



## The Effectiveness of Proper Pain Assessment on Pain Relief for Surgical Patients in the Post-Anesthesia Care Unit (PACU)

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In order to provide effective pain treatment for surgical patients who are currently being cared for in the Post-Anesthesia Care Unit (PACU), it is essential to do accurate pain assessments first. The purpose of this investigation is to determine whether or not appropriate pain assessment procedures have a positive impact on the levels of pain alleviation experienced in the PACU. The purpose of this study is to analyze the connection between accurate pain assessment, prompt action, and enhanced pain alleviation. To do so, the researcher will examine patient records as well as guidelines for pain management. The results will contribute to the improvement of pain management techniques in the PACU by providing significant insights into the influence that accurate pain assessment has on patient outcomes.

Keywords: surgical patients; pain assessment; pain relief; Post-Anesthesia Care Unit

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### 1. Introduction

According to the findings of the Lancet Commission on Global Surgery, which was published in their report titled "Global Surgery 2030," around thirty percent of the world's prevalence of illness can be associated with situations that can be surgically treated. The World Health Organization (WHO) is paying consideration to the significance that surgical and

anesthesia care plays in enhancing both the health of people and the financial efficiency of nations<sup>1</sup>. One of the most important objectives of surgical therapy is to get the patient as close as possible to better healing in order to achieve a good quality of life free of problems and consequences. More than eighty percent of surgery patients have postoperative pain. The inadequate management of this pain has been linked to a range of unfavorable outcomes and continues to be a significant concern all over the globe<sup>2</sup>.

Pain is a typical and difficult sensation for surgery patients throughout their post-operative recovery phase. It is essential to provide patients with effective pain management in order to maximize their level of comfort, speed their recovery, and enhance their overall results<sup>3,4</sup>. Patients are carefully observed in the Post-Anesthesia Care Unit (PACU), which is an important step in the continuum of perioperative care<sup>5</sup>. During this phase, patients are transitioning out of anesthesia and recovering after surgery. Unsatisfactory treatment of the patient's pain at this stage might result in increased patient suffering, a slowed recovery, and possible consequences<sup>6</sup>.

In the PACU, delivering appropriate pain treatment begins with accurately assessing the patient's level of discomfort. Assessing a patient's level of pain requires a thorough investigation into the nature, duration, and specifics of the suffering being endured by the individual<sup>7</sup>. It gives medical providers the ability to assess the specific requirements of each patient and customize pain management procedures in response to those requirements. Accurately evaluating a patient's level of pain is essential to ensuring that the most suitable treatments, both pharmacological and non-pharmacological, are administered in a timely manner in order to provide adequate pain relief<sup>8</sup>.

Persistent postsurgical pain (PPP), the frequency of which can be as high as between thirty and fifty percent and which originates from surgical procedure and acute postoperative pain that is not adequately managed, has significant negative impacts on a person's quality of life, sets an enormous strain on the community, and disturbs millions of people all over the world. It also presents obstacles for perioperative physicians. It has been hypothesized that the degree of postoperative pain is an important determinant of risk for PPP, and it is possible that patients who get enough analgesia for acute pain throughout the initial postsurgical period would have a decreased risk of PPP<sup>9</sup>.

The initial postoperative phase for the majority of patients begins in the PACU, which covers the transition from the operating room to the wards. Patients frequently devote the first few hours following surgery in the PACU<sup>10</sup>. The provision of adequate pain control in the PACU is an essential component of PPP prevention. Sommer et al. (2008) revealed that 41% of patients in the PACU reported experiencing moderate to severe pain. The majority of patients in the PACU exhibit various physiological disruptions resulting from the process of awakening from anesthesia and undergoing surgery<sup>11</sup>. These disruptions have an impact on different organs and systems inside the body. Postoperative pain and subsequent agitation can contribute to increased risks and exacerbation of complications, hence negatively impacting outcomes<sup>11</sup>.

As per the standards established by the American Society of Anaesthesiologists, it is recommended that regular evaluation and surveillance of pain be conducted throughout the emergence and recovery phases. This practice serves to identify potential problems and minimize unfavourable outcomes. Nevertheless, the presence of unconsciousness and/or the inability to explain oneself clearly pose additional challenges when it comes to evaluating and managing pain in the PACU<sup>12</sup>

### **1.1. The Objective of the Research**

The major purpose of this investigation is to investigate the efficacy of appropriate pain assessment with regard to the treatment of pain experienced by surgical patients while they are in the PACU. More specifically, the goals of the research are to:

- Determine the frequency of post-operative pain reported by patients in the PACU as well as the characteristics of this kind of discomfort.
- Determine the extent to which pain assessment tools and methods are being used within the PACU context.
- Investigate the correlation between the provision of timely and suitable pain relief therapies and the correct evaluation of the patient's level of pain.
- It is important to investigate the influence that accurate pain assessment has on patient outcomes such as pain ratings, the amount of analgesic used, and the level of patient satisfaction.
- Determine whether there are any obstacles or difficulties preventing an accurate evaluation of the patient's discomfort in the PACU, and investigate any possible solutions to these problems.

Therefore, the purpose of this study is to make a contribution to the current information about the treatment of pain in the PACU by meeting the research goals outlined above. The results will give useful insights into the significance of accurate pain assessment and the influence it has on the provision of pain treatment for surgical patients. In the end, the purpose of this study is to provide guidance to medical professionals on the optimization of pain management measures, the enhancement of patient outcomes, and the improvement of the overall quality of care provided in the PACU.

## **2. Materials and methods**

### **2.1. Study design**

In this research, a prospective observational study design is used to evaluate the efficacy of appropriate pain assessment on pain treatment for surgical patients located in the PACU at Qassim University Medical City. The purpose of the research is to investigate whether or not there was a connection between an accurate pain assessment and prompt intervention and the degree to which pain was relieved. Surgical data included operation name, specialty, duration of surgery, whether surgery was open or minimally invasive, and operation site.

### **2.2. Study setting**

The research is carried out at Qassim University Medical City, a tertiary care facility in Qassim, Saudi Arabia. The hospital's Post Anesthesia Care Unit (PACU) offers post-operative care to patients recuperating from different surgical operations.

### **2.3. Study duration**

The research is carried out during a six-month period, from June 1, 2022 to December 31, 2022. This period allowed for the inclusion of a significant number of surgery patients as well as the gathering of full pain evaluation and pain relief data.

### **2.4. Sample size**

All cases operated in Qassim University Medical City (150 patients).

### **2.5. Sampling technique**

The study recruited participants using a consecutive sampling method. The sample consisted of all of the surgical patients who were eligible and had been admitted to the PACU while the research was being conducted.

Patients who were unable to participate in the research due to cognitive impairments, linguistic hurdles, or inadequate medical data were not considered.

## **2.6. Data collection methods:**

Data were collected via a mix of direct observation, patient interviews, and medical record examinations. Data collection was the responsibility of trained research assistants under the supervision of the principal investigator. The following information was documented for each patient:

- Demographic data: age, gender, and body mass index (BMI) are correlated with obesity.
- Surgical specifics: kind of operation, surgical method, and length of procedure
- Anesthesia information: type, duration, and intraoperative analgesia technique
- Pain assessment: pain scores using a validated pain assessment instrument (e.g., numerical rating scale (NRS), visual analog scale (VAS)) at predetermined time points in the PACU.
- Pain Management Modality include the time and kind of analgesics used, non-pharmacological pain reduction measures employed, and any recorded adverse events connected to pain management.
- Patient satisfaction is measured using a standardized patient satisfaction questionnaire.
- Procedure name
- Length of stay in PACU
- Pain Score immediately postoperative
- Pain Score after 15 minutes
- Pain Score after 30 minutes
- Pain Score after 45 minutes
- Pain Score after 60 minutes
- Pain Score after 75 minutes
- Pain Score after 90 minutes
- Pain Score after 105 minutes
- Pain Score after 120 minutes

## **2.7. Data management and analysis plan**

All data will be entered and analyzed using SPSS V28<sup>®</sup> (IBM Corp., Armonk, NY, USA). Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means  $\pm$  standard deviations (SDs). The chi-squared test utilized to evaluate the demographic. A p-value of less than 0.05 was considered to be statistically significant.

## **3. Results and Discussion**

This research aimed to examine the effectiveness of implementing a systematic pain assessment protocol on the management of pain in surgical patients inside the Post-Anesthesia Care Unit (PACU) at Qassim University Medical City. The research population included individuals who received a range of surgical interventions and were subsequently admitted to the Post-Anesthesia Care Unit (PACU) for post-operative management. The researchers documented the demographic data of the study sample, which included age, gender, and surgical specialty (Table 1). Furthermore, the collection of pertinent medical history and identification of pre-existing diseases were undertaken in order to evaluate their potential influence on the results of pain treatment. The determination of the sample size and recruitment time was based on considerations of data collecting capability and resource availability.

The pain evaluation techniques in the Post-Anesthesia Care Unit (PACU) are shown in Table 2. The Visual Analog Scale (VAS) emerged as the predominant pain evaluation tool, being used in 40% of instances. In 25% of instances, the Numeric Rating Scale (NRS) was used, while the Verbal Descriptor Scale (VDS) was employed in 15% of cases. The use of the Faces Pain Scale (FPS) and Behavioral Pain Scale (BPS) was seen in 10% of the cases for each scale.(Table 2)

The pain management techniques used for surgery patients in the Post-Anesthesia Care Unit (PACU) were recorded in order to assess the prevailing pain treatment approaches. The documented analgesics included many categories, such as opioids, non-opioid analgesics, and adjuvant medicines. The assessment of the suitability of the selected method was conducted by considering the degree and duration of pain, taking into account several routes of administration, including intravenous, oral, and transdermal. Additionally, several non-pharmacological therapies, including

posture, relaxation methods, and distraction therapy, were recorded. Table 3 displays the pain management techniques that were delivered in the PACU. The administration of intravenous analgesics was shown to be the predominant method of pain therapy, accounting for 66.7% of cases, whilst oral analgesics were employed in 46.7% of cases and transdermal were employed in 13.3% of cases.

The efficacy of pain treatment in the Post-Anesthesia Care Unit (PACU) was evaluated by assessing pain ratings and patient-reported outcomes. The pain ratings before and after the application of proper pain assessment are shown in Table 4, along with the satisfaction levels given by the patients.

In order to evaluate the effects of implementing adequate pain assessment on pain management, a comparative analysis was conducted between the periods before and after the implementation. Table 5 displays a comparative analysis of average pain ratings, levels of satisfaction, and use of medicine before to and after to the adoption of a suitable pain assessment protocol. The comparison demonstrates a noteworthy improvement in the results of pain treatment after the deployment of suitable methods for pain assessment. The average pain score shown a decline from 7.2 to 3.4, indicating a decrease in the degree of pain experienced. Furthermore, there was a notable improvement in patient satisfaction levels, transitioning from a state of low satisfaction to a state of high satisfaction, which serves as an indication of enhanced patient experiences. Furthermore, a notable decline in the use of medicine was seen, indicating the implementation of more precise and effective strategies for pain management.

Table 6 displays the pain ratings as reported by patients throughout different time intervals after their operation while in the Post-Anesthesia Care Unit (PACU). The level of pain experienced by the individual exhibited a gradual decline over the course of time, starting at a score of 6 immediately after the surgical procedure and eventually reaching a score of 0 after 120 minutes. This finding suggests that the pain management strategies used in the Post-Anesthesia Care Unit (PACU) were successful in effectively managing postoperative pain throughout the recovery period.

Table 7 displays the proportion of patients who were given supplementary pain medication at various time intervals. The administration of first pain medication was promptly provided to almost all patients after their surgical procedures. As the duration of pain reduced, a diminishing

proportion of patients needed supplementary medicine. This observation is consistent with the declining pain ratings seen in Table 6.

#### **4. Discussion**

The primary objective of this research was to investigate the effectiveness of implementing a comprehensive pain assessment protocol in the PACU at Qassim University Medical City, specifically in relation to pain management for surgical patients. The study used a prospective observational design to evaluate a cohort of surgical patients. Standardized pain assessment instruments were administered to the patients both before and after the installation of pain evaluation methods that were deemed adequate.

The results of this study are consistent with other research that emphasizes the significance of accurate pain evaluation in maximizing the effectiveness of pain management interventions. The use of standardized pain assessment instruments, such as the Visual Analog Scale (VAS), Numeric Rating Scale (NRS), Verbal Descriptor Scale (VDS), Faces Pain Scale (FPS), and Behavioral Pain Scale (BPS), enhances the precision of pain assessment and permits the customization of pain management therapies. The findings also provide evidence in favor of using a multimodal strategy for pain treatment, which involves the integration of several analgesic modalities in order to cater to the specific requirements of each patient.

In a research done by Yangyang et al. (2018)<sup>13</sup>, akin to our study, the introduction of standardized pain assessment instruments and procedures in the PACU yielded improved results in pain management. The results indicated a significant decrease in pain ratings and an elevation in levels of patient satisfaction. The findings presented in this study are consistent with our research, therefore strengthening the need of doing thorough pain evaluations to enhance pain management for those undergoing surgical procedures.

In research conducted by Johnson et al. (2019), an investigation was undertaken to assess the efficacy of a multimodal strategy for pain management in the PACU. The results of their study demonstrated that the integration of several analgesic modalities, including opioids, nonsteroidal anti-inflammatory medications (NSAIDs), and regional anaesthetic methods, resulted in enhanced pain management and decreased use of opioids. The



findings presented align with the outcomes of our research, emphasizing the advantages of using a multimodal strategy to get optimal pain control <sup>14</sup>.

Nevertheless, it is crucial to acknowledge that some prior research has shown contradictory findings. One example of a research conducted by Brown et al. (2018) revealed that there was no statistically significant disparity in pain ratings or patient satisfaction subsequent to the adoption of standardized pain assessment techniques in the PACU. The authors posited that a multitude of variables, including patient demographics, surgical methods, and variances in pain perception, may potentially account for the lack of consistency shown in these data. The aforementioned inconsistencies underscore the need for more investigation in order to examine the variables that impact the efficacy of pain evaluation and therapeutic approaches <sup>15</sup>.

Furthermore, a comprehensive literature analysis done by Lee and Wu (2020) critically evaluated a range of research pertaining to pain management in surgical populations, highlighting the significance of multidisciplinary cooperation in attaining the highest level of pain mitigation. The study emphasized the need of efficient communication and coordination among surgeons, anesthesiologists, nurses, and other healthcare providers in order to successfully execute complete pain management techniques. The aforementioned discovery is consistent with the results of our investigation, highlighting the importance of multidisciplinary cooperation in improving the effectiveness of pain treatment interventions <sup>16</sup>.

The findings of this research suggest that the installation of a suitable pain assessment protocol has a beneficial effect on the treatment of pain in surgical patients inside PACU. The implementation of a thorough pain assessment enables healthcare professionals to swiftly recognize and attend to the pain requirements of patients, resulting in enhanced pain management and overall happiness of the patients. The results indicate that using standardized pain assessment tools and implementing evidence-based pain treatment procedures are crucial for attaining optimum outcomes in pain management.

Moreover, this study provide evidence that the systematic evaluation of pain levels and the use of suitable pain management strategies in the PACU result in effective control of pain experienced by patients after surgery. The pain ratings exhibited a gradual decrease in a stepwise manner as the anesthesia's effects diminished and the first pain medicine began to take effect. Supplementary analgesic medicine was given as required, guided by

evaluations, resulting in sustained reductions in self-reported pain throughout the duration. This research, which adopts a prospective observational design, presents empirical data supporting the notion that the implementation of a protocol-driven approach to pain management in the Post-Anesthesia Care Unit (PACU) contributes to the achievement of sufficient postoperative pain control.

The implications for clinical practice are significant based on the results obtained from this prospective observational research, which examined the effectiveness of proper pain assessment in managing pain management for surgical patients in PACU at Qassim University Medical City. These implications have the potential to give guidance to healthcare practitioners in enhancing pain management regimens and maximizing patient outcomes during the early postoperative period.

## **5. Contribution and Limitations**

The present research introduces significant original additions to the existing body of literature on pain management in postoperative patients. To begin with, this study presents empirical support for the effectiveness of implementing suitable pain assessment techniques in the Post-Anesthesia Care Unit (PACU). The findings indicate a noteworthy decrease in pain intensity and an enhancement in patient satisfaction. The aforementioned discoveries add to the expanding corpus of research that supports the use of standardized pain assessment instruments and protocols. Additionally, the research emphasizes the advantages of using a multimodal strategy for the treatment of pain, which involves the integration of several analgesic methods that are customized to meet the specific requirements of each patient. This highlights the significance of individualized pain management strategies and their ability to mitigate dependence on opioids, hence addressing issues pertaining to the excessive use of opioids and the consequent adverse consequences.

Nevertheless, it is important to acknowledge that the research does have several limitations. The potential observational design restricts the ability to show a causal link between the application of proper pain assessment and the observed results. Randomized controlled trials are often regarded as a more robust method for generating data on the efficacy of an intervention. Furthermore, it is important to note that the research was done only in a singular medical facility, perhaps constraining the applicability of the results to alternative contexts or demographic groups. In order to strengthen the

external validity of the findings, future investigations should include multicenter studies that encompass a wide range of patient demographics.

Finally, the research investigation centered on the treatment of acute pain immediately after surgical procedures in the Post-Anesthesia Care Unit (PACU). The study did not evaluate the long-term effects of pain and the influence of accurate pain assessment on future phases of recovery and rehabilitation. Further research should investigate the impact of accurate pain assessment on long-term pain outcomes and functional recovery.

## **6. Conclusion**

The current research illustrate that the proper evaluation of pain is crucial in maximizing the effectiveness of pain management for surgical patients in the Post-Anesthesia Care Unit (PACU). By establishing thorough procedures for pain assessment, customizing modalities for pain treatment, and fostering multidisciplinary teamwork, healthcare practitioners have the potential to greatly increase pain management results and improve patient satisfaction. The aforementioned implications provide useful insights that may inform clinical practice and aid in the formulation of evidence-based strategies aimed at enhancing pain management during the postoperative phase.

## **7. Ethical considerations**

- All investigators completed the Bioethics certificate from The National Committee of Bioethics at King Abdulaziz City for Science and Technology.
  - All investigators declare there is no conflict of interest.
8. The ethical approval for this study was obtained from the committees of research ethics, Deanship of Scientific Research at Qassim University.

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