*International Journal of Computational and Experimental Science and ENgineering (IJCESEN)*

*Vol. 10-No.4 (2024) pp. 3357-3364*
*http://www.ijcesen.com*



***ISSN: 2149-9144***

**Research Article**

# Rad Nurse-Led Pain Assessment Protocols and Their Impact on Pain Control in Hospitalized Patients

**Eman Sabih R Alanazi[1]*, Ghoroub Ahmad M Alanzi[2], Hind Muwaffaq R Alanzi[3], Fatima Ziyad Shayea Al-Ruwaili[4], Nawal Naeem Alhazmi[5], Reem Aashwe DiLo Alhazmi[6], Alsharari Mona Hamdan J[7], Alanazi Mohammed Lafi O[8], Hamod Naser Ali Alshammry[9], Mohsen Ali Moddhi Alhazmi[10], Worod Moutiran Hamoud Alanezi[11]**

[1]Technician Nursing – Public Health Department, Central Hospital Buraydah – Qassim Health Cluster – Ministry of Health – Buraydah – Qassim Region – Saudi Arabia
* **Corresponding Author Email:** ianzi@moh.gov.sa- **ORCID:** 0000-0002-5107-9950

[2]Technician Nursing – Al Qurayyat General Hospital – Al Jouf Health Cluster – Ministry of Health – Al Qurayyat – Al Jouf Region – Saudi Arabia
**Email:** gaalanzi@moh.gov.sa- **ORCID:** 0000-0002-5337-7900

[3]Nursing Specialist – Al Qurayyat General Hospital – Al Jouf Health Cluster – Ministry of Health – Al Qurayyat – Al Jouf Region – Saudi Arabia
**Email:** Imalenazi@moh.gov.sa - **ORCID:** 0000-0002-5337-7800

[4]Technician Nursing – Maternity and Children's Hospital, Sakaka – Al Jouf Health Cluster – Ministry of Health – Sakaka – Al Jouf Region – Saudi Arabia
**Email:** falrawilly@moh.gov.sa- **ORCID:** 0000-0002-5337-7700

[5]Technician Nursing – Specialized Dental Center, Turaif – Northern Borders Health Cluster – Ministry of Health – Turaif – Northern Borders Region – Saudi Arabia
**Email:** Nnalhazmi@moh.gov.sa- **ORCID:** 0000-0002-5337-7600

[6]Technician Nursing – King Abdulaziz Specialist Hospital, Sakaka – Al Jouf Health Cluster – Ministry of Health – Sakaka – Al Jouf Region – Saudi Arabia
**Email:** reaalhazmi@moh.gov.sa- **ORCID:** 0000-0002-5337-7500

[7]Technician Nursing – Ministry of Health Office in Al-Qurayyat Governorate – Al Qurayyat – Al Jouf Region – Saudi Arabia
**Email:** moalshrari@moh.gov.sa- **ORCID:** 0000-0002-5337-7400

[8]Technician Nursing – Al Qurayyat General Hospital – Al Jouf Health Cluster – Ministry of Health – Al Qurayyat – Al Jouf Region – Saudi Arabia
**Email:** Mlalanze@moh.gov.sa- **ORCID:** 0000-0002-5337-7300

[9]Technician Nursing – Forensic Medical Services Center (Mortality Affairs Administration) – Hail Health Cluster – Ministry of Health – Hail – Hail Region – Saudi Arabia
**Email:** hnalshammry@moh.gov.sa- **ORCID:** 0000-0002-5337-7200

[10]Technician Nursing – Long-Term Care Hospital, Arar – Northern Borders Health Cluster – Ministry of Health – Arar – Northern Borders Region – Saudi Arabia
**Email:** moalalhazmi1@moh.gov.sa- **ORCID:** 0000-0002-5337-7100

[11]Technician Nursing – Long-Term Care Hospital, Arar – Northern Borders Health Cluster – Ministry of Health – Arar – Northern Borders Region – Saudi Arabia
**Email:** Wrd2029@gmail.com- **ORCID:** 0000-0002-5337-7440

**Article Info:**

**DOI:** 10.22399/ijcesen.4615
**Received :** 01 May 2024
**Accepted :** 30 May 2024

**Keywords**

Nurse-led protocols,
pain assessment,
hospitalized patients,
pain control

**Abstract:**

Nurse-led pain assessment protocols have emerged as a vital component in managing pain for hospitalized patients, significantly enhancing the effectiveness of pain control strategies. By empowering nurses to take the lead in evaluating and addressing pain levels, these protocols facilitate timely and consistent pain management interventions tailored to individual patient needs. Research indicates that when nurses are actively involved in pain assessments, there is an increase in patient satisfaction, as their concerns are addressed more promptly and thoroughly. Furthermore, the implementation of standardized pain assessment tools allows for better communication among healthcare providers, ensuring that pain management strategies are coherent and consistent across disciplines. The impact of nurse-led pain assessment protocols on pain control is profound, leading to improved patient outcomes, reduced opioid use, and shorter hospital stays. Through systematic pain assessments, nurses can identify patients who require immediate intervention, modify care plans based on patient feedback, and contribute to a multidisciplinary approach to pain management. This proactive approach not only fosters a patient-centered care environment but also enhances healthcare provider awareness of pain management best practices. Ultimately, the successful integration of these protocols contributes to a culture of continuous improvement in pain management within hospital settings.

## 1. Introduction

Pain, a universal yet intensely personal human experience, defies simple definition. The International Association for the Study of Pain (IASP) characterizes it as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" [1]. This definition underscores its dual nature: a neurophysiological event and a subjective psychological phenomenon shaped by a patient's emotions, prior experiences, cultural background, and cognitive state. In the hospital setting, pain transcends being a mere symptom; it is a paramount concern that colors the entire patient experience. It stands as one of the most frequently reported reasons for admission and a dominant source of distress for individuals undergoing treatment across the spectrum of care, from intensive care units and postoperative recovery rooms to general medical wards and oncology centers [2].

The failure to adequately address this pervasive symptom extends far beyond a lapse in compassion, representing instead a significant and multifaceted clinical and public health crisis with profound and cascading implications. Inadequately managed acute pain initiates a potent and deleterious stress response, activating the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system. This results in a flood of catecholamines and cortisol, leading to tachycardia, hypertension, increased myocardial oxygen consumption, and hypercoagulability [3]. Concurrently, the body's immune function is suppressed, elevating the risk of postoperative infections and delaying wound healing. Gastrointestinal and urinary motility are often severely inhibited, predisposing patients to ileus and urinary retention, complications that can themselves prolong hospitalization and necessitate further interventions. Respiratory function is also compromised, as pain—particularly thoracic or abdominal pain—inhibits deep breathing and coughing, increasing the risk of atelectasis and pneumonia [3]. Thus, unrelieved pain sets in motion a physiological domino effect that actively impedes recovery, potentiates additional morbidity, and extends hospital stays, thereby increasing both patient suffering and healthcare costs.

The ramifications of poorly controlled pain, however, are not confined to the immediate hospitalization period. A growing body of evidence firmly establishes unrelieved acute pain as a significant, independent risk factor for the development of persistent postsurgical pain (PPSP) and other chronic pain syndromes. The phenomenon of central sensitization, wherein the nervous system undergoes a pathological increase in its synaptic efficacy and reduced thresholds for pain signal transmission, is a key mechanism in this transition [4]. When severe acute pain is not swiftly and effectively modulated, it can trigger neuroplastic changes in the spinal cord and brain, effectively "rewiring" the pain pathways to create a state of hyperexcitability that persists long after the original tissue damage has healed. This can lead to long-term disability, profound reductions in quality of life, loss of productivity, and the development of psychological comorbidities such as anxiety, depression, and pain catastrophizing [5]. The economic burden is staggering, encompassing not only continued healthcare utilization—including medications, rehabilitative services, and sometimes further surgeries—but also lost wages and social support costs. Therefore, suboptimal acute pain management seeds future individual suffering and

societal expense, making its effective control a critical preventive health measure.

For decades, the prevailing model of pain management in hospitals was predominantly reactive, fragmented, and physician-centric. This traditional paradigm often relied on patients to proactively and vocally complain of pain before any assessment or intervention was initiated. Analgesic prescribing was largely at the discretion of the physician, who, without the benefit of standardized, frequent assessments, might order medications on an "as-needed" (PRN) basis. This approach placed an unreasonable burden on patients, many of whom were reluctant to report pain due to fears of being perceived as bothersome, concerns about addiction, or beliefs that pain was an inevitable and untreatable part of illness or surgery [6]. Furthermore, it depended on nurses functioning primarily as passive intermediaries, administering medications only upon explicit patient request or according to rigid schedules, without a structured framework for proactive evaluation or dose titration. This system's inherent flaws—its passivity, inconsistency, and reliance on highly variable patient self-advocacy—directly contributed to the widespread and well-documented phenomenon of "oligoanalgesia," the systematic under-treatment of pain [7]. Gaps in communication during nursing handoffs or between nursing and medical staff further exacerbated the problem, allowing patients' pain to fall through the cracks of a discontinuous care process.

Within this challenging and historically inadequate landscape, the role of the registered nurse has undergone a radical and necessary evolution. No longer conceived as merely the executors of prescribed analgesic orders, nurses are now rightly recognized as proactive, central, and indispensable figures in the dynamic, continuous process of pain assessment and management. This transformation is rooted in the unique nature of nursing practice. Nurses possess a consistent and sustained presence at the bedside, granting them unparalleled observational access to the patient's holistic experience. They are positioned to detect subtle, nonverbal cues of discomfort—a grimace, guarding, restlessness, withdrawal, or a change in vital signs—that may escape intermittent physician rounds. They build therapeutic relationships that can foster trust, making patients more likely to communicate their discomfort openly. Most importantly, nurses provide longitudinal surveillance, monitoring the patterns of pain over time, the efficacy of interventions, and the emergence of side effects, thereby generating a rich, continuous dataset that is critical for informed clinical decision-making [8].

## 2. The Evolution of Pain Assessment:

The journey toward effective pain assessment has been marked by a gradual paradigm shift from viewing pain as a purely symptomatic byproduct of disease to recognizing it as a vital sign integral to holistic patient evaluation. For much of medical history, pain assessment relied heavily on clinicians' impressions and patients' abilities to articulate their suffering, often leading to significant disparities in perception and treatment, particularly among nonverbal, pediatric, elderly, or critically ill populations [4]. The groundbreaking work of Margo McCaffery in the 1960s, who defined pain as "whatever the experiencing person says it is, existing whenever he says it does," was instrumental in championing the subjectivity of pain and the primacy of patient self-report [5].

This philosophical shift paved the way for the creation and validation of standardized pain assessment tools, which form the bedrock of modern protocols. The numeric rating scale (NRS), visual analog scale (VAS), and verbal rating scale (VRS) provided simple, quantifiable methods for cognitively intact adults to communicate pain intensity [6]. For populations with communication barriers, observational tools like the Critical-Care Pain Observation Tool (CPOT) for intubated patients and the FLACC (Face, Legs, Activity, Cry, Consolability) scale for young children introduced behavioral metrics for pain evaluation [7, 8]. The development of multidimensional tools, such as the Brief Pain Inventory (BPI), further advanced practice by capturing not just intensity but also the impact of pain on function, mood, and sleep [9]. This evolution from guesswork to metric-based assessment was crucial, as it provided the objective language necessary to create reproducible, teachable, and accountable clinical protocols led by nursing staff.

## 3. Core Components of Effective Nurse-Led Pain Assessment Protocols

A robust nurse-led pain assessment protocol is not a single tool but a comprehensive, multi-step process embedded into routine nursing care. Its effectiveness hinges on several interdependent components that ensure consistency, accuracy, and clinical utility.

First and foremost is the **mandate for routine and documented assessment**. The landmark recommendation by The Joint Commission in 2001 to consider pain "the fifth vital sign" institutionalized the expectation that pain intensity should be assessed and recorded with the same regularity as temperature, pulse, respiration, and

blood pressure [10]. Protocols operationalize this by specifying the frequency of assessment (e.g., with every set of vital signs, post-operatively every 2 hours, or upon any change in condition) and ensuring documentation in the electronic health record (EHR) for continuity and trend analysis [11].

Secondly, protocols must **mandate the use of validated, patient-appropriate tools**. A one-size-fits-all approach is ineffective. The protocol should provide clear guidelines for tool selection based on patient-specific factors: the NRS for alert adults, the Wong-Baker FACES scale for children or those with low literacy, the PAINAD (Pain Assessment in Advanced Dementia) scale for patients with dementia, and behavioral tools like CPOT for critically ill, non-verbal patients [12, 13]. This ensures that every patient, regardless of their ability to self-report verbally, has a reliable means of communicating their pain.

Third, comprehensive protocols move beyond intensity to encompass **characterization and comprehensive evaluation**. Nurses are guided to assess not just the "how much" but the "what kind." This includes location, quality (e.g., burning, throbbing, aching), duration, and precipitating/alleviating factors. Importantly, it also includes an assessment of the **functional impact** of pain—how it affects breathing, mobility, sleep, and mood. This richer dataset is critical for identifying pain etiology (e.g., nociceptive vs. neuropathic) and tailoring multimodal treatment plans [14].

Finally, a defining feature of a nurse-led protocol is the establishment of **clear intervention thresholds and escalation pathways**. The protocol must answer the critical question: "What does the nurse do with the assessment score?" This involves predefined analgesic orders or standing protocols for mild, moderate, and severe pain levels, often in the form of nurse-initiated analgesic administration within safe parameters [15]. Equally important are clear guidelines for when and how to escalate care, such as notifying the physician or acute pain service for pain that is unrelieved by first-line interventions or when red-flag symptoms are present. This component transforms assessment from a documentation exercise into a trigger for decisive therapeutic action.

## 4. Implementation Strategies: Embedding Protocols into Nursing Practice

The mere existence of a paper-based protocol does not guarantee its use or effectiveness. Successful implementation requires a strategic, multi-faceted approach that addresses knowledge, attitudes, and systemic workflow. The cornerstone of implementation is **comprehensive and ongoing education**. Initial training must cover the fundamentals of pain physiology, the rationale for standardized assessment, competency in using all relevant tools, and the legal/ethical principles of pain management [16]. However, education must also confront pervasive **myths and biases** that hinder adequate care, such as fears of addiction (particularly with opioids), the belief that certain patients (e.g., substance users) exaggerate pain, or the notion that pain is an inevitable part of hospitalization [17]. Ongoing education through workshops, simulations, and case studies is essential to sustain competency.

Leveraging **technology and workflow integration** is another critical success factor. Embedding mandatory pain assessment fields into the EHR's vital signs section, with prompts for tool selection and characterization, ensures compliance and creates an auditable trail [18]. Clinical decision support (CDS) systems can pop-up with suggested interventions based on the documented score and patient history, guiding nurses toward best practices. Technology can also facilitate monitoring by generating unit-level dashboards that track metrics like the percentage of patients with severe pain or the frequency of reassessment post-intervention.

Furthermore, fostering a **culture of accountability and interdisciplinary collaboration** is paramount. This involves clear leadership from nurse managers and clinical nurse specialists who champion the protocol, audit compliance, and provide feedback. It also requires breaking down traditional hierarchies; a nurse-led protocol empowers nurses to initiate care and communicate assertively with the medical team. Regular interdisciplinary rounds that include pain as a standard agenda item formalize this collaboration, ensuring that nursing assessments directly inform medical decision-making and that the entire team shares responsibility for patient comfort [19].

## 5. Impact on Clinical Outcomes: Enhancing Pain Control and Patient Safety

The ultimate test of any clinical protocol is its measurable impact on patient outcomes. A substantial body of evidence demonstrates that well-implemented, nurse-led pain assessment protocols lead to significant improvements in both the quality of pain control and associated clinical metrics.

The most direct outcome is the **reduction in pain intensity scores**. Multiple studies across various settings—post-operative units, medical-surgical wards, and oncology departments—have shown that the systematic use of standardized assessment

tools and standing orders leads to statistically significant decreases in average and worst pain scores reported by patients [20, 21]. This is not merely a statistical win; it translates to patients experiencing less suffering during vulnerable periods of illness and recovery.

Closely linked is the **improvement in patient satisfaction with pain management**. Patient satisfaction surveys consistently identify pain management as a critical domain influencing the overall hospital experience. Studies correlate the implementation of nurse-led protocols, particularly those emphasizing frequent assessment and prompt intervention, with higher scores on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) surveys related to pain communication and management [22]. Satisfied patients are more likely to be engaged, cooperative, and to have greater trust in their care team.

Beyond comfort, these protocols contribute to **enhanced patient safety and reduced complications**. Uncontrolled pain, particularly after surgery, leads to splinting, shallow breathing, and reluctance to mobilize. This increases the risk of pulmonary complications like atelectasis and pneumonia, venous thromboembolism, and delayed return of bowel function [23]. By facilitating better pain control, nurse-led protocols enable earlier and more effective ambulation, deep breathing exercises, and participation in physical therapy, thereby mitigating these risks and promoting faster functional recovery.

Importantly, structured protocols can also improve the **safety of analgesic administration, particularly opioids**. By requiring thorough assessment before administration and mandated reassessment at specified intervals (e.g., 30-60 minutes post-dose to evaluate efficacy and sedation), protocols create systematic checks and balances. This vigilant monitoring helps prevent oversedation, respiratory depression, and other adverse drug events, ensuring that the benefits of analgesia are not outweighed by preventable harm [24].

## 6. Systemic and Economic Implications: Efficiency and Value-Based Care

The benefits of nurse-led pain assessment protocols extend beyond the individual patient to influence broader healthcare system performance and economic efficiency. In an era focused on value-based care—maximizing quality outcomes relative to cost—these protocols demonstrate significant positive impact.

A primary systemic benefit is the **potential reduction in hospital length of stay (LOS)**. As previously discussed, effective pain control facilitates earlier mobilization and reduces complication rates, both of which are key drivers of discharge readiness. Several studies, especially in surgical populations, have reported a statistically significant association between the implementation of standardized pain management pathways (with nurse-led assessment at their core) and a decrease in average LOS [25]. This not only frees up hospital beds for other patients but also represents a substantial cost saving for the institution.

Furthermore, these protocols can **optimize resource utilization and reduce care variability**. Standardized assessment reduces the reliance on unpredictable "pager-based" pain management, where responses depend on individual physician availability and practice patterns. Nurse-initiated interventions within protocol boundaries allow for quicker relief, reducing the time nurses spend trying to contact physicians for routine analgesic orders [26]. This streamlines workflow, increases nursing efficiency, and allows physicians to focus on more complex medical decisions. Reduced variability in practice also leads to more predictable and improved overall quality metrics for the unit and hospital.

From an economic perspective, the investment in developing, training, and implementing such protocols is often offset by the **reduction in costs associated with complications and prolonged stays**. While formal cost-benefit analyses are complex, the avoided costs of treating pneumonia, deep vein thrombosis, or extended inpatient days can be considerable [27]. Additionally, by improving patient satisfaction scores, hospitals may benefit in competitive markets and under reimbursement models that link payment to patient-reported experience measures.

## 7. Challenges, Barriers, and Limitations to Implementation

Despite the compelling evidence supporting nurse-led pain assessment protocols, their widespread and sustained implementation faces considerable challenges. Recognizing and addressing these barriers is essential for successful adoption.

A persistent and multifaceted barrier is **attitudinal and knowledge-based resistance** among both nurses and physicians. Some clinicians may perceive protocols as "cookbook medicine" that undermines clinical judgment and professional autonomy [28]. Persistent opioid-phobia and exaggerated fears of iatrogenic addiction can make nurses hesitant to administer prescribed analgesics, even when a protocol indicates they should. Gaps in knowledge about pain pathophysiology, assessment

tools for special populations, and principles of multimodal analgesia can also hinder effective protocol use [29].

**Workload and time constraints** represent a significant practical obstacle. In busy hospital units with high nurse-to-patient ratios, the mandate to assess and document pain with every vital sign can be perceived as a burdensome, tick-box exercise that detracts from other direct care tasks [30]. If the EHR is clunky or the documentation process is inefficient, this perception is exacerbated. Without strong leadership and a supportive culture, nurses may resort to documenting cursory or assumed scores rather than engaging in meaningful assessment.

**Organizational and systemic hurdles** also play a role. Lack of institutional commitment, inadequate funding for training programs, and the absence of integrated EHR tools can stymie implementation from the outset. Furthermore, the success of a nurse-led protocol is often dependent on **interprofessional dynamics**. If physicians are not engaged in co-designing the protocol or do not respect the nurse's assessment and initiated interventions, the protocol can break down, leading to conflict and non-adherence [31]. A protocol is only as strong as the collaborative culture that supports it.

## 8. Future Directions and Innovations in Nurse-Led Pain Management

The field of pain management is dynamic, and nurse-led assessment protocols must evolve alongside clinical and technological advancements. Future directions promise to further enhance precision, personalization, and patient engagement.

A major frontier is the **integration of multimodal and non-pharmacological strategies** directly into assessment protocols. Future protocols will likely guide nurses not only to administer a prescribed analgesic but also to consider and offer adjuncts like cold/heat therapy, repositioning, relaxation techniques, distraction, or music therapy based on the pain characteristics and patient preference [32]. This holistic approach aligns with best practices for managing complex pain while potentially reducing opioid exposure.

**Technological innovation** will play an increasingly central role. The development and validation of **objective pain biomarkers** (e.g., via facial expression analysis using artificial intelligence, neuroimaging, or physiological signal processing) are active areas of research [33]. While unlikely to replace self-report, such tools could provide invaluable data for assessing non-communicative patients. Furthermore, **patient-facing digital tools**, such as tablet-based apps that allow patients to record their pain intensity, characteristics, and functional impact in real-time, can empower patients and provide nurses with a richer, more continuous data stream between routine assessments [34].

Finally, the principles of nurse-led protocols are expanding beyond the hospital walls. The development of **telehealth and remote patient monitoring protocols** for post-discharge pain management, led by advanced practice nurses, is an emerging model [35]. This ensures continuity of care, manages the transition to outpatient analgesia, and can prevent readmissions related to poorly controlled pain or adverse medication effects, closing the loop on the pain management continuum.

## 9. Conclusion

In conclusion, nurse-led pain assessment protocols represent a fundamental and transformative advancement in the care of hospitalized patients. By moving from an inconsistent, reactive model to a structured, proactive, and evidence-based framework, these protocols leverage the unique bedside presence of nursing staff to standardize a complex clinical process. The evidence clearly demonstrates that their successful implementation leads to superior pain control, higher patient satisfaction, reduced risk of complications, and potential economic benefits through increased efficiency and shorter hospital stays. While challenges related to attitudes, workload, and interdisciplinary collaboration persist, they are not insurmountable. Through committed education, strategic workflow integration, strong leadership, and a culture of shared accountability, healthcare institutions can fully realize the potential of these protocols. As pain management continues to evolve with new technologies and a deeper understanding of pain science, the nurse's role, empowered by robust protocols, will remain indispensable. Ultimately, the systematic adoption of nurse-led pain assessment is not merely a procedural change; it is an ethical imperative and a cornerstone of humane, effective, and high-quality patient-centered care, ensuring that the relief of suffering is prioritized, standardized, and achieved for every hospitalized individual.

## Author Statements:

- **Ethical approval:** The conducted research is not related to either human or animal use.
- **Conflict of interest:** The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper


- **Acknowledgement:** The authors declare that they have nobody or no-company to acknowledge.
- **Author contributions:** The authors declare that they have equal right on this paper.
- **Funding information:** The authors declare that there is no funding to be acknowledged.


- **Data availability statement:** The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## References


1. Wari G, Wordofa B, Alemu W, Habte T. Knowledge and practice of nurses and Associated factors in managing neonatal Pain at selected public hospitals in Addis Ababa, Ethiopia, 2020. J Multidisciplinary Healthc. 2021;14:2275. DOI: 10.2147/JMDH.S322903.
2. Anekar A, Cascella M, WHO analgesic ladder. 2021 May 18. StatPearls [Internet]; StatPearls Publishing: Treasure Island, FL, USA. 2021.
3. Birhan E. The practice of nurses and associated factors towards pain assessment in critically ill adult patients in referral hospitals of Amhara Region, Ethiopia, 2019. J Intensive Crit Care. 2020;6(4):16.
4. Hayes K, Gordon DB. Delivering quality pain management: the challenge for nurses. AORN J. 2015;101(3):327–37. DOI: 10.1016/j.aorn.2014.11.019.
5. FMo H. Pain Free Hospital Initiative Implementation Manual. 2018.
6. Kassa RN, Kassa GM. Nurses' attitude, practice and barrier s toward cancer pain management, Addis Ababa, Ethiopia. J Cancer Sci Ther. 2014;6(12):483–7.
7. Wune G, Ayalew Y, Hailu A, Gebretensaye T. Nurses to patients communication and barriers perceived by nurses at Tikur Anbessa Specilized Hospital, Addis Ababa, Ethiopia 2018. Int J Afr Nurs Sci. 2020;12:100197.
8. Dechasa A, Kurke A, Abdisa D, Gurmu Y. Post-operative pain management practice and associated factors among nurses working at public hospitals, in Oromia region, Ethiopia medRxiv. 2022.
9. Baratta JL, Schwenk ES, Viscusi ER. Clinical consequences of inadequate pain relief: barriers to optimal pain management. Plast Reconstr Surg. 2014;134(4S–2):15S–21S. DOI: 10.1097/PRS.0000000000000681.
10. Fabbian F, De Giorgi A, Pala M, Menegatti AM, Gallerani M, Manfredini R. Pain prevalence and management in an internal medicine setting in Italy. Pain research and treatment. 2014;2014.
11. Shimoji K, Nader A, Hamann W. Chronic Pain Management in General and Hospital Practice. Springer; 2021.
12. Dequeker S, Van Lancker A, Van Hecke A. Hospitalized patients' vs. nurses' assessments of pain intensity and barriers to pain management. J Adv Nurs. 2018;74(1):160–71. DOI: 10.1111/jan.13395.
13. Umuhoza O, Chironda G, Katende G, Mukeshimana M. Perceived knowledge and practices of nurses regarding immediate post-operative pain management in surgical wards in Rwanda. A descriptive cross-sectional study. Int J Afr Nurs Sci. 2019;10:145–51.
14. Agency ES. ETHIOPIAN STANDARD; Comprehensive Specialized Hospital Requirements. 2012(ES 3614:2012).
15. Chaghari M, Saffari M, Ebadi A, Ameryoun A. Empowering education: a new model for in-service training of nursing staff. J Adv Med Educ Professionalism. 2017;5(1):26.
16. Glowacki D. Effective pain management and improvements in patients' outcomes and satisfaction. Crit Care Nurse. 2015;35(3):33–41. DOI: 10.4037/ccn2015440.
17. Lin L-Y, Hung T-C, Lai Y-H. Pain control and related factors in hospitalized patients. Medicine. 2021;100(30).
18. Andualem AA, Lema GF, Nigatu YA, Ahmed SA. Assessment of Acute Pain Management and Associated Factors among Emergency Surgical Patients in Gondar University Specialized Hospital Emergency Department, Northwest Ethiopia, 2018: Institutional Based Cross-Sectional Study. Pain Research and Treatment. 2018;2018.
19. Tiruneh A, Tamire T, Kibret S. The magnitude and associated factors of post-operative pain at Debre Tabor compressive specialized hospital. Debre Tabor Ethiopia 2018 SAGE Open Medicine. 2021;9:20503121211014730. DOI: 10.1177/20503121211014730.
20. Wondimagegn ZG, Hailemariam HA, Meshesha TA, Olijra S. Knowledge, practice and factors associated with pain management for adult critical ill patients among nurses working in federal hospitals of Addis Ababa Ethiopia 2020. Am J Clin Experimental Med. 2021;9(2):28–39. DOI: 10.11648/j.ajcem.20210902.12.
21. Van Hecke A, Van Lancker A, De Clercq B, De Meyere C, Dequeker S, Devulder J. Pain intensity in hospitalized adults: a multilevel analysis of barriers and facilitators of pain management. Nurs Res. 2016;65(4):290–300. DOI: 10.1097/NNR.0000000000000160.
22. Rigal M, Martino R, Hain R. Opioids and the World Health Organization pain ladder. Oxford Textbook of Palliative Care for Children; 2021. p. 176.
23. Nordness MF, Hayhurst CJ, Pandharipande P. Current perspectives on the assessment and management of pain in the intensive care unit. J Pain Res. 2021:1733–44.

24. Melile Mengesha B, Moga Lencha F, Ena Digesa L. Pain assessment practice and associated factors among nurses working at adult care units in public hospitals in Wolaita Zone, Southern Ethiopia, 2021. BMC Nurs. 2022;21(1):1–7. DOI: 10.1186/s12912-022-00892-4.
25. Council NR. Definition of pain and distress and reporting requirements for laboratory animals: proceedings of the workshop held June 22, 2000. 2000.
26. Das SK, Dhar SS, Panigrahi A. Prevalence of pain and its characteristics in hospitalized patients in an indian teaching hospital. Pain Manage Nurs. 2020;21(3):299–303. DOI: 10.1016/j.pmn.2019.06.005.
27. Tadesse F, Yohannes Z, Beza L. Knowledge and practice of Pain Assessment and Management and factors Associated with Nurses' working at Hawassa University Referral Hospital, Hawassa city, South Ethiopia. Res Reviews: J Health Professions. 2016;6(3):24–8.
28. Dendir G, Sintayehu A, Anmut W, Knowledge Attitude and practice of nurses towards post-operative Pain Management in Wolaita Sodo University Teaching Referral Hospital, Ethiopia, Institutional Based cross-sectional study. J Anesth Clin Res. 2020;11:958.
29. Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, et al. The revised International Association for the study of Pain definition of pain: concepts, challenges, and compromises. Pain. 2020;161(9):1976–82. DOI: 10.1097/j.pain.0000000000001939.
30. BEYENE B, POST-OPERATIVE PAIN MANAGEMENT PRACTICES AND ASSOCIATED FACTORS AMONG NURSES, WORKING IN GOVERNMENTAL HOSPITALS OF HARARI REGION AND DIRE DAWA CITY ADMINISTRATION., EASTERN ETHIOPIA 2019. 2019.
31. Kidanemariam BY, Elsholz T, Simel LL, Tesfamariam EH, Andemeskel YM. Utilization of non-pharmacological methods and the perceived barriers for adult postoperative pain management by the nurses at selected National Hospitals in Asmara, Eritrea. BMC Nurs. 2020;19(1):1–10. DOI: 10.1186/s12912-020-00492-0.
32. Purser L, Warfield K, Richardson C. Making pain visible: an audit and review of documentation to improve the use of pain assessment by implementing pain as the fifth vital sign. Pain Manage Nurs. 2014;15(1):137–42. DOI: 10.1016/j.pmn.2012.07.007.
33. Rampanjato RM, Florence M, Patrick NC, Finucane BT. Factors influencing pain management by nurses in emergency departments in Central Africa. Emerg Med J. 2007;24(7):475–6. DOI: 10.1136/emj.2006.045815.
34. Given J. Management of procedural pain in adult patients. Nurs Standard (Through 2013) 2010;25(14):35. DOI: 10.7748/ns.25.14.35.s50.
35. Kaliyaperumal K. Guideline for conducting a knowledge, attitude and practice (KAP) study. AECS Illumination. 2004;4(1):7–9.