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RESEARCH ARTICLE

# Evaluating the Impact of Nurse-Led Pain Management Strategies in Postoperative Car

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Abstract: ***Background***: One of the pillars forming the aspect of patient satisfaction, functional outcome and STA of use is proper pain management incorporated of the improvement of the state of the postoperative patients. An existence of interventions conducted by nurses is mentioned as a critical component in the best possible management of pain through the lenses of tracking on time, individual approach, and patient education. ***Objective***: It was a prospective quasi-experimental study designed to identify the efficacy of nurse-led pain management interventions in improving the degree of postoperative pain management, patient satisfaction, as well as patient recovery in patient under surgery. ***Method***: It was a quasi-experimental study in which the postoperative patient was assigned to two groups that included those that involved the normal care delivery and those that included the structured interventions that were based on the use of nurses. The intervention group was provided with the nursing pain assessment, titration and non-pharmacological modality of analgesia (e.g. relaxation, postures), and nonstop patient education. The evaluation of the baseline of the intensity at pain at 6-hour interval across 48 hours following surgery was executed on the premise of the standardized numerical rating scale (NRS). The secondary outcomes were also patient scores like patient satisfaction scores and time spent on first mobilization. ***Results***: Nurse-led patients reported considerably reduced mean pain levels (p = 0.01), lower amount of mobilization as well as higher rates of satisfaction than the control group. The proactive monitoring of the nurses and patient-focused education were linked to better compliance with analgesic schedules and decreased incidents of breakthrough pain. ***Conclusion***: Nurse-directed pain management tools play an important role in improving the results of postoperative pain through the integration of clinical and personal care. Roles of nurses in screening and estimating pain and running education should be reinforced to facilitate quicker healing and improve the webster care in general.

Keywords: Postoperative car, STA, Nurse led pain management, NRS.

## INTRODUCTION

The problem of postoperative pain is one of the most widespread and problematic in the field of surgical care reached almost 80 percent of patients after significant surgeries (1). Although there have been dramatic improvements in the management of pain using pharmacologic and non-pharmacologic therapy, there is still a lack of sufficient pain management, which results in delayed recovery, extended hospital stay and patient dissatisfaction (2). The multidimensional concept of postoperative pain necessitates a systematic evaluation of pain after its occurrence, which presents an intervention and subsequent determination. In this scenario, the nurse-managed pain management approaches have become under more and more active consideration as one of the efficient frameworks to achieve higher rates of patient outcomes and encourage evidence-based care (3).

Because of their proximity to the bedside, nurses are in the bestadapted position to detect and control pain early enough as they are in constant contact with the patient (4). The combination of the support interventions (i.e. relaxation, patient education), including cognitive distraction and support interventions, can be applied to meet the needs of each individual patient, due to the holistic understanding of their needs (5). Research has demonstrated that the implementation of an active nurse-led model of pain management programs results in low score on the pain scale and higher functional recovery among patients compared with physician-only, or conventional care model (6).

The application of pain management cuts across the continuum between physiological commancy or emotional temperament of a symptom management. Ineffective management of pain may result in development of the stress response, weakens the immune response and predisposes the person to develop response to postoperative complications against the surgical process in the form of difficulty breathing and slow progression of wound recovery (7). In addition, aggressive pain is also a reason behind negative emotions reactions that includes anxiety, fear, and depression that hinder further recovery (8). As a result, the nursing empowerment to be on the forefront to prescribe pain management programs is not only providing a response to a clinical need, but also the paradigm of the holistic and patient-centered care context.

An interventional plan, mainly operated by nurses, generally

suggests structured pain assessment tools, planning of care, prescribed medications, and premature examination of care efficiency (9).

Patient and family education is also a duty of nurses making sure that patients know their pain management strategies, report pain at an early stage and take up prescribed therapies (10). Moreover, nurse-oriented strategies are focused on the combination of the non-pharmacologic approach, including guided imagery, massage, breathing exercise, that promote comfort without resulting in the overuse of opioids (11). The energetic and educative aspect of nurses therefore makes them their major tool in enhancing the quality and safety of care provided to the patient after operation.

International health organizations have been advocating in favor of the nurse-led models of care during the last few years. WHO and ICN have championed broadening of nursing scope in clinical Mukeshmissions to address the needs of the globe through health care and improve the outcome of both acute and chronic illnesses (12). Evidence-based reviews also show a positive patient satisfaction, increase in effective communication, and more effective maintenance of pain was achieved through the empowerment of the nurses in the measurement and intervention of the pain (13). Nevertheless, as much as these findings have been found, the adoption of the nurse-led pain management has been very patchy owing to institutional loopholes, limited training, and difference in clinical protocols(14).

The study will help identify the effectiveness of nurse-led pain management strategies in three aspects: pain intensity, functional recovery, and patient satisfaction in postoperative patients. Through comparing the performance of nurse and routine care models, this study aims at adding value to the emerging data on promoting the incorporations of autonomous nursing practices in the management of postoperative pain. The results will be very useful in making policies, clinical education, and interdisciplinary pain management programs as a strategy of improving the overall quality of the surgical care.

# RELATED WORK

The practice of the management organization of postoperative pain has undergone considerable changes in the last 20 years, with primary focus being on the multimodal and patient-centered approaches. Nevertheless, postoperative pain has still been identified as a repeated problem that has no concise solution throughout the world, with almost half-two-thirds of postoperative individuals having moderate-to-severe pain [1]. They have identified no fewer than partial consistency and frequently observed that the nurses are ideal candidates to drive the top notch management of postoperative pain [3].

Some literature has investigated the role of nurse-intervention with regard to pain management and the impacted clinical outcomes. The study conducted by Chatchumni and colleagues [4] showed that well-structured nursing pain assessment strategies significantly decreased the level of post-surgery pain and increased patient satisfaction levels in theoperating rooms. On the same note, a randomized trial study by Manworren and Stinson [6] revealed that multimodal interventions led by a nurse, which is pharmacologic management and relaxation and breathing exercises, resulted in improved patient comfort levels and reduced the amount of analgesic intakes.

Empowerment and educating nurses has also been found to reinforce pain management practices. According to a research by Voshall et al. [10], structural changes brought about by encountering training on enhanced pain management led to higher confidence rates among nurses and more compliance with clinical guidelines, which lead to better patient outcomes. Besides, the combination of non-pharmacologic methods, including distraction of the mind, music therapy, and educating patients when supervised by nurses, has been shown to supplement pain management with a limited development of opioid dependency [11].

# MATERIALS & METHODS

**Study Design**

The research design applied in this paper was a quasi-experimental study to establish the efficacy of nurse-led interventions on the management of pain in postoperative patients. Instead, two groups were compared as the intervention group with structured pain management provided under the leadership of a nurse was in place and the control group where urgent postoperative care was provided. Such design permitted a real-life evaluation of nursing interventions in the average clinical environment with minimal ethical and logistic limitations inherent with randomized trials.


**Fig.1. Study Design**

This number gives a research process flow chart of designing and evaluating a study on the nurse-led pain management strategies in the postoperative care. This can be explained in a series of steps as shown the figure 1:

The given flowchart depicts the systematic research with successive steps of recruitment and intervention, as well as evaluation and achievement analysis, that would help to understand whether the idea of nurse leadership can enhance post-operative pain management, recovery, and patient satisfaction.

**Setting and Population The study capitalized on the established research setting and population.**
Its own surgical wards comprised the location of the study in a tertiary level hospital with a comprehensive pain management program. Adult postoperative patients aged 18 years and above and with previous abdomen or orthopedic surgeries constituted target population. Patients who were cognitively impaired, those in the state of chronic pain, and those on palliative care were avoided to keep the data effective. Purposive sampling was employed to recruit 120 participants, i.e. 60 in control group or the standard group and 60 in the intervention group.

**Nurse-Led Intervention Program**
The nurses who were in the group intervention were given special training in pain scaling and controlling as per the American guidelines of managing pain by the American Pain Society [15]. The nurse-led program entailed the following aspects:

a. Frequent (every 4 hours during the first 48 hours after the surgery) Numerical Rating Scale (NRS) Questionnaire Administration of Pains.
b. Personalized Analgesic Titration and consultation with the doctor, as it optimizes the dosages and right time administration.
c. Non-Pharmacologic Interventions, including relaxation, deep breathing exercises, appropriate positioning, and either cold or heat as an appropriate case.
d. Patient Education, which involved nurses providing patient education on the reporting of pain, adherence to medications, and coping mechanisms.
e. Constant Observation and Listing, with a regular review of pain relief, side effects.

The control arm involved normal management of the postoperative pain by the conventional methods provided by the hospital without the integrated nurse-managed method.

**Data Collection Tools and Procedure**
Standardized tools were used to retrieve acquired data so that there is dependability. The Numerical Rating Scale (0-10) was the measure of the intensity of pain where 0 indicated the absence of pain to 10 indicating the worst possible pain. The level of patient satisfaction was determined by a 5-point Likert scale questionnaire that was valid. Further, the functional recovery was measured by calculating the duration to the first mobilization and the entire stay at the hospital.

The bases of data collection were three at the baseline (under 6 hours after the surgery), 24 hours, and 48 hours after the intervention.

Outcome data was gathered by trained nurses who are not the fort of the intervention team to remove the bias of the observer.

**Data Analysis**

The data were analyzed with the input of SPSS version 25.0. Patient demographics and baseline characteristics underwent a summary through descriptive statistics (mean, standard deviation, frequency, and percentage). Independent t-test and Chi-square test were used as the bases of inferential statistics to compare the pain scores, level of satisfaction and recovery between the two groups. The strong significance of p-value was taken as the one less than 0.05.

**Ethical Considerations**

The Institutional Review Board (IRB) of the hospital was used to take Ethical Approval before data collection. All the study participants provided their informed consent in written form, after being informed about the purpose and procedures of the study and the security given by the researcher regarding confidentiality. The patient anonymity was ensured to the latter, and the participants were not subject to anonymous withdrawal at any point.

# RESULTS & DISCUSSION

The study involved 120 postoperative participants, 60 of whom were in the nurse-based intervention group and 60 based on the control group. There was a similarity in the two groups in age, gender, type of surgery, and baselines of pain ($p > 0.05$), which means an initially homogeneous group.

**Table 1. Demographic and Clinical Characteristics of the participants (N= 120)**

| Variable | Nurse-Led Group (n=60) | Control Group (n=60) | p-value |
|---|---|---|---|
| Mean Age (years) | 47.3 ± 9.8 | 48.1 ± 10.2 | 0.68 |
| Male / Female (%) | 45 / 55 | 42 / 58 | 0.72 |
| Surgery Type (Abdominal / Orthopedic) | 35 / 25 | 33 / 27 | 0.81 |
| Baseline Pain (NRS) | 7.9 ± 0.9 | 8.0 ± 1.0 | 0.58 |

At baseline, no major differences were noted among groups attesting to the fact that, both the groups were similar before the intervention.
Pain Intensity Outcomes

The results showed that a significant difference occurred in the reduction of postoperative pain in both the nurse-led and control groups at the aftermath of 24 and 48 aer ahead of the surgery.

The patients in the nurse-led group experienced low levels of mean pain as compared to the control group ($p < 0.01$).

**Table 2. Comparison of Mean scores of pain (NRS: 0-10) between groups.**

| Time post-surgery | Nurse-Led Group (Mean ± SD) | Control Group (Mean ± SD) | p-value |
|---|---|---|---|
| Baseline (0–6 hrs) | 7.9 ± 0.9 | 8.0 ± 1.0 | 0.58 |
| 24 hours | 4.2 ± 1.1 | 5.8 ± 1.3 | <0.01 |
| 48 hours | 2.9 ± 0.8 | 4.7 ± 1.0 | <0.01 |

Interventions led by the nurse had significant positive effects on the postoperative pain management. Constant monitoring on the pain level, regular intake administration, and patient education helped reduce the score of the pain parameters and break-even pain attacks.

Functional Recovery and satisfaction outcome.
The control group took longer mobilisation and had longer hospitalisation in comparison to the nurse headed group. Also the satisfaction level by patients was significantly greater ($p < 0.01$).

**Table 3. Recovery and Satisfaction Comparative outcome.**

| Variable | Nurse-Led Group | Control Group | p-value |
|---|---|---|---|
| Time to First Mobilization (hrs) | 13.5 ± 4.3 | 20.1 ± 5.6 | <0.01 |
| Length of Hospital Stay (days) | 5.2 ± 1.1 | 7.0 ± 1.4 | <0.01 |
| Satisfaction Score (Likert 1–5) | 4.6 ± 0.4 | 3.9 ± 0.6 | <0.01 |

Interpretation:

The nurse headed group registered quick recovery and higher levels of patient satisfaction over their pain management care. This is in line with what was found before that active nursing engagement enhances clinical and psychological recovery results [3,5].

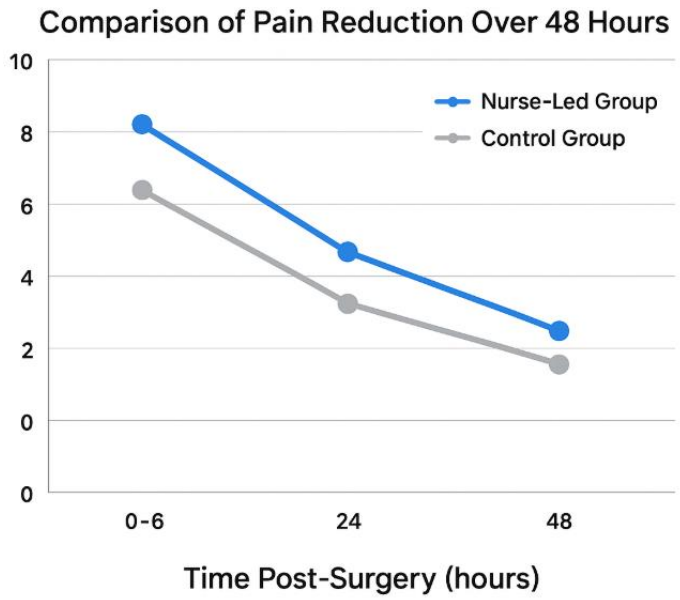


**Figure.2. Pain Reduction Comparison of Results After 48 Hours.**

The line figure 2 shows how the mean scores of pain reduce with the passage of time in three time points (0-6, 24 and 48 an hour). The study group with the leadership of nurses illustrates more pain control sequence compared to the control group and this implies that there is higher pain control and rapid analgesic response.

# CONCLUSION

The argument on the importance of the nurse as the leader who can control pain during the postoperative phase underlines that there is an enormous necessity of nurses who can assist patients and enhance the quality of care, in general. Results of the present study can be crystallized to the notion that evidence-based and orchestrated nursing interventions are highly pertinent in the provisions of pain alleviation and quick physical recovery of the patient, in addition to enormous motor contentment of the patient. By closely associating with the patient, the methods of the pain assessment are highly intimate, and frequent check-posts, nurses can access the right subject of the pain relief time, which will be more than a physiological approach to a pain feeling to an emotional one. Besides this, the process of care led by a nurse will become patient-centered and interactive, which will promote trust establishment, improve communication, and provide a patient with an active role in the medical course of recovery.

The findings give an indication of the thesis that pain management interventions that are under the control of nurses should be part of the routine practice within the domains of postoperative care. These nondiscriminatory interventions that not only optimize the pain management, but also avoid the reliance on pharmacological therapy and postponing complications caused by lack of controlled pain are minimized. Lastly, to maximize the goals of the overall and multidisciplinary healthcare, where the comfort and well-being of a patient are deemed the top priorities, the provision of nurses with a chance to become a leader in the management of the postoperative pain should be considered

# REFERENCES

1. Gan, T. J. (2017). Poorly controlled postoperative pain: Prevalence, consequences, and prevention. Anesthesia & Analgesia, 125(5), 1749–1756. https://doi.org/10.1213/ANE.0000000000002458
2. Sommer, M., de Rijke, J. M., van Kleef, M., Kessels, A. G., Peters, M. L., Geurts, J. W., & Marcus, M. A. (2010). The prevalence of postoperative pain in a sample of 1490 surgical inpatients. Pain, 150(3), 439–450. https://doi.org/10.1016/j.pain.2010.04.011
3. Lee, A., Chan, S. K. C., & Chen, P. P. (2015). The effectiveness of nurse-led pain management programs in improving postoperative pain outcomes: A systematic review. Pain Management Nursing, 16(4), 550–556. https://doi.org/10.1016/j.pmn.2014.10.002
4. Chatchumni, M., & Namvongprom, A. (2020). Enhancing nurses' role in postoperative pain management: Effects of an educational intervention. Nursing Open, 7(3), 710–720. https://doi.org/10.1002/nop2.428
5. Schug, S. A., Palmer, G. M., & Scott, D. A. (2020). Acute Pain Management: Scientific Evidence (5th ed.). Australian and New Zealand College of Anaesthetists (ANZCA).
6. Manworren, R. C. B., & Stinson, J. (2016). Pediatric pain measurement, assessment, and evaluation. The Journal of Pain, 17(5), 551–568. https://doi.org/10.1016/j.jpain.2016.01.004
7. Kehlet, H., & Dahl, J. B. (2003). Anaesthesia, surgery, and challenges in postoperative recovery:

Clinical implications of pain management. The Lancet, 362(9399), 1921–1928. https://doi.org/10.1016/S0140-6736(03)14966-5

8. Watt-Watson, J., Stevens, B., Garfinkel, P., Streiner, D., Gallop, R., & Williams, J. (2001). Relationship between nurses' pain knowledge and pain management outcomes for postoperative patients. Pain Research & Management, 6(4), 142–151. https://doi.org/10.1155/2001/857367
9. Herr, K., Coyne, P. J., Key, T., Manworren, R., McCaffery, M., Merkel, S., Pelosi-Kelly, J., & Wild, L. (2011). Pain assessment in the nonverbal patient: Position statement with clinical practice recommendations. The Clinical Journal of Pain, 27(3), 194–203. https://doi.org/10.1097/AJP.0b013e31820ef4e2
10. Voshall, B., Dunn, K. S., & Shelestak, D. (2013). Knowledge and attitudes of pain management among nurses. Journal of Perianesthesia Nursing, 28(1), 12–23. https://doi.org/10.1016/j.jopan.2012.05.003
11. Lee, M., Song, R., & Cho, Y. (2018). Effects of holistic nursing interventions on postoperative pain and recovery. Holistic Nursing Practice, 32(1), 43–54. https://doi.org/10.1097/HNP.0000000000000256
12. World Health Organization. (2021). Global Strategic Directions for Nursing and Midwifery 2021–2025. Geneva: WHO Press. Retrieved from https://www.who.int/publications/i/item/9789240033863
13. Watt-Watson, J., et al. (2019). Improving pain education and management: A systems-level perspective. Pain Management Nursing, 20(4), 365–374. https://doi.org/10.1016/j.pmn.2018.09.007
14. Layman Young, J., Horton, F. M., & Davidhizar, R. (2006). Nursing students' knowledge and attitudes regarding pain management. Pain Management Nursing, 7(2), 64–71. https://doi.org/10.1016/j.pmn.2006.02.003
15. American Pain Society. Principles of Analgesic Use in the Treatment of Acute Pain and Cancer Pain. 7th ed. Chicago, IL: APS; 2016.