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Research Article

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Nurses and Midwives' Knowledge, attitudes and Practices towards Postoperative Pain Management in Selected Hospitals, Rwanda

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Abstract

Background: Post-operative pain management involves a multi-disciplinary team; however, nurses and midwives play a fundamental role especially in administering various analgesics, their knowledge, attitudes, and practices are the cornerstone for POP management. The study aims to assess the knowledge, attitudes and practices of nurses and midwives toward postoperative pain management at selected Hospitals in Rwanda.

Methods: This study employed descriptive, quantitative, and cross-sectional approaches, with 196 bedsides nurses and midwives caring for post-operative patients. Data was collected using a self-administered adopted questionnaire, and data was analyzed using the Statistical Package for the Social Studies (SPSS), version 21.58.7% of nurses and midwives reported inadequate knowledge with (53.84% average score), positive attitude (Average 57.14% of agree responses) and negative practice (Below 50% of always responses).

Conclusion: Nurses and midwives participated in this research have reported inadequate knowledge, positive attitudes and negative practices toward POP Management. Continuous and focused in-service training including new protocol and guidelines on POP Management are required and combinations of various pain management approaches (Multimodal analgesia) for getting effective pain management.

Keywords: Cross-Sectional Studies; Midwives; Nurses; Postoperative Pain; Analgesics

Introduction

Pain was defined as personal unpleasant feelings associated with possible or known tissue injury. It is personal and it can be influenced by psychological factors like culture, attention, and meaning of the situation, [1]. Dilek Ceyhan et al. defined a

postoperative pain as a condition of tissue damage associated with muscle spasms that occur after surgery, [2]. Worldwide than 230 million surgical interventions are done across every year which simply means that one person in 25 undergoes surgery annually,



[2]. So, postoperative pain management is an interesting topic in medicine especially in critical care. As a critical care-nursing student, I grasp the opportunity to go in deep on postoperative pain especially in our setting by conducting this research after seeing that pain is not well managed yet is essential to POPM. This chapter discusses the various headings of the introduction, which include; the background, the stamen of research problem, the study aim and study objectives as well as the study significance and the operationalization of key terms.

The Operationalization of Key Terms

Surgery: The According to the American College of Surgeons, defined as surgery a diagnostic or therapeutic operations performed in the purpose of correcting the abnormalities or defects, to repair the injuries or to diagnose a certain disease [3].

Postoperative pain: International Association for Pain study defined pain "An disagreeable feeling whether sensory or emotional associated with real or possible tissue impairment, or described in terms of such damage" Therefore, in context of this study, the postoperative pain is any kind of pain experienced by Patient because of a surgical operation [4].

Attitude: It is a persistent mental and neutral readiness to address postoperative pain [5]. In our context, this means the behavior and actions of midwives and nurses about pain treatment. This is characterized as positive attitude and negative attitude.

Knowledge: collections of facts, assumptions, beliefs, and approaches of a nurse or a midwife for diagnosis, or management of postoperative pain [5]. In our context the midwives and nurses' the level of theoretical understanding of pain associated to surgery as well as its specific treatment and it classified as adequate or inadequate.

Practice: use of nurse or midwife's knowledge toward postoperative pain [5]. In our context means the midwives and nurses' interventions in post-operative pain management. This is categorized as good practice and bad practice.

Nurse: A qualified professional by graduation from an accredited school or university as nurse and licensed by national regulatory body. Our study concerned with those providing bedside care especially to patients who undergone surgical operations, [5].

Midwives: A qualified professional by graduation from an accredited school or university as midwife specialist and licensed by national regulatory body in our context we consider those in contact with patient at bedside and assist patient to manage pain after childbirth post-caesarean section, [5].

Postoperative management: Any specific care given to the patient in the period following the surgical interventions, whether in the operating room or in PACU, as well as in other service where the patient admitted after the surgery, [4]. In our context it to manage pain post operation.

Background

Postoperative pain management is generally suboptimal

because it is undertreated based inadequate knowledge in the area of assessment and management of pain, poor practices, and negative attitudes of health care providers, [6]. The prevalence of postoperative pain was found to be around 80% in developed countries, with 75% reporting inadequate pain management [7], United States National Institute of Health reported also that 80% of postoperative pain, and a half of them receive inadequate pain management related to bad attitudes and practices [8]. In Europe, a survey conducted in 746 hospitals concluded that POPM is suboptimal due to bad practices, especially pain assessment in 34% of institutions [8]. Another study conducted in 60 hospitals in Australia revealed that 57% reported postoperative pain [9].

On another hand for developing countries, a study done in Ghana in 2018 on POP management by Awube Menlahre reported a knowledge deficit toward POP among nurses and midwives. On the other hand, the author reported that nurses and midwives have good attitude [1]. Postoperative pain management in developing countries is still inadequate as the following studies reveal: a study conducted in Tanzania of 106 post-surgical patients revealed that 85.5%, of patients experienced the various degree of Postoperative pain in 24 hours following the surgery while 77.4% of patients experienced it the various in 48 hours [10], another research on 150 posts operative patients conducted in Kenya, revealed POP incidence of 58%, in ½ hour, 55.3% 24 hours, and 34.7% after 48 hours following a surgical operation [11]. Concerning Rwanda as our study setting, comparative surveys of postoperative pain management at CHUK from 2013to 2017-revealed POPM improvement was at 80%, this study did not focus on attitudes, knowledge, and practices of healthcare providers [7]. Another research done in Rwanda studied the attitudes and practices of nurses working in ICU and emergency departments at CHUK, this study revealed that 67.2% of nurses have inadequate knowledge of POPM [12].

Even if this study was conducted accurately in one referral hospital CHUB, two district hospital (Gitwe and kabgayi), and one provincial hospital (Ruhango) but need to be extended to all hospital of Rwanda in other to make sure that pain management no patients who complain POP while there is guideline and protocol elaborated by minister of health in Rwanda.

Problem Statement

WHO declared that freedom from Pain is a patient right. To ensure that right, every postoperative patient should be pain-free. It is of paramount importance for nurses and midwives to manage postoperative pain effectively as they spend much more time with surgical patients than any other clinicians while monitoring vital signs including pain [13]. Inadequate education about pain for health care providers is one of trending factors contributing to insufficiency knowledge on pain pathophysiology and management and lead to inadequate POP management and suboptimal pain control, [3]. Knowledge and behaviors of health care providers were underlying causes [12]. Bad attitudes, inadequate knowledge and bad practices were found as factors of lack of analgesia in postoperative patients at a university hospital [7]. It remains crucial

to understand that postoperative pain management is an ethical issue. Inadequate POP management may lead to physiological and psychological deviations that increases the mortality rate and morbidity associated to surgery and it can also increase the cost of care as well and decreasing the quality of post-operative life in general [14]. Furthermore, poor POP management is linked to an increased risk of deep vein thrombosis (DVT), delayed wound healing, pulmonary embolism, pneumonia, and demoralization [15]. It has the potential to delay recovery and rehabilitation, increased hospital stay, and thereby overall hospital cost [14]. Much has been done to address POP like putting in place pain assessment and management protocols and guidelines but POP is still a concern throughout the world, and POP is more poorly addressed in resource-limited settings [16].

For Rwanda, a comparative study done at CHUK in 2013 and 2017 reported that postoperative pain management was improving as in 2017, more than 95% of POP patients get postoperative pain management from 75% who got POPM in 2013. However, the same as in other developing countries, knowledge of postoperative pain management appears to be inadequate among health care providers [17]. A qualitative study conducted at the University Teaching Hospital Kigali (CHUK) revealed multiple perceived challenges by anesthesia residents like inconsistent use of tools for pain assessment, insufficient training, poor communication with patients and healthcare staff, and unawareness of existing protocols [18].

Available studies done in Rwanda in this area of Nurses' Knowledge, Attitudes, and Practices toward POP management were limited to the University teaching hospital level, especially in Emergency and ICU only but other level of health care settings with the package of surgical operations were not included. Therefore, as Nurses and Midwives are the frontline for postoperative pain management and play a pivotal role in postoperative care, this research dissertation investigated the knowledge, attitudes and practices of nurses and midwives as they may impact the quality of POP care and related outcomes.

In a study conducted in two referral hospitals of Rwanda using descriptive cross-sectional design on 131 participants, 79% of nurses had sufficient knowledge on immediate POP management but their attitudes and practices were not explored [19].

Research Objectives

Main Objective

This dissertation aimed at exploring the knowledge attitudes, and practices of nurses and midwives toward POP treatment.

Specific Objectives

- 1) To assess the knowledge of nurses and midwives toward POP management.
- 2) To determine the nurses and midwives' attitudes toward postoperative pain management.
- 3) To identify postoperative pain management practices among nurses and midwives.

Research Questions

This study answered a set of 3 research questions:

- a) Are the nurses and midwives at selected hospitals have the adequate knowledge toward post-operative pain management?
- b) Are the nurses and midwives at selected hospitals have positive attitudes toward post-operative pain management?
- c) Are the nurses and midwives at selected hospitals have positive practices toward post-operative pain management?

Study Significance

The findings from this study will benefit the following areas:

Nursing and midwifery practice: The results from this study will help to provide suggestions to hospital policymakers like regular training on POP management, especially in study settings, Rwanda

Nursing and midwifery Education: The results of this dissertation will help to set the basis to enhance postoperative pain management in nursing and midwifery education as during internship both midwife and nursing students will benefit from knowledgeable nurses and midwives concerning POP management.

Nursing and midwifery research: The findings from this study will be used in subsequent studies especially in the nursing and midwifery profession.

Literature Review

Introduction

The purpose of this chapter is to review systematically the available literatures around POP management, the theoretical or conceptual framework as well as the empirical data about knowledge, attitudes and practices of nurses and midwives toward POP management. Scientific papers are appraised for what is known on the topic, research methodologies, and identifiable gaps on the topic. This chapter will discuss literature search process, theoretical literature review like basic principles of pain management, and measures of pain, research gap identified and conceptual framework.

Literature Search Process

The literature search was conducted with the following databases and search engines: Elsevier, Research Gate, Hindawi, Karger, SAGE publishing, and PubMed, Dove press, BMC, and Google scholar. The literature search included has used updated evidence-based findings. Only articles written in English were used. The keywords used in the search were: Nurses' Knowledge, Attitude, and Practice or perceived practice, pain management, and postoperative pain management, terms were used separately like knowledge of nurses, and midwives and POPM.

Theoretical Literature Review

This section reviews the available theories, Principles and tools guiding clinical pain assessment and post-Operative Pain management.

Basic Principles of Pain Management

Every individual experience pain at certain point in life. Therefore, pain understanding, and pain control is a central focus for everyone. Poorly controlled pain can cause delayed restoration of capacity and rehabilitation capacity, it can cause fatal consequences like Atelectasis and hospital-acquired pneumonia

especially after abdominal surgery and incubated clients mostly those found in the ICU, therefore pain management should be understood as a systematic component of care and include both non-pharmacological pharmacological interventions. For the pharmacological approach, the WHO ladder is recommended for adequate pain management [20]. Details are summarized below figure1

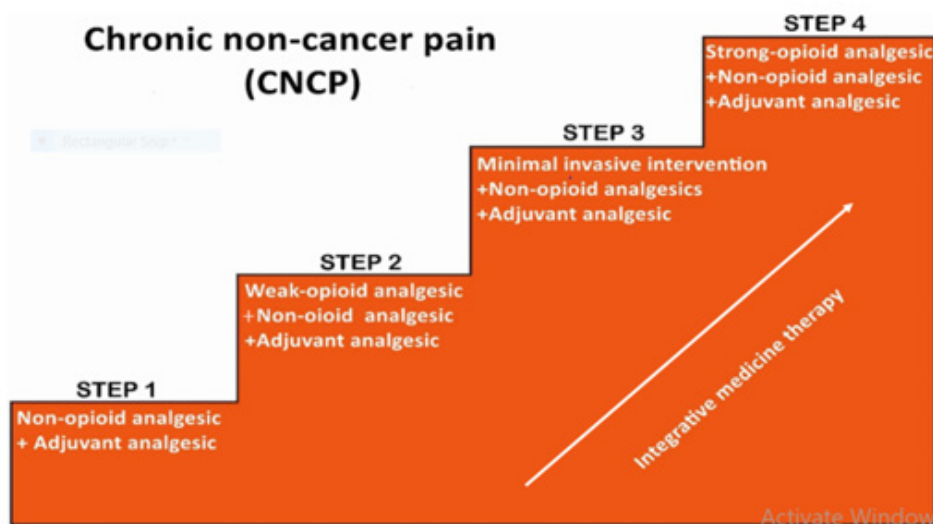


Figure 1: WHO Pain ladder.

The World Health Organization's pain ladder is a simplified representation of a four-tier analgesic ranking system. In contrast to the 1986 "ladder," this four-step ladder reflects the advances in the use of non-opioid modalities for better pain relief. It commends that integrative medical therapies can be used at every stage of the pain management process to reduce or even eliminate the use of pain medication for all types of pain. Before switching to strong opioids, this ladder recommends starting with non-opioid or weak opioid therapy and progressing to further treatment modalities that involve minimally invasive procedures [21]. The treatment should be planned taking consideration the type of pain, the location of the pain, its duration, and its intensity. To address this concern, multimodal analgesia has been adopted in the management of POP for more than 20 years [14].

Pain is a medical condition as others mean it can be detected by history taking (reported by the patient) and even physical examination, remember pain is a personal experience means it is reported by the sufferer, so never undermine any reported pain, in addition pain should also be anticipated and prevented in advance like before undergoing operation, during or after operation. From

objective findings, pain can be expressed by following clinical features like tachycardia, tachypnea, high blood pressure, sweating, or flushing. Effective pain management requires an accurate pain assessment.

Measures of Pain

There are many measures used to identify a patient's pain. They mainly used pain measures as proposed by the Rwanda Ministry of Health are Numerical Rating Scales (NRS) and Visual Analogy Scales (VAS). The Numerical rating scales (NRS) have four categories of pain intensity: severe, moderate, mild, and no pain. For this tool to be effective, patients should be involved in pain intensity scoring, with relevant questions to guide the intensity scoring such as "what is your pain like?; mild, moderate, or severe?" and other probing questions to engage the patient in exploration of other issues related to pain and pain intensity [13]. The Visual Analog Scales (VAS) are the most used tools to evaluate the intensity of pain. It is a 100 mm in length, continuum of values anchored by which A rating of 0 to 5 mm indicates "no pain," 5 to 44 mm indicates "mild pain," 45 to 74 mm indicates "moderate pain," and greater than 70 mm indicates "severe pain" [13].

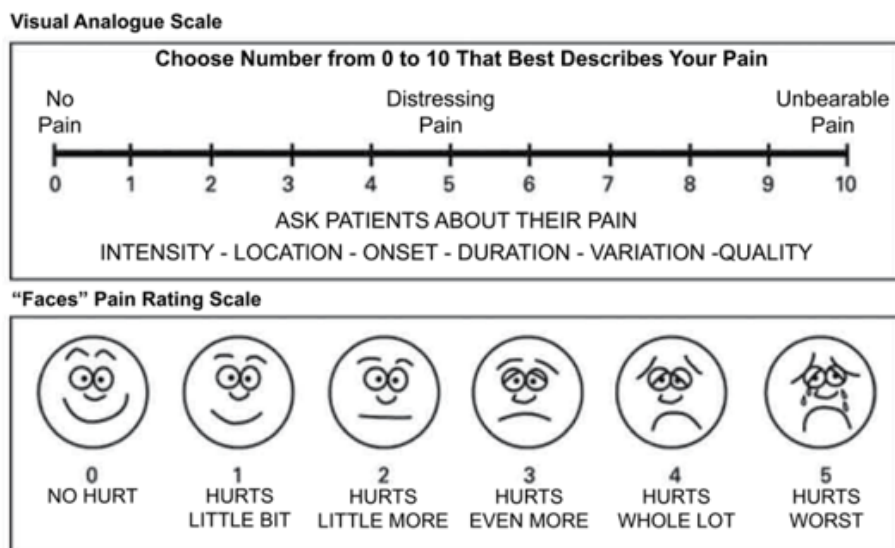


Figure 2: Visual Analogue Scale [13].

Pain Management

Postoperative pain management requires enough expertise in the field with required skilled knowledge and skills.

The International Association for the Study of Pain (IASP) defines pain as “distressing sensory and emotional feelings caused by real or possible tissue damage” [22]. Basically, pain is classified into two types: acute and chronic of varying intensities. The most commonly mentioned type of acute pain is postoperative pain, which occurs after surgery. Postoperative pain is frequently associated with patients’ anxiety about undergoing surgery [23]. Acute pain can cause fear and anxiety, as well as anger and resentment, and it can lead to a negative relationship with caregivers. Pain can also cause or worsen insomnia, which worsens both mental and physical health., [24]. It is critical to remember both before and during surgery that when patients are overwhelmed by the fear of POP, which leads to an unpleasant feeling, it is critical to emphasize the relevant education of healthcare providers and the required ability to provide the appropriate POP management support.

Based on the requirements for postoperative pain management, nurses and midwives must have knowledge, skills and abilities to determine the appropriate level of pain evaluation across lifespan, particularly in those who are not able to communicate. Furthermore, it is crucial for them to know the personal abilities to manage pain. The reason, the effective pain management necessitates the use of appropriate pain scales to determine the intensity of pain [23].

Nurses and midwives must also emphasize a variety of interventions such as pain assessment, analgesics, and other treatment modalities during POP pain treatment. For the effectiveness of POP management, nurses and midwives must

ensure that the pain was correctly evaluated, and each patient must be assessed individually and properly, even if the surgical act is the same to them. As a result, nurses and midwives should consider the patient’s feelings at rest and during movement when evaluating pain, regardless of whether the pain is at the site of the surgery or in a completely different location.

It’s also worth noting that regular pain assessments at regular intervals are an important part of postoperative pain management. It is also the responsibility of nurses and midwives to evaluate prescribed analgesics and administer them in response to the patient’s complaints of pain, as well as to assess the effects of medications administered. Another critical role of nurses and midwives in POP management is proper documentation of all interventions performed under their supervision [58]. POP management is nowadays considered to be an integral or important part of standard surgical practice. WHO and IASP have already recognized and mentioned that pain relief is right of the patients. Appropriate pain treatment significantly decreases the hospital stays, costs of care as well as the risks of complications and increases patient satisfaction. Also it is necessary to note that Poor POP management in children may result in a prolonged risk of behavioral changes [24]. Suboptimal management of POP may also increase the morbidity, impaired physical mobility with high probability of developing chronic pain and reduction of quality of life [24].

Physiology of Pain

Pain is widely recognized as a symptom that can indicate disease severity. Pain’s function in the human body, according to the Ministry of Health, is to protect the body from tissue damage and to maintain adequate homeostasis by detecting pathologic

mechanisms invading the tissues. As a result, given its importance in patient satisfaction, public reporting, and value-based purchasing, pain control is critical from both an ethical patient care and an organizational standpoint. Furthermore, pain pathology is distinguished by a combination of nociception and limbic system activation, resulting in emotional arousal manifested as unpleasant sensations [25]. Chemical irritants such as serotonin, bradykinin, histamine, and acidic or basic environments can all cause pain. The excitatory amino acids glutamate and aspartate are produced as a result of P Substance's role in pain transmission. Furthermore, noradrenergic and serotonergic transmission from the brain cortex can result in endogenous pain relief. Heat, cold, and mechanical distortion are all common responses to noxious stimuli [26]. Deep tissues can be affected and sensitized during surgery, resulting in significant pain. This presents difficulties in the POP period in terms of proper pain management [27].

Assessment of Pain and Associated Challenges

Thorough pain assessment during the period of perioperative is critical for effective postoperative management. This should begin with an understanding of the patient's past history and a detailed description of such as the location, duration, radiation, intensity, as well as characteristics. Knowing a patient's history and the nature of their symptoms enables clinicians to assess the type of pain they are experiencing and to determine the best pain treatment options [26].

Physical examination is also important in understanding POP and necessitates an examination of the surgical site as well as any other location of complaining discomfort [28]. It is critical to note that pain characteristics change depending on the cause. Furthermore, the pain patterns, aggravating and relieving factors, are critical components of POP assessment [28].

Classifying the intensity of postoperative pain is a common difficulty for all clinicians, particularly novices. The NRS and VAS are the two common standard tools, as described in section 2.3.2 above. Furthermore, drawings of faces, ranging from pleasant smile to a distressed-looking face, may be used in children and the elderly population. According to the American Pain Society's 2016 guidelines, one of these validated scales should be used to assess and measure response to the interventions. However, some elderly people with severe dementia or nonverbal patients will be unable to articulate pain, which is why caregivers must be aware of nonverbal pain indicators such as nervousness, irritability, loss of appetite, defensiveness and abnormal interactions or decreased level of consciousness, as well as any change in usual activities [29]. It is important to understand the differences between pain and comorbidities like psychiatric disorders, substances, and drug abuse. Regardless of these comorbidities, all must be evaluated and treated appropriately in the postoperative setting, but with strict precautions to avoid drug overuse. It is also essential to differentiate between pre-existing chronic pain and new acute POP. Furthermore, patients who are already on long-term opioid medications may require more pre-operative opioids. It is frequently necessary

to investigate the pre-operative analgesic requirements in order to develop a reasonable and optimal plan for postoperative pain management [30].

Management of expectations and the Stepwise Approach

Management of expectations and stepwise is a significant aspects of postoperative pain management. Making patients set some expectations can help them engage in some of the various non-medication pain-relief techniques. Most providers associate pain management with pharmacologic pain regimens, and it is critical to address a patient's belief in a specific therapy on a regular basis; even though literature supports are currently limited, it provides a sense of both physiological and psychological understandings. Patient education about the procedure and what to expect afterwards is an important part of managing postoperative pain. Patients' education on the duration of potential causes of pain and how long to expect it will help them manage their symptoms during the post-operative period, as well as prepare them to deal with pain in the various aspects of pain control and management [31].

There are non-pharmacological measures that can include cold to reduce inflammation and heat to reduce spasms; however, the literature has prescribed limited benefits. Transcutaneous Electrical Nerve Stimulation (TENS), cognitive behavioral therapy, biofeedback, autogenic and relaxation training, progressive muscle relaxation, mindfulness, and hypnosis are some other techniques that may be used. Although these interventions have mixed results, Neilsen and colleagues suggested to incorporate those techniques in institutional package of postoperative care if the resources and specific training are available. They also suggested that if pharmacologic management is of necessary, the World Federation of the Society of Anesthesiologists conceptual model may be useful. As a result, intravenous opioid or non-opioid agents should be considered in the immediate postoperative period [32].

Multimodal Pain Management Strategies

A multimodal pain management strategy is one that strategy using a combination of non-opioid and opioid pharmacologic regimens together with no pharmacologic measures in the management of pain [33]. Opioids are a "broad class of drugs that include natural compounds extracted from poppy seeds, such as morphine and codeine, as well as synthetic and semisynthetic derivatives such as oxycodone, hydromorphone, oxymorphone, meperidine, fentanyl, and methadone" Staud classifies opioids as full agonists (morphine, fentanyl) and agonist-antagonists (buprenorphine), then describes how they interact with their receptors, which are widely distributed throughout the central and peripheral nervous systems, as well as other systems such as the gastrointestinal tract, to produce their primary effects, and classifies those receptors as Alpha and Beta [27].

The APS recently published a clinical guideline for POP management, and one of its essential endorsements is to adopt the multimodal analgesia for the treatment of POP, taking into account the use of a variety of analgesic medications combined with no

pharmacological interventions, [34]. Randomized trials suggest that a practice of combining medications that act on different cell receptors or administered via different routes, provide the greater effects in POP and decreased opioid use. They emphasize that pain should be viewed through a biopsychosocial lens, and that a multimodal approach should address each of these areas, which could potentially help to reduce opioid use when used effectively [26].

Pharmacological Approaches

According to the HWO guideline on pain management “ladder,” the ideal pharmacological pain management is to progress from low steps to the next if a previous step proves ineffectiveness. The first step entails using simple non-opioid such as paracetamol, NSAIDs adjuvant (anticonvulsants, ...). Step 2 employs weak opioids, nonopioid adjuvants and step 3 employs strong opioids. Inversely POP begins at its high intensity and gradually decreases; thus, analgesics may be initiated at a higher level and gradually reduced as pain improves. At all three levels, adjuvant therapy such as NSAIDs or tricyclic antidepressants can be used. Pre-emptive analgesia aims to prevent pain perception as well as the neurophysiological and biochemical effects of noxious input to the central nervous system [26].

Non-Pharmacological Approach

There are numerous Non-Pharmacological Measures (NPMs) available to assist patients in reducing postoperative pain. Despite their repeated recommendations, there is little data to support its actual clinical use [35]. There are categorized into physical and psychosocial options. In terms of physical options, a variety of exercises such as stretching, general aerobic conditioning, coordination balance, relaxation, postural stabilization, yoga, passive physical modalities, and occupational therapy techniques such as adaptations, mobilization with stretching, manipulation, massage, and traction [35].

Regarding psychosocial approaches we have both psychological and social interventions such as education about biopsychosocial model of pain, distraction techniques, cognitive restructuring, and others, Seeking social support, changing environments, stress activities planning, physical or emotional [26].

Empirical Literature Review

This section reviews and criticizes the available data around POP management from previous studies. This includes published results as well as methodologies used to generate the findings.

Nurses and Midwives' Knowledge Toward Post-Operative Pain Management

A descriptive study done for assessing POP after C/S revealed the most common chief complaint that motivates clients to visit a healthcare provider and nearly 71% of hospitalized patients complain of pain [36]. Post-operative pain is especially challenging since patients continue reporting pain despite available intervention and strategies for pain management [37]. Sufficient

knowledge and positive attitudes are indispensable components in the management of POP. Poor management of immediate POP is associated with insufficient knowledge toward POP [38].

In Iran (N=114), nurses working in surgical wards demonstrated moderate knowledge of pain assessment and management [39].

The study conducted in Ghana on 168 nurses and midwives revealed that 48% showed inadequate knowledge about POP management [1]. Another study conducted in Zimbabwe has found that 84 % are not able to identify the correct tool used in pain assessment, 76% are not capable of identifying types of pain measuring scales [40].

Quantitative cross-sectional study conducted in Ethiopia in 2018 recruited 144 nurses working in POP care unit, revealed that 56.5% [95% CI= (51.6–61.3 had sufficient knowledge of POP management [41]. For Kenya, 236 health care providers at Moi Hospital with 170 nurses, 49% had poor knowledge to diagnose and manage POP [38]. A study conducted in Eritrea on nursing working in the emergency department using 126 nurses, found that pain management knowledge of nurses is higher among those with a high level of education with $p < 0.001$, and those with previous training on pain management compared to those without training with 95% CI = 1.82–8.99 and $p = 0.00$ [42]. In Pakistan a study on knowledge toward POP management, involving 60 nurses found that 68.4% of nurses had poor knowledge regarding POP management [43].

The study conducted in China on 512 nursing students found that they have negative attitudes and insufficient intention toward pain management with 51.13 (SD of 5.84) and -0.06 (SD of 3.31) [44]. The study conducted in Jordan on pain management involving 266 nurses found that nurses have a moderate level of attitude as explained by a standard deviation of 0.935 and a mean of 4.504 [19]. Even though in some studies many nurses demonstrated adequate knowledge towards POP management, only a small number had a positive attitude, for example, a study conducted in Ethiopia on 433 nurses only 8.9% [95% CI= (6.1–11.6)] of them had positive attitudes [32]. According to the study of Dessie et al (2019), positive attitude was linked to being trained on POP management, reading, and learning pain management in the class [31]. A study by Wurjine et al. (2018) on POP management comprising of 144 nurses revealed that 52.1 % had negative attitudes while only 47.9% had a positive attitude toward POP management [39].

Practices of Nurses and Midwives Toward Post-Operative Pain Management

With regards to nursing practice, a study conducted in Australia at 7 hospitals on 662 health care providers where 60% of them were nurses; nurses scored the lowest 24% on knowledge and practice in pain assessment and management among other health care professionals [6]. The authors recommend education about pain management and training programs specifically for nurses to improve patient outcomes. By contrast, another study conducted in Ethiopia at Northern region on 251 nurses found that 55.8% of

nurses exhibited good practice with pain management, which was associated with following guidelines, specific protocols, knowledge, and charting [45].

A study conducted in Ethiopia on POP management comprising of 144 nurses revealed that those who have good practice are male (50.7%), those aged between 20 and 30 (65.2%); while those who have low practice are those with bachelor's degrees (80%), those working in the surgical ward (34.7%) (36). In the same study, participants stated nursing workload (23.6%), absence of assessment tools (47.2%), inadequate education on assessment tools (16%), inadequate exposure to the assessment tools with tools (3.5%), unavailable of protocols, and guidelines on pain assessment and management (8.3%) and absence of charting areas (1.4%) are the common barriers for management of POP [36]. In a study conducted in two referral hospitals of Rwanda using a descriptive cross-sectional design on 131 participants, 88% of nurses had moderate levels of practice of immediate POP management [19].

Nurses reported barriers of inadequacy in the management of POP such as congested departments, absence of protocols, over workload, and absence of assessment tools in a study of emergency nurses [42]. The study conducted in Jordan on pain management involving 266 nurses found that nurses have a moderate level of practice as the standard deviation is 1.310 and mean of 4.968 [46].

Research Gap Identified

The above literature review suggests a need for a deep study of nurses and midwives regarding postoperative pain management in Rwanda especially in District Hospitals as available studies have been done at University teaching hospitals and recruiting population from Emergency and ICU. It shows that post-operative pain assessment tools and POP management protocols are available but they are not applied consistently due to poor knowledge, negative attitudes, and poor practices on pain assessment and management. This suggests that there is still a gap between their knowledge, attitude, and their practice. This existing gap can be bridged with the proposed study to investigate nurses' and midwives' knowledge, attitudes, and practices toward POP assessment and management at selected Hospitals.

Conceptual Framework

The knowledge-attitude-practice (KAP) model was used to guide this study. The KAP model originated in family planning and population research around 1950 [47]. It is suggested from this model that the knowledge can influence attitudes, and practice. The KAP model was later modified from that of Basak et al. in 2010.

This model has been used widely to explore the knowledge, attitudes, and practices of nurses in the area of pain and its management [39]. It was also used as the appropriate conceptual in this study.

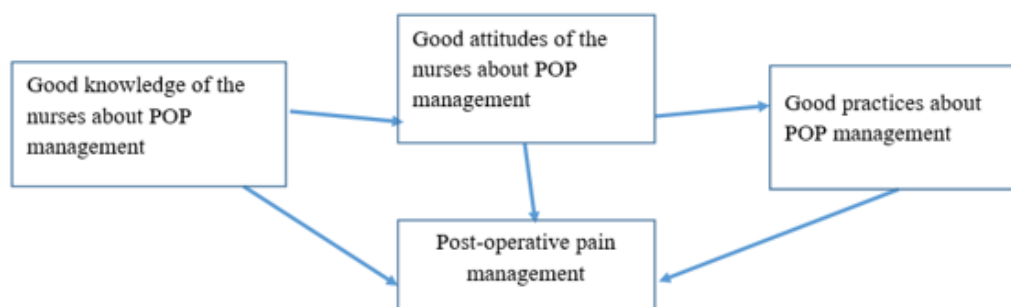


Figure 3: Conceptual framework adapted from Basak S, et al (2010).

In this model, this symbol → has the meaning of influences. In this model, the quality of POP management is influenced by a good knowledge of the nurses, good attitudes, and good practices.

Methodology

A quantitative approach was used in this study. a method in which a researcher explains phenomena by collecting numerical data and analyzing it using mathematically based methods, specifically statistics [48]. So, in this study the researcher used a

quantitative measurement to describe the nurses and midwives 'knowledge, attitudes, and practices toward POP management. In this study, a cross-sectional study design [48] was used to investigate nurses' and midwives' knowledge, attitude, and nurse's practice about POP management at one specific point in time. Cross-sectional research is a method using a list of questions aimed to assess or to extract knowledge, opinions, and feelings of a particular group on a specific topic. Cross-sectional study has also been used to gather information on health care personnel's practice

patterns and professional attitudes toward a clinical problem [49]. From the above characteristics, cross-sectional study design was used as it meets my research objectives; it has an additional advantage as it looks at the present, no cost of time and no need for a follow-up period. This study was suggestive to use the sample of hospitals at different level of health care setting with major surgical operation package. However, because of resource limitations (grant and timeline of study), the researcher decided to use one University teaching hospital, one provincial hospital, and two district hospitals geographically accessible the researcher namely CHUB, Ruhango provincial hospital, Gitwe district hospital and Kabgayi District hospitals.

Gitwe district hospital is a hospital located in Ruhango district, which is a rural area of the Southern province of Rwanda. It started in 1997 as a converted health center. It has grown to serve a population of eight health centers [11]. This hospital holds a total of two hundred (200) beds capacity. The total number of Nurses in this hospital is 70 nurses and midwives. The hospital has two surgical wards, one ward for male patients and another for female patients. It also has a maternity ward where all post-operative mothers care. 27 Nurses and midwives were recruited for the study. Kabgayi Hospital is a free subsidized hospital of the Diocese of Kabgayi, administratively located in the Southern Province, Muhanga District, Nyamabuye Sector. Kabgayi Hospital was inaugurated on September 9, 1937, has a capacity of 372 beds, and has 14 departments: 9 Units and serves a population of approximately 700,000 inhabitants. It is responsible for 16 Health Centers. The hospital has a total of 90 nurses and midwives. 50 nurses and midwives were recruited in this study.

Ruhango Provincial Hospital is located in Southern Province, Ruhango District, and Kinazi Sector. This hospital has a capacity of 150 beds; it has been inaugurated in 2012. 21 nurses and midwives were recruited in this study. University Teaching Hospital of Butare (CHUB) is a Teaching Hospital Located in the Southern Province, Huye District. The Hospital started in 1928 as Butare Hospital and later in 1966 became University Teaching Hospital. CHUB has different medical services, which include Internal Medicine, Surgery, Gynecology and Obstetrics, Accident and Emergency, Pediatrics, Anesthesiology, and Critical Care Medicine (ICU), Dialysis, and Mental Health. The hospital is considered as a referral hospital for all district hospitals located in Southern and Western provinces. The department of surgery at CHUB is made of Five Functional Units, which are "General surgery, orthopedic surgery, Ear nose and Throat (ENT), Oro-maxillo-facial surgery and Ophthalmology". 98 nurses and midwives were recruited in this study. In this study, the targeted population were nurses and midwives who were working at Gitwe District hospital which contributed 27 nurses and midwives, Kabgayi contributed 50 nurses and midwives, Ruhango provincial Hospital contributed 21 nurses and midwives, CHUB contributed 98 Nurses and midwives. The total population were 196 Nurses and Midwives. Sampling refers to the process of selecting a subset of objects from a larger set (population) of objects [48]. According to Ajay et al., if the population is less than 200, the

whole population was used as the sample size [50], so the sample was taken from the target population which were 196 midwives and nurses participants in study.

The current study used the questionnaire developed by McCaffery and Ferrell in 1987. It has been used widely from the time until the present. When the tool was developed, it was developed to evaluate the knowledge, attitudes and practices toward POP. Many researchers since then up to date have used the tool. The original tool was composed of 4 sections making 51 questions; the first section is the section of 6 questions regarding demographic data, the second section is composed by 13 questions on knowledge, and the third section is composed of 14 questions on attitude while the fourth section is composed of 18 questions on practices. However, it was observed that three interventions on Practices are not current in Rwanda context and was removed from the questionnaire. Therefore, the used questionnaire was composed of 13 questions on knowledge, 14 questions on attitudes and 15 questions on practices. The permission to use the questionnaire was requested and provided prior to the data collection (written permission is enclosed herein appendix).

The instrument's reliability is the extent to which it produces consistent results, whereas the instrument's validity is the extent to which the instrument measures what it is supposed to measure. It is tested and found to be reliable with a coefficient of correlation of 0.8 and above [48]. It has been revised in 2012 by various pain experts like the American pain society, WHO, and National comprehensive cancer network. Its reliability and validity are assured, it has been tested and retested (reliability $r > 0.80$ and internal constancy $\text{Alpha} > 0.70$). The process of data collection was started after Ethical approval and permission from UR-CMHS Institutional Review Board (IRB), and Kabgayi, Ruhango, Gitwe hospital administration, and CHUB administration, herein found attached copy. The researcher printed the questionnaire, which was used in data collection, after reaching above mentioned hospitals/sites, After the approval, the researcher will meet the Director of Nursing and in charge of Maternity, and Surgical Ward for respective hospitals and explain to them the purpose, objectives, and procedures for data collection. The researcher has requested a list of nurses working in each service of concerned setting.

The researcher identified participants who met the criterion to participate in this study. No name was required to ensure anonymity; information given was kept confidential, as nobody will know who provided a specific answer the researcher requested the participants in their respective services the appointment means their convenient time (this is for avoiding poor service delivery to patients and maximize response rate) and explain their objectives of the study.

The participant first signed the consent form then a structured questionnaire was distributed among the participant, and after answering, the researcher collected it on the same day, the researcher was around so that any complaint that can be raised by the participant while completing the questionnaire can be

addressed immediately. After completing the questionnaire, the researcher collected the filled questionnaire still respecting confidentiality and bring then in a prepared locked room while waiting for that data entry and data analysis to follow.

Results Presentation

The current study recruited 196 participants (2 drop out and remained 194 in the study). 51.5% were females and 48.4% males.

Regarding the age, 53% were in age category between 31 and 40 years old, 28.3% in 41-50 years old group, 15.5% in the group of 20-30 while 1.5% was in the group of 51-60 as well as the above 60 years old. The study also revealed that 59.2% were Nurses while 40.2% were Midwives. 59.3% have advanced diploma, 36.6 Bachelor holder and the remaining few have A2 certificate. 37.6% were working in post caesarian section unit and 40.2% have working experience of 6-10 years (Table 1).

Table 1: Demographic Data (N=194).

	Variables	Frequency	Percent
Age	20-30 Y/O	30	15.5
	31-40 Y/O	103	53
	41-50 Y/O	55	28.3
	51-60 Y/O	3	1.5
	Above 60 Y/O	3	1.5
Genda	Male	94	48.4
	Female	100	51.5
Role	Nurse	116	59.8
	Midwifery	78	40.2
Level of education	A2	5	2.6
	A1	115	59.3
	A0	71	36.6
	Postgraduate	3	1.5
Ward of allocation	PACU	38	19.6
	Orthopedics	13	6.7
	General Surgery	40	20.6
	ICU	22	11.3
	Post C/S	73	37.6
	ENT	6	3.1
	Ophthalmology	2	1
	Working experience		
Working experience	Less than 1 Year	13	6.7
	1-5 Years	59	30.4
	6-10 Years	78	40.2
	11-15 Years	30	15.5
	16-20 Years	10	5.6
	Above 20 Years	4	2.1

Nurses And Midwives' Knowledge Toward Pop Management

The results of this score demonstrated a mean score of (53.84%) 7.11 ± 1.34 on the total score of 13. A scored of 7 or less is considered inadequate knowledge toward POP management while a score of 8 and above is taken adequate knowledge toward POP management.

To evaluate the level of Knowledge, the knowledge scores have been calculated and categorized in two levels (Inadequate; the score below the average and Adequate; the score above the average). As indicated in the table below, the current study showed that 58.7% of participants have inadequate knowledge compared to 41.2% of participants with adequate knowledge (Table 3).

With the detail analysis of each question, this study showed

that five questions (Questions 1, 5, 7, 9 and 10) were mostly answered correctly. However, on the other side, other five questions (Questions 2, 3, 4, 11, and 13) were mostly answered incorrectly

and the remained three questions (Questions 6 and 8 the responses were around 50/50. (Table 2).

Table 2: Nursing Knowledge Toward Post-Operative Management (N=194).

Knowledge about POP Management	Incorrect answer		Correct Answer		Neutral	
	No.	%	No.	%	No	%
Q1	48	24.74	131	67.53	15	7.73
Q2	91	46.91	102	52.58	1	0.52
Q3	138	71.13	56	28.87	0	0
Q4	144	74.23	50	25.77	0	0
Q5	36	18.56	156	80.41	2	1.03
Q6	94	48.45	99	51.03	1	0.52
Q7	61	31.44	131	67.53	2	1.03
Q8.	84	43.3	108	55.67	2	1.03
Q9	50	25.77	141	72.68	3	1.55
Q10	33	17.01	160	82.47	1	0.52
Q11	113	58.25	81	41.75	0	0
Q12	96	49.48	95	48.97	3	1.55
Q13	125	64.43	66	34.02	3	1.55

Table 3: Distribution Post-Operative Management Knowledge Scores (N=194).

Knowledge Scores out of 13	Knowledge score in %	Distribution of knowledge	Level of knowledge/Frequency	Mean ±SD	Skewness
3	23.08	7 (3.6%)	Inadequate-114 (58.7%)	7.11 ±1.84 (53.84%)	-0.136
4	30.77	11 (5.7%)			
5	38.46	16 (8.2%)			
6	46.15	34 (17.5%)			
7	53.85	46 (23.7%)			
8	61.54	38 (19.6%)	Adequate-80 (41.2%)		
9	69.23	21 (10.8%)			
10	76.92	16 (8.2%)			
11	84.62	5 (2.6%)			

Nursing and Midwives Attitudes Toward Pop Management

Considering the average responses of each level indicators; Disagree, Don't know and Agree, the current study showed that 57.11% of average responses were agree, 29.41% were indifferent and 12.01% of average responses were disagree. This showed an overall positive attitude toward POP management. Majority of Nurses and Midwives (78.9%) responded that the analgesic is an essential component of POP Management. 69% responded that visual evaluation of patient experiencing pain influences their responses toward the treatment of POP. Regarding whether the type of surgery done influences responses of nurses and midwives toward postoperative pain management, 68% responded agreed.

On the issue that it is the right patient to assume the total POP relief as consequences of treatment also 63.9% claimed by agree. For the concern of anticipating pain in all surgical procedures before assessment and treatment of pain, 63.4% responded by agreement, Similarly to the use of pain measurement instruments as an integral in POP management. Another area that Nurses and midwives claimed with positive attitudes is that the absence of pain expression doesn't mean freedom from pain. Here the agreement responses were 61.9%.

On the other side, Nurses and Midwives reported negative attitudes toward some indicators. For the following five indicators, the agreement responses were in the middle range (between 50% and 60%); the impacts of cultural background on nursing

management of pain (50%), whether the patient should exhibit discomfort prior to administration of next dose of pain medications, if the patients should be encouraged to endure as much pain as possible before using an opioid (55%), and if Morphine is a very strong drug (50%). POP patients would be content with just one dose (50%). Those levels of agreement responses between 50%-60% are too much for those indicators to indicate negative. On the

question that the analgesic opioids should not be administered to patients with a history of substance abuse 39.7% agreed with the statement and also 34% of participants responded that the frequent request pain medications influence their response time to analgesic administration. So, for 6 indicators a high percentage of participants demonstrated negative attitudes (Table 4).

Table 4: Indicators Of Attitudes Toward Post-Operative Management (N=194).

Indicators/Measures	Disagree		Don't know		Agree	
	No.	%	No.	%	No.	%
Q1	33	17.01	64	32.99	97	50
Q2	23	11.86	72	37.11	99	51.03
Q3	12	6.19	48	24.74	134	69.07
Q4	52	26.8	76	39.18	66	34.02
Q5	23	11.86	48	24.74	123	63.4
Q6	24	12.37	47	24.23	123	63.4
Q7	26	13.4	61	31.44	107	55.15
Q8	38	19.59	57	29.38	99	51.03
Q9	43	22.16	74	38.14	77	39.69
Q10	8	4.12	62	31.96	124	63.92
Q11	26	13.4	71	36.6	97	50
Q12	13	6.7	49	25.26	132	68.04
Q13	20	10.31	54	27.84	120	61.86
Q14	15	7.73	26	13.4	153	78.87
Average responses	25.43	13.11	57.79	29.79	110.79	57.11

Nursing And Midwives Practices Toward Post-Operative Management in Selected Hospitals

With regards to the POP management interventions, this study showed that nurses and Midwives reported positive practices on only two interventions. Here 58.8% said they provide a clean, calm, and well-ventilated environment for POP management and 54.60%

reported never to administer sterile water by injection as placebo to assess whether the patient has pain is real not compared to 17% who reported always to this indicator.

For the remaining interventions, the rate of always response is below 50%.and somewhere never outweighed the other responses (Table 5).

Table 5: Practices Interventions Toward Post-Operative Management (N=194).

Interventions/Measures	Never		Sometimes		Always	
	No.	%	No.	%	No.	%
Q1	9	4.64	71	36.6	114	58.76
Q2	25	12.89	83	42.78	86	44.33
Q3	44	22.68	77	39.69	73	37.63
Q4	77	39.69	71	36.6	46	23.71
Q	56	28.87	79	40.72	59	30.41
Q6	51	26.29	88	45.36	55	28.35
Q7	31	15.98	69	35.57	94	48.45
Q8	60	30.93	68	35.05	66	34.02

Q9	30	15.46	75	38.66	89	45.88
Q10	75	38.66	55	28.35	64	32.99
Q11	106	54.64	54	27.84	34	17.53
Q12	39	20.1	62	31.96	93	47.94
Q13	61	31.44	78	40.21	55	28.35
Q14	100	51.55	59	30.41	35	18.04
Q15	38	19.59	90	46.39	66	34.02

Discussion of Findings

The results of this score demonstrated a mean score of 53.84% with the range of 23.08-84.62% (7.11 ± 1.34 on the total score of 13). This indicated that have inadequate knowledge of POP management. Table 3 indicates that 58.7% of participants have inadequate knowledge compared to 41.2% of participants with adequate knowledge. Table 2 also indicates that some questions 1, 5, 7, 9 and 10 were most frequently answered correctly while Questions 2, 3, 4, 11, and 13 were most frequently answered incorrectly.

According to the POP management classification criteria used in the study conducted in Ghana by Menlah et al in 2018, a score of 7 or less out of a total score of 13 should be classified as inadequate knowledge, and a score of 8 or higher as adequate knowledge on POP management [1]. This study yielded similar results to the current which showed that 81 nurses (48%) had insufficient knowledge toward POP management, with Questions 5, 7, 8, 9, 10, and 12 frequently answered correctly and Questions 2, 3, 4, 11, and 13 frequently answered incorrectly. Those findings are also almost similar to the results of this study cited. These results are also supported by results of a study from A. et al, (2015) which showed that nurses' knowledge of pain management was poor ranging from range=39.2% to 92.9% with a total mean of 64.5% [39]. However, based on the referent score in this study (80%) for adequate knowledge, only 5 participants representing 2.6% would be classified as having adequate knowledge toward POP management.

On the other hands, some research provides controversial results. The study conducted in hospitals of Arsi zone, Southeast Ethiopia in 2018 which classified POP management knowledge as low if less than the mean value and good if more than the mean, revealed knowledge mean score of 10.78 with a standard deviation of 1.817. This study showed also that 45.1% had low Knowledge and 54.9% had good knowledge about post-operative pain management [36].

The study by Desie and colleagues showed that 56.5% of respondents had adequate knowledge of POP management [51] and the study in Pakistan by Aurang Zeb et al in 2019 showed that 71.7% had good knowledge and 21.7% had excellent knowledge about post-operative pain management [41]. Cross-sectional research using multicenter study design done in Ethiopia, which recruited 433 of nurses working at Amhara region referral hospitals, also revealed that more than a half of participants showed adequate

knowledge [41].

In terms of attitudes toward postoperative pain, the findings of this study revealed that nurses and midwives had generally positive attitudes (57.11%). Respondents agree that the absence of pain expression does not always imply the absence of pain. They also agreed that nurses must anticipate pain before assessing and treating patients. Furthermore, the majority of respondents agreed that postoperative pain management is a part of the patient's rights. The current study's findings are still consistent with the one conducted in Ghana, [52]. It is not consistent with study findings from Ethiopia on 433 nurses which revealed that respondents had negative attitudes toward POP [36], also The study conducted in hospitals of Arsi zone, Southeast Ethiopia in 2018 by Habte and colleagues showed that 52.1 % had an unfavorable attitude towards POP management while only 47.9% had Favorable attitude towards post-operative pain management [36].

Although our study revealed that, generally respondents had good attitudes, some respondents had bad attitudes on some items specifically using Opioids in POP management probably due to fear of side effects of opioids, and lack of familiarity with opioids as they are controlled drugs.

Our study revealed that nurses and midwives have good practices for some interventions like providing clean, calm, and a well-ventilated ward environment post-operatively. In addition, participants did not use placebo for pain assessment. Similar results were provided by the study conducted in Ethiopia where 55.8% of nurses exhibited good practice with pain management [37]; And by the study conducted in Ghana, which revealed that 97.6% of nurses showed good practices [1] But the last one provided high positive results compared to the current study. However, the study showed negative practices to the remaining interventions especially on multimodal analgesia/combining NSAIDS with other analgesia rather than using a single painkiller.

Conclusion And Recommendations

This study recruited 196 respondents and 2 drop out, and then remained 194 (nurses and midwives) from Gitwe, Ruhango, Kabgayi District Hospitals, and CHUB on the Knowledge, attitudes, and practices of nurses and midwives toward Postoperative pain management. The findings of the current study revealed that Nurses and Midwives self-reported inadequate knowledge (Mean score of 53.84% with a range from 23.08%-84.62%) with 58.7%

of participants having inadequate knowledge, a moderate level of Attitudes (only 57.11% of participants with positive attitudes) and generally negative Practices toward POP management especially for using opioids and multimodal analgesia in the management of POP.

The reason for the current results was thought to be related to the involvement of Midwives in the study, extending some specialties such as ENT, Ophthalmology, and post-Caesarian section while previous studies focused on surgery and ICU where Pain management is specialized compared to other services. However, this study was limited only to the description Knowledge, Attitudes and Practices of Nurses and Midwives toward POP management but factors were not explored. It is also limited to four hospitals due to the limited financial resources and timeline.

The absence of pain is a basic human right [53]. Because Nurses and Midwives' knowledge, attitudes, and practices toward POP management are limited, but they play an important role in POP management, any means to equip them with required knowledge, attitudes, and practices toward POP management, whether a formal academic curriculum and in-service training, is an important pillar to support. Regular and focused in-service training on pain assessment, grading, and management for nurses and midwives. Pain assessment charts, pain management guidelines, and protocols should be made available so that people can become acquainted with them and influence their attitudes and practices toward POP management. Comprehensive research, which integrates the exploration of factors and extended national wide, is recommended to serve as preliminary data in the area of POP management, is also recommended to improve the quality of POP management, Post-Operative patients' outcomes as well as satisfaction.

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Conflict of Interest

No conflict of interest.

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