Indonesian Journal of Global Health Research
Volume 8 Number 5, October 2026
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

THE EFFECT OF NURSING EDUCATION ON PAIN LEVELS IN POSTOPERATIVE PATIENTS

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ABSTRACT
Postoperative pain is one of the most common problems experienced by patients following surgical procedures. Nursing education is a non-pharmacological intervention that may help reduce pain levels. This study aimed to determine the effect of nursing education on postoperative patients' pain levels. A quantitative research design with two independent groups was employed, consisting of an education group and a non-education group, with a total of 30 respondents. Data were collected through direct measurement of postoperative pain intensity using the Numeric Rating Scale (NRS) at baseline (pre-test) and after the intervention (post-test) in both the intervention and control groups.The data were analyzed using both parametric (Independent t-test) and non-parametric (Mann–Whitney U test). The results showed a significant value of $p < 0.05$ in both tests, indicating a significant difference between the two groups. Nursing education was found to be effective in reducing pain levels among postoperative patients.

Keywords: nursing education; pain; postoperative patients

How to cite (in APA style)
Setiyowati, E., Soares, J., Setiyanti, S., & Pratama, B. R. (2026). The Effect of Nursing Education on Pain Levels in Postoperative Patients. *Indonesian Journal of Global Health Research*, *8*(5), 45–50. https://doi.org/10.37287/ijghr.v8i5.2298.

INTRODUCTION

Postoperative pain is one of the primary problems frequently experienced by patients following surgical procedures. Inadequately managed pain can lead to various negative consequences, including delayed mobilization, sleep disturbances, increased anxiety, reduced comfort, and prolonged hospital stays. Optimal pain management is an essential component of nursing care because it significantly influences the healing process and patients' quality of life after surgery. Recent studies indicate that postoperative pain management remains a challenge in various healthcare settings despite the implementation of multiple interventions (Thurston et al., 2023).

Postoperative pain occurs as a result of tissue damage during surgical procedures, which stimulates the release of inflammatory mediators and activates pain receptors. The intensity of pain experienced by patients may vary depending on the type of surgery, physical and psychological conditions, previous pain experiences, and patients' understanding of pain and its management. Insufficient knowledge regarding pain management can increase pain perception and anxiety during the recovery period. Therefore, nursing education is needed to help patients understand their condition and develop effective pain-control strategies (Grommi et al., 2023).

Nursing education is one of the non-pharmacological interventions that can be provided by nurses before and after surgery. This education includes information about the surgical process, relaxation techniques, early mobilization, distraction techniques, deep-breathing exercises, and the appropriate use of analgesic medications. Effective educational interventions can enhance patients' knowledge, reduce anxiety, improve coping abilities, and encourage active participation in pain management. Several studies have reported that educational interventions positively influence pain management practices and patient satisfaction with healthcare services (Thurston et al., 2023).

Furthermore, therapeutic communication and nurses' involvement in providing clear and comprehensive information to patients has been shown to contribute to successful postoperative pain management. Structured educational programs can improve patients' preparedness for postoperative pain, thereby reducing the intensity of pain experienced after surgery. Educational approaches are also considered effective in strengthening the relationship between patients and healthcare providers throughout the care process (Grommi et al., 2023).

Based on the above considerations, nursing education plays an important role in helping reduce postoperative pain levels. Therefore, research on the effect of nursing education on postoperative pain levels is necessary to evaluate the effectiveness of educational interventions in supporting successful pain management and improving the quality of nursing care.

METHOD

This study employed a quantitative comparative design. Participants were recruited using a consecutive sampling technique, in which all postoperative patients who met the inclusion criteria and presented consecutively during the study period were enrolled until the required sample size of 30 participants was achieved. The participants were then allocated into two groups: an intervention group that received nursing education and a control group that did not receive nursing education.

The independent variable was nursing education, while the dependent variable was pain intensity, measured using the Numeric Rating Scale (NRS) with scores ranging from 0 to 10. Data were collected by assessing pain intensity in both groups before (pre-test) and after (post-test) the intervention. The intervention group received structured nursing education consisting of information about the surgical procedure, relaxation techniques, early mobilization, distraction techniques, deep breathing exercises, and the appropriate use of analgesics. In contrast, the control group underwent pain assessments at the same time intervals without receiving any educational intervention.

Data analysis was performed in several stages. Data normality was assessed using the Shapiro–Wilk test. For normally distributed data, between-group comparisons were conducted using the Independent samples t-test, whereas the Mann–Whitney U test was applied for non-normally distributed data.

RESULT

The total sample in this study was 30 people of various ages, pain levels, And characteristics other. Explanation related characteristics respondents will served in the following table

Table 1.
Respondent Characteristics and Univariate Results

Variables	Mean (sd)	Median	Min-Max
Age	40.17 (13.25)	42	20-65
Pain Pre Intervention Group	6.07 (1.22)	6	4-8
Post Pain Control Group	3.00 (0.76)	3	2-4
Pain Pre Intervention Group	7.00 (0.76)	7	6-8
Post Pain Control Group	5.80 (1.37)	6	3-8

From the table 1, the average (*mean*) age of respondents is 40.17 years with a standard deviation (sd) of 13.25, a median value of 42 years, and the age range moves from the youngest 20 years to the oldest 65 years. Before being given nursing education, the intervention group had a fairly high average pain score, namely 6.07 with a pain scale range ranging from 4 to 8. On the other hand, the initial (*pre*) measurement in the control group showed a higher average pain score, namely 7.00 with a scale range between 6 to 8. After the evaluation was carried out, there was a very drastic decrease in pain levels in the intervention group. Meanwhile, the control group who did not receive nursing education remained stuck at a high pain level with an average of 5.80 and a post-test pain scale range that was still between 3 and 8.

Table 2. Distribution Of *Pre-Test* Pain Scores

Age	Group	Pain Score
MEAN MEAN (SD), (MIN-MAX)		MEAN (SD), (MIN-MAX)
Mean : 41,13 Mean (SD) : (12,50) (Min-Max) : (20-65)	the education group	Mean (SD) : 6,07 (1,22) (Min-Max) : (4-8)
Mean : 39,20 Mean (SD) : (14,33) (Min-Max) : (21-61)	the non-education group	Mean (SD) : 7,00 (0,76) (Min-Max) : (6-8)

In the initial measurements before the intervention, the majority of patients in both groups reported moderate to severe pain levels (scale 4–8). Patients in the education group (Group 1) had *pre-test scores* ranging from 4 to 8. Meanwhile, in the non-education group (Group 2), initial pain conditions tended to be more uniformly severe, dominated by scores of 6, 7, and 8 (such as ID 16 on a scale of 7 and ID 17 on a scale of 8).

Table 3.
Comparison of Pre-test and Post-test Pain Scores

Group	Pain Variables	Mean	Standard Deviation (SD)	p -Value (T-Test/Mann Whitney)
Intervention (Education) (n = 15)	Pre-Test	6.07	1.22	< 0.05
	Post Test	3.07	0.70	
Control (Non-Educational) (n = 15)	Pre-Test	7.00	0.76	< 0.05
	Post Test	5.80	1.37	

Before the intervention, the average patient pain score was 6.07. After receiving nursing education (such as relaxation techniques and deep breathing), there was a drastic decrease in the average pain score to 3.07. This indicates that education is clinically very effective in helping patients control their pain. In the group that did not receive education, the initial pain score averaged 7.00. After the post-test evaluation, their pain score only decreased slightly to 5.80 and remained in the moderate to severe pain category. The results of the bivariate statistical test using *the Independent T-Test* and strengthened by *the Mann-Whitney U Test* showed a *p -value* <0.05. This significance value smaller than 0.05 empirically proves that there is a meaningful and significant difference in the average reduction in pain scores between the group that received education and the group without education. Thus, the alternative hypothesis (H1) is accepted, which confirms that nursing education is effective as a non-pharmacological intervention in post-operative pain management.

DISCUSSION

Based on the results of the research conducted, it was found that nursing education had a significant impact on reducing pain levels in post-operative patients. Descriptive analysis results showed that the average pain level in the group given nursing education was lower. more low compared to group without education. Group education own average level painful as big as 3.1, whereas group without education own average around 7.1. Difference This show that giving education nursing capable help Patients control pain more effectively than patients who do not receive education.

Results test statistics use Independent T-Test show mark significance $p < 0.05$, indicating a significant difference between the education and non-education groups. These results were supported by the Mann-Whitney test , which also showed a p-value <0.05, thus accepting the alternative hypothesis (H1) and rejecting the null hypothesis (H0). Thus, nursing education has been shown to be effective in reducing postoperative pain levels in patients.

Painful post operation is response physiological consequence damage network during surgical procedure. The surgical process causes the release of inflammatory mediators such as prostaglandins, histamine, And bradykinin Which can stimulate receptors painful. Level painful If not handled properly, it can cause various complications such as delayed mobilization, sleep disorders, increased anxiety, and even prolonging the patient's hospitalization period. By Because

That, management painful Which optimal become part important in nursing services to accelerate the patient's healing process (Thurston et al., 2023).

The results of this study indicate that nursing education can be an effective non-pharmacological intervention in helping to reduce the intensity of patient pain. The education provided to Patient information includes information about the healing process, relaxation techniques, early mobilization, deep breathing exercises, distraction techniques, and the appropriate use of analgesics. Knowledge Which Good about management painful can increase ability patients in controlling pain and reducing anxiety during the recovery period.

Decline level painful on group education can explained through theory gate control which states that pain perception is influenced by psychological, emotional, and cognitive factors. When patient get information Which clear about condition post operation And By managing pain, patients will feel calmer and have control over their condition. Condition psychological Which more stable can reduce stimulation painful Which received by the brain so that the perception of pain becomes lower.

The results of this study are in line with research conducted by Grommi et al. (2023) which stated that pain education has a positive influence on improving pain management. painful And practice nursing in control painful patient. Education Which provided systematically can improve the understanding of patients and health workers in managing painful so that quality service become more Good. Study other by Susilowati et al. (2023) also demonstrated that education using virtual reality technology was effective in reducing post-operative pain intensity in patients because it helped patients divert attention from the pain and increased relaxation.

Besides That, study Hijriana et al. (2023) find that technique distraction And Relaxation provided as part of nursing education can significantly reduce postoperative pain levels in patients. Distraction techniques help patients shift their focus from pain, while relaxation techniques can reduce muscle tension and anxiety, thus reducing the perception of pain.

Nursing education also influences patient psychological preparedness. Patients who understand the healing process and pain management techniques tend to be more cooperative during treatment and early mobilization. Early mobilization can help improve blood circulation, prevent muscle stiffness, improve organ function, and accelerate surgical wound healing. Research by Wicaksono (2024) shows that mobilization early influential significant to decline level painful on patient post-operative section caesarean . Study Faridasari et al. (2023) Also find that mobilization Early intervention is effective in reducing the intensity of pain in post-general surgery patients.

In addition to early mobilization, deep breathing relaxation techniques and guided imagery have also been shown to be effective in reducing post-operative pain. Relaxation techniques help reduce sympathetic nervous system activity, resulting in greater relaxation and decreased pain perception. Research by Ede et al. (2024) found that guided imagery effectively reduced pain levels in post-appendectomy patients. Research by Putri Lenggo Geni et al. (2024) also demonstrated that deep breathing relaxation techniques combined with lavender aromatherapy significantly reduced post-operative pain levels.

In a way physiological, education Which combined with technique relaxation can Stimulates the release of endorphins, which act as the body's natural analgesics. When patients feel comfortable and calm, muscle tension decreases, thereby reducing pain stimulation. This explains why the group receiving education experienced lower pain levels than the group without education.

In nursing practice, education is a form of independent nursing intervention. Which very important in increase quality service health. Nurse has a role as an educator whose job is to provide information clearly, simply and easily understood patient. Education Which done in a way structured can increase participation patients in the healing process, increasing compliance with therapy, and accelerating the post-operative recovery process.

However thus, there is a number of factor Which can influence success Nursing education on reducing patient pain, such as age, education level, previous surgical experience, psychological condition, culture, and family support. Patients with high levels of anxiety tend to have a more severe pain perception than patients with lower levels of anxiety. calm. By Because That, approach education Which individual And therapeutic very is needed so that the intervention provided is more effective.

Based on the research results and supported by various previous studies, it can be concluded that nursing education has an influence which significantly reduces the level of painful patient post operation. Education nursing help patient understand condition experienced, improving coping skills, reducing anxiety, and increasing patient involvement in the recovery process. Thus, nursing education needs to be implemented in a way optimal as part from intervention non-pharmacological in management postoperative patient pain.

CONCLUSION

Education nursing influential significant to decline level painful patient post-operative. Patient Which given education experience level painful more low compared to patients without education. Nursing education help improve knowledge, ability coping, reducing anxiety, and supporting the patient's recovery process. Thus, nursing education is effectively used as a non-pharmacological intervention in postoperative pain management.

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