fundamental to acknowledging and satisfying a patient's cultural needs and preferences and the pain-related principles such as understanding the patient as a unique person, exploring the patient's pain experience and behaviour, understanding the patient's perspective of pain and pain management, and adapting a patient inclusive decision-making system (Prosen, 2019:10). Cultural background can influence the decision the patients make regarding their pain management. In some cultures, the patients can decide about their pain management plan as an individual but in others the family members or the spouse must be consulted (Givler & Maani-Fogelman, 2019:3).

Furthermore, the assessment of a patient's pain experience is a pivotal step in planning the approach to effective pain management (Latina *et al.*, 2015:962). For decades it has been advocated that a formal, structured pain assessment approach should be used to initiate and monitor the effectiveness of pain management (Williamson & Hoggart, 2005:802). A study conducted in the Netherlands reported that due to an increase in pain assessment, nurses demonstrated an increase in pain awareness in adult patients with traumatic injuries in the EC (Ridderikhof, Schyns, Schep, *et al.*, 2017:422).

Documentation of pain assessment should be done from the initial assessment of the patient, since pain is regarded as the fifth vital sign (Samcam & Papa, 2016:3). Prompt and accurate pain assessment is critical in planning appropriate pain management. Accurate, detailed documentation is of paramount importance to provide individualised effective pain management. Accurate documentation metrics for pain assessment and pain management

Stellenbosch University https://scholar.sun.ac.za

should include pain scores, functional status and opioid use, reassessment and evaluation (Ardon, Warrick & Wickas, 2019:2). Ramia, Nasser, Salameh, *et al.* (2017:7) highlighted in their prospective, cross-sectional study in Lebanon that 90% of the surveyed documents had incomplete pain intensity documentation. Findings from an integrative review conducted by Heikkilä, Peltonen and Salanterä, (2016:86) reported that documentation of pain assessment and pain management was done sporadically and documented incompletely. This incomplete documentation placed the continuity of care at risk and there was also a lack of communication between healthcare workers and patients. Implementation of a monitoring system for documentation would be beneficial and would be further enhanced by clear guidelines or care plans for pain management and documentation.

A pre-post interventional design using focus groups, daily audits and weekly newsletters was implemented in a study conducted in the EC in Pittsburgh, USA to review pain reassessment and documentation. The results indicated that there was a 26% increase of pain assessment and documentation from the pre-interventional period to the post-interventional period. For quality improvement purposes daily audits were proposed with weekly newsletter updates (Wissman, Cassidy, D'Amico, *et al.*, 2020:509). A similar study was conducted in South Central, USA where the purpose was to conduct chart audits on pain assessment to evaluate the current state of pain reassessment documentation, and gaps between policies and pain reassessment practice. The findings concluded that the workflow processes were not conducive for the nurse to perform reassessment and documentation optimally. Consequently, it was recommended the workflow be reviewed to reflect the organisational goals and objectives for pain management reassessment (Ross, Feider, Nahm, *et al.*, 2017:1693). Assessment and reassessment improved in the post-intervention phase of the study conducted by Sepahvand *et al*. (2019:645), reiterating that educational programmes are beneficial. These educational programmes should be based on the best available evidence, which can include best practice guidelines or evidence summaries. An important step in achieving improved pain outcomes in the EC is to evaluate the actual care planned and provided (Stang, Hartling, Fera, *et al.*, 2014:179). Nurses reported language as a challenge to the evaluation of pain in a study conducted in an EC in Switzerland (Vuille *et al.*, 2018:672).

2.5 MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN

Pain management is an important issue for patients. The outcomes of pain management and the patient's perceptions of the pain management rendered are quality indicators of pain management (Bozimowski, 2012;187; Köse Tamer & Sucu Dağ, 2020:2; Zoëga *et al.*, 2015:236). Since pain is a universal phenomenon, pain management should similarly be a universal effort for nurses to be knowledgeable, skilled and to have positive attitudes towards

Stellenbosch University https://scholar.sun.ac.za

pain management (Kaur, 2017:5). It is recommended that quality pain management systems be put in place to enhance a positive experience for the patient and improve the outcomes of pain management (Abdolrazaghnejad, Banaie, Tavakoli, *et al.*, 2018:1; Köse Tamer & Sucu Dağ, 2020:2). The lack of nursing knowledge regarding the assessment and management of pain, and the inadequate administration of analgesics continue to be barriers to effective pain assessment and management in the EC (DeVore *et al.*, 2017:23). This can be achieved by alleviating pain by administering pharmacological and nonpharmacological strategies that are based on evidence-based recommendations (Jamal, Fathil, Nidzwani, *et al.*, 2011:89). Furthermore, to manage pain effectively it is important to implement multimodal pain management strategies, which should include nonpharmacological strategies.

Combining pharmacological and nonpharmacological pain management allows effective and holist management of the patient's pain experience (Mwanza *et al.*, 2019:2). The findings in a study conducted in Iran concluded that no plans for the assessment and management of pain were in place for the majority of patients and that only 13, 3% of patients with severe pain received analgesics after almost one hour (Masoudi Alavi *et al.*, 2017:55). The WHO pain ladder has been implemented since 1986, to provide a stepwise guide to pain management (Birkhan, Desai, Foley, *et al.*, 1986:55; "Who Pain Ladder.Pdf", 1996:15). The WHO pain ladder proposes that analgesics be administered incrementally, by starting with non-opioids and depending on the pain intensity to administer weak and strong opioids accordingly (Ballantyne, Kalso & Stannard, 2016:1). Though initially developed for cancer patients, the WHO pain ladder is widely used and is very valuable in the EC.

It is the responsibility of nurses to initiate and provide nonpharmacological pain management strategies in addition to pharmacological pain management (Manwere *et al.*, 2015:2). In conjunction with pharmacological pain management there are many nonpharmacological pain management strategies that can relieve pain, e.g. repositioning the patient to make him/her more comfortable (Ministry of Health Malaysia, 2018:8). Nonpharmacological pain management strategies are safe and simple to implement (Sullivan *et al.*, 2016:365). It is done complimentary to the administration of analgesia creating a holistic multimodal approach to pain management.

Globally, the use of nonpharmacological pain management strategies, for example immobilisation or cryotherapy, is a challenge and can be contributed to lack of knowledge and poor attitudes (Mwanza *et al.*, 2019:2). Data synthesised from a systematic review showed that there is evidenced-based ground for the implementation of nonpharmacological pain management interventions. Such interventions may include cognitive behaviour therapy, physical therapy, and music therapy (Sakamoto, Ward, Vissoci, *et al.*, 2018: 952). Active

Stellenbosch University https://scholar.sun.ac.za

warming in the form of a heated blanket or increased ambient temperature has been reported to have reduced pain in patients with minor trauma (Pak, Micalos, Maria, *et al.*, 2015:4). Nurses as the primary healthcare professionals at the point of care for patients in the EC should thus base their decision making on evidence-based guidelines and recommendations.

2.6 PATIENTS PRESENTING WITH ACUTE-TRAUMA RELATED PAIN IN THE EC

Pain management is a human right. Patient satisfaction is measured on the approach that pain management is planned, and quality of care delivered (Latina *et al.*, 2015:960). Patient education regarding basic knowledge of pain, importance of reporting pain and advantages of taking prescribed pain medication, will furthermore improve the efficacy of pain management as patients will be more co-operative and compliant (Bozimowski, 2012:188). Nurses are in a unique position as they are the direct link between patients and doctors, and they have the most contact with the patients experiencing pain. Nurses are therefore able to educate patients regarding their pain management (Nuseir *et al.*, 2016:5).

Patient satisfaction is an important indicator to measure the quality of care and is an impetus for nurses to achieve their goals for effective pain management (Ibitoye, Olubiyi, Anyebe, *et al.*, 2020:39). The primary aim of assessment and management of acute pain in trauma patients is to reduce pain, to improve function and increase the quality of life of patients (Adam *et al.*, 2013:136). It is important for nurses to acknowledge the patient's perception of pain to provide optimal pain management (Bozimowski, 2012:186). Studies report that patients' perceptions on the administration of analgesia and implementation of pain control measures in the EC were associated with better satisfaction (Fallon *et al.*, 2016:1231; Sturesson, Lindström, Castrén, *et al.*, 2016:35).

A study conducted at a major level one regional center in the United States of America examined the associations between inpatients' trauma-related pain, demographic and treatment factors, pain, and sleep problems. Reported findings included educational level of patients where those patients that indicated a higher level of pain also had lower education and received more opioid analgesia (Accardi-Ravid *et al.*, 2018:702). Patients respond differently to pain and to pharmacological treatment, including physical and psychological factors. Farčić, Barać, Pačarić, *et al.* (2017:4), concurred that patients' perception and experience of pain can be very different even if they receive the same treatment for pain. Similarly, they reported in their study that patients were content with the pain management delivered to them despite high ratings of pain. However, there were patients who sought the attention of nurses, even if it was to nurture and indulge them during their painful experience (Farčić *et al.*, 2017:5). Pain assessment can be very challenging as trauma patients further

Stellenbosch University https://scholar.sun.ac.za

experience emotional trauma, fear, anxiety and psychosomatic distress (Ahmadi *et al.*, 2016:91).

According to a patient survey carried out in Beirut, Lebanon, barriers to effective pain management included fear of adverse effects, addiction, tolerance, and costs (Ramia *et al.*, 2017:9). This was perceived as a lack of knowledge by patients regarding pain issues. The First National Pain Medicine Summit concurred with these findings and further added the following: belief that pain is inevitable; reluctance in reporting pain and fear in taking prescribed medication and unavailability of healthcare professionals (Lippe *et al.*, 2010:1447). It is therefore important that patients are informed of their pain and how their pain will be assessed and managed.

As part of the delivery of a healthcare service patients expect that healthcare workers, especially nurses, will actively monitor and relieve their pain with pharmacologic and nonpharmacologic strategies (Ayaz & Sherman, 2022:1). To provide optimum care to a wide spectrum of trauma patients such as adults, teenagers and the elderly, nurses need to be equipped with current evidence-based knowledge and practices (Ahmadi *et al.*, 2016:90). Nurses are thus even more obligated to provide the best care that is based on the latest evidence and evidence-based recommendations, which can guide their pain assessment and management practices.

2.7 BEST PRACTICE GUIDELINES

Best practice guidelines (BPGs), also commonly referred to as clinical practice guidelines (CPGs), are resources that provide evidence-based information that can be implemented in clinical practice (Saunders, 2015:2036). BPGs are useful tools used to bridge the gap between scientific evidence and clinical practice more specifically, to positively impact the quality of care provided by nurses and improve patient outcomes. The implementation of clinical practice guidelines (CPGs) or BPGs is advocated to optimise the quality, consistency, appropriateness, and cost-effectiveness of health care.

Guidelines are in essence recommendations that are compiled to guide healthcare providers and recipients of health care and other stakeholders to make informed decisions that support clinical practice (Organisation, 2014:1; Gagliardi, Brouwers, Palda, *et al.*, 2011:1). The World Health Organisation (WHO) has endorsed the importance of following a rigorous process when searching for best available evidence to inform clinical practice recommendations (Oxman, Schünemann & Fretheim, 2006b:2). Recommendations are informed by a systematic review or scoping review of evidence and an assessment of the benefits and harms of alternative care options to optimize the outcome of patient care (Greenfield, Steinberg,

Stellenbosch University https://scholar.sun.ac.za

Auerbach, *et al.*, 2011:4). Recommendations inform the intended end-user of the guideline what should be done in a specific situation to achieve the best health outcomes for the patient, the healthcare provider, and the organisation (WHO, 2014:1). Recommendations guide end-users to make informed decisions, allowing them to prioritise, from various potential interventions and measures to suite the specific situation. Implementation of BPGs increases the standardisation of the assessment and management of acute pain and is a framework to measure quality (Saunders, 2015: 2036). BPGs on the assessment and management of pain outlines general core competencies using evidence-based recommendations to expand on nurses' skills and practices on the assessment and management of pain.

Best practice guidelines are the key conduit to the implementation of EBP. The RNAO instituted the Best Practice Spotlight Organization (BPSO) in 2003 to empower the implementation of BPGs and to ensure sustainability of EBP (Best Practice Spotlight Organization (BPSO, 2011:1). Nurses play a critical role in implementing EBP and making a positive change (Sharplin, Adelson, Kennedy, *et al.*, 2019:2). The JBI Model of Evidence-Based Health Care is the fundamental tool for the development of a BPG for nurses for the assessment and management of acute trauma-related pain in the EC. It is evident that the implementation of recommendations of BPG will lead to a culture of evidence-based practice in the EC.

2.7.1 Best Practice Guidelines for pain assessment and management

To manage pain effectively in any setting, evidence-based recommendations in the form of best practice guidelines are recommended for nurses to deliver best practice nursing care (Esteban-Sepúlveda, Sesé-Abad, Lacueva-Pérez, *et al.*, 2021:451).

Guidelines for pain assessment and pain management have been developed in low to middle-income countries (LMIC) (Ministry, 2018; Ministry of Health Malaysia, 2020) as well as high-income countries (Grady, 2015; HCANJ, 2017). The New Zealand Pain Society (NZPS, 2018) and the Royal College of Nursing (Cox, Cannons, Lewis, *et al.*, 2015) have developed the pain knowledge and skills framework for the nursing team which is a guidance document for pain management for nurses. However, these guidelines were often applicable to allied healthcare workers and not all specific to nurses and acute trauma-related pain in the EC. Furthermore, these guidelines would not have sufficed the context of trauma and trauma nursing in South Africa where there is evident low resource settings and shortage of nurses with a high influx of patients (Brysiewicz, Scott, Acheampong, *et al.*, 2021:335). There are no known guidelines for nurses in the Western Cape (WC) and the broader South Africa (SA) for the assessment and management of acute trauma-related pain in the EC. It is thus apparent

Stellenbosch University https://scholar.sun.ac.za

that there is a paucity of guidelines for nurses for the assessment and management of acute trauma-related pain in the EC.

2.7.2 Development of best practice guidelines

There are several methods to develop BPGs and guideline developers should consider the different approaches prior to the process. These methods include writing de novo, or guidelines can be adopted from another environment, or it can be adapted (modified). A hybrid approach, called adolopment which combines elements of de novo, adoption or adaptation can also be used. However, to consider different environments, circumstances, service frameworks and needs of different countries, the process of guideline contextualisation was created (Gonzalez-Suarez, Dizon, King, *et al.*, 2012: 142).

Guideline developers must first consider approaches such as adoption, contextualisation or adaptation rather than developing one from scratch (de novo approach) (McCaul, De Waal, Hodkinson, *et al.*, 2018:1). Developing a new guideline (de novo) is considered when there are no guidelines or no high-quality updated guidelines in place, in a specific field. This is an expensive, time consuming process, which is not often feasible in low resource settings (McCaul *et al.*, 2020:193; Dizon *et al.,* 2016:2). With guideline adoption, a guideline that is applicable to a specific context and setting is chosen and implemented (Dizon *et al.*, 2016:3). No changes are made to the recommendations. Guideline adaptation is another option. The ADAPTE working group describes guideline adaptation as a process that uses a systematic approach to adapt an existing guideline in a specific setting for use in a different cultural or organisational context (ADAPTE, 2010); Dizon *et al.*, 2016:4).

Improving the applicability of the recommendations for the intended settings by integrating contextualisation during BPG and implementation is suggested to enhance BPG uptake. BPG contextualisation is an approach to facilitate the uptake of evidence in resources-constrained environments. It allows extracting recommendations to apply to local settings to address local strategies and issues (Dizon *et al.*, 2016:3; Grimmer, Louw, Dizon, *et al.*, 2019:4). This alternative approach involves contextualising published high-quality evidence that informed BPGs and CPGs to a particular setting. It is challenging to implement a guideline in a context other than where the guideline was developed (Wang, Norris & Bero, 2018:2). Contextualisation of guidelines is placing a word, phrase, or idea within a suitable context. With contextualisation a recommendation cannot be changed, but conditions in a specific context must be considered and integrated in the implementation of the recommendation (Gonzalez-Suarez, Dizon, King, *et al.*, 2012:143; McCaul *et al.*, 2018:2).

Stellenbosch University https://scholar.sun.ac.za

Considering the need for a guideline in the South African context and the diverse context factors, the contextualisation approach was proposed. For the purpose of this study, guidelines were contextualised specifically for nurses to address the assessment and management of acute trauma-related pain in the Western Cape, South African EC.

2.8 SUMMARY

In this chapter a narrative literature review was done to give the reader an understanding of the pain assessment and pain management. A global approach to pain and pain assessment was explored to give cognisance of the global health problem. Pain assessment should be structured and should follow a stepwise approach. It is important to choose the correct pain assessment tools for the EC environment that is simple to use for the nurse and easy to understand by the patient. Pain management should be planned with the patient. The use of pharmacological and nonpharmacological strategies is encouraged. To improve the quality of pain assessment and pain management there must be investment in the education of nurses and patients. For this organisational support is paramount and must be championed. In the following chapter the research design and research method used in this study is described.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapters provided an overview and introduction to the study, as well as a literature review that guided the underpinning for the study. In this chapter a comprehensive discussion of the research design, and methodology of the study are provided. The three phases, addressing the research objectives of the study are discussed in this chapter.

The research objectives are:

- To explore and describe the knowledge, attitudes, and practices of professional nurses on the assessment and management of acute trauma-related pain of adult patients in ECs.
- To explore and describe the patient's understanding regarding the assessment and management of acute trauma-related pain rendered by nurses in the ECs.
- To identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.
- To contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adults in ECs.

3.2 RESEARCH DESIGN

Research design refers to the blueprint for conducting a study that maximizes control over factors that could interfere with the validity of the study (McGregor, 2018:210). A multiphase approach was used, namely phase one: a quantitative design comprising two cross-sectional descriptive sub-studies, addressing the first two research objectives; phase two: scoping review to address research objective three, and phase three, addressing the fourth objective of the study. This culminated in the contextualisation of a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adult patients in ECs. A schematic presentation of the different phases of the study is depicted in Figure 3.1.

Stellenbosch University https://scholar.sun.ac.za

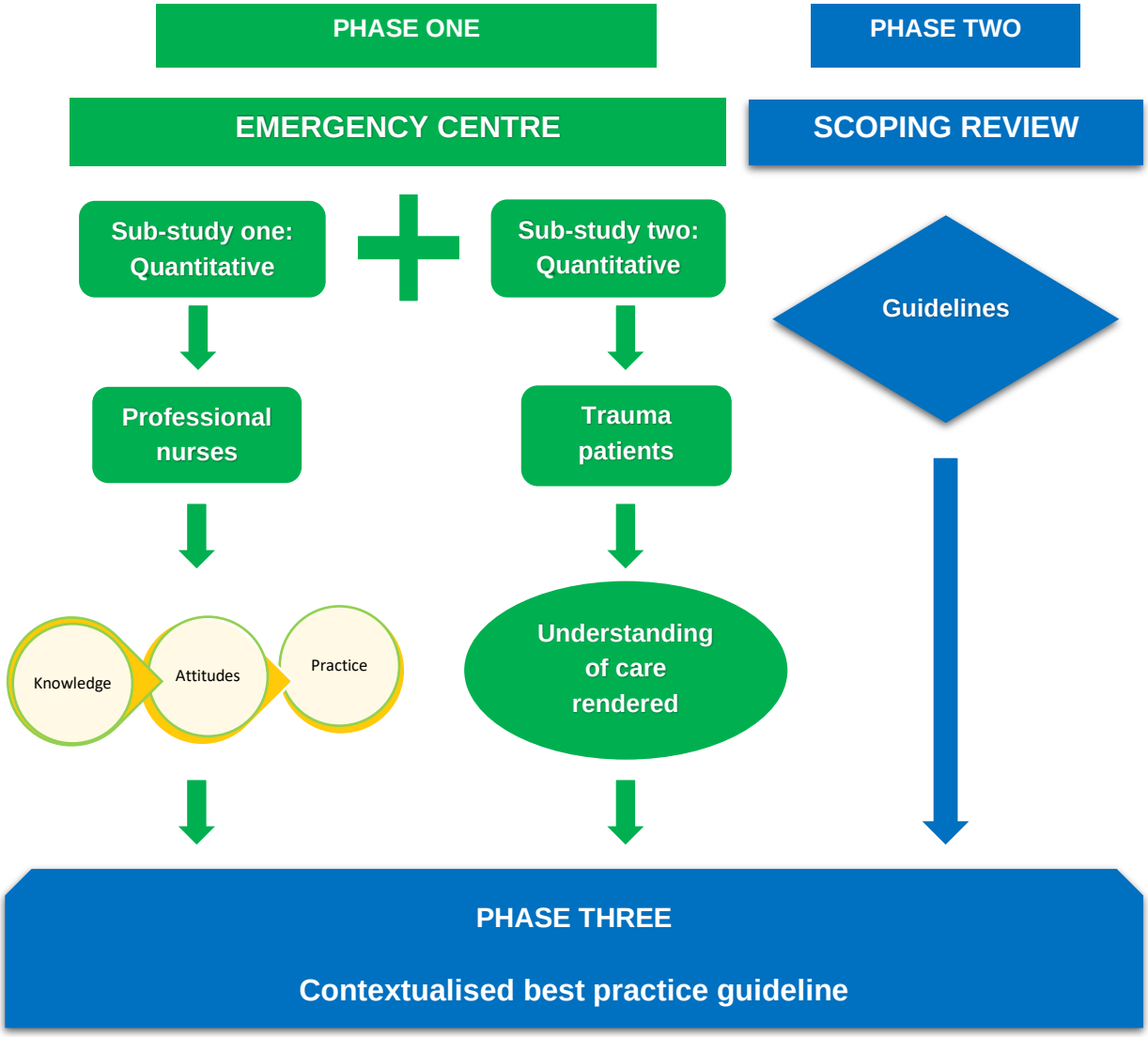


Figure 3.1: Schematic presentation of phases within the study

3.2.1 Phase one

Based on the evidence generation segment from the JBI Model, phase one comprises of two sub-studies, highlighting the nurses and the patient perspectives, using a quantitative, explorative, and descriptive design (Figure 3.2).

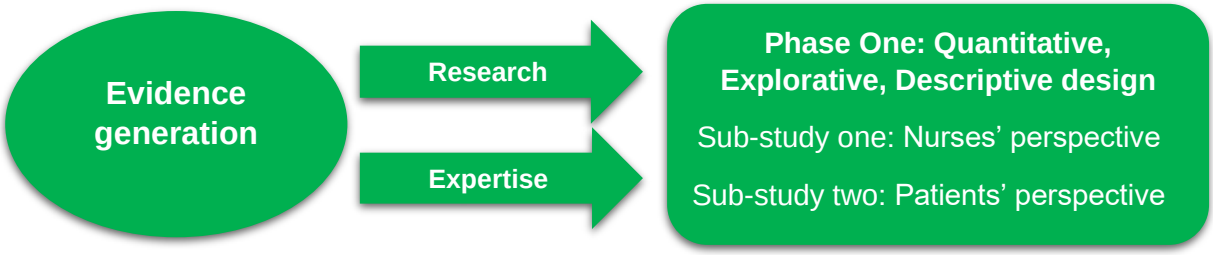


Figure 3.2: Schematic presentation of phase one of the study

Stellenbosch University https://scholar.sun.ac.za

Quantitative research relies on scientific methods by using objective and unbiased empirical observations (McGregor, 2018:255). It uses numerical data to quantify and analyse variables by using statistical analysis to obtain results (Apuke, 2017:41). Quantitative designs allow a larger sample to be used, enabling better generalisability, and increasing the accuracy in inferences made. A quantitative research design was used in this study to obtain objective evidence from professional nurses and adult patients on acute trauma-related pain in the ECs. Data was collected by means of surveys from the nurses and the patients.

Exploratory research starts with an idea or theory that the researcher has an interest in and then continues to investigate more on the subject (Polit & Beck, 2021:15). An exploration is pursued to get a more comprehensive perspective of the subject from different angles. In this study a survey was used in sub-study one to explore the knowledge, attitudes, and practices of professional nurses on the assessment and management of acute trauma-related in adult patients in the EC. A second survey was used in sub-study two to explore the patient's understanding regarding the assessment and management of acute trauma-related pain rendered in the ECs.

Descriptive design presents findings by describing what exists, by observing, describing and reporting additional information (McGregor, 2018:206). The distribution of numerical data through frequencies, measures of central tendencies and measures of dispersion, by focusing on one variable at a time are described (Fouché, Strydom & Roestenberg, 2022:263). The research followed a descriptive design to describe and categorize information by means of structured surveys. A cross-sectional design using surveys reflected information that could provide a broader perspective of acute trauma-related pain assessment and pain management in the ECs (Figure 3.1).

3.2.2 Phase two

A scoping review refers to 'mapping,' a process of summarising a range of evidence in order to convey the breadth and depth of a field (Levac, Colquhoun & O'Brien, 2010:1). A scoping review is a form of knowledge synthesis that can be used to clarify complex concepts and refine subsequent research inquiries (Colquhoun, Levac, O'Brien, *et al.*, 2014:1291). Scoping reviews answer broad review questions aiming to explore the scope of available evidence, to organise the information into categories and to identify gaps. Conversely, systematic reviews answer more specific, clinical questions (Peters, Marnie, Colquhoun, *et al.*, 2021:2). To the knowledge of the researcher and at the date when the study was conducted, no scoping review was done on the topic.

Stellenbosch University https://scholar.sun.ac.za

A scoping review was done to identify, appraise, and summarise the best available evidence on pain assessment and pain management guidelines. A *priori* scoping review protocol was developed, explaining the process of the scoping review (Appendix R) and was approved as part of the proposal review process. The Johanna Briggs Institute (JBI) methodological framework for scoping reviews (Peters, Micah; Godfrey, Mcinerney, 2015) was used in conducting the review. The steps included: (i) identifying the research question, (ii) developing the inclusion and exclusion criteria, (iii) searching for the evidence, (iv) selection of eligible studies, (v) data extraction and (vi) data appraisal. The results were reported using the Preferred Reporting Items for Systematic Reviews and Meta Analyses for Scoping Reviews Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco, Lillie, Zarin, *et al.*, 2018:467).

3.2.3 Phase three

The comprehensive description of the process of the contextualisation of BPGs is presented in chapter six of the study. Findings from phase one and extracted recommendations from phase two were synthesised. A guideline development group (GDG) reached consensus on contextualisation of the final recommendations. The recommendations were integrated in the final draft BPG, which was validated by an expert review panel. The final BPG is presented in chapter seven.

3.3 RESEARCH METHODS

Research methods are the umbrella terms for all the techniques and methods used for conducting research (Mishra & Alok, 2017:1). Research methods in quantitative research entails the use of empirical evidence from large samples to answer the research questions. This will include the following linear and sequential steps: sampling, data collection, data analysis, rigour, and ethical considerations. A multi-phased approach was used in the study to allow for a wider perspective of the assessment and management of acute trauma-related pain to be included. The methods used for the different phases of the study are described below.

3.3.1 Research study setting

The Western Cape is one of nine provinces in South Africa and is situated on the south-western part of the country. It is the fourth largest of the nine provinces with an estimated 4,602 248 million inhabitants and covers 129, 376 km (Redfern, Westwood & Donald, 2016). Cities and towns in the Western Cape are divided according to districts in which they are located: Cape Metropole, West Coast, Cape Winelands, Overberg, Garden Route, Klein Karoo, and Central Karoo. for a map of the health districts can be used as reference (Figure 3.3). This study was conducted in the Cape Metropole district, which consists of thirty suburbs.

Stellenbosch University https://scholar.sun.ac.za

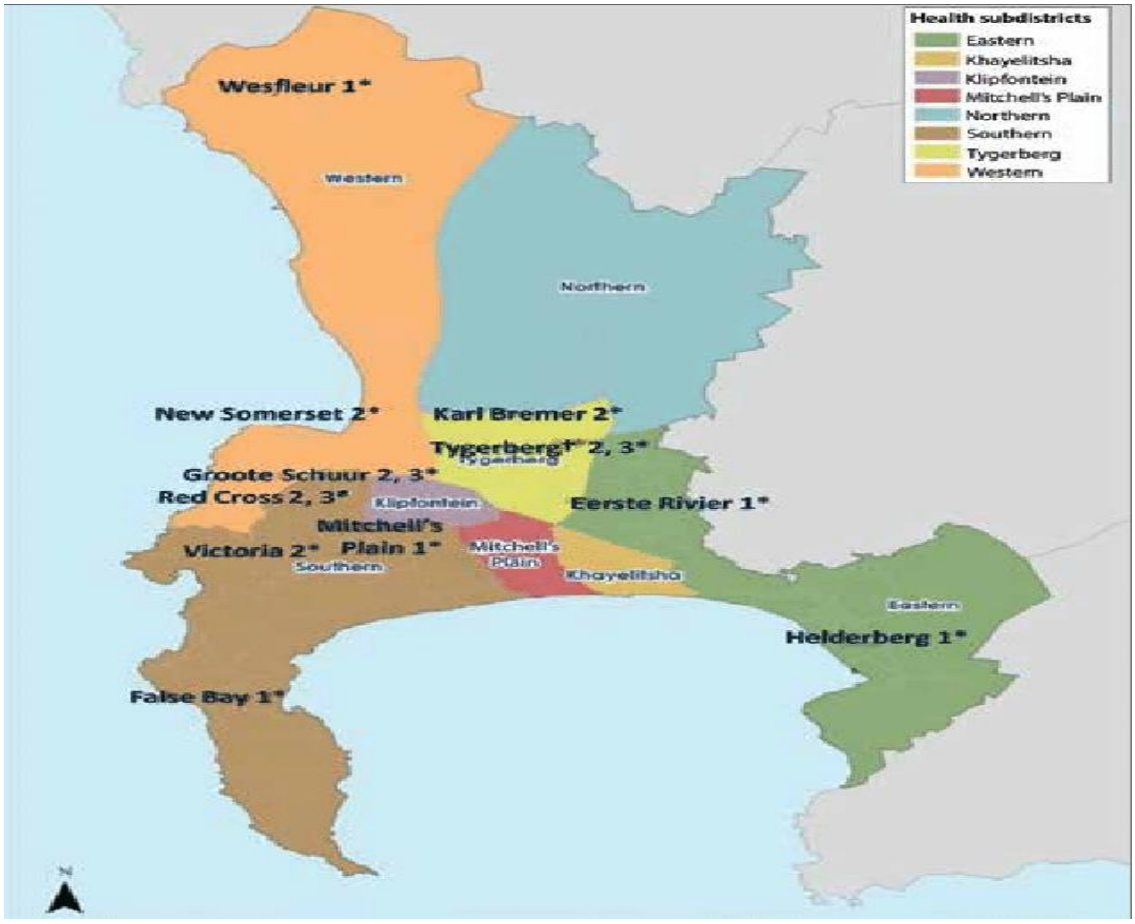


Figure 3.3: Map of health subdistricts in the Cape Town metropole (Hospital and level of care).

Researchgate.net

South Africa has three categories of hospitals, commonly known as District, Regional and Tertiary. These categories are further called level one, two and three hospitals. As their names imply, they offer different levels of service (Cullinan, 2006:6). District or level one hospitals are the first level of referral and generalist staff are available with access to basic diagnostic and therapeutic services. They provide 24-hour emergency services and treat common injuries and emergencies. A regional hospital, level two, provides basic specialist services and should include at least five types. Tertiary hospitals, level three provide specialist and sub-specialist care. Care provided is delivered by expert clinicians (Cullinan, 2006:12–18; Western Cape Department of Health, 2011:21).

This study was conducted in the ECs of five institutions in the Cape Metropole district of the Western Cape, namely: two tertiary hospitals, Bellville, and Observatory; one regional hospital in Cape Town, and two district hospitals, Khayelitsha and Mitchell's Plain. Primary care is delivered at clinics and rural district-level hospitals. Regional hospitals are the main referral sites and are based in bigger rural towns and in the Cape Town Metropole, where general

Stellenbosch University https://scholar.sun.ac.za

specialist services are offered. Tertiary care is provided at the two academic hospitals in Cape Town, where all specialist and sub-speciality services are provided (Slabbert & Smith, 2011:12).

In all ECs patients with trauma-related injuries are admitted and referred to the appropriate levels of care accordingly. The total estimated population size for the WC was 4014765 in 2017, with an estimated population adjustment for 2020 of 419 4179 (Western Cape Government, 2018:6). Statistics for 2022 were not available. Patients with trauma-related injuries are all admitted to ECs of the five institutions included in this study. Those patients with traumatic injuries are admitted to all levels of primary healthcare facilities that deliver emergency services as depicted (South Africa & Department of Health, 2020). For the scope of this study only the five afore-mentioned institutions were included and the remainder of the institutions, that admit patients with trauma-related injuries in the ECs in Cape Town and Western Cape, were excluded. Purposively sampling was done to determine the five institutions chosen based on their geographical accessibility. Sub-study one is part of three phases in this study and therefore, for the scope of this study data collection has been confined to the five institutions. Accessibility and costs were also considered when selecting these institutions.

3.3.2 Phase one

Phase one comprises of the two sub-studies of which the method is respectively discussed.

3.3.2.1 Sub-study one

The objective of sub-study one was to explore, and describe the knowledge, attitudes, and practices of professional nurses on pain assessment and pain management in the acute trauma-related pain in the EC.

a. Target Population

The population comprised of professional nurses working in the ECs of the identified hospitals. According to the scope of practice (South African Nursing Council, 1991) a professional nurse should be able to diagnose health needs of patients and plan and execute a nursing regimen that meets the needs of the patient. Professional nurses have a responsibility to assess and manage acute trauma-related pain in adult patients presenting to the EC and are thus accountable for the outcome of patient care. Nurses in a sub-category report to the professional nurse and was therefore not included in this study. The target population for the study is presented in Table 3.1.

Stellenbosch University https://scholar.sun.ac.za

Table 3.1: Target Population for sub-study one: Professional Nurses

Hospital	Level of Care	Professional Nurses (N)
Hospital A	Tertiary	50
Hospital B	Tertiary	28
Hospital C	Regional	13
Hospital D	District	14
Hospital E	District	14
Total		**119**

b. Sampling

A sample is a subset of the population under study that will represent the entire population (Brink *et al.*, 2018:117; Polit & Beck, 2017:250). An all-inclusive sampling method was used, as the population setting in this study was the ECs which are specialised units and thus relatively small. All professional nurses working in the EC were eligible to participate in this study.

c. Recruitment

Fieldworkers recruited participants since the principal investigator was known to the potential participants. Professional nurses who had an interest in research, willing to assist in this study and willing to sign a confidentiality agreement were recruited as a fieldworker at each hospital. A professional nurse, not working in the EC of the participating institution, was identified as a fieldworker at each hospital. Fieldworkers signed a consent form to confirm voluntary participation and that they will always ensure confidentiality (Appendix K). Due to Covid-19 regulations and social distancing regulations, it was not possible to host a workshop with all the fieldworkers in one venue. As a result of technical problems, a virtual workshop could not take place. Fieldworkers were thus trained individually regarding data collection and adherence to ethical principles. To recruit participants, fieldworkers consulted with professional nurses in the EC to determine appropriate times to meet. To accommodate the night staff, the fieldworker came in earlier in the morning before the night staff went off duty to meet them. When it was not possible to meet the participants, the fieldworker left the envelopes in the EC with the operational managers and participants completed the surveys. Fieldworkers approached professional nurses and explained the study to them. Participants were given an opportunity to read the information letter and then decide regarding participation in the study.

Recruitment flyers (Appendix M) requesting participation in the study were also advertised on prominent notice boards in the EC. Furthermore, it was requested that the study be announced

Stellenbosch University https://scholar.sun.ac.za

in the EC departmental meetings. In follow-up visits the operational managers confirmed that professional nurses were informed of the study.

d. Inclusion and exclusion criteria

All professional nurses working in the ECs were included in the study. Ancillary nurses i.e., enrolled nurses (ENs), and enrolled nursing auxiliaries (ENAs) have a limited scope of practice regarding the assessment and management of acute trauma-related pain in the EC and they report to the professional nurse. Therefore, ENs and ENAs were excluded from this study.

e. Data collection instrument

Data was collected by means of a self-administered survey (Appendix N). No known validated survey could be found for this study that could answer all the research questions. Therefore, in conjunction with the supervisor and co-supervisor, extractions of selected and relevant items were adopted from a pre-existing validated data collection tool, namely Knowledge and Attitudes Survey Regarding Pain (KASRP) developed by Ferrel, and McCaffery in 1987 and has since been widely adopted (Ferrell, & McCaffery, 2014). Permission was granted by the authors (Appendix Q). Further questions that were relevant to the study were compiled by the researcher and based on the literature review done.

The survey for data collection comprises the following sections:

- **Section A** – demographic data, comprising five items exploring the highest qualification, age, total years worked in the EC, formal training, and types of formal training, e.g., workshops, courses, conferences.
- **Section B** – knowledge related to pain assessment and management, comprising 34 items: ten true/false items, of which three were sourced from KASRP by Ferrell, Betty and McCaffery (2014): four yes/no items, 16 Likert scale items of which one was sourced from KASRP and four multiple-choice items.
- **Section C** – attitudes related to the assessment and management of acute trauma-related pain, comprising four items: two multiple choice questions, two Likert scale items, of which one was sourced from the KASRP tool.
- **Section D** – practices related to the assessment and management of acute trauma-related pain, comprising seven items: two yes/no questions, four Likert scale items and one multiple choice question. All these questions were developed by the researcher.

f. Pilot test

A pilot test was conducted for sub-study one to determine the feasibility of the study, to identify any problem areas and to validate the survey tools. Since the researcher compiled some questions in the survey, it was important to ensure that all the items addressed the research

Stellenbosch University https://scholar.sun.ac.za

question. A pilot test also ensured that the survey was comprehensible, appropriate and that the questions were well defined and presented logically. A sample size of 10% was considered, in consultation with the statistician, for the pilot test to be conducted in a hospital that was not included in the main study. This was regarded as an acceptable sample size to test the survey. The pilot test for sub-study one was done at Hospital F, which is also a district hospital in Cape Town and has easy geographically accessibility. Data was collected in the same manner as for the study, including the application and consideration of the ethical principles.

During the pilot test, the data collection process was evaluated, including the time it took participants to complete the survey. Average time for completion of surveys was approximately 25 to 30 minutes to read the consent and complete the surveys. It also gave an indication of how professional nurses perceived this study and their comprehension of the survey. No major problems were identified in the pilot test e.g., no questions were changed or replaced. However, spelling errors were rectified for the main study, but no changes were made to the questions. Fourteen surveys were distributed during the pilot test and fourteen surveys were returned. All participants met the inclusion criteria for the pilot test. The hospital, as well as the data collected from the pilot test, was not included in the main study.

g. Data collection method

Following the pilot test, the main study was conducted. Participants who indicated and provided consent for the study were contacted. All ethical principles were maintained during the data collection phase. Fieldworkers collected data at the five participating hospitals in the ECs when it was not so busy.

The fieldworkers worked in the participating hospitals and were therefore able to keep in contact with the operational managers who alerted them of convenient times to approach the participants. The fieldworker reported that the afternoons were a more convenient time for nurses to be released to complete the survey; one or two at a time, so that the shifts could be covered. A few participants preferred to complete the surveys during their lunch break. When approached by the fieldworker, the participants were invited to participate in the study. The completed surveys were placed by the participants in a sealed envelope and then placed in a sealed box in the presence of the participants.

Data was collected when South Africa was experiencing the third wave of the Covid-19 pandemic during July to September 2021. Strict Covid-19 measures and hospital protocols were complied with. In addition, level four lockdown regulations were implemented from 04

Stellenbosch University https://scholar.sun.ac.za

July 2021 to 25 July 2021, requiring stricter Covid-19 compliance measures. Fieldworkers reported that all protocols were adhered to as required.

For sub-study one, the whole population was invited to participate in the study due to the small size of the population. In total 119 surveys were returned. One survey was incomplete and ultimately 118 were accepted. The researcher collated the raw data and then captured on RedCap for statistical analysis.

h. Data Analysis

The process of analysing data entails converting data collected to numeric values to be analysed so that it could be understood in a meaningful way (Kühberger, Fritz, Lermer, *et al.*, 2015:5). Data analysis was completed with the assistance of a statistician, and a statistical software program, Statistical Packages (SPSS) version 27. On completion of data collection, all surveys were screened comprehensively for completeness. It was also necessary to check that the surveys were only completed by professional nurses working in the EC, since enrolled nurses and enrolled nurse auxiliaries and other allied healthcare workers were not included in this study. Each hospital was assigned a letter ranging from A to E and data was captured accordingly. Data was cleaned and entered on the RedCap online data bases by the researcher. Thereafter, the data was exported to the SPSS and available for analysis. Data was entered on SPSS and cleaned in preparation for data analysis. Descriptive analysis was completed using means, standard deviation, and range of scores. Nominal data (age groups, current post) was correlated with the Likert scale data. An overall knowledge category scores were calculated using metrics of poor, adequate and good knowledge.

The analysed data is presented in chapter four, organised using tables to provide a graphic representation and descriptive information according to the results of each question in the survey, which are in line with the objectives of the study.

3.3.2.2 Sub-study two

Sub-study two comprised a descriptive quantitative design which explored and described the patient's understanding regarding the assessment and management of acute trauma-related pain rendered in the ECs.

a. Target Population

All adult trauma patients admitted to the EC with complaints of acute trauma-related pain were included in the study. Adults in this study were patients that were eighteen years and older. An adult is regarded as a person who is fully grown or developed and in South Africa adults are eighteen years and older (Department of Social Development, n.d.:9). The patients were

Stellenbosch University https://scholar.sun.ac.za

asked their age, and the reason for their admission. Most times the injuries were visible, thereby making it obvious that they were presenting to the EC with acute trauma. These patients were assessed for inclusion to this study. The target population for sub-study two was 2814 (Table 3.2).

Table 3.2: Target Population for sub-study two: Patients

Hospital	Level of Care	Patients (N)
Hospital A	Tertiary	557
Hospital B	Tertiary	557
Hospital C	Regional	1000
Hospital D	District	300
Hospital E	District	400
Total		**2814**

b. Sampling

Consecutive sampling was carried out which allowed every patient to be selected who met the eligible inclusion criteria until the specific sample size (Table 3.3) was obtained (Polit & Beck, 2017:254). Consecutive sampling is an easy way of collecting data with a decreased opportunity for manipulation and sampling bias, since all participants are included (Thewes, Rietjens, Van den Berg, *et al.*, 2018:2056). It does not allow for randomisation which can be a disadvantage. It further minimises the concern of delaying data collection when patients refuse to participate in the study.

A checklist was compiled (Appendix P) to guide the inclusion and exclusion criteria for sub-study two. Adult patients that were admitted to the EC with acute trauma-related pain who were alert, were included in the study. Patients admitted with traumatic brain injuries, altered level of consciousness or patients that were haemodynamically unstable were excluded from the study. The researcher personally perused through the patients' progress reports to determine if the patient met the inclusive criteria by measuring against the checklist before approaching them. Patients who met the inclusion criteria were then approached and invited to participate in the study. It was difficult to obtain accurate statistics of the number of patients admitted to ECs. At certain institutions statistics were incomplete and others were unable to provide statistics. Therefore, the average number of patients admitted to the EC was estimated according to the minimal statistics obtained. These included statistics obtained from one tertiary hospital, one regional hospital and one district hospital. The sample size was determined with the assistance of a statistician.

Stellenbosch University https://scholar.sun.ac.za

Power denotes the capacity of the study to identify if there are differences or relationships prevalent in the population. A power analysis was thus used to determine the sample size (Gray, Grove & Sutherland, 2017:347). The sample size was determined by taking the following into account: 95% confidence interval, 5% margin of error, 50% prevalence and 10% non-response rate. The study was conducted in the two tertiary-level hospitals, the one regional hospital and two randomly selected district-level hospitals. To account for differences among the various levels of hospitals, the sample size was determined separately. A design effect of two was considered at a lower level. A total sample of 680 was initially calculated for this study. Due to the challenges of the Covid-19 pandemic which threatened a delay in data collection, the sample sizes were decreased. After consultation with the statistician, a decision was made to consider a margin error of 0,9%. As a result, the sample size was modified from 680 to 529 with the assistance of a statistician (Table 3.3). This did not affect the data analysis plan and reliability of the study. Details of the sample allocation per hospital type is given in Table 3.3.

Table 3.3: Sample size allocation of main study

Level of Hospital	Initial Sample Size	Recalculated sample size due to Covid-19
Tertiary	120	119
	120	115
Regional Hospital	240	108
District Hospital	130	80
	170	107
TOTAL	**680**	**529**

c. Inclusion and exclusion criteria

The inclusion criteria included all adult patients admitted to the EC with complaints of acute trauma-related pain. Only adult patients who were awake and alert, were included in the study. The level of consciousness was assessed to determine the level of alertness and eligibility to participate in the study.

Patients with pain-related comorbidities (any pain related chronic condition e.g., arthritis) that might have influenced the acute trauma-related pain were excluded from the study. Furthermore, patients admitted with medical emergencies were excluded since the focus of this study was on patients with traumatic injuries and trauma-related pain.

Stellenbosch University https://scholar.sun.ac.za

d. Recruitment

The EC manager or shift leader was approached with each visit who identified the patients admitted with trauma-related injuries. The patient files were then consulted to determine the patient's eligibility according to the recruitment checklist, (Appendix P), to participate in the study. Patients who were eligible were approached and invited to participate in the study after explaining the research study. The researcher had to wait for some patients, until they had been hemodynamically stabilised and comfortable after admission to the EC. Others had been moved to a ward or another holding area whilst awaiting further treatment. These participants were approached when it was convenient to recruit them.

For sub-study two, the researcher experienced difficulty in recruiting participants. There were few trauma patients admitted to the EC during the period of data collection (30/04/2021 – 24/07/2021). Furthermore, most of these patients were admitted at night and either discharged or transferred to a high-level facility within hours. Another challenge was that not all the patients met the criteria (Appendix P) to be a participant in the study. The researcher phoned the EC periodically and found a contact person for each shift to receive information when a trauma patient was admitted. Data collection for sub-study two thus took longer than anticipated.

e. Data collection instrument

Data collection for sub-study two comprised the distribution of surveys to patients admitted to the EC with trauma-related injuries (Appendix O).

The researcher compiled a 9-item survey to be completed by the patient. This survey was compiled based on previous studies (Elkbuli, Stotsenburg, Epstein, *et al.*, 2020; Sturesson, Falk, *et al.*, 2016). The survey consisted of questions related to demographics and the patients understanding of the assessment and management of their acute trauma-related pain. The data survey comprised the following sections:

- **Section A** – demographic data, comprising two items.
- **Section B** – patients' understanding regarding the assessment and management of acute trauma-related pain, comprising, seven yes / no items.

f. Translation of the questionnaires

The survey was translated into Afrikaans and IsiXhosa, prior to the study, to facilitate interpretation and understanding of the surveys. Translation of data was done by the language department at Stellenbosch University (Appendix AD) and was validated by the same department. However, most patients opted for the English survey. Three patients completed the Afrikaans survey, and no patients completed the Xhosa survey. The researcher translated

Stellenbosch University https://scholar.sun.ac.za

the Afrikaans survey back to English and was checked by the researcher to ensure that the translation was correct.

g. Pilot test

A pilot test was done on patients admitted with trauma-related injuries that met the inclusion criteria. The pilot test was conducted in the same hospital as sub-study one, Hospital F. A sample size of 10% was initially considered for the pilot test to be conducted. Due to the lockdown restrictions that were implemented in South Africa at the time of the pilot test, only eight participants were included in the pilot study. This hospital, as well as the data collected from the pilot test, was not included in the main study.

The researcher compiled all the questions in the survey. It was therefore compulsory to test the survey for feasibility, reliability, and appropriateness. The pilot test indicated if the survey questions were well formulated and clearly understood by the participants. It further ensured that the items addressed the research question. During the pilot test, the data collection process was evaluated, including determining the duration it took participants to complete the survey. Average time for completion of surveys in sub-study two was approximately 15 to 25 minutes to read the consent and complete the surveys. The pilot test gave an opportunity to rehearse how the main study would evolve. It also gave an indication of how patients perceived this study and their comprehension of the survey. No problems were identified in the pilot test e.g., use of language that needed to be rectified for the main study. All participants met the inclusion criteria for the pilot test.

h. Data Collection Method

Once ethical approval from the participating institutions and the national health research database in the WC were approved, data collection commenced. Data collection for sub-study two occurred concurrently with data collection for sub-study one. All Covid-19 protocols were adhered to, for example wearing of masks was mandatory, sanitising of hands before and after contact with patient records and with patients. Social distancing was also a requirement, but this was not always possible due to high patient admissions to the EC. The average duration of the data collection was 20 minutes, and this depended on the patient turnover and types of injuries presented and literacy levels of patients. The researcher visited the EC on weekends (Friday afternoons, Saturdays, and Sundays) and public holidays, and spent hours waiting for appropriate times to recruit trauma patients. In certain ECs patients sit next to each other on chairs or benches waiting to be seen by a doctor, or for further diagnostic tests or to be transferred. Considering the overcrowding in the EC, privacy was ensured whenever possible. The patient was invited to participate in the study, and consent was obtained. An

Stellenbosch University https://scholar.sun.ac.za

opportunity was allowed to ask any questions regarding the research study. All questions asked by the patients were clarified.

The survey was then handed out to the adult patient. The patient was left alone during the completion of the survey. The researcher inserted the completed survey in a sealed envelope and then placed in a sealed box in the presence of the adult patient. In total, 529 patients completed the survey for sub-study two (Table 3.3). There were patients who refused to participate in the study, and this was respected. In total twenty-two patients refused to participate in the study.

Data collection for the main study took place from May 2021 to August 2021. This was a challenge during Covid-19 pandemic which required strict adherence to protocols. This was further complicated by the Level 4 Covid-19 lockdown restrictions implemented by the South African government from the 4th July to 25th July 2021. Additionally, it also became evident that it was difficult to collect data in the pilot test as planned. Therefore, adjustments were made regarding the administration of surveys.

i. Data Analysis

Data analysis was completed with the assistance of a statistician, and a statistical software program, Statistical Packages (SPSS) version 27. On completion of data collection all surveys were screened comprehensively for completeness. Each hospital was assigned a letter ranging from A to E and data was captured accordingly. This assisted in analysing and comparing data from the different hospitals. Data was cleaned and entered on the RedCap online data bases by the researcher. Thereafter, the data was exported to the SPSS and available for analysis.

Descriptive analysis was completed using means, standard deviation, and range of scores. Frequency distribution tables were presented for the demographic data of sub-study two.

3.3.3 Phase two

A scoping review was conducted to identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings. A review protocol was developed as a preliminary to the scoping review. It is important to develop a priori review protocol as it demonstrates transparency of the process and outlines the plan for the scoping review. Appendix R refers to a copy of the scoping review protocol that outlines the process.

The Johanna Briggs Institute (JBI) methodological framework for scoping reviews (Peters *et al.,* 2015) was followed in conducting the review. The steps included: (i) identifying the

Stellenbosch University https://scholar.sun.ac.za

research question, (ii) developing the inclusion and exclusion criteria, (iii) searching for the evidence, (iv) selection of eligible studies, (v) data extraction and (vi) data appraisal. The results were reported using the Preferred Reporting Items for Systematic Reviews and Meta Analyses for Scoping Reviews Extension for Scoping Reviews (PRISMA-ScR) checklist (Figure 5.2) (Tricco *et al.*, 2018:467). Details on how the scoping review was conducted and the findings of the review is comprehensively discussed in chapter five of the study.

3.3.4 Phase three

On completion of phase one and phase two the primary guideline developer started with the synthesis of the six final guidelines appraised from the scoping review. This was done by means of thematic analysis and coding. Following this process, recommendations were extracted from each of the six guidelines. Thereafter, the guideline development group (GDG) followed a rigorous process of contextualising the extracted recommendations and finalising the recommendations for inclusion and exclusion. Once this process was completed, the GDG sat again and followed a similar process of extracting recommendations from sub-study one and sub-study two.

The draft version of the guideline was sent to a panel of external reviewers for comment. The review panel consisted of nine members, who were purposively sampled. The following criteria was used in constituting the expert panel:

- Individuals who had experience in guideline development,
- Individuals who had practical experience and interest in pain assessment and pain management in the ECs,
- Individuals with skills and experience in pain management,
- Different health care settings e.g., ECs, academic institutions, nursing educational institutions,
- A diverse group of clinicians, nurses, doctors, and academics.

Panel members were identified through their involvement in emergency nursing and contributions in pain and emergency care. The panel who consented to be part of the expert panel review included: two guideline developers, two emergency nurse specialists, an EC nurse manager, an EC clinician, two academics from nursing education institutions (college and university) and a paramedic, that had experience in trauma practice and the methodological process of guideline development. Patients were not part of the review process, but their perspectives were included in sub-study two of phase one of the research.

The guideline was reviewed by the panel according to the AGREE II tool and feedback was incorporated into the final guideline, which is presented in chapter seven. Quality assurance

Stellenbosch University https://scholar.sun.ac.za

was done by study supervisors to ensure that all the changes had been amended as indicated by the reviewers and that all the data collected during the study were included in the guideline recommendations.

3.3.4.1 Rigour

Rigour is the process of following a precise, consistent, and detailed process to be able to validate the research process. In quantitative studies it is important that the study design is appropriate, and the sample size is representative of the population and calculated using rigorous methods (Gray & Grove, 2021:52).

3.3.4.2 Reliability

Reliability indicates the consistency of results that would be scored when an instrument is used repeatedly. Strong reliability yields low measurement errors (Polit & Beck, 2022: 398; Gray & Grove, 2021:458).

The reliability of the data collection instrument was done on 16-Likert scale items for sub-study one. The Cronbach's Alpha was 0.801, which proves to be reliable instrument, while the individual item scales are reflected in Table 3.4.

Table 3.4: Cronbach's Alpha for the Likert Scale items

Item	Cronbach's Alpha
21. Opioids	.801
22. Non-opioids	.794
23. Non-steroidal anti-inflammatory drugs (NSAIDS)	.795
24. Anticonvulsants	.809
25. Cryotherapy (cold compression)	.784
26. Elevation of extremities	.787
27. Distraction e.g., music, imagery	.778
28. Fluid intake	.801
31. Detailed assessment of pain e.g., pain scale	.797
32. Frequency of pain assessment	.791
33. Pharmacological pain management	.792
34. Nonpharmacological pain management	.783
35. Physiological pain predictors	.774
36. Behavioural pain predictors	.772
37. History: e.g., age, underlying conditions	.787
38. Documentation of pain assessment and management	.794

Stellenbosch University https://scholar.sun.ac.za

The reliability of the study was in line with that of the KASRP tool indicating a Cronbach's Alpha of >.70 for the items reflecting the knowledge and attitude domains (Ferrell and McCaffery, 2014).

Reliability for phase two was ensured by means of doing a critical appraisal, as discussed under phase two. Reliability in phase three was ensured by using an external review panel to validate and review the guideline.

3.3.4.3 Validity

Validity refers to the measurement against which the instrument reflects the research study (Gray & Grove, 2021:463). Content and face validity was done to ensure the integrity of the research design, as well as the accuracy of the survey tools.

a. Content Validity

Content validity measures the content of an instrument to the research aim, objectives and questions to ensure that the outcome is valid (Polit & Beck, 2022:154).

The supervisor, co-supervisor and the researcher are professional nurses who are all from a critical care nursing background and have experience of working in an EC. They analysed and reviewed the content of the survey tools for phase one to ensure that it measures the identified variables. Two professional nurses working in the EC reviewed the survey tools. A professional nurse working as a pain manager in a tertiary hospital was further consulted to validate the content of the surveys.

b. Face Validity

Face validity refers to the appearance of the instrument and if it reflects the study (Gray & Grove, 2021:459). The face validity of the survey was reviewed by the supervisors, a pain manager, and a statistician. All the reviewers focused on the neatness, legibility, and format of the questions in the survey.

3.4 SUMMARY

In this chapter the research design and method were discussed, which are cardinal in planning and performing the research study. The following chapter describes the findings of the scoping review that addressed the objective of phase two: to identify, appraise, and summarise the content of the available best practices guidelines for the assessment and management of acute trauma-related pain in adult patients within emergency centers.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 4: EMPIRICAL RESULTS AND DISCUSSION: QUANTITATIVE DATA

4.1 INTRODUCTION

Chapter four provides an overview of the research design and methods used in the study. This chapter presents the empirical results of phase one of the research study. As illustrated in Figure 4.1 and linked to the JBI Model, this phase is linked to evidence generation and comprises the two sub-studies, that explore the nurses' and patients' perspectives.

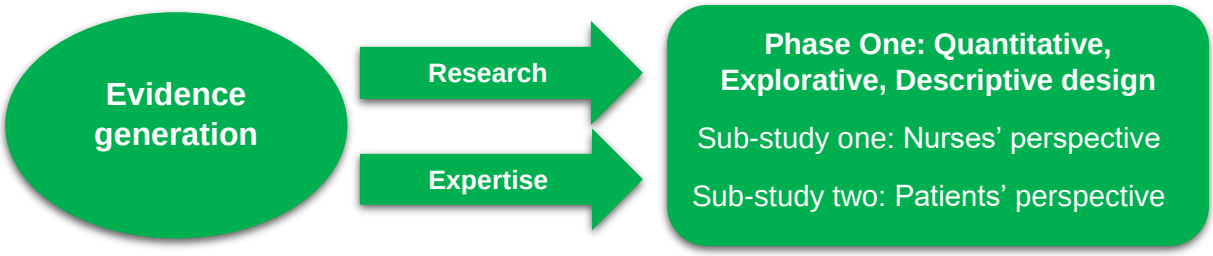


Figure 4.1: Schematic presentation of Phase one of the study

The research questions for phase one and this part of the research report are:

- What is the knowledge, attitudes, and practices of professional nurses related to the assessment and management of acute trauma-related pain of patients in ECs?
- What is the adult patient's understanding regarding the assessment and management of acute trauma-related pain as rendered by professional nurses in the EC?

The data provides valuable contextual information on what nurses know, do, and perceive regarding pain assessment and pain management in the research setting. An understanding of the patients' perspectives related to pain assessment and pain management of acute trauma-related pain in the EC can inform the assessment and management of pain in the context of the South African ECs. The data findings of these two sub-studies provided valuable contextual information that will be important to include in the BPG for nurses.

The knowledge levels of the professional nurses ranked as good, adequate, and poor are also reported in this chapter, as it highlights the need for information that is based on the best available evidence to be provided to professional nurses in pain assessment and pain management of the acute trauma-related pain in the EC.

Stellenbosch University https://scholar.sun.ac.za

4.1 RESULTS: SUB-STUDY ONE – NURSES' PERSPECTIVES

One hundred and eighteen (118) nurses working across five ECs in identified hospitals in the Western Cape participated in the study. The demarcation and the number of nurses that participated at each of the five hospitals are indicated in able 4.1. Most of the participants were from the central hospitals (A & B) as they had the most bed occupancy. The least participants were from the regional and district hospitals (C, D & E).

Table 4.1: Participating hospitals

Hospital	Frequency (n)	Percentage (%)
A	50	42
B	28	24
C	13	11
D	13	11
E	14	12
Total	**118**	**100**

4.1.1 Section A: Demographic information

The demographic data comprised of five items that explored the participants' highest qualification, age, years worked in the ECs, and training received.

Table 4.2 depicts the demographic variables that are either nominal data (training received in pain management or not) or ordinal data (age groups). The quantitative variable, total years worked in the EC (continuous data), are presented in Table 4.3.

Table 4.2: Demographic information: Sub-study one

		Frequency (n)	Percentage (%)
1. Highest qualification	Diploma (Bridging course)	34	29
	Diploma (4-year integrated course)	37	31
	Baccalaureate degree	27	23
	Masters	3	3
	Other	16	14
	Total	**118**	**100**
2. Age	21-30	23	20
	31-40	27	23
	41-50	33	28
	51-60	33	28
	>60	1	1
	Total	**117**	**1**

Stellenbosch University https://scholar.sun.ac.za

3. Have you had any formal training in pain management?	No	87	74
	Yes	30	26
	Total	**117**	**1**
4. If yes, indicate what kind of formal training in pain management you have completed.	Short Course (half day)	11	9
	Short course (1-5 days)	4	3
	Graduate Certificate	9	8
	Masters Certificate	0	0
	Seminars, conferences	3	3
	Other	2	2
	Total	**29**	**25**

The majority of the participants (n=37, 31%) indicated that they hold a four-year integrated diploma course in nursing, followed by participants (n=34, 29%) who completed the diploma in nursing (bridging course) according to Regulation 683 as regulated by SANC. Successful completion of these two courses leads to registration as a professional nurse with SANC.

The majority of the participants, between the age groups (31-40) and (41-50) working in the EC presented with the same findings: (n=33, 28%). Most of the participants indicated that they did not have formal training in pain management, (n=87, 74%), while a total of (n=29, 25%) participants had attended some type of formal training.

Table 4.3 depicts the total years that the participants worked in the EC.

Table 4.3: Total number of years worked in EC

n		115
Minimum		.25
Maximum		36.00
Percentiles:	25	4.0000
	50	9.0000
	75	20.0000

As indicated in Table 4.3, the median percentile number of years of nursing experience reported was 9 years with a range of 0.25 to 36 years.

4.1.2 Section B: Knowledge regarding the assessment and management of acute trauma-related pain in the emergency center (EC)

This section comprises of 34 items, with a variety of question types. In this section the findings related to the knowledge questions regarding the assessment and management of acute

Stellenbosch University https://scholar.sun.ac.za

trauma-related pain are presented. The data is presented according to the question types and grouped accordingly. The three items as reflected in Table 4.4. provide data related to the nurses' knowledge on pain assessment.

Table 4.4: Knowledge regarding pain assessment of acute trauma-related pain in the emergency center

	True		False	
	(n)	%	(n)	%
6. Pain assessment should be done as the 5th vital sign	84	71	33	28
7. Pain assessment should be done according to a structured plan	95	81	23	20
8. On admission, you assess every patient by using a validated pain assessment scale	95	81	22	19

The results in Table 4.4 indicate that the majority of participants (n=95, 81%) agree that pain assessment should be done according to a structured plan, using a validated pain assessment scale. Furthermore, n=85, 71% of them indicated that pain assessment should be regarded as the fifth vital sign.

The next item explored the pain intervals after which the initial pain must be reassessed. The results are depicted in Table 4.5.

Table 4.5: Pain assessment intervals

	Hourly		Two-hourly		Four-hourly		Six-hourly	
	(n)	%	(n)	%	(n)	%	(n)	%
9. After the initial pain assessment, how often do you think that pain should be reassessed in a patient with acute trauma-related pain in the EC?	33	28	29	25	47	40	9	8

Most of the participants (n=47, 40%) responded that pain should be reassessed four hourly. However, the correct answer was hourly with a response rate of n=33, 28%.

The next three items focused on the knowledge of nurses regarding pain assessment scales and the results are depicted in Table 4.6.

Stellenbosch University https://scholar.sun.ac.za

Table 4.6: Knowledge of nurses regarding pain assessment scales

	Numeric pain scale (NRS)		Visual analogue scale (VAS		Verbal descriptive scale (VDS)		Face, legs, activity, crying and consolability pain scale (FLACC)	
	(n)	%	(n)	%	(n)	%	(n)	%
10. If you ask your patient to rate the level of his or her pain on a scale of 1 to 10 then you would be using the following scale	87	74	3	3	12	10	12	10
11. If you ask your patient if his or her pain is mild, moderate, or severe then you would be using the following scale	21	18	14	12	71	60	9	8
12. If you ask your patient to mark his or her pain level on a line between two endpoints then you would be using the following scale	26	22	55	47	16	14	17	15

Question ten tested the knowledge of the participants on the use of different scales, for example the NRS, the VAS and VDS. Most participants answered correctly (n=87, 74%). In terms of question 11 most participants correctly responded in identifying the use of the VDS n=71, (60%). The minority of the participants (n= 55, 47%) were not knowledgeable regarding the VAS scale.

Questions 13, 14 and 15 explored the knowledge of the assessment of acute trauma-related pain as illustrated in Table 4.7.

Table 4.7: Knowledge on the assessment of acute pain

	True		False	
	(n)	%	(n)	%
13. Non-verbal signs of pain include increased blood pressure, tachycardia, frowning, grunting	113	96	5	4
14. You screen every patient that is admitted to the emergency center with trauma-related pain	89	75	29	25
15. Culture and spiritual consideration play a role	77	65	41	35

Overall, participants responded positively, with professional nurses being evidently knowledgeable regarding the non-verbal signs of pain as illustrated in Table 4.7. There were (n=113, 96%) participants who correctly responded that non-verbal signs of pain include increased blood pressure, tachycardia, frowning, grunting. Most participants responded (n=89, 75%) that they screen every patient that is admitted to the EC with trauma-related pain, with (n=29, 25%) responded they did not. The majority of the participants (n=77, 65%)

Stellenbosch University https://scholar.sun.ac.za

correctly answered that culture and spiritual consideration play a role, while (n=41, 35%) responded incorrectly.

The following item, which was a yes/no question explored if nurses knew that a stepwise approach should be used to manage a patient with acute trauma-related pain. The results indicated in Table 4.8, indicated that the majority of the participants (n=87, 74%) use a stepwise approach to manage the patient with acute trauma-related pain in the EC; it was concerning that (n=30, 25%) indicated they did not.

Table 4.8: Stepwise approach to the management of acute trauma-related pain in the EC

	Yes		No	
	(n)	%	(n)	%
16. You use a stepwise approach to manage the patient with acute trauma-related pain in your EC	87	74	30	25

The next 4 items explored the knowledge of nurses on pain management, and the results are displayed in Table 4.9.

Table 4.9: Knowledge on pain management

	True		False	
	(n)	%	(n)	(%
17. Combining analgesics that work by different mechanisms (e.g., combining an opioid with a NSAID) may result in better pain control with fewer side effects than using a single analgesic agent	94	80	24	20
18. After an initial opioid dose analgesia is given, subsequent doses should be adjusted in accordance with the individual's response	101	86	17	14
19. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of time	79	67	38	32
20. Inadequate pain management can further complicate the patient's recovery process	110	93	7	6

The majority of participants (n=110, 93%) indicated that inadequate pain management can further complicate the patient's recovery process. Similarly, (n=101, 86%) of the participants correctly responded that after an initial opioid dose analgesia is given, subsequent doses should be adjusted in accordance with the individual's response. Participants correctly responded (n=94, 80%) that combining analgesics that work by different mechanisms e.g., combining an opioid with a NSAID may result in better pain control with fewer side effects than using a single analgesic agent.

Stellenbosch University https://scholar.sun.ac.za

A Likert scale, as illustrated in Table 4.10, was used to obtain the results for questions 21 to 28 on the pharmacological agents that can be used for the management of acute trauma-related pain in the EC.

Table 4.10: Pharmacological agents can be used for the management of acute trauma-related pain in the EC

The following pharmacological agents can be used for the management of acute trauma-related pain in the EC	Strongly agree/agree		Unsure		Disagree/ Strongly disagree		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
21. Opioids	115	98	3	3	0	0	118	100
22. Non-opioids	81	69	23	20	14	12	118	100
23. Non-steroidal anti-inflammatory drugs (NSAIDS)	96	82	10	9	11	9	117	100
24. Anticonvulsants	49	42	12	10	57	48	118	100
25. Cryotherapy (cold compression)	77	65	17	14	24	20	118	100
26. Elevation of extremities	107	92	5	4	5	4	117	100
27. Distraction e.g., music, imagery	56	48	22	19	39	34	117	100
28. Fluid intake	46	39	28	24	44	37	118	100

The majority of the participants strongly agreed/agreed (n=107, 92%) to the elevation of extremities, while (n=77, 65%) strongly agreed/agreed that cryotherapy should be used. Only (n=56, 48%) strongly agreed/agreed to the use of distraction e.g., music, imagery, with (n=39, 33%) disagreed/strongly disagreed and (n=22, 19%) were unsure.

Items 29 and 30 are yes/no questions exploring the knowledge of the nurses regarding the administration of medication and the results are as per Table 4.11.

Table 4.11: Administration of pain medication

	Yes		No	
	(n)	%	(n)	%
29. After administering pain medication you assess the efficacy of the medications.	110	93	8	7
30. After administering pain medication you monitor the patient for potential side effects.	108	92	9	8

The majority of the participants (n=110, 93%) responded that after administering pain medications they assess the efficacy of the medications and (n=108, 92%) indicating that after administering pain medication they monitor the patient for potential side effects.

Stellenbosch University https://scholar.sun.ac.za

Items 31 to 38 explored the knowledge regarding the information to be included in the nursing care plan and the results are depicted in Table 4.12.

Table 4.12: Information to be included in the nursing care plan

The following information should be included in a nursing care plan for patients admitted with acute trauma-related pain	Strongly agree/agree		Unsure		Disagree/Strongly disagree		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
31. Detailed assessment of pain e.g., pain scale	116	98	2	2	0	0	118	100
32. Frequency of pain assessment	117	99	1	1	0	0	118	100
33. Pharmacological pain management	112	96	4	3	1	1	117	100
34. Nonpharmacological pain management	99	85	11	9	7	6	117	100
35. Physiological pain predictors	89	76	23	20	5	4	117	100
36. Behavioural pain predictors	94	80	14	12	9	8	117	100
37. History: e.g., age, underlying conditions	113	96	3	3	2	1	118	100
38. Documentation of pain assessment and management	117	99	0	0	1	1	118	100

Findings revealed a consensus in this section with totals ranging from 99% to 76%. Physiological pain predictors had a strongly agree/agree response (n=89, 76%), with n=23, (20%) that were unsure. Participants' response to behavioural pain predictors were n=94, (80%) strongly agreed/agreed, n=14, (12%) were unsure. Participants strongly agreed/agreed that history e.g., age, underlying conditions should be included were (n=113, (96%). Participants unanimously responded n=117, (100%) that they strongly agree/agree that documentation of pain assessment and management should be included.

Item 39 explored the participants' level of knowledge on pain assessment and management and the results are illustrated in Table 4.13.

Stellenbosch University https://scholar.sun.ac.za

Table 4.13: Participants' level of knowledge

	Yes		No	
	(n)	%	(n)	%
39. Do you think that your level of knowledge on the assessment and management of acute trauma-related pain is up to date according to best practice nursing?	54	46	63	54

Most of the participants (n=63, 54%) did not consider their level of knowledge on the assessment and management of acute trauma-related pain to be up to date according to best practice nursing, whilst n=54, (46%) responded positively.

4.1.2.1 Knowledge Score

The knowledge category scales were tested for this section, and the results are depicted in Table 4.14. The following metric was used:

- <50% - poor knowledge
- 50-74% - adequate knowledge
- >75% - good knowledge

Table 4.14: Overall Knowledge categories

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	poor knowledge <50%	5	4	4	4
	adequate knowledge 50-74%	57	48	48	53
	good knowledge >=75%	56	48	48	100
	Total	118	100	100	

The overall findings regarding knowledge of pain assessment and pain management for items explored in Section B of the survey showed that the participants (n=57, 48%) portray adequate knowledge and (n=56, 48%) indicated good knowledge, while the minority (n=5, 4%) of the participants have poor knowledge related to pain assessment and management of acute-trauma related pain in the EC.

4.1.3 Section C: Attitudes on the assessment and management of acute trauma-related pain in the EC

In this section the attitudes, using four-items on the assessment and management of acute trauma-related pain in the EC were explored. Item 40 addressed the nurses' attitudes regarding the patient who is requesting increased doses of pain medication was addressed, and the results are displayed in Table 4.15.

Stellenbosch University https://scholar.sun.ac.za

Table 4.15: Response to patient requesting increased doses of pain medication

The following questions evaluate your attitudes related to the assessment and management of acute trauma-related pain in the EC	The patient is experiencing increased pain		The patient is experiencing increased anxiety or depression		The patient is requesting more staff attention		The patient's requests are related to addiction		None of the above	
	(n)	%	(n)	%	(n)	%	(n)	%	(n)	%
40. The most likely reason a patient would request increased doses of pain medication is:	98	83	5	4	2	2	12	10	2	2

Most participants (n=98, 83%) correctly responded that the most likely reason a patient would request increased doses of pain medication is because the patient is experiencing increased pain. It was however, reported by n=12, (10%) participants that the patients' requests are related to addiction.

Item 41 explored the participants' attitude related to the most accurate judge of the intensity of the patient, and the results are depicted in Table 4.16.

Table 4.16: Most accurate judge of the intensity of the patient's pain

	The treating doctor		The patient's primary nurse		The patient		The patient's spouse of family	
	(n)	%	(n)	%	(n)	%	(n)	%
41. The most accurate judge of the intensity of the patient's pain is:	10	9	9	8	94	80	1	1

Most of the participants (n=94, 80%) responded correctly that the patient is the most accurate judge of their intensity of pain. The treating doctor (n=10, 9%) and the patient's primary nurse (n=9, 8%) were interestingly, also reported.

Items 42 and 43 addressed the attitudes of the participants' perception of acute pain management in the EC, of which the results are displayed in Table 4.17.

Stellenbosch University https://scholar.sun.ac.za

Table 4.17: Attitudes regarding acute pain management

	Strongly agree/agree		Unsure		Disagree /Strongly disagree		Total	
42. Elderly patients cannot tolerate opioids for pain relief	51	44	19	16	47	40	117	100
43. You perceive the management of acute pain in the emergency center to be important	107	95	3	3	3	8	113	100

Participants showed a lack of knowledge regarding the elderly and their tolerance of opioids as pain relief. Most participants (n=51, 44%) responded incorrectly that elderly patients cannot tolerate opioids for pain relief, whilst n=19, (16%) were unsure. Only n=47, (40%) responded correctly. It was encouraging that most participants strongly agreed/agreed, (n=107, 95%) that they perceived the management of acute pain in the EC to be important.

4.1.4 Section D: Practices regarding the assessment and management of acute trauma-related pain in the EC

This section explored the self-reported practices of the participants and consist of seven-items, which are different question types, and will be reported as such. Table 4.18 report the results regarding the use of pain scales in the EC.

Table 4.18: The practice of pain assessment tools/scales in the EC

The following questions assess your practices related to the assessment and management of acute trauma-related pain in the emergency center	Yes		No	
	(n)	%	(n)	%
44. The use of pain assessment tools/scales is a common practice in your EC	53	45	64	54

The data analysed revealed that the use of pain assessment tools/scales is not a common practice in the EC as depicted in Table 5.17 with n=53, (45%) that responded yes, and n=64, (54%) no.

Item 45 explored the use of nursing care plans for the assessment and management of acute trauma-related pain in the EC. The results are displayed in Table 4.19.

Stellenbosch University https://scholar.sun.ac.za

Table 4.19: The practice of nursing care plans in the EC

	A standardized nursing care plan for pain		A nursing care plan is drawn up for each patient on admission		There is no nursing care plan in our EC	
	(n)	%	(n)	%	(n)	%
45. In your EC you have the following nursing care plan for the assessment and management of acute trauma-related pain:	25	21	7	6	79	67

This question addressed the practice of nursing care plans for the assessment and management of acute trauma-related pain. As summarised in Table 4.19, the majority (n=79, 67%) indicated that there was no nursing care plan in the EC, with n=25, (21%) indicating that a standardised nursing care plan for pain was used in their EC.

Items 46 to 49 explored the practices of nurses regarding acute trauma-related pain management in the EC. The results are depicted in Table 4.20.

Table 4.20: Practices regarding acute trauma-related pain management

	Strongly agree/agree		Unsure		Disagree /Strongly disagree		Total	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
46. Acute pain is generally prioritized by professional nurses in your emergency center	83	70	2	2	33	28	118	100
47. My concern about the patient becoming tolerant to analgesia hinders me from providing optimal pain management in the emergency center	63	53	11	9	44	37	118	100
48. Waiting for the doctor's prescription results in the delay in the administration of analgesia	98	83	2	2	18	15	118	100
49. Oligoanalgesia (inadequate treatment of acute pain) is a concern in your emergency center	75	64	7	6	35	30	117	100

Most of the participants (n=98, 83%) strongly agreed/agreed that waiting for the doctor's prescription results in the delay in the administration of analgesia. Furthermore, (n=83, 70%) of the participants responded that acute pain is generally prioritised by professional nurses in their department. Whilst (n=75, 64%) considered oligoanalgesia (inadequate treatment of acute pain) to be a concern in the EC, n=63, (53%) responded that their concern about the patient becoming tolerant to analgesia hinder them from providing optimal pain management in the EC.

Stellenbosch University https://scholar.sun.ac.za

The final item 50 enquired about best practice guidelines for the assessment and management of acute trauma-related pain as the underpinning to improve patient outcomes in the EC. The results are illustrated in Table 4.21.

Table 4.21: Best practice guideline

	Yes		No	
	(n)	%	(n)	%
50. Do you think that a best practice guideline for the assessment and management of acute trauma-related pain will improve patient outcomes with regard to your assessment and management of acute trauma-related pain in the emergency center	113	96	5	

The majority of the participants (n=113, 96%) unanimously agreed that a best practice guideline for the assessment and management of acute trauma-related pain would improve patient outcomes with regard to their assessment and management of acute trauma-related pain in the EC.

4.2 SUB-STUDY TWO: PATIENTS' PERSPECTIVES

The following research objective was addressed under sub-study two: to explore and describe the patient's understanding regarding the assessment and management of acute trauma-related pain rendered in the ECs.

For sub-study two, the researcher self-administered surveys to adult patients in the EC of two tertiary hospitals (A and B), one regional hospital (C) and two district hospitals (D and E). Since trauma admissions are higher between Fridays and Sundays, data collection took place during this period. Using consecutive sampling, a total of 529 surveys were completed by adult male and female patients. A survey, containing nine items were administered to patients admitted to the EC with trauma-related pain at the five participating hospitals. Patients that were transferred to the trauma wards or surgical wards were also included in this study. The results are depicted in Table 4.21.

Stellenbosch University https://scholar.sun.ac.za

Table 4.22: Participating Hospitals

Participating Hospital	Frequency (n)	Percent %
A	121	23
B	114	22
C	108	20
D	80	15
E	106	20
Total	529	100

In total 529 participants completed the survey for sub-study two. The two tertiary hospitals were Hospital A (n=121, 23%) and Hospital B (n=114, 22%). Hospital C was the regional hospital and comprised (n=108, 20%) of the participants. The district hospitals were Hospital D (n=80, 15%) and Hospital E (n=106, 20%).

4.2.1 Section A: Demographic data

The demographic data is presented as nominal data in Table 4.23.

Table 4.23: Demographic Information: Sub-study two

		Frequency (n)	Percentage (%)
Age	18-20	64	12
	21-30	168	32
	31-40	158	30
	41-50	70	13
	51.60	42	8
	>60	27	5
	Total	529	100
Gender	Female	129	24
	Male	400	76
	Total	529	100

The majority of the participants as illustrated in Table 4.22 were between the age groups of 21-30, (n=168, 32%) closely followed by the 31-40 age group, (n=158, 30%). The age groups 18-20, (n=64, 12%) and 41-50, (n=70, 13%) were in a close range. Participants that were 60 years and older (n=27, 5%) were the smallest. One participant did not enter the age (n=1, .2%). More male participants (n= 400, 76%) than female participants (n=129, 24) visited the EC.

Stellenbosch University https://scholar.sun.ac.za

4.2.2 Section B: Understanding regarding the assessment and management of acute trauma-related pain

This section explored the patient's understanding regarding the assessment and management of acute trauma-related pain rendered by the nurse. The results are illustrated in Table 4.24.

Table 4.24: Patient's understanding of the assessment and management of acute trauma-related pain rendered by nurses in the EC

Question	Yes		No	
	Frequency (n)	Percentage %	Frequency (n)	Percentage %
3. On arrival to the emergency center you had pain	516	98	13	2
4. On arrival to the emergency center did the nurse ask you if you had pain	443	84	85	16
5. The nurse then assessed your pain intensity (level of pain) e.g., by asking you how severe your pain is	238	54	205	46
6. The nurse assessed your pain by asking you to describe your pain in your own words	213	48	230	52
7. The nurse gave you pain medication after asking you if you have pain	312	70	131	30
8. Before giving you any pain medication, did the nurse describe possible side effects (reactions of the medication) in a way that you understand?	171	32	358	68
9. Since your admission to the emergency centre, did the nurses do everything they could to relieve your pain?	189	43	254	57

The majority of the participants (n=516, 98%) responded that they had pain on arrival to the EC, and (n=443, 84%) indicated that on arrival to the EC the nurse asked them if they had pain. Whilst (n= 238, 53%) responded that the nurse then assessed their pain intensity (level of pain) e.g., by asking how severe the pain is, (n=205, 46%) responded no. The majority (n=230, 52%) of the participants responded negatively to the question: The nurse assessed your pain by asking you to describe your pain in your own words: (n=213, 48%) responded yes. Most participants (n=312, 70%) responded that the nurse gave them pain medication after asking if they have pain, with (n=131, 30%) responding no. Most participants responded negatively (n= 358, 68%) to the question: Before giving you any pain medication, did the nurse describe possible side effects (reactions of the medication) in a way that you understand and 32% (n=171) responded positively. The majority (n=254, 57%) of the participants responded

Stellenbosch University https://scholar.sun.ac.za

that the nurses did not do everything they could to relieve their pain on their admission to the EC.

4.3 DISCUSSION

The assessment and management of pain is a challenge in many ECs, despite the progress that has been made over the years. In South Africa, no such study has been conducted by a nurse in the EC, to the knowledge of the researcher. The knowledge, attitudes, and practice of nurses are vital in improving patient outcomes. Additionally, involving the patient in the management plan further improves patient satisfaction. Exploring the nurses, as well as the patients' perspectives regarding pain assessment and pain management provided contextual information that is important to consider in the BPG process. This section included the discussion related to both sub-studies.

4.3.1 Sub-study one: Nurses' perspectives

Demographic information in sub-study one, revealed an equal distribution of academic qualifications amongst the professional nurses in the study. Similarly, there was a balanced representation of the age categories amongst the nurses in the study. Only 25% responded that they had received formal training, irrespective of their age or years of work experience. Contrarily, a quantitative study conducted in Qatar reported that 93% of the nurses had received formal pain management training (Bouri *et al.*, 2018:8). An explorative qualitative study conducted in Ghana reported that a wide range of approaches and tools were available for the assessment and management of pain but were under-utilized due to nurses lack of skills (Mahama & Ninnoni, 2019:5). Findings from a quantitative cross-sectional study conducted in Ethiopia reported that nurses who had a work experience of two to five years more likely were 1.67 times [AOR=1.67; 95% CI= (1.08-2.60)] to practice pain assessment inadequately compared to nurses whose work experience was more than five years (Negese *et al.*, 2020:5).

Pain assessment as the fifth vital sign was favoured by most participants, (n=71%). This finding was congruent with a study conducted in a public hospital in Portugal. A comparison analysis study was conducted between public and private healthcare systems to assess the implementation of pain as the fifth vital sign (P5VS). Findings concluded that pain was recorded as the fifth vital sign in the EC (62%) in public hospitals, whilst only 18% in private hospitals (Pozza, *et al.,* 2021:4). Contrary to the findings in this study, a descriptive study conducted in Turkey to assess nurses' opinions on pain as the fifth vital sign reported that 77% of the nurses were unaware of pain as a fifth vital sign. They further reported that 57% of the nurses reported that pain should not be the fifth vital sign due to work overload, lack of staff and time, and the belief that the patient would report pain if it was present (Kutlutürkan &

Stellenbosch University https://scholar.sun.ac.za

Urvaylioğlu, 2020:90). The assessment of pain as the fifth vital sign is aimed to assess and manage pain that is not managed adequately, consequently improving patient outcomes (Pozza *et al.,* 2021:5). To improve pain services in Malaysia, the Ministry of Health initiated the "Pain as the fifth Vital Sign'' strategy to meet their objective of having a pain-free hospital. This guideline was revised in 2018, still advocating for pain as the fifth vital sign (Ministry of Health Malaysia, 2018:3).

Participants agreed (81%) that pain assessment should be done according to a structured plan. They also agreed (74%) that a stepwise approach should be used to manage a patient with acute trauma-related pain in the EC. This concurred with findings conducted on a cross-sectional study in Indonesia on the implementation of reassessment (Ngasu & Restiana, 2021:68). In agreement with this, Ahmadi *et al.* (2016:90)**,** concluded that acute pain should be assessed using the OPQRST mnemonic, and the patients' report of their pain and pain assessment scales. The misunderstanding, misuse and misreporting of pain assessment is common in clinical settings that can be eliminated by the use of a structured pain assessment plan (Loadsman & Craigie, 2019:411).

It was concerning that the majority of nurses in this study indicated that pain should be reassessed four-hourly after the initial pain assessment in a patient with acute trauma-related pain in EC. This is in accordance with the study conducted in the Netherlands where pain was only assessed once during treatment (Scholten *et al.*, 2015:803). Pain should be assessed hourly in the acute phase.

It is positive that participants indicated (81%) that on admission every patient is assessed using a validated pain assessment scale. Participants were knowledgeable regarding the numerical pain scale (74%) and the verbal descriptor scale (62%). They, however, were not knowledgeable (47%) regarding the VAS scale. In a quantitative, descriptive, and cross-sectional study conducted in Finland EC, nurses used three common pain scales when assessing patient acute pain: the VRS, NRS and VAS with the VRS being the most used (54%) pain scale (Hämäläinen, Kvist & Kankkunen, 2022:6). Findings from a cross-sectional study conducted in Denmark concluded that the numerical rating scale was most commonly used (81.6%) for evaluating pain intensity (Pozza *et al., 2*021:5). No known studies regarding the assessment of pain with validated pain assessment tools have been conducted in the Western Cape or in South Africa.

Most participants agreed (96%) that non-verbal signs of pain include high blood pressure, tachycardia, frowning, grunting. Inadequate assessment and management of acute trauma-related pain may have both physiological and psychological consequences that can develop

Stellenbosch University https://scholar.sun.ac.za

to further complications (Gan, 2017:2289). Physiologically, there may be an increase in catecholamines release leading to tachycardia, raising blood pressure, and increased myocardial oxygen consumption. In extreme circumstances ventricular dysfunction and myocardium ischemia may result (Oliveira *et al.*, 2016:2). Furthermore, the inadequate treatment of acute pain can stimulate the production of hormones such as cortisol and glucagon, making the patient susceptible to immunological resistance to insulin, hyperglycaemia, hypercoagulability, and dysfunctions (Dunwoody e*t al.*, 2008:23; Oliveira *et al.*, 2016:2:2). Psychological effects may include emotional instability, demoralisation, and anxiety (Gan, 2017:2289). The above can escalate resulting in a conundrum, further complicating the patient's condition. No studies that focused on the knowledge of nurses regarding signs of pain were found.

The results of the screening of every patient admitted to the EC with trauma-related pain (96%) is in accordance with a cross-sectional study conducted to assess the implementation of a two-step screening process in a primary care setting (Bifulco, Anderson, Blankson, *et al.*, 2021:6).

Most nurses (65%) thought that cultural and spiritual considerations played a role in the assessment and management of acute pain. This is in line with the findings of a qualitative exploratory study that described and interpreted South African Nguni and Sotho perceptions of physical pain. Conclusions drawn from this study included the importance of cultural considerations in pain assessment (Nortjé & Albertyn, 2015:24). The perception that Hispanic communities have certain beliefs about pain that influence their reluctance to accept pain management was confirmed in a study conducted in the USA (Torres *et al.*, 2017:2065). Consideration of patients' cultural beliefs will help to understand how they perceive their pain and to consider their needs (Prosen, 2019:2).

Combining analgesics that work by different mechanisms was considered to result in better pain control and fewer side-effects by (80%) of the nurses. It was encouraging that nurses were knowledgeable regarding the administration of an initial opioid dose analgesia and the further administration of subsequent doses. The WHO advocates the use of "pain ladder'' instituted in 1986, to provide a sequential approach of pharmacological analgesics to pain management (Birkhan *et al.*, 1986:19). The WHO pain ladder proposes that analgesics be prescribed incrementally by starting with non-opioids and introducing opioids based on pain intensity (Ballantyne *et al*., 2016:1).

It was concerning that 38% of the nurses did not know that respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period. This

Stellenbosch University https://scholar.sun.ac.za

supported the findings reported in a quantitative study conducted in Qatar with 62% of the nurses answering incorrectly (Bouri *et al.*, 2018:9). A qualitative study conducted in Jordan reported that physiological consequences of pain was an area that nurses (51%) were least educated in (Hamdan, Shaheen & Abdalrahim, 2022:570). This lack of knowledge is a barrier to optimal pain management.

Nurses in the EC unanimously responded (93%) that inadequate pain management can further complicate the patient's recovery phase. The inadequate management of acute pain following trauma, may progress to chronic pain with adverse effects (Keene *et al.*, 2011:168). Therefore, prompt pain management results in early and uncomplicated healing with an ultimate reduced duration of hospitalisation and decreased costs (Ahmadi *et al.*, 2016:90).

Participants' knowledge regarding the use of pharmacological agents for the management of acute trauma-related pain in the EC were: Opioids were strongly favoured by 96% of nurses and non-opioids (69%). Similarly, participants responded (97%) in favour of NSAIDS and conversely 42% for anticonvulsants. It appears as if the responses are related to what participants are exposed to everyday, for example, most participants (n=115, 98%) responded that opioids should be used. There were (n=81, 69%) who strongly agree/agreed that non-opioids can be used whilst (n=23, 20%) were unsure. This was a concern as non-opioids are frequently used in the EC. There was a unanimous response (n=96, 82%) for the use of non-steroidal anti-inflammatory drugs. There was a marginal difference to the use of anticonvulsants with (n=57, 48%) of the participants that disagreed/strongly disagreed and (n=49, 42%) that strongly agreed/agreed. In a review study conducted in Iran, it was recommended that the choice of analgesics administered should be based on the pain assessment score and the WHO Pain Ladder (Ahmadi *et al.*, 2016:92). In their review article Abdolrazaghnejad *et al.* (2018:2), reported that systematic analgesic agents such as narcotics and anti-inflammatory drugs (NSAID) should be administered in a way that would improve the patient's pain whilst having few side-effects. A cross-sectional, retrospective medical record audit conducted to evaluate pain assessment and pain management practices supported that pain management methods should embark on an empirical approach, the WHO analgesic ladder (stepping-up medication, stepping-down medication) (Prempeh *et al.*, 2020:4).

With regard to nonpharmacological strategies, nurses supported the use of cryotherapy (65%) and elevation of extremities (92%). Knowledge on distraction was the borderline as 48% responded positively, 33% negatively and 18% were unsure. Distraction is not commonly reinforced as a nonpharmacological pain management strategy in the EC and therefore it is likely that participants did not associate it as such. A quantitative study conducted in Qatar concluded that more doctors (64%) than nurses (57%) agreed that nonpharmacological

Stellenbosch University https://scholar.sun.ac.za

measures can decrease the patient's pain perception (Bouri *et al.*, 2018:5). The use of nonpharmacological pain management methods by nurses in Iran was that 56% reported in a descriptive cross-sectional study that repositioning and the use of comfort equipment and created a quiet and comfortable environment as the most common methods (Kia, Allahbakhshian, Ilkhani, *et al.*, 2021:2). Findings from a pre/post quasi-experimental study conducted in Egypt concluded that there were statistically differences (P.0.017) in the use of nonpharmacological pain interventions and different education levels of nurses (Mohamed, El-Bana, Mohamed, *et al.*, 2019:289). Data synthesized from a systematic review indicated that there are evidence-based grounds for the implementation of nonpharmacological pain management interventions (Sakamoto *et al.*, 2018:952).

Participants positively responded that after administering pain medication, they assess the efficacy of the medication (93%), and they monitor the patient for potential side effects (91%). No studies were found to support this finding.

Responses to information that should be included in a nursing care plan for patients admitted with acute trauma-related pain were nurses supported the inclusion of a detailed assessment of pain (98%) and the frequency of pain assessment (92%). Physiological pain predictors (76%), behavioural pain predictors (80%) and history taking (96%) were also proposed for pain assessment in the nursing care plan. Pharmacological pain management (96%) and nonpharmacological pain management (85%) were also supported for inclusion in a nursing care plan. There was an overwhelming support for documentation of pain assessment and management. A cross-sectional study conducted in Malaysia concluded that the first step to pain assessment and pain management is to identify the presence of pain (Baharuddin *et al.*, 2010:18). A comprehensive pain assessment (e.g., intensity level using pain scales, nature and quality, duration, location) is the cornerstone to developing pain management nursing care plans for trauma patients (Sullivan *et al.*, 2016:362). Unlike this study, a cross-sectional study conducted in Lebanon reported in their study that pain intensity was not documented in most of the patients (Ramia, *et al.*, 2017:7). Similar findings were concluded in another study in Lebanon that indicated that there was a lack of documentation of pain scores. A further retrospective, comparative pre–post implementation observational study conducted in the Netherlands reported a significant increase in documentation, since the initiation of auditing of records (Ridderikhof *et al.*, 2017:420). Similarly, a pre-post interventional study conducted in the EC in Pittsburgh, USA reviewed pain assessment and documentation indicating a 26% increase of pain assessment and documentation from the pre-interventional period to the post-interventional period (Wissman *et al.*, 2020:509). In addition, Sepahvand *et al.* (2019:645),

Stellenbosch University https://scholar.sun.ac.za

concurred that assessment and reassessment improved in the post-intervention phase of their pre-post interventional study conducted in Iran.

It was concerning that only 46% thought that their level of knowledge on the assessment and management of acute trauma-related pain is up to date according to best nursing practices. This concurs with the cross-sectional study conducted in Saudi Arabia that reported that the surveyed nurses had limited knowledge on pain management (Samarkandi, 2018:222). The complexity of pain makes it fundamental for nurses to be knowledgeable about pain (Holl & Carmack, 2015:378).

The attitudes of nurses regarding the assessment and management of acute trauma-related pain were assessed. It was encouraging that the nurse realised when a patient requests increased doses of pain medication the patient is experiencing increased pain (83%). They also accurately responded that the most accurate judge of the intensity of pain is the patient (80%). It was concerning that 44% believed elderly patients cannot tolerate opioids for pain relief. It was encouraging that 95% of the nurses perceived the management of acute pain in the EC to be important. Findings from a descriptive study in Turkey reported that the majority of nurses indicated (75%) that the patient's description of pain was the most reliable indicator during pain assessment (Ucuzal & Doğan, 2015:77). Self-report is the patient's subject assessment of their pain and should be accepted and acted upon (Pozza *et al.*, 2021:2).

The practices regarding the assessment and management of acute trauma-related pain in the EC was also assessed. Most nurses (65%) indicated that the use of pain assessment tools is not a common practice in their EC. This is contrary to the response on the section on knowledge where nurses responded that on admission every patient is assessed using a validated pain assessment scale (81%). The medical record audit conducted by Prempeh *et al.* (2020:4), revealed that there was documentation of a pain management plan; 140 of the 168 patients (83%) irrespective of them having a documented pain assessment. A study conducted in the Netherlands reported that due to an increase in pain assessment, nurses demonstrated an increase in pain awareness in adult patients with traumatic injuries in the EC (Ridderikhof *et al.*, 2017:422). Most nurses (80%) indicated that there was no nursing care plan in their EC. No studies could be found to support this finding.

Nurses responded unanimously (70%) that acute pain is generally prioritised by professional nurses in their EC. This finding concurred with earlier findings on attitudes where nurses perceived acute pain management to be important in the EC. However, a South African study conducted in pre-hospital settings in the Western Cape on pre-hospital acute trauma assessment and management practices revealed that acute pain is not adequately assessed

Stellenbosch University https://scholar.sun.ac.za

(Lourens *et al.,* 2020:2). The Ethiopian quantitative study concluded that nurses who reported the low prioritisation they gave to pain assessment were 2.08 times, AOR=2.08; 95% CI (1.27-3.41)] are more likely to provided inadequate pain assessment practices (Negese *et al.*, 2020:5). Pain medication should not be delayed (Abdolrazaghnejad *et al.*, 2018:1). A review of the burden of trauma pain in emergency settings in Europe was explored (Dißmann *et al.*, 2018:180). They reported that the most common complaint of trauma patients is pain and therefore it is crucial that acute pain management should be prioritised by healthcare workers (Dißmann *et al.*, 2018:180).

Another concern was that most nurses (64%) acknowledged that their concern about the patient becoming tolerant to analgesia, hinders them from providing optimal pain management in the EC. Nevertheless, there is consensus (64%) that oligoanalgesia is a concern in their EC. Regardless of advances in the assessment and management of pain, oligoanalgesia is still a prevalent problem in ECs (Pierik *et al.*, 2016:3; Reardon, Anger & Szumita, 2015: 1531).

There was an overwhelming response (83%) confirming that waiting for the doctor's prescription, results in the delay in the administration of analgesia. A literature review conducted in Australia reported that delays in the assessment and management of acute pain in the EC is a consequence of a lack of standardisation and cognisance of acute pain and inadequate education programmes (Hatherley, Jennings & Cross, 2016:27). A delay in the treatment of pain in adult trauma patients, is commonly recognised as a barrier in the EC (MacKenzie, Zed & Ensom, 2016:209).

Nurses unanimously (96%) advocated that a best practice guideline for the assessment and management of acute trauma-related pain will improve patient outcomes in the EC, specifically regarding their assessment and management of acute trauma-related pain in the EC. There was support for the practice of guidelines as reported by the prospective pre-post intervention cohort study conducted in the Netherlands that confirmed the improvement of the administration of pain analgesia after the implementation of a pain guideline (Van Woerden, Van Den Brand, Den Hartog, *et al.*, 2016:5). A systematic review conducted by Rababa, Al-Sabbah & Hayajneh (2021:3488), concluded that the most frequently reported system-related barrier to effective pain management was the lack of standardised pain assessment tools, guidelines and pain management protocols. Guidelines for the assessment and management of pain are fundamental for improving pain outcomes in trauma patients (Dißmann *et al.*, 2018:186).

Stellenbosch University https://scholar.sun.ac.za

4.3.2 Sub-study two: Patients' perspectives

Demographic information in sub-study two was done to obtain an overview of the age ranges and gender representation of patients admitted to the Western Cape ECs. Most of the patients admitted were between 21-30 (32%) and 31-40 years (30%) old. A retrospective cohort study conducted on trauma patients in the EC in Jeddah revealed that gender had no impact on pain score, with no significant difference in pain score between males and females (Wazzan *et al.*, 2021:4).

Patients unanimously responded (98%) that they had pain on arrival to the EC. Similar findings were recorded in a cross-sectional study conducted in Lebanon where the main reason for hospitalisation was pain (72%) (Ramia *et al.*, 2017:3). A descriptive cross-sectional study conducted in Italy revealed 18% (23 cases) of patients complained of mild pain, 31% (39 cases) moderate pain and 51% (64 cases) severe pain on admission to the EC (Giusti, *et al.,* 2018:67). The retrospective cohort study conducted on trauma patients with acute pain in Jeddah confirmed that the initial pain assessment score was 222 (69%) of patients assessed for pain, with 100 (31%) that were not assessed for pain (Wazzan *et al.*, 2021:3).

Most patients (84%) indicated that on arrival to the EC, the nurse asked them if they had pain. Most of the patients (55%) responded that the nurse did not assess their pain intensity level. Similarly, (59%) participants responded that the nurse did not assess their pain level by asking them to describe the pain in their own words. The quantitative study concluded by Bouri *et al.* (2018:9)**,** concurred that the patient is the most important tool in the assessment of pain. Similar findings were reported in the quantitative, descriptive, and cross-sectional study conducted in Finland where the majority of the patients (n=95, 83%) reported that nurses assessed their acute pain upon entering the EC (Hämäläinen *et al.*, 2022:5). Findings from the study conducted by Wazzan *et al.* (2021:3)**,** reported that (69%) of patients were assessed for pain, resulting in 31% that were not assessed for pain.

With regard to pain management (61%) participants stipulated that the nurse gave them pain medication after asking them if they had pain. Most of the participants (68%) responded that the nurse did not describe possible side-effects in a way that they could understand, before administering pain medication. Further reports by Hämäläinen *et al.* (2022:5)**,** indicated that patients reported that EC nurses asked them about the intensity of their pain before administration of analgesics 64% (n= 73), and 66% (n= 76) patients stated that EC nurses asked them about the intensity of their pain after analgesics were administered. Most of the patients in an observational, prospective study conducted in Iran, reported moderate to severe pain, but did not receive adequate pain management while in the EC (Masoudi Alavi *et al.*, 2017:58)

Stellenbosch University https://scholar.sun.ac.za

Most of the participants (64%) responded that the nurses did not do everything they could to relieve their pain. These findings concurred with the study conducted in Finland where patients stated that they did not receive optimal assessments of acute pain in the EC (Hämäläinen *et al.*, 2022:6). Conversely, findings from a prospective cross-sectional study conducted in Lebanon that evaluated overall patient's satisfaction regarding pain management, reported satisfied to strongly satisfied results (Ramia *et al.*, 2017:3). It is essential to assess and manage pain promptly and adequately to improve patient satisfaction and prevent adverse effects (Masoudi Alavi *et al.,* 2017:53; Scholten *et al.*, 2015:799).

4.4 SUMMARY

This chapter presented the data attained from phase one of the study, which explored and reported on the context within which acute trauma-related pain is assessed and managed in selected ECs within the Western Cape of South Africa. The key informants were the patients and the nurses involved in the assessment and management of acute trauma-related pain.

The findings indicated that approximately half of the nurses displayed adequate knowledge, while half had good knowledge and 4% had poor knowledge related to pain assessment and management. The overall scores for attitudes and practices were not possible to statistically analyse. The majority of the nurses did not have training on best practices related to pain assessment and management and agreed that best practice guidelines will be beneficial in guiding practice and decision making when caring for patients with acute trauma-related pain. Attitudes and self-reported practices on pain assessment and management were congruent with the knowledge levels of nurses. Most of the nurses (n=63, 54%) did not consider their level of knowledge on the assessment and management of acute trauma-related pain to be up to date according to best practice nursing. This highlights the fact that nurses need to apply evidence-based practice and use tools like best practice guidelines to help them in delivering cost-effective, quality care when assessing and managing pain in the patient with acute trauma-related pain in the EC.

Patient data findings indicated that the nurses consistently practised pain assessment and pain management of acute trauma-related pain in the ECs. The findings confirmed that there is a need to base practices on the best available evidence, which will help nurses to have relevant knowledge, positive attitudes and practise pain assessment and management consistently and effectively. The need for best practice guidelines or evidence summaries are expressed by nurses. The contextual information is important in the development and contextualisation process of the best practice guidelines.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 5: SCOPING REVIEW

5.1 INTRODUCTION

Chapter one and two set the scene to the study by providing an introduction, as well as the narrative literature. Chapter three discussed the research methodology as applied in the study. In chapter four, the first phase of the study was presented. As part of the evidence synthesis, which is adapted from the JBI Model, the empirical results and the discussion of the findings were presented. In this chapter phase two of the study, which is related to the evidence synthesis pebble of the JBI Model, namely the scoping review is presented (Figure 5.1).

Figure 5.1: Schematic presentation of phase two of the study

Scoping reviews are done to map the key concepts underpinning a specific research area. It is exploratory and addresses broad questions (Arksey & O'Malley, 2005:21). A scoping review was conducted to identify available guidelines for the assessment and management of acute pain. Scoping reviews determine the scope and volume of available literature for a specific topic, thereby giving a detailed overview of the focus. Conversely, systematic reviews follow a structured and pre-defined process by applying rigorous methods to ensure that the results are both reliable and meaningful to end users (Munn, Peters, Stern, *et al.*, 2018:2). Whilst scoping reviews also use rigorous processes for evidence synthesis, they address broader concepts of existing and emerging literature with less restrictive inclusion criteria, they identify knowledge gaps, and clarify concepts that can be used to inform practice (Peters *et al.*, 2015:7; Peters *et al.*, 2015:2). Hence, it was necessary to conduct a scoping review on the topic.

A scoping review further clarifies key concepts in the field of pain assessment and pain management, and identifies key characteristics that can be synthesised to recommendations in a best practice guideline (Tricco, Lillie, Zarin, *et al.*, 2016:2; Tricco *et al.*, 2018: 467). A rapid preliminary search for scoping reviews was done to identify any previously conducted reviews

Stellenbosch University https://scholar.sun.ac.za

as proposed by Munn *et al.,* (2018:3). Preliminary findings of scoping reviews did not reveal any scoping or other reviews that were specific to the assessment and management of acute trauma-related pain by nurses in the EC, thus compelling the need to conduct a scoping review.

5.2 AIM

The aim of the scoping review was to identify, appraise and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.

5.3 OBJECTIVES

The objectives of the scoping review were as follows:

- Identify best practice guidelines on the assessment and management of acute-trauma related pain in the emergency care settings.
- Critically appraise the methodological quality of the best practice guidelines.
- Determine the relevancy and recency of the best practice guidelines.
- Explore the level of quality or grading of the recommendations in the best practice guidelines.
- Summarise the content of the included best practice guidelines.

5.4 METHODS

The Johanna Briggs Institute (JBI) methodological framework for scoping reviews (Peters *et al.,* 2015) was used in conducting the review. The steps included: (i) identifying the research question, (ii) developing the inclusion and exclusion criteria, (iii) searching for the evidence, (iv) selection of eligible studies, (v) data extraction and (vi) data appraisal. The results were reported, using the Preferred Reporting Items for Systematic Reviews and Meta Analyses for Scoping Reviews Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco *et al.*, 2018: 467).

5.4.1 Review questions

The overarching review question guiding the scoping review was:

“What best practice guidelines are available to guide professional nurses to provide pain assessment and pain management of acute-trauma related pain in adults in the emergency care settings?”

5.4.2 Inclusion criteria

Best practice guidelines eligible for inclusion into the review were determined by using the Participants Concept and Context (PCC) and framework (Peters *et al.,* 2015:10).

Stellenbosch University https://scholar.sun.ac.za

5.4.2.1 Participants

The review considered best practice guidelines that included adults aged 18 years and older, irrespective of their gender who present with acute pain or trauma-related pain.

5.4.2.2 Concept

The concept or intervention of interest was acute trauma-related pain assessment and pain management. Pain management in the form of pharmacological or nonpharmacological pain management was accepted. Pain assessment and pain management can be improved in the form of education and ensuring optimal organizational structures to support professional nurses.

5.4.2.3 Context

The context included healthcare settings such as ECs, critical care units, pre-hospital settings in any country of the world.

5.4.2.4 Type of sources

The review was limited to best practice guidelines published from 2015. BPGs are sources of evidence-based literature and therefore it was important to find updated evidence to contextualise for this BPG.

5.4.3 Exclusion criteria

Best practice guidelines were excluded from the review if the focus is on the assessment and management of paediatric patients and patients with chronic pain. Furthermore, best practice guidelines will be excluded in the review if it is published in non-English language to avoid the misinterpretation of recommendations and due to the translation cost.

5.4.4 Search Strategy

A three-step search strategy was used, according to the methodology for JBI scoping reviews (Peters, *et al.*, 2015:13). The search strategy was developed in collaboration with the research group and the librarian.

5.4.4.1 Step One

An initial search was conducted on PubMed Central and Cumulated Index to Nursing and Allied Literature (CINAHL). The index words and key words were identified for further searches. The key strings were developed, and the syntax of the search strategy is presented in Appendix S.

Stellenbosch University https://scholar.sun.ac.za

5.4.4.2 Step Two

The index words and key words identified were searched in all relevant databases such as PubMed, CINAHL or EBSCOHost. The search was extended to repositories of guideline-developing organizations such as: Scottish Intercollegiate Guidelines Network (SIGN), Trip and Guidelines International Network, Guidelines International Network (G-I-N), National Institute for Health and Care Excellence (NICE), the National Guidelines Clearinghouse (NGC), ECRI Guidelines, Guideline Central, Australian Clinical Practice Guidelines, RNAO, JBI, Cochrane and ERIC.

5.4.4.3 Step Three

Thirdly, the reference lists of literature found was explored for additional guidelines. Furthermore, an attempt was made to contact the WHO regarding the updating of the trauma-care guideline which encompasses the assessment and management of pain. There was no response.

Grey literature was also considered to find unpublished guidelines. Grey literature searching was done systematically, by carefully planning the sources where grey literature could be obtained from e.g., guidelines, presented at conferences e.g., PainSA, European Pain Federation, and guidelines not yet published. ProQuest Dissertations and Theses, Research Gate, Google Scholar, and Google were searched to identify relevant best practice guidelines that have not been published in formal journals of other publishing platforms. A further search for the key words was conducted across all the identified databases.

5.4.5 Study selection

The review process consisted of two levels of screening: (1) screening of titles and abstracts and (2) a full text screening. The guidelines were exported into Mendeley Reference Manager (Mendeley LTD., Elsevier, Netherlands), a web-based citation and reference management system. Following the search, the identified records were collated. Two reviewers independently (YM and CI) screened the retrieved records. Any conflicts were resolved through consultation. A third reviewer (PJ) was available for consultation. Guidelines that were potentially relevant were retrieved as a full text, and their citation details were manually tabled. The full texts of the potentially eligible guidelines were independently screened for eligibility by the two reviewers. Reasons for exclusion of guidelines that did not meet the review criteria were provided and are reported in this scoping review in Table 5.2. Any disagreements that transpired between the reviewers during the selection process was resolved through discussion. A third reviewer was available for consultation. The results are presented in a flow diagram, PrismaScR (Figure 5.2). Guidelines that were included are presented in Table 5.1.

Stellenbosch University https://scholar.sun.ac.za

Data was manually extracted (Appendix V) from guidelines by two independent reviewers (YM and CI) using a pre-piloted data extraction form adapted from the JBI data extraction tool available in JBI SUMARI (Jordan *et al.*, 2019:38). The two review authors (YM and CI) extracted data using the adapted data extraction tool. The data obtained from each guideline included specific details about the title, the organisation or author(s), country of origin, date/year of publication, aims/purpose, target users (who is to use the guideline), guideline content: pain assessment and management recommendations and their grading systems (where indicated).

5.4.6 Critical Appraisal

Even though critical appraisal is not a requirement when doing scoping reviews, the best practice guidelines were critically appraised by two reviewers (the researcher and an independent reviewer) to assess their methodological quality before using their recommendations to inform the best practice guidelines. A third reviewer (PJ) was consulted to give input when necessary, or if there was any disagreement between the two reviewers. The quality of the recommendations was appraised using the 23-item AGREE II which is a valid and reliable tool developed to provide a framework to assess and optimize the quality of guidelines, to provide a methodological strategy to develop guidelines and to inform on the reporting of recommendations. Findings are reported in the AGREE II, Reporting Checklist. Recommendations that are clinically credible, trustworthy, and implementable can be used to inform guideline development.

The AGREE II tool has six domains namely: scope and purpose, level of stakeholder involvement, rigour of development, clarity of presentation, applicability, and editorial independence (Brouwers, Kho, Browman, *et al.*, 2010a). A seven-point response scale (minimum score of one [strongly disagree] to a maximum score of seven [strongly agree] was used to assess the items in each domain (AGREE II, 2017:8). Both reviewers' domain scores were summed and presented as a percentage of their maximum possible scores. Each reviewer's domain scores were calculated by using the formula provided by the AGREE II, which is:

$$\text{Domain score} = \frac{\text{Obtained score} - \text{Minimum possible score}}{\text{Maximum possible score} - \text{Minimum possible score}} \times 100 = \%$$

Each of the six domain scores is reported for each domain and aggregated into a final score. After consultation the three reviewers agreed to include all guidelines that scored 50% and more in total. A summary of the critical appraisal calculations is presented in Tables 5.3 and 5.4.

Stellenbosch University https://scholar.sun.ac.za

5.5 RESULTS

The results of the scoping review are presented below.

5.5.1 Search results

A total of 4 029 records were identified from electronic databases, 1 379 from guideline repositories and 15 from search engines (Figure 5.2). After screening, 34 records were assessed for eligibility of which 22 were excluded (Table 5.2). There were three records (International Association for the Study of Pain, 2019; South African Society of Anaesthesiologists, 2016, Stanford Health Care) that were applicable to patients under 18 years old, three reports (Oliveira, C.B.; Maher, C.G.; Pinto, R.F., Traeger, A.C., Lin, C.C. Chenot, J.F., Van Tulder, M., & Koes, B.W., 2018; Oregon Pain Guidance of Southern Oregon, 2016; Scottish Intercollegiate Guidelines Network (SIGN), 2019) that were applicable to patients with chronic pain; 10 records (NICE Guidelines, 2012; British Pain Society, 2013; Health Care Association of New Jersey, 2006; Kopf, A., & Patel, N.B, 2010; National Emergency Care Pain Management Initiative National Institute of Clinical Studies, 2011; Raf, M., Melvill, R., Coetzee, G., & Smuts, J., 2013; Raf, M., Crosier, J., Eppel, S., Neyer, H., Sarembock, B., & Webb, D, 2014; Republic of Rwanda: Ministry of Health, 2012; The College of Emergency Medicine: Best Practice Guidelines, 2014; World Health Organization, 2004) were published before 2015 and 6 records (NICE Guidelines 2020; NICE Guidelines, 2016; NICE Guidelines, 2016; NICE Guideline NG180, 2020; Agency for Health Care Research and Quality, 2019; Youssef, S, 2019) were not specific to trauma or pain. Twelve best practice guidelines were screened, but after critical appraisal only six (6) were included in the review.

Stellenbosch University https://scholar.sun.ac.za

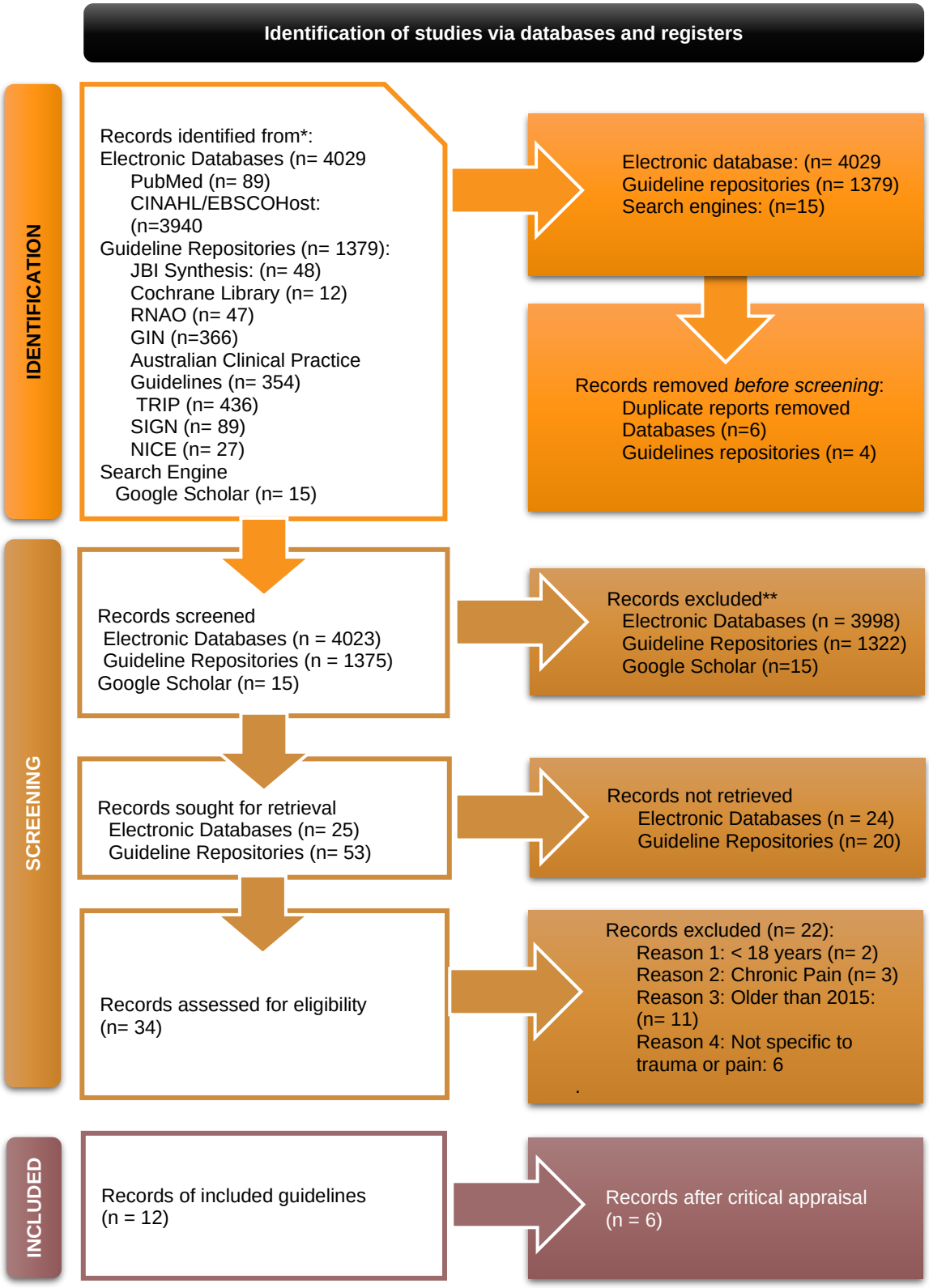


Figure 5.2: PRISMA ScR search flow diagram illustrating the study selection process

(Page, Mckenzie, Bossuyt, *et al.*, 2021:5)

Stellenbosch University https://scholar.sun.ac.za

5.5.2 Included best practice guidelines

Following the critical appraisal, six (6) best practice guidelines, which answered the review questions, for inclusion were included as depicted in Table 5.1.

Table 5.1: Included best practice guidelines (n=6)

No	Guideline Title	Authors or organisation	Country of Origin	Guideline relevancy	Guideline recency: Publication date	Guideline recency: Revision date
1	Acute Pain Management: Scientific Evidence	Australian and New Zealand College of Anaesthetists and Faculty American College of Surgeons: Schug, Palmer, Scott, Halliwell & Trinca, 2015	Australia	Allied health care worker	2015	Not mentioned but proposed 5 years
2	Acute Pain Guideline: Best Practice Guidelines for Acute Pain Management in Trauma Patients	American College of Surgeons Quality Programs, 2020	United States of America	allied health care workers	2020	
3	Assessment and Management of Pain	Registered Nurses Association of Ontario, 2013	Canada		2013	
4	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury	Hsu, J.R.; Mir, H., Wally, M.K.& Seymour, R.B. 2019	United States of America		2019	
5	Guidelines for the management of acute pain in emergency situations	European Society for Emergency Medicine, 2020	Europe		2020	
6	Guidelines for the Management of Pain in Nigeria	Federal Ministry of Health, 2018	Nigeria		2018	

5.5.3 Excluded best practice guidelines

The best practice guidelines that did not answer the review questions or that were not eligible to be included in the review are reflected in Table 5.2.

Stellenbosch University https://scholar.sun.ac.za

Table 5.2: Excluded best practice guidelines (n= 22)

No	Guideline Title/Author/Organisation	Publication Date	Reason for exclusion
1	Guidelines for the management of pain in vulnerable populations, International Association for the Study of Pain	2019	Applicable to children under 18 years
2	Paediatric Sedation Guidelines for Procedural Sedation and Analgesia. South African Society of Anaesthesiologists	2016	Applicable to children under 18 years
3	Trauma Guidelines, Stanford Health Care	2016	Applicable to children under 18 years
4	Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview, Oliveira, C.B.; Maher, C.G.; Pinto, R.F., Traeger, A.C., Lin, C.C. Chenot, J.F., van Tulder, M., & Koes, B.W.	2018	Applicable to patients with chronic pain
5	Oregon Pain Guidance. Oregon Pain Guidance of Southern Oregon	2016	Applicable to patients with chronic pain
6	Management of chronic pain, Scottish Intercollegiate Guidelines Network (SIGN)	2019	Applicable to patients with chronic pain
7	Emergency Care Acute Pain Management Manual, National Emergency Care Pain Management Initiative National Institute of Clinical Studies	2011	Older than 5 years
8	Guidelines for Pain Management Programmes for adults *An evidence-based review prepared on behalf of the British Pain Society* British Pain Society	2013	Older than 5 years
9	Guide to Pain Management in Low-Resource Settings, Kopf, A; & Patel, N.B.	2010	Older than 5 years
10	Management of Pain in Adults. The College of Emergency Medicine. Best Practice Guideline	2014	Older than 5 years
11	Pain Management Guideline, Health Care Association of New Jersey	2006	Older than 5 years
12	Pain Management Guidelines. Republic of Rwanda: Ministry of Health	2012	Older than 5 years
13	Guidelines for Essential Trauma Care. World Health Organization	2004	Older than 5 years
14	South African guideline for the use of chronic opioid therapy for chronic non-cancer pain, Raf, M.; Crosier, J., Eppel, S., Neyer, H., Sarembock, B., & Webb, D	2014	Older than 5 years Emphasis on chronic pain
15	Spinal cord stimulation for the management of pain: Recommendations for best clinical practice Raf, M., Melvill, R., Coetzee, G., & Smuts, J	2013	Older than 5 years Not specific to acute pain
16	Patient experiences in adult NHS services: improving the experiences of care for people using adult NHS services NICE Guidelines	2012	Older than 5 years Not specific to pain
17	Covid-19 rapid guideline: acute myocardial injury NICE Guidelines 2020	2020	Not specific to trauma related pain
18	NICE Guideline NG180	2020	Emphasis on post operative care
19	Major trauma: assessment and initial management NICE Guidelines	2016	Not specific to the assessment and management of pain

Stellenbosch University https://scholar.sun.ac.za

20	Fractures (non-complex): assessment and management, NICE Guidelines	2016	Not specific to assessment and management of pain
21	Treatment for Acute Pain: An Evidence Map Agency for Health Care Research and Quality	2019	Emphasis not on acute trauma related pain
22	Clinical guidelines and evidence base for acute pain management, Youssef, S	2019	Too much emphasis on pharmaceutical management

5.5.4 Methodological quality

The AGREE II domain scores are provided in Table 5.3. The appraisal of all twelve studies that met the eligible criteria were included. However, as indicated in Appendix W six of the guidelines had a low score and were thus excluded in the final inclusion of guidelines for the review.

Table 5.3: AGREE II Combined Domain Scores in % for the initial included best practice guidelines

No	Guideline Title	Domain 1: Scope and Purpose	Domain 2: Stakeholder involvement	Domain 3: Rigour of development	Domain 4: Clarity of presentation	Domain 5: Applicability	Domain 6: Editorial independent	Total mean score
1	Assessment and Management of Pain: Registered Nurses' Association of Ontario (RNAO)	90	67	86	95	59	68	**78**
2	Guidelines for the Management of Acute Pain in Emergency Situations EUSEM	83	67	41	97	40	100	**71**
3	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury	83	56	39	94	38	100	**68**
4	Acute Pain Management: Scientific Evidence	83	72	46	83	50	50	**64**
5	Guidelines for the Management of Pain in Nigeria	86	72	21	72	54	54	**60**
6	Best Practice Guidelines for the Management of Acute Pain	81	50	24	78	42	25	**50**
7	Pain Management Best Practices Inter Agency Task Force Report	83	75	36	44	35	13	**48**
8	Core Standards for Pain Management in the UK	83	56	21	81	21	0	**44**
9	New Zealand Pain Management Nursing Knowledge and Skills Framework for Registered Nurses	83	64	27	44	21	8	**41**
10	South African Acute Pain Guidelines. South African Society of Anaesthesiologists (SASA)	31	31	5	78	15	38	**33**
11	Pain Management in Emergency and Trauma Department Ministry of Malaysia	58	31	11	44	23	0	**28**
12	RCN Pain Knowledge and Skill Framework for the Nursing Team	39	31	17	25	13	17	**24**

Stellenbosch University https://scholar.sun.ac.za

The breakdown of the scores for the AGREE domain scores for the final six (6) included best practice guidelines are reflected in Table 5.4.

Table 5.4: All the AGREE II domain scores of final guidelines

No	Guideline	Domain 1: Scope and Purpose	Domain 2: Stakeholder involvement	Domain 3: Rigour of development	Domain 4: Clarity of presentation	Domain 5: Applicability	Domain 6: Editorial independent	Total means score
1	Acute Pain Management: Scientific Evidence	83	72	46	83	50	50	64
2	Best Practice Guidelines for the Management of Acute Pain	81	50	24	79	42	25	50
3	Assessment and Management of Pain: Registered Nurses' Association of Ontario (RNAO	90	67	86	95	59	68	79
4	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury	83	56	39	94	38	100	68
5	Guidelines for the Management of Acute Pain in Emergency Situations EUSEM	83	67	41	97	40	100	74
6	Guidelines for the Management of Pain in Nigeria	86	72	21	72	54	54	60
Overall scoring		84	64	43	87	47	66	66

5.5.5 Evidence-grading systems used in the best practice guidelines

Grading systems were not clearly indicated in all the guidelines (Table 5.5). The grading system indicated by Schug, Palmer, Scott, *et al.* (2016), was National Health and Medical Research Council (NHMRC) designated and the levels of evidence were outlined. The American College of Surgeons, the committee on trauma & American Society of Anesthesiologists (2020), did not indicate any grading system or level of evidence. The Registered Nurses' Association of Ontario (2013), used the Scottish Intercollegiate Guidelines Network (SIGN), (2012), and indicated the levels of evidence. Hsu *et al.* (2019), implemented the Grading of Recommendations Assessment, Development, and Evaluation Working Group and indicated the levels of evidence and strength of recommendations. Hachimi-Idrissi *et al.* (2020), did not indicate the grading system used, but they indicated levels of evidence. No grading system of levels of evidence were mentioned in the Ministry, (2018).

Stellenbosch University https://scholar.sun.ac.za

Table 5.5: Evidence-grading systems used for the best practice guidelines

No	Guideline Title	Name of grading system	Level or quality of evidence	Strength of the recommendations
1	Acute Pain Management: Scientific Evidence	Documented according to NHMRC designation (NHMRC 1999 GL) Narrative Reviews (NR) Case Reports (CR) Clinical Practice Guidelines (GR)	I II III-1 III-2 III-3 IV	High Medium Low
2	Acute Pain Guideline: Best Practice Guidelines for Acute Pain Management in Trauma Patients	Not indicated	Not indicated	Not indicated
3	Assessment and Management of Pain	Scottish Intercollegiate Guidelines Network (SIGN), 2012,	Ia Ib IIa IIb III IV	High Medium low
4	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury	Grading of Recommendations Assessment, Development, and Evaluation Working Group	Strong Moderate Weak	"strong" (practices in which benefits are sure to outweigh potential harms) or "conditional" (the evidence was weaker or if the benefits do not significantly outweigh potential harms)
5	Guidelines for the management of acute pain in emergency situations	Not indicated	Evidence levels: IA, meta-analysis of randomised clinical trials IB, randomised clinical trial IIA, non-randomised clinical trial IIB, other study; III non-experimental descriptive study; IV, expert opinion.	High Medium Low
6	Guidelines for the Management of Pain in Nigeria	Not indicated	Not indicated	Not indicated

5.5.6 Guideline Content Analysis

The data extracted and synthesised from the review were categorised by means of content analysis to identify common patterns of pain assessment and pain management emerging

Stellenbosch University https://scholar.sun.ac.za

from the guidelines. This will be useful and clearly understood by nurses for whom the guidelines are intended. In this review common and recurring patterns across all six guidelines were coded. Based on the analysis the following, categories (Table 5.6) were developed and display a layout for the best practice guidelines:

Table 5.6: Content categories

Main Category	Sub-category
Practice	Pain Assessment: • *Assessment* • *Pain Scales* • *Re-assessment* • *Documentation* Pain Management: • *Patient collaboration* • *Pharmacological management* • *Non-pharmacological management*
Education	Patient Education Nurse education
Organisational	Organisational support

5.6 DISCUSSION

A summary of the content extracted from the evidence in the review is presented in this section. The extracted recommendation will be presented in chapter six.

5.6.1 Practice considerations: Pain assessment

Pain assessment for the acute-trauma related patients should focus on different practice aspects, as extracted from all six guidelines, and is illustrated in Figure 5.3.

Stellenbosch University https://scholar.sun.ac.za

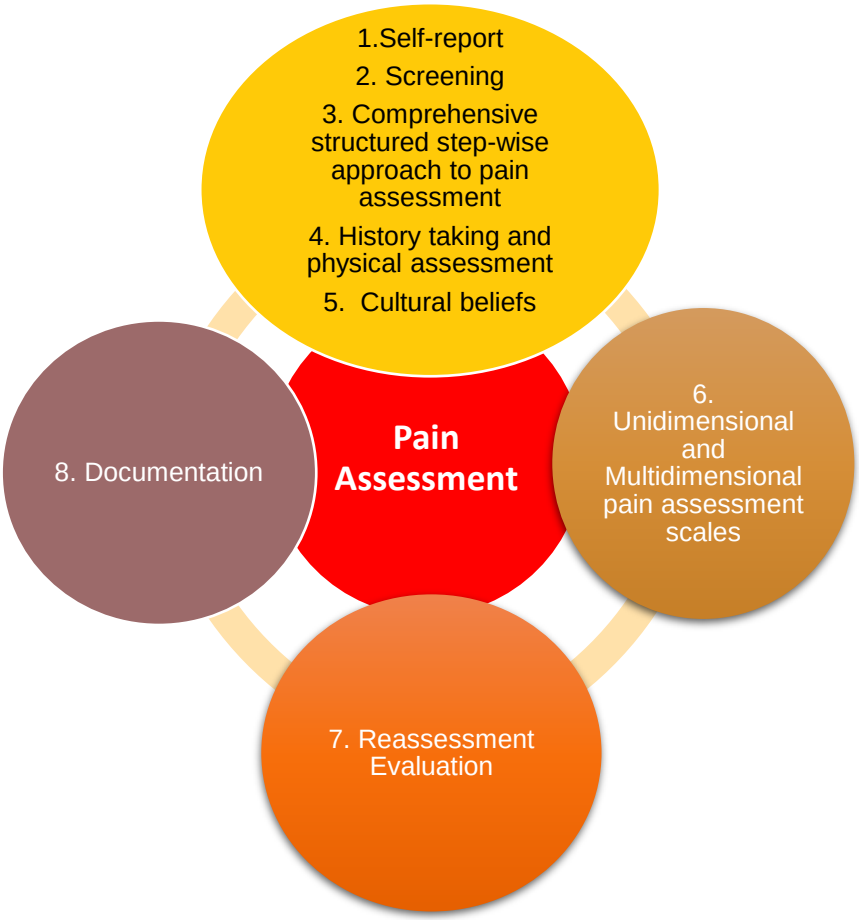


Figure 5.3: Pain assessment practice considerations

5.6.1.1 Self-reporting

Four of the six guidelines suggest that self-reporting of pain should be prioritised in the assessment and management of acute pain. However, during pain assessment it is important to take into account the patient's cognitive level and ability to communicate (American College of Surgeons, the committee on trauma & American Society of Anesthesiologists, 2020:11). Since pain is a subjective experience, self-reporting of pain should be encouraged whenever appropriate and possible (Hachimi-Idrissi *et al.*, 2020:13; Schug *et al.*, 2016:48). Furthermore, the perception of pain is based on the individual patient experience that may present a challenge to nurses regarding the patient's understanding of their pain experience, hence the importance of self-reporting where possible (Hachimi-Idrissi *et al.*, 2020:17). To ensure that pain assessment is effective, nurses must acknowledge the patient's self-reporting of their pain experience and regard it as accurate and the primary source of information. The assessment of pain is a dialogue between the patient and the healthcare provider and the ability of the patient to communicate must be considered during pain assessment to obtain the patient's input (Ministry, 2018:7; American College of Surgeons *et al.*, 2020:11).

Stellenbosch University https://scholar.sun.ac.za

5.6.1.2 Screening

Three of the six guidelines recommended the screening of patients for any pain or risk of pain. Even though other healthcare professionals are either directly or indirectly involved in the assessment of a patient's pain, nurses have the most contact with people admitted to healthcare facilities (Registered Nurses' Association of Ontario, 2013:19). Nurses are thus in a unique position to screen for pain, in order to proceed with a comprehensive assessment if the screening for pain is positive (Registered Nurses' Association of Ontario, 2013:19). Appropriate assessment should include screening to determine the presence of pain (Schug *et al.*, 2016:48). Routine screening is suggested on admission to the EC, after a change in medical status and prior to, during and after a procedure (Registered Nurses' Association of Ontario, 2013:20). In accordance, in America the Joint Commission standards state that a hospital must have defined criteria to screen (American College of Surgeons *et al.*, 2020:18). Patients should be screened for the presence, or risk of any type of pain on admission (Registered Nurses' Association of Ontario, 2013:7).

5.6.1.3 Comprehensive structured stepwise approach to pain assessment

Three of the six guidelines recommended that it is fundamental to assess pain within a biopsychosocial model that recognises the physiological, psychological and environmental factors that influence the overall pain experience of the patient (Schug *et al.*, 2016:43). The cornerstone of accurate pain assessment and effective clinical management of pain entails a comprehensive assessment of the patient's pain, symptoms, clinical history and functional status (Ministry, 2018:6). A comprehensive pain assessment should be performed on patients screened of having the presence, or risk of any type of pain (Registered Nurses' Association of Ontario, 2013:20). A hierarchical approach to pain assessment is recommended by the American College of Surgeons *et al.* (2020:16), while the Registered Nurses' Association of Ontario (2013:21) concurs in stating that a systematic approach should be employed to explore and assess pain.

5.6.1.4 History taking and physical examination

Four of the six guidelines recommend that history taking and physical examination of the patient presenting with pain are important. The critical elements of pain assessment should include history taking and performing a physical examination prior to taking a decision on the diagnosis and management of the patient. A thorough medical history and physical examination can elicit important diagnostic information about the patient (Hachimi-Idrissi *et al.*, 2020:17 & 61; Schug *et al.*, 2016:4). Pain assessment should address previous pain history, sensory characteristics of pain and the impact of pain (Registered Nurses' Association of Ontario, 2013:20). A brief mnemonic, which is useful to aid in remembering while doing a

Stellenbosch University https://scholar.sun.ac.za

pain assessment is PQRST (Ministry, 2018:7). An adapted pain assessment using the mnemonic O,P,Q,R,S,T,U and V is recommended to assist nurses systematically to explore and assess pain (Registered Nurses' Association of Ontario, 2013:21). Therefore, pain history should include a self-report of the patient explaining the onset of pain, provoking or palliating factors, the quality of pain, the region or radiation of pain, the severity of pain (pain tools), the timing of pain or treatment, obtaining the patient's understanding of their pain and their values regarding their pain management goal. A physical examination can be done, guided by the patient's report of the onset of the pain and region or radiation of pain. The nurse is the first contact with the patient and history taking and a physical examination should be done while admitting the patient. A thorough pain assessment will guide the nurse on how to approach the management of the acute pain reported by the patient, the planning of the nursing care plan and urgent concerns that need to be reported to the doctor. Obtaining information during pain assessment such as provoking factors, pain intensity and examining the identified region can guide the nurse to initiate pain relieving measure for example immobilizing, splinting, and elevating a swollen limb. Thus, obtaining a history of the patient's pain and performing a physical examination provide a holistic approach to pain assessment.

5.6.1.5 Cultural beliefs

Five of the six guidelines indicated that cultural beliefs should be considered when assessing pain. An influx of immigrants has made it imperative to understand different cultures when considering pain assessment and pain management. This extends beyond the language spoken and the healthcare professionals or nurse must consider the individual's culture, faith, beliefs, attitudes, health literacy, expectations, perceptions norms of behaviour and pain relief expectations. Consequently, healthcare professionals need to consider their own attitudes and cultural assumptions to address cross-cultural elements that underpin individual patient responses to pain (Schug *et al.*, 2016:552). There are also cultural differences in pain intensity and alleviation of pain with medication where in certain cultures and societies patients report higher pain intensity levels and rely more on opioids for pain relieve than others (Hsu, Mir, Wally *et al.*, 2019:161). The response of patients to pain and pain management may be influenced by amongst others, culture making it necessary to consider cultural factors when choosing a pain assessment tool. Cultural factors such as behaviour, emotions, language, and understanding of the pain experienced should be included in the individual assessment of pain (Hachimi-Idrissi, Coffey, *et al.*, 2020:61; Ministry, 2018:33). To ensure that the pain assessment is more thorough and individualized, an effort must be made to understand the patient's beliefs and misbeliefs, culture, and an understanding about pain and pain management must be explored (Registered Nurses' Association of Ontario, 2013:22).

Stellenbosch University https://scholar.sun.ac.za

5.6.1.6 The use of validated pain tools

All six guidelines recommended the use of validated pain tools in the assessment of pain. Pain assessment is a complex process and should be assessed and reassessed using appropriate and validated tools. The tools used must be interpreted contextually during the patient-provider interaction (American College of Surgeons *et al.*, 2020:11; Hsu *et al.*, 2019:15). The choice of a pain assessment tool must reflect the patient as an individual in terms of developmental, cognitive, emotional, and language factors (Hachimi-Idrissi, *et al.*, 2020:61). It is important to use tools that can easily be used by patients to determine the quality and intensity of pain. The selected tool for assessing pain must be easily understood by the patient and must be reliable, valid, responsive, feasible and practical. It must furthermore be developmentally and culturally appropriate for the population it is designed for (Registered Nurses' Association of Ontario, 2013:22, 23). Pain tools are used to determine the severity and intensity of pain in adults with the use of commonly used unidimensional and multidimensional tools (Ministry, 2018:8). Unidimensional tools, include categorical scales and numerical scales, which assess pain intensity, while multidimensional tools provide further information on the characteristics of the pain and the impact on the patient (Schug *et al.*, 2016:45, 47). Unidimensional pain assessment tools are easy to use and are familiar to patients and healthcare providers. Unidimensional measures of pain intensity such as the visual analogue scales (VAS), numerical rating scales (NRS) and verbal descriptor scales (VDS) are commonly used to quantify pain in the emergency setting than multidimensional measures. Categorical and numerical scales are recommended for the assessment of the degree and the intensity of acute pain (Hachimi-Idrissi *et al.*, 2020:18).

5.6.1.7 Reassessment

It is recommended through all six guidelines that pain must be reassessed in response to the pain management. The recording of pain intensity as the ''fifth vital sign'' increases awareness and utilization of pain assessment. Therefore, regular, and repeated measurement of pain should be conducted to assess ongoing adequacy of pain management. The appropriate frequency of reassessment will depend on the duration and severity of pain, the patient's needs and responses to pain management and the type of pain intervention (Schug *et al.*, 2016:45). Reassessment is recommended after a pain intervention is completed, for both pain control and adverse reactions to the intervention. Reassessment should be done regularly for both pain control and adverse reactions at an appropriate interval, based on the anticipated effect ideally using the same tool. This is supported by the Joint Commission standards that state a hospital should have a criterion to reassess pain (American College of Surgeons *et al.*, 2020:19; Hsu *et al.*, 2019:158). Reassessment of pain is as important as the initial assessment and the frequency of reassessment should be guided by the severity of pain,

Stellenbosch University https://scholar.sun.ac.za

presence of pain, pain intensity, stability of the patient's medical condition, the type of pain and practice setting (Hachimi-Idrissi *et al.*, 2020:61; Registered Nurses' Association of Ontario, 2013:38). Pain assessment should not be an on-and-off process and should be done at regular intervals and should be integrated into clinical care. It is recommended to reassess the patient's response to the pain management interventions consistently (Ministry, 2018:6).

5.6.1.8 Evaluation

In five of the six guidelines, it is recommended that the evaluation of pain is an important aspect and should form part of the pain assessment. Pain assessment leads to adjustments in pain management regime and therefore, evaluation of the patient is important to ensure improvements in the quality of care (Schug *et al.*, 2016:43). Significant changes in pain should be re-evaluated for missed, new or developing injuries. Similarly, the cause of increasing pain needs to be promptly investigated before increasing analgesia (American College of Surgeons *et al.*, 2020:11, 53). Evaluation is a requirement to decide on the need to initiate or discontinue pain management (Hsu, *et al.,* 2019:170). It is important to monitor patients to obtain an informed evaluation of the effectiveness of pain management interventions (Ministry, 2018:53). Ongoing monitoring and evaluation of a patient's response to their pain management interventions are vital to adjust the treatment plan, thereby ensuring effective pain management (Registered Nurses' Association of Ontario, 2013:38).

5.6.1.9 Documentation

Documentation of pain is highlighted in all six guidelines. Attention should be given to documentation to make pain relief techniques more effective (Schug *et al.*, 2016:61). Pain documentation should be standardised and consistent through the phases of trauma care to foster continuity of care (American College of Surgeons *et al.*, 2020:116). The compilation and analysis of data to inform continued performance improvement is a requirement of the Joint Commission in the USA (Hsu, *et al.,* 2019:170). Pain documentation is necessary to evaluate the trend of the patients pain and to plan the way forward (Hachimi-Idrissi *et al.*, 2020:17). Documentation of pain assessment and pain management by nurses supports care and treatment and is a professional and legal requirement that promotes safe, effective and ethical pain care (Registered Nurses' Association of Ontario, 2013:39). Healthcare professionals should thus be trained in essential steps to provide effective pain management, including documentation of pain (Ministry, 2018:72).

5.6.2 Practice considerations: Pain management

Pain management for the acute trauma-related patients should focus on different practice aspects, as extracted from all six guidelines, and is illustrated in Figure 5.4.

Stellenbosch University https://scholar.sun.ac.za

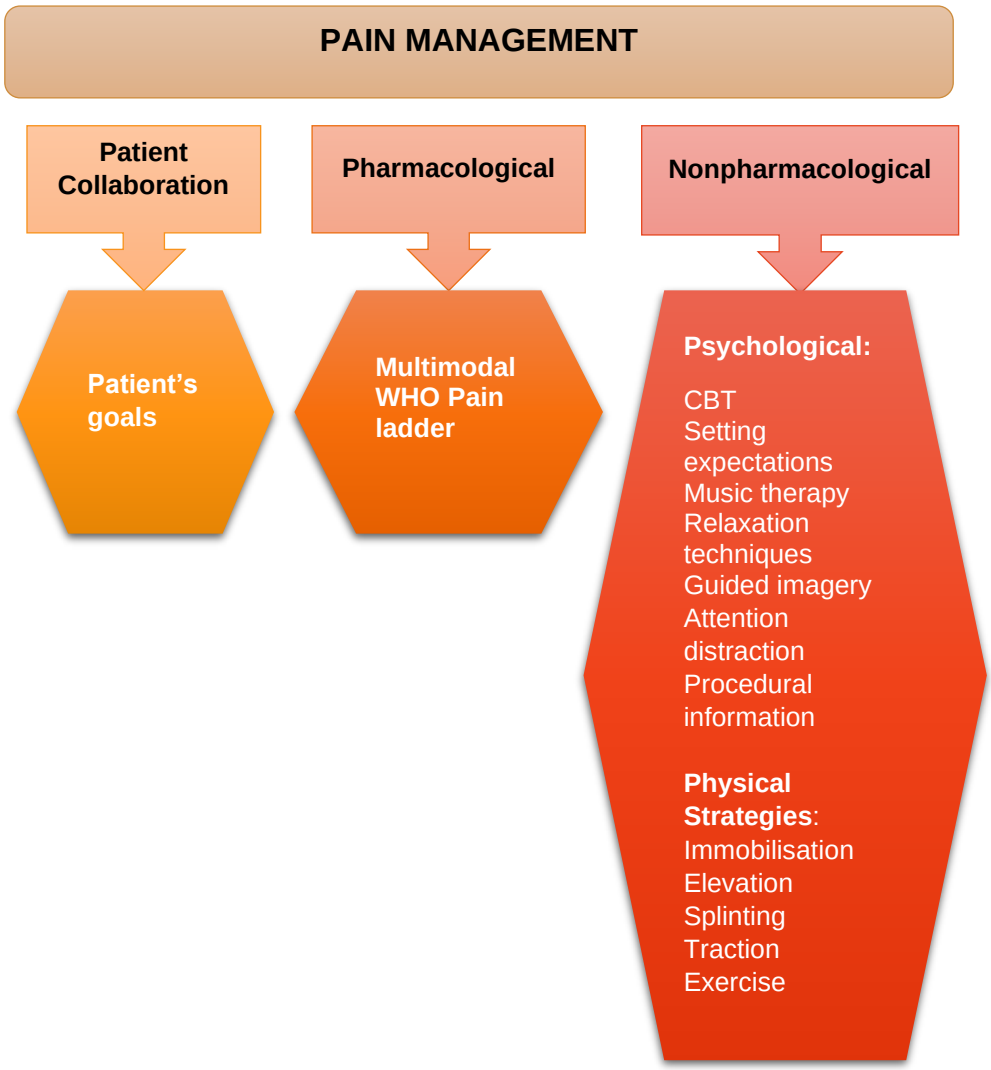


Figure 5.4: Pain management practice considerations

5.6.2.1 Collaboration with the patient

It is recommended in all six guidelines that the healthcare professional must collaborate with the patient as a first step in pain management. Patient expectations is a powerful determinant in the management of pain (Schug *et al.*, 2016:13). During pain assessment healthcare providers must acknowledge their biases and navigate multiple competing interests to relieve pain, thereby preserving the patient-provider relationship (American College of Surgeons *et al.*, 2020:11). Enquiring or patient education about patient expectations for the management of pain is a highly effective intervention for pain management (American College of Surgeons *et al.*, 2020:53). Discussing the alleviation of pain, the expected recovery course, goals for their plans and the patient's experience are recommended (Hachimi-Idrissi *et al.*, 2020:17; Hsu *et al.,* 2019:159). The response of patients to their experience is multi-fold such as genetics, age, gender ethnicity, culture, religion, previous pain experiences and the patients' perceptions and expectations. Therefore, the management plan must involve discussion of

Stellenbosch University https://scholar.sun.ac.za

options with patients for their pain management. A collaborate partnership that facilitates and supports people with pain to participate in all aspects of their care is vital to enhance and promotes recovery (Ministry, 2018:34 & 36). There should be collaboration with patients to identify their goals for pain management, thereby ensuring a comprehensive approach to the patient's plan of care (Registered Nurses' Association of Ontario, 2013:8).

5.6.2.2 Pharmacological pain management

In all six guidelines the use of pharmacological therapies for pain management are recommended. Emergency centers should have systems in place to ensure that adequate pain assessment, timeously, adequate, and appropriate analgesia, frequent monitoring, and reassessment are implemented. Strategies, like nurse-initiated processes should be adopted to improve analgesic administration (Schug *et al.*, 2016:355). Most patients will require pharmacological analgesia after traumatic injury. Multimodal is referred to as a balanced analgesia, that is the use of multiple analgesic medications including opioid, nonopioid and nonpharmacological interventions. A multimodal approach using a combination of multiple analgesia, regional analgesia, and nonpharmacological interventions is a concept that can be applied across the continuum of the trauma injury experience (American College of Surgeons *et al.*, 2020:32, 53). Benefits of this treatment paradigm include greater pain control without relying on any one class of medication (Hsu *et al.*, 2019:165). The World Health Organisation (WHO) pain ladder is a widely accepted guide for the management of acute pain, providing a stepped approach to pain management. In acute pain the pain relief ladder can be used in reverse if the patient presents with severe pain, starting with step three (opioids) and weaning to step one (non-opioids), until the pain is managed (Hachimi-Idrissi *et al.*, 2020:15). Analgesia is the cornerstone of pain management and therefore requires a clear understanding of the pharmacology, impact on patient and the adverse effects of the prescribe analgesics. To guide the choice of a drug, the WHO has promoted the three-step ladder as a framework for the rational use of analgesic medications in the treatment of pain. They advocate that the choice of a drug should be prescribed according to the severity of pain and not the stage of the disease (Ministry, 2018:12). Pharmacological interventions are implemented, using principles that maximize efficacy and minimize adverse effects (Registered Nurses' Association of Ontario, 2013:33).

5.6.2.3 Nonpharmacological pain management strategies

The inclusion of nonpharmacological pain management strategies is recommended in all six guidelines. In addition to analgesic agents in the EC setting the importance of nonpharmacological treatments should not be forgotten (Schug *et al.*, 2016:359). A multimodal approach to managing pain using a combination of pharmacological and nonpharmacological

Stellenbosch University https://scholar.sun.ac.za

pain management interventions must be considered (Hachimi-Idrissi *et al.*, 2020:25). Nonpharmacological pain management strategies are implemented as adjuncts for pain and anxiety management in trauma, particularly to minimize opioid usage and the development of chronic pain. Though not expansive in the setting of acute injury, nonpharmacological pain management strategies are low-risk and require not much specialised training. Often some techniques are used subconsciously by healthcare providers (American College of Surgeons *et al.*, 2020:22). Nonpharmacological pain management includes interventions that do not involve the use of medications to treat pain. These are considered to be more cost effective with fewer side effects and tend to be preferred by older patients (Ministry, 2018:32). The use of nonpharmacological interventions should be evaluated for effectiveness and the potential for interaction with pharmacological interventions (Registered Nurses' Association of Ontario, 2013:36). Nonpharmacological approaches should not be substituted by adequate pharmacological management but rather be used concurrently (Registered Nurses' Association of Ontario, 2013:36). Nonpharmacological interventions are further sub-divided into psychological and physical interventions.

5.6.2.4 Psychological interventions

There is accumulating evidence that a range of psychological factors can contribute to the experience and impact of acute pain and therefore have potentially important implications for pain management in acute pain settings (Schug *et al.*, 2016:11). The role of psychological interventions is generally seen as adjunctive to pharmacological and physical interventions of acute pain management (Schug *et al.*, 2016:259). Psychological factors that influence the experience of pain, include the processes of attention, procedural information, cognitive behavioural processes such as learning, thinking styles, beliefs, and mood, as well as interactions with the environment (Schug *et al.*, 2016:9). Relaxation techniques using music, suitable imagery, focus on altering breathing patterns are forms of distractions (Schug *et al.*, 2016:260). Psychological interventions in the forms of sharing information, relaxation, attention control methods and Cognitive Behavioural Therapy (CBT) are recommended (Hachimi-Idrissi *et al.*, 2020:25). Psychological interventions such as CBT, music, distraction, and relaxation techniques play an important role in how the patient thinks, feels and responds to pain (Registered Nurses' Association of Ontario, 2013:37). Distraction using music has reduced acute pain in a systematic review of 42 RCTs (Hachimi-Idrissi *et al.*, 2020:26).

Cognitive-behavioural interventions are psychological modalities used to help reduce the patient's pain. Important modalities include patient education, distraction, music therapy, relaxation, and imagery (Hsu *et al.,* 2019:159). Cognitive Behavioural Therapy (CBT) involves applying behaviour changing principles that will lead to positive reinforcement behaviour such

Stellenbosch University https://scholar.sun.ac.za

as goal setting (Schug *et al.*, 2016:262). Cognitive behavioural therapy assists patients to have control over their perception of pain. This includes setting expectations, teaching relaxation techniques, the use of guided mental imagery for diversion and active distraction through conservation (American College of Surgeons *et al.*, 2020:22).

Distraction is a cost-effective CBT that is most effective when the pain is mild to severe (Ministry, 2018:34). Relaxation techniques include teaching the patient diaphragmatic breathing, music therapy and guided imagery (Ministry, 2018:35). Music therapy is a passive distraction technique that is self-explanatory requiring minimal-to-no expertise from the caregiver (American College of Surgeons *et al.*, 2020:23).

5.6.2.5 Physical strategies

Recommendations in two of the six guidelines are the positioning of the patient and in three out of the six guidelines immobilisation as physical strategies in pain management are suggested. Nonpharmacological physical intervention should include ice, elevation, and splinting for injuries (Schug *et al.*, 2016:359). All six guidelines include cryotherapy and heat therapy as treatment options for pain management. Temperature therapy, including cryotherapy to reduce internal tissue temperature and heat therapy to relieve discomfort associated with injury are recommended (American College of Surgeons *et al.*, 2020:26). Cryotherapy is recommended for acute musculoskeletal injury with multifactorial biological effects, including increasing the threshold of painful stimuli and increasing the threshold to pain (Hsu *et al.,* 2019:163). Cryotherapy e.g., icepacks and gel packs, and heat therapy are also recommended for the reduction of pain, oedema, inflammation, and muscle spasm; exercise, including adjustment of positioning (Hachimi-Idrissi *et al.*, 2020:28; Ministry, 2018:42). The application of heat or cold must be considered in conjunction with pharmacological interventions to reduce pain, improve sleep and general wellbeing (Registered Nurses' Association of Ontario, 2013:36).

Immobilisation has multifaceted advantages that include a beneficial effect on pain management during the acute injury period. Three of the six guidelines include immobilisation as a nonpharmacological pain management strategy. Immobilisation is strongly recommended as an adjunct to pain management in adult patients with acute pelvic or extreme trauma (American College of Surgeons *et al.*, 2020:25). The use of immobilisation, ice and elevation should however be used appropriately (Hsu *et al*, 2019:159). Fracture stabilisation such as traction and bracing, and immobilisation of patients lowers pain scores. Furthermore, appropriate positioning especially for noncomplex fractures can alleviate pain and is widely recommended. Similarly, the use of splints or slings for soft tissue injury is recommended to reduce pain and promote healing (Hachimi-Idrissi *et al.*, 2020:28). Physical pain management

Stellenbosch University https://scholar.sun.ac.za

strategies include positioning, bracing, manipulation, mobilisation, heat therapy, cold therapy, bedrest and exercise (Ministry, 2018:36). Skeletal traction is commenced for pre-operative fracture stabilisation and pain control. Bracing is also useful but should be done appropriately and mobilisation should be commenced early to prevent complications. It is also recommended that appropriate positioning must be done according to the patient's injury (Hachimi-Idrissi *et al.*, 2020:28).

5.6.3 Education

Pain assessment and management for the acute trauma-related patients should focus on patient and nurse education, as extracted from all six guidelines.

5.6.3.1 Patient education

Educating the patient about pain will assist him/her to have some control over the quality of his/her pain. For acute pain, management goals involve patient education, assurance, and advice on resuming normal activity (Ministry, 2018:36). Education encourages patients to become active participants in their treatment plan and their commitment is promoted (Ministry, 2018:41). Patient education is encouraged to educate patients about the expectations of pain management (American College of Surgeons *et al.*, 2020:53). Patients should have access to educational information and trained on self-management interventions (Hsu *et al.*, 2019:162). All departments admitting patients with acute trauma-related pain such as emergency departments, trauma wards and orthopaedic wards should also support educational efforts for patients such as explaining the analgesics administered, and positioning that will promote comfort (Hsu *et al.,* 2019:171).

Educational strategies are more effective when combined structurally, culturally appropriate, and patient-specific when implemented rather than generically (Schug *et al.,* 2015:53). Furthermore, information should be provided to patients intermittently to update them on their progress and their pain management plan, thereby preventing anxiety and despair (Hachimi-Idrissi *et al.*, 2020:25). Procedural information would include education on how to behave, exercises to do or body positions (Schug *et al.,* 2015:259). Short teaching interventions for patients such as teaching them distraction techniques and brief education of their pain will reduce anxiety, and decrease their desire for opioids (American College of Surgeons *et al.*, 2020:23). Teaching the patient how to reduce the severity of pain through use of appropriate body mechanics and exercise pacing, are encouraged especially when complications arise regarding the use of opioids (Ministry, 2018:33). Empowering patients to understand their pain will improve co-operation from the patient (Ministry, 2018:41). Teaching the patient about the pain management strategies and addressing known concerns and beliefs must be included in the plan of care (Registered Nurses' Association of Ontario, 2013:8).

Stellenbosch University https://scholar.sun.ac.za

5.6.3.2 Nurse education

Education of medical and nursing staff is essential if better results are to be derived from conventional methods of pain relief and the use of more sophisticated forms of analgesia. Education can include the provision of guidelines and accompanying changes to practice to achieve good outcomes (Schug *et al.*, 2016:56). Education regarding prescribing, administration, documentation, monitoring of patients and the provision of appropriate policies, protocols and guidelines for positive outcomes (Schug *et al.*, 2016:58). There is a lack of training in pain management and the effectiveness of educational interventions is strong (Hsu *et al.,* 2019:171). The core principles in developing and sustaining an effective pain management plan are education of healthcare workers about the nature of the pain, setting appropriate goals and developing a comprehensive treatment plan (Ministry, 2018:33). Healthcare workers, administrators, policy makers and caregivers should be trained in all the essential steps involved in the delivery of comprehensive, effective pain management (Ministry, 2018:72). To ensure that pain management is championed by all staff members an integral part of healthcare, skills development in pain management by either formal education of healthcare providers or continuing medical education must be available (Ministry, 2018:73). Interprofessional education and collaboration should be promoted regarding the translation of evidence related assessment and management of pain into practice. Educational institutions and education programmes for healthcare providers can incorporate the content into their curricula (Registered Nurses' Association of Ontario, 2013:9). Healthcare professionals should participate in continuing education opportunities to stay updated with knowledge and skills to competently assess and manage pain (Registered Nurses' Association of Ontario, 2013:10).

5.6.4 Organisational

Organisational requirements, pain assessment and pain management were identified in five of the six guidelines included in the review.

The health system is a combination of the organisations, structures, operational processes, and procedures in the health sector that contribute to the delivery of healthcare to patients. Patients admitted to the EC with acute trauma-related pain are likely to interact with the healthcare system, expecting that their needs would be met (Ministry, 2018:69).

Support of appropriate organisational structures and systems for effective pain assessment and pain management will enable patients to access best practice care (Schug *et al.*, 2016:58). Protocols for pain assessment and pain management strategies developed in collaboration with the trauma team should be in place, since a patient might arrive before the trauma surgeon arrives (American College of Surgeons *et al.*, 2020:62; Registered Nurses'

Stellenbosch University https://scholar.sun.ac.za

Association of Ontario, 2013:45). Prioritisation of pain assessment and pain management should be an organisational priority and staff in leadership roles should be established to address performance improvement activities related to patient safety (Hsu *et al.,* 2019:171). A pain-free hospital initiative was proposed by the Federal Ministry of Health in Nigeria with the aim of improvement of pain management (Ministry, 2018:73). This involved a comprehensive approach to capacity building to strategically target all persons involved in the care of patients in pain (Ministry, 2018:74). Organisations should establish platforms to make pain assessment and pain management as a strategic clinical priority.

A systematic organisation supported approach should be used to implement the best practice guideline to facilitate uptake of best practices (Registered Nurses' Association of Ontario, 2013:10). Implementing a trauma center BPG begins with the support from trauma medical directors, trauma programme managers and trauma staff where everyone has a role in being responsible for the oversight, management and continuous commitment to improving pain assessment and pain management in trauma centers (American College of Surgeons *et al.*, 2020:111). Implementation of the guidelines should be carefully planned for: readiness to implement, the involvement of the relevant stakeholder for implementation (head of hospital, nursing managers), and appointing qualified persons to support the education and implementation process, to ensure success (Registered Nurses' Association of Ontario, 2013:46). A designated team or representatives will lead and advocate the implementation of the pain management guidelines and pain care in the EC (American College of Surgeons *et al.*, 2020:115).

5.7 SUMMARY

The scoping review focused on identifying, appraising, and summarising the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings. Six guidelines were included in the review. The AGREE II tool was used to appraise the guidelines, with the lowest score of 50% and the highest score of 78% obtained. The guidelines varied in the scope, format, quality and grading of evidence and strength of recommendations. The content analysis of the included guidelines indicated that recommendations for pain assessment and management focused on practice, education, and organisational considerations. The data findings in this phase contributed to the contextualised best practice guidelines.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 6: GUIDELINE CONTEXTUALISATION

6.1 INTRODUCTION

Phase one of the study provided quantitative data from the nurse's and patient's perspective, which sketches a background of the context in which the BPG for the assessment and management of acute trauma-related pain in the ECs is to be implemented. This phase is linked to the evidence generation segment in the JBI Model that supported the underpinning for the study. In phase two, the process of identifying, extracting, evaluating, summarizing, and synthesising evidence-based recommendations and information from the existing quality BPGs were described. This phase was linked to the evidence synthesis segment in the JBI Model, as depicted in chapter one.

Phase three comprises the drafting of the recommendations by grouping, analysing and merging similar recommendations. The adoption, wording and acceptance of the recommendations are an important step in the contextualisation process. The end-product of this phase was a best practice guideline for nurses for the assessment and management of acute-trauma related pain in the ECs. Furthermore, as an additional document for ease of reference for the nurses in EC, namely an algorithm, was developed. Both documents were validated by means of an expert panel. This chapter provides an outline of the process followed to produce the final end-products of this dissertation and is illustrated in Figure 6.1.

6.2 METHODOLOGY

The Filipino guideline contextualisation process used by the Philippine Academy of Rehabilitation Medicine (PARM) was used to contextualise the guideline (Gonzalez-Saurez, Grimmer-Somers, Dizon, King, Lorenzo, Valdecanas, Gambito & Fidel, 2012). The process comprises of four phases; (1) getting started, (2) systematic search, appraisal, and synthesis of the evidence, (3) contextualisation, and (4) directions for further evaluation, dissemination, and implementation.

Stellenbosch University https://scholar.sun.ac.za

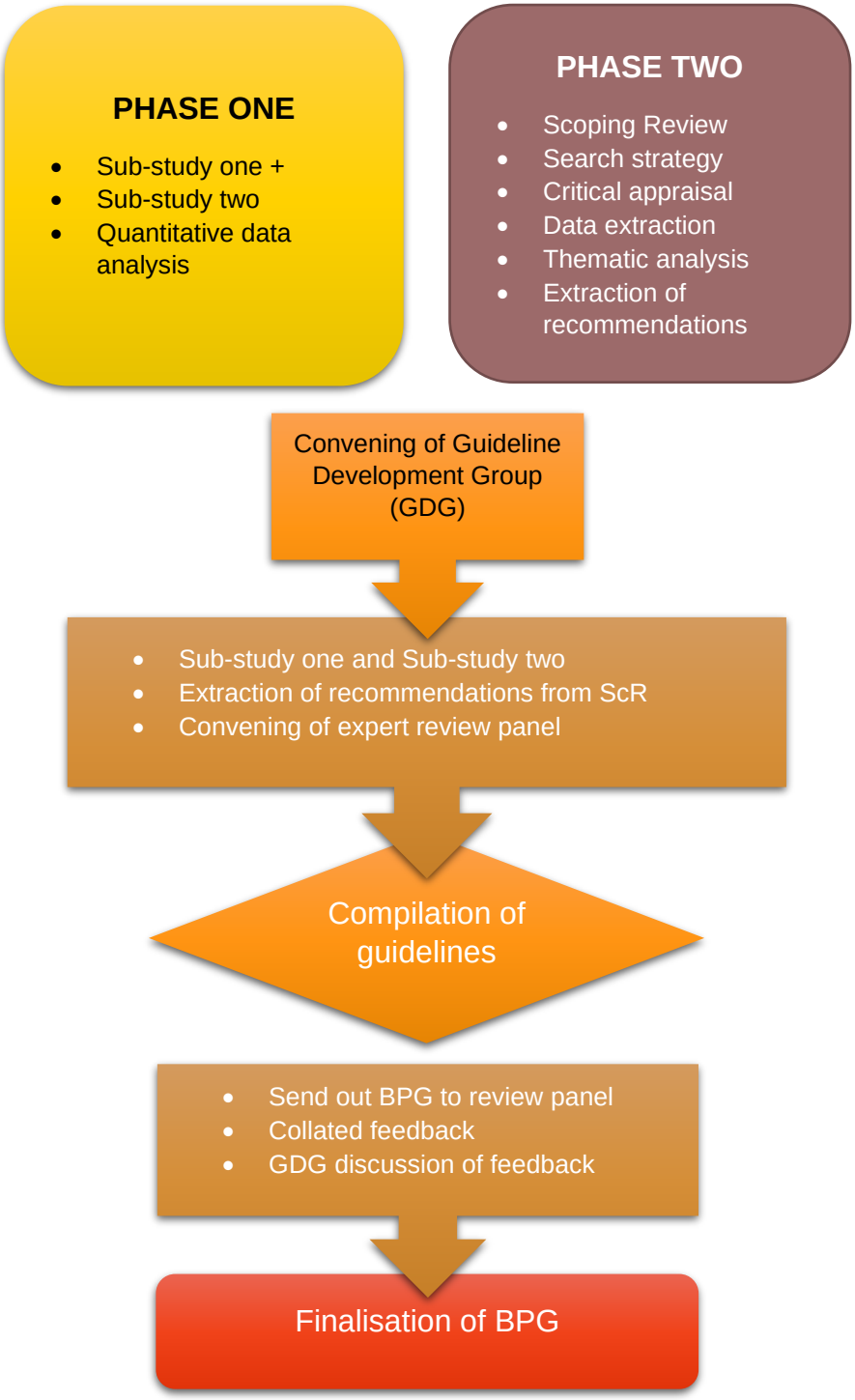


Figure 6.1: Overview of the guideline development process

(Figure by researcher)

6.2.1 Getting started

The purpose, scope and end-users of the guideline were discussed and finalised by the GDG group.

Stellenbosch University https://scholar.sun.ac.za

6.2.2 Systematic search, appraisal, and synthesis of evidence

This step was operationalised by means of a scoping review, and data collected from the two sub-studies.

6.2.2.1 Data synthesis from phase one and phase two

In phase one of the study, data findings from surveys to professional nurses focused on the knowledge, attitudes and practices of pain assessment and pain management in patients admitted to the EC with the acute trauma-related injuries, use of BPGs and training on pain assessment and pain management. The overall knowledge scales indicated that approximately half of the nurses had good knowledge, while the other half had poor knowledge on pain assessment and pain management. Sub-study two revealed the survey data from patients with acute trauma-related pain in the ECs. Patients indicated that they had pain on admission to the EC and were asked by the nurse if they had pain. However, less than half of the nurses assessed the pain, discussed the management or side effects and less than half of the patients indicated that the nurses did not do everything they could to relieve the pain.

From the scoping review (phase two), content of the appraised and identified guidelines were summarised and divided into three categories, namely practice, education and organisational. The practice and context points obtained from the data in the sub-studies were mapped to the three categories and sub-categories. The research team, who acted as the Guideline Development Group (GDG) discussed the results from both phases, and consensually allocated the items in the surveys to the summarised guideline content as depicted in Table 6.1.

Table 6.1: Data synthesis from Phase One and Phase Two

Phase One		**Phase Two**	
Sub- study one	**Sub-study two**	**Main category**	**Sub-categories**
20-30 % of nurses did not use a structured plan or validated pain scales. With regard to their reported practices 45% did not use pain scales or where scales were used, it was only the NRS, VAS and VDA Reassessment of pain was not done in accordance with best practice recommendation by the majority of nurses Screening of patients was not done by 25% of the nurses	The patient's pain was not assessed by the majority of nurses, neither did they use pain assessment scales	Practice	Pain Assessment: *Assessment* *Pain assessment tool* *Monitoring* *Re-assessment* *Documentation*

Stellenbosch University https://scholar.sun.ac.za

Nurses appear to be compliant in documenting pain assessment and management findings and actions, but according to their practices no care plans were used in the ECs			
Approximately 35% did not consider culture or spiritual consideration in pain assessment	Patients were not informed regarding the pain management strategies or side effects or the pain medication.		Pain Management: *Patient collaboration* *Pharmacological management* *Non-pharmacological management*
Not all the nurses have knowledge regarding the pharmacological and nonpharmacological management of pain	Patients were not monitored for potential side-effects after pain medication was administered		
86% of the nurses agreed that after an initial dose of analgesia is given, subsequent doses should be adjusted in accordance with individual response	The efficacy of the patient's pain was not monitored after the administration of pain medication		
Only 46% of the nurses indicated that their knowledge on pain assessment and management is update and according to best practices and that they require training. Only 48% displayed good knowledge on pain assessment and pian management	Patient education regarding pain assessment and management appears not be prioritised by the nurses	Education	Patient Education Nurse education
Only 64% of nurses indicate that oligoanalgesia is a concern for their respective ECs Training on BPGs for pain is required for nurses		Organisational	Organisational support Implementation strategies for BPGs, protocols

6.3 CONTEXTUALISATION

Although PARM group recommended the use of seven steps under this phase, the process was adapted as relevant for the use of this study.

6.3.1 Extraction of recommendations

Following the content analysis of the six included appraised guidelines in the scoping review, the review questions for the best practice guideline were formulated. The review questions were as follows:

1. What is the best available evidence for practice recommendations on pain assessment and management of acute trauma-related pain in the EC?

Stellenbosch University https://scholar.sun.ac.za

2. What is the best available evidence for education recommendations on pain assessment and management of acute trauma-related pain in the EC?
3. What is the best available evidence for organisational recommendations on pain assessment and management of acute trauma-related pain in the EC?

Recommendations and their underlying level of evidence, strength of recommendations and references supporting the recommendation were extracted from the six guidelines. Once this process was completed the guideline development group (GDG), scrutinised the extracted recommendations word for word and took into consideration the consistency of the content, relevancy, and currency. The GDG reached consensus on the recommendations that should be included or excluded. Recommendations were extracted based on findings from phase one and data synthesis from phase two. Further considerations were given to the review questions and the applicability, and feasibility of the recommendations to the local EC context. In addition, the GDG looked at the words and phrasing of concepts for appropriateness to the local EC context. No wording or phrases from the recommendations were changed. Following consensus between the members, recommendations were reduced from 114 to 39. The main reasons for the reduction in the number of recommendations were merging of similar recommendations and exclusion of recommendations that were not relevant to the South African EC context. The recommendations were synthesised into a core set of recommendations for inclusion into the BPG. Three key recommendations, based on the synthesis of the scoping review were formulated.

6.3.2 Wording of the recommendations

Wording of the recommendations is an important step in the guideline process. Recommendations should be worded in a concise, unambiguous, and easy manner that can be translated into practice. Language must be simple, consistent, state what the readers need to know, focus on the actions that need to be taken and identify the person who needs to take this action (National Institute for Health and Care Excellence, 2014).

The PARM group recommended that a guideline for use in developing countries meant retaining its current form and writing strategies that assisted in its operationalisation in the local environment. This process would not involve any de novo guideline development steps, rather the work would focus on how to best translate existing evidence statements into local practice. All the relevant recommendations and their accompanying summaries of the strength of evidence (where available) were collated into tables. The PARM guide for summarising the strength of evidence and the guide for writing endorsements, as illustrated in Table 6.2 were considered in wording the recommendations.

Stellenbosch University https://scholar.sun.ac.za

6.3.3 Finalisation of Recommendations

Following the process, the extracted recommendations from the appraised guidelines and as per consensus between the group members were finalised. Guideline developers were contacted to request permission to utilise the relevant guidelines that were finalised. Permission was requested from the American Society of Anesthesiology Administrative Council, Registered Nurses Association of Ontario (RNAO), Australian and New Zealand (ANZCA), EUSEM, Hsu, and the Ministry of Nigeria. Permission was granted by the ANZCA, Hsu, and RNAO. The other guideline developers did not respond to the email despite several attempts.

Stellenbosch University https://scholar.sun.ac.za

Table 6.2: Philippine Academy of Rehabilitation Medicine guide for summarizing the strength of evidence

		Guide for writing endorsements
1. There is strong evidence	Consistent grades of high-quality evidence with uniform thought, and at least a moderate volume of references to support the recommendation(s)	We strongly recommend
2. There is evidence	A mix of moderate- and high-quality evidence with uniform thought and at least a low volume of references OR A mix of high- and low-quality evidence with uniform thought and high volume of references OR High-level evidence coupled with GPPs, and at least moderate volume of references OR One level I paper with at least moderate volume of references	We recommend
3. There is some evidence	Single level II (A) paper OR Inconsistent grades of high and low evidence with uniform thought and moderate volume of references OR Consistent grades of low-level evidence with uniform thought and at least a moderate volume of references	We recommend
4. There is conflicting evidence	A mix of levels of evidence with nonuniform thought, irrespective of the volume of evidence	We suggest that clinicians consider
5. There is insufficient evidence	Low or inconsistent levels of evidence with low volume references with or without General Practice Points (GPPs)	We do not endorse
6. There is no evidence	Absence of evidence for any aspect of the patient journey	We do not endorse

In addition, the GDG group reviewed the primary research data as collected from phase one and decided on the context and practice points to be added to the extracted recommendations. The additional recommendations were shared with the expert panel, for their view. No disagreement or additional feedback was provided by the expert panel members. Recommendations that were duplicated or stated similarly were merged to prevent repetition. The recommendations from the scoping review were reduced from 39 to 28 after considering comments from the review panel and further discussion from the GDG. The final recommendations (n=55) are depicted in Box 2, with the context recommendations (n=28) and practice points (n=27) indicated with an asterisk (*).

Stellenbosch University https://scholar.sun.ac.za

Box 6.1: Summary of Recommendations for Practice: Pain assessment

We recommend that an acute pain assessment be done on all patients admitted to the EC with acute trauma-related pain and should include the following sub-recommendations:

Self-report

1. We recommend that self-reporting of pain should be used whenever appropriate, as pain is a subjective experience.

Screening

2. We highly recommend that screening should be done for the presence, or risk of, any type of pain.
3. We recommend that acute pain should be prioritised.
4. We recommend that on arrival to the EC the nurses should ask patients if they have pain.
5. We recommend that every patient that is admitted to the EC with acute trauma-related pain should be screened.
6. *We recommend that nurses should assess the pain intensity (level of pain) of patients e.g., by asking how severe their pain is.

Comprehensive pain assessment

7. We highly recommend that a comprehensive pain assessment be performed on persons who have been screened having the presence, risk, or any type of pain using a systematic approach and appropriate, validated tools.
8. We recommend collecting as much accurate information as possible prior to taking a decision on both diagnosis and treatment.
9. We recommend that an adequate assessment of patients' pain should be undertaken prior to instituting treatment and at regular intervals as care continues.
10. We recommend that pain assessment should be done according to a structured plan and a stepwise approach should be used to manage the patient with acute trauma-related pain in the EC.
11. *We recommend that non-verbal signs of pain include blood pressure, tachycardia, frowning, and grunting.
12. *We recommend that findings include a detailed assessment of pain e.g., a pain scale, history e.g., age, underlying conditions
13. *We recommend that physiological pain and behavioural pain predictors should be included in a nursing care plan for patients admitted with acute trauma-related pain.

Cultural

14. We recommend that developmental, cognitive, emotional, language and cultural factors should be considered when assessing pain.
15. We recommend the exploring of the person's beliefs, knowledge, and level of understanding about pain and pain management.
16. We recommend that nurses should help patients advocate for what feels appropriate for them within their cultural context in pain management.
17. We recommend that pain management must be standardized to acknowledge diversity in culture, values, and belief systems, and ensure that practice is non-discriminatory and promote dignity and self-determination.
18. *We recommend that culture and spiritual considerations must be considered in the assessment and management of acute pain.

Stellenbosch University https://scholar.sun.ac.za

Pain assessment tools

19. We recommend that the pain assessment tool should be appropriate to the individual patient and the clinical context e.g., intensive care, ward, community.
20. We recommend healthcare providers be familiar with pain assessment tools and employ them in their daily practice.
21. *We recommend that on admission every patient should be assessed by using a validated pain assessment tool for example, a Numerical Rating Scale (NRS), Verbal Descriptor Scale (VDS) or Visual Analogue Scale (VAS) and that the use of pain assessment tools is a common practice in the EC.
22. *We recommend that the patient must be asked to rate the level of his or her pain.
23. *We recommend that the nurse assess the patients' pain by asking them to describe their pain in their own words.

Monitoring

24. We recommend that patients should be monitored to evaluate the effectiveness of treatment interventions.
25. *We recommend that after administering pain medication, the patient should be monitored for potential side-effects.
26. *We recommend that after administering pain medication, the efficacy of pain should be assessed.
27. *We recommend that after an initial dose of analgesia is given, subsequent doses should be adjusted in accordance with individual response.

Documentation

28. We recommend that pain documentation should be standardized and consistent to foster continuity of care.
29. We highly recommend documenting the person's pain characteristics.
30. We recommend communicating and documenting the person's responses to the pain management plan.
31. *We recommend that documentation of pain assessment and management should be included in a nursing care plan for patients admitted with acute trauma-related pain.

Reassessment

32. We highly recommend that regular, accurate assessment of pain is required to improve acute pain management.
33. We recommend that pain should be reassessed systematically, ideally using the same appropriate tool.
34. * We recommend that pain assessment should be done as the fifth vital sign.
35. * We recommend that the frequency of pain assessment should be included in a nursing care plan for a patient admitted with acute trauma-related pain.

Box 6.2: Summary of Recommendations for Practice: Pain Management

We recommend pain management for acute trauma-related pain in the EC and should include the following sub-recommendations:

Patient Collaboration

- We highly recommend that following a detailed pain assessment nurses must collaborate with patients to identify their goals and discuss the alleviation of pain, expected recovery

Stellenbosch University https://scholar.sun.ac.za

course, and patients' experience at all times to ensure a comprehensive approach to the plan of care.

Pharmacological pain management

- We recommend that the WHO Pain Ladder, or a new adaptation of it, which accommodates the modern and invasive techniques of pain management, be used as the general guidance in managing pain in patients.
- *We recommend that pharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.
- *We recommend that combining analgesics that work by mechanisms (e.g., combining an opioid with a NSAID) may result in better pain control with fewer side effects than using a single analgesic agent as prescribed.
- *We recommend that pharmacological agents such as opioids, non-opioids, non-steroidal anti- inflammatory drugs (NSAIDS), and anticonvulsants can be used, as prescribed, for the management of acute trauma-related pain in the EC.
- *We recommend that nurses administer pain medication to patients as prescribed, after asking them if they had pain.
- *We recommend that nurses describe possible side-effects (reactions of the medication) in a way that patients understand, before giving them any pain medication.

Nonpharmacological pain management

- We recommend that nonpharmacological measures are effective in providing pain relief and should always be considered and used if practical.
- We recommend that nonpharmacological interventions be implemented early with patients, either alone or in combination with pharmacological options.
- We recommend the use of immobilisation, ice (cryotherapy), elevation, and splinting to achieve pain relief.
- We recommend distraction to reduce pain e.g., listening to music.
- We recommend procedural information (often combined with behavioural instructions, like exercises or body position) in reducing pain.
- *We recommend that nonpharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.
- *We recommend that cryotherapy (cold therapy), elevation of extremities and distraction should be used for the management of acute trauma-related pain.

Box 6.3 Summary of Recommendations for Education

We recommend that education be prioritised and should include the following sub-recommendations:

Patient education

- We recommend that patient education about expectations for management should be provided.

Staff education

- We recommend that even "simple" techniques of pain relief can be more effective if attention is given to education, documentation, patient assessment and provision of appropriate guidelines and policies.
- *We recommend that the level of knowledge of nurses on the assessment and management of acute trauma-related pain be updated.

Stellenbosch University https://scholar.sun.ac.za

Box 6.4: Organisational

We recommend that the organisation and organisational structure should support the implementation of pain assessment and pain management and should include the following sub-recommendations:

1. We recommend that successful management of acute pain requires close liaison between all personnel involved in the care of the patient.
2. We recommend that appropriate institutional support and engagement are important for the effective implementation of acute pain service.
3. *We recommend that best practice guidelines for the assessment and management of acute trauma-related pain be implemented in the EC.

6.3.4 Best practice guideline development

The BPG was developed, using the format/layout used as per the AGREE II tool, and included three key recommendations and sub-recommendations. The BPG was sent to an expert panel review for their feedback on the layout and recommendations (Appendix AB). The feedback from the panel was used to refine the BPG, after which the content for the recommendations were added. The final BPG is presented in chapter seven.

6.4 EVIDENCE SUMMARY DOCUMENT

Algorithms are tools that are developed from evidence-based best practice guidelines to enhance the practice of nursing care (Jablonski, DuPen & Ersek, 2011:36). This best practice guideline was contextualised for nurses to guide nurses in the assessment and management of acute trauma-related pain. However, the implementation of the BPG may not be clear or accessible to nurses in the busy EC, an algorithm was thus developed to provide a quick step-by-step method on the implementation of the guideline. An algorithm provides easy access to guide the nurse with the assessment and management of pain. The algorithm followed the steps of the BPG to allow nurses to refer to the guideline systematically when needed.

The algorithm was reviewed by the expert panel and the final document is presented in chapter seven.

6.5 EXPERT PANEL REVIEW

The expert panel comprised of academics, researchers, clinicians, and nurses with expertise in guideline development and/or emergency nursing (Appendix AA). The reviewers were chosen as they would either endorse or be end-users of the BPG in the ECs. Patients were not included in the review, but they were involved in the primary survey and would be consulted when the BPG would be implemented post-doctoral.

Stellenbosch University https://scholar.sun.ac.za

The expert panel that was invited to participate in the review consisted of:

- Higher Education Sector, inclusive of four academics: two at the local SA universities, one at an international university, and one at a public college, who have knowledge in either guideline methodology or emergency nursing;
- Emergency Nursing Experts, inclusive of two nurses, and a manager in trauma and emergency nursing;
- Emergency Medical Expert, inclusive of a physician involved in pain care;
- Paramedic, inclusive of a paramedic teaching at a higher education institution.

A total of nine reviewers were identified. Consent letters (Appendix L) were sent to the nine reviewers inviting them to be expert panel members for the guideline review. The panel was requested to critically appraise the BPG using the AGREE II tool. In addition, the algorithm was included for review.

6.6 EXTERNAL REVIEW PROCESS

The summarised guideline, with the recommendations, as well as the algorithm was emailed to the expert review panel with a copy of the AGREE II critical appraisal tool. The AGREE II guideline explanation document was also emailed to guide those members who were not familiar with the tool. The reviewers were given a period of two weeks to complete the review and submit the completed tool via email. The results, from the seven-point Likert scores on the AGREE II tool, were captured in an Excel spreadsheet. The data from the open-ended comment sections on the AGREE II tool were summarised narratively.

6.7 RESULTS

6.7.1 Demographic profile of external reviewers

Nine responses were received from the invited responses. All the groups as envisaged were represented. One academic from an international university did not respond, despite follow-up emails. The response rate was thus 90%. The demographic profile of the expert panel reviewers is reflected in Table 6.3.

Stellenbosch University https://scholar.sun.ac.za

Table 6.3: Demographic profile of the expert panel reviewers

Variable	Frequency (n=9)	Percentage (%)
Gender:		
Male	(n=3)	33
Female	(n=6)	67
Profession:		
Guideline developer	(n=2)	22
Academic Nurse	(n=1)	11
Academic Nurse researcher	(n=1)	11
Emergency Nurse Clinician	(n=2)	22
Emergency Unit Manager	(n=1)	11
Pain Physician	(n=1)	11
Paramedic	(n=1)	11
Work setting:		
Nelson Mandela University	(n=1)	11
Stellenbosch University	(n=1)	11
Ghana University	(n=1)	11
Public Nursing College	(n=1)	11
Emergency center	(n=4)	44
Cape Peninsula University of Technology	(n=1)	11
Demographic outlay:		
Ghana	(1)	11
Eastern Cape	(1)	11
Western Cape	(7)	78

6.7.2 AGREE II Score results

The reviewers AGREE II domain scores were entered into Excel after consensus was reached between the researcher and the supervisors. The quality scores for each domain were calculated using the guiding principles and the formula provided in the user manual.

The formula used is as follows:

Scaled domain score = Obtained score- minimum possible score / maximum possible score – minimum possible score X 100 =%

The combined AGREE II scores from the nine reviewers in % is reflected in Table 6.4

Stellenbosch University https://scholar.sun.ac.za

Table 6.4: Combined AGREE II scores in %

	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Reviewer 5	Reviewer 6	Reviewer 7	Reviewer 8	Reviewer 9	Median
Domain 1: Scope and Purpose	95	90	86	90	100	100	95	53	76	87
Domain 2: Stakeholder involvement	100	95	76	95	100	100	90	76	95	92
Domain 3: Rigour of development	96	88	79	93	89	73	91	70	75	84
Domain 4: Clarity of presentation	95	86	71	95	100	100	95	100	100	94
Domain 5: Applicability	100	82	36	43	86	68	93	82	96	76
Domain 6: Editorial Independence	100	100	14	100	100	100	86	100	100	89
Total	**98**	**90**	**60**	**86**	**96**	**90**	**92**	**80**	**90**	**87**
Overall score out of 7	**684**	**631**	**422**	**602**	**671**	**631**	**642**	**561**	**632**	

All the AGREE II domain scores are illustrated in Table 6.5

Table 6.5: All AGREE II domain scores

	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Reviewer 5	Reviewer 6	Reviewer 7	Reviewer 8	Reviewer 9	Median
1. The overall objective(s) of the guideline is (are) specifically described	7	6	6	7	7	7	6	3	5	6
2. The health question(s) covered by the guideline is (are) specifically described	6	6	6	7	7	7	7	5	5	6
3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described	7	7	6	5	7	7	7	3	6	6
4.Guideline development group individuals from all relevant professional groups	7	7	4	7	7	7	6	7	6	6
5. The views and preferences of the target population (patients, public, etc.) have been sought	7	7	6	7	7	7	6	6	7	7
6. The target users of the guideline are clearly defined	7	6	6	6	7	7	7	3	7	6
7. Systematic methods were used to search for evidence	7	7	6	7	7	6	6	6	5	6
8. The criteria for selecting the evidence are clearly described	7	6	5	7	7	6	6	4	5	6
9. The strengths and limitations of the body of evidence are clearly described	7	6	5	6	1	6	6	4	1	5
10. The methods for formulating the recommendations are clearly described	6	6	5	7	7	6	7	7	6	6

Stellenbosch University https://scholar.sun.ac.za

11. The health benefits, side effects, and risks have been considered in formulating the recommendations	7	5	6	5	7	NA	7	3	7	5
12. There is an explicit link between the recommendations and the supporting evidence	7	6	4	7	7	6	7	7	5	6
13. The guideline has been externally reviewed by experts prior to its publication	7	6	6	7	7	7	6	7	7	7
14. A procedure for updating the guideline is provided	6	7	7	6	7	4	6	1	6	6
15. The recommendations are specific and unambiguous	7	5	4	7	7	7	6	7	7	6
16. The different options for management of the condition or health issue are clearly presented	6	6	5	6	7	7	7	7	7	6
17. Key recommendations are easily identifiable	7	7	6	7	7	7	7	7	7	7
18. The guideline describes facilitators and barriers to its application	7	6	1	4	4	6	6	6	6	5
19. The guideline provides advice and/or tools on how the recommendations can be put into practice	7	7	4	6	7	6	7	7	7	6
20. The potential resource implications of applying the recommendations have been considered	7	5	4	1	7	7	7	7	7	6
21. The guideline presents monitoring and/or auditing criteria	7	5	1	1	6	NA	6	3	7	4
22. The views of the funding body have not influenced the content of the guideline	7	7	1	7	7	7	6	7	7	6
23. Competing interests of guideline development group members have been recorded and addressed	7	7	1	7	7	7	6	7	7	6

6.7.3 Combined reviewer feedback from comments

The AGREE II tools provide an opportunity for the reviewers to comment on each domain. The feedback from the reviewers is captured and illustrated in Table 6.5.

Table 6.6: Combined reviewers' comments

Domain 1:	**Scope and Purpose** **The overall objective (s) of the guideline is (are) specifically described.**	**Score**
Reviewer		
1	The objectives that were set for the study are clear and easily understandable	7
2	The BPG is for the nurse assessment and management of acute trauma related pain in the EC	6
3	Agree with the objective. It is short and concise. Explain the reason for the need of the guideline	6
4	Well described	7
5	The overall objectives were to contextualise a Best Practice Guideline (BPG) for professional nurses for the assessment and management of acute trauma-related pain of	

Stellenbosch University https://scholar.sun.ac.za

	adult patients in Emergency Centers (ECs) in the Western Cape (WC). This was well explained.	
6	The objective is clear and concise	
7	No comment	
8	Objectives of guideline in terms of health benefits ("improving patient outcomes") might be too broadly stated as the expected health benefit. Patient views included in the study, so would the guideline aim to provide patient-centred pain management / improve patient satisfaction	3
9	The objective is clearly indicated under the scope of the guideline. The overall objective currently reads: to contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adult patients in ECs in the WC. I would suggest slightly changing this to the objective of the actual guidelines: e.g., what does the guideline want to achieve? I think contextualise can be left out.	
	The health question (s) covered by the guideline is (are) specifically described.	
1	The health question is well described, understandable and in layman's terms	6
2	No comment	6
3	The health question is specific to the guideline. The assessment and management BPGs specifically for nurses. Detailed explanation given.	6
4	The PICO question is clearly stated.	7
5	The clinical /health question was specifically described as expected. The question posed in the BPG is " What are the core recommendations for nurses for the assessment and management of acute trauma-related pain in ECs to improve adult patient outcomes?" This is in line with the overall objective.	7
6	No comment	7
7	No comment	7
8	PICO question stated. However, not explained in detail	5
9	The review question was clearly indicated. Currently it however reads like an objective. Perhaps the review question can be moved up (page 2) and the PICO or PCC (in case this is a scoping review) can be featured. See my comments.	5
	The population (patients, public, etc.) for whom the guideline is meant to apply to specifically described.	
1	The population to whom this guideline applies to is specifically described in the study and it will be of great use for professional nurses in the Emergency Center settings as they deal with patients in constant pain every day.	7
2	No comment	7
3	Nurses and patients were well described and the role of each in the use of the guideline. I would suggest to state on page 4 of the guideline that nurses are often the first healthcare workers to first interact with the patient and not as currently stated that they are the first to interact with patients. In red category or P1 patients the doctor/ trauma surgeon will be part of that first interaction and not the nurse alone.	6
4	It is clear that the guideline is pertaining to adult patients with acute trauma-related pain. Another aspect I can think of from a practice point of view, is timing of the assessment and management. For example with long waiting times of trauma patients in the public sector, the benefit of having early assessment by nurses and not doctors with regard of correct triage according to the SATS will potentially lead to more correct prioritising of the patients, and also relevant if practice of early initiation of pain management can be done by nurses potentially independent of doctors, as this will probably lead to earlier initiation compared to where pain management is delayed to when the patient is seen by a doctor only. With this I also question if the BPG applies to the whole stay of the patient in the EC, as in practice PN's focus later on the patient 's stay in EC usually shifts to management of pain in cooperation with doctors, i.e., to give analgesia or manage pain according to what the doctor and team identified as the appropriate strategy for the patient.	5

Stellenbosch University https://scholar.sun.ac.za

5	The guideline states that the nurses are those who will be using the BPG for the assessment and management of acute trauma-related pain of adult patients admitted to the ECs.	7
6	No comment	7
7	No comment	3
8	Not sure about the population covered by the guideline. Acute trauma-related pain and adult patients admitted not explained or described, e.g., would a patient who received sedation for rapid sequence intubation, or having continuous infusion of sedation be included, or severe head trauma with reduced LOC be assessed and managed the same?	
9	The population was clearly described. Perhaps you can indicate the number of patients included in the questionnaire	
Domain 2	**STAKEHOLDER INVOLVEMENT** **4: The guideline development group includes individuals from all relevant professional groups**	
1	The development group that was chosen for this study covers medical professionals from different spheres. All their input would make this guideline inevitable and a great model to follow.	7
2	No comments	7
3	A great mix of multidisciplinary team was used (nurses, doctors, and paramedics)	4
4	The GDG consists of 3 members that evaluated the evidence and different existing guidelines. A large variety of health professionals have been included in the expert reviewers' group.	7
5	It is stated in the BPG document that the Guideline Decision Group (GDG) and a panel of 8 reviewers with 8 expertise in the relevant professional disciplines and also BPG developers were engaged. These experts are deemed to be appropriate stakeholders for the development of the BPG	7
6	No comment	7
7	No comments	6
8	Professional nurses as the target users completed surveys. Multidisciplinary team members involved in guideline development, as well as a scoping review to collect scientific evidence	7
9	The guideline development group seems to have the required expertise. Perhaps to add the credentials of each member to enhance the credibility.	6
	5. The views and preferences of the target population (patients, public, etc.) have been sought.	
1	Views and preferences of target population were taken into consideration for this study to make it a holistic and well-rounded study.	7
2	Voices of the patients were gathered by means of a survey.	7
3	Well done, the perspectives of patients and nurses were obtained through a survey and their view incorporated.	6
4	Although I have not seen the results of the surveys mentioned, it is clearly stated how patients' views are elicited.	7
5	The views of adult patients admitted to the ECs with acute trauma-related pain have been sought through surveys conducted by the BPG developer.	7
6	No comment	7
7	No comment	6
8	Survey done to involve the population of the study and the guideline include their views and preferences. Not sure how the information was used to inform the guideline development?	6
9	No comment	

Stellenbosch University https://scholar.sun.ac.za

	6. The target users of the guideline are clearly defined.	
1	Target users which will be the medical professionals have been identified and the specific target group of professional nurses has been clearly identified.	7
2	Professional nurses working in the EC were surveyed.	6
3	Well described	6
4	It is clear that the main target user is a professional nurse (PN) in an EC in the Western Cape, with external validity sought for the rest of South Africa also. From a practice point of view, I believe in many ECs in the Western Cape because of PN shortages and other operational considerations most initial contact and sometimes only nursing contact with trauma patients are not PNs but other nurses' levels e.g., ENs and ENAs. Obviously, this is a vital consideration if nursing scope of practice is taken into consideration especially if the pharmacological pain management is considered.	6
5	The target users of the guideline are clearly defined in the document as the target users.	7
6	No comment	7
7	No comment	7
8	In the beginning of the document, it is stated as nurses. However, later the target users identified are professional nurses. Not sure if the enrolled nurse assistant will be involved in the actual implementation of the guideline as they might have to assess pain but will report to the professional nurse for management.	3
9	No comment	7
Domain 3	**7. Systematic methods were used to search for evidence**	
1	A great overall approach was used to search for evidence and a wide variety of sources were used.	7
2	No comment	7
3	A multiphase method was used. Both stakeholders and evidence were used. It seems as if a scoping review search methods were utilized as described in the guideline development document. I would suggest adding the search time period as well.	6
4	The systematic methods of identifying relevant guidelines and recommendations from those guidelines are clearly stated.	7
5	The methods used to search for evidence can be said to be systematic as per the processes outlined in the BPG document	7
6	No comment	6
7	No comment	6
8	Search strategy described in detail. Search key words and time periods not included.	6
9		5
	8. The criteria for selecting the evidence are clearly described.	
1	No comment	7
2	No comment	6
3	Well described. Please note that in the document it states AGREE 11 and not AGREE **II**	5
4	Well done	7
5	The criteria for the selection of evidence are clearly defined in the document. Independent reviewers were involved and a score of 50% or more was agreed to be the acceptable percentage for the inclusion of BPG for the study.	7
6	No comment	6
7	No comment	6
8	Inclusion/exclusion criteria or rationale for selecting guidelines with the systematic review not included. (8. The criteria for selecting the evidence - mention AGREE II tool appraising 'this' guideline-page 6) Although it is stated that the 'the critical appraisal process' was implemented to select 6 guidelines, it is not clearly explained. Also not explained why 75 recommendations were excluded.	4

Stellenbosch University https://scholar.sun.ac.za

9	The process is described here but not the criteria for selection/screening, critical appraisal.	5
	9. The strength and limitations of the body of evidence are clearly described.	
1	Strengths and limitations are clearly described and should aways be taken into consideration.	7
2	No comment	6
3	Good. Annexure D described the level of evidence.	5
4	It is not clearly stated why 75 out of 114 extracted recommendations were excluded. A summary of reasons could enhance this aspect easily.	6
5	The strengths and limitations of the body of evidence are not clearly described in the BPG document.	1
6	No comment	6
7	No comment	6
8	Level of evidence included in Appendix D for the 6 guidelines selected. However, explicit descriptions of strengths and limitations of evidence not provided. Consistency of results across guidelines included in the discussion of recommendations.	4
9	I could not find this. Link between the recommendation and the supporting evidence.	1
	10.The methods for formulating the recommendations are clearly described.	
1	No comment	6
2	No comment	6
3	Well described	5
4	Clearly stated	7
5	The methods are clearly defined in the BG document.	7
6	No comment	6
7	No comment	7
8	Formal process to compile the recommendation well explained.	7
9	Was the extraction and synthesis process done independently?	6
	11. The health benefits, side-effects, and risks have been considered in formulating the recommendations.	
1	No comment	7
2	No comment	5
3	Not included as part of these guidelines, but well described as to why not.	6
4	Would it not be fair to say that correct initial and ongoing assessment of pain and appropriate pain management both pharmacological and nonpharmacological would have certain health benefits, but if inappropriate assessments would have potential harms and risks? I believe these can be discussed without involving interventional studies even.	5
5	The point was not addressed since it was not the main purpose and scope of the development of the BPG which has clearly been stated in the document.	7
6	No comment	NA
7	No comment	7
8	Specific health benefits of acute trauma pain management might be a bit vague. Reading the recommendations does not convince that it is really important to assess and manage the pain of trauma patients. Stated that pharmacology as risk not included in the guidelines.	3
9	N//A as this will be done when the BPG will be piloted.	7

Stellenbosch University https://scholar.sun.ac.za

	12. There is an explicit link between the recommendations and the supporting evidence.	
1	No comment	7
2	No comment	6
3	Not all literature used was attached to the guideline but looking at the summary in Annexure B various literature was consulted.	4
4	Levels of evidence correlation to an aspect is stated in Appendix D	7
5	Linkages between the recommendations and supporting evidence were clearly stated in the document	7
6	No comment	6
7	No comment	7
8	Recommendations well linked to supporting evidence and easy to find	7
9	Was there any classification or hierarchy of evidence used and were recommendations based on stronger evidence regarded as 'better' as compared to those based on 'weaker' or lower levels of evidence?	5
	13. The guideline has been externally reviewed by experts prior to its publication.	
1	The study consists of a panel of expert reviewers that will be able to review and add their expert opinions in the final product of this study.	7
2	No comment	6
3	Panels of experts were used and described. As mentioned earlier I would suggest including the expertise of each reviewer.	6
4	It is clearly stated that there are 8 reviewers reviewing the BPG.	6
5	The review of the BPG by external reviewers has been done.	7
6	No comment	7
7	No comment	7
8	Multidisciplinary team members' review done using a standardised tool. Include details of review panel.	7
9	8 reviewers and input from nurses in the field	7
	14. A procedure for updating the guideline is provided.	
1	Personally, I think the guideline should be reviewed every year as new policies develop every year and guidelines should be updated yearly or every 2nd year to keep up to date with new evidence.	6
2	No comment	7
3	A suggestion for 3 years was made.	7
4	Time frame is stated, but not clear in terms of what process will be followed.	6
5	The procedure for update of the guidelines has clearly been stated as every 3 years based on the evidence available.	7
6	States that 3 years is the recommended time period for update of guideline, how is this derived, what evidence?	4
7	No comment	6
8	Mentioned that it must be done, but procedure not explained	1
9	How will this be done, e.g., will you update the search for updated BPGs?	6
Domain 4	**15. The recommendations are specific an unambiguous**	
1	No comment	7
2	No comment	5
3	Persons and patients and ED and ECs are both used in the recommendations. I would suggest sticking to the use of one. Pain assessment is very broad whereas the pain	4

Stellenbosch University https://scholar.sun.ac.za

	management part is very detailed. Can the assessment part not also be made more specific to provide clear guidelines in practice, e.g., providing an example of a pain assessment tool. Under pain assessment tools bullet one I would suggest stating the clinical context - EC and not the examples of the ward etc. as this is for EC. It refers to pain assessment tool and rating the level of pain separate, but level of pain/ severity is usually part of the pain assessment tool. Can an example of pain assessment documentation be included to use? What will be the best according to evidence to use, to ensure best practice is implemented? I would suggest stating nonpharmacological pain management measures first as these can be initiated prior to a prescription. I would suggest saying cold packs instead of ice, ECs usually do not have ice available. Under non-pharmacological measure there is mention made of children, should these guidelines not only focus on adults? There is also mention of postoperative pain, which does not fall under the category of acute trauma related pain.	
4	Clear	7
5	A summary of key recommendations is clearly provided in Box 2, 3, 4, & 5.	7
6	No comment	7
7	No comment	6
8	Recommendations are clear	7
9	No comment	7
	16. The different options for pain management of the condition or health issue are clearly presented.	
1	Management options are identified and can be adjusted according to clinical institutions where it will be used.	6
2	No comment	6
3	Both pharmacological and nonpharmacological options were provided. Please see comments above on the specific suggestions.	5
4	Recommendations in Box 3 are clear. I would have liked to see the WHO pain ladder as an appendix for easy reference.	6
5	The different options for management of adult patients with acute trauma- related pain are clearly presented under pharmacological and non-pharmacological pain management in Box 3	7
6	No comment	7
7	No comment	7
8	Both pharmacological and nonpharmacological options included as well as educating the patient.	7
9	No comment	7
	17. Key recommendations are easily identifiable.	
1	No comment	7
2	No comment	7
3	It is easy to identify assessment and management as they are in separate boxes.	6
4	Well described	7
5	Key recommendations in the BPG are easily identifiable in Boxes 2, 3, 4, & 5.	7
6	No comment	7
7	No comment	7
8	Recommendations presented in boxes and guidelines include flow charts.	7
9	No comment	7
Domain 5	**18. The guidelines describe facilitators and barriers to its application.**	
1	No comment	7
2	No comment	6

Stellenbosch University https://scholar.sun.ac.za

3	Not observed in guidelines	1
4	I am not sure how to interpret the lack of discussion of organizational requirements because recommendations only become feasible if there are not potentially barriers that will make recommendations nonsensical because it is not implementable because of the barriers that exist. For both pharmacological and nonpharmacological interventions, scope of practice can potentially be such a barrier and must be discussed to either state it is not an insurmountable barrier, or it is and thus influencing the actual recommendations' feasibility.	4
5	The potential organizational barriers in the application of the guideline although stated as presented in Box 1 as part of organisational requirements are not clearly stated. Facilitators were not stated.	4
6	No comment	6
7	No comment	6
8	Organisational barriers considered	6
9	The section mainly focuses on barriers. Perhaps to state that the barriers are 'reversed' equivalent of facilitators.	6
	19. The guideline provides advice and/or tools on how the recommendations can be put into practice.	
1	No comment	7
2	No comment	7
3	Was provided, though no specifics were given, or examples of assessment tools were not given for instance.	4
4	As the tool that is used for the assessment is vital, it would have been great to see the NRS, VDS and VAS validated assessment tools chosen for the algorithm which could be included as further appendices for easy reference but also for clarity. Again, I think it would be important to state when the initial screening would be done.	6
5	Advice and tools on how the recommendations can be put into practice has been presented with an algorithm attached to the document as Appendix C.	7
6	Algorithms are ideal in the EC setting. They are easy to follow.	6
7	No comment	7
8	Algorithm included in guideline	7
9	No comment	7
	20. The potential resource implications of applying the recommendations have been considered.	
1	Resource implications have been clearly identified and is clearly understandable.	
2	No comment	5
3	Information on organisational structures were provided. Although specific logistical information was not included.	4
4	No specifics mentioned as the FAME survey results will influence cost implications.	1
5	How the potential cost implications for the application of recommendations after FAME survey is conducted has been stated in the document.	7
6	No comment	7
7	No comment	7
8	No comment	7
9	No comment	7
	21. The guideline presents monitoring and/or auditing criteria	
1	No comment	7
2	No comment	5
3	Not observed	1

Stellenbosch University https://scholar.sun.ac.za

4	Not yet done, awaiting FAME survey	1
5	Auditing was not done. However, the BPG developer hopes to do this after the FAME survey is done which will guide the process of monitoring and auditing.	6
6	No comment	NA
7	No comment	6
8	Not done yet / guideline does not include auditing criteria. FAME survey will guide.	3
9	No comment	7
Domain 6	**EDITORIAL INDEPENDANCE**	
	22. The view of the funding body has not influenced the content of the guideline.	
1	No comment	7
2	No comment	7
3	No acknowledgment section in the guideline.	1
4	Declared	7
5	It's clearly been stated in the document that there is no funding body in respect of the development of the BPG. It is a PHD work mainly self-funded by the BPG developer, and a bursary.	7
6	No comment	7
7	No comment	6
8	No comment	7
9	N/A as the study was self-funded.	7
	23. Competing interests of guideline development group members have been recorded and addressed.	
1	No comment	7
2	No comment	7
3	No comment	1
4	No conflict of interest declared by GDG	7
5	It is clearly stated in the BPG document that there is no conflict of interest to declare.	7
6	No comment	7
7	No comment	6
8	No comment	7
9	No conflicts of interested noted	7

The comments as indicated above were discussed by the GDG group, and the necessary amendments were made where indicated by the reviewers.

6.7.4 Interpretation of the results obtained from the reviewers

Two reviewers requested a reason for the exclusion of 75 recommendations. The reason was included in Appendix X. Three reviewers commented on the hierarchy of evidence and strength of recommendations. These reviews were addressed in Appendix X. One reviewer indicated that the presence of the WHO pain ladder and visual figures of the pain scales would have been more vivid. Both the WHO pain ladder and figures of the pain scales are included in the final BPG. One reviewer commented that the recommendations were not specific and to confine recommendation to the EC and not to another department. Recommendations were

Stellenbosch University https://scholar.sun.ac.za

combined where appropriate to prevent duplication (Boxes 6.1, 6.2, 6.3 and 6.4). Two reviewers commented on the lack of discussion of organisational requirements. The overall AGREE II score of the reviewers was 87%.

6.7.5 Guideline amendments and finalization

Minor amendments were made after considering the feedback from the review panel. The final BPG is presented in chapter seven.

6.8 FEEDBACK ON THE ALGORITHM

There was positive feedback on the algorithm. One reviewer commented that the presence of an algorithm is ideal in the EC and easy to follow. Other reviewers commented positively on the availability of the algorithm.

6.9 SUMMARY

In this chapter the process of the contextualisation of the best practice guideline was presented. The extracted recommendations were synthesised by the GDG and included according to the research objectives. A draft BPG and an algorithm was developed and sent to the expert review panel. Feedback from the review panel was considered and the BPG was amended where required. No changes were recommended from the expert review panel on the algorithm that was presented as an appendix. The final BPG is presented in chapter seven.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 7: BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN EMERGENCY CENTERS

7.1 INTRODUCTION

In the previous chapter the process for the contextualisation of the best practice guideline was presented. The methodology of the contextualisation process was described in detail. In this chapter the final best practice guideline for nurses for the assessment and management of acute trauma-related pain in ECs is presented. In addition, an algorithm was developed to provide easy access to pain assessment and pain management guidelines. Feedback from the expert review panel was integrated to finalise the BPG.

7.2 BEST PRACTICE GUIDELINE

The BPG is presented, using the format that is suggested in the AGREE II instrument.

7.2.1 Scope and purpose

The objectives, review questions, and target population are presented in this section.

7.2.1.2 Overall objectives of the guideline

There are no known available BPGs for nurses specifically for the assessment and management of acute trauma-related pain for the context of the Western Cape ECs. It was therefore critical to develop this guideline, using a contextualisation approach. This BPG might offer nurses a standardised evidence-based platform to provide care for patients with acute trauma-related pain, thereby improving patient outcomes.

The overall objective was to contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adult patients in ECs in the Western Cape.

Review question

The overarching review question of the scoping review was:

> "Identify the availability, and quality of best practice guidelines used for the assessment and management of acute trauma-related pain in adult patients, by nurses, in ECs."

The PICO question for the BPG was:

> "What are the core recommendations for nurses for the assessment and management of acute trauma-related pain in ECs?"

Stellenbosch University https://scholar.sun.ac.za

7.2.2 Stakeholder involvement

This BPG was initiated as part of a research project for a PhD programme. The stakeholders that were involved in the BPG process included:

The Guideline Decision group (GDG), comprising the researcher, the supervisor and co-supervisor of the research project:

- The expert panel reviewers, which include individuals from various groups. The composition, credentials, and demographics of the review panel are presented in Table 6.3 in chapter six.
- The professional nurses who participated in the primary research.
- Although the patients were not part of the BPG review or validation, they participated in the primary research. The patients' views and preferences have been acknowledged as they were captured in the surveys.

The results from these surveys were included as contextual and practice recommendations, in addition to the evidence-based recommendations from the scoping review. This best practice guideline is intended to provide recommendations to nurses regarding the assessment and management of acute trauma-related pain of adult patients admitted to the EC.

7.2.3 Rigour of development

In order to ensure the rigor of the process, systematic methods were used for the search of evidence. A multiphase study was conducted that culminated in the development of this BPG. Evidence generation of the primary research constituted a twofold phase: Sub-study one and sub-study two. For sub-study one a survey was distributed to professional nurses working in the EC of five hospitals in the WC. This included two tertiary hospitals, one regional hospital and two district hospitals. The knowledge, attitudes, and practice of professional nurses regarding the assessment and management of acute trauma-related pain in the EC were explored. It was important to obtain the nurses input so that the guideline could be contextualised to their needs and shortcomings based on the findings of sub-study one.

For sub-study two of phase one, a survey was distributed to adult patients (≥ 18 years) admitted to the EC with acute trauma-related pain. Data was collected in the same hospitals as sub-study one. The patient's understanding regarding the assessment and management of acute trauma-related pain was explored. Listening to the voice of the patient allows pain management to be patient centred and it is envisaged that it will contribute to improve patient satisfaction.

Stellenbosch University https://scholar.sun.ac.za

Phase two consisted of the scoping review and evidence generated from guidelines globally. The JBI was the underpinning in the guideline development as it conceptualises EBP as clinical decision-making that considers the best available evidence; the context in which the care is delivered, patient preference and the professional judgment of the health professional (Pearson, *et al.*, 2005:209). The methodology for the scoping review in search for evidence is comprehensively discussed in chapter five and a scoping review protocol is provided (Appendix S). Only guidelines were included in the search strategy as the aim was to contextualise a guideline/s for the context of ECs in the WC. Following data extraction and data synthesis twelve guidelines were selected. Using the AGREE II critical appraisal tool as the criteria for selecting evidence, two independent reviewers (YM and CI) appraised this guideline. A third reviewer (PJ) was available for consultation. The reviewers unanimously agreed that only guidelines that scored 50% and above will be included. Following the critical appraisal process six guidelines were selected for final inclusion (Appendix Z).

7.2.3.1 The methods for formulation of the recommendations

The GDG systematically extracted recommendations according to the PICO question for this BPG. A total of 114 recommendations from the six guidelines were scrutinized by the GDG. Following extraction of recommendations, 39 recommendations were included and 75 were excluded. The recommendations were then divided into three main themes. The wording of the recommendations was guided by Shiffman, Dixon, Brandt, *et al.*, 2005:2; Gonzalez-Suarez; Gimmer-Somers, Dizon et al., 2012;143. The final recommendations are presented in chapter six (Boxes 6.1, 6.2, 6.3 and 6.4).

The extracted guidelines did not explicitly indicate the health benefits, harms or risks related to pain assessment and management. This was noted as a limitation. The feasibility, appropriate, meaningful, and effective (FAME) survey will be conducted post-doctoral. However, the BPG used by nurses, is envisaged as providing them with evidence–based recommendations to assess and manage pain in the ECs. The algorithm will assist nurses to have a quick reference guide for pain assessment and pain management in the EC that is often busy, with a high patient acuity and turnover. If practices are done consistently and are based on best practice and evidence, it is envisaged that patient satisfaction will increase, and the quality of care delivered will be improved.

7.2.3.2 BPG update

For the scope, it is recommended that the BPG be updated every three to five years according to evidence. It is thus recommended that this guideline will be updated in three years, since it is the first guideline to be implemented in the EC.

Stellenbosch University https://scholar.sun.ac.za

7.2.4 Clarity of presentation

A summary of the three key recommendations is provided in Box 7.1, while the list of sub-recommendations is provided in chapter 6 (Boxes 6.1, 6.2, 6.3, and 6.4).

Box 7.1: Summary of key recommendations

1. Practice Recommendations
   - Acute pain assessment
   - Acute pain management
2. Education Recommendation
3. Organisational Recommendation

7.2.4.1 Different options for the topic

The guideline sub-recommendations indicate the different options for pain assessment and pain management. Furthermore, it provides recommendations for the education and organisational context. The supporting evidence as extracted from the guidelines is provided. Management of acute trauma-related pain was divided into pharmacological and nonpharmacological pain management (Box 6.2).

7.2.4.2 Key recommendations

The key and sub-recommendations are presented in Boxes 6.1, 6.2, 6.3 and 6.4. These recommendations include extractions from the final guidelines and from the contextual findings in sub-study one and sub-study two. Contextual recommendations are indicated by an "*" and italics. Recommendations from guidelines are numbered at the end according to the guideline the recommendation was extracted from. The list of final guidelines is presented in Appendix Z.

7.2.5 Applicability

This BPG is a much-needed source of guidance to nurses working in the EC. Patients have the right to receive the best possible evidence-based pain assessment and pain management. It is challenging to provide the ideal care in a limited and constrained resources setting. However, that can still be implemented in the EC.

7.2.5.1 Potential Facilitators and barriers to the application of recommendations

It is important that potential barriers and facilitators be identified that can influence the implementation of recommendations. Presenting the recommendations of this best practice guideline to the professional nurses, nurse managers, hospital managers and other health-care professionals within the EC, might facilitate support for the implementation and use of the BPG. The simplicity of the recommendations and the developed algorithm can facilitate

Stellenbosch University https://scholar.sun.ac.za

implementation of evidence-based recommendations in the EC. Creating awareness of evidence-based practice and BPG recommendations amongst nurses in the EC might be another facilitating factor for the use and implementation of the BPG recommendations and algorithm. Presenting the recommendations of the BPG to management in the ECs will promote buy-in and acceptance for the use and implementation of the BPG.

Organisational barriers, which include managerial support, availability of resources, and evidence-based champions might hamper the use and implementation of the BPG. The high turnover of patients, safety, time, shortage of nursing staff and prioritisation of pain management in the EC are other potential barriers to the use and implementation of the BPG (Afaya, Bam, Azongo, *et al.*, 2021:2; Sampson *et al.*, 2020:87). Future research on these barriers and facilitators in the implementation of BPGs in the EC need to be conducted and addressed.

7.2.5.2 Advice or tools for recommendations application

It is important that guideline developers provide advice and/or tools to support implementation thereof. The recommendations are simple, clear and should be easy to be used by professional nurses in the ECs. The guideline is further supported with tools for application, for example, an algorithm (Figure 7.4). The algorithm follows quick and easy accessibility for nurses to refer to and to efficiently determine the acuity of the patient's pain. Examples of the pain assessment tools for example NRS, VDS, and VAS will be supplemented to the guideline (Figure 7.1 and Figure 7.2).

7.2.5.3 Consideration of potential resource implications in applying the recommendations

The potential resources of applying the recommendations have been considered. These resources can include human capacity (staff availability in the ECs), time, physical or financial means to implement and monitor the use and implementation of the BPG. In conducting a FAME survey, post-doctoral, the feasibility, appropriateness, meaningfulness, and effectiveness of the recommendations and the algorithm will be assessed.

7.2.5.4 Monitoring and/or auditing criteria

Identifying criteria for monitoring and auditing is part of the guideline development process. Monitoring provides an indication of the extent to which the BPG recommendations are known, accepted, or implemented. Audits are processes conducted to measure quality improvement measure and form part of clinical governance (Limb, Fowler, Gundogan, *et al.*, 2017:1). Thus, audits allow management to measure the quality of nursing care delivered in the EC and thereby plan quality improvement programmes as remedial actions. Auditing is an ongoing

Stellenbosch University https://scholar.sun.ac.za

process with continuous attempts to strive for the best quality of nursing care. The monitoring and auditing should be done after the BPG recommendations are implemented. It is recommended that an evidence-based practice champion is identified within the EC or the training department of the hospital, who can assist with this process. Auditing and monitoring tools can be developed for this purpose.

7.2.6 Editorial independence

7.2.6.1 Independent of funding body

This research was conducted independently of a funding body. The BPG was developed for the purpose of obtaining a qualification (PhD in Nursing). No funding bodies were involved in the guideline development process and no views of any funding body influenced the content of the guideline or the algorithm.

7.2.6.2 Conflict of interest

There was no conflict of interest to declare from the GDG and the expert panel that were involved in the process of guideline contextualisation, as well as the finalisation of the guideline.

7.3 GUIDELINE RECOMMENDATIONS

The key recommendations, with the sub-recommendations and a rationale per recommendations are presented below.

7.4 RECOMMENDATIONS FOR PRACTICE

7.4.1 Recommendation 1: Pain assessment

Acute pain assessment must be done on all patients admitted to the EC with acute trauma-related pain and should include the following sub-recommendations:

7.4.1.1 Recommendation 1a: Self-reporting of pain

The following are recommended regarding the self-reporting of pain

- Self-reporting of pain should be used whenever appropriate, as pain is by definition a subjective experience.

. *Rationale*

All six guidelines advocate the assessment of pain. Four of the six guidelines indicated that self-reporting should be included in the pain assessment process. Pain is a multidimensional subject phenomenon, so a person's self-report is the most valid way of assessing pain if the person is able to communicate (Registered Nurses' Association of Ontario, 2013:21). Pain is always a subjective experience and is whatever the experiencing person says it is (Ministry,

Stellenbosch University https://scholar.sun.ac.za

2018:32). The pain assessment process is essentially a dialogue between the patient and the healthcare provider that addresses the nature, location, and the extent of the pain (Ministry, 2018:6). Pain perception is a subjective and individual experience modulated by physiological, psychological and environmental factors such as previous events, culture prognosis, coping strategies, fear, and anxiety (Schug *et al.*, 2016:45). This can present a challenge to healthcare professionals when it comes to understanding the degree of pain that a patient is experiencing. Due to the subjective nature of pain most measures of pain are based on self-report and should be used whenever appropriate (Hachimi-Idrissi *et al.*, 2020:13). Most pain measures are based on self-report (Schug *et al.*, 2016:45). To have an effective pain assessment, the healthcare provider must accept the patient's self-report pain as accurate and the primary source of information (Ministry, 2018:7). Self-reporting of pain should be used where possible, as proxy ratings of pain have been shown to underestimate high levels of pain in some studies. It is important to ensure that careful attention is paid to the patient's reported symptoms to direct the process of the physical examination (Hachimi-Idrissi *et al.*, 2020:17).

7.4.1.2 Recommendation 1b: Screening

The following are recommended regarding the screening of pain

- Screening should be done for the presence, or risk of any type of pain.
- Acute pain should be prioritised.
- On arrival at the EC the nurses should ask patients if they have pain.
- Every patient that is admitted to the EC with acute trauma-related pain should be screened.
- Nurses should assess the pain intensity (level of pain) of patients e.g., by asking how severe their pain is.

Rationale

**Patients recommended that the nurses should assess their pain intensity (level of pain) e.g., by asking how severe their pain is.*

**Professional nurses recommended that every patient that is admitted to the EC with trauma-related pain should be screened.*

Patients recommended that on arrival to the EC the nurses should ask them if they had pain.

Two of the six guidelines propose the screening of pain. Nurses have an important role in screening for pain (Registered Nurses' Association of Ontario, 2013:19). Although other health-care professionals are directly or indirectly involved in the assessment and management of a person's pain, nurses have the most contact with people receiving health

Stellenbosch University https://scholar.sun.ac.za

care. This involvement places nurses in a unique position to screen for pain, and, if the screen is positive, to move forward with a comprehensive assessment of the person's pain experience (Registered Nurses' Association of Ontario, 2013:19). Hospitals should have a defined criteria to screen, assess, and reassess pain that are consistent with the patient's age, condition, and ability to understand (American College of Surgeons *et al.*, 2020:18).

When screening for the presence of, or risk of any type of pain, it is important for the nurse to ask directly about pain, rather than assuming the person or their family or caregivers will voluntarily disclose.

Screening can include any of the following questions in patients who are able to self-report:

- "Are you feeling any aching or soreness now?"
- "Do you have pain?"
- "Do you hurt anywhere?"
- "Are you having any discomfort?"
- "Have you taken any medication for pain?"
- Have you any aching or soreness that kept you up all night?"
- Have you had trouble with any of your usual day-to-day activities?"
- "How intense is your pain?"

(Registered Nurses' Association of Ontario, 2013:19)

7.4.1.3 Recommendation 1c: Comprehensive pain assessment

The following are recommended regarding comprehensive pain assessment:

- A comprehensive pain assessment must be performed on persons presenting with pain, or risk of any type of pain using a systematic approach and appropriate, validated tools.
- Consider collecting as much accurate information as possible prior to taking a decision on both diagnosis and treatment.
- An adequate assessment of patient's pain should be undertaken prior to instituting treatment and at regular intervals as care continues.
- Pain assessment should be done according to a structured plan and a stepwise approach should be used to manage the patient with acute trauma-related pain in the EC.

Stellenbosch University https://scholar.sun.ac.za

Rationale

**Professional nurses recommended that pain assessment should be done according to a structured plan and a stepwise approach should be used to manage the patient with acute trauma-related pain in the EC.*

**Professional nurses recommended that nonverbal signs of pain include blood pressure, tachycardia, frowning, and grunting. Further contextualised findings include a detailed assessment of pain e.g., a pain scale; history e.g., age, underlying conditions; physiological pain predictors and behavioural pain predictors should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

Three of the six guidelines indicate that a comprehensive pain assessment should be done by obtaining sufficient accurate information to undertake adequate assessment of patient's pain. A person who has screened positive for the presence, or risk of any type of pain requires a further comprehensive and systematic approach to pain assessment (Registered Nurses' Association of Ontario, 2013:20). Screening and comprehensive assessment of pain provides both subjective and objective data, from self-reports and assessment tools (Registered Nurses' Association of Ontario, 2013:30). Effective clinical management of pain ultimately depends on its accurate assessment, which entails a comprehensive evaluation of the patient's pain symptoms, clinical history and functional status (Ministry, 2018:6). Nurses should use a consistent, systematic approach to exploring and assessing pain (Registered Nurses' Association of Ontario, 2013:21). Comprehensive assessment includes determining the quality and severity (intensity) of pain (Registered Nurses' Association of Ontario, 2013:22). Table 7.1 describes an acronym that uses the mnemonic OPQRSTUV to assist nurses and healthcare providers to systematically explore and assess people who screened positive for the presence or risk of any type of pain and who are able to self-report (Registered Nurses' Association of Ontario, 2013:21).

Effective clinical management of pain ultimately depends on its accurate assessment, which entails a comprehensive evaluation of the patient's pain, symptoms, clinical history, and functional status (Ministry, 2018:6). The first element to effective pain assessment and pain management is an effective 'patient history' and an evaluation of associated functional impairment. During the pain history, an understanding of the following is required: location of pain, temporal characteristics, aggravating and alleviating, impact of pain on function and quality of life, past treatment, and reports and the patient expectations and goals for their pain (Hachimi-Idrissi *et al.*, 2020:17). The assessment of acute pain should include a thorough general medical history and physical examination, a specific pain history (Hachimi-Idrissi *et al.*, 2020: 61; Schug et al., 2016:43). The approach to patients with pain begins with a detailed

Stellenbosch University https://scholar.sun.ac.za

and careful examination to identify the cause, whether the pain is part of a specific syndrome and if it is nociceptive, neuropathic, or mixed nociceptive and neuropathic (Ministry, 2018:5). The critical elements of the assessment of pain include 1) patient history, 2) physical examination and 3) pain measurement (Ministry, 2018:6). Patient's history includes collecting information regarding the following elements: onset, duration, location, periodicity, radiation to other areas, patient's description of pain, aggravating and relieving factors, psychosocial effects, previous pain condition, pain medical history, perceived intensity/severity, and a patient's emotional response (Table 7.1) (Ministry, 2018:7).

Table 7.1: Comprehensive pain assessment

ONSET	When did it begin, how long does it last, how often does it occur?
PROVOKING/PALLIATING	What brings it on, what makes it better? What makes it worse?
QUALITY	What does it feel like? Can you describe it?
REGION/RADIATION	Where is it? Does it spread anywhere?
SEVERITY	What is the intensity of the pain? On a scale of 0-10 with 0 being none and 10 being worst possible pain right now?
TIMING/TREATMENT	Is the pain constant? Does it come and go? Is it worse at any particular time? What medication and treatment are you currently taking? How effective are these? Do you have any side-effects from the medications and treatments?
UNDERSTANDING/IMPACT ON YOU	What do you believe is causing the pain? Are there any other symptoms with this pain? How is the pain impacting you and your family?
VALUES	What is your goal for this pain? What is your comfort goal or acceptable level for this pain? (On a scale of 0-10 with 0 being none and 10 being the worst possible). Are there any other views or feelings about the pain that is important to you or your family? Is there anything else you would like to say about your pain that has not been discussed or asked?

Adapted from "Symptom Assessment Acronym "OPQRSTUV", in Northern Health Palliative Care Team, 2019, Hospice Palliative Care Program Symptom Guidelines. Retrieved from https://www.northernhealth.ca/sites/northern_health/files/health-professionals/palliative-care/documents/symptom-guidelines-4th-edition.pdf

7.4.1.4 Recommendation 1d: Cultural

The following are recommended regarding comprehensive pain assessment:

- The developmental, cognitive, emotional, language and cultural factors should be considered when assessing pain.
- The person's beliefs, knowledge, and level of understanding about pain and pain management should be assessed.

Stellenbosch University https://scholar.sun.ac.za

- Nurses should help patients advocate for what feels appropriate for them within their cultural context in pain management.
- Pain management must be standardised to acknowledge diversity in culture, values, and belief systems, and ensure that practice is non-discriminatory and promote dignity and self-determination.

Rationale

**Professional nurses recommended that culture and spiritual considerations play a role in the assessment and management of acute pain.*

Four of the six guidelines recommend the inclusion of culture and cultural factors in pain assessment. Pain management must be standardised to acknowledge diversity in culture, values and belief systems and ensure that practice is non-discriminatory, and promote dignity and self-determination (Ministry, 2018:34). When selecting the pain measurement tool(s) to be used in assessing pain, the healthcare provider should take into consideration all relevant factors related to the individual patient: development, cognitive, emotional, language and cultural factors (Hachimi-Idrissi *et al.*, 2020:17). There are also cultural differences in pain intensity and alleviation of pain with medication (Hsu *et al.,* 2019:161). Misbeliefs about pain are common. Healthcare providers need to be aware of these misbeliefs and the facts about the assessment and management of pain (Registered Nurses' Association of Ontario, 2013:27).

People with pain have certain beliefs about pain-related practices shaped by their past pain experiences, age, education, culture or ethnicity, and gender. A person's beliefs about pain often influence whether they will seek it and what strategies they will accept to manage it (Registered Nurses' Association of Ontario, 2013:26). The response of patients to pain may be influenced by genetics, age, gender, ethnicity, socioeconomic and psychiatric factors, culture, religion, previous experiences, patient perceptions, and patient expectations (Ministry, 2018:33). The patients' overall experience and duration of illness are often influenced by the actions of nurses and caregivers. Effective and quality nursing and other healthcare professionals' roles in relation to pain management include, but not limited to having adequate knowledge and understanding of culture and patients' beliefs (Ministry, 2018:47).

7.4.1.5 Recommendation 1e: Pain assessment tools

The following are recommended regarding comprehensive pain assessment:

- The pain assessment tool should be appropriate to the individual patient and the clinical context e.g., intensive care, ward, community.

Stellenbosch University https://scholar.sun.ac.za

- Healthcare providers must be familiar with pain assessment tools and employ them in their daily practice.

Rationale

**Professional nurses recommended that on admission every patient should be assessed by using a validated pain assessment tool for example, a Numerical rating scale (NRS), Verbal descriptor scale (VDS) or Visual analogue scale (VAS) and that the use of pain assessment tools is a common practice in the EC.*

Five of the six guidelines indicate the use of pain measurement tools. Pain assessment is a complex process, and pain is difficult to fully quantify with any single assessment tool (American College of Surgeons *et al.*, 2020:11). Unidimensional measures of pain intensity such as the numeric rating scales, verbal descriptor scales and visual analogue scales are more commonly used to quantify pain in the acute setting than in multidimensional measures (Hachimi-Idrissi *et al.*, 2020:61). It is important to use tools for assessing pain that can be easily understood by the person and their family or caregivers (Registered Nurses' Association of Ontario, 2013:22). A number of scales are available that measure either pain intensity or the degree of pain relief following an intervention (Schug et al., 2016:45). Unidimensional pain assessment tools take little time to administer, are easy to trend over time, and are familiar to patients and healthcare providers (American College of Surgeons *et al.*, 2020:11). Unidimensional tools are easy-to-use, simple, and quick, but they are valid and reliable tools that measure pain intensity only (Ministry, 2018:9). However, these tools are subjective, require patients to be responsive, and may not completely and appropriately assess a patient's pain (American College of Surgeons *et al.*, 2020:11). Therefore, these tools are no substitutes for comprehensive pain assessment. They are more commonly used in patients with acute pain (Ministry, 2018:9).

b. Numeric Rating Scales (NRS)

Numeric rating scales (NRS) can be delivered verbally or in a written format ((Hachimi-Idrissi *et al.*, 2020: 18; Schug *et al.*, 2016: 46)). The NRS is an 11-point, patient-reported metric that scores current pain level on a scale from 0 to 10, with 0 being no pain and 10 being the worst imaginable pain (Figure 7.1) (American College of Surgeons *et al.*, 2020:11; (Hachimi-Idrissi *et al.*, 2020:18; Ministry, 2018:9; Schug *et al.*, 2016:46). The NRS is commonly used to assess acute pain because it is familiar and simple to understand (American College of Surgeons *et al.*, 2020:11). Mild pain would be considered as a pain score of 1-3, moderate pain a score of 4-7 and severe pain a score of >7 (Hachimi-Idrissi *et al.*, 2020:18).

Stellenbosch University https://scholar.sun.ac.za

Professional nurses recommended that if you ask your patient to rate the level of his or her pain on a scale of 1 to 10 then you would be using the numeric pain scale.

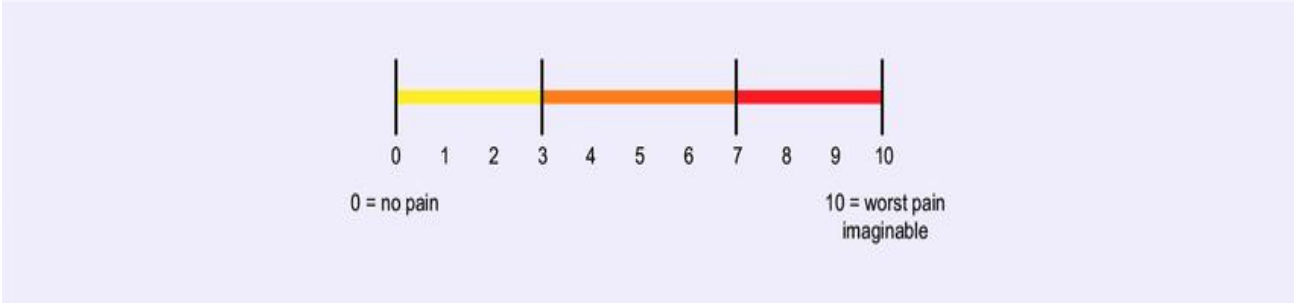


Figure 7.1: Numerical Rating Scale

https://www.researchgate.net/figure/The-numeric-rating-scale-NRS-11_fig2_339901016

c. Categorical pain scales

Categorical scales use words to convey the degree of pain relief. A verbal descriptor scale (VDS) is the most used type of categorical pain scale. Categorical scales use words to convey the degree or magnitude of pain or pain relief. A verbal descriptor scale (VDS) is the most used type of categorical pain scale ((Hachimi-Idrissi *et al.*, 2020:18; Schug et al., 2015:45). This type of scale typically includes four to five descriptors from 'no pain' through to 'excruciating/agonizing pain' (or similar terminology). The benefit of categorical scales is that they are quick and simple to use. However, they rely on the patient correctly interpreting and understanding the descriptor words, so may not be suitable for all patients, particularly where there is a language barrier (Hachimi-Idrissi *et al.*, 2020:18)

Professional nurses recommended that the verbal descriptor scale should be used to ask the patient if his or her pain is mild, moderate, or severe.

Patients recommended that the nurse should assess their pain by asking them to describe their pain in their own words.

d. Visual analogue scale

The visual analogue scale (VAS) is the most commonly used scale for rating pain intensity in clinical trials ((American College of Surgeons *et al.*, 2020:18; Schug *et al.*, 2016:46). The VAS is a self-reported acute pain assessment tool (American College of Surgeons *et al.*, 2020:11). VAS scales consist of a 100mm/10cm horizontal line, the left end of which is defined as 'no pain' and the right end as worst possible pain with no other marks along the length of the line

Stellenbosch University https://scholar.sun.ac.za

(Figure 7.2). The following synthesis was derived from three guidelines: The patient marks the point along the line they feel corresponds to the level of pain that they are experiencing, and the pain score is recorded as the measurement in millimeters or centimeters from the left end of the scale to the patient's mark (American College of Surgeons *et al.*, 2020:11; (Hachimi-Idrissi *et al.*, 2020:18; Ministry, 2018:9). The patient is asked to mark the line and the 'score' is the distance in millimeters from the left side of the scale to the mark (Schug *et al.*, 2016:46). Patients make a mark along the line indicating what they feel best represents their perception of the intensity of their pain (Ministry, 2018:9) or that corresponds to the level of pain that they are experiencing (Hachimi-Idrissi *et al.*, 2020:18).

**Professional nurses recommended that the visual analogue scale should be used when asking a patient to mark his or her pain level on a line between two endpoints.*

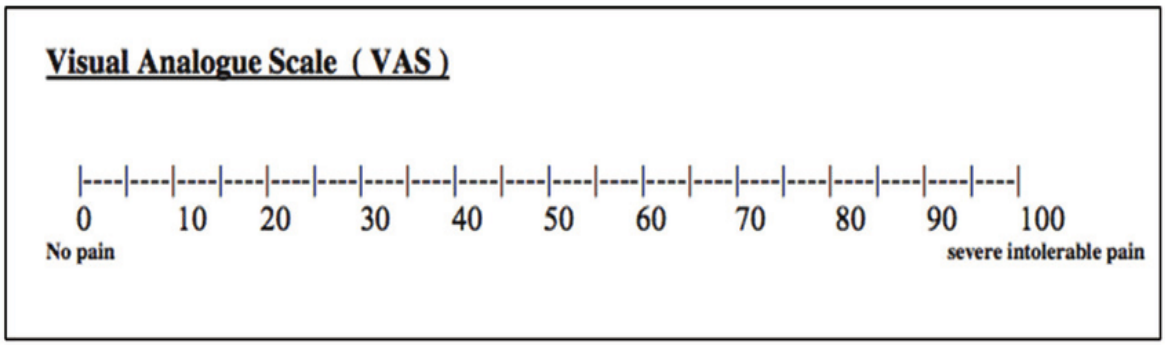


Figure 7.2: Visual Analogue Scale

Researchgate.net/figure/The-visual-analogue-scale-VAS-used-for-evaluating-the-perceived-pain-among-patients_fig1_330139149

7.4.1.6 Recommendation 1f: Monitoring

The following is recommended regarding comprehensive pain assessment:

- Patients' monitoring is essential for informed evaluation of the effectiveness of treatment interventions.

Rationale

**Professional nurses recommended that after administering pain medication, the patient should be monitored for potential side-effects.*

Three of the six guidelines propose that patient monitoring is essential to evaluate the effectiveness of treatment interventions. Pain assessment is not a once-off process, and it is important that treatment interventions be evaluated by subsequent pain assessments to determine their effectiveness (Ministry, 2018:6). Ongoing monitoring and evaluation of a

Stellenbosch University https://scholar.sun.ac.za

person's response to pain management interventions is necessary to adjust the strategies and ensure effective pain control and minimization of adverse effects (Registered Nurses' Association of Ontario, 2013:38). Patient monitoring during pain management is important as it allows for the determination of the effectiveness of the prescribed pain interventions in a way that prompt review/modification of the pain management plan is accomplished. In follow-up, information on screening and comprehensive assessment also provides baseline data to compare the results of future reassessments (Registered Nurses' Association of Ontario, 2013:30). Patient monitoring during pain management is important for many reasons. It allows for the determination of the effectiveness of the prescribed pain interventions so that prompt review/modification of pain management plan is accomplished. It allows for monitoring of complications such as drug side effects, allergic reactions, adverse drug reactions, to ensure compliance with the prescriptions (Ministry, 2018:52).

A person's response to pharmacological, physical, and psychological interventions can vary over time. Monitoring and reassessing the person's responses help to ensure safety and effectiveness (Registered Nurses' Association of Ontario, 2013:38). Monitoring the person's health outcomes such as presence and severity of pain, impacts on function and mobility after pain management interventions are required to determine if there is a need to modify care (Registered Nurses' Association of Ontario, 2013:39).

7.4.1.7 Recommendation 1g: Documentation

The following are recommended regarding comprehensive pain assessment:

- Pain documentation should be standardised and consistent to foster continuity of care.
- Pain characteristics as presented by the patients should be documented.
- The person's responses to the pain management plan should be communicated and documented.

Rationale

**Professional nurses recommended that documentation of pain assessment and pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

Three of the six guidelines indicated that the documentation of pain be included in the pain assessment and pain management process. Screening and assessment findings must be documented and communicated to everyone involved in a person's health care for optimal pain prevention and management. This information about the person's pain characteristics (such as pain history; sensory characteristics [intensity, quality, temporal features, location and what makes the pain better or worse]; impacts of pain on everyday activities;

Stellenbosch University https://scholar.sun.ac.za

psychological impacts; cultural beliefs and effective interventions used to manage pain), when documented and communicated, can assist the team to make effective clinical judgements about the status of a person's pain and create an individualized plan of care to prevent or minimize it (Registered Nurses' Association of Ontario, 2013:30). Integrating assessment forms into documentation systems can also help guide staff through the required steps needed to effectively assess and manage pain (Registered Nurses' Association of Ontario, 2013:44).

Documentation is one of the essential steps in providing effective pain management (Ministry, 2018:72). Nursing documentation is also a professional and legal requirement that promotes:

- Safe, effective, and ethical pain care
- Continuity of care across interprofessional team
- Communication of the:
    - Plan of care
    - Assessment of findings
    - Effectiveness of implemented interventions
    - Education provided to the person on their condition, plan of care, assessment, and reassessment of findings; and
    - Follow-up actions of reassessments to ensure optimal health outcomes (College of Nurses [CNO], 2008:3).

Documentation needs to be accessible to all the interprofessional team members involved in the person's care. Documentation communicates the care activities of each interprofessional team member, such as the assessment, planning and implementation of interventions and validates the monitoring and evaluation of a person's response and ability to adhere to the plan of care and follow-up actions (Registered Nurses' Association of Ontario, 2013:40). Pain documentation should be standardised and consistent to foster continuity of care (American College of Surgeons *et al.*, 2020:115). Communication and documentation by nurses supports care and treatment by the interprofessional team, the person, and the person's family and caregivers (Registered Nurses' Association of Ontario, 2013:39).

In contrast, the absence of clear communication and documentation of pain management including date and time; pain type, severity, rating, location, and quality; pharmacological and nonpharmacological interventions; the person's responses; and any adverse effects, affects the ability of the nurse and the team to evaluate the effectiveness of the plan and determine whether different interventions are needed (Registered Nurses' Association of Ontario, 2013:40).

Stellenbosch University https://scholar.sun.ac.za

7.4.1.8 Recommendation 1h: Reassessment

The following are recommended regarding comprehensive pain assessment:

- Regular, accurate assessment of pain is required to improve acute pain management.
- Pain should be reassessed systematically, ideally using the same appropriate tool.

Rationale

**Professional nurses recommended that:*

- *pain assessment should be done as the fifth vital sign.*
- *the frequency of pain assessment should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

**Professional nurses recommended that after:*

- *an initial dose of analgesia is given, subsequent doses should be adjusted in accordance with individual response.*
- *administering pain medication, the efficacy of pain is assessed*
- *administering pain medication, the patient must be monitored for potential side-effects.*

All six guidelines indicated that pain should be reassessed. Pain assessment should be carried out at regular intervals and should be integrated into clinical care (Ministry, 2018:6). The intensity of monitoring (frequency and duration) depends on a person's risk profile and the onset and duration of action or potential adverse effects of the interventions (pharmacological, nonpharmacological [physical or psychological]) (Registered Nurses' Association of Ontario, 2013:39). Regular and repeated measurements of pain should be made to assess ongoing adequacy of analgesic therapy. In acute pain management, assessment must be undertaken at appropriate frequent intervals. An appropriate frequency of reassessment will be determined by the duration and severity of the pain, patient needs and response, and the type of medicine or intervention (Schug *et al.*, 2016:43 & 45). Reassessment of pain systematically, using the same appropriate tool is suggested (American College of Surgeons *et al.*, 2020:11).

Reassessment of pain is as important as the initial assessment, in order to monitor effectiveness of pain management and the changing analgesic requirements of the patient. It should take place at a frequency guided by the patient's pain severity, with more frequent assessments as pain severity increases (Hachimi-Idrissi *et al.*, 2020:61). Regular assessment of pain is recommended to evaluate the need for initiation or continuation of opioid therapy (Hsu *et al.*, 2019:170). After a pain intervention is completed, patients should be reassessed for both pain control and adverse reactions to the intervention at an appropriate interval based on the anticipated effect (American College of Surgeons *et al.*, 2020:19). Recording pain 'as

Stellenbosch University https://scholar.sun.ac.za

the fifth vital sign' aims to increase awareness and utilisation of pain assessment and may lead to improved acute pain management (Schug *et al.*, 2016:45). If changes are required based on the reassessment, the interprofessional team must discuss proposed changes to pharmacological and nonpharmacological interventions, outline their benefits and risks, and revise the pain management plan for optimal health outcomes (Registered Nurses' Association of Ontario, 2013:39).

How often people should be monitored and reassessed depend on the interventions being used, the stability of the person's medical condition, and the person's self-reports of the severity of pain or behavioural pain responses and associated distress (Registered Nurses' Association of Ontario, 2013:39). The level of monitoring employed, depends on the pain diagnosis. However, the minimum monitoring to be employed should include monitoring the dimensions of pain which are physical, psychosocial, and spiritual. In acute pain conditions such as trauma, monitoring is at the level of the simple unidimensional tools employed in pain assessment (Ministry, 2018:52). The assessment of pain should include an evaluation of associated functional impairment. Data derived from categorical, and VAS of pain intensity or relief, produce a range of summary outcomes that can be used to assess the degree of analgesic effect, the time to analgesic effect, and the duration of the effect (Schug *et al.*, 2016:49).

Monitoring is usually performed by the healthcare professionals, however patients are the focus of care and should be actively engaged in their own monitoring (Ministry, 2018: 52). Monitoring actions must become a routine practice which informs treatment decisions, protects patients and documents progress towards a healthy life (Ministry, 2018:53).

7.5 RECOMMENDATIONS FOR PRACTICE

7.5.1 Recommendation 2: Pain management

We recommend pain management for acute trauma-related pain in the EC and should include the following sub-recommendations:

7.5.1.1 Recommendation 2a: Patient collaboration

A detailed pain assessment should be followed where nurses collaborate with patients to identify their goals and discuss the alleviation of pain, expected recovery course, and patient experience at all times to ensure a comprehensive approach to the plan of care.

Rationale

All six guidelines indicate strategies for pain management as depicted in the sub recommendations. Three of the six guidelines indicate patient collaboration in pain

Stellenbosch University https://scholar.sun.ac.za

management. For acute pain, recommended management involves pain education, assurance, advice on resuming normal activity and discussions for pain management, as needed (Ministry, 2018:36). Engaging with the patients commences when the nurse communicates with the patient. This is the ideal opportunity for nurses to engage with patients about their goals for pain management. Establishing a pain-management plan based on the findings from the assessment and incorporating the person's beliefs and goals are important for minimising pain and distress (Registered Nurses' Association of Ontario, 2013:31).

Persons with the presence, or risk of any type of pain must be involved in decisions about interventions proposed to manage their pain, and the strategies adopted for the plan of care must be tailored to meet the person's goals (needs and priorities) and preferences. Randomised control trials report significant outcomes when nurses, the interprofessional team and the person and their family and caregivers collaborate in developing a comprehensive pain-management approach combining pharmacological (multimodal analgesic approach) and nonpharmacological interventions such as physiotherapy and psychological cognitive behavioural therapy (Registered Nurses' Association of Ontario, 2013:30). There must be a collaborative partnership that facilitates and supports people with pain to participate in all aspects of their care (Ministry, 2018:34).

7.5.1.2 Recommendation 2b: Pharmacological pain management

The WHO Pain Ladder, or a new adaptation of it, which accommodates the modern and invasive techniques of pain management, should be used as the general guidance in managing pain in patients.

Rationale

**Professional nurses recommended that pharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

**Professional nurses recommended that:*

- *pharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*
- *combining analgesics that work by mechanisms (e.g., combining an opioid with a NSAID) may result in better pain control with fewer side effects than using a single analgesic agent and*
- *pharmacological agents such as opioids, non-opioids, non-steroidal anti- inflammatory drugs (NSAIDS), and anticonvulsants can be used for the management of acute trauma-related pain in the EC.*

Stellenbosch University https://scholar.sun.ac.za

**Patients recommended that the nurse should:*

- *give them pain medication after asking them if they had pain and*
- *describe possible side-effects (reactions of the medication) in a way that they understood, before giving them any pain medication.*

Two of the six guidelines advocate the WHO pain ladder as a guide to pain management.

Analgesics form the mainstay of pharmacological management of pain (Ministry, 2018:12). The "WHO Pain Ladder" first published in 1986, (Figure 7.3) was originally designed for cancer patients but is widely accepted as a guide for either acute or chronic non-malignant pain who require analgesic. The WHO pain relief ladder proposed the use of a limited number of relatively inexpensive medication, such as morphine, in a stepwise approach and this has revolutionised the management of pain world-wide (Hachimi-Idrissi *et al.*, 2020:15; Ministry, 2018:14). Adjuvants can be used in conjunction with analgesics for pain management or to mitigate pain, such as oedema, swelling, anxiety and muscle contraction or spasticity (Hachimi-Idrissi *et al.*, 2020:15).

The primary aim of acute pain management is to reduce the patient's pain with minimal adverse effects while allowing them to maintain function (Hachimi-Idrissi *et al.*, 2020:60). For all patients, the goal of pain management is a tolerable pain level that allows the patient to function, not 'zero pain' (American College of Surgeons *et al.*, 2020:4). It is important to initiate pain management interventions as early as possible. At all stages during the acute pain management process, it is imperative for healthcare workers to reassure patients that their pain is understood and will be taken seriously (Hachimi-Idrissi *et al.*, 2020:13).

The cornerstone of the ladder rests on five simple recommendations for the correct use of analgesics to make prescribed treatment effective.

The 5 points are as follows:

1. Administration of analgesics
2. Analgesics should be given at regular levels
3. Analgesics should be prescribed according to pain intensity as evaluated using a pain rating scale
4. Dosing of pain medication should be adapted to the individual
5. Analgesics should be prescribed with a constant concern for detail
6. (Ministry, 2018:14)

Stellenbosch University https://scholar.sun.ac.za

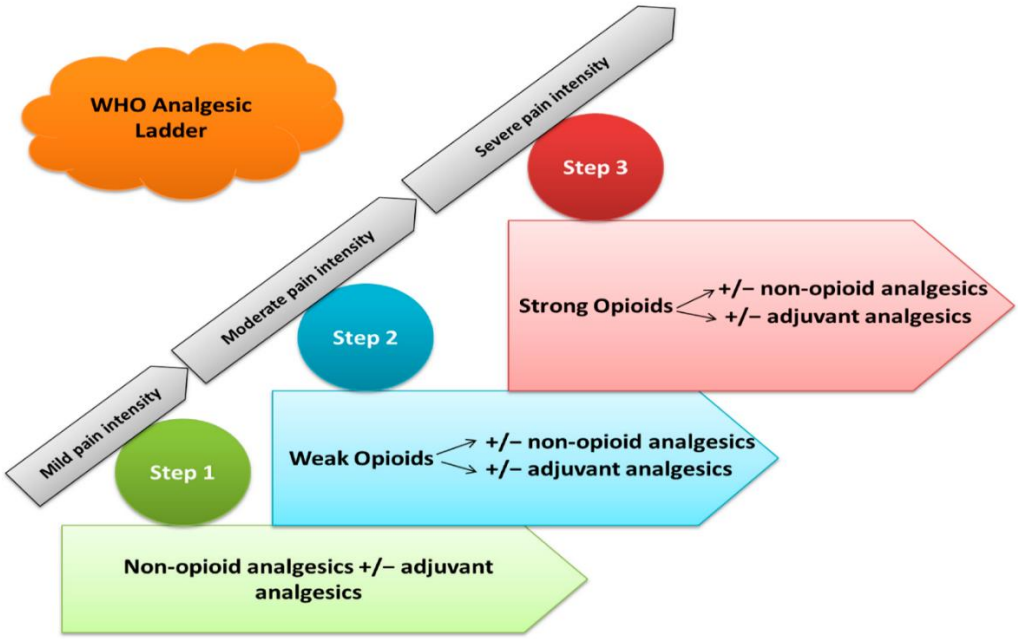


Figure 7.3:Overview of WHO pain ladder

https://www.mdpi.com/1648-9144/55/9/584#

7.5.1.3 Recommendation 2c: Nonpharmacological pain management

- Nonpharmacological measures should always be considered and used for pain relief if practical.
- Nonpharmacological interventions should be implemented early with patients, either alone or in combination with pharmacological options.
- The use of immobilisation such as ice (cryotherapy), elevation, and splinting can be used to achieve pain relief.
- Distraction can be used to reduce pain e.g., listening to music.
- Procedural information (often combined with behavioural instructions, like exercises or body position) can be effective in reducing pain.

Rationale

**Professional nurses recommended that nonpharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

**Professional nurses recommended that cryotherapy (cold therapy), elevation of extremities and distraction should be used for the management of acute trauma-related pain.*

All six guidelines advocate the use of nonpharmacological pain interventions. Nonpharmacological pain therapy refers to interventions that do not involve the use of medications to treat. While pharmacological analgesics are essential for the management of

Stellenbosch University https://scholar.sun.ac.za

pain in the EC, the place and importance of nonpharmacological treatments should not be overlooked (Hachimi-Idrissi *et al.*, 2020:25). It has been proven that combining pharmacological and nonpharmacological methods yield more effective pain control for the patient (Ministry, 2018:32). Nonpharmacological interventions, whether physical, such as physiotherapy or massage, or psychological, such as cognitive behaviour therapy, are often used with pharmacological interventions to manage pain. Prioritise nonpharmacological techniques for pain management when possible (American College of Surgeons *et al.*, 2020:62).

The goals on nonpharmacological interventions include, but are not limited to:

- Reduce pain, decrease fear, reduce distress and anxiety
- Provide patients with a sense of control
- Reduce the dosage of analgesic medications thereby decreasing side effects, especially when using opioids
- Avoid the use of medications where possible, and
- Improve the quality of life, prevent and/or manage complications and preserve functional abilities.

(Ministry, 2018:32)

b. Physical Interventions

Perform physical interventions to assist in the reduction of acute trauma-related pain. Appropriate physical interventions such as rest, cryotherapy (ice), compression, elevation, patient positioning, traction and bracing can be implemented (Hachimi-Idrissi *et al.*, 2020:28). Physical interventions such as physiotherapy and exercise, and application of heat or cold should be considered along with pharmacological interventions to reduce pain, improve sleep, mood, and general well-being (Registered Nurses' Association of Ontario, 2013:36).

Cold therapy (cryotherapy) is the use of external cooling to reduce internal tissue temperature, which in turn decreases vascular permeability and tissue edema, local inflammatory mediators, metabolic demand, and tissue hypoxia, ice packs, gel packs and cold-water immersion are widely used as pain management adjuncts in orthopedic and soft tissue injuries (American College of Surgeons *et al.*, 202:26). Cryotherapy is defined as the therapeutic application of a substance (e.g., ice pack or coolant spray) to the body that removes heat from the body, resulting in decreased tissue temperature, while heat spray is the therapeutic application of a substance (heat wrap, bath) to the body that adds heat, resulting in increased tissue temperature. The physiological effects of cryotherapy include reduction in pain, oedema, inflammation, and muscle spasm, while the physiological effects of heat therapy

Stellenbosch University https://scholar.sun.ac.za

include relief from pain and increases in blood flow and elasticity of connective tissues (Hachimi-Idrissi *et al.*, 2020:28). Heat therapy, the use of external warming to relieve the discomfort associated with injury, increases blood flow (including oxygen and nutrient delivery), decreases joint stiffness, and promotes muscle relaxation. It is most commonly used after the acute injury period (American College of Surgeons *et al.*, 2020:26). Heat treatment is particularly effective in managing pain related to muscle spasms or tension and tissue injury (Ministry, 2018:38). Heat should not be applied to fresh injuries, because increased blood flow to the treated area may actually worsen swelling and enhance haemorrhage (Ministry, 2018:39). Cryotherapy is the application of an external cold source in which the desired effect is a drop in tissue temperature. The decrease in tissue temperature has been shown to increase the threshold of painful stimuli and increase the tolerance to pain (Hsu *et al.*, 2019:163).

Positioning is another simple strategy for pain control. Simply assisting a patient to change position in the bed or chair or while ambulating can improve comfort. Additionally, appropriate body alignment and support of extremities can improve patient comfort and outlook (Ministry, 2018:42). Skeletal traction is a common method for preoperative fracture stabilisation and pain control in patients with femoral shaft, acetabular and unstable pelvic fractures. In a prospective study of adult trauma patients, pain scores during immobilisation of isolated femur fractures were lower in patients placed in skeletal traction than patients who were splinted. Bracing may be useful to reduce pain and protect the neck, back and joints from further injury. In non-complex fractures it has long been established that appropriate positioning, for example with a back slab for wrist/arm fractures can alleviate pain and this is recommended widely. Likewise, splints or slings may be helpful in patients with soft tissue injury in the early post-injury period, in order to reduce pain and promote healing. In these instances, elevation and ice may also be beneficial (EUSEM, 2020:28). Splinting an injured area to immobilise the joints around the area and prevent movement could be a major means of providing rest for the injured tissues (Ministry, 2018:36). Immobilisation is used in extremity and pelvic trauma to stabilise the affected body part prior to surgical repair. In addition to its widely acceptable beneficial effects on haemorrhage reduction and fracture healing, immobilisation also has a beneficial effect on pain management during the acute injury period (American College of Surgeons *et al.*, 2020:25).

Nonpharmacological approaches should not be used as a substitute for adequate pharmacological management (Registered Nurses' Association of Ontario, 2013:36).

Stellenbosch University https://scholar.sun.ac.za

c. Psychological interventions

Cognitive behavioural therapy (CBT) is a psychological technique that includes cognitive and behavioural modifications of specific activities to reduce the impact of pain and disability and overcome barriers to physical and psychosocial recovery. Interventions aim to reduce the impact of the distressing or threatening nature of pain and enhance a patient's sense of confidence to cope with it (Hachimi-Idrissi *et al.*, 2020:26). CBTs aim to improve a patient's control over their perception of pain (American College of Surgeons *et al.*, 2020:22). Psychological (psychosocial) interventions such as cognitive behaviour therapy, music, distraction, relaxation techniques and education should be considered in pain management because these interventions affect the way a person thinks, feels and responds to pain (Registered Nurses' Association of Ontario, 2013:37). Patient sharing, distraction, and relaxation techniques such as diaphragmatic breathing, guided imagery, and music therapy are various forms of CBT interventions that can be implemented (Hachimi-Idrissi *et al.*, 2020:25; Ministry, 2018:35). Typically, CBT interventions involve the application of a range of behavioural change principles, such as different positive reinforcement of desired behaviours, identification and modification of unhelpful thoughts, and goal setting, in order to achieve change in targeted behaviours (Schug *et al.*, 2016:262).

Distraction is the most common type of cognitive-behavioural methods and is most effective when pain is mild to moderate (it is difficult to concentrate when pain is severe). It is an intervention that is often used to guide attention away from painful stimuli (Ministry, 2018:34). Consider using anxiety-reducing strategies to increase self-efficacy and promote peace of mind with patients like aromatherapy, music therapy, or cognitive behavioural therapy (Hsu *et al.*, 2019:161). Music therapy has also demonstrated positive effects on pain relief and opioid dose reduction (Hsu *et al.*, 2019:162). Music therapy is a passive distraction technique that is self-explanatory, low-risk, and requires minimal-to-no caregiver expertise. One observational pre/post study suggests music therapy can reduce pain and is highly acceptable to adult orthopaedic trauma patients. Another study of hospitalised patients with acute pain demonstrated reductions in pain perception and mood scores after listening to the music of their choice (American College of Surgeons *et al.*, 2020:24).

The use of relaxation training can help patients to reduce stress and tension through techniques such as focusing on breathing patterns, concentrating on mental imagery, or relaxing scenes and gradually releasing muscle tension throughout the body. Music often forms an important part of the relaxation process (Hachimi-Idrissi, *et al.*, 2020:25). Relaxation training usually involves teaching a patient ways to reduce their feelings of stress and/or arousal (Schug *et al.*, 2016:260). Procedural information is information given to a patient

Stellenbosch University https://scholar.sun.ac.za

before any treatment that summarises what will happen during that treatment (Schug *et al.*, 2016:259).

7.5.2 Recommendation 3: Education

Education should be prioritised and should include the following sub-recommendations:

7.5.2.1 Recommendation 3a: Patient education

Patient education about expectations for pain management should be provided.

Rationale

Two of the six guidelines propose patient education as part of the pain management plan. A person and their family and caregivers should receive education on both pharmacological and nonpharmacological interventions in the care plan, the potential adverse effects of those interventions and information to correct inaccurate beliefs and ease concerns to prevent or minimize fears about management of the patient's pain (Registered Nurses' Association of Ontario, 2013:37). Psychological interventions related to education have been shown to assist with coping and enhancing the person's ability to self-manage to lessen pain (Registered Nurses' Association of Ontario, 2013:37). The person and their family/caregivers should be educated on the need to monitor and reassess pain management interventions for optimum pain relief and adverse effects (Registered Nurses' Association of Ontario, 2013:38). It is essential that patients understand the likely aetiology of their pain. Patients must be made to understand the necessary commitment to their programme, as poor compliance with treatment may be a risk factor for poor patient outcome (Ministry, 2018:42).

Preparation is a key component of reducing pain and anxiety associated with procedures. The main goal of preparation and patient education is to inform the patient about the procedure and to start desensitizing the patient (Ministry, 2018:34).

Education should include but not be limited to:

- Reinforcing the importance of communicating pain
- How and when to communicate one's pain experience
- Explaining communication of pain not perceived by health-care professionals as complaining
- Information on pharmacological, physical, and psychological pain management options, emphasizing both risks and benefits; and
- Information on potential adverse effects and strategies for dealing with them

(Registered Nurses' Association of Ontario, 2013:38).

Stellenbosch University https://scholar.sun.ac.za

7.5.2.2 Recommendation 3b: Staff education

"Simple" techniques of pain relief can be more effective if attention is given to education, documentation, patient assessment and provision of appropriate guidelines and policies.

Rationale

**Professional nurses recommended that the level of knowledge of nurses on the assessment and management of acute trauma-related pain be updated.*

Two of the six guidelines indicate education on the pain assessment and management process. Assessment and management of pain in persons with the presence, or risk of any type of pain is a complex and dynamic process that requires a team of healthcare professionals with specialised knowledge and skills. The team should adopt a person-centered approach and have a sound base of knowledge for solving problems and ensuring their work is evidence-based and aligned with their organisation's policies and procedures (Registered Nurses' Association of Ontario, 2013:43).

Two of the six guidelines indicate the role of staff education in pain assessment and management. Assessment and management of pain in persons with the presence, or risk of any type of pain is a complex and dynamic process that requires a team of healthcare professionals with specialised knowledge and skills (Registered Nurses' Association of Ontario, 2013:41). Education may also include the provision of guidelines and accompanying changes to practice to enable good outcomes from education (Schug *et al*., 2016:56).

7.5.3 Recommendation 4: Organisational

Organisational support should be prioritised and should include the following sub-recommendations:

7.5.3.1 Recommendation 4a: Organisational requirements

- The organisation and organisational structure should support the implementation of pain assessment and pain management and should include the following sub-recommendations:
- Successful management of acute pain requires close liaison between all personnel involved in the care of the patient.
- Appropriate institutional support and engagement are important for the effective implementation of acute pain service.

Rationale

**Professional nurses recommended that best practice guidelines for the assessment and management of acute trauma-related pain be implemented in the EC.*

Stellenbosch University https://scholar.sun.ac.za

Two of the six guidelines included the role of the organisation and the organisational structure in pain assessment and pain management and recommended organisational support.

Organisations must recognise that all people have the right to the best pain management possible (Registered Nurses' Association of Ontario, 2013:44). It is recognised that patients should be able to access best-practice care, including appropriate assessment of their pain and effective pain management strategies. However, effective acute pain management will to a large extent, depend not only on medicines and techniques available but also on the systems involved in their delivery (Schug *et al.*, 2016:58).

Organisations must make pain assessment and pain management a strategic priority for prevalence and impacts of inadequate pain management (Registered Nurses' Association of Ontario, 2013:44). Organisational approaches may improve pain and other approaches (Schug *et al.,* 2016:56).

To achieve this, organisations need:

- Standards, policies, and procedures to assess and manage pain effectively
- Standardised tools for documenting and communicating pain assessment and management strategies and outcomes
- Consistent use of validated assessment tools across teams and settings, appropriate for specific populations and contexts of care
- Pain education that includes orientation of new staff to the organisation's pain management policies, procedures and practices, and ongoing professional development; and
- Continuous quality improvement initiatives to evaluate pain assessment and pain management processes and outcome.

(Registered Nurses' Association of Ontario, 2013:44).

An effective organisational plan for implementing guidelines include:

- Assessing the organisation's readiness for implementation and barriers to it
- Involving all members in implementation, either directly or in a supportive function
- Reinforcing the importance of best practices through ongoing education
- Appointing one or more qualified individuals to support the education and implementation process; and
- Offering opportunities for personal and organisational reflections on implementing guidelines.

Stellenbosch University https://scholar.sun.ac.za

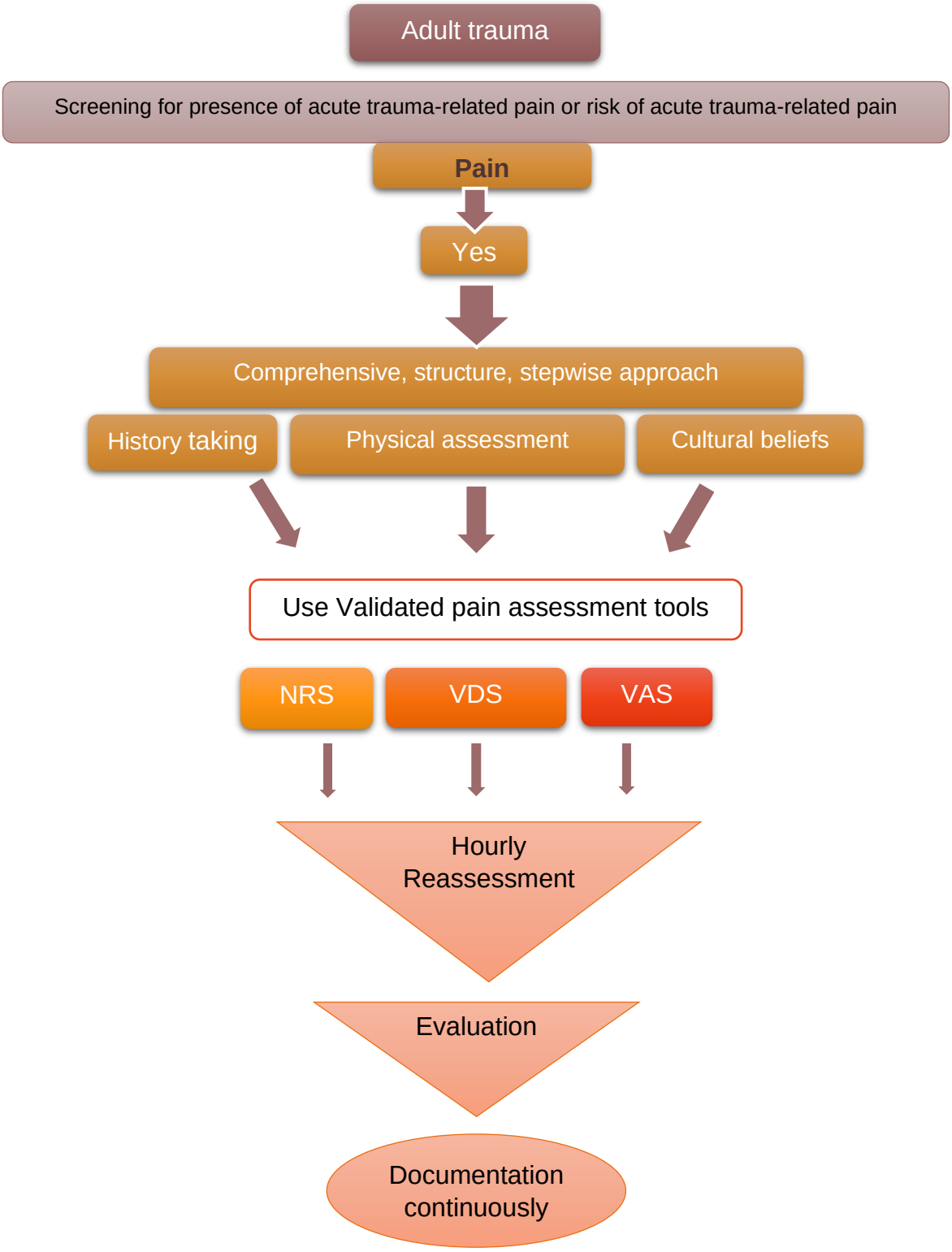
(Registered Nurses' Association of Ontario, 2013:46).

7.6 ALGORITHM

The algorithm (Figure 7.5) for pain assessment and another for pain management was developed to provide quick, easy access for nurses in the busy EC. It provides a schematic step-by-step guide on how to assess and manage acute trauma-related pain. There is no time to peruse a BPG in the EC and the absence of this algorithm will prevent or delay implementation of the BPG. There was positive feedback from the review panel acknowledging the relevance of an algorithm in the EC.

The algorithm should firstly, be placed in the triage room since this is the first port of entry in the EC and interaction with the nurse and where the first pain assessment is done. Thereafter, prominent areas should be identified in the EC where pain assessment is done for easy access for the nurse, for example patient waiting areas, or the patient's bedside.

Stellenbosch University https://scholar.sun.ac.za



Stellenbosch University https://scholar.sun.ac.za

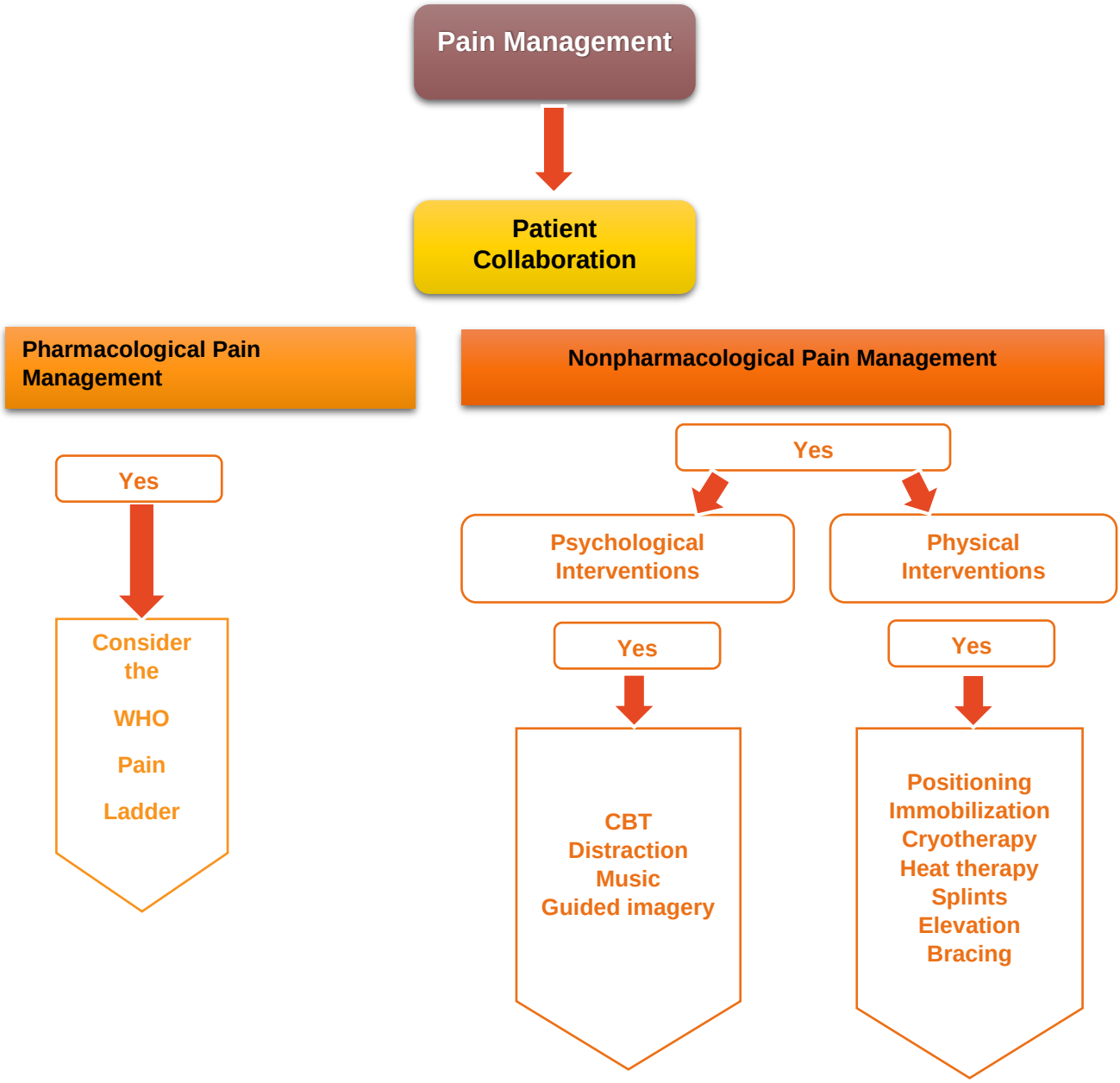


Figure 7.4: Algorithm for Pain Assessment and Pain Management

7.7 SUMMARY

This chapter provides the outlay of the best practice guideline that was finalised to provide recommendations to nurses in the EC for the assessment and management of acute trauma-related pain. The domains as per the AGREE II instrument was used to guide the format of the guideline. The recommendations with the rationale of the evidence found is provided. Furthermore, the validated algorithm is provided that was developed for ease of reference to nurses in the EC.

Stellenbosch University https://scholar.sun.ac.za

CHAPTER 8: CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

8.1 INTRODUCTION

The overall aim of this study was to contextualise a best practice guideline for nurses for the assessment and management of acute trauma-related pain in the ECs in the Western Cape, South Africa. To achieve this aim, the following research objectives guided the study:

- To explore and describe the knowledge, attitudes, and practices of professional nurses on the assessment and management of acute trauma-related pain of adult patients in ECs.
- To explore and describe the patients' understanding regarding the assessment and management of acute trauma-related pain rendered by nurses in the ECs.
- To identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.
- To contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adults in ECs.

To operationalise the objectives, the study was conducted in three phases:

8.1.1 Phase One

Two quantitative sub-studies were done in phase one. Sub-study one constituted a survey on the knowledge, attitudes, and practices of professional nurses regarding acute trauma-related pain in the EC. In sub-study two surveys were distributed to patients admitted to the EC with acute trauma-related pain and enquired about the care rendered by nurses. Five hospitals were identified for both sub-study one and sub-study two that included two tertiary hospitals, one regional hospital and two district hospitals. Quantitative data analysis was done with the assistance of a statistician.

8.1.2 Phase Two

A scoping review was conducted in phase two to identify, appraise, and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within EC settings. Search strategies for guidelines include electronic data bases, guideline repositories and search engines (Figure 5.2). Guidelines found were appraised by using the Appraisal of Guidelines Research and Evaluation, Version II (AGREE II). Recommendations were extracted from the appraised guidelines. The extracted guidelines were synthesised and included in the BPG.

Stellenbosch University https://scholar.sun.ac.za

8.1.3 Phase Three

Phase three comprised the development of the best practice guideline. A synthesis of the extracted recommendations was done by the GDG, and a best practice guideline was drafted. The draft guideline was sent to an expert panel for validation of the recommendations. The guideline, based on the feedback received from the expert panel, was finalised. An algorithm as an additional document for ease of reference for professional nurses in the EC was developed and reviewed by the expert panel, after which the document was finalised.

The purpose of this chapter is to provide a discussion of the conclusion of the study, limitations, and recommendations for nursing practice, education, and research. The chapter is thus structured in such a way.

8.2 CONCLUSIONS OF THE STUDY

The emergency center of a healthcare facility is the first point of entry for patients seeking treatment for diverse forms of acute pain, including acute trauma-related pain (Etoundi, Mbengono, Ntock, *et al.*, 2019:2; Hämäläinen, Kvist & Kankkunen, 2022:1). Furthermore, the inadequate assessment and management of pain is an ongoing problem, despite advances in pain management. Anecdotal observations of this occurrence by the researcher over a period of time was the motivation for this study. Inadequate pain assessment and pain management, and a lack of standardisation of patient care related to pain assessment and pain management observed were a concern. To address this problem, best practice guidelines are advocated to guide the nurses as the end-users of the guideline, regarding the best action to take regarding pain assessment and pain management to achieve the best health outcomes for the patient (Wang, Norris & Bero, 2018:1).

Best practice guidelines are based on evidence-based recommendations that follow a rigorous process in the development. In essence, BPGs are the channels in which EBP, and research are translated into clinical practice. The use of BPG would eliminate inconsistencies in the practice and would further foster evidence-based decisions in a time-constrained environment (Guerra-Farfan, Garcia-Sanchez, Jornet-Gibert, *et al.*, 2022:2).

8.2.1 Phase One

Phase one comprised two sub-studies.

8.2.1.1 Sub-study one

Findings in this study revealed that nurses unanimously agreed that pain assessment should be done according to a structured plan, using a validated pain assessment scale. They further agreed that pain assessment should be regarded as the fifth vital sign. The findings indicated that approximately half of the nurses displayed adequate knowledge, while half have good

Stellenbosch University https://scholar.sun.ac.za

knowledge and 4% have poor knowledge related to pain assessment and management. The findings also showed that nurses do not practice the use of pain assessment tools in the EC. Findings further revealed that nurses collectively agreed that a best practice guideline for the assessment and management of acute trauma-related pain would improve patient outcomes with regard to their assessment and management of acute trauma-related pain in the EC.

8.2.1.2 Sub-study two

The findings concluded the presence of pain in the majority of patients present in the ECs of the participating hospitals at the time of data collection. However, their pain was not convincingly assessed by nurses. Patients were dissatisfied regarding the pain management rendered by nurses; according to them, the nurses did not do enough to address their pain needs.

In the absence of BPGs in the current practice, this study and the contextualisation of a BPG would contribute to nurses' knowledge, attitudes, and practices of acute trauma-related pain management in the EC. Best practice guidelines provide evidence-based recommendations that are available to provide guidance and assist with decision making in clinical practice (Oliveira, Maher, Pinto, *et al.*, 2018:2792). It is envisaged that this guideline would alleviate the patient's dissatisfaction by providing step-by-step guidelines, and an algorithm on the assessment and management of acute trauma-related pain in the EC. Evidence-based recommendations would contribute to improving patient outcomes.

8.2.2 Phase Two

A rigorous search strategy (Figure 5.2) was conducted resulting in twelve eligible guidelines. Using the Appraisal of Guidelines Research and Evaluation, Version II (AGREE II) to appraise these guidelines, and six guidelines were selected for inclusion (Table 5.1). Findings from this phase revealed that grading systems and levels of evidence were not clearly indicated in all the guidelines, hence not all BPGs were of high quality (Table 5.5).

Content analysis was used to categorise the extracted data to identify common patterns of pain assessment and pain management emerging from the guidelines (Table 5.6). Three main themes emerged from this analysis: practice, education, and organizational. Recommendations were extracted from each guideline according to these themes. Practice considerations included pain assessment and pain management. Findings in this phase contributed to the contextualised best practice guideline.

Stellenbosch University https://scholar.sun.ac.za

8.2.3 Phase three

Phase three comprise the contextualisation of the best practice guideline, which included four steps, namely (1) the synthesis of the extracted recommendations, (2) wording of the recommendations, (3) contextualisation of guidelines and (4) expert validation. The three main recommendations identified were practice (acute pain assessment and acute pain management), education, and organisational. In addition, an evidence summary document, namely the algorithm was developed. Since the EC is a busy and often overcrowded area, the algorithms will allow quick and easy access for nurses to refer to when assessing and managing acute trauma-related pain. Algorithms can be placed at assessment points in the EC, for example, in the triage area, patient holding sections and at the bedside of the patient.

8.3 LIMITATIONS

Limitations to the study were identified: settings of phase one of the study, the Covid-19 pandemic, and the scoping review.

8.3.1 Settings

Ensuring privacy was a challenge due to the geographical layout of the ECs and proximity of patients in both the pilot test and main study. Overcrowding was a problem as it compromised the privacy of the participating patients. Furthermore, it was difficult to administer the consent forms and surveys to the patients in an envelope as planned. It was awkward for patients to remove the documents, read, sign, and place back in the envelope. Additionally, patients with hand injuries only had the use of one hand. Many patients were in pain and found it cumbersome to remove the documents and place it back after completion. So, the consent forms and surveys were handed to the patients. On completion both forms were taken from the patient and placed in a sealed box in front of the patient. However, despite these challenges, the collection of data was not compromised.

8.3.2 Covid-19 pandemic

Data collection was delayed due to the Covid-19 pandemic. The Department of Health in the Western Cape did not allow face-to-face contact for research purposes, including data collection during this period. The researcher was reluctant to pursue electronic data collection as nurses' accessibility to computers for research purposes was a concern and the researcher feared a low response rate. Data collection for sub-study two had to be conducted face-to-face. During data collection, the researcher had to follow Covid-19 protocols. Adhering to these protocols was difficult due to the general busy encounters of ECs. Furthermore, the South African government implemented national restrictions on alcohol usage during the lockdown period that led to a notable decrease in trauma admissions. Accordingly, fewer trauma cases were admitted that further delayed the data collection process. As a result, the

Stellenbosch University https://scholar.sun.ac.za

sample size for sub-study two was reviewed to expedite the data collection process. This allowed the data collection process to be completed sooner, whilst still maintaining the integrity of the study. However, despite these limitations, sufficient data was collected to make generalisations about the findings of the study.

Access to certain guideline repositories was not accessible on the University of Stellenbosch website, for example Scottish Intercollegiate Guideline Network (SIGN), limiting access to the search for guidelines for the scoping review. Access to a wider range of guidelines would have given the researcher a broader range of guidelines to select from, thereby increasing the search strategy of guidelines specific to acute trauma-related pain. However, for the scope of this study, the researcher was able to access substantial guidelines on pain assessment and pain management and was able to proceed with the scoping review. The rigour of the scoping was not compromised.

8.3.3 Instrument

Psychometric testing of the data collections instrument in phase one would have enhanced the reliability and validity of the research study. This would add to the credibility and trustworthiness of the results of the study.

8.4 RECOMMENDATIONS

Recommendations for this research study are applicable to nursing practice, education, and research.

8.4.1 Recommendations for Practice

To the researcher's knowledge there is no guideline for nurses for the assessment and management of acute trauma-related pain in ECs in the Western Cape. It is recommended that this BPG be implemented in ECs to promote standardisation in evidence-based assessment and management of acute trauma-related pain. The implementation of the BPG would allow the standardisation of acute pain assessment and management in the ECs in the WC. It is recommended that the management of healthcare facilities with ECs make the implementation of this BPG mandatory and further implement monitoring and auditing systems for quality assurance.

8.4.2 Recommendations for Education

Based on the findings of the research study, the following recommendations are made for nursing education:

Education and training platforms must be created to provide evidence-based pain assessment and pain management training. Short courses can be provided to enhance the knowledge,

Stellenbosch University https://scholar.sun.ac.za

attitudes, and practices of nurses on pain assessment and pain management of the trauma patients in the ECs. Online modules can be developed to assist nurses in accessing information on pain assessment and management. Workshops can be held to help nurses understand the use of validated pain scales in the management of acute trauma-related pain in the ECs. As part of continuous professional development, nurses can attend seminars and webinars that focus on pain assessment and pain management. Specific topics, for instance pharmacological and nonpharmacological management of acute trauma-related pain can be addressed by means of educational training material, interventions, and training programmes. Additionally, there should be more emphasis on pain assessment and pain management in the under-and postgraduate nursing curricula.

To ensure that the implementation of the BPG is sustainable, there must be engagement on different levels. To enhance dissemination and implementation of this BPG and algorithm, it is imperative to provide training for nurses working in the ECS. Training can be conducted as workshops and in-service training. Training would incorporate knowledge regarding the BPG, the implementation and use of the BPG and the algorithm. Further, it is recommended that EBP workshops be held to create an awareness in nurses to base their decisions on the best available evidence and the role of guidelines in the delivery of nursing care.

8.4.3 Recommendations for Research

Based on the findings of this study, it is recommended that qualitative studies be conducted in exploring the experiences of patients in the ECs regarding pain. Furthermore, a qualitative study on the barriers and facilitators related to pain assessment and pain management amongst nurses in the ECs can be conducted. A study can be done amongst the nurse managers and other members of the healthcare team in the ECs to explore organisational factors that might influence the implementation of BPGs on pain assessment and pain management. Further quantitative research studies can be conducted amongst all the members of the health care team involved in the patients' journey in the ECs to explore their knowledge, attitudes and practices related to pain assessment and management. Educational interventions can be developed and implemented on pain assessment and pain management, after which pre-and postintervention studies can be conducted amongst nurses in the EC. Surveys, exploring the knowledge and use of BPGs amongst nurses can be done, in order to establish the effective implementation of BPGs.

Finally, as part of continuation of this research and as post-doctoral work, the BPG should be tested for feasibility, appropriateness, meaningfulness, and effectiveness, where the JBI FAME framework can be used.

Stellenbosch University https://scholar.sun.ac.za

8.5 SUMMARY

The findings of the study showed that nurses' knowledge was inadequate regarding the assessment and management of acute trauma-related pain and that trauma patients were dissatisfied regarding the pain management rendered by nurses. It was evident from the findings that there was a need for a best practice guideline in the EC setting. The combination of practice findings from phase one and contextual recommendations from phase two constituted the draft guideline. Feedback from the expert review panel resulted in amendments to these recommendations and the finalisation of the BPG. The limitations to this study did not compromise the integrity of the study. Recommendations for further studies to improve best practices regarding acute trauma-related pain assessment and management has been highlighted.

Stellenbosch University https://scholar.sun.ac.za

REFERENCE LIST

Abdolrazaghnejad, A., Banaie, M., Tavakoli, N., Safdari, M. & Rajabpour-Sanati, A. 2018. Pain management in the emergency department: A review article on options and methods. *Advanced Journal of Emergency Medicine,* 2(4):1–14.

Abudari, G., Aljawi, D., Almass, K., Botha, S. & Alhnaidi, S. 2021. Quality of pain assessment for Emergency Department nurses and physicians at a tertiary hospital, EC. *Nursing And Healthcare,* 3(2):87-101.

Accardi-Ravid, M.C., Dyer, J.R., Sharar, S.R., Wiechman, S., Jensen, M.P., Hoffman, H.G. & Patterson, D.R. 2018. The nature of trauma pain and its association with catastrophizing and sleep. *International Journal of Behavioral Medicine,* 25(6):698–705.

Adam, V.N., Mršić, V., Matolić, M., Tonković, D., Rašić, Ž. & Matejić, T. 2013. Stress and pain in emergency and trauma patients. *Periodicum Biologorum,* 115(2):135–138.

ADAPTE. 2010. *Guideline adaptation: a resource toolkit.* [Online], Available: https://g-i-n.net/wp-content/uploads2021/03/ADAPTE-Resource-toolkit-March-2010.pdf, [2021, July 15].

Admassie, B.M., Lema, G.F., Ferede, Y.A. & Tegegne, B.A. 2022. Emergency nurses perceived barriers to effective pain management at emergency department in Amhara region referral hospitals, Northwest Ethiopia, 2021. Multi-center cross sectional study. *Annals of Medicine and Surgery*. 81:1-6, [Online], Available: https://doi.org/10.1016/j.amsu.2022.104338, [2022, September 05].

Afaya, A., Bam, V., Azongo, T.B., Afaya, R.A., Yakong, V.N., Kpodo, G.K., Kaba, R.A., Nangsire Zinle, D.A., et al. 2021. We are left with nothing to work with; challenges of nurses working in the emergency unit at a secondary referral hospital: A descriptive qualitative study. *PLoS ONE,* 16(2):1–12.

Ahmadi, A., Bazargan-Hejazi, S., Heidari Zadie, Z., Euasobhon, P., Ketumarn, P., Karbasfrushan, A., Amini-Saman, J. & Mohammadi, R. 2016. Pain management in trauma: A review study. *Journal of Injury and Violence Research,* 8(2):89–98.

Al-Quliti, K.W. & Alamri, M.S. 2015. Knowledge, attitudes, and practices of health care providers in Almadinah Almunawwarah, Saudi Arabia. *Neurosciences,* 20(2):131–136.

Alkhatib, G.S., Al Qadire, M. & Alshraideh, J.A. 2020. Pain management knowledge and attitudes of healthcare professionals in primary medical centers. *Pain Management*

Stellenbosch University https://scholar.sun.ac.za

Nursing, 21(3):265–270.

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

Alvesson Karremann 2000_Study of organizations through discourse analysis. *Human Relations*, 53(9):1125-1149.

American College of Surgeons, the committee on trauma & American Society of Anesthesiologists. 2020. *Guidelines for acute pain management in trauma patients*. [Online], Available: https://www.facs.org/media/exob3dwk/acute_pain_guidelines.pdf, [2021, January 05].

Angeletti, C., Guetti, C., Paesani, M., Colavincenzo, S., Ciccozzi, A. & Angeletti, P.M. 2018. An analysis of Italian nurses' approach to patients' pain: A nationwide online survey. *Pain Research and Management*, [Online], Available:DOI: 10.1155/2018/5165262 [2021, August 11].

Apuke, O.D. 2017. Quantitative research methods : A synopsis approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 6(11):40–47.

Ardon, A., Warrick, M. & Wickas, T. 2019. A Multi-faceted educational approach for pain metric recording prior to knee and hip arthroplasty: Effects on documentation by an acute pain service. *Cureus,* 11(6):1-11.

Arksey, H. & O'Malley, L. 2005. Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology: Theory and Practice,* 8(1):19–32.

Ayaz, N.P. & Sherman, D.W. 2022. Understanding Attitudes, social norms, and behaviors of a cohort of post-operative nurses related to pain and pain management. *Healthcare (Switzerland)*, 10(5):1-12.

Baharuddin, K.A., MohaMad, N., Rahman, HA., Rashidi Ahmad, R., & Shaiffudin, A. 2010. Assessing Patient pain scores in the ER. *Malaysian Journal of Medical Science,* 17(1):17–22.

Balasubramanian, I., Mohan, H.M., Whelan, R.J., McDermott, F. & Winter, D.C. 2016. Restructuring an evolving Irish trauma system: What can we learn from Europe and Australia *Surgeon,* 14(1):44–51.

Ballantyne, J.C., Kalso, E. & Stannard, C. 2016. WHO analgesic ladder: A good concept gone astray. *BMJ (Online),* 352:1–2. [Online], Available:

Stellenbosch University https://scholar.sun.ac.za

https://www.bmj.com/content/352/bmj.i20.full, [2022, June 05].

Ballout, R.A., Foster, J.P., Kahale, L.A. & Badr, L. 2017. Body positioning for spontaneously breathing preterm infants with apnoea. *Cochrane Database of Systematic Reviews* 2017, Issue 1. Art. No.: CD004951. DOI: 10.1002/14651858.CD004951.pub3, [2021, September 05].

Berben, S.A.A., Meijs, T.H.J.M., van Grunsven, P.M., Schoonhoven, L. & van Achterberg, T. 2012. Facilitators and barriers in pain management for trauma patients in the chain of emergency care, *Injury*, 43(9):1397–1402.

Best, J.T., Musgrave, B., Pratt, K., Hill, R., Evans, C. & Corbitt, D. 2018. The Impact of scripted pain education on patient satisfaction in outpatient abdominal surgery patients. *Journal of Perianesthesia Nursing,* 33(4):453–460.

Best Practice Spotlight Organization. 2011. Impact survey summary of survey results overview, 1-4. [Online], Available: https://rnao.ca/bpg/bpso, [2022, April 10].

Bifulco, L., Anderson, D.R., Blankson, M.L., Channamsetty, V., Blaz, J.W., Nguyen-Louie, T.T. & Scholle, S.H. 2021. Evaluation of a chronic pain screening program implemented in primary care. *JAMA Network Open,* 4(7):1–11.

Birkhan, J., Desai, P.B., Foley, K., Martelete, M., RANE, A., Swerdlow, M. & Takeda, F. 1986. *Cancer pain relief*. World Health Organization: Geneva.

Blumstein, B. & Barkley, T.W. 2015. Neuropathic pain management: A reference for the clinical nurse. *MEDSURG Nursing,* 24(6):381-438.

Board of Nursing. 2010. *Pain management nursing role / core competency a guide for nurses, 1-13*.

Bouri, F., El Ansari, W., Mahmoud, S., Elhessy, A., Al-Ansari, A. & Al-Dosari, M. 2018. Orthopedic professionals' recognition and knowledge of pain and perceived barriers to optimal pain management at five hospitals. *Healthcare*, 6(3):1-14.

Bozimowski, G. 2012. Patient perceptions of pain management therapy: A comparison of real-time assessment of patient education and satisfaction and registered nurse perceptions. *Pain Management Nursing,* 13(4):186–193.

Brady, B., Veljanova, I. & Chipchase, L. 2017. An exploration of the experience of pain among culturally diverse migrant communities. *Rheumatology Advances in Practice,* 1(1):1–14.

Stellenbosch University https://scholar.sun.ac.za

Brennan, F., Lohman, D. & Gwyther, L. 2019. Access to pain management as a human right. *American Journal of Public Health,* 109(1):61–65.

Brink, H., Van der Walt, C. & Van Rensburg, G.H. 2018. *Fundamentals of research methodology for healthcare professionals*. 4th edition. Cape Town: Juta.

Brouwers, M.C., Kho, M.E., Browman, G.P., Burgers, J.S., Cluzeau, F., Feder, G., Fervers, B., Graham, I.D., et al. 2010. AGREE II: Advancing guideline development, reporting, and evaluation in health care, *CMAJ,* 182(18):839-842.

Brysiewicz, P., Scott, T., Acheampong, E. & Muya, I. 2021. Facilitating the development of emergency nursing in Africa: Operational challenges and successes. *African Journal of Emergency Medicine,* 11(3):335–338.

Buccheri, R.K. & Sharifi, C. 2017. Critical Appraisal Tools and Reporting Guidelines for Evidence-Based Practice. *Worldviews on Evidence-Based Nursing,* 14(6):463–472.

Cakir, U., Cete, Y., Yigit, O. & Bozdemir, M.N. 2018. Improvement in physician pain perception with using pain scales. *European Journal of Trauma and Emergency Surgery*, 44(6):909–915.

Campbell, J.N. 2016. The fifth vital sign revisited. *Pain,* 157(1):3–4.

Chew, K.S. & Shaharudin, A.H. 2017. An open-label randomised controlled trial on the efficacy of adding intranasal fentanyl to intravenous tramadol in patients with moderate to severe pain following acute musculoskeletal injuries. *Singapore Medical Journal*, 58(10):601–605.

Chow, K.M., Chan, J.C.Y. & Joanne, C.Y. 2014. Pain knowledge and attitudes of nursing students: A literature review. *Nursing Education Today*. [Online] Available:doi:10.1016/j.nedt.2014.10.01J.C.Y [2022, June 02].

Clark, K., Rao, A., Chen, V., Mda, P., Piek, F., Irudeo, J., Maharaj, R., Wallis, L., et al. 2020. We need to target trauma: A prospective observational study in Eastern Cape Province, South Africa. *South African Medical Journal.* 110(1):38–43.

Colquhoun, H.L., Levac, D., O'Brien, K.K., Straus, S., Tricco, A.C., Perrier, L., Kastner, M. & Moher, D. 2014. Scoping reviews: Time for clarity in definition, methods, and reporting. *Journal of Clinical Epidemiology,* 67(12):1291–1294.

Coren, E., Hossain, R., Pardo Pardo, J. & Bakker, B. 2016. Interventions for promoting reintegration and reducing harmful behaviour and lifestyles in street-connected children and young people. *The Cochrane Database of Systematic Reviews, 8(4):1140-1272*.

Stellenbosch University https://scholar.sun.ac.za

Cox, F., Cannons, K., Lewis, S., Brown, D., Everett, D., Jenkins, S., Roberts, J., Townsend, R., et al. 2015. RCN pain knowledge and skills framework for the nursing team. *Nursing Standard,* 25(1): 36-39.

Creswell, J.W. & Creswell J. David. 2018. *Research design qualitative, quantitative, and mixed methods approaches*. 5th edition. California: SAGE.

Cullinan, K. 2006. Health services in South Africa: A basic introduction. *The South African Health News Service,* 1–38.

Cuomo, A., Bimonte, S., Forte, C.A., Botti, G. & Cascella, M. 2019. Multimodal approaches and tailored therapies for pain management: The Trolley Analgesic Model. *Journal of Pain Research*, 12:711-714.

Dale, J. & Bjørnsen, L.P. 2015. Assessment of pain in a Norwegian Emergency Department. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine,* 23(1):1–5.

Department of Health, SA. 2019. *Annual Report 2019-2020.* Pretoria: Government Printers.

Department of public service and administration, S.A. 2014. The Batho Pele Vision, 1–11.

Department of Social Development. n.d. *The Chilfren's Act Explained Booklet 1: Children and parents - rights and responsibilities*.[Online] Available: https://www.justice.gov.za/vg/children/dsd-Children_Act_ExplainedBooklet1_June2009.pdf, (2022, March 20].

DeVore, J., Clontz, A., Ren, D., Cairns, L. & Beach, M. 2017. Improving patient satisfaction with better pain management in hospitalized patients. *The Journal for Nurse Practitioners*, 13(1):e23--e27.

Diamond, M.B., Dalal, S., Adebamowo, C., Guwatudde, D., Laurence, C., Ajayi, I.O., Bajunirwe, F., Njelekela, M.A., et al. 2018. Prevalence and risk factor for injury in sub-Saharan Africa: A multicountry study. *Injury Prevention,* 24(4):272–278.

Dijkink, S., Nederpelt, C.J., Krijnen, P., Velmahos, G.C. & Schipper, I.B. 2017. Trauma systems around the world: A systematic overview. *Journal of Trauma and Acute Care Surgery,* 83(5):917–925.

Dilunga, G.D., Sawe, H.R., Kulola, I.B., Mfinanga, J.A., Lucumay, N.J., Mulesi, E.M. & Weber, E.J. 2018. Pain assessment and management of trauma patients in an emergency department of a tertiary hospital in Tanzania. *Safety in Health,* 4(12):1-6.

Dißmann, P.D., Maignan, M., Cloves, P.D., Gutierrez Parres, B., Dickerson, S. & Eberhardt, A. 2018c. A review of the burden of trauma pain in emergency settings in Europe. *Pain*

Stellenbosch University https://scholar.sun.ac.za

and Therapy, 7(2):179–192.

Dizon, J.M., Machingaidze, S. & Grimmer, K. 2016. To adopt, to adapt, or to contextualise? the big question in clinical practice guideline development. *BMC Research Notes,* 9(1):1–9.

Dries, D.J. 2005. Guidelines for essential trauma care. *Shock,* 23(1):97–98.

Dunwoody, C.J., Krenzischek, D.A., Pasero, C., Rathmell, J.P. & Polomano, R.C. 2008. Assessment, physiological monitoring, and consequences of inadequately treated acute pain. *Journal of Perianesthesia Nursing*, 23(1):S15-S27.

Elkbuli, A., Stotsenburg, M., Epstein, C., Calvert, K., Boneva, D., McKenney, M. & Deaton, K. 2020. A multidisciplinary approach to improve pain management and satisfaction in a trauma population. *Journal of Trauma Nursing*, 27(2):96–103.

Esteban-Sepúlveda, S., Sesé-Abad, A., Lacueva-Pérez, L., Domingo-Pozo, M., Alonso-Fernandez, S., Aquilue-Ballarin, M., Barcelo-Martinez, A.I., Cristobal-Dominguez, E., et al. 2021. Impact of the implementation of best practice guidelines on nurse's evidence-based practice and on nurses' work environment: Research protocol. *Journal of Advanced Nursing,* 77(1):448–460.

Etoundi, P.O., Mbengono, J.A.M., Ntock, F.N., Tochie, J.N., Ndom, D.C.A., Angong, F.T.E., Beyiha, G. & Minkande, J.Z. 2019. Knowledge, attitudes, and practices of Cameroonian physicians with regards to acute pain management in the emergency department: A multicenter cross-sectional study. *BMC Emergency Medicine*, 19(1):1–5.

Fallon, E., Fung, S., Rubal-Peace, G. & Patanwala, A.E. 2016. Predictors of patient satisfaction with pain management in the Emergency Department: *Advanced Emergency Nursing Journal,* 38(2):115–122.

Farčić, N., Barać, I., Pačarić, S., Lovrić, I. & Ilakovac, V. 2017. Acute postoperative pain in trauma patients - The fifth vital sign. *Macedonian Journal of Medical Sciences,* 5(3):310–315.

Ferrell, Betty and McCaffery, M. 2014. *Knowledge and attitudes survey regarding pain*. [Online] Available: https://prc.coh.org/Knowledge%20%20&20Attitude%20Survey%207-14%20(1).pdf, [2020, January 05].

Fineout-Overholt, E., Melnyk, B.M. & Schultz, A. 2005. Transforming health care from the inside out: Advancing evidence-based practice in the 21st century. *Journal of Professional Nursing,* 21(6):335–344.

Stellenbosch University https://scholar.sun.ac.za

Fineout-Overholt, E., Melnyk, B.M., Stillwell, S.B. & Williamson, K.M. 2010. Evidence-based practice, step by step: Critical appraisal of the evidence part III. *American Journal of Nursing,* 110(11):43–51.

Fouché, C., Strydom, H. & Roestenberg, W. 2022. *Research at grass roots for the social sciences and human services professions*. 5th edition. Pretoria: Van Schaik.

Free, M.M. 2002. Cross-cultural conceptions of pain and pain control. *Baylor University Medical Center Proceedings*, 15(2):143–145.

Gaakeer, M.I., Van Lieshout, J.M. & Bierens, J.J.L.M. 2010. Pain management in emergency departments: A review of present protocols in the Netherlands. *European Journal of Emergency Medicine,* 17(5):286–289.

Gagliardi, A.R., Brouwers, M.C., Palda, V.A., Lemieux-Charles, L. & Grimshaw, J.M. 2011a. How can we improve guideline use? A conceptual framework of implementability. *Implementation Science,* 6(1):26.

Gagliardi, A.R., Brouwers, M.C., Palda, V.A., Lemieux-Charles, L. & Grimshaw, J.M. 2011b. How can we improve guideline use? A conceptual framework of implementability. *Implementation Science,* 6(1):1–11.

Gan, T.J. 2017. Poorly controlled post operative pain. *Journal of Pain Research,* 10:2287–2298.

Gerber, M.R. & Gerber, E.B. 2019. An introduction to trauma and health. *Trauma-Informed Healthcare Approaches*, 3–23.

Germossa, G.N., Hellesø, R. & Sjetne, I.S. 2019. Hospitalized patients' pain experience before and after the introduction of a nurse-based pain management programme: a separate sample pre and post study. *BMC Nursing,* 18(1):40.

Geurts, J.W., Willems, P.C., Lockwood, C., van Kleef, M., Kleijnen, J. & Dirksen, C. 2017. Patient expectations for management of chronic non-cancer pain: A systematic review. *Health Expectations,* 20(6):1201–1217.

Giusti, G.D., Reitano, B. & Gili, A. 2018. Pain assessment in the emergency department. Correlation between pain rated by the patient and by the nurse: An observational study. *Acta Biomedica,* 89:64–70.

Giustini, M., Rogmans, W., Turner, S., Bejko, D., Ellsaesser, G., Laursen, B., Pitidis, A., Valkenberg, H., et al. 2021. Injuries in the European Union 2009-2018, [Online]. Available: https://www.eurosafe.eu.com/uploads/inline-

Stellenbosch University https://scholar.sun.ac.za

files/Report%20Injuries%20in%20EU%202009-2018%20FINAL%20SEPT%2021_pdf.pdf, [2021, September 10]

Givler, A. & Maani-Fogelman, P.A. 2019. The importance of cultural competence in pain and palliative care. *StatPearls*. [Online], Available: http://www.ncbi.nlm.nih.gov/pubmed/29630206, [2021, July 07].

Gonzalez-Suarez, C., Dizon, J., King, Lorenzo, Valdecanas, Gambito, Fidel & Grimmer-Somers, K. 2012. Contextualizing Western guidelines for stroke and low back pain to a developing country (Philippines): an innovative approach to putting evidence into practice efficiently. *Journal of Healthcare Leadership, 2012(4):*141-156.

Gorawara-Bhat, R., Wong, A., Dale, W. & Hogan, T. 2017. Nurses' perceptions of pain management for older-patients in the Emergency Department: A qualitative study. *Patient Education and Counseling*, 100(2):231–241.

Gordon, D.B. 2015. Acute pain assessment tools: Let us move beyond simple pain ratings. *Current Opinion in Anaesthesiology*, 28(5):565–569.

Gordon, D.B., de Leon-Casasola, O.A., Wu, C.L., Sluka, K.A., Brennan, T.J. & Chou, R. 2016. Research gaps in practice guidelines for acute postoperative pain management in adults: findings from a review of the evidence for an american pain society clinical practice guideline. *The Journal of Pain,* 17(2):158–166.

Grady, K. 2015. Core Standards for pain management services in the UK., Royal College of Anaesthetists Guidelines. [Online] Available: https://fpm.ac.uk/sites/fpm/files/documents/2019-07/Core%20Standards%20for%20Pain%20Management%20Services.pdf, [2020, November 01].

Gray, J.R. & Grove, Susan, K. 2021. *Burns and Grove's: The practice of nursing research appraisal, synthesis, and generation of evidence*. 9th edition. St. Louis, Missouri: Elsevier.

Gray, J.R., Grove, S.K. & Sutherland, S. 2017. *The Practice of nursing research appraisal, synthesis, and generation of evidence*. 8th edition. St Louis: Elsevier.

Greenfield, S., Steinberg, E., Auerbach, A. & Al, E. 2011. *Clinical practice guidelines we can trust*. Washington, DC: *Institute of Medicine,* 2011:1-3.

Gregory, J. 2017. Initial testing of a behavioural pain assessment tool within trauma units. *International Journal of Orthopaedic and Trauma Nursing,* 24:3–11.

Gretarsdottir, E., Zoëga, S., Tomasson, G., Sveinsdottir, H. & Gunnarsdottir, S. 2017.

Stellenbosch University https://scholar.sun.ac.za

Determinants of knowledge and attitudes regarding pain among nurses in a university hospital: A cross-sectional study. *Pain Management Nursing,* 18(3):144–152.

Grimmer, K., Louw, Q., Dizon, J.M., Brown, S.M., Ernstzen, D. & Wiysonge, C.S. 2019. A South African experience in applying the Adopt-Contextualise-Adapt framework to stroke rehabilitation clinical practice guidelines. *Health Research Policy and Systems,* 17(1):1–14.

Guerra-Farfan, E., Garcia-Sanchez, Y., Jornet-Gibert, M., Nuñez, J.H., Balaguer-Castro, M. & Madden, K. 2022. Clinical practice guidelines: The good, the bad, and the ugly. *Injury,* 13(23):5–8.

Haagsma, J.A., Graetz, N., Bolliger, I., Naghavi, M., Higashi, H., Mullany, E.C., Abera, S.F., Abraham, J.P., et al. 2016. The global burden of injury: Incidence, mortality, disability-adjusted life years and time trends from the global burden of disease study 2013. *Injury Prevention,* 22(1):3–18.

Haagsma, J.A., Charalampous, P., Ariani, F., Gallay, A., Iburg, K.M., Nena, E., Ngwa, C.H., Rommel, A., et al. 2022. The burden of injury in Central , Eastern , and Western European sub - region : a systematic analysis from the Global Burden of Disease 2019 Study. *Archives of Public Health*, 1–14.

Hachimi-Idrissi, S., Dobias, V., Hautz, W.E., Leach, R., Sauter, T.C., Sforzi, I. & Coffey, F. 2020. Approaching acute pain in emergency settings; European Society for Emergency Medicine (EUSEM) guidelines-part 2: management and recommendations. *Internal & Emergency Medicine*, 15(7):1141–1155. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=146033716&site=ehost-live&scope=site, [2021, January 08].

Hall, G. & Gregory, J. 2016. The assessment and management of pain in an orthopaedic out-patient setting: A case study. *International Journal of Orthopaedic and Trauma Nursing,* 22:24–28.

Hämäläinen, J., Kvist, T. & Kankkunen, P. 2022. Acute pain assessment inadequacy in the Emergency Department: Patients' perspective. *Journal of Patient Experience,* 9:1–9.

Hamdan, K.M., Shaheen, A.M. & Abdalrahim, M.S. 2022. Barriers and enablers of intensive care unit nurses' assessment and management of patients' pain. *Nursing in Critical Care,* 27(4):567–575.

Hardcastle, T.C. 2008. What's in a name? Terminology in emergency care in South Africa. *South African Medical Journal*, 98(9):658.

Stellenbosch University https://scholar.sun.ac.za

Hardcastle, T.C., Oosthuizen, G., Clarke, D. & Lutge, E. 2016. Trauma, a preventable burden of disease in South Africa : review of the evidence, with a focus on KwaZulu-Natal. *South African Health Review,* 2016(1):179–189. [Online], Available: https://journals.co.za/content/healthr/2016/1/EJC189309?TRACK=RSS, [2021, July 15].

Hatherley, C., Jennings, N. & Cross, R. 2016. Time to analgesia and pain score documentation best practice standards for the Emergency Department: A literature review. *Australasian Emergency Nursing Journal*, 19(1):26–36.

HCANJ. 2017. Pain Management Guideline. *Health Care Association of NJ*. 1–30. [Online], Available: https://www.hcanj.org/files/2013/09/Pain-Management-Guidelines-_HCANJ-May-12-final.pdf, 2020, February 12].

Heikkilä, K., Peltonen, L.M. & Salanterä, S. 2016. Postoperative pain documentation in a hospital setting: A topical review. *Scandinavian Journal of Pain,* 11(2016):77–89.

Henry, S.G. & Matthias, M.S. 2018. Patient-clinician communication about pain: A conceptual model and narrative review. *Pain Medicine (United States),* 19(11):2154–2165.

Ho, S.E., Ho, C.C., Pang Yuen, H., Lexshimi, R., Choy, Y.C., Jaafar, M.Z., Cardosa, M. & Das, S. 2013. A study of knowledge and attitudes of registered nurses towards pain management in an urban hospital. *La Clinica terapeutica*, 164(3):215–219.

Holl, R.M. & Carmack, J. 2015. Complexity of pain, nurses' knowledge, and treatment options. *Holistic Nursing Practice,* 29(6):377–380.

Hsu, J.R., Mir, H., Wally, M.K., Seymour, R.B., Archer, K.R., Attum, B., Chad Coles, K.Y., Dumpe, J., et al. 2019. Clinical practice guidelines for pain management in acute musculoskeletal injury. *Journal of Orthopaedic Trauma*, 33(5):E158–E182.

Hsu, J.R., Mir, H., Wally, M.K. & Seymour, R.B. 2019. Clinical practice guidelines for pain management in acute musculoskeletal injury. *Journal of Orthopaedic Trauma*, 33(5):e158–e182.

Ibitoye, B.M., Olubiyi, S.K., Anyebe, E. & Ampofo, A. 2020. Incidence of post-operative pain and patient satisfaction with its management in University of Ilorin Teaching Hospital. *Tropical Journal of Health Sciences*, 27(2):39–44. [Online], Available: https://www.researchgate.net/publication/351637462 [2022, January 11].

Jablonski, A.M., DuPen, A.R. & Ersek, M. 2011. The use of algorithms in assessing and managing persistent pain in older adults. *American Journal of Nursing,* 111(3):34–43.

Jamal, S.M., Fathil, S.M., Nidzwani, M.M., Ismail, A.K. & Yatim, F.M. 2011. Vintravenous

Stellenbosch University https://scholar.sun.ac.za

Ketamine is as effective as midazolam/ fentanyl for procedural sedation and analgesia in the Emergency Department. *Medical Journal of Malaysia,* 66(3):231–233.

Jonsdottir, T. & Gunnarsson, E.C. 2021. Understanding nurses' knowledge and attitudes toward pain assessment in dementia: A literature review. *Pain Management Nursing*, 22(3):281–292.

Jordan, Z., Lockwood, C., Munn, Z. & Aromataris, E. 2018. Redeveloping the JBI model of evidence based healthcare. *International Journal of Evidence-Based Healthcare*, 16(4):227–241.

Jordan, Z., Lockwood, C., Munn, Z. & Aromataris, E. 2019. The updated Joanna Briggs Institute Model of Evidence-Based Healthcare. *International Journal of Evidence-Based Healthcare,* 17(1):58–71.

Kahsay, D.T. & Pitkäjärvi, M. 2019. Emergency nurses´ knowledge, attitude and perceived barriers regarding pain management in resource-limited settings: Cross-sectional study. *BMC Nursing,* 18(1):1–13.

Kaur, K. 2017. Knowledge and attitude regarding pain management among staff nurses. *Nursing & Care Open Access Journal*, 2(1):7–9.

Keene, D.D., Rea, W. e. & Aldington, D. 2011. Acute pain management in trauma. *Trauma,* 13(3):167–179.

Kia, Z., Allahbakhshian, M., Ilkhani, M., Nasiri, M. & Allahbakhshian, A. 2021. Nurses' use of non-pharmacological pain management methods in intensive care units: A descriptive cross-sectional study. *Complementary Therapies in Medicine,* 58:1-5.

Klopper, H., Andersson, H., Minkkinen, M., Ohlsson, C. & Sjöström, B. 2006. Strategies in assessing post operative pain - A South African study. *Intensive and Critical Care Nursing,* 22(1):12–21.

Köse Tamer, L. & Sucu Dağ, G. 2020. The assessment of pain and the quality of postoperative pain management in surgical patients. *SAGE Open,* 10(2):1-10.

Kühberger, A., Fritz, A., Lermer, E. & Scherndl, T. 2015. The significance fallacy in inferential statistics psychology. *BMC Research Notes,* 8(1):1–9.

Kutlutürkan, S. & Urvaylioğlu, A. 2020. Evaluation of pain as a fifth vital sign: Nurses' opinions and beliefs. *Asia-Pacific Journal of Oncology Nursing,* 7(1):88–94.

Latina, R., Mauro, L., Mitello, L., D'Angelo, D., Caputo, L., De Marinis, M.G., Sansoni, J., Fabriani, L., et al. 2015. Attitude and knowledge of pain management among Italian

Stellenbosch University https://scholar.sun.ac.za

nurses in hospital settings. *Pain Management Nursing,* 16(6):959–967.

Leider, J.P., DeBruin, D., Reynolds, N., Koch, A. & Seaberg, J. 2017. Ethical Guidance for disaster response, specifically around crisis standards of care: A systematic review. *American Journal of Public Health,* 107(9):e1–e9.

Levac, D., Colquhoun, H. & O'Brien, K.K. 2010. Scoping studies: Advancing the methodology. *Implementation Science*. 5(69):1–9. [Online], Available: http://www.implementationscience.com/content/5/1/69%0D, [2021, February 02].

Limb, C., Fowler, A., Gundogan, B., Koshy, K. & Agha, R. 2017. How to conduct a clinical audit and quality improvement project. *International Journal of Surgery: Oncology*, 2(24):1-4.

Lippe, P.M., Brock, C., David, J., Crossno, R. & Gitlow, S. 2010. The First National Pain Medicine Summit - Final Summary Report. *Pain Medicine,* 11(10):1447–1468.

Liu, X., Li, L., Wang, L., Herr, K. & Chen, Q. 2021. Implementation and evaluation of a pain management core competency education program for surgical nurses. *International Journal of Nursing Sciences,* 8(1):51–57.

Loadsman, J.A. & Craigie, M.J. 2019. Clinical assessment of pain and its measurement and reporting for research: A state of discomfort. *Anaesthesia and Intensive Care,* 47(5):411–412.

Lourens, A., Parker, R. & Hodkinson, P. 2020. Prehospital acute traumatic pain assessment and management practices in the Western Cape, South Africa: A retrospective review. *International Journal of Emergency Medicine,* 13(1):21.

Lourens, A., Hodkinson, P. & Parker, R. 2020. Acute pain assessment and management in the prehospital setting, in the Western Cape, South Africa: A knowledge, attitudes and practices survey. *BMC Emergency Medicine,* 20(1):1–32.

Lutge, E., Moodley, N., Tefera, A., Sartorius, B., Hardcastle, T. & Clarke, D. 2016. A hospital based surveillance system to assess the burden of trauma in KwaZulu-Natal Province South Africa. *Injury,* 47(1):135–140.

MacKenzie, M., Zed, P.J. & Ensom, M.H.H. 2016. Opioid Pharmacokinetics-Pharmacodynamics: Clinical implications in acute pain management in trauma. *Annals of Pharmacotherapy*, 50(3):209–218.

Mahama, F. & Ninnoni, J.P.K. 2019. Assessment and management of postoperative pain among nurses at a resource-constraint teaching hospital in Ghana. *Nursing Research*

Stellenbosch University https://scholar.sun.ac.za

and Practice, 2019:1–7.

Manwere, A., Chipfuwa, T., Mukwamba, M.M. & Chironda, G. 2015. Knowledge and attitudes of registered nurses towards pain management of adult medical patients: A case of Bindura Hospital. *Health Science Journal*, 9(4):1–6.

Marchand, S. 2008. The physiology of pain mechanisms: From the periphery to the brain. *Rheumatic Disease Clinics of North America*, 34(2):285–309.

Masoudi Alavi, N., Aboutalebi, M.S. & Sadat, Z. 2017. Pain management of trauma patients in the emergency department: a study in a public hospital in Iran. *International Emergency Nursing,* 33:53–58.

Matthews, R., McCaul, M. & Smith, W. 2017. Description de l'administration d'analgésiques pharmaceutiques par des auxiliaires médicaux spécialisés en réanimation du secteur public dans la ville du Cap. *African Journal of Emergency Medicine,* 7(1):24–29.

McCaul, M., De Waal, B., Hodkinson, P., Pigoga, J.L., Young, T. & Wallis, L.A. 2018. Developing prehospital clinical practice guidelines for resource limited settings: Why re-invent the wheel? *BMC Research Notes,* 11(1):1–5.

McCaul, M., Ernstzen, D., Temmingh, H., Draper, B., Galloway, M. & Kredo, T. 2020. Clinical practice guideline adaptation methods in resource-constrained settings: Four case studies from South Africa. *BMJ Evidence-Based Medicine,* 25(6):193–198.

McGregor, S.L.T. 2018. *Understanding and evaluating research a critical guide*. Los Angeles: SAGE.

Melnyk, B.M., Gallagher-Ford, L., Long, L.E. & Fineout-Overholt, E. 2014. The establishment of evidence-based practice competencies for practicing registered nurses and advanced practice nurses in real-world clinical settings: Proficiencies to improve healthcare quality, reliability, patient outcomes, and costs. *Worldviews on Evidence-Based Nursing,* 11(1):5–15.

Meyr, A.J. & Steinberg, J.S. 2008. The Physiology of the acute pain pathway. *Clinics in Podiatric Medicine and Surgery,* 25(3):305–326.

Mierendorf, S.M. & Gidvani, V. 2014. Palliative care in the emergency department. *The Permanente Journal*, 18(2):77–85.

Min, A., Min, H. & Hong, H.C. 2019. Work schedule characteristics and fatigue among rotating shift nurses in hospital setting: An integrative review. *Journal of Nursing Management*, 27(5):884–895.

Stellenbosch University https://scholar.sun.ac.za

Ministry. 2018. Guidelines for the management of pain in Nigeria. *Federal Ministry of Health Nigeria,* 26(4):206–209, (Online] Available: esearchgate.net/publication/327154496_Guidelines_for_the_Management_of_Pain_in_Nigeria, (2020, November 15].

Ministry of Health Malaysia. 2018. *Pain as the 5th vital sign guideline.* 3rd Edition. [Online] Available: https://www.moh.gov.my/moh/resources/Penerbitan/Program%20Bebas%20Kesakitan/Garis%20Panduan/2_in_1_P5VS_Guideline_3rd_Edition_Corrected_2020.pdf, [2021, January 12].

Ministry of Health Malaysia. 2020. *Pain Management in Emergency & Trauma Department 2nd Edition. [Online] Available: https://www.moh.gov.my/moh/resources/Penerbitan/Program%20Bebas%20Kesakitan/Garis%20Panduan/Pain_Management_in_ETD_2020_(2nd_Ed.)_.pdf, [2021, March 07]*.

Mishra, S.B. & Alok, S. 2017. *Handbook of research methodology: A compendium for scholars and researchers*. India: Educreation Publishng.

Mitra, S., Turner, B., Mbugua, L.W., Neki, K., Wambula, W. & Job, S. 2021. *Guide to integrating safety into road design*. Washington, DC: World Bank.

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.

Mohamed, F.A., El-Bana, S.M., Abd-Elaziz Mohamed, E. & Abolwafa, N.F. 2019. Effect of educational program on pediatric nurses' knowledge and practice regarding selected nonpharmacological techniques to relive pain in neonates. *Journal of Neonatal Nursing,* 25(6):285–292.

Möller, A., Hunter, L., Kurland, L., Lahri, S. & van Hoving, D.J. 2018. The association between hospital arrival time, transport method, prehospital time intervals, and in-hospital mortality in trauma patients presenting to Khayelitsha Hospital, Cape Town. *African Journal of Emergency Medicine,* 8(3):89–94.

Moon, K. & Blackman, D. 2014. A guide to understanding social science research for natural scientists. *Conservation Biology,* 28(5):1167–1177.

Moon, K., Blackman, D.A., Adams, V.M., Colvin, R.M., Davila, F., Evans, M.C., Januchowski-Hartley, S.R., Bennett, N.J., et al. 2019. Expanding the role of social science in conservation through an engagement with philosophy, methodology, and methods.

Stellenbosch University https://scholar.sun.ac.za

Methods in Ecology and Evolution, 10(3):294–302.

Moore, B.J., Stocks, C. & Owens, P.L. 2017. Trends in emergency department visits, 2006–2014. *Healthcare Cost and Utilization Project (HCUP) Statistical Briefs*. Statistica(December 2012):893–908. [Online], Available: www.hcupnet.ahrq.gov/%0Ahttps://www.hcup-us.ahrq.gov/reports/statbriefs/sb227-Emergency-Department-Visit-Trends.pdf, [2021, February 02].

Morriss, W.W. & Roques, C.J. 2018. Pain management in low- and middle-income countries. *BJA Education,* 18(9):265–270.

Mota, M., Cunha, M., Santos, M.R., Silva, D. & Santos, E. 2019. Non-pharmacological interventions for pain management in adult victims of trauma: a scoping review protocol. *JBI Database of Systematic Reviews & Implementation Reports*. 17(12):2483–2490. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=144269994&site=ehost-live&scope=site, [2021, February 03].

Munn, Z., Lockwood, C. & Moola, S. 2015. The development and use of evidence summaries for point of care information systems: A streamlined rapid review approach. *Worldviews on Evidence-Based Nursing,* 12(3):131–138.

Munn, Z., Peters, M., Stern, C., Tufanaru, C., McArthur, A. & Aromataris, E. 2018. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology, 18(143):1-7*. [Online] Available: https://doi.org/10.1186/s12874-018-0611-x, [2021, February 02].

Mura, P., Serra, E., Marinangeli, F., Patti, S., Musu, M., Piras, I., Massidda, M.V., Pia, G., et al. 2017. Prospective study on prevalence, intensity, type, and therapy of acute pain in a second-level urban Emergency Department. *Journal of Pain Research,* 10:2781–2788.

Mwanza, E., Gwisai, R.D. & Munemo, C. 2019. Knowledge on nonpharmacological methods of pain management among nurses at Bindura Hospital, Zimbabwe. *Pain Research and Treatment,* 2019:1-8.

National Institute for Health and Care Excellence. 2014. Developing NICE Guidelines: Developing Review questions and planning the evidence review. *Developing NICE guidelines: the manual Process and methods [PMG20] (2018)*. (October 2014):62–85. [Online], Available: https://www.nice.org.uk/process/pmg20/chapter/developing-review-questions-and-planning-the-evidence-review%0Ahttps://www.nice.org.uk/process/pmg20/resources/developing-nice-

Stellenbosch University https://scholar.sun.ac.za

guidelines-the-manual-pdf-72286708700869, [2021, January 05].

Negese, B., Zeleke, H., Assefa, B., Haile, D. & Dessie, B. 2020. The practice of nurses and associated factors towards pain assessment in critically ill adult patients in referral hospitals of Amhara Region, Ethiopia, 2019. *Journal of Intensive & Critical Care*, 6(4):1-8.

Ngasu, K.E. & Restiana, R. 2021. Factors affecting implementation of pain reassessment in inpatient unit at Balaraja Regional Hospital. *Open Access Macedonian Journal of Medical Sciences,* 9(4):66–69.

Nicol, A., Knowlton, L.M., Schuurman, N., Matzopoulos, R., Zargaran, E., Cinnamon, J., Fawcett, V., Taulu, T., et al. 2014. Trauma surveillance in Cape Town, South Africa: An analysis of 9236 consecutive trauma center admissions. *JAMA Surgery*, 149(6):549–556.

Nortjé, N. & Albertyn, R. 2015. The cultural language of pain: A South African study. *South African Family Practice*, 57(1):24–27.

Nuseir, K., Kassab, M. & Almomani, B. 2016. Healthcare providers' knowledge and current practice of pain assessment and management: How much progress have we made? *Pain Research and Management,* 2016:1–7.

Oliveira, C.B., Maher, C.G., Pinto, R.Z., Traeger, A.C., Lin, C.W.C., Chenot, J.F., van Tulder, M. & Koes, B.W. 2018. Clinical practice guidelines for the management of non-specific low back pain in primary care: An updated overview. *European Spine Journal*, 27(11):2791–2803.

Oliveira, P.E.P. de, Pereira, L.V., Santos, N.R. & Souza, L.A.F. 2016. A enfermagem no manejo da dor em unidades de atendimento de urgência e emergência. *Revista Eletrônica de Enfermagem,* 18:1-13.

Oxman, A.D., Schünemann, H.J. & Fretheim, A. 2006a. Improving the use of research evidence in guideline development: 16. Evaluation. *Health Research Policy and Systems,* 4:1–7.

Oxman, A.D., Schünemann, H.J. & Fretheim, A. 2006b. Improving the use of research evidence in guideline development: 8. Synthesis and presentation of evidence. *Health Research Policy and Systems*, 4(1):1–10.

Page, M.J., Mckenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, C., Mulrow, C.D., Shamseer, L., Tetzlaff, J.M., et al. 2021. Research methods and reporting the PRISMA 2020 statement : An updated guideline for reporting systematic reviews systematic

Stellenbosch University https://scholar.sun.ac.za

reviews and Meta-Analyses. *The BMJ,* 2021:(272)1-9.

Pak, S.C., Micalos, P.S., Maria, S.J. & Lord, B. 2015. Nonpharmacological interventions for pain management in paramedicine and the emergency setting: A review of the literature. *Evidence-based Complementary and Alternative Medicine,* 2015:1-8.

Parker, M. & Rodgers, A. 2015. Management of Pain in Pre-Hospital Settings. *Emergency Nurse*, 23(3):16–21. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=109799544&site=ehost-live&scope=site, [2021, March 15].

Parnass, A.J., Greenbaum, N.R., Glick, M.A. & Halpern, P. 2016. Pain management framework in the emergency department: Patterns in 40 emergency departments worldwide. *European Journal of Emergency Medicine*, 23(4):311–314.

Pathmawathi, S., Beng, T.S., Li, L.M., Rosli, R., Sharwend, S., Kavitha, R.R. & Christopher, B.C.M. 2015. Satisfaction with and perception of pain management among palliative patients with breakthrough pain: A qualitative study. *Pain Management Nursing*, 16(4):552–560.

Paydar, S., Farhadi, P., Ghaffarpasand, F., Taheri, A., Farbood, A., Dabiri, G., Ghahramani, Z., Bolandparvaz, S., et al. 2014. Acute trauma pain control algorithm. *Bulletin of Emergency & Trauma*, 2(4):170–171. [Online], Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4771294/ [2020, November 23].

Pearson, A., Msc, R., Frcn, F., Wiechula Rn, R., Bn, B., Dnurs, M., Court, A., Lockwood, C., et al. 2005. model of evidence-based healthcare. A Pearson The JBI model of evidence-based healthcare. *International Journal of Evidence Based Healthcare Blackwell Science*, 3:207–215. [Online], Available: http://extranet.hospitalcruces.com/doc/adjuntos/JBI model of evidence based healthcare 2005.pdf,[2021, February 05].

Peter, N.A., Pandit, H., Le, G., Nduhiu, M., Moro, E. & Lavy, C. 2016. Delivering a sustainable trauma management training programme tailored for low-resource settings in East, Central and Southern African countries using a cascading course model. *Injury,* 47(5):1128–1134.

Peters, Micah; M Godfrey, Christina; Mcinerney, P. 2015. The Joanna Briggs Institute reviewers' manual 2015: Methodology for JBI scoping reviews. *Joanne Briggs Institute*. [Online] Available: https://nursing.lsuhsc.edu/jbi/docs/reviewersmanuals/scoping-.pdf, [2020, February 05].

Stellenbosch University https://scholar.sun.ac.za

Peters, M.D.J., Godfrey, C.M., Khalil, H., McInerney, P., Parker, D. & Soares, C.B. 2015. Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, 13(3):141–146.

Peters, M.D.J., Marnie, C., Colquhoun, H., Garritty, C.M., Hempel, S., Horsley, T., Langlois, E. V., Lillie, E., et al. 2021. Scoping reviews: Reinforcing and advancing the methodology and application. *Systematic Reviews,* 10(1):1–6.

Pierik, J.G.J., Berben, S.A., IJzerman, M.J., Gaakeer, M.I., van Eenennaam, F.L., van Vugt, A.B. & Doggen, C.J.M. 2016. A nurse-initiated pain protocol in the ED improves pain treatment in patients with acute musculoskeletal pain. *International Emergency Nursing,* 27:3–10.

Polit, D.F. & Beck, C.T. 2017. *Nursing Research generating and assessing evidence for nursing practice*. 10th edition. Philadelphia: Wolters Kluwer.

Polit, D.F. & Beck, C.T. 2021. *Nursing research: generating and assessing evidence for nursing practice*. 11th edition. Philadelphia: Wolters Kluwer.

Polit, D.F. & Beck, C.T. 2022. *Essentials of nursing research appraising evidence for nursing practice*. 10th edition. Philadelphia: Wolters Kluwer.

Poprawska, N., Dyl, J., Rowiński J., Liniarski, M., Krzemiński,D., Sianos, G., Sorokman, T., & Pidvysotsky, N. 2017. Oligoanalgesia in the medical emergency. *Journal of Public Health, Nursing and Medical Rescue,* (6):29–31.

Porter, K.M., Siddiqui, M.K., Sharma, I., Dickerson, S. & Eberhardt, A. 2018. Management of trauma pain in the emergency setting: Low-dose methoxyflurane or nitrous oxide? A systematic review and indirect treatment comparison. *Journal of Pain Research,* 11:11–21.

Pothiawala, S., Lau, H.K. & Annathurai, A. 2020. Regular versus extended shift outbreak roster in the emergency department and its impact on staff well-being. *Emergency Medicine Journal*, 37(8):468.

Pozza, D.H., Azevedo, L.F. & Lopes, J.M.C. 2021. Pain as the fifth vital sign—A comparison between public and private healthcare systems. *PLoS ONE,* 16(11 November):1–9.

Prempeh, A.B.A., Duys, R., de Vaal, A. & Parker, R. 2020. Pain assessment and management: An audit of practice at a tertiary hospital. *Health SA Gesondheid*, 25:1–7.

Pretorius, A., Searle, J. & Marshall, B. 2015. Barriers and Enablers to Emergency Department

Stellenbosch University https://scholar.sun.ac.za

Nurses' Management of Patients' Pain. *Pain Management Nursing*, 16(3):372–379.

Prosen, M. 2019. The Impact of Culture on Perceptions of Pain and Pain Related Behaviour. *University of Primorska,* 1–11 [Online] Available: https://www.researchgate.net/publication/336486210, [2022, March 15].

Rababa, M., Al-Sabbah, S. & Hayajneh, A.A. 2021. Nurses' perceived barriers to and facilitators of pain assessment and management in critical care patients: A systematic review. *Journal of Pain Research*, 14:3475–3491.

Ramia, E., Nasser, S.C., Salameh, P. & Saad, A.H. 2017. Patient perception of acute pain management: Data from three tertiary care hospitals. *Pain Research and Management*, 2017:1-12.

Ramsey, Z., Palter, J.S., Hardwick, J., Moskoff, J., Christian, E.L. & Bailitz, J. 2018. Decreased nursing staffing adversely affects emergency department throughput metrics. *Western Journal of Emergency Medicine,* 19(3):496–500.

Rawal, E.N. 1999. *Management of Acute and Chronic Pain*. [Online], Available: BMJ Books.

Reardon, D.P., Anger, K.E. & Szumita, P.M. 2015. Pathophysiology, assessment, and management of pain in critically ill adults. *American Journal of Health-System Pharmacy*, 72(18):1531–1543.

Redfern, A., Westwood, A. & Donald, K.A. 2016. Children with disabling chronic conditions in the western health subdistrict of Cape Town, South Africa: Estimating numbers and service gaps. *South African Medical Journal*, 106(3):302–307.

Registered Nurses' Association of Ontario. 2013. Assessment and Management of Pain, Third Edition. *Clinical Best Practice Guidelines*. (December):1–103. [Online], Available: http://rnao.ca/sites/rnao-ca/files/AssessAndManagementOfPain_15_WEB-_FINAL_DEC_2.pdf, [2021, January 06].

Ridderikhof, M.L., Schyns, F.J., Schep, N.W., Lirk, P., Hollmann, M.W. & Goslings, J.C. 2017. Emergency Department pain management in adult patients with traumatic injuries before and after implementation of a nurse-initiated pain treatment protocol utilizing fentanyl for severe pain. *Journal of Emergency Medicine*, 52(4):417–425.

Ross, A., Feider, L., Nahm, E.S. & Staggers, N. 2017. An outpatient performance improvement project: A baseline assessment of adherence to pain reassessment standards. *Military Medicine*, 182(5):e1688–e1695.

Van de Ruit, C., Lahri, S. & Wallis, L.A. 2020. Clinical teams' experiences of crowding in public

Stellenbosch University https://scholar.sun.ac.za

emergency centres in Cape Town, South Africa. *African Journal of Emergency Medicine*. 10(2):52–57.

Sackett, D.L., Rosenberg, W.M.C., Gray, J.A.M., Haynes, R.B. & Richardson, W.S. 1996. Evidence based medicine: What it is and what it isn't. It's about integrating individual clinical expertise and the best external evidence. *British Medical Journal*, 312(7023):71–72.

Sakamoto, J.T., Ward, H.B., Vissoci, J.R.N. & Eucker, S.A. 2018. Are nonpharmacologic pain interventions effective at reducing pain in adult patients visiting the Emergency Department? A systematic review and meta-analysis. *Academic Emergency Medicine, 25:940-957*.

Salway, R., Valenzuela, R., Shoenberger, J., Mallon, W. & Viccellio, A. 2017. Emergency Department (Ed) overcrowding: Evidence-Based answers to frequently asked questions. *Revista Médica Clínica Las Condes,* 28(2):213–219.

Samarkandi, O.A. 2018. Knowledge and attitudes of nurses toward pain management. *Saudi Journal of Anaesthesia,* 12(2):220–226.

Samcam, I. & Papa, L. 2016. Acute pain management in the Emergency Departement. in *Pain Management*, 13:1-26.

Sampson, F.C., Goodacre, S.W. & O'Cathain, A. 2014. Interventions to improve the management of pain in emergency departments: Systematic review and narrative synthesis. *Emergency Medicine Journal,* 31(e1):e9–e18.

Sampson, F.C., O'Cathain, A. & Goodacre, S. 2020. How can pain management in the emergency department be improved? Findings from multiple case study analysis of pain management in three UK emergency departments. *Emergency Medicine Journal*, 37(2):85–94.

SANC. 1985. South African Nursing Council Notification of Completion of Training Education and Training of a Nurse (General , Psychiatric and Community) and Midwife Leading to Registration as a Professional Nurse, 6:3–8. [Online], Available: https://www.sanc.co.za/r-425/ [2021, January 06].

SANC (South African Nursing Council). 1991. Regulations relating to the scope of practice of persons who are registered or enrolled under the Nursing Act, 1978. *Government Gazette*. R. 260:1–6. [Online], Available: http://www.sanc.co.za/regulat/Reg-scp.htm, [2021, July 07].

Stellenbosch University https://scholar.sun.ac.za

SANC (South African Nursing Council). 1997. *The South African Nursing Council Regulations Relating to the Minimum Requirements for a Bridging Course for Enrolled Nurses Leading to Registration as a General Nurse or a Psychiatric Nurse, [2021,July 07]*.

SASA Acute Pain Guideline Committee. 2009. South African Acute Pain Guidelines. *South African Journal of Anaesthesia and Analgesia*, 15(6):1–120. [Online], Available: http://www.sasaweb.com/images/sasa_pain_guidelines.pdf, [2021, January 06].

Saunders, H. 2015. Translating knowledge into best practice care bundles: A pragmatic strategy for EBP implementation via moving postprocedural pain management nursing guidelines into clinical practice. *Journal of Clinical Nursing*, 24(13–14):2035–2051, [2021, August 10].

Scholten, A.C., Berben, S.A.A., Westmaas, A.H., van Grunsven, P.M., de Vaal, E.T., Rood, P.P.M., Hoogerwerf, N., Doggen, C.J.M., et al. 2015. Pain management in trauma patients in (pre)hospital based emergency care: current practice versus new guideline. *Injury*, 46(5):798–806. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=109723017&site=ehost-live&scope=site, [2021, August 10].

Schug, S.A., Palmer, G.M., Scott, D.A., Halliwell, R. & Trinca, J. 2016. Acute pain management: Scientific evidence, 4th edition, 2015. *Medical Journal of Australia*, 204(8):315-317.e1, [2021, January 09].

Sciarra, E. 2012. The importance of practice guidelines in clinical care. *Dimensions of Critical Care Nursing*, 31(2):84–85.

Sepahvand, M., Gholami, M., Hosseinabadi, R. & Beiranvand, A. 2019. The use of a nurse-initiated pain protocol in the Emergency Department for patients with musculoskeletal injury: A Pre-post intervention study. *Pain Management Nursing*, 20(6):639–648. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=140092312&site=ehost-live&scope=site, [2021, August 10].

Sharplin, G., Adelson, P., Kennedy, K., Williams, N., Hewlett, R., Wood, J., Bonner, R., Dabars, E., et al. 2019. Establishing and sustaining a culture of evidence-based practice: an evaluation of barriers and facilitators to implementing the best practice spotlight organization program in the Australian healthcare context. *Healthcare (Switzerland)*, 7(4).

Shiffman, R.N., Dixon, J., Brandt, C., Essaihi, A., Hsiao, A., Michel, G. & O'Connell, R. 2005.

Stellenbosch University https://scholar.sun.ac.za

The GuideLine Implementability Appraisal (GLIA): Development of an instrument to identify obstacles to guideline implementation. *BMC Medical Informatics and Decision Making,* 5:1–8.

Slabbert, J.A. & Smith, W.P. 2011. Patient transport from rural to tertiary healthcare centres in the Western Cape: Is there room for improvement? *African Journal of Emergency Medicine,* 1(1):11–16.

Smigelsky, M.A., Aten, J.D., Gerberich, S., Sanders, M., Post, R., Hook, K., Ku, A., Boan, D.M., et al. 2014. Trauma in sub-Saharan Africa: review of cost, estimation methods, and interventions. *International Journal Of Emergency Mental Health*, 16(2):354–365.

South Africa & Department of Health. 2020. *Annual Report 2020/21.* Pretoria: Government Printers.

Spilman, S.K., Lechtenberg, G.T., Hahn, K.D., Fuchsen, E.A., Olson, S.D., Swegle, J.R., Vaudt, C.C. & Sahr, S.M. 2016. Is pain really undertreated? Challenges of addressing pain in trauma patients during prehospital transport and trauma resuscitation. *Injury*, 47(9):2018–2024.

Stang, A.S., Hartling, L., Fera, C., Johnson, D. & Ali, S. 2014. Quality indicators for the assessment and management of pain in the Emergency Department: A systematic review. *Pain Research & Management*, 19(6):e179-90.

Steeds, C.E. 2016. The anatomy and physiology of pain. *Surgery (United Kingdom),* 34(2):55–59.

Stevens, K.R. 2013. The impact of evidence-based practice in nursing and the next big ideas. *Online Journal of Issues In Nursing*, 18(2):4.

Sturesson, L., Falk, A.C., Castrén, M., Niemi-Murola, L. & Lindström, V. 2016. Mandatory documentation of pain in the emergency department increases analgesic administration but does not improve patients' satisfaction of pain management. *Scandinavian Journal of Pain,* 13(2016):32–35.

Sturesson, L., Lindström, V., Castrén, M., Niemi-Murola, L. & Falk, A.-C. 2016. Actions to improve documented pain assessment in adult patients with injury to the upper extremities at the Emergency Department – A cross-sectional study. *International Emergency Nursing*, 25:3–6. [Online], Available: http://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=113538768&site=ehost-live&scope=site, [2021 July 10].

Stellenbosch University https://scholar.sun.ac.za

Sullivan, D., Lyons, M., Montgomery, R. & Quinlan-Colwell, A. 2016. Exploring Opioid-sparing multimodal analgesia options in trauma: A nursing perspective. *Journal of Trauma Nursing,* 23(6):361–375.

Tawil, S., Iskandar, K. & Salameh, P. 2018. Pain management in hospitals: Patients' satisfaction and related barriers. *Pharmacy Practice,* 16(3):1–9.

Thewes, B., Rietjens, J.A.C., van den Berg, S.W., Compen, F.R., Abrahams, H., Poort, H., van de Wal, M., Schellekens, M.P.J., et al. 2018. One way or another: The opportunities and pitfalls of self-referral and consecutive sampling as recruitment strategies for psycho-oncology intervention trials. *Psycho-Oncology,* 27(8):2056–2059.

Torres, C.A., Thorn, B.E., Kapoor, S. & DeMonte, C. 2017. An examination of cultural values and pain management in foreign-born Spanish-speaking Hispanics seeking care at a federally qualified health center. *Pain Medicine (United States),* 18(11):2058–2069.

Treede, R.D. 2018. The International Association for the Study of Pain definition of pain: As valid in 2018 as in 1979, but in need of regularly updated footnotes. *Pain Reports,* 3(2):3–5.

Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K., Colquhoun, H., Kastner, M., Levac, D., Ng, C., et al. 2016. A scoping review on the conduct and reporting of scoping reviews. *BMC Medical Research Methodology,* 16(1):1–10.

Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D.J., et al. 2018. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, 169(7):467–473.

Ucuzal, M. & Doğan, R. 2015. Emergency nurses' knowledge, attitude and clinical decision making skills about pain. *International Emergency Nursing*, 23(2):75–80.

Ung, A., Salamonson, Y., Hu, W. & Gallego, G. 2016. Assessing knowledge, perceptions and attitudes to pain management among medical and nursing students: A review of the literature. *British Journal of Pain*,10(1):8–21.

United States of America Department of Health, Education, and W. 1979. *Ethical principles and guidelines for the protection of human subjects of research*. [Online], Available: http://216.239.59.104/search?q=cache:SabFuEhEXAsJ:www.isu.edu/research/docs/hsc_forms/belmontreport.pdf+Scientific+research+has+produced+substantial+social+benefits.+It+has+also+posed&hl=en&gl=ie&ct=clnk&cd=3&client=firefox-a, [2021, November 06].

Stellenbosch University https://scholar.sun.ac.za

Vijayvargiya, M., Panchal, S., Asawale, K. & Desai, A. 2021. Oligoanalgesia in the emergency setting: An Indian review. *Journal of Clinical Orthopaedics and Trauma,* 18:38–43.

Vincent-Lambert, C. & De Kock, J.M. 2015. Use of morphine sulphate by South African paramedics for prehospital pain management. *Pain Research and Management*, 20(3):141–144.

Vuille, M., Foerster, M., Foucault, E. & Hugli, O. 2018. Pain assessment by emergency nurses at triage in the emergency department: A qualitative study. *Journal of Clinical Nursing*, 27(3):669–676.

Walters, E.T. & De C Williams, A.C. 2019. Evolution of mechanisms and behaviour important for pain. *Philosophical Transactions of the Royal Society B: Biological Sciences,* 374(1785).

Wang, Z., Norris, S.L. & Bero, L. 2018a. The advantages and limitations of guideline adaptation frameworks. *Implementation Science*, 13(1):1–13.

Wang, Z., Norris, S.L. & Bero, L. 2018b. The advantages and limitations of guideline adaptation frameworks. *Implementation Science,* 13(1):1–13.

Wazzan, A., Albeladi, Y., Altaifi, R., Alqahtani, M. & Bakheet, R. 2021. Assessment of the effectiveness of pain management among trauma patients in the Emergency Department. *Saudi Journal of Emergency Medicine*, 257–261.

Western Cape Department of Health. 2011. 2020 The future of health care in the Western Cape. *Western Cape Government*. (November):1–59. [Online], Available: www.westerncape.gov.za/other/2011/12/healthcare_2020_-_9_december_2020.pdf, [2022, January 15].

Western Cape Government. 2018. Cape Metro District Health Plan 2018/19 - 2020/21. 1–22. [Online], Available: https://resource.capetown.gov.za/documentcentre/Documents/City strategies, plans and frameworks/Metro District Health Plan_2019-20.pdf, [2022, January 15].

WHO. 2014. Injuries Violence the Facts. The magnitude and causes of injuries. *Geneva: World Health Organization*. 20. [Online], Available: http://www.who.int/violence_injury_prevention/media/news/2015/Injury_violence_facts_2014/en/, [2021, April 20].

World Health Organization. 2014. *Handbook for guideline development.* 2nd edition. Geneva:WHO.

Stellenbosch University https://scholar.sun.ac.za

World Health Organization. 1996. Cancer pain relief: With a guide to opioid availabilty. 2nd edition. World Health Organization. [Online], Available: https://apps.who.int/iris/handle/10665/37896, [2021, November 21].

Williamson, A. & Hoggart, B. 2005. Pain: A review of three commonly used pain rating scales. *Journal of Clinical Nursing,* 14(7):798–804.

Wissman, K.M., Cassidy, E., D'Amico, F., Hoy, C., Vissari, T. & Baumgartner, M. 2020. Improving Pain Reassessment and Documentation Rates: A Quality Improvement Project in a Teaching Hospital's Emergency Department. *Journal of Emergency Nursing,* 46(4):505–510.

Van Woerden, G., Van Den Brand, C.L., Den Hartog, C.F., Idenburg, F.J., Grootendorst, D.C. & Van Der Linden, M.C. 2016. Increased analgesia administration in emergency medicine after implementation of revised guidelines. *International Journal of Emergency Medicine,* 9(1):1–7.

Wolf, L., Brysiewicz, P., Lobue, N., Heyns, T., Bell, S.A., Coetzee, I., Papa, A., Augustyn, J., et al. 2012. Developing a framework for emergency nursing practice in Africa. *African Journal of Emergency Medicine,* 2(4):174–181.

Zaidi, A.A., Dixon, J., Lupez, K., De Vries, S., Wallis, L.A., Ginde, A. & Mould-Millman, N.K. 2019. The burden of trauma at a district hospital in the Western Cape Province of South Africa. *African Journal of Emergency Medicine,* 9:S14–S20.

Van Zanden, J.E., Wagenaar, S., Ter Maaten, J.M., Ter Maaten, J.C. & Ligtenberg, J.J.M. 2018. Pain score, desire for pain treatment and effect on pain satisfaction in the emergency department: A prospective, observational study. *BMC Emergency Medicine,* 18(1):1–10.

Zazzera, E. 2020. Use of social media for injury prevention: An integrative review. *Journal of Trauma Nursing,* 27(1):13–28.

Zoëga, S., Sveinsdottir, H., Sigurdsson, G.H., Aspelund, T., Ward, S.E. & Gunnarsdottir, S. 2015. Quality pain management in the hospital setting from the patient's perspective. *Pain Practice*, 15(3):236–246.

Zou, Q., Ransom, P. & Freeman, S. 2017. The use of analgesia in acute trauma: A comparison between two emergency departments in UK and China. *Trauma and Emergency Care*, 2(3):1–4.

Zubairi, O. & Dixit, D. 2018. Acute pain management in the general population. *Pharmacy*

Stellenbosch University https://scholar.sun.ac.za

Times Health Systems Edition, 7(4):1–18.

APPENDICES

APPENDIX A: APPROVAL NOTICE NEW APPLICATION

03/12/2020

Project ID: 18556

HREC Reference No: S20/08/214 (PhD)

Project Title: BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN EMERGENCY CENTERS

Dear Ms Yolande Magerman

The Response to Modifications received on 29/10/2020 13:25 was reviewed and approved by members of Health Research Ethics Committee via expedited review procedures on 03/12/2020.

Thank you for attending to the requested modifications, your research protocol is now finally approved. Please note the following information about your approved research protocol:

Protocol Approval Date: 03 December 2020

Protocol Expiry Date: 02 December 2021

Please remember to use your Project ID 18556 and Ethics Reference Number S20/08/214 (PhD) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review
Translation of the informed consent document(s) to the language(s) applicable to your study participants should now be submitted to the HREC.

Please note you can submit your progress report through the online ethics application process, available at: Links Application Form Direct Link and the application should be submitted to the HREC before the year has expired. Please see *Forms and Instructions* on our HREC website (www.sun.ac.za/healthresearchethics) for guidance on how to submit a progress report.

Stellenbosch University https://scholar.sun.ac.za

The HREC will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Please note that for studies involving the use of questionnaires, the final copy should be uploaded on Infonetica.

Provincial and City of Cape Town Approval
Please note that for research at a primary or secondary healthcare facility, permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Please consult the Western Cape Government website for access to the online Health Research Approval Process, see: https://www.westerncape.gov.za/general-publication/health-research-approval-process. Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and instructions, please visit: Forms and Instructions on our HREC website https://applyethics.sun.ac.za/ProjectView/Index/18556

If you have any questions or need further assistance, please contact the HREC office at 021 938 9677.

Yours sincerely,

Mrs. Brightness Nxumalo HREC 2 Coordinator

National Health Research Ethics Council (NHREC) Registration Number:

REC-130408-012 (HREC1)•REC-230208-010 (HREC2)

Federal Wide Assurance Number: 00001372

Office of Human Research Protections (OHRP) Institutional Review Board (IRB) Number: IRB0005240 (HREC1)•IRB0005239 (HREC2)

The Health Research Ethics Committee (HREC) complies with the SA National Health Act No. 61 of 2003 as it pertains to health research. The HREC abides by the ethical norms and principles for research, established by the World Medical Association (2013). Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects; the South African Department of Health (2006). Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa (2nd edition); as well as the Department of Health (2015). Ethics in Health Research: Principles, Processes and Structures (2nd edition).

The Health Research Ethics Committee reviews research involving human subjects conducted or supported by the Department of Health and Human Services, or other federal departments or agencies that apply the Federal Policy for the Protection of Human Subjects to such research (United States Code of Federal Regulations Title 45 Part 46); and/or clinical investigations regulated by the Food and Drug Administration (FDA) of the Department of Health and Human Services.

Stellenbosch University https://scholar.sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

APPENDIX B: APPROVAL LETTER PROGRESS REPORT

12/11/2021

Project ID: 18556

Ethics Reference No: S20/08/214 (PhD)

Project Title: BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN INEMERGENCY CENTERS

Dear Ms YN Magerman

We refer to your request for an extension/annual renewal of ethics approval dated 11/10/2021.

The Health Research Ethics Committee reviewed and approved the annual progress report through an expedited review process. The approval of this project is extended for a further year.

Approval date: 03 December 2021

Expiry date: 02 December 2022

Kindly be reminded to submit progress reports two (2) months before expiry date.

Where to submit any documentation
Kindly note that the HREC uses an electronic ethics review management system, *Infonetica*, to manage ethics applications and ethics review process. Tosubmit any documentation to HREC, please click on the following link: https://applyethics.sun.ac.za.

Please remember to use your Project Id 18556 and ethics reference number S20/08/214 (PhD) on any documents or correspondence with the HREC concerning your research protocol.

Please note that for studies involving the use of questionnaires, the final copy should be uploaded on Infonetica. Yours sincerely,

Mrs A Fortuin

Health Research Ethics Committee 2 (HREC2)

National Health Research Ethics Council (NHREC) Registration Number: REC-130408-012 (HREC1)•REC-230208-010 (HREC2)

Stellenbosch University https://scholar.sun.ac.za

Federal Wide Assurance Number: 00001372

Office of Human Research Protections (OHRP) Institutional Review Board (IRB) Number: IRB0005240 (HREC1)•IRB0005239 (HREC2)

The Health Research Ethics Committee (HREC) complies with the SA National Health Act No. 61 of 2003 as it pertains to health research. The HREC abides by the ethical norms and principles for research, established by the World Medical Association (2013). Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects; the South African Department of Health (2006).Guidelines for Good Practice in the Conduct of Clinical Trials with Human Participants in South Africa (2nd edition); as well as the Department of Health (2015). Ethics in Health Research: Principles, Processes and Structures (2nd edition).

The Health Research Ethics Committee reviews research involving human subjects conducted or supported by the Department of Health and Human Services, or other federal departments or agencies that apply the Federal Policy for the Protection of Human Subjects to such research (United States Code of Federal Regulations Title 45 Part 46); and/or clinical investigations regulated by the Food and Drug Administration (FDA) of the Department of Health and Human Services.

Stellenbosch University https://scholar.sun.ac.za

APPENDIX C: PERMISSION LETTER HOSPITAL A

Western Cape Government
Health

[redacted]

Enquiries: Dr Bernadette Eick

e-mail: GSHReserach.Request@westerncape.gov.za

Ms Yolande Magerman

STELLENBOSCH UNIVERSITY – NURSING & MIDWIFERY

E-mail: Yolande.magerman@westerncape.gov.za / Yolande.Magerman@gmail.com

Dear Ms. Magerman,

RESEARCH PROJECT: Best Practice Guidelines For Nurses For the Assessment And Management OfAcute Trauma Related Pain In Emergency Centres

Your recent letter to the hospital refers.

You are granted permission to proceed with your research, which is valid until **2 December 2021.**

Please note the following:

a) Your research may not interfere with normal patient care.
b) Hospital staff may not be asked to assist with the research.
c) Confidentiality must always be maintained.
d) No additional costs to the hospital should be incurred as indicated in your Annexure 2 i.e. Lab,consumables or stationery. **If access to TRACK Care/NHLS is required, kindly attach our letter of approval to the application form and approach Information Management to assist with data.**
e) No patient folders may be removed from the premises or be inaccessible.
f) Please provide the research assistant/field worker with a copy of this letter as verification ofapproval.
g) Should you at any time require photographs of your subjects, please obtain the necessary indemnity forms from our Public Relations Office (E45 OMB or ext. 2187/2188).
h) Should you require additional research time beyond the stipulated expiry date, please apply for anextension.
i) Please discuss the study with the HOD before commencing.
j) Please introduce yourself to the person in charge of an area before commencing.
k) On completion of your research, please forward any recommendations/findings that can be beneficial to use to take further action that may inform redevelopment of future policy / reviewguidelines.
l) Please contact Michelle Riley (Patient Fees) at ext. 2276 to ascertain if there will be charges forconducting the Research and to obtain a quote or to discuss charges
m) Kindly submit a copy of the publication or report to this office on completion of the research.
n) At no time should any posters encouraging patients to partake in research, be displayed within aclinical area.

Stellenbosch University https://scholar.sun.ac.za

o) Please adhere to ALL COVID-19 regulations and Groote Schuur Hospital policies.

I would like to wish you every success with the project.

Yours sincerely

***pp*. DR BERNADETTE EICK**
CHIEF OPERATIONAL OFFICER

Date: 29 April 2021

C.C. Mr. L. Naidoo

Mr A. Mohamed

Professor A. Nicol

G46 Management Suite, Old Main Building,
Observatory 7925
Tel: +27 21 404 6288 fax: +27 21 404 6125

Private Bag X,
Observatory, 7935
www.westerncape.gov.za/health

Stellenbosch University https://scholar.sun.ac.za

APPENDIX D: PERMISSION LETTER HOSPITAL B

Western Cape Government
Health

[redacted]
REFERENCE:
Research Projects
ENQUIRIES: [redacted]
[redacted]
TELEPHONE [redacted]

Project ID: 18556

Ethics Reference: S20/08/214 [PhD]

TITLE: **BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN EMERGENCY CENTERS.**

Dear Ms Yolanda Magerman

PERMISSION TO CONDUCT YOUR RESEARCH AT TYGERBERG HOSPITAL.

1. In accordance with the Tygerberg Hospital Health Research Policy and Protocol of **April 2018,** permission is hereby granted for you to conduct the above-mentioned research here at Tygerberg Hospital for a year based on your HREC approval.

2. Researchers, in accessing Provincial health facilities, are expressing consent to provide the Department with an electronic copy of the final feedback within six months of completion of research. This can be submitted to the Provincial Research Co-Ordinator (Health.Research@westerncape.gov.za).

DR GG MARINUS
MANAGER: MEDICAL SERVICES

Date: 10/5/2021

Administration Building, Francie van Zilj Avenue, Parow, 7500 Private Bag X3, Tygerberg, 7505
tel: +27 21 938-6267 fax: +27 21 938-4890 www.capegateway.go.v.za

Stellenbosch University https://scholar.sun.ac.za

APPENDIX E: PERMISSION LETTER HOSPITAL C

WC_202012_019

Inbox

Ashleigh Levendall
to me

Dear Researcher

I hope this email finds you well.

Please be informed that [redacted] has approved your research request under the following conditions

> "researcher must supply OWN PPE as hi risk environment. N95/ visor / apron and gloves"

Kind regards Ashleigh

Ms Ashleigh Levendall Admin Clerk

Directorate:
Health Impact Assessment
Western Cape Government: Health

Address: 5th Floor, 8 Riebeek Street, Cape Town
Tel: (021) 483 9319
Fax: (021) 483 6058
Email : Ashleigh.Levendall@westerncape.gov.za
Website : www.westerncape.gov.za

Stellenbosch University https://scholar.sun.ac.za

APPENDIX F: PERMISSION LETTER HOSPITAL D

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 0866: fax: +27 21 483 6058
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_202101_024
ENQUIRIES: Dr Sabela Petros

Francie van Zijl Drive
Tygerberg
7505
Cape Town
South Africa

For attention: Mrs Yolande Magerman

Re: BEST PRACTICE GUIDELINES FOR NURSESFOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAINELATED PAIN IN EMERGENCY CENTERS

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.
Please contact the following people to assist you with any further enquiries in accessing the following sites:

[redacted] **Dr Graeme Dunbar** **021 799 1211**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE:
CC

Dr Melvin Moodley
Director: Health Impact Assessment
21 APR 2021

Stellenbosch University https://scholar.sun.ac.za

APPENDIX G: PERMISSION LETTER HOSPITAL E

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT

Health.Research@westerncape.gov.za tel: +27 21 483 0866: fax: +27 21 483 6058

5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001

REFERENCE: WC_202101_024

ENQUIRIES: Dr Sabela Petros

Francie van Zijl Drive Tygerberg
7505
Cape Town South Africa

For attention: Mrs Yolande Magerman

Re: BEST PRACTICE GUIDELINES FOR NURSESFOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAINELATED PAIN IN EMERGENCY CENTERS

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Note that due to the third wave of Covid, physical access to facilities is not recommended over the peak of the wave. Research through use of virtual technology may be accommodated subject to the availability of staff.

Bearing in mind the constraints imposed by Covid-19 and the resultant pressure on the service platform, you can contact the following people to assist you with further enquiries in accessing the following sites:

[redacted] Kitesh Moodley 021 360 4500

Kindly ensure that the following are adhered to:

36. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
37. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
38. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
39. The reference number above should be quoted in all future correspondence.

Yours sincerely

Stellenbosch University https://scholar.sun.ac.za

DR M MOODLEY

DIRECTOR: HEALTH IMPACT ASSESSMENT

DATE : CC 11 October 2021

Stellenbosch University https://scholar.sun.ac.za

APPENDIX H: PERMISSION LETTER HOSPITAL F

:

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 0866: fax: +27 21 483 6058
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_202101_024
ENQUIRIES: Dr Sabela Petros

Francie van Zijl Drive
Tygerberg
7505
Cape Town
South Africa

For attention: Mrs Yolande Magerman

Re: BEST PRACTICE GUIDELINES FOR NURSESFOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAINELATED PAIN IN EMERGENCY CENTERS

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.
Please contact the following people to assist you with any further enquiries in accessing the following sites:

[redacted] **Dr Jacek Marszalek** **021 377 4782**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report (**Annexure 8**) to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
4. The reference number above should be quoted in all future correspondence.

Yours sincerely

DR M MOODLEY
DIRECTOR: HEALTH IMPACT ASSESSMENT
DATE:
CC

Dr Melvin Moodley
Director: Health Impact Assessment
11 MAY 2021

Stellenbosch University https://scholar.sun.ac.za

APPENDIX I: PARTICIPATION INFORMATION LETTER AND CONSENT FORM: SUB-STUDY 1

UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

Best Practice Guideline for Nurses for the Assessment and Management of AcuteTrauma-Related Pain in Emergency Centers

CONSENT TO PARTICIPATE IN RESEARCH

Dear Colleague
You are invited to take part in a study conducted by Yolande Nerissa Magerman, from the Nursing and Midwifery Department, at Stellenbosch University. You were approached as a possible participant because you are a professional nurse working in an emergency center. Please take some time to read the information presented here, which will explain the details of this project. Please ask any questions about any part of this project that you do not fully understand.

This study has been approved by the: Health Research Ethics Committee at Stellenbosch University and will be conducted according to the Belmont Report of 1978, which provides a platform for adherence to ethical principles and guidelines forthe Protection of Human Subjects of Research (Belmont Report). Ethical approval has also been granted by the Provincial Health Research Committee of the Department of Health in the Western Cape and the hospital's ethical committee.

PURPOSE OF THE STUDY

The purpose of this research study is to conduct a study on the knowledge, attitudes,and practices of professional nurses with regards to the assessment andmanagement of acute trauma-related pain in the emergency center. The results will contribute to the development of a best practice guideline for nurses for the management of acute trauma-related-pain in the emergency center.

WHAT WILL BE EXPECTED OF ME?

A fieldworker will approach you at a convenient time to you and invite you toparticipate in this research project. You will be granted the opportunity to read the information letter and ask questions. If you agree to participate in the study, the fieldworker will arrange a time and private room in the EC place, at your convenienceto complete the survey.

POSSIBLE RISKS AND DISCOMFORTS

The researcher does not foresee any risks or discomforts. However, if you feel distressed threatened or harmed at any point, please feel free contact the researcher, Yolande Nerissa Magerman at 082 44 79 701.

Stellenbosch University https://scholar.sun.ac.za

POSSIBLE BENEFITS TO PARTICIPANTS AND/OR TO THE SOCIETY

There are no direct benefits to you for participating in this study. However, thefindings of this study will guide the researcher to the development of a best practiceguideline for the assessment and management of acute trauma-related pain that isappropriate for a South African emergency center setting. The aim is to improve theassessment and management of acute trauma-related pain by the professionalnurse and to improve patient satisfaction.

PAYMENT FOR PARTICIPATION

There will be no financial compensation for participating in this research study. However, a small token of appreciation will be provided to you.

PROTECTION OF YOUR INFORMATION, CONFIDENTIALITY, ANDIDENTITY

Any information you share during this study, that could identify you as a participant, will be protected. You will not be required to provide your name on the survey. The completed survey will be placed in a sealed envelope. The sealed envelope will thenbe placed in a sealed box in front of you. After the data has been collected, collated, and analysed, the completed surveys will be placed in a sealed box again and stored by the researcher for five years. Only the researcher will have access to the surveys. You will be requested to sign an informed consent form which will be kept confidential. This form will also be stored by the researcher for five years in a safe, locked cupboard.

The information collected and analysed in this study may be used for further publications.

PARTICIPATION AND WITHDRAWAL

You may choose whether to be in this study or not. If you agree to take part in thisstudy, you may withdraw at any time without any consequences.

RESEARCHERS' CONTACT INFORMATION

If you have any questions or concerns about this study, please feel free to contact

Yolande Nerissa Magerman at Yolande.magerman@westerncape.gov.za orCell: 082 44 79701,

Supervisor: Professor Portia Jordan at pjordan@sun.ac.za.

CO Supervisor: Dr Marian Van Der Heever at mmvdheever@sun.ac.za

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

Stellenbosch University https://scholar.sun.ac.za

DECLARATION OF CONSENT BY THE PARTICIPANT

As the participant, I confirm that:

I have read the above information, and it is written in a language that I amcomfortable with. I have had a chance to ask questions, and all my questions have beenanswered. All issues related to privacy and the confidentiality and use of the information Iprovide have been explained.

Please place a cross (x) on the choice that you make.

I agree to participate in theresearch study	I do not agree to participate inthis study

Signature of Participant Date

DECLARATION BY THE FIELDWORKER

As the **fieldworker,** I hereby declare that the information contained in this document has been thoroughly explained to the participant. I also declare that the participant has been encouraged (and has been given ample time) to ask any questions.

Signature of Fieldworker Date

Stellenbosch University https://scholar.sun.ac.za

APPENDIX J: PARTICIPANT INFORMATION LETTER AND CONSENT FORM: SUB-STUDY 2

UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

Best Practice Guideline for Nurses for the Assessment and Management of Acute Trauma-Related Pain in Emergency Centers

STELLENBOSCH UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH

Dear Participant

You are invited to take part in a study conducted by Yolande Nerissa Magerman, from the Department of Nursing and Midwifery, at Stellenbosch University. You wereasked to take part in this study because you are an adult patient who was admittedto the emergency center with a trauma injury and has experienced acute trauma- related pain. Please take some time to read the information presented here. The information concerns the details of this study to help you to understand what this study is about. Please ask any questions about any part of this study that you do notfully understand. This study has been approved by the Health Research Ethics Committee at Stellenbosch University and will be conducted according to the Belmont Report of 1978. This report provides a platform for adherence to ethical principles and guidelines for the Protection of Human Subjects of Research (BelmontReport). Ethical approval has also been granted by the Provincial Health Research Committee of the Department of Health in the Western Cape and the hospital's ethical committee.

PURPOSE OF THE STUDY

The purpose of this research study is to obtain your input regarding your understanding of the care given to you by the nurse with specific regards to the assessment and management of the pain that you had after you were brought to this emergency center. The results will help with the development of a best practice guideline for nurses for the management of acute trauma-related-pain in the emergency center.

WHAT WILL BE EXPECTED OF ME?

If you agree to take part in this study, you will be given a survey to complete. I will approach you at a convenient time to you and invite you to participate in thisresearch project. You will be given a chance to read the information letter and ask questions. I will answer any questions you have so that you fully understand the reason for this study and your part. If you agree to take part in the study, I will arrange a time with you and a private place, at your convenience to complete the survey. If you prefer, you can complete the survey at your bedside with the curtains or dividers drawn, to ensure your privacy.

Stellenbosch University https://scholar.sun.ac.za

POSSIBLE RISKS AND DISCOMFORTS

I do not foresee any risks and discomforts. However, if you feel distressed, threatened, or harmed at any point, please feel free to inform me.

POSSIBLE BENEFITS TO PARTICIPANTS AND/OR TO THE SOCIETY

There are no direct benefits to you for taking part in this study. However, the findingsof this study will assist with the development of a best practice guideline for theassessment and management of acute trauma-related pain that is appropriate for anemergency center in South Africa. The aim is to improve the assessment andmanagement of acute trauma-related pain by the professional nurse and to improvepatient satisfaction.

PAYMENT FOR PARTICIPATION

There will be no financial payment for participating in this research study. However, you will be given a health snack as a small token of appreciation.

PROTECTION OF YOUR INFORMATION, CONFIDENTIALITY, AND IDENTITY

Any information you share with me during this study that could identify you as a participant will be protected. You will not be required to provide your name on the

survey. The completed survey will be placed in a sealed envelope. The sealed envelope will then be placed in a sealed box in your presence. After the data has been collated and analysed, the completed surveys will be placed in a sealed box again and stored in a locked safe for five years. Only the researcher will have accessto the survey. You will be requested to sign an informed consent form that will be kept confidentially in a safe place by the researcher for five years.

The information collected in the study and results may be used for further publications.

PARTICIPATION AND WITHDRAWAL

You may choose whether you would like to be part of this study or not. If you agreeto take part in this study, you may withdraw at any time without any consequences.

RESEARCHERS' CONTACT INFORMATION

If you have any questions or concerns about this study, please feel free to contact

Yolande Nerissa Magerman at Yolande.magerman@westerncape.gov.za or Cell:082 44 79701,
Supervisor: Professor Portia Jordan at pjordan@sun.ac.za.
Co-supervisor: Dr Mariana van der Heever at mmvdheever@sun.ac.za

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

Stellenbosch University https://scholar.sun.ac.za

DECLARATION OF CONSENT BY THE PARTICIPANT

As a participant, I confirm that:

I have read the above information, and it is written in a language that I amcomfortable with. I have had a chance to ask questions, and all my questions have beenanswered. All issues related to privacy and the confidentiality and use of the information Iprovide have been explained.

Please place a cross (x) on the choice that you make.

I agree to participate in theresearch study	I do not agree to participatein this study

Signature of Participant Date

DECLARATION BY THE PRINCIPAL INVESTIGATOR

As the **principal investigator,** I hereby declare that the information contained in this document has been thoroughly explained to the participant. I also declare that the participant has been encouraged (and has been given ample time) to ask anyquestions. In addition, I would like to select the following option:

The conversation with the participant was conducted in the English language in which the participant is fluent.
The conversation with the participant was conducted in the Afrikaans language in which the participant is fluent.
The conversation with the participant was conducted in the IsiXhosa with the assistance of a translator (who has signed a non-disclosure agreement).

Signature of Principal Investigator Date

Stellenbosch University https://scholar.sun.ac.za

APPENDIX K: FIELDWORKER INFORMATION LETTER AND CONSENT FORM: SUB-STUDY 1

UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

Best Practice Guideline for Nurses for the Assessment and Management of AcuteTrauma-Related Pain in Emergency Centers

CONSENT TO PARTICIPATE IN RESEARCH

Dear Colleague

You are invited to take part in a study conducted by Yolande Nerissa Magerman, fromthe Nursing and Midwifery Department, at Stellenbosch University. You were approached as a possible participant because you are a professional nurse who has an interest in research. Please take some time to read the information presented here,which will explain the details of this project. Please ask any questions about any partof this project that you do not fully understand.

This study has been approved by the: Health Research Ethics Committee at Stellenbosch University and will be conducted according to the Belmont Report of 1978, which provides a platform for adherence to ethical principles and guidelines forthe Protection of Human Subjects of Research (Belmont Report). Ethical approval has also been granted by the Provincial Health Research Committee of the Department of Health in the Western Cape and the hospital's ethical committee.

PURPOSE OF THE STUDY

The purpose of this research study is to conduct a study on the knowledge, attitudes,and practices of professional nurses with regards to the assessment and managementof acute trauma-related pain in the emergency center. The results will contribute to the development of a best practice guideline for nurses for the management of acute trauma-related-pain in the emergency center.

WHAT WILL BE EXPECTED OF ME?

You will perform as the fieldworker in this research project. You will be required to approach professional nurses in the EC of your allocated hospital at a convenient timefor you and the professional nurse and invite them to participate in this research project. You must grant them the opportunity to read the information letter and ask questions. You must answer any questions they have and when uncertain you may contact me. If the participate agrees to participate in the study, the fieldworker will arrange a time and private room in the EC, at their convenience to complete the survey.

POSSIBLE RISKS AND DISCOMFORTS

The researcher does not foresee any risks or discomforts. However, if you feel distressed threatened or harmed at any point, please feel free contact the researcher,Yolande Nerissa Magerman at 082 44 79

Stellenbosch University https://scholar.sun.ac.za

701. A session will be scheduled to prepareyou for the data collection and to give you an opportunity to ask questions.

POSSIBLE BENEFITS TO PARTICIPANTS AND/OR TO THE SOCIETY

There are no direct benefits to you for participating in this study. However, the findingsof this study will guide the researcher to the development of a best practice guideline for the assessment and management of acute trauma-related pain that is appropriatefor a South African emergency center setting. The aim is to improve the assessmentand management of acute trauma-related pain by the professional nurse and toimprove patient satisfaction.

PAYMENT FOR PARTICIPATION

There will be no financial compensation for participating in this research study. However, a small token of appreciation will be provided to you.

PROTECTION OF YOUR INFORMATION, CONFIDENTIALITY, AND IDENTITY

All information provided by the participants must be kept confidential. Therefore, participants will not be required to provide their names on the survey. The completedsurvey will be placed in a sealed envelope. The sealed envelope will then be placed in a sealed box in front of you. After the data has been collected, collated, and analysed, the completed surveys will be placed in a sealed box again and stored by the researcher for five years. Only the researcher will have access to the surveys. Theparticipants will be requested to sign an informed consent form which will be kept confidential. This form will also be stored by the researcher for five years in a safe, locked cupboard.

The information collected and analysed in this study may be used for further publications.

PARTICIPATION AND WITHDRAWAL

Participants may choose whether to be in this study or not. If they agree to take partin this study, they may withdraw at any time without any consequences.

RESEARCHERS' CONTACT INFORMATION

If you have any questions or concerns about this study, please feel free to contact
Yolande Nerissa Magerman at Yolande.magerman@westerncape.gov.za orCell: 082 44 79701,
Supervisor: Professor Portia Jordan at pjordan@sun.ac.za.
CO Supervisor: Dr Marian Van Der Heever at mmvdheever@sun.ac.za

RIGHTS OF RESEARCH FIELDWORKERS

You may withdraw your consent at any time and discontinue participation as a fieldworker without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

Stellenbosch University https://scholar.sun.ac.za

DECLARATION OF CONSENT BY THE PARTICIPANT

As the fieldworker, I confirm that:

I have read the above information, and it is written in a language that I amcomfortable with. I have had a chance to ask questions, and all my questions have beenanswered. All issues related to privacy and the confidentiality and use of the information Iprovide have been explained.

Please place a cross (x) on the choice that you make.

I agree to participate in theresearch study	I do not agree to participate inthis study

Signature of Participant **Date**

DECLARATION BY THE FIELDWORKER

As the **fieldworker,** I hereby declare that the information contained in this document has been thoroughly explained to the participant. I also declare that the participant hasbeen encouraged (and has been given ample time) to ask any questions.

Signature of Fieldworker **Date**

Stellenbosch University https://scholar.sun.ac.za

APPENDIX L: CONSENT LETTER TO EXPERT REVIEW PANEL

Stellenbosch
UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

forward together
sonke siya phambili
saam vorentoe

Dear Reviewer

Re: Expert panel reviewer request

I am a PhD student, enrolled in the Department of Nursing and Midwifery, Faculty of Medicine and Health Sciences at Stellenbosch University, South Africa. The topic of my research study is: “Best Practice Guidelines for nurses for the assessment and management of acute trauma-related pain in the emergency center”. A multi-phase study was conducted that guided the development of a Best Practice Guideline (BPG).The study was approved by the Health Research Ethics Committee at the University of Stellenbosch S20/08/214 (PhD).

This is an invitation and expression of interests to participate as an expert in a review panel. To participate, you will be requested to review and critical appraise a best practice guideline for nurses on the assessment and management of acute trauma- related pain in the emergency center, using the AGREE II critical appraisal form. In addition, you will be requested to complete a checklist commenting on the overall guideline.

Therefore, the format of the guideline will comprise of the evidence found and recommendations that were extracted from best available evidence, patient preferences and the professional nurses. Your anonymity as a participant will be ensured. Any information or input provided by you will be confidential. You are under no obligation to participate in this research study. However, your input will be valuable in the successful completion of the review.

forward together
sonke siya phambili
saam vorentoe

Department name | Isebe |
Departement se naam: Nursing and Midwifery
+27 21 808 xxxx | name@sun.ac.za | www.sun.ac.za
Private Bag X1 | Privaat Sak X1 | Matieland 7602 | South Africa |
eMzantsi Afrika | Suid-Afrika

Stellenbosch University https://scholar.sun.ac.za

If you agree all the relevant documents will be emailed to you once the guideline is completed. A copy of the AGREE II appraisal tool is attached for your perusal.

Please complete the consent form below, confirming your willingness to participate inthe review panel. You may refer any queries / questions to me or my supervisor, Professor P.J Jordan (pjordan@sun.ac.za) and co-supervisor Dr M.M Van Der Heever(mmvdheever@sun.ac.za).

Declaration of Consent by the Reviewer

As a reviewer, I confirm that:

- I have read the above information, and it is written in a language that I amcomfortable with.
- I have had a chance to ask questions, and all my questions have beenanswered.
- All issues related to privacy and the confidentiality and use of the information Iprovide have been explained.
- Please place a cross (x) on the choice that you make.

I agree to participate in the research study	I do not agree to participate in the research study

Name of reviewer	
Credentials/qualification of the reviewer	
Institution	

I hereby give consent to be an expert panel reviewer for the study: “Best Practice Guideline for nurses for the assessment and management of acute trauma-related pain in the emergency center.

Signature of Participant _____ Date _____

forward together
sonke siya phambili
saam vorentoe

Department name | Isebe |Nursing and Midwifery
Departement se naam

+27 21 808 xxxx | name@sun.ac.za | www.sun.ac.za

Private Bag X1 | Privaat Sak X1 | Matieland 7602 | South Africa |
eMzantsi Afrika | Suid-Afrika

Stellenbosch University https://scholar.sun.ac.za

SECTION 2: Phase One: Quantitative study

APPENDIX M: RECRUITMENT FLYER

A RESEARCH STUDY ABOUT

PAIN

EMERGENCY CENTER PROFESSIONAL NURSES

ARE INVITED TO PARTICIPATE

YOUR VALUABLE INPUT WILL CONTRIBUTE TO THE DEVELOPMENT OF A BEST PRACTICE GUIDELINE FOR THE MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN THE EMERGENCY CENTER

PARTICIPATION WILL INVOLVE COMPLETING A SURVEY EXPLORNG THE KNOWLEDGE, ATTITUDES, AND PRACTICES ABOUT THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN THE EMERGENCY CENTER

CONFIDENTIALTY AND ANONYMITY WILL BE ASSURED

FIELDWORKERS WILL APPROACH PROFESSIONAL NURSES IN THE EMERGENCY CENTER

*Participating Hospitals - Full ethical approval has been obtained: Groote Schuur, Tygerberg Hospital, Mitchell's Plain District Hospital, Victoria Hospital, New Somerset Hospital, and Khayelitsha District Hospital,

This study has been approved by the University of Stellenbosch Human Research Ethics Committee (Approval NO:) If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Division for Research Development on Tel 021 808 4622 or email Ms contact Ms Maléne Fouché at mfouche@sun.ac.za;

Stellenbosch University https://scholar.sun.ac.za

APPENDIX N: SURVEY FOR SUB-STUDY ONE

Confidential

Sub-survey 1

Dear Participant

This study endeavours to develop a best practice guideline for nurses to facilitate the assessment and management of acute trauma-related pain in emergency centers.

For the purpose of this study the following terms are viewed in the following context:

Acute pain - The duration of pain of fewer than six weeks, subacute is between six to twelve weeks (Geurts e t al., 2016:1203).

Acute trauma-related pain: The word 'trauma' depicts physical injury or a wound resulting in pain (Santeas, 2019:1). Acute trauma re lated-pain results from tissue damage or neuropathic pain, resulting from nerve damage (Andre w, Meyr & Steinberg, 2008:317).

Emergency centers (EC) - ECs are health care settings where patients most often seek urgent care. Care is provided for various circumstances, including life-threatening emergencies, acute illness and injuries, and complications associated with chronic conditions. Furthermore, care is also provided for non-urgent situations, as an alternative to primary care (Moore, Stocks & Owens, 2017:1; Mierendorf & Gidvani, 2014:77).

Please note:

1. All feedback is considered confidential and you do not have to mention your name.

2. Al data will be collated and will not be traceable o you.

3. A fieldworker will distribute and collect the survey.

4. The suvey consists of four (4) sections: Section A deals with demographic details such as qualification, age, and experience. Section B contains the research questions on knowledge regarding the assessment and management of acute trauma-related pain , Section C, Attitude s regarding the assessment and management of acute trauma-re la ted pain and Section D on practices regarding the assessment and management of acute trauma-re lated pain.

SECTION A: DEMOGRAPHIC INFORMATION

Please indicate your biographical details by placing a tick in the appropriate space below. Where appropriate, write your answer in the space provided.

(Please circle your answer)

1. Highe st education qualification	◯ Diploma (Bridging course) ◯ Diploma (4 year integrated course) ◯ Bacca laure ate degree ◯ Ma sters ◯ PhD ◯ Other
2. Age	◯ 21-30 ◯ 31-40 ◯ 41-50 ◯ 51-60 ◯ > 60

Stellenbosch University https://scholar.sun.ac.za

3. Indicate the total years that have you worked in the emergency center (All EC's)	_____
4. Have you had any formal training in pain management?	◯ Yes ◯ No
5. If yes, indicate what kind of formal training in pain management you have completed?	☐ Short course (half day) ☐ Short course (1-5 days) ☐ Graduate Certificate ☐ Masters ☐ seminars, conferences ☐ Other (please specify)

SECTION B: KNOWLEDGE REGARDING THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN

The following questions assess your knowledge related to the assessment and management of acute trauma-related pain in the emergency center.

True / False -

(Please circle the correct answer)

6. Pain assessment should be done as the 5th vital sign	◯ True ◯ False
7. Pain assessment should be done according to a structured plan.	◯ True ◯ False
8. On admission, you assess every patient by using a validated pain assessment scale	◯ True ◯ False
9. After the initial pain assessment, how often do you think that pain should be reassessed in a patient with acute trauma-related pain in the EC.	◯ Hourly ◯ Two hourly ◯ Four hourly ◯ Six hourly
10. If you ask your patient to rate the level of his or her pain on a scale of 1 to 10 then you would be using the following scale.	◯ Num eric pain scale (NRS) ◯ Visual ana logue scale (VAS) ◯ Verbal descriptive scale ◯ Face, legs, activity, crying and consolability pain scale (FLACC)

Stellenbosch University https://scholar.sun.ac.za

11. Inadequate pain management can further complicate the patients recovery process.	◯ True ◯ False

The following pharmacological agents can be used for the management of acute trauma-related pain in the EC.

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
12. Opioids	◯	◯	◯	◯	◯
13. Non-opioids	◯	◯	◯	◯	◯
14. Non-ste roidal anti-inflammatory drugs (NSAIDS)	◯	◯	◯	◯	◯

15. Culture and spiritual considerations play a role in the assessment and management of acute pain.	◯ True ◯ False
16. You use a step-wise approach to manage the patient with acute trauma-related pain in your EC.	◯ Yes ◯ No
17. Combining analgesics that work by different mechanisms (e.g. combining an opioid with a NSAID) may result in better pain control with fewer side effects than using a single analgesic agent.	◯ True ◯ False
18. After an initial opioid dose analgesia is given, subsequent doses should be adjusted in accordance with the individual's response.	◯ True ◯ False
19. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of time.	◯ True ◯ False
20. Inadequate pain management can further complicate the patients recovery process.	◯ True ◯ False

Stellenbosch University https://scholar.sun.ac.za

The following pharmacological agents can be used for the management of acute trauma-related pain in the EC.

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
21. Opioids	○	○	○	○	○
22. Non-opioids	○	○	○	○	○
23. Non-steroidal anti-inflammatory drugs (NSAIDS)	○	○	○	○	○
24. Anticonvulsants	○	○	○	○	○

The following non-pharmacological methods can be used for the management of acute trauma-related pain.

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
25. Cryotherapy (cold compression)	○	○	○	○	○
26. Elevation of extremities	○	○	○	○	○
27. Distraction eg music, imaginary	○	○	○	○	○
28. Fluid intake	○	○	○	○	○

29. After administering pain medications you assess the efficacy of the medication.	○ Yes ○ No
30. After administering pain medication you monitor the patient for potential side effects.	○ Yes ○ No

The following information should be included in a nursing care plan for patients admitted with acute trauma-related pain.

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
31. Detailed assessment of pain e.g pain scale	○	○	○	○	○
32. Frequency of pain assessment	○	○	○	○	○
33. Pharmacological pain management	○	○	○	○	○
34. Non-pharmacological pain management	○	○	○	○	○
35. Physiological pain predictors	○	○	○	○	○
36. Behavioural pain predictors	○	○	○	○	○
37. History: e.g age, underlying conditions	○	○	○	○	○
38. Documentation of pain assessment and management	○	○	○	○	○

Stellenbosch University https://scholar.sun.ac.za

39. Do you think that your level of knowledge on the assessment and management of acute trauma pain is up to date according to best nursing practices.

- ◯ Yes
- ◯ No

SECTION C: ATTITUDES ON THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN THE EC.

The following questions evaluate your attitudes related to the assessment and management of acute trauma-related pain in the emergency center.

(Please circle your answer)

40. The most likely reason a patient with pain would request increased doses of pain medication is:
(Please circle only one answer)

- ☐ The patient is experiencing increased pain
- ☐ The patient is experiencing increased anxiety or depression
- ☐ The patient is requesting more staff attention
- ☐ The patient's requests are related to addiction
- ☐ None of the above

41. The most accurate judge of the intensity of the patient's pain is:
(Please circle only one answer)

- ☐ The treating doctor
- ☐ The patient's primary nurse
- ☐ The patient
- ☐ The patient's spouse or family

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
42. Elderly patients cannot tolerate opioids for pain relief	◯	◯	◯	◯	◯
43. You perceive the management of acute pain in the emergency center to be important	◯	◯	◯	◯	◯

SECTION D: PRACTICES REGARDING THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN THE EC

The following questions assesses your practices related to the assessment and management of acute trauma-related pain in the emergency center.

(Please circle your answer)

44. The use of pain assessment tools/scales is a common practice in your EC.

- ◯ Yes
- ◯ No

45. In your EC you have the following nursing care plan for the assessment and management of acute trauma-related pain:

- ◯ A standardized nursing care plan for pain
- ◯ A nursing care plan is drawn up for each patient on admission
- ◯ There is no nursing care plan in our EC

	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
46. Acute pain is generally prioritised by professional nurses in your emergency department.	◯	◯	◯	◯	◯

Stellenbosch University https://scholar.sun.ac.za

47. My concern about the patient becoming tolerant to analgesia hinders me from providing optimal pain management in the emergency department.	○	○	○	○	○
48. Waiting for the doctor's prescription results in the delay in the administration of analgesia.	○	○	○	○	○
49. Oligoanalgesia (inadequate treatment of acute pain) is a concern in your emergency center	○	○	○	○	○

50. Do you think that a best practice guideline for the assessment and management of acute trauma-related pain will improve patient outcomes with regards to your assessment and management of acute trauma-related pain in the emergency center.

○ Yes
○ No

Thank you for taking the time to complete this survey. Your input is extremely valuable and your participation is very much appreciated.

Completed survey forms must be inserted in the envelope and the sealed box which will be provided by the fieldworker.

Stellenbosch University https://scholar.sun.ac.za

APPENDIX O: SURVEY FOR SUB-STUDY TWO

Dear Participant

This study endeavours to develop a best practice guideline for nurses to facilitate the assessment and managementof acute trauma-related pain in emergency centers.

For the purpose of this study, the following terms are viewed in the following context:

Emergency centers (ECs): - ECs are health care settings where patients most often seek urgent care. Care is provided for various reasons, including life-threatening emergencies, acute illnesses and injuries, and complicationsassociated with chronic conditions. Furthermore, care is also provided for non-urgent situations, as an alternative toprimary care (Moore, Stocks & Owens, 2017:1; Mierendorf & Gidvani, 2014:77).

Acute trauma-related pain: The word 'trauma' depicts physical injury or a wound resulting in pain (Santeas, 2019:1).Acute trauma-related pain results from trauma or injury which can be classified as nociceptive pain, resulting from tissue damage or neuropathic pain, resulting from nerve damage (Andrew, Meyr & Steinberg, 2008:3017).

Pain assessment: Pain assessment is a multidimensional observational assessment of a patient's experience of pain.It is a broad concept involving clinical judgment based on observation of the type, significance and context of the individual's pain experience (Royal Children's Hospital).

Pain management: Pain management is a collaborative effort between the nurse and the patient where the most appropriate intervention is selected while considering the patient's individual needs (Oliver, Coggins, Compton, Hagan, Matteliano, Stanton, St.Marie, Strobbe & Turner, 2012:170).

Please note:

1. All feedback is considered confidential, and you do not have to mention your name.
2. All data will be collated and will not be traceable to you.
3. The researcher will personally distribute and collect the survey.
4. The survey consists of two (2) sections: Section A deals with demographic details such as age and gender; Section B contains the research questions on the patient's understanding regarding the assessment and management of acute trauma-related pain.

	SECTION A: DEMOGRAPHIC INFORMATION (Please indicate your demographic details, by placing a circle in the appropriate space below)	
1)	Age	◯ 18-20 ◯ 21-30 ◯ 31-40 ◯ 41-50 ◯ 51-60 ◯ >60
2)	Gender	◯ Female ◯ Male

Stellenbosch University https://scholar.sun.ac.za

SECTION B: UNDERSTANDING REGARDING THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN

The following questions assess your understanding related to the assessment and management of acute trauma-related pain rendered in the emergency center.

(Please circle your answer)

3)	On arrival at the emergency center you had pain	○ Yes ○ No
4)	On arrival at the emergency center did the nurse ask you if you had pain?	○ Yes ○ No
5)	The nurse then assessed your pain intensity (level of pain) e.g. by asking you how severe your pain is.	○ Yes ○ No
6)	The nurse assessed your pain by asking you to describe your pain in your own words.	○ Yes ○ No
7)	The nurse gave you pain medication after asking you if you have pain.	○ Yes ○ No
8)	Before giving you any pain medication, did the nurse describe possible side effects (reactions to the medication) in a way that you understand?	○ Yes ○ No
9)	Since your admission to the emergency center, did the nurses do everything they could to relieve your pain?	○ Yes ○ No

Thank you very much for taking the time to complete this survey. Your input is extremely valuable and your participation is very much appreciated.

Completed survey forms must be inserted in the envelope and the sealed box which will be provided by the researcher.

Stellenbosch University https://scholar.sun.ac.za

APPENDIX P: RECRUITMENT CHECKLIST SUB-STUDY 2

Please tick the appropriate block

ITEM	YES
Presents with trauma injury /injuries	
Complaints of acute trauma-related pain	
Age >18	
Glasgow coma scale 15/15	
The patient is hemodynamically stableand comfortable	
The patient *does not* present with thefollowing: Traumatic brain injury Pain related comorbidities egchronic pain, arthritis Medical emergencies	

In order to meet the inclusion criteria the patient must achieve a Yes tick for all of the above.

Stellenbosch University https://scholar.sun.ac.za

APPENDIX Q: CONSENT FOR THE USE OF FERREL & MCCAFFERY

City of Hope

QUESTIONNAIRE

July 2014

The “Knowledge and Attitudes Survey Regarding Pain” tool can be used to assess nurses and other professionals in your setting and as a pre and post test evaluation measure for educational programs. The tool was developed in 1987 and has been used extensively from 1987 - present. The tool has been revisedover the years to reflect changes in pain management practice.

Regarding issues of reliability and validity: This tool has been developed over several years.

Content validity has been established by review of pain experts. The content of the tool is derived from current standards of pain management such as the American Pain Society, the World Health Organization,and the National Comprehensive Cancer Network Pain Guidelines. Construct validity has been established by comparing scores of nurses at various levels of expertise such as students, new graduates, oncology nurses, graduate students, and senior pain experts. The tool was identified as discriminating between levels of expertise. Test-retest reliability was established (r>.80) by repeat testing in a continuingeducation class of staff nurses (N=60). Internal consistency reliability was established (alpha r>.70) with items reflecting both knowledge and attitude domains.

Regarding analysis of data: We have found that it is most helpful to avoid distinguishing items as measuring either knowledge or attitudes. Many items such as one measuring the incidence of addiction really measures both knowledge of addiction and attitude about addiction. Therefore, we have found the most benefit to be gained from analyzing the data in terms of the percentage of complete scores as well asin analyzing individual items. For example, we have found it very helpful to isolate those items with the least number of correct responses and those items with the best scores to guide your educational needs.

Enclosed for your use is a copy of our instrument and an answer key. You may use and duplicate the tool for any purpose you desire in whole or in part. References to some of our studies which have included thistool or similar versions are included below. We have received hundreds of requests for the tool and additional use of the tool can be found in other published literature. We also acknowledge the assistance of several of our pain colleagues including Judy Paice, Chris Pasero, and Nessa Coyle in the revisions over the years. If using or publishing the tool results please cite the reference as **“Knowledge and Attitudes Survey Regarding Pain” developed by Betty Ferrell, RN, PhD, FAAN and Margo McCaffery, RN, MS, FAAN, (http://prc.coh.org), revised 2014.**

We hope that our tool will be a useful aid in your efforts to improve pain management in your setting.
Sincerely,

Betty R Ferrell PhD, FAAN Margo McCaffery

Stellenbosch University https://scholar.sun.ac.za

Betty R. Ferrell, RN, PhD, FAAN
MS, FAANResearch Scientist
Consultant

Margo McCaffery, RN,
Lecturer and

Stellenbosch University https://scholar.sun.ac.za

Knowledge and Attitudes Survey Regarding Pain

True/False – Circle the correct answer.

T **F** 1. Vital signs are always reliable indicators of the intensity of a patient's pain.

T **F** 2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.

T **F** 3. Patients who can be distracted from pain usually do not have severe pain.

T **F** 4. Patients may sleep in spite of severe pain.

T **F** 5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.

T **F** 6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.

T **F** 7. Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.

T **F** 8. The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.

T **F** 9. Opioids should not be used in patients with a history of substance abuse.

T **F** 10. Elderly patients cannot tolerate opioids for pain relief.

T **F** 11. Patients should be encouraged to endure as much pain as possible before using an opioid.

T **F** 12. Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.

T **F** 13. Patients' spiritual beliefs may lead them to think pain and suffering are necessary.

T **F** 14. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.

T **F** 15. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.

T **F** 16. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO.

T **F** 17. If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.

T **F** 18. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.

T **F** 19. Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.

T **F** 20. Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

T **F** 21. The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.

T **F** 22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.

Stellenbosch University https://scholar.sun.ac.za

Multiple Choice – Place a check by the correct answer.

23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is
    ____ a. intravenous
    _____ b. intramuscular
    _____ c. subcutaneous
    _____ d. oral
    _____ e. rectal

24. The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onsetsuch as trauma or postoperative pain is
    _____ a. intravenous
    _____ b. intramuscular
    _____ c. subcutaneous
    _____ d. oral
    _____ e. rectal

25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolongedmoderate to severe pain for cancer patients?
    _____ a. codeine
    _____ b. morphine
    _____ c. meperidine
    _____ d. tramadol

26. A 30 mg dose of oral morphine is approximately equivalent to:
    _____ a. Morphine 5 mg IV
    _____ b. Morphine 10 mg IV
    _____ c. Morphine 30 mg IV
    _____ d. Morphine 60 mg IV

27. Analgesics for post-operative pain should initially be given
    _____ a. around the clock on a fixed schedule
    _____ b. only when the patient asks for the medication
    _____ c. only when the nurse determines that the patient has moderate or greater discomfort

28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hourintravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is
    _____ a. less than 1%
    _____ b. 1-10%
    _____ c. 11-20%
    _____ d. 21-40%
    _____ e. > 41%

29. The most likely reason a patient with pain would request increased doses of pain medication is
    _____ a. The patient is experiencing increased pain.
    _____ b. The patient is experiencing increased anxiety or depression.
    _____ c. The patient is requesting more staff attention.
    _____ d. The patient's requests are related to addiction.

30. Which of the following is useful for treatment of cancer pain?
    _____ a. Ibuprofen (Motrin)
    _____ b. Hydromorphone (Dilaudid)
    _____ c. Gabapentin (Neurontin)
    _____ d. All of the above

Stellenbosch University https://scholar.sun.ac.za

31. The most accurate judge of the intensity of the patient's pain is
_____ a. the treating physician
_____ b. the patient's primary nurse
_____ c. the patient
_____ d. the pharmacist
_____ e. the patient's spouse or family

32. Which of the following describes the best approach for cultural considerations in caring for patients in pain:
_____ a. There are no longer cultural influences in the U.S. due to the diversity of the population.
_____ b. Cultural influences can be determined by an individual's ethnicity (e.g., Asians are stoic, Italians areexpressive, etc).
_____ c. Patients should be individually assessed to determine cultural influences.
_____ d. Cultural influences can be determined by an individual's socioeconomic status (e.g., blue collarworkers report more pain than white collar workers).

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

< 1% 5 – 15% 25 - 50% 75 - 100%

34. The time to peak effect for morphine given IV is
_____a. 15 min.
_____b. 45 min.
_____c. 1 hour
_____d. 2 hours

35. The time to peak effect for morphine given orally is
_____a. 5 min.
_____b. 30 min.
_____c. 1 – 2 hours
_____d. 3 hours

36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:
_____ a. sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued.
_____ b. Impaired control over drug use, compulsive use, and craving.
_____ c. The need for higher doses to achieve the same effect.
_____ d. a and b

37. Which statement is true regarding opioid induced respiratory depression:
_____ a. More common several nights after surgery due to accumulation of opioid.
_____ b. Obstructive sleep apnea is an important risk factor.
_____ c. Occurs more frequently in those already on higher doses of opioids before surgery.
_____ d. Can be easily assessed using intermittent pulse oximetry.

Case Studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain andmedication.

Directions: Please select one answer for each question.

38. Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

A. 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.

0 1 2 3 4 5 6 7 8 9 10

Stellenbosch University https://scholar.sun.ac.za

No pain/discomfort Worst Pain/discomfort

B. 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.

_____ 1. Administer no morphine at this time.
_____ 2. Administer morphine 1 mg IV now.
_____ 3. Administer morphine 2 mg IV now.
_____ 4. Administer morphine 3 mg IV now.

39. Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

A. 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:

0 1 2 3 4 5 6 7 8 9 10

No pain/discomfort Worst Pain/discomfort

B. 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:

_____ 1. Administer no morphine at this time.
_____ 2. Administer morphine 1 mg IV now.
_____ 3. Administer morphine 2 mg IV now.
_____ 4. Administer morphine 3 mg IV now.

Stellenbosch University https://scholar.sun.ac.za

Answer Key

Knowledge and Attitudes Survey Regarding Pain

True/False – Circle the correct answer.

F 1. Vital signs are always reliable indicators of the intensity of a patient's pain.

F 2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences.

F 3. Patients who can be distracted from pain usually do not have severe pain.

T 4. Patients may sleep in spite of severe pain.

F 5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases.

T 6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months.

T 7. Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent.

F 8. The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours.

F 9. Opioids should not be used in patients with a history of substance abuse.

F 10. Elderly patients cannot tolerate opioids for pain relief.

F 11. Patients should be encouraged to endure as much pain as possible before using an opioid.

F 12. Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity.

T 13. Patient's spiritual beliefs may lead them to think pain and suffering are necessary.

T 14. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response.

F 15. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real.

T 16. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5 - 10 mg of morphine PO.

F 17. If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.

F 18. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose.

T 19. Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment.

T 20. Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

T 21. The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief.

T 22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression.

Answer key
Knowledge and Attitudes Survey Regarding Pain

Stellenbosch University https://scholar.sun.ac.za

Multiple Choice – Place a check by the correct answer.

23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is
_____ a. intravenous
_____ b. intramuscular
_____ c. subcutaneous
__X__ d. oral
_____ e. rectal

24. The recommended route of administration of opioid analgesics for patients with brief, severe pain of suddenonset, such as trauma or postoperative pain is
__X__ a. intravenous
_____ b. intramuscular
_____ c. subcutaneous
_____ d. oral
_____ e. rectal

25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolongedmoderate to severe pain for cancer patients?
_____ a. codeine
__X__ b. morphine
_____ c. meperidine
_____ d. tramadol

26. A 30 mg dose of oral morphine is approximately equivalent to:
_____ a. Morphine 5 mg IV
__X__ b. Morphine 10 mg IV
_____ c. Morphine 30 mg IV
_____ d. Morphine 60 mg IV

27. Analgesics for post-operative pain should initially be given
__X__ a. around the clock on a fixed schedule
_____ b. only when the patient asks for the medication
_____ c. only when the nurse determines that the patient has moderate or greater discomfort

28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hourintravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is
__X__ a. less than 1%
_____ b. 1-10%
_____ c. 11-20%
_____ d. 21-40%
_____ e. > 41%

29. The most likely reason a patient with pain would request increased doses of pain medication is
__X__ a. The patient is experiencing increased pain.
_____ b. The patient is experiencing increased anxiety or depression.
_____ c. The patient is requesting more staff attention.
_____ d. The patient's requests are related to addiction.

30. Which of the following is useful for treatment of cancer pain?
_____ a. Ibuprofen (Motrin)
_____ b. Hydromorphone (Dilaudid)
_____ c. Gabapentin (Neurontin)
__X__ d. All of the above

31. The most accurate judge of the intensity of the patient's pain is
_____ a. the treating physician
_____ b. the patient's primary nurse

Stellenbosch University https://scholar.sun.ac.za

___X_c. the patient
_____ d. the pharmacist
_____ e. the patient's spouse or family

32. Which of the following describes the best approach for cultural considerations in caring for patients in pain:
_____ a. There are no longer cultural influences in the U.S. due to the diversity of population.
_____ b. Cultural influences can be determined by an individual's ethnicity (e.g., Asians are stoic, Italians are expressive, etc).
___X_ c. Patients should be individually assessed to determine cultural influences.
_____d. Cultural influences can be determined by an individual's socioeconomic status (e.g., blue collarworkers report more pain than white collar workers).

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

< 1% **5 - 15%** 25 - 50% 75 - 100%

34. The time to peak effect for morphine given IV is
___X_a. 15 min.
_____b. 45 min.
_____c. 1 hour
_____d. 2 hours

35. The time to peak effect for morphine given orally is
_____a. 5 min.
_____b. 30 min
___X_c. 1 – 2 hours
_____d. 3 hours

36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:
___X_a. sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued
_____ b. Impaired control over drug use, compulsive use, and craving
_____ c. The need for higher doses to achieve the same effect.
_____ d. a and b

37. Which statement is true regarding opioid induced respiratory depression:
_____ a. More common several nights after surgery due to accumulation of opioid.
___X_ b. Obstructive sleep apnea is an important risk factor.
_____ c. Occurs more frequently in those already on higher doses of opioids before surgery.
_____ d. Can be easily assessed using intermittent pulse oximetry.

Case Studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain andmedication.

Directions: Please select one answer for each question.

38. Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

A. 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.

0 1 2 3 4 5 6 7 **8** 9 10

No pain/discomfort Worst Pain/discomfort

B. 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

Stellenbosch University https://scholar.sun.ac.za

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.

_____ 1. Administer no morphine at this time.
_____ 2. Administer morphine 1 mg IV now.
_____ 3. Administer morphine 2 mg IV now.
__X__ 4. Administer morphine 3 mg IV now.

39. Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room,he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information:BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

A. 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:

0 1 2 3 4 5 6 7 **8** 9 10

No pain/discomfort Worst Pain/discomfort

B. 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:

_____ 1. Administer no morphine at this time.
_____ 2. Administer morphine 1 mg IV now.
_____ 3. Administer morphine 2 mg IV now.
__X__ 4. Administer morphine 3 mg IV now.

Stellenbosch University https://scholar.sun.ac.za

SECTION 3: Phase Two: Scoping Review

APPENDIX R: SCOPING REVIEW PROTOCOL

TITLE

Best practice guideline for the assessment and management of acute pain in adult patients: A scoping review protocol

ABSTRACT

Objectives

The primary objective of the scoping review was to identify, appraise and summarise the content of the available best practice guidelines for the assessment and management of pain in adult patients within the emergency care settings.

Introduction

Trauma-related pain represents a large proportion of admissions to ECs across Europe and other countries. Nurses are the front-line health care workers who have the first contact with patients in the EC, enabling them to assess and manage pain early. To manage pain effectively in any setting, best recommendations in the form of best practice guidelines are recommended.

Hence, a scoping review will be conducted to identify and appraise available guidelines for the assessment and management of acute pain.

Inclusion criteria

Based on the Participants, Concept, and Context (PCC) framework, the eligible population will consider best practice guidelines that include adults aged 18 years and older, irrespective of their gender who present with acute pain or trauma-related pain.

The concept of interest is acute pain, trauma-related pain, pain assessment, pain management. The context includes healthcare settings such as ECs, critical care units, pre-hospital settings in any country of the world.

Methods: Healthcare-related online databases will be searched such as PubMed, EBSCOhost, CINAHL, and Guideline Clearinghouses. The JBI methodology for scoping reviews will be used to conduct the review. Pre-determined inclusion and exclusion criteria will be used to select relevant guidelines. Data will be extracted and synthesized from guidelines on acute pain assessment and management.

Keywords: acute pain, acute pain management, nurses, emergency centers, best practice guidelines

Introduction

The international association for the study of pain defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage Blumstein & Barkly, 2015:381; IOM,

Stellenbosch University https://scholar.sun.ac.za

2011:1). Oligoanalgesia, the inadequate treatment of pain, is a commonly recognized issue in the EC (Samcam, & Papa, 2016:2); where 60-80% of patients report acute pain, yet pain remains inadequately managed.

Burden of Injury

Trauma-related pain represents a large proportion of admissions to emergency centers (ECs) across Europe and is considered to be the most prevalent complaint among trauma patients in the emergency center (Dißmann, Maignan, Cloves, et *al.,* 2018:180*).* Trauma patients present to emergency centers with acute pain following evident or suspected injuries sustained from mechanisms that include blunt or penetrating forces (Grady, 2015:31). High trauma burden leads to overcrowding of patients in the EC making it difficult to meet the timely needs of patients admitted, including pain assessment and management (Salway et al., 2017:215). The lack of pain management strategies exacerbates the situation (Pretorius, Searle & Marshall, 2015:373).

Nurses Role

Nurses are the front-line health care workers who have the first contact with patients in the EC, enabling them to assess and manage pain early (Parnass, Greenbaum, Glick, et al., 2016:1). Pain assessment and the initiation of pain management strategies are the responsibility of the registered nurse (Pretorius et al., 2015:375). Thus, nurses are the ideal role-players to facilitate the assessment and management of acute pain in the EC.

Guideline Quality

To manage pain effectively in any setting, best recommendations in the form of clinical practice guidelines or best practice guidelines are recommended (The Registered Nurses Association of Ontario (RNAO) (Registered Nurses' Association of Ontario, 2013:6). These terms are used interchangeably in practice. Guidelines are recommendations that are compiled to guide healthcare providers to make informed decisions that support clinical practice (Registered Nurses' Association of Ontario, 2013; Organisation, 2014). Recommendations are *informed by a systematic review or scoping review of evidence and an assessment of the benefits and harms of alternative care options to optimise the outcome of patient care (McCaul, De Waal, Hodkinson, et al., 2018:2).* Best practice guidelines (BPGs) are developed systematically using the best available evidence to support clinical and management decision making and practice to enhance decision-making for individualized care (Registered Nurses' Association of Ontario, 2013). BPGs are useful tools used to bridge the gap between scientific evidence and clinical practice (Registered Nurses' Association of Ontario, 2013:5), more specifically, to positively impact the quality of care provided by nurses. BPG's on the assessment and management of pain outlines general core competencies using evidence-based recommendations to expand on nurses' skills and practices on the assessment and management of pain.

Gaps in availability of guidelines

A rapid search for scoping reviews was done, as proposed by (Munn, Peters, Stern, et al., 2018:3) (Appendix A), to identify any previous scoping reviews that were conducted on guidelines. Preliminary search did not reveal guidelines that were specific to the assessment and management of acute trauma-

Stellenbosch University https://scholar.sun.ac.za

related pain by nurses in the EC, compelling the need to conduct a scoping review. There are no known guidelines for nurses in the Western Cape and the broader South Africa for the assessment and management of acute trauma-related pain in the EC. Guidelines have been developed in low to middle-income countries (LMIC) (Ministry, 2018); (Ministry of Health Malaysia, 2020) as well as high-income countries (Grady, 2015;(HCANJ, 2017; Registered Nurses' Association of Ontario, 2013). However, these guidelines were not specific to nurses and acute trauma-related pain in the emergency center. The New Zealand Pain Society (NZPS:2015) and the (Royal College of Nursing (RCN:2015) have developed the pain knowledge and skill framework for the nursing team which is a guidance document for pain management by nurses. The RNAO developed a best practice guideline for pain assessment and management (Registered Nurses' Association of Ontario, 2013) but is not specific to the assessment and management of acute trauma-related pain in adult patients in the emergency center. It is thus apparent that there is a paucity of guidelines for nurses for the assessment and management of acute trauma-related pain in the emergency center.

A preliminary search for scoping reviews was done to identify any previously conducted guidelines (Munn *et al.*, 2018:3). Preliminary findings of scoping reviews did not reveal guidelines that were specific to the assessment and management of acute trauma-related pain by nurses in the EC, compelling the need for a scoping review. Guidelines have been developed in low to middle-income countries (LMIC) (Ministry, 2018);(Ministry of Health Malaysia, 2020) as well as high-income countries (Grady, 2015; (HCANJ, 2017). However, these guidelines were not specific to nurses and acute trauma-related pain in the emergency center. It is thus mandatory to conduct a scoping review to inform the guideline contextualization for nurses for the assessment and management of acute trauma-related pain of adult patients in the EC.

In summary, for the purpose of this study, a scoping review will be conducted as a phase of a research study to inform the contextualisation of a best practice guideline for nurses for the assessment and management of acute trauma-related pain in ECs in South Africa (SA).

Review questions

The overarching review question guiding the scoping review is:

"What best practice guidelines are available to guide professional nurses to provide pain assessment and pain management of acute-trauma related pain in adults in the emergency care settings? "

Inclusion criteria

The Participants, Concept, and Context (PCC) framework will be used to determine studies eligible for inclusion in this review (Peters, Godfrey, Khalil, *et al.*, 2015:6)

Participants

The review will consider best practice guidelines that include adults aged 18 years and older, irrespective of their gender who present with acute pain or trauma-related pain.

Concept

Stellenbosch University https://scholar.sun.ac.za

The concept of interest is acute pain, trauma-related pain, assessment of pain, pain management. Pain management will include pharmacological and non-pharmacological pain management pain management strategies.

Context

The context includes emergency centers, wards, critical care units, prehospital settings, lower, middle- and higher-income countries.

Types of sources

Only guidelines published in English globally on acute pain management will be included due to costs of translation. Only guidelines developed between 2015–2020, will be included in the review. Guidelines become outdated at different rates depending on the availability of new evidence. Primary evidence regarding the assessment and management of paediatric patients and patients with chronic pain will be excluded. The review will consider any guidelines for allied health professionals that will be applicable to nursing practice, used for the assessment and management of adult patients who present with acute pain. There are guidelines available for allied health workers that were not written for nurses but include practices that are applicable to nursing practice.

Methodology

The Johanna Briggs Institute (JBI) methodological framework for scoping reviews [1] is used in conducting the review. The steps included: (i) identifying the research question, (ii) developing the inclusion and exclusion criteria, (iii) searching for the evidence, (iv) selection of eligible studies, (v) data extraction and (vi) data appraisal. The results will be reported, using the Preferred Reporting Items for Systematic Reviews and Meta Analyses for Scoping Reviews Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco, Lillie, Zarin, *et al.*, 2018:467).

Search strategy

The three-step search process recommended by JBI will be followed. A comprehensive search for published and unpublished guidelines will be conducted. The following databases will be used to search for published guidelines: PubMed, CINAHL, EBSCOhost and guideline clearinghouses: Scottish Intercollegiate Guidelines Network (SIGN), Trip and Guidelines International Network, Guidelines International Network (G-I-N), National Institute for Health and Care Excellence (NICE), the National Guidelines Clearinghouse (NGC), ECRI Guidelines, Guideline Central, Australian Clinical Practice Guidelines. Grey literature will also be considered to find unpublished guidelines. The search for grey literature will be done systematically, by carefully planning the sources where grey literature can be obtained from e.g., guidelines, presented at conferences e.g., PainSA, European Pain Federation, and but not yet published. A mixed approach will be used to obtain grey literature using library databases and search engines such as Google and browsing websites of organisations relevant to the research area. A further search for the keywords will be conducted across all the identified databases. Additionally, we will contact key experts, policymakers, and practitioners for unpublished guidelines if necessary. The search strategy will be done in consultation with a librarian who is experienced in developing a search strategy. To conclude, a search will be conducted on ResearchGate and Google

Stellenbosch University https://scholar.sun.ac.za

Scholar to identify additional guidelines, which may not have been widely available through conventional databases.

Following the full search, all citation results will be captured, and duplicates will be removed. A random sample of 20 titles/abstracts will be selected and screened manually by two independent reviewers (YN) and (CI) using prespecified inclusion criteria using Mendeley v.1.19.8 (Mendeley Ltd., Elsevier, Netherlands), a web-based citation and reference management system. Discrepancies will be assessed, and disagreements will be resolved through discussion or consultation of a third person. Any changes will be noted.

A preliminary search was conducted on PubMed (Appendix A).

Data extraction

Data will be extracted from guidelines included in the scoping review by two independent reviewers (Tricco *et al.*, 2018:469) (YM and CI) using a data extraction tool based on the standardized tools in the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia) from the JBI data extraction tool available in JBI SUMARI (Munn *et al.*, 2018:5). The data extracted will include specific details about the authors, date of publication, country, guideline development team, aims/purpose, population in the guideline, methodology of developed guideline, pain assessment, pain management, clinical outcomes measured and other key findings and will be refined during the review. At least two review authors (YM and CI) will independently and in duplicate, assess the quality and variability of the included guidance documents using the AGREE II (Brouwers, Kho, Browman, *et al.*, 2010:839). Any disagreements will be discussed, and a third reviewer (PJ) may be consulted when disagreements are not resolved by the two reviewers. It strategically informs the development and reporting process. Findings will be reported in Preferred Reporting for Systematic Reviews and Meta-analysis extension for scoping review (PRISMA-ScR) Checklist.

Data analysis and presentation of findings

Extracted data will be charted on tables aligned to the questions of this scoping review with specific details regarding which countries the guidelines were obtained and how the information will be presented for acute trauma-related pain assessment and acute trauma-related pain management. The data extracted will be summarised in a narrative according to the key findings. The summarized recommendations will be presented in a table indicating the specific guideline and the recommendation for acute pain assessment and acute pain management. Data analysis and presentation may be further refined during the review process as the reviewers become more aware of the content of all their included studies (Peters *et al.*, 2015:143). A final scoping review report will be prepared upon completion of the review.

Acknowledgments

Mr. Ras Yusuf, librarian at Stellenbosch University, for assisting with the literature search.

This review will contribute towards a PhD in Nursing for YNM.

Stellenbosch University https://scholar.sun.ac.za

Keywords:
acute pain,
acute pain assessment
acute pain management,
nurses,
emergency centers,
best practice guidelines

Stellenbosch University https://scholar.sun.ac.za

REFERENCES

Aromataris E, Munn Z. 2017. Chapter 1: JBI Systematic Reviews. In: Aromataris E, Munn Z (Editors). *Joanna Briggs Institute Reviewer's Manual.* The Joanna Briggs Institute, Available from https://reviewersmanual.joannabriggs.org/ Retrieved: 12 May 2020.

Blumstein, B., & Barkley, T.W. 2015. Neuropathic Pain Management: A Reference for the Clinical Nurse. *MEDSURG Nursing*, 24(6): 381-390.

Brouwers M.C, Kho ME, Browman G.P, Burgers J.S, et al., AGREE II: Advancing guideline development, reporting and evaluation in healthcare. *CMAJ* 2017;182: E839-842.

Dißmann, P.D., Maignan, M., Cloves, P.D., Parres, B.G., Dickerson, S., & Eberhardt, A. 2018. A Review of the Burden of Trauma Pain in Emergency Settings in Europe. Available from: https://doi.org/10.1007/s40122-018-0101-1 Retrieved 15 August 2019.

Federal Ministry of Health Nigeria. Guidelines for the management of Pain in Nigeria. 2018. Available from: https://www.researchgate.net/publication/327154496_Guidelines_for_the_Management_of_Pain_in_Nigeria/link/5b7ce6224585151fd126960f/download Retrieved 02 June 2019.

Grady, K. 2015. Core Standards for Pain Management Services in the UK. Faculty of Pain Medicine. Available from: https://www.rcoa.ac.uk/system/files/FPM-CSPMS-UK2015.pdf Retrieved 02 June 2019

Health Care Association of New Jersey. Pain Management Guideline. 2017. Available from: https://www.hcanj.org/files/2013/09/Pain-Management-Guidelines-HCANJ-May-12-final.pdf Retrieved 02 June 2019.

Institute of Medicine (IOM). 2011. Clinical Practice Guidelines We Can Trust. Washington, DC: The National Academies Press.

Malaysian Association for the Study of Pain. 2012. Management of Neuropathic Pain. 2nd edition.

[10] McCaul M., de Waal B., Hodkinson P., Pigoga J.L., Young T., Wallis L.A. 2018. Developing prehospital clinical practice guidelines for resource limited settings: why re-invent the wheel? *BMS Research Notes,* 11 (97): 1-5.

Munn, Z., Micah D. J. Peters, M.D.J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. 2018. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology,* 18(1):1-7.

New Zealand Pain Society – Nurses Interest Group. 2013. New Zealand Pain Management nursing Knowledge and Skill Framework for Registered Nurses.

Peters, M.D.J, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. 2015. Guidance for conducting systematic scoping reviews. *Int J Evid Based Healthc*. 2015;13(3):141–146.

Parnass, A.J., Greenbaum, N.R., Glick, M.A., & Halpern, P. 2015. Pain management framework in the emergency department: patterns in 40 emergency departments worldwide. *European Journal of Emergency Nursing*, 00:000-000. Available from: DOI: 10.1097/MEJ.0000000000000299 Retrieved: 06 January 2020.

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.

Stellenbosch University https://scholar.sun.ac.za

Registered Nurses Association of Ontario. 2013. Assessment and Management of Pain. 3rd edition. Available from: https://rnao.ca/bpg/guidelines/assessment-and-management-pain Retrieved: 30 June 2019.

Royal College of Nursing. 2015. RCN Pain Knowledge and Skills Framework for the Nursing Team. Available from: https://www.britishpainsociety.org/static/uploads/resources/files/RCN_KSF_2015.pdf Retrieved: 20 July 2019.

Salway, R.J., Valenlenzuela, R., Soenberger, J.M., Mallon, W.K., & Viccellio, A. 2017. Emergency Department (ED) Overcrowding Evidence-Based Answers to frequently asked questions, *Rev.Med. Clin.Condes*, 28(2):213-219.

[Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med 2018;169(7):467–73.

[World Health Organization. 2014. WHO Handbook for Guideline Development. Available from: https://apps.who.int/iris/bitstream/handle/10665/75146/9789241548441_eng.pdf;sequence=1. Retrieved: 25 May 2020.

Stellenbosch University https://scholar.sun.ac.za

Appendix A: Search strategy

Search conducted on pain assessment: 01 November 2020

Search		Query	Records Retrieved
PubMed	#5 + #6 = #7	(("Nursing"[Title/Abstract] OR "emergency nursing"[Title/Abstract] OR "Nurses"[Title/Abstract]) AND ("pain assessment"[Title/Abstract] OR "pain measurement"[Title/Abstract] OR "pain observations"[Title/Abstract] OR "pain evaluation"[Title/Abstract]) AND ("acute trauma"[Title/Abstract] OR "Pain"[Title/Abstract] OR "trauma pain"[Title/Abstract])) AND ("clinical practice guidelines"[Title/Abstract] OR "best practice guidelines"[Title/Abstract])	16
	#6	(("Nursing"[Title/Abstract] OR "emergency nursing"[Title/Abstract] OR "Nurses"[Title/Abstract]) AND ("pain assessment"[Title/Abstract] OR "pain measurement"[Title/Abstract] OR "pain observations"[Title/Abstract] OR "pain evaluation"[Title/Abstract])) AND ("acute trauma"[Title/Abstract] OR "Pain"[Title/Abstract] OR "trauma pain"[Title/Abstract])	
	#1 + #4 = #5	("Nursing"[Title/Abstract] OR "emergency nursing"[Title/Abstract] OR "Nurses"[Title/Abstract]) AND ("pain assessment"[Title/Abstract] OR "pain measurement"[Title/Abstract] OR "pain observations"[Title/Abstract] OR "pain evaluation"[Title/Abstract])	1, 465
	#4	"Nursing"[Title/Abstract] OR "emergency nursing"[Title/Abstract] OR "Nurses"[Title/Abstract#4	390, 662
	#3	"clinical practice guidelines"[Title/Abstract] OR "best practice guidelines"[Title/Abstract]#3	14,240
	#2	"acute trauma"[Title/Abstract] OR "Pain"[Title/Abstract] OR "trauma pain"[Title/Abstract]#2	641,101
	#1	"pain assessment"[Title/Abstract] OR "pain measurement"[Title/Abstract] OR "pain observations"[Title/Abstract] OR "pain evaluation"[Title/Abstract]	7,651

Stellenbosch University https://scholar.sun.ac.za

APPENDIX S: SEARCH STRATEGY FOR DATABASES AND GUIDANCE CLEARING HOUSES

Search strategy Pubmed – 14/12/20

Search		Query	Records Retrieved
Pubmed			
	#12	(((nurse[MeSH Terms]) OR (nurse[Title/Abstract] OR nursing[Title/Abstract] OR emergency nurse NOT nursing home[Title/Abstract])) AND ((acute pain[MeSH Terms]) OR (pain[Title/Abstract] OR acute pain[Title/Abstract] OR trauma pain[Title/Abstract]))) AND (((pain management[MeSH Terms]) OR (pain measurement[MeSH Terms])) OR (pain management[Title/Abstract] OR pain measurement[Title/Abstract] OR pain assessment[Title/Abstract] OR pain treatment[Title/Abstract] OR pain strategies[Title/Abstract] OR pain observation[Title/Abstract] OR pain evaluation[Title/Abstract] OR non-pharmacological[Title/Abstract])) **Filters: Practice Guideline**	25
	#3 AND #6 AND #10 = #11	(((nurse[MeSH Terms]) OR (nurse[Title/Abstract] OR nursing[Title/Abstract] OR emergency nurse NOT nursing home[Title/Abstract])) AND ((acute pain[MeSH Terms]) OR (pain[Title/Abstract] OR acute pain[Title/Abstract] OR trauma pain[Title/Abstract]))) AND (((pain management[MeSH Terms]) OR (pain measurement[MeSH Terms])) OR (pain management[Title/Abstract] OR pain measurement[Title/Abstract] OR pain assessment[Title/Abstract] OR pain treatment[Title/Abstract] OR pain strategies[Title/Abstract] OR pain observation[Title/Abstract] OR pain evaluation[Title/Abstract] OR non-pharmacological[Title/Abstract]))	4,755
	#7 OR #8 OR #9= #10	((pain management[MeSH Terms]) OR (pain measurement[MeSH Terms])) OR (pain management[Title/Abstract] OR pain measurement[Title/Abstract] OR pain assessment[Title/Abstract] OR pain treatment[Title/Abstract] OR pain strategies[Title/Abstract] OR pain observation[Title/Abstract] OR pain evaluation[Title/Abstract] OR non-pharmacological[Title/Abstract])	143,452
	#9	pain management[Title/Abstract] OR pain measurement[Title/Abstract] OR pain assessment[Title/Abstract] OR pain treatment[Title/Abstract] OR pain strategies[Title/Abstract] OR pain observation[Title/Abstract] OR pain evaluation[Title/Abstract] OR non-pharmacological[Title/Abstract]	44,903
	#8	pain measurement[MeSH Terms]	87,266
	#7	pain management[MeSH Terms]	35,070
	#4 OR #5=#6	(acute pain[MeSH Terms]) OR (pain[Title/Abstract] OR acute pain[Title/Abstract] OR trauma pain[Title/Abstract])	645,476
	#5	pain[Title/Abstract] OR acute pain[Title/Abstract] OR trauma pain[Title/Abstract]	645,320
	#4	acute pain[MeSH Terms]	2,261
	#1 OR #2 = #3	(nurse[MeSH Terms]) OR (nurse[Title/Abstract] OR nursing[Title/Abstract] OR emergency nurse NOT nursing home[Title/Abstract])	387,596
	#2	nurse[Title/Abstract] OR nursing[Title/Abstract] OR emergency nurse NOT nursing home[Title/Abstract]	341,529
	#1	nurse[MeSH Terms]	89,068

Stellenbosch University https://scholar.sun.ac.za

CINAHL / EBSCOHost

25 January 2021

	#7	Publication Type: Practice guidelines Language: English Special Interest: Emergency Care, Pain and Pain Management, Keyword Search: Nurs* AND Trauma AND Management Nurs*: nurs or nurses or nursing AND pain management or pain relief or pain control or pain reduction AND Trauma or emergency	2
	#4 OR #5=#6	Acute pain management AND nursing AND emergency department OR emergency center AND trauma AND adult OR Practice guidelines OR guidelines AND acute pain management AND emergency department	16
	#5	Practice guidelines OR guidelines AND acute pain management AND emergency department	13
	#4	Acute pain management AND nursing AND emergency department OR emergency center AND trauma AND adult	3,584
	#1 OR #2 = #3	Nurs* AND Trauma AND Management OR Nurs*: nurs or nurses or nursing AND pain management or pain relief or pain control or pain reduction AND Trauma or emergency	1,142
	#2	Nurs*: nurs or nurses or nursing AND pain management or pain relief or pain control or pain reduction AND Trauma or emergency	3940
	#1	Nurs* AND Trauma AND Management	0

Search Strategy for Guideline Repositories

14 June 2021

National Institute for Health and Care Excellence (NICE)		
#8	Guidelines AND pain assessment AND acute pain management AND nurses AND emergency department AND trauma OR injury NOT children	27
Scottish Intercollegiate Guidelines Network (SIGN)		
#7	**“Pain assessment’’ AND "acute pain management AND nurses AND "emergency departments"**	89
TRIP		
#6	“Pain assessment’’ AND “acute pain management’’ AND nurses AND ‘’emergency department OR emergency room from:2015	436
Australian Clinical Practice Guidelines		
#5	Australian Clinical Practice Guidelines AND pain assessment AND acute pain management AND nurses AND emergency department from:2015	354
Guidelines International Network (GIN)		
#4	Guidelines International Network AND pain assessment AND acute pain management AND nurses AND emergency department NOT children from:2015	366

Stellenbosch University https://scholar.sun.ac.za

Registered Nurses Association of Ontario		
#3	Registered Nurses Association of Ontario AND pain assessment AND acute pain management AND emergency department from:2015	(47)
Cochrane Library		
#2	Guidelines AND pain assessment AND pain management AND emergency department AND nurses in Title Abstract Keyword	12
JBI Synthesis		
#1	JBI Synthesis AND pain assessment AND pain management AND emergency department from:2015	48

Stellenbosch University https://scholar.sun.ac.za

APPENDIX T: SUMMARY OF FINDINGS OF INCLUSION GUIDELINES

Author	Title	Year	Setting	Level of Evidence	Reason	Agree Ⅱ Score
Schug, S., Palmer, G.M., Scott, D.A., Halliwell, R., & Trinca, J.	Acute Pain Management: Scientific Evidence	2015	• Perioperative and post traumatic care (EC)	According to the NHMRC designation (**NHMRC 1999 GL**).	• Assessment and Management of pain treatment • Outcome measures in pain management • Pain management education for patient and staff • Pharmacological pain management • Non-pharmacological techniques • Acute pain management in the EC	64%
American College of Surgeons	ACS Trauma Quality Programs: Best Practice Guidelines for Acute Pain Management in Trauma Patients. American College of Surgeons	2020	• Emergency Centers	Not indicated	• English • Trauma-related • Includes adults • Pain assessment • Pharmacological pain management • Non-pharmacological pain management • Education	50%
Hsu, J.R.; Mir, H.; Wally, M.K.; Seymour, R.B.	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury.	2019	• Orthopaedic practices • Other specialities to improve pain management following acute pain management	Grading of Recommendations Assessment, Development, and Evaluation (GRADE)	• English • Acute Pain • Musculoskeletal injury – trauma-related • Pain assessment • Pharmacological pain management • Evidence-based recommendations on non-pharmacological pain management strategies • GRADE system used	67%
Faculty of Pain Medicine of the Royal College of Anaesthetists	CSPMS Core Standards for Pain Management Services in the UK	2015	• In hospital • Community	Not indicated	• English • Guide for implementation • Patient pathways • Pain assessment • Pain interventions • Acute pain management services	44%

Stellenbosch University https://scholar.sun.ac.za

					• Non-pharmacological therapies • Education	
European Society for Emergency Medicine	Guidelines for the management of acute pain in emergency situations: EUSEM	2020	• Emergency settings e.g., emergency department or pre-hospital setting		• English • Principles of acute pain management • Assessment of pain • WHO pain ladder • Pharmacological pain management • Non-pharmacological therapies in acute pain • Recommendations given	69%
Federal Ministry of Health Nigeria	Ministry of Nigeria: Guidelines for Pain Management in Nigeria	2015	• All settings where pain management is implemented	• Identification of priority topics • Identification and evaluation of pain treatments publications from web searches • Review of other appropriate literatures from web search • Detailed assessment and synthesis of the evidence • Formation of recommendations • Writing and publication of the guidelines' content	• English • Aim is to standardize pain management • Treatment of pain • Overarching approach to pain management • Patient care • Patient assessment • Critical elements of pain assessment • Recommendations • WHO pain ladder • Non-pharmacological interventions • Code of Ethics for nurses in pain management	57%
New Zealand Pain Society Nurses' Interest Group	New Zealand Pain Management: Nursing Knowledge and Skills Framework for registered nurses	2018	Areas of nursing practice where nurses will come into contact with patients experiencing pain	Not indicated (Framework)	• English • For registered nurses • Educational pathway • Review team consist of nurses • Makes use of an assessment rating scale for nurses to assess their competency • Includes different domains of practice	47%

Stellenbosch University https://scholar.sun.ac.za

					• Includes non-pharmacological strategies	
U.S. Department of Health and Human Services	Pain Management Best Practices Inter-Agency Task Force Report	2019	Primary care providers	Not indicated	• English • Approaches to pain management • Restorative therapy • Behavioural approaches • Complementary approaches • Gaps and recommendations provided • Education	47%
Medical Care Quality Section Ministry of Health Malaysia	Pain Management in Emergency & Trauma Department Medical Care Quality Section. Ministry of Malaysia	2020	Emergency & Trauma Department	Not indicated	• English • Pain management pathway during triage • Approach to pain assessment • Approach to pain management • Pain management issues • Pain control principles • Pain management holistic approach	28%
Royal College of Nursing and British Pain Society	RCN Pain Knowledge and Skills Framework for the Nursing Team	2015	Across the nursing continuum in all four UK countries dealing with pain	Not indicated (Framework)	• English • Implementation of guidelines is emphasized • Peer reviewed • Pain assessment • Pain management • Nursing Responsibilities • Provides a knowledge and skills framework for registered nurses • Registered nurse's physical strategies to manage pain • Registered nurse's self-management strategies' • Registered nurse's complex pain management	24 %
South African Society of Anaesthesiologists SASA)	South African Acute Pain Guidelines	2015	All settings involving acute pain management of adults and children	Not indicated	• English • South African context • Measurement and assessment of acute pain • Pain assessment tools	25%

Stellenbosch University https://scholar.sun.ac.za

					• Non-pharmacological pain management methods/techniques • Acute trauma pain	
Registered Nurses' Association of Ontario	RNAO: Clinical Best Practice Guidelines. Assessment and Management of Pain	2013	All settings involving pain	According to SIGN 2012	• English • Practice recommendations • Discussion of evidence • Pain assessment • Pain management • Education recommendations • Organization and policy recommendations	78%

Stellenbosch University https://scholar.sun.ac.za

APPENDIX U: SUMMARY OF FINDINGS OF EXCLUDED STUDIES

Author	Title	Year	Reason for Exclusion
Agency for Health Care Research and Quality	Treatment for Acute Pain: An Evidence Map	2019	• Emphasis is on acute pain in general and not on trauma-related pain
British Pain Society	Guidelines for Pain Management Programmes for adults *An evidence-based review prepared on behalf of the British Pain Society*	2013	• Older than 5 years • Not reviewed as proposed
Health Care Association of new Jersey	• Pain Management Guideline	2006	• Older than 5 years
International Association for the Study of Pain	• Guidelines for the management of pain in vulnerable populations	2019	• Emphasis on vulnerable population: Pediatrics. Older patients, intellectual disabilities
Kopf, A., & Patel, N.B.	• Guide to Pain Management in Low-Resource Settings	2010	• Older than 5 years
National Emergency Care Pain Management Initiative National Institute of Clinical Studies	• Emergency Care Acute Pain Management Manual	2011	• Older than 5 years
NICE Guidelines	• Covid-19 rapid guideline: acute myocardial injury	2020	• Not trauma-related
NICE Guidelines	• Fractures (non-complex): assessment and management	2016	• Not specific
Nice Guidelines	• Major trauma: assessment and initial management	2016	• Concentrates on different systems and trauma. • Pain management is referred to the NICE guideline on patient experiences in adult NHS services. • This guideline does not give a detailed assessment and management of pain or recommendations.
NICE Guidelines	• NICE: Patient experiences in adult NHS services: improving the experiences of care for people using adult NHS services	2012	• Older than 5 years • Does not address pain assessment and management adequately
NICE Guideline NG180	• Perioperative care in adults • Evidence reviews for managing acute post-operative pain.	2020	• Emphasis on post-operative pain
Oliveira, C.B.; Maher, C.G.; Pinto, R.F., Traeger, A.C., Lin, C.C. Chenot, J.F., van Tulder, M., & Koes, B.W.	• Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview	2018	• Low-back pain • Does not give recommendations on pain assessment and pain management
Oregon Pain Guidance of Southern Oregon	• Oregon Pain Guidance	2016	• Too much emphasis on chronic pain and pharmacological management

Stellenbosch University https://scholar.sun.ac.za

Raf, M.; Crosier, J., Eppel, S., Neyer, H., Sarembock, B., & Webb, D.	• South African guideline for the use of chronic opioid therapy for chronic non-cancer pain	2014	• Older than 5 years • Emphasis on chronic pain
Raf, M., Melvill, R., Coetzee, G., & Smuts, J.	• Spinal cord stimulation for the management of pain: Recommendations for best clinical practice	2013	• Older than 5 years • Not specific to acute pain
Registered Nurses' Association of Ontario	• RNAO Best Practice Guidelines: Toolkit: Implementation of Best Practice Guidelines	2012	• Older than 5 years
Republic of Rwanda: Ministry of Health	• Pain Management Guidelines	2012	• Older than 5 years
Scottish Intercollegiate Guidelines Network (SIGN)	• Management of chronic pain	2019	• Emphasis on chronic pain
South African Society of Anaesthesiologists	• Paediatric Sedation Guidelines for Procedural Sedation and Analgesia	2016	• Paediatrics • Emphasis on procedural analgesia
World Health Organisation	• Guidelines for Essential Trauma Care	2004	• Older than 5 years • Emphasis is on trauma care in general
Youssef, S.	• Clinical guidelines and evidence base for acute pain management •	2019	• Too much emphasis on pharmaceutical management

Stellenbosch University https://scholar.sun.ac.za

APPENDIX V: TABLE: DATA EXTRACTION

Authors/ ID year	Year of Publication	Country of origin	Guideline Development Team	Aims/purpose	Population in guideline	Methodology of developed guidelines	Context	Pain Assessment and details of assessment of acute pain:	Management of acute pain	Clinical outcomes measured	Other key findings
Acute Pain Management: Scientific Evidence											

Australian and New Zealand College of Anaesthetists and Faculty of Pain	2015	Australia and New Zealand	Health professional across the globe	• To combine a review of the best available evidence for acute pain management with current clinical and expert practice.
				• To summarise the substantial amount of evidence currently available for the management of acute pain in a concise and easily readable form.
					Adult patients	Systematic Reviews Randomized control trials		Pain assessment includes:
								• General medical history
								• Physical examination
								• Fundamentals of pain history (GAQs) e.g., site of pain, circumstances associated with pain, character of pain, Intensity of pain, associated symptoms,
								• Categorical scales e.g., Verbal Descriptor Scale (VDS) which can be converted to numerical scores.
								• Numerical Rating Scales (NRS):
								  • Have both written and verbal forms.
								  • Patients rate their pain intensity on the scale of zero to ten. Zero represents 'no pain' and ten
									Psychological interventions:
									• Listening to music
									• Distraction reduces the pain.
									• Coping mechanisms with training.
										None noted	

Stellenbosch University https://scholar.sun.ac.za

							represents 'worst pain'. • Visual Analogue Scale (VAS) consists of a 100 mm horizontal line with verbal anchors at both ends with no tick marks. The patient is asked to mark the lin. The score is the distance in millimetres from the left side of the scale to the mark. • VAS can also be used to measure other aspects of the pain experience e.g., affective component, patient satisfaction. • Education: Patients who are educated about the assessment and management of pain will have some control and comment on the quality of their pain relief.			
Best Practice Guidelines for Acute Pain Management in Trauma Patients										
American College of Surgeons (ACS)	2020	United States	Multidisciplinary	• To provide an evidence-based, practical guideline and recommend	Adult patients Nurse	Randomized control trials	• Pain is difficult to quantify with any single assessment tool due to its complexity. • Numerical Rating Scale (NRS): an 11-	• Cognitive Behavioural Therapy (CBT): Aims to improve the patient's control over their	None noted	Implementing Best Practice Guidelines for acute pain management in trauma patients:

Stellenbosch University https://scholar.sun.ac.za

	ations to acute pain managemen t of the trauma patient			point patient-reported metric that scores pain on a scale from 0 to 10, • With 0 being no pain and 10 being worst imaginable pain. • Visual Analog Scale (VAS): Is a self-report acute pain assessment tool. • The patient marks their pain on a 10 cm line with no pain written on the left and worst possible pain on the right side. • Defense and Veterans Pain rating scale (DVPRS): self-reporting, graphic acute pain assessment tool. Uses same scale as NRS but provides more description of each level of pain with colour coding and cartoon facial expressions. • Additionally, it has supplemental questions that measure the degree to which pain interferes with usual activity, sleep, mood, and stress.	perception of pain. • Includes teaching relaxation techniques, using guided mental imagery for diversion, music therapy, a passive, self-explanatory, low-risk distraction technique. • Physical Strategies: • Immobilization is used in extremity and pelvic trauma to stabilize the affected body part. It is strongly recommended as an adjunct to pain management. • Temperature Therapy” • Cryotherapy (cold therapy) uses external cooling to reduce internal tissue temperature e.g., ice packs, gel packs and	• trauma medical directors, trauma program managers, and staff have a leadership role in implementin g and supporting pain managemen t • and implementin g and monitoring compliance of the pain managemen t best practice guidelines (BPG).

Stellenbosch University https://scholar.sun.ac.za

			• Assessment tools for adult patients with cognitive impairment: It is challenging to assess pain in these patients.
			  • Behavioural pain scale (BPS): a three-domain tool with four scores in each domain for a possible score range of 3-12.
			  • Is an objective scale scored at the bedside by the nurse has high inter-rater reliability?
			• Critical care pain observation tool (CPOT): acute pain assessment tool which objectively score patients in four domains: facial expressions, body movements, ventilator compliance/vocalization, and passive muscle tension.
			  • To obtain baseline values for each domain observe the patient at rest for one minute.
			• Functional Pain Assessment Tools
				cold-water immersion.
				• Heat therapy uses external warming to relieve discomfort associated with injury. Commonly used after the acute injury period,

Stellenbosch University https://scholar.sun.ac.za

Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury									
Hsu, J.R., Mir, H., Wally, M.K., & Seymour, R.B.	May 2019	Florida, United States	• To provide evidence-based recommendations for the management of acute musculoskeletal pain.	Adult patients	Available in Digital Content 1 – unable to access	• Assess pain regularly with short, validated tools	• Cognitive strategies: alleviation of pain, expected recovery course, and patient experience at all times. • Connect patients with severe pain to psychological interventions and resources. • Consider strategies for optimal mindset using anxiety-reducing strategies to promote self-efficacy and promote peace of mind e.g., music, therapy of approaches based on cognitive behavioural therapy. • Physical strategies: use mobilization, ice, and elevation appropriately • Consider the use of cryotherapy.	None	none

Stellenbosch University https://scholar.sun.ac.za

								• Psychological interventions: cognitive behavioural therapy, self-management interventions and training, educational information.		
Core Standards for Pain Management Services in the UK										
Faculty of Pain Medicine of the Royal College of Anaesthetics	October 2015	United Kingdom (UK)	Multidisciplinary	To provide a framework for standard setting in the provision of Pain Management Services.	Adult patients, Nurses	Not mentioned	• Pain assessment as 5th vital sign. • Thorough history. • Use of valid and reliable assessment tools. • Comprehensive assessment • Patients with acute pain must have regular assessments using consistent, validated tools. • Patients with acute pain must be treated within 30 minutes and reassessed at the appropriate time.	• Pain champions to lead acute pain management. • Management must also be aimed at the consequences of pain e.g., low moods, anxiety, loss of confidence. • Use psychological strategies to empower patient. • Treatment plans to be formulated by nurse considering the biopsychosocial components of the individual's pain. • Use interventions that promote the development of self-efficacy and self-management skills.	None	Governance • Pain management services within an institution should be under a unified management % government structure. Training: • There should be training standards for clinical involvement with acute pain. • Training must be well defined i.e., learning aims, and objectives

Stellenbosch University https://scholar.sun.ac.za

		• Acute pain management must be supervised by specialist nurses with appropriate training and competencies.
		• Cognitive Behavioural principles:
		  • Cognitive therapy methods to identify, examine and change the impact of distressing, misleading or restricting thoughts and beliefs.
		  • Psychological flexibility to enhance acceptance and mindfulness.
		  • Physical exercise to change behaviour patterns, to increase movement, to enable goal-directed activity.
		  • Education to improve
			must be well defined to meet competencies.
			• Nurse participates in clinical audit to identify areas for change and improvement.

Stellenbosch University https://scholar.sun.ac.za

								knowledge and understanding to produce behaviour change or improve daily functioning	
Guidelines for the management of acute pain in emergency situations (EUSEM)									
European Society for Emergency Medicine (EUSEM)	March 2020	Europe	Multidisciplinary	• To provide a robust, systematic aid to making clinical decisions with respect to acute pain for patients. • To improve the lives of patients. • To support improvements in the assessment and management of acute pain in emergency settings.	Adult patients, Nurses	• PubMed to search MEDLINE, • Cochrane, • Google Scholar, • EMBASE Included: • Randomised Controlled Trials (RCTs) • Clinical Trials, without randomisation eg open label, observational, retrospective • Meta-analysis • Case Series/case-controlled studies • Systematic Reviews	• Effective patient pain history: - Careful attention to patient's reported symptoms to direct the process of physical examination. - Location of pain - Temporal characteristics - Aggravating and alleviating factors - Impact of pain on function and quality of life - Past treatment and reports - Patient expectations and goals for their pain • Categorical pain scales: - a verbal descriptor scale is used. - includes four to five descriptors from 'no pain' to 'excruciating pain'.	• Psychological interventions: - Sharing information: providing patients with procedural information - Attention control measures e.g., distraction techniques, concentration on imagined scenes or sensations, focus on external stimuli e.g., music, odours - Cognitive behavioural therapy is a psychological technique that includes cognitive and behavioural modifications of specific activities to reduce the impact of pain	• Principles of acute pain management: - Proper and effective pain management is a right of all patients experiencing pain. the key aim is to reduce pain, maintain function and minimise effects. - Acute pain generally associated with limited duration. It results from the activation of nerve endings at

Stellenbosch University https://scholar.sun.ac.za

		- can be converted to numeric scores. - pain relief can also be graded. - Simple and easy to use. • Numeric rating scales (NRS) can be delivered verbally or written format. - Patients are asked to rate the intensity of pain according to an 11-point scale. • Visual analogue scale (VAS) is the most commonly used scale for rating pain intensity in clinical trials. • Patient marks the point along the line that they feels corresponds to the level of pain that they are experiencing. • Pain score is recorded as the measurement in millimetres or centimetres from the left of the scale to the patient's mark. • Assessment of functional impact of pain: - Functional impact scale (FAS) is a simple 3-level categorical score to	and disability and overcome barriers to physical and psychosocial recovery. - Cold and heat: Physiology effects of cryotherapy include reductions in pain, oedema, inflammation and muscle spasm and physiology effects of heat therapy include relief from pain and increase in blood flow and elasticity of connective tissue. - Traction and bracing: Skeletal traction for preoperative fracture stabilisation and pain control. - Bracing is useful to reduce pain and protect the neck, back and joints. - Patient positioning: appropriate positioning for noncomplex	the site of tissue damage. - Appropriate and adequate validation of the patient's pain and pain assessment is vital to effective pain management. - Effective pain management can improve long-term outcomes, while untreated or undertreated acute pain is associated with significant negative impact.

Stellenbosch University https://scholar.sun.ac.za

		assess if a patient can undertake appropriate activity at their current pain level. - Patient is asked to complete a certain activity. • Assessment of pain in special situations: - It is important to recognise impaired or limited ability. - Pain is generally underreported in the elderly. - Use appropriate pain assessment tool: verbal descriptor scales, NRS, FPS, Wong-Baker FACES, PAINAD (Observer related tool for assessing pain-related behaviour, partly based on FLACC). - Other physiological signs can indicate pain in the elderly: hypertension, tachycardia or bradycardia, sweating and increased muscle tone. • Sedated or unconscious patients is a challenge, particularly when	fractures, e.g. back slab, can alleviate pain. - Splints or slings in patients with soft tissue injury. - Elevation and ice also beneficial.

Stellenbosch University https://scholar.sun.ac.za

							patients are non-verbal sedation or lack of consciousness. - The behavioural pain scale (BPS) has been validated in critically ill, sedated and mechanically ventilated patients. - The BPS score is calculated as the sum of three subscales (facial expression, upper limb movements and compliance with ventilation). - Evaluation of acute pain			
Guidelines for the management of pain in Nigeria										
Federal Ministry of Health,	2018	Nigeria	Interdisciplinary	• To provide informed guidance to healthcare practitioners as they manage pain in patients. • To provide standards of practice that will assist healthcare practitioners in the effective assessment,	Nurses and Adults	Not mentioned	Patient History: • PQRST • Validated tool: • Numerical Rating Scale (NRS) • Verbal Analogue Scale (VAS) • Verbal Rating Scale (VRS) • Physiological assessment	Non-pharmacological pain interventions: Goals: • reduce pain, • decrease fear, • reduce distress and anxiety. • reduce the dosage of analgesic medications. • avoid use of medications where possible.	None	Unique population: • Elderly • Pregnant patients • Patients with mental health conditions • Patients with cognitive impairment Role of Nurses:

Stellenbosch University https://scholar.sun.ac.za

				• improve quality of life. Cognitive-Behavioural Interventions: • Psychological approaches • Distraction • Relaxation techniques Physical interventions: • Bed rest • Thermotherapy: application of heat to the injured site eg tissue injury, joint • Cryotherapy: use of ice packs • Exercise improves pain as well as strengthens and improves flexibility of limbs. Positioning • Changing patient's position in the bed or chair an improve pain. Additionally, ambulation, elevation, appropriate body alignment and	• Proper assessment of patient • Individualised nursing care plan • Adequate understanding and knowledge of culture and patient's beliefs • Holistic approach to pain management • Advocates for patient in pain Health Service Delivery: Any person experiencing pain is likely to interact with the health care system. Will the system meet the patient's needs? Building Capacity Pain management is an integral
	treatment, and monitoring of pain. • To ensure that all patients experiencing within the receive the highest quality care complying to the ethical framework.				

Stellenbosch University https://scholar.sun.ac.za

							support of extremities can improve patient comfort.	part of healthcare and must be championed by all staff members
New Zealand Pain Management Nursing Knowledge and Skills Framework for Registered Nurses								
New Zealand Pain Society	2018	New Zealand	Nurses	• To promote consistent evidence-based practice. • To contribute to improved health outcomes for the person / people with pain.	Nurses Adult patients	Comprehensive pain history: • Onset and duration • Site of pain • Character of pain • Intensity of pain at rest and movement • Aggravating factors e.g., sleep • Modulating factors – pharmacological & non-pharmacological • Associated symptoms e.g., nausea, constipation, fatigue • Timing and temporal factors • Effect of pain on ADLs • Anxiety and mood disorders • The person with pain's identified goal of pain management Appropriate assessment tools for: • Older adults • Cognitive impaired	• Environmental modification • Physical strategies • Behavioural strategies. • Psychological including cognitive behavioural strategies. • Competently and confidently incorporate such interventions into clinical teaching and into care of the person with pain. • Provide comprehensive education not person with pain • Management plan: - Turning/positioning/mobilisation - Wound support/reach devices - Heat/cold	Guide for implementation: Assist in the development of a range of transferrable clinical skills to be used in delivery of care. Seeks to minimises risk by ensuring that staff are competent and know the standard of care required I the specialty of pain management. Can inform curriculum development for undergraduate and post graduate registered nursing programmes.

Stellenbosch University https://scholar.sun.ac.za

				• Speak a language other than that of healthcare worker. Comprehensively and critically evaluate effectiveness of pain management interventions. Documentation	- Toileting - Distraction - Relaxation - Mindfulness	Provides a structure to develop educational programmes. Provide a mechanism by which registered nurses can measure health outcomes and the effectiveness of their practice.
Pain Management Best Practices Inter-Agency Task Force Report						
Pain Management Best Practices Inter-Agency Task Force	May 2019	United States (US)	Systematic Reviews of CPGs	• History taking • Physical examination	• Biopsychosocial approach • Treatment plan • Restorative therapy: - Physical exercise helps patients to understand and overcome secondary pathologies, fear of movement and anxiety that contribute to pain and disability. - Traction - Heat and cold: component of RICE (Rest, Ice, Compression,	• Policy makers to evaluate and advocate to improve access to restorative therapy.

Stellenbosch University https://scholar.sun.ac.za

			Elevation) paradigm for acute pain syndromes. • Behavioural Health Approaches should be considered a key component of the biopsychosocial model for pain management: - Psychological factors play an important role in an individual's experience and response to pain. - Behavioural therapy (BT) for pain focuses on improving functioning e.g., exercise. - Acceptance and commitment therapy (ACT) focuses on creating psychological flexibility through acceptance of psychological and physical experiences rather than challenging them.

Stellenbosch University https://scholar.sun.ac.za

								- Algorithms: management of acute pain symptoms.		
Pain Management in Emergency & Trauma Department										
Medical Care Quality Section, Ministry of Health Malaysia	July 2020	Malaysia	Multidisciplinary, synergistic approach	Not clear	Nurses Adult patients	Guidance source not mentioned	• Pain assessed as 5th vital sign • Primary triage: - First look - Diagnose pain by visual stereotyping i.e., facial expression, frowning, grimacing, tears and crying, reaction and behavioural pattern e.g., aggressive & agitated, shouting, weak and lethargy, fracture, swelling, bruises, sweating, burn area - At this stage non-pharmacological pain methods to be applied • Secondary triage: - Assessment done subjectively and objectively. - Aim is to confirm, grade, prioritize and manage pain. - Brief history taken. - Diagnose pain by frequently asked questions (FAQ) i.e., onset, site,	• Pain to be managed holistically by psychological and non-pharmacological methods. • Non-pharmacological pain management - Application of art and personality of the triageur e.g., reassure & counselling, voice tone soft and gentle, correct word and accent, empathy (feeling, sensitivity), body language, facial expressions, care, respect patient's feelings. - Bandage, ice pack, arm sling, cervical collar, walking sticks, trolleys, wheelchairs. - Immobilization (e.g., use of	None	None noted

Stellenbosch University https://scholar.sun.ac.za

							radiating pain. aggravating/relieving pain, nature and progression, associated symptoms. • To grade pain, use appropriate pain scale (NRS, VAS) • Document pain score in the vital sign chart	traction, arm sling) • Vital signs to confirm pain: • Pulse rate - tachycardia - Respiratory rate - increased - Blood pressure - high - Pain score - Cold clammy peripheries - Dysfunctional state e.g., not able to walk or stand	
RCN Pain Knowledge and Skills Framework for the Nursing Team									
Royal College of Nursing	2015	United Kingdom	Interdisciplinary team	• To provide a framework that supports the development of competence in managing pain for the entire nursing team.	Nurses Adult Patients	Not mentioned	• Patient's physiology: - Temperature - Pulse - Blood pressure - Respiratory rate • Use validated, recommended tools to perform, measure and document pain assessment. • Demonstrate how to assess pain. • Assess pain in patients with a range of clinical conditions and cognitive states. • To consider patients who are unable to self-report.	• Physical strategies to manage pain: - Turning and positioning - Wound support - Reach devices - Heat and cold - Mobilisation - Exercise • Identify different ways in which acute pain can be managed and the role of self-management.	Guidelines for implementation: • Act as a development tool for graded clinical skills that can be used throughout nursing careers. • Provide a structure to develop education programmes

Stellenbosch University https://scholar.sun.ac.za

							• Identify the relationship of the patient's pain experience to: - Anxiety - Depression - Fear/avoidance - Spirituality - Quality of life		
South African Pain Guidelines										
South African Society of Anaesthesiologists (SASA)	2016	South Africa	Practioners	• To aid any healthcare professional managing acute pain	• Acute pain managem ent pf adults and children			• Measurement and assessment of acute pain • Pain assessment tools: VAS, VNRS, VRS, Wong-Baker FACES, Pain assessment in Advanced Dementia Scale, • Regular reassessment and the fifth vita sign • Practices • Recommendations • Documentation • Evaluation	• Pharmacological pain management • Non-pharmacological methods: psychological preparation, teaching coping strategies, using relaxation therapies, using distraction techniques, splinting, and immobilising wounds, heat, and cold therapy • Clinical practice points given	
Assessment and Management of Pain										
Registered Nurses Association of Ontario (RNAO)	2013	Canada	Registered Nurses Association of Ontario Best Practice Guideline	• To provide evidence-based recommend ations for nurses who are	• Adults • Children	• Meta-analysis or systematic reviews of randomized controlled trials	• All settings when caring for persons with the	• Screening of patient • Comprehensive pain assessment • Pain history	• Collaborate with persons to identify their goals for pain management	• Education recommend ations • Organization s and policy

Stellenbosch University https://scholar.sun.ac.za

	Program Team (Nurses)	assessing and managing persons with the presence, or risk of, any type of pain • To assist nurses to become more comfortable, confident and competent when caring for persons with the presence, or risk of, any type of pain	• Well-designed quasi-experimental study • Well-designed non-experimental descriptive studies such as comparative studies, correlation studies and case studies • Expert committee reports or opinions and/or clinical experiences of respected authorities	presence , or risk of, any type of pain	• Unidimensional and multidimensional self-report tools • Comprehensive pain assessment on persons unable to self-report using a validated tool • Explore persons beliefs, knowledge, and level of understanding about pain • Document • Evaluation	• Comprehensive plan of care • Multimodal analgesic approach • Non-pharmacological interventions: physical, psychological, • Teach the person, family, and caregivers about the pain management strategies		recommend ations • Guideline implementati on • Monitoring of guideline

Stellenbosch University https://scholar.sun.ac.za

APPENDIX W: SUMMARY OF CRITICAL APPRAISAL

1. Acute Pain Management: Scientific Evidence

DOMAIN 1	Item 1	Item 2	Item 3	TOTAL	%
Appraiser 1	6	6	6	18	
Appraiser 2	6	6	6	18	
Total	**12**	**12**	**12**	**36**	**83**

1 x 3 x 2 = 6 36- 6 30
7 x 3 x 2 = 42 = 42-6 = 36 x 100 = 83%

DOMAIN 2	Item 4	Item 5	Item 6	TOTAL	%
Appraiser 1	7	2	7	16	
Appraiser 2	7	2	7	16	
Total	**14**	**4**	**14**	**32**	**72**

1 x 3 x 2 = 6 16-6 16
7 x 3 x 2 = 42 = 42-6 = 36 X 100 = 72%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	2	3	7	3	4	5	3	3	30	
Appraiser 2	2	3	7	3	4	5	3	3	30	
Total	**4**	**6**	**14**	**6**	**8**	**10**	**6**	**6**	**60**	**46**

1 x 8 x 2 = 16 60-16 44
7 x 8 X 2 = 112 = 112-16 = 96 x 100 = 45, 8%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	4	7	7	18	
Appraiser 2	4	7	7	18	
Total	**8**	**14**	**14**	**36**	**83**

1 x 3 x 2 = 6 36 -6 30
7 x 3 X 2 = 42 = 42-6 = 36 x 100 = 83, 33%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	3	6	6	1	16	
Appraiser 2	3	6	6	1	16	
Total	**6**	**12**	**12**	**2**	**32**	**50**

1 x 4 x 2 = 8 32-8 24
7 x 4 X 2 = 56 = 56-8 = 48 X 100 = 50 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	5	3	8	
Appraiser 2	5	3	8	
Total	**10**	**6**	**16**	**50**

1 x 2 X 2 = 4 16-4 12
7 x 2 x 2 = 28 = 28–4 = 24 X 100 = 50%

2. Best Practice Guidelines for the Management of Acute pain

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	7	3	7	17	
Appraiser 2	6	6	6	18	

Stellenbosch University https://scholar.sun.ac.za

Total	**13**	**9**	**13**	**35**	**81**

1 x 3 x 2 = 6 35-6 29
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 80, 55%

DOMAIN 2	**Item 4**	**Item 5**	**Item 6**	**Total**	**%**
Appraiser 1	7	1	3	11	
Appraiser 2	6	1	6	13	
Total	**13**	**2**	**9**	**24**	**50**

1 x 3 x 2 = 6 24-6 18
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 50%

DOMAIN 3	**Item 7**	**Item 8**	**Item 9**	**Item 10**	**Item 11**	**Item 12**	**Item 13**	**Item 14**	**Total**	**%**
Appraiser 1	1	1	1	1	6	6	1	1	18	
Appraiser 2	2	2	1	3	4	5	1	3	21	
Total	**3**	**3**	**2**	**4**	**10**	**11**	**2**	**4**	**39**	**24**

1 x 8 x 2 = 16 39-16 23
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 23, 95%

DOMAIN 4	**Item 15**	**Item 16**	**Item 17**	**Total**	**%**
Appraiser 1	5	7	7	19	
Appraiser 2	4	5	6	15	
Total	**9**	**12**	**13**	**34**	**78**

1 x 3 x 2 = 6 34-6 28
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 77, 77%

DOMAIN 5	**Item 18**	**Item 19**	**Item 20**	**Item 21**	**Total**	**%**
Appraiser 1	3	6	6	1	16	
Appraiser 2	3	6	2	1	12	
Total	**6**	**12**	**8**	**2**	**28**	**42**

1 x 4 x 2 = 8 28-8 20
7 x 4 x 2 = 56= 56-8 = 48 X 100 = 41, 66%

DOMAIN 6	**Item 22**	**Item 23**	**Total**	**%**
Appraiser 1	5	3	8	
Appraiser 2	1	1	2	
Total	**6**	**4**	**10**	**25**

2 x 2 = 4 10-4 6
7 x 2 X 2 = 28 = 28-4 = 24 X 100 = 25%

3. Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury

DOMAIN 1	**Item 1**	**Item 2**	**Item 3**	**Total**	**%**
Appraiser 1	6	6	6	18	
Appraiser 2	7	6	6	18	
Total	**12**	**12**	**12**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 83, 33%

Stellenbosch University https://scholar.sun.ac.za

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	2	5	4	11	
Appraiser 2	7	2	6	15	
Total	**9**	**7**	**10**	**26**	**56**

1 x 3 x 2 = 6 26-6 20
7 x 3 X 2 = 42= 42-6 = 36 X 100 = 55, 55%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	6	3	1	1	3	2	2	1	19	
Appraiser 2	4	3	5	5	4	6	6	1	34	
Total	**10**	**6**	**6**	**6**	**7**	**8**	**8**	**2**	**53**	**39**

1 x 8 x 2 = 16 53-16 37
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 38, 54%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	6	7	7	20	
Appraiser 2	6	7	7	20	
Total	**12**	**14**	**14**	**40**	**94**

1 x 3 x 2 = 6 40-6 34
7 x 3 X 2 =42= 42-6 = 36 X 100 = 94%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	4	6	1	1	12	
Appraiser 2	4	6	2	2	14	
Total	**8**	**12**	**3**	**3**	**26**	**50**

1 x 4 x 2 = 8 32-8 24
7 x 4 X 2 = 56 = 56-8 = 48 100 = 50%

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	7	7	14	
Appraiser 2	7	7	14	
Total	**14**	**14**	**28**	**100**

1 x 2 x 2 = 4 28-4 24
1 x 2 X 2 = 4 = 28-4 = 24 X 100 = 100 %

4. Core Standards for Pain Management Services in the UK

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	6	5	7	18	
Appraiser 2	6	6	6	18	
Total	**12**	**11**	**13**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 83%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	7	1	4	12	
Appraiser 2	6	2	6	14	
Total	**13**	**3**	**10**	**26**	**56**

1 x 3 x 2 = 6 26-6 20
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 55, 55%

Stellenbosch University https://scholar.sun.ac.za

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	1	1	2	1	2	6	2	1	16	
Appraiser 2	2	1	2	3	3	6	1	2	20	
Total	**3**	**2**	**4**	**4**	**5**	**12**	**3**	**3**	**36**	**21**

1 x 8 x 3 = 16 36-16 20
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 20, 83%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	7	4	6	17	
Appraiser 2	6	6	6	18	
Total	**13**	**10**	**12**	**35**	**81**

1 x 3 x 2 = 6 35-6 29
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 80, 55%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	1	1	1	3	6	
Appraiser 2	3	5	3	1	12	
Total	**4**	**6**	**4**	**4**	**18**	**21**

1 x 4 x 2 = 8 18-8 10
7 x 4 X 2 = 56 = 56-8 = 48 X 100 = 20, 83 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	1	1	2	
Appraiser 2	1	1	2	
Total	**2**	**2**	**4**	**0**

1 x 2 x 2 = 4 4 - 4 0
7 x 2 X 2 = 28 = 28-4 = 24 X 100 = 0%

5. Guidelines for the Management of Acute Pain in Emergency Situations EUSEM

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	6	6	6	18	
Appraiser 2	6	6	6	18	
Total	**12**	**12**	**12**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 x 2 = 42 = 42-6 = 36 X 100 = 83%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	6	5	4	15	
Appraiser 2	7	2	6	15	
Total	**13**	**7**	**10**	**30**	**67**

1 x 3 x 2 = 6 30-6 24
7 x 3 x 2 = 42 X 42-6 = 36 X 100 = 66, 66%

Stellenbosch University https://scholar.sun.ac.za

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	6	3	1	1	3	2	2	1	19	
Appraiser 2	7	6	1	4	4	5	5	1	33	
Total	**13**	**9**	**2**	**5**	**7**	**7**	**7**	**2**	**52**	**38**

1 x 8 x 2 = 16 52-16 36
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 37, 5%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	6	7	7	20	
Appraiser 2	6	7	7	20	
Total	**12**	**14**	**14**	**40**	**94**

1 x 3 x 2 = 6 40-6 34
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 94, 44%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	4	7	1	1	13	
Appraiser 2	4	6	2	2	14	
Total	**8**	**13**	**3**	**3**	**27**	**40**

1 x 4 x 2 = 8 27-8 19
7 x 4 X 2 = 56 = 56-8 = 48 X 100 = 39, 58 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	7	7	14	
Appraiser 2	7	7	14	
Total	**14**	**14**	**28**	**100**

1 x 2 x 2 = 4 28-4 24
7 x 2 X 2 = 28 = 28-4 = 24 X 100 = 100 %

6. Guidelines for the Management in Nigeria

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	7	4	7	18	
Appraiser 2	7	6	6	19	
Total	**14**	**10**	**13**	**37**	**86**

1 x 3 x 2 = 6 37-6 31
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 86, 11%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	7	2	7	16	
Appraiser 2	7	2	7	16	
Total	**14**	**4**	**14**	**32**	**72**

1 x 3 x 2 = 6 32-6 26
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 72, 22%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	2	6	1	1	2	3	3	5	23	
Appraiser 2	2	1	1	5	7	6	2	1	25	
Total	**4**	**7**	**2**	**6**	**9**	**9**	**5**	**6**	**48**	**33**

Stellenbosch University https://scholar.sun.ac.za

1 x 8 x 2 = 16 48-16 32
7 x 8 X 2 = 112= 112-16 = 96 X 100 = 33, 33%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	5	7	6	18	
Appraiser 2	4	7	3	14	
Total	**9**	**14**	**9**	**32**	**72**

1 x 3 x 2 = 6 32-6 26
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 72, 22%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	2	7	1	5	15	
Appraiser 2	3	7	6	3	19	
Total	**5**	**14**	**7**	**8**	**34**	**54**

1 x 4 x 2 = 8 34-8 26
7 x 4 X 2 = 56 = 56-8 = 48 X 100 = 54, 16 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	4	1	5	
Appraiser 2	7	3	10	
Total	**11**	**4**	**15**	**46**

1 x 2 x 2 = 4 15 - 4 11
7 x 2 X 2 = 28 = 28- 4 = 24 X 100 = 45, 83%

7. New Zealand Pain Management Nursing Knowledge and Skills Framework for Registered Nurses

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	7	6	6	19	
Appraiser 2	5	6	6	17	
Total	**12**	**12**	**12**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 83, 33%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	5	1	5	11	
Appraiser 2	5	6	7	18	
Total	**10**	**7**	**12**	**29**	**64**

1 x 3 x 2 = 6 29-6 23
7 x 3 x 2 = 42 = 42-6 = 36 X 100 = 63, 88%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	3	1	1	1	4	2	4	1	17	
Appraiser 2	2	2	1	3	6	3	5	3	25	
Total	**5**	**3**	**2**	**4**	**10**	**5**	**9**	**4**	**42**	**27**

1 x 8 x 2 = 16 42-16 26
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 27, 08%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	3	6	5	14	
Appraiser 2	1	6	1	8	
Total	**4**	**12**	**6**	**22**	**44**

Stellenbosch University https://scholar.sun.ac.za

1 x 3 x 2 = 6 22-6 16
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 44, 44%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	2	3	1	2	8	
Appraiser 2	4	4	1	1	10	
Total	**6**	**7**	**2**	**3**	**18**	**21**

1 x 4 x 2 = 8 18-8 10
7 x 4 X 2 =56 = 56-8 = 48 X 100 = 20, 83 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	1	1	2	
Appraiser 2	1	3	4	
Total	**2**	**4**	**6**	**8**

1 x 2 x 2 = 4 6-4 2
7 x 2 X 2 = 28 = 28-4 = 24 X 100 = 8, 33%

8. Practices Inter Agency Task Force PMFT Final Report

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	6	6	6	18	
Appraiser 2	6	6	6	18	
Total	**12**	**12**	**12**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 83, 33%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	5	6	6	17	
Appraiser 2	7	6	6	19	
Total	**10**	**7**	**12**	**36**	**83**

1 x 3 x 2 = 6 36-6 30
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 83, 33%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	2	1	3	1	4	5	1	1	18	
Appraiser 2	2	2	6	4	6	5	5	3	33	
Total	**4**	**3**	**9**	**5**	**10**	**10**	**6**	**4**	**51**	**36**

1 x 8 x 2 = 16 51-16 35
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 36, 45%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	3	6	5	14	
Appraiser 2	1	6	1	8	
Total	**4**	**12**	**6**	**22**	**44**

1x 3 x 2 = 6 22-6 16
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 44, 44%

Stellenbosch University https://scholar.sun.ac.za

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	2	2	1	1	8	
Appraiser 2	6	7	1	1	10	
Total	**8**	**9**	**2**	**2**	**18**	**21**

1 x 4 x 2 = 8 18-8 10
7 x 4 X 2 = 56 56-8 = 48 X 100 = 20, 83 %

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	1	1	2	
Appraiser 2	2	3	5	
Total	**3**	**4**	**7**	**13**

x 2 x 2 = 4 7-4 3
7 x 2 X 2 =28 = 28-4 = 24 X 100 = 12, 5%

9. Pain Management in Emergency and Trauma Department Ministry of Malaysia

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	5	4	5	14	
Appraiser 2	1	6	6	13	
Total	**6**	**10**	**11**	**27**	**58**

1 x 3 x 2 = 6 27-6 21
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 58, 33 %

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	5	1	3	9	
Appraiser 2	6	1	1	8	
Total	**11**	**2**	**4**	**17**	**31**

1 x 3 x 2 = 6 17-6 11
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 30, 55%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	1	1	1	1	3	1	4	1	13	
Appraiser 2	1	2	1	2	1	1	3	3	14	
Total	**2**	**3**	**2**	**3**	**4**	**2**	**7**	**4**	**27**	**11**

1 x 8 x 2 = 16 27-16 11
7 x 8 X 2 = 112 = 112-16 = 96 X 100 = 11, 45%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	4	6	3	13	
Appraiser 2	1	7	1	9	
Total	**5**	**13**	**4**	**22**	**44**

1 x 3 x 2 = 6 22-6 16
7 x 3 X 2 = 42 = 42-6 = 36 X 100 = 44, 44%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	2	5	1	1	9	
Appraiser 2	2	6	1	1	10	
Total	**4**	**11**	**2**	**2**	**19**	**23**

1 x 4 x 2 = 8 19-8 11
7 x 4 X 2 = 56 = 56-8 = 48 X 100 = 22, 91 %

Stellenbosch University https://scholar.sun.ac.za

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	1	1	2	
Appraiser 2	1	1	2	
Total	**2**	**2**	**4**	**0**

x 2 x 2 = 4 4-4 0

7 x 2 x 2 = 28 = 28-4 = 24 X 100 = 0 %

10. RCN Pain Knowledge and Skill Framework for the Nursing Team

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	7	5	5	17	
Appraiser 2	1	1	1	3	
Total	**8**	**6**	**6**	**20**	**39**

1 x 3 x 2 = 6 20-6 14

7 x 3 x 2 = 42 = 42-6 =36 = 38, 88%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	7	1	6	14	
Appraiser 2	1	1	1	3	
Total	**8**	**2**	**7**	**17**	**31**

1 x 3 x 2 = 6 17 - 6 11

7 x 3 x 2 = 42 = 42 - 6 = 36 = 30, 55%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	1	2	1	3	2	1	7	7	24	
Appraiser 2	1	1	1	1	1	1	1	1	8	
Total	**2**	**3**	**2**	**4**	**3**	**2**	**8**	**8**	**32**	**17**

1 x 8 x 2 = 16 32-16 16

7 x 8 x 2 = 112 = 112-16 = 96 = 16, 66%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	6	3	3	12	
Appraiser 2	1	1	1	3	
Total	**7**	**4**	**4**	**15**	**25**

1 x 3 x 2 = 6 15-6 9

7 x 3 x 2 = 42 = 42-6 = 36 = 25%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	4	4	1	1	10	
Appraiser 2	1	1	1	1	4	
Total	**5**	**5**	**2**	**2**	**14**	**13**

1 x 4 x 2 8 14=8 6

7 x 4 x 2 = 56 = 56-8 = 48 = 12, 5%

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	5	1	6	
Appraiser 2	1	1	2	
Total	**6**	**2**	**8**	**17**

1 x 2 x 2 = 4 8-4 4

7 x 2 x 2 = 28 = 28-4 = 24 = 16, 66%

Stellenbosch University https://scholar.sun.ac.za

11. South African Acute Pain Guidelines. South African Society of Anesthesiologists (SASA)

DOMAIN 1	**Item 1**	**Item 2**	**Item 3**	**Total**	**%**
Appraiser 1	4	5	5	14	
Appraiser 2	1	1	1	3	
Total	**5**	**6**	**6**	**17**	**31**

1 x 3 x 2 = 6 17-6 11
7 x 3 x 2 = 42 = 42-6 = 36 = 30, 55%

DOMAIN 2	**Item 4**	**Item 5**	**Item 6**	**Total**	**%**
Appraiser 1	2	1	5	8	
Appraiser 2	1	1	7	9	
Total	**3**	**2**	**12**	**17**	**31**

1 x 3 x 2 = 6 17-6 11
7 x 3 x 2 =42 = 42-6 = 36 = 30, 5%

DOMAIN 3	**Item 7**	**Item 8**	**Item 9**	**Item 10**	**Item 11**	**Item 12**	**Item 13**	**Item 14**	**Total**	**%**
Appraiser 1	1	1	1	1	5	2	1	1	13	
Appraiser 2	1	1	1	1	1	1	1	1	8	
Total	**2**	**2**	**2**	**2**	**6**	**3**	**2**	**2**	**21**	**5**

1 x 8 x 2 = 16 21-16 = 5
7 x 8 x 2 = 112 = 112-16 = 96 = 5, 20%

DOMAIN 4	**Item 15**	**Item 16**	**Item 17**	**Total**	**%**
Appraiser 1	6	7	6	19	
Appraiser 2	7	7	1	15	
Total	**13**	**14**	**7**	**34**	**78**

1 x 3 x 2 = 6 34-6 28
7 x 3 x 2 = 42 = 42-6 = 36 = 77, 77%

DOMAIN 5	**Item 18**	**Item 19**	**Item 20**	**Item 21**	**Total**	**%**
Appraiser 1	2	6	2	1	11	
Appraiser 2	1	1	1	1	4	
Total	**3**	**7**	**3**	**2**	**15**	**15**

1 x 4 x 2 = 8 15-8 7
7 x 4 x 2 = 56 = 56-8 = 48 = 14, 58%

DOMAIN 6	**Item 22**	**Item 23**	**Total**	**%**
Appraiser 1	7	4	11	
Appraiser 2	1	1	2	
Total	**8**	**5**	**13**	**38**

1 x 2 x 2 = 4 13-4 9
7 x 2 x 2 = 28 = 28-4 = 24 = 37, 5%

Stellenbosch University https://scholar.sun.ac.za

12. Assessment and Management of Pain. Registered Nurses' Association of Ontario (RNAO)

DOMAIN 1	Item 1	Item 2	Item 3	Total	%
Appraiser 1	7	5	7	19	
Appraiser 2	7	5	7	19	
Total	**14**	**10**	**14**	**38**	**89**

1 x 3 x 2 = 6 38-6 32
7 x 3 x 2 = 42 = 42-6 = 36 = 89%

DOMAIN 2	Item 4	Item 5	Item 6	Total	%
Appraiser 1	6	3	5	14	
Appraiser 2	6	3	5	14	
Total	**12**	**6**	**10**	**28**	**61**

1 x 3 x 2 = 6 28-6 22
7 x 3 x 2 =42 = 42-6 = 36 = 61, 11%

DOMAIN 3	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Total	%
Appraiser 1	7	7	5	4	6	6	7	5	47	
Appraiser 2	7	7	6	5	6	6	7	5	49	
Total	**2**	**2**	**2**	**2**	**6**	**3**	**2**	**2**	**96**	**83**

1 x 8 x 2 = 16 96-16 80
7 x 8 x 2 = 112 = 112-16 = 96 = 83, 33%

DOMAIN 4	Item 15	Item 16	Item 17	Total	%
Appraiser 1	6	7	7	20	
Appraiser 2	7	7	7	21	
Total	**13**	**14**	**14**	**41**	**97**

1 x 3 x 2 = 6 41-6 35
7 x 3 x 2 = 42 = 42-6 = 36 = 97, 22%

DOMAIN 5	Item 18	Item 19	Item 20	Item 21	Total	%
Appraiser 1	4	5	2	6	17	
Appraiser 2	4	4	2	6	16	
Total					**33**	**52**

1 x 4 x 2 = 8 33-8 25
7 x 4 x 2 = 56 = 56-8 = 48 = 52, 08%

DOMAIN 6	Item 22	Item 23	Total	%
Appraiser 1	5	4	9	
Appraiser 2	5	5	10	
Total	**10**	**9**	**19**	**63**

1 x 2 x 2 = 4 19-4 5
7 x 2 x 2 = 28 = 28-4 = 24 = 62, 5%

Stellenbosch University https://scholar.sun.ac.za

APPENDIX X: SUMMARY OF FINDINGS OF FINAL GUIDELINES

Authors/ ID year	Year of Publication	Country of origin	Guideline Development Team	Aims/purpose	Population in guideline	Methodology of developed guidelines	Context	Pain Assessment and details of assessment of acute pain:	Management of acute pain	Clinical outcomes measured	Other key findings
Acute Pain Management: Scientific Evidence											
Australian and New Zealand College of Anaesthetists and Faculty of Pain	2015	Australia and New Zealand	Health professional across the globe	• To combine a review of the best available evidence for acute pain management with current clinical and expert practice. • To summarise the substantial amount of evidence currently available for the management of acute pain in a concise and easily readable form.	Adult patients	Systematic Reviews Randomized control trials		Pain assessment includes: • General medical history • Physical examination • Fundamentals of pain history (GAQs) e.g., site of pain, circumstances associated with pain, character of pain, Intensity of pain, associated symptoms, • Categorical scales e.g., Verbal Descriptor Scale (VDS) which can be converted to numerical scores. • Numerical Rating Scales (NRS): - Have both written and verbal forms. - Patients rate their pain intensity on the scale of zero to ten. Zero represents 'no pain' and ten represents 'worst pain'. • Visual Analogue Scale (VAS) consists of a 100 mm horizontal line with verbal anchors at both ends with no tick marks. The patient is asked to mark the lin. The score is the distance in millimetres from the left side of the scale to the mark. - VAS can also be used to measure other aspects of the pain experience e.g.,	Psychological interventions: • Listening to music • Distraction reduces the pain. • Coping mechanisms with training.	None noted	

Stellenbosch University https://scholar.sun.ac.za

							affective component, patient satisfaction. • Education: Patients who are educated about the assessment and management of pain will have some control and comment on the quality of their pain relief.			
Best Practice Guidelines for Acute Pain Management in Trauma Patients										
American College of Surgeons (ACS)	2020	United States	Multidisciplinary	• To provide an evidence-based, practical guideline and recommendations to acute pain management of the trauma patient	Adult patients Nurse	Randomized control trials	• Pain is difficult to quantify with any single assessment tool due to its complexity. • Numerical Rating Scale (NRS): an 11-point patient-reported metric that scores pain on a scale from 0 to 10, - With 0 being no pain and 10 being worst imaginable pain. • Visual Analog Scale (VAS): Is a self-report acute pain assessment tool. - The patient marks their pain on a 10 cm line with no pain written on the left and worst possible pain on the right side. • Defense and Veterans Pain rating scale (DVPRS): self-reporting, graphic acute pain assessment tool. Uses same scale as NRS but provides more description of each level of pain with colour coding and cartoon facial expressions. - Additionally, it has supplemental questions that measure the degree to which pain interferes with usual activity, sleep, mood, and stress. • Assessment tools for adult patients with cognitive impairment: It is challenging	• Cognitive Behavioural Therapy (CBT): Aims to improve the patient's control over their perception of pain. - Includes teaching relaxation techniques, using guided mental imagery for diversion, music therapy, a passive, self-explanatory, low-risk distraction technique. • Physical Strategies: - Immobilization is used in extremity and pelvic trauma to stabilize the affected body part. It is strongly recommended as an adjunct to pain management.	None noted	Implementing Best Practice Guidelines for acute pain management in trauma patients: • - trauma medical directors, trauma program managers, and staff have a leadership role in implementing and supporting pain management • - and implementing and monitoring compliance of the pain management best practice guidelines (BPG).

Stellenbosch University https://scholar.sun.ac.za

		to assess pain in these patients. - Behavioural pain scale (BPS): a three-domain tool with four scores in each domain for a possible score range of 3-12. - Is an objective scale scored at the bedside by the nurse has high inter-rater reliability? • Critical care pain observation tool (CPOT): acute pain assessment tool which objectively score patients in four domains: facial expressions, body movements, ventilator compliance/vocalization, and passive muscle tension. - To obtain baseline values for each domain observe the patient at rest for one minute. • Functional Pain Assessment Tools	- Temperature Therapy" - Cryotherapy (cold therapy) uses external cooling to reduce internal tissue temperature e.g., ice packs, gel packs and cold-water immersion. - Heat therapy uses external warming to relieve discomfort associated with injury. Commonly used after the acute injury period,

Stellenbosch University https://scholar.sun.ac.za

Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury									
Hsu, J.R., Mir, H., Wally, M.K., & Seymour, R.B.	May 2019	Florida, United States	• To provide evidence-based recommendations for the management of acute musculoskeletal pain.	Adult patients	Available in Digital Content 1 – unable to access	• Assess pain regularly with short, validated tools	• Cognitive strategies: alleviation of pain, expected recovery course, and patient experience at all times. - Connect patients with severe pain to psychological interventions and resources. - Consider strategies for optimal mindset using anxiety-reducing strategies to promote self-efficacy and promote peace of mind e.g., music, therapy of approaches based on cognitive behavioural therapy. • Physical strategies: use mobilization, ice, and elevation appropriately - Consider the use of cryotherapy. • Psychological interventions: cognitive behavioural therapy, self-management interventions and training,	None	none

Stellenbosch University https://scholar.sun.ac.za

									educational information.	
Guidelines for the management of acute pain in emergency situations (EUSEM)										
European Society for Emergency Medicine (EUSEM)	March 2020	Europe	Multidisciplinary	• To provide a robust, systematic aid to making clinical decisions with respect to acute pain for patients. • To improve the lives of patients. • To support improvements in the assessment and management of acute pain in emergency settings.	Adult patients, Nurses	• PubMed to search MEDLINE, • Cochrane, • Google Scholar, • EMBASE Included: - Randomised Controlled Trials (RCTs) - Clinical Trials, without randomisation eg open label, observational, retrospective - Meta-analysis - Case Series/case-controlled studies - Systematic Reviews	•	• Effective patient pain history: - Careful attention to patient's reported symptoms to direct the process of physical examination. - Location of pain - Temporal characteristics - Aggravating and alleviating factors - Impact of pain on function and quality of life - Past treatment and reports - Patient expectations and goals for their pain • Categorical pain scales: - a verbal descriptor scale is used. - includes four to five descriptors from 'no pain' to 'excruciating pain'. - can be converted to numeric scores. - pain relief can also be graded. - Simple and easy to use. • Numeric rating scales (NRS) can be delivered verbally or written format. - Patients are asked to rate the intensity of pain according to an 11-point scale. • Visual analogue scale (VAS) is the most commonly used scale for rating pain intensity in clinical trials. • Patient marks the point along the line that they feels corresponds to the level of	• Psychological interventions: • Sharing information: providing patients with procedural information - Attention control measures e.g., distraction techniques, concentration on imagined scenes or sensations, focus on external stimuli e.g., music, odours - Cognitive behavioural therapy is a psychological technique that includes cognitive and behavioural modifications of specific activities to reduce the impact of pain and disability and overcome barriers to physical and psychosocial recovery. - Cold and heat: Physiology effects of	• Principles of acute pain management: - - Proper and effective pain management is a right of all patients experiencing pain. the key aim is to reduce pain, maintain function and minimise effects. - Acute pain generally associated with limited duration. It results from the activation of nerve endings at the site of tissue damage. - Appropriate and adequate validation of the patient's pain and pain assessment is vital to effective pain management. - Effective pain management can improve long-term outcomes, while untreated or undertreated acute pain is associated with significant negative impact.

Stellenbosch University https://scholar.sun.ac.za

	pain that they are experiencing. • Pain score is recorded as the measurement in millimetres or centimetres from the left of the scale to the patient's mark. • Assessment of functional impact of pain: - Functional impact scale (FAS) is a simple 3-level categorical score to assess if a patient can undertake appropriate activity at their current pain level. - Patient is asked to complete a certain activity. • Assessment of pain in special situations: - It is important to recognise impaired or limited ability. - Pain is generally underreported in the elderly. - Use appropriate pain assessment tool: verbal descriptor scales, NRS, FPS, Wong-Baker FACES, PAINAD (Observer related tool for assessing pain-related behaviour, partly based on FLACC). - Other physiological signs can indicate pain in the elderly: hypertension, tachycardia or bradycardia, sweating and increased muscle tone. • Sedated or unconscious patients is a challenge, particularly when patients are non-verbal sedation or lack of consciousness. - The behavioural pain scale (BPS) has been validated in critically ill, sedated and	cryotherapy include reductions in pain, oedema, inflammation and muscle spasm and physiology effects of heat therapy include relief from pain and increase in blood flow and elasticity of connective tissue. - Traction and bracing: Skeletal traction for preoperative fracture stabilisation and pain control. - Bracing is useful to reduce pain and protect the neck, back and joints. - Patient positioning: appropriate positioning for noncomplex fractures, e.g. back slab, can alleviate pain. - Splints or slings in patients with soft tissue injury. - Elevation and ice also beneficial.

Stellenbosch University https://scholar.sun.ac.za

								mechanically ventilated patients. - The BPS score is calculated as the sum of three subscales (facial expression, upper limb movements and compliance with ventilation). - Evaluation of acute pain			
Guidelines for the management of pain in Nigeria											
Federal Ministry of Health,	2018	Nigeria	Interdisciplinary	• To provide informed guidance to healthcare practitioners as they manage pain in patients. • To provide standards of practice that will assist healthcare practitioners in the effective assessment, treatment, and monitoring of pain. • To ensure that all patients experiencing within the receive the highest quality care complying to the ethical framework. •	Nurses and Adults	Not mentioned	Patient History: • PQRST • Validated tool: • Numerical Rating Scale (NRS) • -Verbal Analogue Scale (VAS) • Verbal Rating Scale (VRS) - Physiological assessment	Non-pharmacological pain interventions: Goals: • reduce pain, • decrease fear, • reduce distress and anxiety. • reduce the dosage of analgesic medications. • avoid use of medications where possible. • improve quality of life. Cognitive-Behavioural Interventions: • Psychological approaches • Distraction • Relaxation techniques Physical interventions: • Bed rest • Thermotherapy: application of heat to the	None	Unique population: • Elderly • Pregnant patients • Patients with mental health conditions • Patients with cognitive impairment Role of Nurses: • Proper assessment of patient • Individualised nursing care plan • Adequate understanding and knowledge of culture and patient's beliefs • Holistic approach to pain management • Advocates for patient in pain Health Service Delivery: Any person experiencing pain is likely to interact with the health care system. Will the

Stellenbosch University https://scholar.sun.ac.za

									injured site eg tissue injury, joint • Cryotherapy: use of ice packs • Exercise improves pain as well as strengthens and improves flexibility of limbs. • Positioning • Changing patient's position in the bed or chair an improve pain. Additionally, ambulation, elevation, appropriate body alignment and support of extremities can improve patient comfort.	system meet the patient's needs? Building Capacity Pain management is an integral part of healthcare and must be championed by all staff members
Assessment and Management of Pain										
Registered Nurses Association of Ontario (RNAO)	2013	Canada	Registered Nurses Association of Ontario Best Practice Guideline Program Team (Nurses)	• To provide evidence-based recommendations for nurses who are assessing and managing persons with the presence, or risk of, any type of pain • To assist nurses to become more comfortable, confident, and competent when caring for persons with the	• Adults • Children	• Meta-analysis or systematic reviews of randomized controlled trials • Well-designed quasi-experimental study Well-designed non-experimental descriptive studies such	• All settings when caring for persons with the presence, or risk of, any type	• Screening of patient • Comprehensive pain assessment • Pain history • Unidimensional and multidimensional self-report tools • Comprehensive pain assessment on persons unable to self-report using a validated tool • Explore persons beliefs, knowledge, and level of understanding about pain • Document	• Collaborate with persons to identify their goals for pain management • Comprehensive plan of care • Multimodal analgesic approach • Non-pharmacological interventions: physical, psychological,	• Education recommendations • Organizations and policy recommendations • Guideline implementation • Monitoring of guideline

Stellenbosch University https://scholar.sun.ac.za

	presence, or risk of, any type of pain	as comparative studies, correlation studies and case studies • Expert committee reports or opinions and/or clinical experiences of respected authorities	of pain	• Evaluation	• Teach the person, family, and caregivers about the pain management strategies

Stellenbosch University https://scholar.sun.ac.za

APPENDIX Y: THEMES ANALYSIS

Themes	Sub-themes
1.Pain Assessment	• Self-report (1, 2, 4, 5) • Screening (1,2, 6) • Comprehensive structural stepwise pain assessment: (.1, 2, 5, 6) • History taking (1, 4, 5, 6) • Cultural beliefs (1, 3, 4, 5, 6) • Physical assessment (1, 4, 5, 6) • Unidimensional and multidimensional pain assessment tools (1, 2, 3, 4, 5, 6) • Assessment of pain in special situations (2, 4, 5, 6) • Reassessment (1, 2, 3, 4, 5, 6) • Documentation (1, 2, 3, 4, 5, 6) • Evaluation of pain (1, 2, 3, 5, 6)
2. Pain Management 1, 2, does not specifically refer to the WHO pain ladder but the medications recommended are included in the WHO pain ladder 3, 4, 5, 6	• Collaboration with patient (1, 2, 3, 4, 5, 6) • Pharmacological Pain Management • WHO pain ladder (4, 5) • Multimodal (1, 2, 3, 6) Non-pharmacological pain management • Psychological (1, 3, 4, 5, 6) - CBT (1, 2, 3, 5, 6 - Distraction (1, 2, 3, 4, 5, 6) - Goal setting (1, 2, 6) • Physical - Position (1, 3, 4, 5) - Immobilization (2, 3, 4, 5) - Exercise, 5, 6 - Skeletal traction and bracing/splinting (1, 4, 5, 6 - Thermotherapy e.g., cryotherapy or warming strategies (1, 2, 3, 4, 5, 6)
3. Education	• Patient education (1, 2, 3, 4, 5, 6) • HCW Education - Education programs for HCW (1, 3, 5, 6)
4. Organization Requirement	• Organizational implementation of BPG (1, 2, 3, 4, 5, 6)

Stellenbosch University https://scholar.sun.ac.za

APPENDIX Z: LIST OF FINAL GUIDELINES

NO	GUIDELINE	AUTHOR
1	ACS Trauma Quality Programs: Best Practice Guidelines for Acute Pain Management in Trauma Patients. American College of Surgeons	Schug, S., Palmer, G.M., Scott, D.A., Halliwell, R., & Trinca, J.
2	Acute Pain Management: Scientific Evidence	American College of Surgeons
3	Assessment and management of pain (RNAO)	Registered Nurses Association of Ontario
4	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury.	Hsu, J.R.; Mir, H.; Wally, M.K.; Seymour, R.B.
5	Guidelines for the management of acute pain in emergency situations: EUSEM	European Society for Emergency Medicine
6	Ministry of Nigeria: Guidelines for Pain Management in Nigeria	Federal Ministry of Health Nigeria

Stellenbosch University https://scholar.sun.ac.za

SECTION 4: GUIDELINE DEVELOPMENT

APPENDIX AA: GUIDELINE DEVELOPMENT GROUP AND GUIDELINE EXPERT PANEL

Guideline Development Group

Professor P.J. Jordan
PhD, MBA, MCUR (ICU), Dip Neph Nurs, fANSA
Professor and Executive Head
Department of Nursing and Midwifery
Faculty of Medicine and Health Sciences
Stellenbosch University

D M.M. Van Der Heever
Lecturer
Department of Nursing and Midwifery
Faculty of Medicine and Health Sciences
Stellenbosch University

Ms YN Magerman
Lecturer
Western Cape College of Nursing
Western Cape

Guideline Review Panel

International

- Dr GP Mensa: Ghana
  Lecturer
  School of Nursing and Midwifery
  University of Ghana
  PO Box LG 43
  Legon, Accra Ghana
  ggpmensah@ug.edu.gh

South Africa

Eastern Cape

- Dr W ten Ham-Baloyi
  Nelson Mandela University

Western Cape

- Mrs. S De Lange
  Emergency Nurse Lecturer,
  Stellenbosch University

Stellenbosch University https://scholar.sun.ac.za

- Mrs. H Stevens
  Lecturer,
  Western Cape College of Nursing

- Mr. R Rhodes
  Area Manager,
  Emergency Center,
  Mitchells Plain District Hospital

- Ms. M Mgoqi
  Emergency Nurse
  Khayelitsha District Hospital

- Mr. A. Albertus
  Emergency Nurse,
  Tygerberg Hospital

- Dr M De Man,
  Emergency Consultant,
  Mitchells Plain District Hospital

- Mr. C Lloyd
  Paramedic,
  Cape Town University of Technology

Stellenbosch University https://scholar.sun.ac.za

APPENDIX AB: GUIDELINE DEVELOPMENT GROUP (GDG) AND EXPERT REVIEW PANEL

BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA RELATED PAIN IN EMERGENCY CENTERS

2022

Stellenbosch University https://scholar.sun.ac.za

Contents

Stellenbosch University https://scholar.sun.ac.za

1. INTRODUCTION

Pain is a universal, common symptom experienced by patients admitted to the emergency centre (EC). The global burden of pain includes trauma-related pain (Morriss & Roques, 2018:265), which is a natural consequence of injury, resulting from mild to severe injuries and is a reported factor in the development of persistent pain (Accardi-Ravid, Dyer, Sharar, *et al.*, 2018:699).

Nurses are the frontline health care workers in the EC, allowing them to assess and manage pain early (Parnass, Greenbaum, Glick, *et al.*, 2016:1). Nurses play a pivotal role in communicating with EC patients and providing care with the greatest opportunity to improve patient satisfaction with pain assessment and management (DeVore, Clontz, Ren, *et al.*, 2017:23).

Acute trauma-related pain is a common presentation to the EC due to the high incidence of trauma in the Western Cape (WC), South Africa (SA). Currently, there are no known BPGs for nurses the assessment and management of acute trauma-related pain in the EC in the WC. Best practice guidelines (BPGs) are the key conduit to the implementation of evidenced-based nursing (EBP). Nurses play a critical role in implementing EBP and making a positive change (Sharplin, Adelson, Kennedy, *et al.*, 2019:2).

2. METHODOLOGY

The best practice guideline was developed as part of a research project for a PHD. The team consisted of a Guideline Decision Group (GDG) constituting three members.

The guideline development process followed the format of the AGREE II (Appraisal of Guidelines Research and Evaluation) tool to ensure that all domains are covered to ensure methodological quality. The AGREE II tool is intended to be used by health care providers undertaking their own assessment of a guideline before adopting its recommendations into practice (Brouwers, 2017:3).

The structure of the six domains AGREE II of the:

- Scope and Purpose
- Stakeholder involvement
- Rigour of development
- Clarity of Presentation
- Applicability
- Editorial independence

D1. Scope and purpose

1. Overall objectives of the guideline

There are no known available BPGs for nurses specifically for the assessment and management of acute trauma-related pain for the context of the WC ECs.

Stellenbosch University https://scholar.sun.ac.za

Emergency centers in the Western Cape are busy areas with a high turnover of patients (van de Ruit, Lahri & Wallis, 2020: 54). In light of the absence of a best practice guideline for the assessment and management of acute trauma-related pain in the EC, to the best of our knowledge, it was critical to develop this guideline. Furthermore, this BPG offers nurses a standardised evidence-based platform to provide care for patients with acute trauma-related pain thereby improving patient outcomes.

The overall objective was to contextualise a best practice guideline for professional nurses for the assessment and management of acute trauma-related pain of adult patients in ECs in the WC.

2. Review or clinical question

Scoping review

The overarching review question of the scoping review was to:

> "Identify the availability, and quality of best practice guidelines used for the assessment and management of acute trauma-related pain in adult patients, by nurses, in ECs. "

Search strategy

A three step search strategy was used, according to the methodology for JBI scoping reviews (Peters, Micah; Godfrey, Christina; Mcinerney, 2015:13). An initial search was conducted on PubMed Central and Cumulated Index to Nursing and Allied Literature (CINAHL). Secondly, the index and keywords were searched in all relevant databases such as PubMed, CINAHL or EBSCOHost. The search extended to repositories of guideline-developing organizations such as: Scottish Intercollegiate Guidelines Network (SIGN), Trip and Guidelines International Network, Guidelines International Network (G-I-N), National Institute for Health and Care Excellence (NICE), the National Guidelines Clearinghouse (NGC), ECRI Guidelines, Guideline Central, Australian Clinical Practice Guidelines, RNAO, JBI, Cochrane and ERIC. Grey literature was also considered to find unpublished guidelines. Grey literature searching was done systematically, by carefully planning the sources where grey literature could be obtained from e.g., guidelines, presented at conferences e.g., PainSA, European Pain Federation, and guidelines not yet published. ProQuest Dissertations and Theses, Research Gate, Google Scholar, and Google was searched to identify relevant best practice guidelines that have not been published in formal journals of other publishing platforms. A further search for the keywords was conducted across all the identified databases. Additionally, key experts, policymakers, and practitioners for unpublished guidelines were sought.

Stellenbosch University https://scholar.sun.ac.za

Thirdly, the reference lists of literature found was explored for additional guidelines. Furthermore, an attempt was made to contact the WHO regarding the updating of the trauma care guideline which encompasses the assessment and management of pain.

The search strategy was done in consultation with a librarian who is experienced in developing a search strategy (See Appendix A for search strategy).

PICO question for the BPG
What are the core recommendations for nurses for the assessment and management of acute trauma-related pain in ECs to improve adult patient outcomes?

3. Target population

This is best practice guideline is developed to provide recommendations to nurses regarding the assessment and management of acute trauma-related pain of adult patients admitted to the EC.

D2 Stakeholder involvement

4. Guideline development group

This BPG was initiated as part of a research project for a PHD programme. The guideline was compiled with the guidance of a Guideline Decision group (GDG). The (GDG) comprised the guideline developer, the supervisor and co-supervisor of the research project.

- YN Magerman
- Professor P.J. Jordan
- Dr M.M. Van Der Heever

A panel of expert reviewers were assembled to provide their expert opinion (Appendix A). The panel of expert reviewers comprised of a panel of eight members compromising of guideline developers and content experts. International guideline developers were included to benchmark the BPG according to international standards. It was important to include a guideline developer out of the Western Cape as this BPG can be used in all ECs in South Africa. The content experts compromised of a multidisciplinary team. Two academics in emergency nursing were included to give insight to the content of the guideline. One of the academics is also involved in guideline development. An area manager and two professional nurses were included as content experts since they work in ECs and were able to provide valuable input from a clinical perspective. Similarly, a doctor was included as a content expert to give input as a medical and trauma emergency clinician. A paramedic was also included as a content expert since pain assessment and pain management commences pre-hospital.

Stellenbosch University https://scholar.sun.ac.za

5. The patient views and preferences

In sub-study 2 objective data was generated by means of a survey that was distributed to adult patients admitted to the EC with acute trauma-related pain. Listening to the voice of the patient allows pain management to be patient-centered and improves patient satisfaction.

6. The target user

Professional nurses working in the ECs in the Western Cape and patients admitted to the EC with acute trauma-related pain were consulted. Surveys were distributed to professional nurses and patients in the EC. The results from these surveys were included as contextual recommendations in addition to the evidence-based recommendations from the scoping review.

It was important to obtain the input of nurses who are the end users of the guideline and will be delivering the health care and well as the patients who receive the health care. Nurses are the first healthcare workers to interact with patients admitted to the EC with acute- trauma related pain. They also spend more time with the patients than any other healthcare worker. They are therefore ideally positioned to commence the assessment and management of acute trauma-related pain of adult patients in the EC.

Professional nurses' input will be sought to comment on the final guideline. The best practice guideline will be piloted amongst the end-users, professional nurses. They will be requested to complete a short survey based on the FAME (Feasibility, Appropriate, Meaningful and Effective) component of the JBI (Johanna Briggs Institute) Model. Only professional nurses will be included in the survey since they are ultimately accountable for patient care, including pain assessment and pain management. Feedback from this survey will be integrated in the final guideline. A summary of the recommendations is presented in Table 1.

Table 1 Summary of Recommendations

1. Practice	1.1 What are the best practice recommendations for acute pain assessment for patients with acute trauma-related pain in the EC?
	1.2 What are the best practice recommendations for acute pain management for patients with acute trauma-related pain in the EC?
2 Education	2.1 What are the best practice recommendations for educational strategies in a patient with acute trauma-related pain?
3. Organizational structure	3.1 What are the best practice recommendations for organizational structure requirements for patients with acute trauma-related pain in the EC?

Stellenbosch University https://scholar.sun.ac.za

D3. Rigour of development

7. Systematic methods were used to for the search of evidence

A multiphase study was conducted that culminated to the development of this BPG.

Evidence generation of the primary research constituted a twofold phase: Sub-study 1 and sub-study 2. For sub-study 1 a survey was distributed to professional nurses working in the EC of five hospitals in the WC. This included two tertiary hospitals, one regional hospital and two district hospitals. The knowledge, attitudes, and practice of professional nurses regarding the assessment and management of acute trauma-related pain in the EC was explored. It was important to obtain the nurses input so that the guideline could be contextualized to their needs and shortcomings based on the findings of sub-study 1.

For sub-study 2 of phase 1, a survey was distributed to adult patients (≥ 18 years) admitted to the EC with acute trauma-related pain. Data was collected in the same hospitals as sub-study 1. The patient's understanding regarding the assessment and management of acute trauma-related pain was explored. Listening to the voice of the patient allows pain management to be patient centered and improves patient satisfaction.

Phase two consisted of the scoping review and was evidence generation of secondary research. The JBI was the underpinning in the guideline development as it conceptualises EBP as clinical decision-making that considers the best available evidence; the context in which the care is delivered, patient preference and the professional judgment of the health professional (Pearson, Wiechula, Court, *et al.*, 2005:209).

A search strategy for guidelines was conducted as follows: Databases, Guideline Clearing Houses, Google Scholar. Only guidelines were included in the search strategy as the aim was to contextualize a guideline/s for the context of ECs in the Western Cape (WC). Following data extraction and data synthesis 12 guidelines were selected.

8. The criteria for selecting the evidence

Using the AGREE 11 critical appraisal tool two independent reviewers (YM and CI) appraised this guideline. A third reviewer (PJ) was available for consultation. The reviewers unanimously agreed that only guidelines that scored 50% and above will be included. Following the critical appraisal process six guidelines were selected for final inclusion.

9. The methods for formulation the recommendation

The GDG sat and systematically extracted recommendations according to the PICO question for this BPG. A total of 114 recommendations from the six guidelines was scrutinized by the GDG. Following extraction of recommendations 39 recommendations were included and 75 were

Stellenbosch University https://scholar.sun.ac.za

excluded. The recommendations were then divided into three main themes. The wording of the recommendations was guided by Shiffman, Dixon, Brandt et al., (2005:2; Gonzalez-Suarez, Gimmer-Somers, Dizon etal.,2012;143). The final recommendations are presented in Table 2.

10. The health benefits, harms, risks have been considered in formulating the guideline

The PICO did not address this section as pharmacology was not the main purpose and scope of the BPG and therefore did not look at interventional studies. However, it will be explored when addressing the feasibility of the study.

11. Link between the recommendation and the supporting evidence

Guidelines were selected based on the AGREE 11 tool. Recommendations were extracted from the appraise guidelines epitomising current evidence-based literature.

12. Reviewed by expert panel

This process involves the review by an expert panel in guideline development and emergency settings. Feedback from this panel will be considered and integrated in the final guideline.

13. BPG update

For the scope the degree, it is recommended that the BPG is updated every three years according to evidence.

D4 Clarity of presentation

14. The recommendations presented are specific and unambiguous (Box 1).

A summary of the key recommendations is provided in Box 1. Furthermore, recommendations are provided specifically and unambiguously in Boxes 2, 3, 4 and 5.

15. Different options for management of the topic are clearly presented

Management of acute trauma related pain was divided into pharmacological and non-pharmacological pain management (Box 3).

16. Key recommendations clearly identified

Key recommendations are presented in Boxes 2, 3, 4 and 5. These recommendations include extractions from the final guidelines and from the contextual findings in sub-study 1 and sub-study 2. Contextual recommendations are indicated by an "*****" and in italics. Recommendations from guidelines are numbered at the end according to the guideline the recommendation was extracted from.

Stellenbosch University https://scholar.sun.ac.za

Box 1: Summary of recommendations

1. Practice
    - Acute pain assessment
    - Acute pain management
2. Education
3. Organisational

D5 Applicability

17. Facilitators and barriers

The potential organizational barriers in applying the recommendations have been discussed and noted. Organisational barriers have been included in the 3rd recommendation (Box 1). Future research can zoom into identification of possible barriers in the EC for example the high turnover of patients, safety, shortage of nursing staff and prioritizing of pain management in the EC (Afaya, Bam, Azongo et al, 2021:2; Sampson *et al.*, 2020:87).

18. Advice/tools

The guideline will be supported with tools for application, for example, an algorithm (Appendix C) will be included in the guideline to highlight the flow of acute pain assessment and management. The algorithm furthermore allows quick and easy accessibility for nurses to refer to and to efficiently determine the acuity of the patient's pain. The algorithm included is a draft copy and will be finalised once input from this panel is received after an expert in algorithm development has been consulted.

19. Resource implications

Potential cost implications of applying the recommendations have been considered. This will be noted once the results and rationale from the FAME survey has been conducted.

20. Monitoring and/or auditing criteria

Criteria for monitoring and auditing is part of the guideline development process. However, an audit was not done but the results obtained from the FAME survey will guide this process.

D6 Editorial independence

21. Independent of funding body

This research was conducted independently of a funding body. It is part of PhD and was assisted by a bursary but predominantly self-funded.

22. Conflict of interest

There was no conflict of interest to declare from the GDG and the expert panel.

Stellenbosch University https://scholar.sun.ac.za

3. GUIDELINE RECOMMENDATIONS

Recommendations are presented as follows:

3.1 Pain assessment

What are the best available recommendations for the assessment of acute trauma-related pain in ECs?

Rationale for pain assessment

All six guidelines advocate the assessment of pain. Four of the six guidelines indicated that self-reporting should be included in the pain assessment process. Two of the six guidelines propose the screening of pain. Three of the six guidelines indicate that a comprehensive pain assessment should be done by obtaining sufficient accurate information to undertake adequate assessment of patient's pain. Four of the six guidelines recommend the inclusion of culture and cultural factors in pain assessment.

Five of the six guidelines indicate ethe use of pain measurement tools. All six guidelines indicated that pain should be reassessed. Three of the six guidelines proposes that patient monitoring is essential to evaluate the effectiveness of treatment interventions.

Three of the six guidelines indicates that documentation be included.

Box 2: Summary of recommendations for Practice

We recommend that an acute pain assessment be done on all patient admitted to the to the EC with acute trauma-related pain and should include the following sub-recommendations:

Self-report

- We recommend that self-reporting of pain should be used whenever appropriate as pain is by definition a subjective experience. (2)

Screening

- We recommend that screening should be done for the presence, or risk of, any type of pain. (3)
- * We recommend that acute pain should be prioritized
- ** We recommend that on arrival to the EC the nurses should ask patients if they have pain.*
- ** We recommend that every patient that is admitted to the EC with trauma-related pain should be screened.*
- **We recommend that nurses should assess the pain intensity (level of pain) of patients e.g., by asking how severe their pain is.*

Comprehensive pain assessment

Stellenbosch University https://scholar.sun.ac.za

- We recommend that a comprehensive pain assessment be performed on persons who have been screened having the presence, or risk, any type of pain using a systematic approach and appropriate, validated tools. (3)
- We recommend that it is critical to collect as much accurate information as possible prior to taking a decision on both diagnosis and treatment. (6)
- We recommend that adequate assessment of patient's pain should be undertaken prior to instituting treatment and at regular intervals as care continues. (6)
- ** We recommend that that pain assessment should be done according to a structured plan and a stepwise approach should be used to manage the patient with acute trauma-related pain in the EC.*
- **We recommend that nonverbal signs of pain include blood pressure, tachycardia, frowning, and grunting.*
- **We recommend that findings include a detailed assessment of pain e.g., a pain scale, history e.g., age, underlying conditions*
- **We recommend that physiological pain predictors and behavioural pain predictors should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

Cultural

- We recommend that developmental, cognitive, emotional, language and cultural factors should be considered. (2)
- We recommend explore the person's beliefs, knowledge, and level of understanding about pain and pain management. (3)
- We recommend that nurses should help patients advocate for what feels appropriate for them within their cultural context in pain management. (6)
- We recommend that pain management must be standardized to acknowledge diversity in culture, values, and belief systems, and ensure that practice is non-discriminatory and promote dignity and self-determination. (6)
- **We recommend that culture and spiritual considerations play a role in the assessment and management of acute pain.*

Pain assessment tools

- We recommend that the pain measurement tool should be appropriate to the individual patient and the clinical context e.g., intensive care, ward, community. (2)
- We recommend that healthcare providers should be familiar with pain assessment tools and employ them in their daily practice. (6)
- **We recommend that on admission every patient should assessed by using a validated pain assessment tool and the use of pain assessment tools is a common practice in the EC.*
- **We recommend that you ask your patient to rate the level of his or her pain.*
- **We recommend that the nurse should assess the patient's pain by asking them to describe their pain in their own words.*

Stellenbosch University https://scholar.sun.ac.za

- ** We recommend that the verbal descriptor scale should be used to ask the patient if his or her pain is mild, moderate, or severe.*
- **We recommended that the visual analogue scale should be used by asking a patient to mark his or her pain level on a line between two endpoints.*

Re-assessment

- We recommend that reassess pain systematically, ideally using the same appropriate tool (1)
- We recommend that regular assessment of pain leads to improved acute pain management (2)
- We recommend that regular, accurate assessment of pain is required to improve acute pain management (5)

Monitoring

- We recommend that patients' monitoring is essential for informed evaluation of the effectiveness of treatment interventions (6)
- **We recommend that after administering pain medication, the patient should be is monitored for potential side-effects.*
- **We recommend that after administering pain medication, the efficacy of pain should be assessed.*
- **We recommend that after an initial dose of analgesia is given, subsequent doses should be adjusted in accordance with individual response.*

Documentation

- We recommend that pain documentation should be standardized and consistent to foster continuity of care (1)
- We recommend that document the person's pain characteristics (3)
- We recommend that communicate and document the person's responses to the pain management plan (3)
- **We recommend that documentation of pain assessment and management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*

Reassessment

- We recommend that pain should be reassessed systematically, ideally using the same appropriate tool (1)
- We recommend that regular assessment of pain leads to improved acute pain management (2)
- We recommend that regular, accurate assessment of pain is required to improve acute pain management (5)
- ** We recommend that pain assessment should be done as the 5th vital sign.*

** We recommend that the frequency of pain assessment should be included in a nursing care plan for a patient admitted with acute trauma-related pain*.

Stellenbosch University https://scholar.sun.ac.za

3.2 Pain Management

What are the best available recommendations for management of acute trauma-related pain in ECs?

All six guidelines indicate strategies for pain management as depicted in the sub recommendations. Three of the six guidelines indicate patient collaboration in pain management. Two of the six guidelines advocate the WHO pain ladder as a guide to pain management.

All six guidelines advocate the use of nonpharmacological pain interventions.

Box 3 Pain management

We recommend pain management for acute trauma-related pain in the EC and should include the following sub-recommendations:

Collaboration

- We recommend that nurses collaborate with the person to identify their goals for pain management and suitable strategies to ensure a comprehensive approach to the plan of care, (3) and
- We recommend that nurses discuss the alleviation of pain, expected recovery course, and patient experience at all times, (4)
- We recommend that following a detailed assessment of the patient, the appropriate intervention to safely relieve the pain is selected. (6)

Pharmacological pain management

- We recommend that the WHO Pain Ladder, or a new adaptation of it, which accommodates the modern and invasive techniques of pain management, found in figure 10.2, should be used as the general guidance in managing pain in patients. (5 & 6)
- **We recommend that pharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*
- **We recommend that combining analgesics that work by mechanisms (e.g., combining an opioid with a NSAID) may result in better pain control with fewer side effects than using a single analgesic agent and 9as prescribed)*
- **We recommend that pharmacological agents such as opioids, non-opioids, non-steroidal anti-inflammatory drugs (NSAIDS), and anticonvulsants can be used, as prescribed, for the management of acute trauma-related pain in the EC.*
- **We recommend that nurses administer pain medication to patients, as prescribed, after asking them if they had pain*
- **We recommend that nurses describe possible side-effects (reactions of the medication) in a way that patients understand, before giving them any pain medication.*

Stellenbosch University https://scholar.sun.ac.za

Non-pharmacological pain management

- We recommend that non-pharmacological agents should also be used to treat pain in the ED setting. These include ice, elevation and splinting for injuries and explanation of the cause of pain and its likely outcome to allay anxiety (p359). (2)
- We recommend that nonpharmacological measures are effective in providing pain relief and should always be considered and used if practical (p365). (2)
- We recommend that non-pharmacological interventions should be implemented early with patients, either alone or in combination with pharmacological options. (5)
- We recommend considering using strategies for optimal mindset such as aromatherapy, music therapy, or approach. (4)
- We recommend the use immobilization, ice, and elevation appropriately. (4)
- We recommend that in all cases consider the use of non-pharmacological analgesic strategies to achieve pain relief. This may involve techniques such as splinting, immobilisation, heat/cold, distraction, etc. and for children additional distraction techniques such as play. (5)
- We recommend listening to music produces a small reduction in postoperative pain and opioid requirement. (2)
- We recommend distraction to reduces pain. (2)
- We recommend procedural information (often combined with behavioural instructions, like exercises or body position) has been found to be effective in reducing pain (p259). (2)
- **We recommend that nonpharmacological pain management should be included in a nursing care plan for patients admitted with acute trauma-related pain.*
- **We recommend that cryotherapy (cold therapy), elevation of extremities and distraction should be used for the management of acute trauma-related pain.*

3.3 Education

What are the best available recommendations the education of nurses and patients regarding acute trauma-related pain in ECs?

Two of the six guidelines indicate education on the pain assessment and management process. Two of the six guidelines indicate the role of staff education in pain assessment and management.

Box 4 Education

We recommend that education be prioritised and should include the following sub-recommendations:

Patient education

- We recommend that patient education about expectations for management is a highly effective intervention for pain management. (1)

Stellenbosch University https://scholar.sun.ac.za

Staff education

- We recommend that even “simple” techniques of pain relief can be more effective if attention is given to education, documentation, patient assessment and provision of appropriate guidelines and policies. (2)
- **We recommend that the level of knowledge of nurses on the assessment and management of acute trauma-related pain be updated.*

3.4 Organisational

What are the best available recommendations for organisational structure regarding acute trauma-related pain in ECs?

Two of the six guidelines included the role of the organisation and the organisational structure in pain assessment and pain management. Two of the six guidelines recommend organizational support.

Box 5: Organisational

We recommend that the organisation and organisational structure should support the implementation of pain assessment and pain management and should include the following sub-recommendation:

- We recommend that successful management of acute pain requires close liaison between all personnel involved in the care of the patient. (2)
- We recommend that appropriate institutional support and engagement is important for the effective implementation of acute pain services. (2)
- **We recommend that best practice guidelines for the assessment and management of acute trauma-related pain be implemented in the EC.*

Stellenbosch University https://scholar.sun.ac.za

Appendix A: Guideline expert panel

International

- Dr GP Mensa: Ghana
  Lecturer
  School of Nursing and Midwifery
  University of Ghana
  PO Box LG 43
  Legon, Accra Ghana
  ggpmensah@ug.edu.gh

South Africa

Eastern Cape

- Dr W ten Ham-Baloyi
  Nelson Mandela University

Western Cape

- Mrs. S De Lange
  Emergency Nurse Lecturer,
  Stellenbosch University

- Mrs. H Stevens
  Lecturer,
  Western Cape College of Nursing

- Mr. R Rhodes
  Area Manager,
  Emergency Center,
  Mitchells Plain District Hospital

- Ms. M Mgoqi
  Emergency Nurse
  Khayelitsha District Hospital

- Mr. A. Albertus

Stellenbosch University https://scholar.sun.ac.za

Emergency Nurse,
Tygerberg Hospital

- Dr M De Man,
  Emergency Consultant,
  Mitchells Plain District Hospital

- Mr. C Lloyd
  Paramedic,
  Cape Town University of Technology

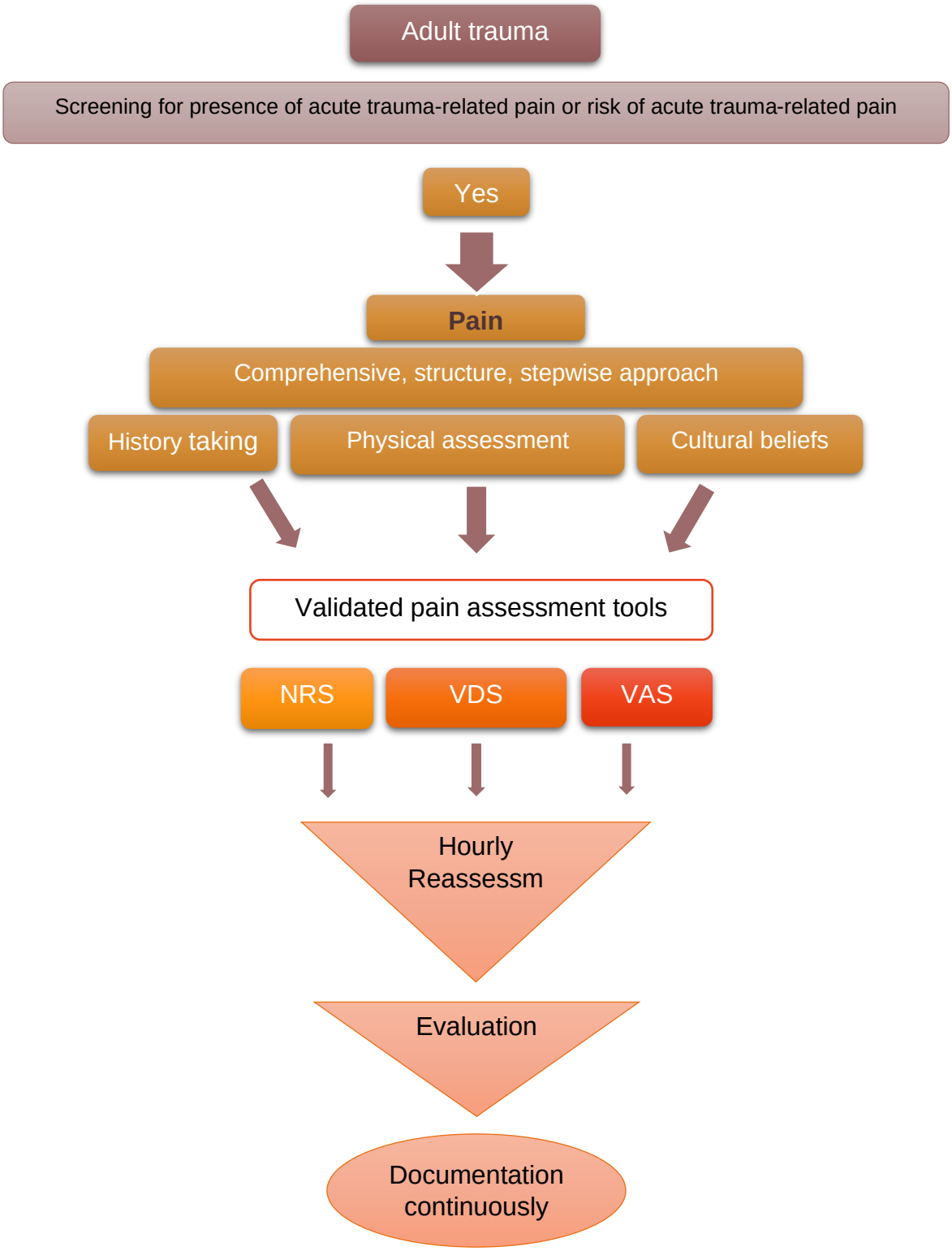
APPENDIX B

NO	GUIDELINE	AUTHOR
1	ACS Trauma Quality Programs: Best Practice Guidelines for Acute Pain Management in Trauma Patients. American College of Surgeons	Schug, S., Palmer, G.M., Scott, D.A., Halliwell, R., & Trinca, J.
2	Acute Pain Management: Scientific Evidence	American College of Surgeons
3	Assessment and management of pain (RNAO)	Registered Nurses Association of Ontario
4	Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury.	Hsu, J.R.; Mir, H.; Wally, M.K.; Seymour, R.B.
5	Guidelines for the management of acute pain in emergency situations: EUSEM	European Society for Emergency Medicine
6	Ministry of Nigeria: Guidelines for Pain Management in Nigeria	Federal Ministry of Health Nigeria

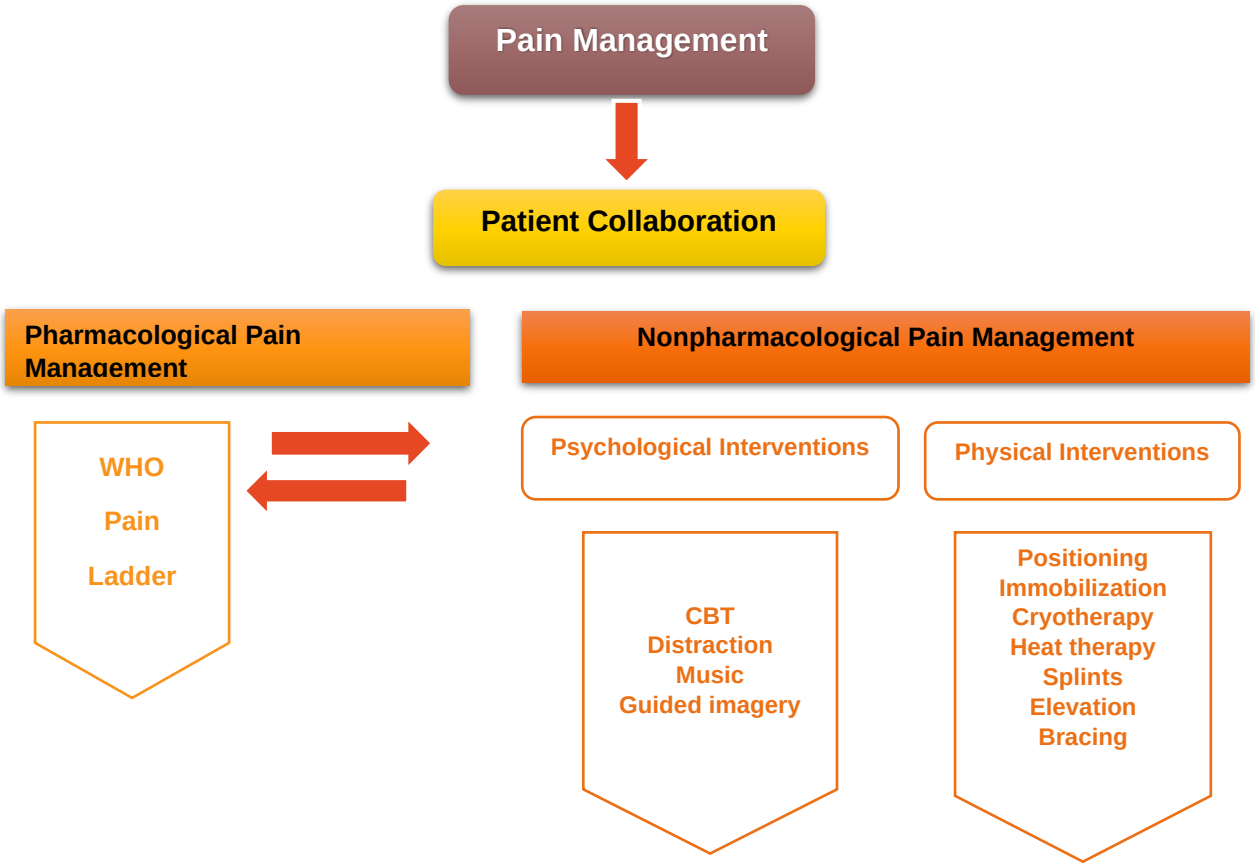
Stellenbosch University https://scholar.sun.ac.za

APPENDIX C

Algorithm for best practice recommendations for acute trauma-related pain in the ECs



Stellenbosch University https://scholar.sun.ac.za



Stellenbosch University https://scholar.sun.ac.za

APPENDIX D

Table 2 Summary of recommendations for best practice guidelines

Guideline	Level of Evidence	Pain Assessment	Pain Management			Education	Organizational Requirements
			Pharmacological Pain Management	Non-Pharmacological Pain Management Strategies			
				Cognitive Behavioural Therapy (CBT)/ Psychological	Physical Strategy		
Acute Pain Management in Trauma patients (ACS)	• Mentions RCT and Meta-analysis at times, otherwise not indicated	• The complexity of pain requires multimodal pain assessment techniques. • Numerical Rating Scale (NRS) - 11-point patient reported pain scale 0- 10 • Visual Analogue Scale (VAS) • Self-report Patients mark pain on 10 cm line. • Defense and Veterans Pain Rating Scale (DVPRS) - Self-reporting - Graphic acute pain assessment tool • Same as NRS but gives more description of each level of pain • Critical Care pain observation Tool (CPOT). Health care workers objectively score patients in 4 domains: facial	• Multimodal pain management across trauma continuum • Pharmacological analgesia: Administer acetaminophen and ibuprofen around-the-clock" to maintain a constant serum level. • NSAIDS • Adjuvant Analgesics Have a protocol for safe de-escalation of analgesics as quickly as possible	• Aims to improve the patients control over their perception of pain e.g., - Setting expectations, - Teaching relaxation therapies - Using guided mental imagery for diversion - Music therapy - Using active distraction through conservation • Multimodal Pain Management across the Trauma Care Continuum	• Immobilization used in extremity and pelvic trauma (RCT). • Temperature therapy: - Cryotherapy uses external cooling to reduce internal tissue temperature e.g., ice packs, gel packs and cold-water immersion (RCT) Heat therapy uses external warming to relieve discomfort associated with injury Used after acute injury period (Meta-analysis).	• Patient education about expectations for pain management • Educational information • Self-management interventions of patient • Coaching family members	• Implementing Best Practice Guidelines for acute pain management in trauma patients • Trauma medical directors (TMDs), Trauma liaisons, registrars and staff have a leadership role in: - supporting pain management - implementing and monitoring compliance of the pan management

Stellenbosch University https://scholar.sun.ac.za

	expression, body movements, ventilator compliance/vocalization, and passive muscle tension. • Functional Pain Assessment Tools: - Clinically Aligned Pain Assessment (CAPA): Provides a framework for health care worker to have a conservation with patient that focuses on pain intensity, effect of pain on function and sleep, efficacy of treatment and progress towards relief. • Functional Pain Scale (FPS): Assesses pain in an older population using 3 domains of inquiry. • FLACC-Revised (Faces, Legs, Activity, Cry, Consolability) Behaviourable Pain Assessment: for the assessment of patients with cognitive disability or who are unable to self-report. This scale quantifies 5 domains. • Pain reassessment: criteria to screen, assess, and reassess pain that is consistent with the patient's age, condition, and the ability to understand.			best practice guideline - establishment of a pain management guideline workgroup comprising of champions and stakeholders

Stellenbosch University https://scholar.sun.ac.za

Acute Pain Management: Scientific Evidence	• Documented according to NHMRC designation • (NHMRC 1999 GL) • Narrative Reviews (NR) • Case Reports (CR) • Clinical Practice Guidelines (GR)	• Obtain medical history of patient • Physical assessment **(NR):** - Location site - Radiation - Type - Mobility - Intensity of pain Categorical Scales **(NR)** • Verbal descriptor scales (VDS) **(Level III-2)** • Numerical Rating Scale (NRS) **(NR)** • Visual Analogue Scale (VAS) **(Level 1V)** • Functional Activity Scale (FAS) • Behavioural Pain Scale (BPS) **(Level III-3)** • Critical Care Pain Observation Tool (CPOT) **(Level III-3)**	Methods • Oral • Peripheral • Intramuscular • Epidural • Patient Controlled Analgesia • Intrathecal Types • Paracetamol **(Level I)** • Non-selective NSAIDS • Opioids	• Use psychological interventions to reduce stress and arousal • Listening to music **(Level I)** • Distraction reduces pain **(Level I)** • Coping mechanism with training **(Level I)** • Procedural information given before treatment **(Level IV)** • Application of a range of behaviour change principles such as: - Positive reinforcement behaviour - Identification and - modification of unhelpful thoughts **(Level II-2)** - Goal setting to achieve change in targeted behaviour - CBT methods focus on both overt and cognitions processes in patients, and - Interaction with environmental factors e.g., interaction between patients and others, especially nursing and medical staff as well as families.	• Warming and cooling interventions (Level I)	• Educated patients will have better pain control • Will comment on quality of pain and relief of pain **(NR)** • Training of patients in coping strategies **(Level II)**	• Standardized clinical observation charts • Acute pain services (APS) (Level IV), (NR)

Stellenbosch University https://scholar.sun.ac.za

Assessment and management of pain (RNAO)	• (NHMRC	• Screening of persons **(Level Ib)** • Self-report of persons • Perform comprehensive pain assessment **(Level I)** • using O,P,Q,R,S,T,U and V acronym **(Level I)** • Unidimensional and multidimensional pain tools **(Level I)** • Comprehensive assessment on persons unable to self-report **(Level III)** • Explore the belief's knowledge and level of understanding **(Level III)** • Document the persons pain characteristics **(Level II)** • Establish a comprehensive plan of care • Reassessment and evaluation **(Level II)**		• Implement the comprehensive plan of care **(Level III)** • Patient collaboration to identify their goals **(Level Ib)** • Multimodal analgesic approach • **(Level Ib)** • Changing of opioids, when necessary, tools **(Level Ib)** • Prevention, assessment, and management of adverse effects tools **(Level Ib)**	• Focus on external stimuli e.g., music, odours • Psychological technique that includes cognitive and behavioural modifications to reduce the impact of pain • Evaluate non-pharmacological psychological interventions **(Level Ib)** - CBT, - Music therapy - Distraction • Relaxation techniques	• Evaluate non-pharmacological physical interventions - Physiotherapy - Exercise • Application of heat /cold	• Teach the person, family, and caregivers about pain management • Educational institutions to incorporate the guideline into basic and interprofessional curricula **(Level IIb)** • Education programs for health care providers **(Level IIb)** • Continuous education opportunities to enhance specific knowledge and skills (**Level 1V)**	• To establish pain assessment and management as a strategic clinical priority • **(Level 1V)** • Establish a model of care to support interprofessional collaboration **(Level IIb)** • Use a systematic organization-wide approach to implement the guideline **(Level 1V)**
Clinical Practice Guidelines for Pain Management in Acute Musculoskeletal Injury	• Grading of Recommendations, Assessment, Development and Evaluation (GRADE)	• Assess pain regularly with short, validated tools		• Pain medication strategies • Use MMA. MMA may include NSAIDs, acetaminophen, and immediate-release opioids. • Prescribe the lowest effective immediate release opioid dose for the shortest period possible.	• Cognitive and Emotional Strategies - Discuss alleviation of pain, expected recovery course and patient experience (strong recommendation, moderate quality evidence) - Connect patients with pain that is greater or more persistent to psychosocial	• Immobilization • Elevation • Cryotherapy: cold gel packs, cold water submersion (conditional recommendation, low quality evidence)	• Training of patients • Educational information access • Teach patient self-management interventions	• Prioritization of pain assessment and management as an organizational priority

Stellenbosch University https://scholar.sun.ac.za

					interventions (strong recommendations), low quality evidence) • Psychosocial interventions - Consider strategies for optimal mindset using anxiety-reducing strategies to promote self-efficacy e.g. - Music therapy - (strong) recommendation, low quality evidence) - Peer support - Online social networking			
Guidelines for the Management of Acute Pain in Emergency Situation	• NHMRC	• Medical History • Physical examination • Pain History - Fundamental components of pain history - Circumstances associated with pain onset - Character of pain - Intensity of pain - Associated symptoms - Effect of pain on activities and sleep - Treatment - relevant medical history - factors affecting patient's symptomatic treatment		• Determine which analgesic is the most appropriate to use in patients depending on the setting, • the pain intensity of the patient as determined by pain assessment and recommendations on the class of analgesic as provided by the WHO ladder • Paracetamol • NSAIDS • Codeine • Tramadol • Morphine • Ketamine • Nerve blockade	• Psychological Interventions - Sharing information - - involving patients with procedural information and - - sensory information (Level of evidence: low) • Relaxation (stress and tension reduction) - Techniques such as: - focusing on breathing patterns - Concentrating on mental imagery of relaxing scenes - music • Attention control measures - Distraction techniques - Use of imagery scenes	• Heat and cold **(Level Ⅰ B)** - Cryotherapy: cold to physiologically reduce pain, oedema, inflammation, and muscle spasms - Heat to physiologically relief from pain, and increase blood flow and elasticity of tissue • Skeletal traction and bracing to reduce pain, protect the neck, back and	• Written discharge instructions • Used to complement verbal instructions	• Not indicated

Stellenbosch University https://scholar.sun.ac.za

		- Patient's report (self-report) • Patient expectations • Categorical Pain Scales - Verbal descriptor scale: - no pain to excruciating pain - Can be converted to NRS - Pain relief can also be graded - Numerical Raring Scale - Verbally of written format - 11-point scale - Visual Analogue Scale - Patients mark the points along the line - Assessment of Functional Impact Scale (FAS) - Patient asked to complete a certain activity • Assessment of pain in special situations - Use appropriate pain assessment tool - NRS, FPS, Wong-Baker FACES, PAINAD (Observer related tool for assessing pain-related behaviour, partly based on FLACC • Behavioural pain scale (BPS) (critically ill, sedated and mechanically ventilated patients)				joints, stabilize fractures • **(Level ⅡB)** • Patient positioning • **(Level Ⅰ A)** • Appropriate positioning for non-complex fractures e.g., back slab will align and alleviate pain • Splints and slings for soft tissue injuries • Elevation of limbs • Discharge from the EC - Effective communication between physician/nurse and patient for optimal management of patient after discharge from EC **(Level Ⅳ)**		

Stellenbosch University https://scholar.sun.ac.za

		• Evaluation of acute pain • Reassessment of pain						
Guidelines for the Management of Pain in Nigeria	• Not indicated	• Patient history - PQRST • Validated tool - Numerical rating scale (NRS) - Verbal Analogue Scale (VAS) - Verbal Rating Scale (VRS)		• WHO Analgesic Ladder: adults • Newly proposed analgesic ladder • Administration of analgesics • Analgesics should be given at regular intervals • Analgesics should be prescribed according to pain intensity as evaluated using pain rating scale • Analgesics should be prescribed with a constant concern for detail • Summary Classification of Analgesics	• Psychological preparation • Distraction: effective when pain is mild to moderate • Effective when adapted to patient's development and cognitive level • Active distraction: involves patient participating in activities during procedure e.g., Interactive with an electronic device etc • Relaxation techniques - Progressive muscle relaxation (PMR) - Diaphragmatic breathing - Music therapy - Guided imagery	• Bedrest • Exercise improves pain and strengthens and improves flexibility of limbs • Positioning • Ambulation • Elevation, appropriate body alignment and support of extremities - Splinting • Thermotherapy - Cryotherapy - Use of ice packs - Heat therapy - Application of heat to injured site	• Patient education - Advice on resuming normal activity - Discussion or options for pain management	• Should involve other agencies and stakeholders in the collaborative provision of holistic, evidence-based care • Skill development in pain management • Capacity building, the act of improving skill toward having resources and the ability to address problems or challenges • Curricula must provide adequate training

Stellenbosch University https://scholar.sun.ac.za

APPENDIX AC: COMBINED FEEDBACK EXPERT REVIEW PANEL WITH COMMENTS FROM GDG

Domain 1:	Scope and Purpose **1. The overall objective (s) of the guideline is (are) specifically described.**	Comments from GDG	Score
Appraiser	The overall objective(s) of the guideline is (are) specifically described.		
1	The objectives that were set for the study are clear and easily understandable		7
2	The BPG is for the nurse assessment and management of acute trauma related pain in the EC		6
3	Agree with the objective. It is short and concise. Explain the reason for the need of the guideline.		6
4	Well described		7
5	The overall objectives were to contextualise a Best Practice Guideline (BPG) for professional nurses for the assessment and management of acute trauma-related pain of adult patients in Emergency Centers (ECs) in the Western Cape (WC). This was well explained.		
6	The objective is clear and concise		
7	No comment		
8	Objectives of guideline in terms of health benefits ("improving patient outcomes") might be too broadly stated as the expected health benefit. Patient views included in the study, so would the guideline aim to provide patient-centered pain management / improve patient satisfaction?	The aim of this study was to contextualise a best practice guideline. The two sub-studies were phases to guide in this process.	3
9	The objective is clearly indicated under the scope of the guideline. The overall objective currently reads: to contextualise a best practice guideline for professional nurses for the assess and management of acute trauma-related pain of adult patients in ECs in the WC. I would suggests slightly changing this to the objective of the actual guidelines: e.g., what does the guideline want to achieve? I think contextualise can be left out.	The aim was to contextualise a guideline	
	2. The health question (s) covered by the guideline is (are) specifically described.		
1	The health question is well described, understandable and in layman's terms		6
2	No comment		6
3	The health question is specific to the guideline. The assessment and management BPGs specifically for nurses Detailed explanation given.		6
4	The PICO question nis clearly stated.		7
5	The clinical /health question was specifically described as expected. The question posed in the BPG is " What are the core recommendations for nurses for the assessment and management of acute trauma-related pain in ECs to improve adult patient outcomes?" This is in line with the overall objective.		7
6	No comment		7

Stellenbosch University https://scholar.sun.ac.za

7	No comment		7
8	PICO question stated. However, not explained in detail		5
9	The review question was clearly indicated. Currently it however reads like an objective. Perhaps the review question can be moved up (page 2) and the PICO or PCC (in case this is a scoping review) can be featured. See my comments.	The GDG discussed this and opted to keep it as stated	5
	2. The population (patients, public, etc) to whom the guideline is meant to apply to specifically described.		
1	The population to whom this guideline applies to is specifically described in the study and it will be of great use for professional nurses in the Emergency Center settings as they deal with patients in constant pain every day.		7
2	No comment		7
3	Nurses and patients were well described and the role of each in the use of the guideline. I would suggest to state on page 4 of the guideline that nurses are often the first health care workers to first interact with the patient and not as currently stated that they are the first to interact with patients. In red category or P1 patients the doctor/ trauma surgeon will be part of that first interaction and not the nurse alone.	Feedback was adopted.	6
4	It is clear that the guideline is pertaining to adult patients with acute trauma-related pain. Another aspect I can think of from a practice point of view, is timing of the assessment and management. For example with long waiting times of trauma patients in the public sector, the benefit of having early assessment by nursing and not doctors would be in regards of correct triage according to the SATS which will potentially lead to more correct prioritising of the patients, and also relevant if practice of early initiation of pain management can be done by nurses potentially independent of doctors, as this will probably lead to earlier initiation compared to where pain management is delayed to when the patient is seen by a doctor only. With this I also question if the BPG applies to the whole stay of the patient in the EC, as in practice PN's focus later on the patient 's stay in EC usually shifts to management of pain in cooperation with doctors, i.e., to give analgesia or manage pain according to what the doctor and team identified as the appropriate strategy for the patient.	The BPG is intended for the whole stay in the EC. Pain assessment must start at triage according to SATS.	5
5	The guideline states that the nurses are those who will be using the BPG for the assessment and management of acute trauma-related pain of adult patients admitted to the ECs.		7
6	No comment		7
7	No comment		3
8	Not sure about the population covered by the guideline. Acute trauma related pain and adult patients admitted not explained or described. e.g., would a patient who received sedation for rapid sequence intubation, or having continuous infusion of sedation be included, or severe head trauma with reduced LOC be assessed and managed the same?	This is explicit in the final BPG and in the full thesis. For the scope of this study this BPG is intended for adult patient who are alert.	
9	The population was clearly described. Perhaps you can indicate the number of patients included in the questionnaire	This is provided in the full thesis	

Stellenbosch University https://scholar.sun.ac.za

Domain 2	**STAKEHOLDER INVOLVEMENT** **4: The guideline development group includes individuals from all relevant professional groups.**		
1	The development group that was chosen for this study covers medical professionals from different spheres. All their input would make this guideline inevitable and a great model to follow		7
2	No comments		7
3	A great mix of multidisciplinary team was used (nurses, doctors, and paramedics)		4
4	The GDG consists of 3 members of that evaluated the evidence and different existing guidelines. A large variety of health professionals have been included in the expert reviewers' group.		7
5	It is stated in the BPG document that Guideline Decision Group (GDG) and a panel (8 reviewers with 8 expertise in the relevant professional disciplines and also BPG developers were engaged. These experts are deemed to be appropriate stakeholders for the development of the BPG.		7
6	No comment		7
7	No comments		6
8	Professional nurses as the target users completed surveys. Multidisciplinary team members involved in guideline development, as well as a scoping review to collect scientific evidence		7
9	The guideline development group seems to have the required expertise. Perhaps to add the credentials of each member to enhance the credibility	The credentials were added as an appendix	6
	5. The views and preferences of the target population (patients, public, etc.) have been sought)		
1	Views and preferences of target population was taken into consideration for this study to make it a holistic and well-rounded study.		7
2	Voices of the patients was gathered by means of a survey.		7
3	Well done, the perspectives of patients and nurses were obtained through a survey and their view incorporated.		6
4	Although I have not seen the results of the surveys mentioned, it is clearly stated how patients' views are elicited.		7
5	The views of adult patients admitted to the ECs with acute trauma-related pain have been sought through surveys conducted by the BPG developer.		7
6	No comment		7
7	No comment		6
8	Survey done to involve the population of the study and the guideline include their views and preferences. Not sure how the information was used to inform the guideline development?	This is explained in the final guideline	6
9	No comment		

Stellenbosch University https://scholar.sun.ac.za

	6. The target users of the guideline are clearly defined.		
1	Target users which will be the medical professionals has been identified and the specific target group of professional nurses has been clearly identified.		7
2	Professional nurses working in the EC were surveyed.		6
3	Well described		6
4	It is clear that the main target user is aa professional nurse (PN) in an EC in Western Cape, with external validity sought for the rest of South Africa also. From a practice point of view, I believe in many EC's in the Western Cape because of PN shortages and other operational considerations most initial contact and sometimes only nursing contact with trauma patients are not PN's but other nurses levels e.g. EN's and ENA's. Obviously, this is a vital consideration if nursing scope of practice is taken into consideration especially in terms of the pharmacological pain management is considered.	This BPG is intended for all nurses. However, the professional nurses remains accountable for the assessment and management of acute pain considering the scope of practice of the different nursing categories.	6
5	The target users of the guideline are clearly defined in the document as the target users.		7
6	No comment		7
7	No comment		7
8	In the beginning of the document, it is stated as nurses, However, later the target users identified are professional nurses. Not sure if the enrolled nurse assistant will be involved in the actual implementation of the guideline as they might have to assess pain but will report to the professional nurse for management.		3
9	No comment		7
Domain 3	7. Systematic methods were used to search for evidence		
1	A great overall approach was used to search for evidence and a wide variety of source were used.		7
2	No comment		7
3	A multiphase method was used. Both stakeholders and evidence were used. It seems as if a scoping review search methods were utilized as described in the guideline development document. I would suggest to add the search time period as well.	It is indicated in Chapter 5 of the full thesis.	6
4	The systematic methods of identifying relevant guidelines and recommendations from those guidelines are clearly stated.		7
5	The methods used to search for evidence can be said to be systematic as per the processes outlined in the BPG document		7
6	No comment		6
7	No comment		6
8	Search strategy described in detail. Search key words and time periods not included.	It is indicated in of the full thesis.	6
9			5
	8. The criteria for selecting the evidence are clearly described.		
1	No comment		7
2	No comment		6

Stellenbosch University https://scholar.sun.ac.za

3	Well described. Please note that in the document it states AGREE 11 and not AGREE **II**	This was corrected	5
4	Well done		7
5	The criteria for the selection of evidence are clearly defined in the document. Independent reviewers were involved and a score of 50% or more was agreed to be the acceptable percentage for the inclusion of BPG for the study		7
6	No comment		6
7	No comment		6
8	Inclusion/exclusion criteria or rationale for selecting guidelines with the systematic review not included. (8. The criteria for selecting the evidence - mention AGREE II tool appraising 'this' guideline-page 6) Although it is stated that the 'the critical appraisal process' was implemented to select 6 guidelines, it is not clearly explained. Also not explained why 75 recommendations were excluded.	This is addressed in Chapter 6 and the final BPG	4
9	The process is described here but not the criteria for selection/screening, critical appraisal		5
	9. The strength and limitations of the body of evidence are clearly described.		
1	Strengths and limitations are clearly described and should aways be taken into consideration		7
2	No comment		6
3	Good. Annexure D described the level of evidence		5
4	It is not clearly stated why 75 out of 114 extracted recommendations were excluded. A summary of reasons could enhance this aspect easily.		6
5	The strengths and limitations of the body of evidence are not clearly described in the BPG document.		1
6	No comment		6
7	No comment		6
8	Level of evidence included in Appendix D for the 6 guidelines selected. However, explicit descriptions of strengths and limitations of evidence not provided. Consistency of results across guidelines included in the discussion of recommendations.	This is addressed in Chapter 7	4
9	I could not find this. Link between the recommendation and the supporting evidence	This is addressed in Chapter 6 and Chapter 7	1
	1. The methods for formulating the recommendations are clearly described.		
1	No comment		6
2	No comment		6
3	Well described		5
4	Clearly stated		7
5	The methods are clearly defined in the BG document		7
6	No comment		6
7	No comment		7
8	Formal process to compile the recommendation well explained		7
9	Was the extraction and synthesis process done independently?	Yes	6

Stellenbosch University https://scholar.sun.ac.za

	11. The health benefits, side-effects, and risks have been considered in formulating the recommendations		
1	No comment		7
2	No comment		5
3	Not included as part of these guidelines, but well described as to why not.		6
4	Would it not be fair to say that correct initial and ongoing assessment of pain and appropriate pain management both pharmacological and non-pharmacological would have certain health benefits, but if inappropriate assessments would have potential harms and risks? I believe these can be discussed without involving interventional studies even.	This is addressed in Chapter 7 with specific regards to recommendations of the study	5
5	The point was not addressed since it was not the main purpose and scope of the development of the BPG which has clearly been stated in the document		7
6	No comment		NA
7	No comment		7
8	Specific health benefits of acute trauma pain management might be a bit vague. Reading the recommendations does not convince that is really important to assess and manage the pain of trauma patients. Stated that pharmacology as risk not included in the guidelines.	This was not the purpose and scope of the development of this BPG. It wIll be addressed during the implementation of the BPG.	3
9	N//A as this will be done when the BPG will be piloted.		7
	12. There is an explicit link between the recommendations and the supporting evidence.		
1	No comment		7
2	No comment		6
3	Not all literature used was attached to the guideline but looking at the summary in Annexure B various literature was consulted.		4
4	Levels of evidence correlation to an aspect is stated in Appendix D		7
5	Linkages between the recommendations and supporting evidence were clearly stated in the document		7
6	No comment		6
7	No comment		7
8	Recommendations well linked to supporting evidence and easy to find		7
9	Was there any classification or hierarchy of evidence used and were recommendations based on stronger evidence regarded as ‘better’ as compared to those based on ‘weaker’ or lower levels of evidence?	This is addressed in Chapter 6 and Chapter 7	5
	13. The guideline has been externally reviewed by experts prior to its publication.		
1	The study consists of a panel of expert reviewers that will be able to review and add their expert opinions in the final product of this study.		7
2	No comment		6

Stellenbosch University https://scholar.sun.ac.za

3	Panels of experts was used and described. As mentioned earlier I would suggest including the expertise of each reviewer		6
4	It is clearly stated that there are 8 reviewers reviewing the BPG		6
5	The review of the BPG by external reviewers has been done		7
6	No comment		7
7	No comment		7
8	Multidisciplinary team members review done using a standardised tool. Include details of review panel		7
9	8 reviewers and input from nurses in the field		7
	14. A procedure for updating the guideline is provided.		
1	Personally, I think the guideline should be reviewed every year as new policies develop every year and guideline should be updated yearly or every 2nd year to keep up to date with new evidence.		6
2	No comment		7
3	A suggestion for 3 years was made		7
4	Time frame is stated, but not clear in terms of what process will be followed	It is generally that guidelines are updated every 3-5 years. Since this is a new guideline the GDG opted to review and update the guideline in 3 years	6
5	The procedure for update of the guidelines has clearly been stated as every 3 years based on the evidence available		7
6	States that 3 years is the recommended time period for update of guideline, how is this derived, what evidence	It is generally that guidelines are updated every 3-5 years. Since this is a new guideline the GDG opted to review and update the guideline in 3 years	4
7	No comment		6
8	Mentioned that it must be done, but procedure not explained		1
9	How will this be done? e.g., will you update the search for updated BPGs?	Yes	6
Domain 4	**15. The recommendations are specific an unambiguous**		
1	No comment		7
2	No comment		5
3	Persons and patients and ED and ECs are both used in the recommendations. I would suggest to stick to the use of one. Pain assessment is very broad whereas the pain management part is very detailed. Can the assessment part not also be made more specific to provide clear guidelines in practice, e.g., providing an example of a pain assessment tool. Under pain assessment tools bullet one I would suggest stating the clinical context - EC and not the examples of the ward etc. as this is for EC. It refers to pain assessment tool and rating the level of pain separate,	EC was used. This was corrected. The GDG looked at the recommendations and opted to keep as it is with minor changes.	4

Stellenbosch University https://scholar.sun.ac.za

	but level of pain/ severity is usually part of the pain assessment tool. Can an example of pain assessment documentation be included to use? What will be the best according to evidence to use, to ensure best practice is implemented. I would suggest stating non-pharmacological pain management measures first as these can be initiated prior to a prescription. I would suggest saying cold packs instead of ice, ECs usually do not have ice available. Under non-pharmacological measure there is mention made of children, should these guidelines not only focus on adults? There is also mention of postoperative pain, which does not fall under the category of acute trauma related pain.	Comments were considered but no changes were made.	
4	Clear		7
5	A summary of key recommendations are clearly provided in Box 2, 3, 4, & 5		7
6	No comment		7
7	No comment		6
8	Recommendations are clear		7
9	No comment		7
	16. The different options for pain management of the condition or health issue are clearly presented.		
1	Management options are identified and can be adjusted according to clinical institutions where it will be used.		6
2	No comment		6
3	Both pharmacological and non-pharmacological options were provided. Please see comments above on the specific suggestions.		5
4	Recommendations in Box 3 is clear. I would have liked to see the WHO pain ladder as an Appendix for easy reference	It is included I the final BPG	6
5	The different options for management of adult patients with acute- trauma related pain is clearly presented under pharmacological and non-pharmacological pain management in Box 3		7
6	No comment		7
7	No comment		7
8	Both pharmacological and non-pharmacological options included as well as educating the patient		7
9	No comment		7
	17. Key recommendations are easily identifiable.		
1	No comment		7
2	No comment		7
3	It is easy to identify assessment and management as they are in separate boxes.		6
4	Well described		7
5	Key recommendations in the BPG are easily identifiable in Boxes 2, 3, 4, & 5		7
6	No comment		7
7	No comment		7

Stellenbosch University https://scholar.sun.ac.za

8	Recommendations presented in boxes and guideline include flow charts		7
9	No comment		7
Domain 5	**18. The guidelines describes facilitators and barriers to its application**		
1	No comment		7
2	No comment		6
3	Not observed in guidelines		1
4	I am not sure how to interpret the lack of discussion of organizational requirements because recommendations only become feasible if there are not potentially barriers that will make recommendations nonsensical because it is not implementable because of the barriers that exist. For both pharmacological and non-pharmacological interventions, scope of practice can potentially be such a barrier and must be discussed to either state it is not an insurmountable barrier, or it is and thus influencing the actual recommendations' feasibility.		4
5	The potential organizational barriers in the application of the guideline although stated as presented in BOX 1 as part of organisational requirements is not clearly stated. Facilitators were not stated.		4
6	No comment		6
7	No comment		6
8	Organisational barriers considered		6
9	The section mainly focuses on barriers. Perhaps to state that the barriers are 'reversed' equivalent of facilitators		6
	19. The guideline provides advice and/or tools on how the recommendations can be put into practice.		
1	No comment		7
2	No comment		7
3	Was provided, though np specifics were given, or examples of assessment tools was not given for instance		4
4	As the tool that is used for the assessment is vital, it would have been great to see the NRS, VDS and VAS validated assessment tools chosen for the Algorithm could be included as further appendices for easy reference but also for clarity. Again, I think it would be important to state when the initial screening would be done.	Assessment tools re included in the final BPG	6
5	Advice and tools on how the recommendations can be put into practice has been presented with an Algorithm attached to the document as Appendix C.		7
6	Algorithms are ideal in the EC setting. They are easy to follow.		6
7	No comment		7
8	Algorithm included in guideline		7
9	No comment		7
	20. The potential resource implications of applying the recommendations have been considered.		
1	Resource implications have been clearly identified and is clearly understandable.		
2	No comment		5

Stellenbosch University https://scholar.sun.ac.za

3	Information on organizational structures were provided. Although specific logistical information was not included.	4
4	No specifics mentioned as the FAME survey results will influence cost implications	1
5	How the potential cost implications for the application of recommendations after FAME survey is conducted has been stated in the document	7
6	No comment	7
7	No comment	7
8	No comment	7
9	No comment	7
	21. The guideline presents monitoring and/or auditing criteria	
1	No comment	7
2	No comment	5
3	Not observed	1
4	Not yet done, awaiting FAME survey	1
5	Auditing was not done. However, the BPG developer hopes to do this after FAME survey is done which will guide the process of monitoring and auditing	6
6	No comment	NA
7	No comment	6
8	Not done yet / guideline does not include auditing criteria. FAME survey will guide	3
9	No comment	7
Domain 6	**EDITORIAL INDEPENDANCE**	
	22. The view of the funding body have not influenced the content of the guideline	
1	No comment	7
2	No comment	7
3	No acknowledgment section in the guideline	1
4	Declared	7
5	Its clearly been stated in the document that there is no funding boy in respect of the development of the BPG. It is a PHD work mainly self-funded by the BPG developer, and a bursary.	7
6	No comment	7
7	No comment	6
8	No comment	7
9	N/A as the study was self-funded	7
	23. Competing interests of guideline development group members have been recorded and addressed.	
1	No comment	7
2	No comment	7
3	No comment	1
4	No conflict of interest declared by GDG	7
5	It is clearly stated in the BPG document that there is no conflict of interest to declare.	7
6	No comment	7
7	No comment	6
8	No comment	7
9	No conflicts of interested noted	7

Stellenbosch University https://scholar.sun.ac.za

APPENDIX AD: TRANSLATION OF SURVEYS

21 January 2021

Ms Yolande Magerman
Critical Care: Trauma and Emergency
Western Cape College of Nursing
Klipfontein Road
Heideveld
Cape Town
7764

Dear Ms Magerman

Translation of questionnaire

The Stellenbosch University Language Centre hereby confirms that in November to December 2020 we translated the following questionnaire into Afrikaans and isiXhosa:

Sub-study 2: Best practice guideline 19 October 2020

Please contact me should you have any queries.

Regards

pp. 

Marguerite van der Waal
Head: Language Service
Stellenbosch University Language Centre
Tel: 021 808 3096
Fax: 021 808 2863
E-mail: mvdwaal@sun.ac.za

Stellenbosch University https://scholar.sun.ac.za

APPENDIX AE: DECLARATION BY LANGUAGE PRACTITIONER

Lona's Language Services

English/Afrikaans
Afrikaans/English

3 Beroma Crescent Beroma Bellville

Cell 0782648484
Email illona@toptutoring.co.za

* Translations * Editing * Proofreading
* Transcription of Historical Docs
* Transcription of Qualitative Research
* Preparation of Website Articles

TO WHOM IT MAY CONCERN

This language certificate serves to confirm that the undersigned

ILLONA ALTHAEA MEYER

has edited and proofread the **dissertation of Yolande Nerissa Magerman** for language correctness and has translated the **Abstract** into **Afrikaans**.

TITLE: BEST PRACTICE GUIDELINE FOR NURSES FOR THE ASSESSMENT AND MANAGEMENT OF ACUTE TRAUMA-RELATED PAIN IN EMERGENCY CENTERS

Signed

Ms IA Meyer

04 October 2022

Stellenbosch University https://scholar.sun.ac.za

APPENDIX AF: DECLARATION BY TECHNICAL FORMATTER

To whom it may concern

This serves as confirmation that I, Lize Vorster, performed the technical formatting of Yolande Magerman's thesis entitled:

Best practice guideline for nurses for the assessment and management of acute trauma-related pain in emergency centers

Technical formatting entails complying with the Stellenbosch University's technical requirements for theses and dissertations, as presented in the Calendar Part 1 – General or where relevant, the requirements of the department.

Yours sincerely

Lize Vorster
Language Practitioner

Vygie street 9, Welgevonden Estate, Stellenbosch, 7600 * e-mail: lizevorster@gmail.com * cell: 082 856 8221