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THE EFFECT OF EARLY MOBILIZATION ON PAIN LEVELS IN POST-LAPARATOMY SURGERY PATIENTS IN THE SURGICAL INPATIENT ROOM

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Abstract
Complications that occur in post-laparotomy patients can include impaired tissue perfusion with thrombophlebitis, damage to skin integrity and protection problems in the form of pain. Postoperative pain occurs due to an inflammatory process that can stimulate pain receptors, which release chemicals in the form of histamine, bradychymine, prostaglandins, which cause pain in the patient. When suffering from pain, the patient will feel uncomfortable, if not treated immediately, the pain will have a negative impact on the lung, cardiovascular, digestive, endocrine and immune systems. This study aims to determine the effect of early mobilization on pain levels in patients after laparotomy surgery. The research design uses a pre-test and post-test control group design. The total research sample was 32 respondents using purposive sampling technique. The research instrument for measuring pain levels uses NRS (numerical rating scale). Pain response was measured before and after early mobilization. The statistical test used is the independent T-test. The results of the Independent T-test show a P-value of 0.000 < 0.005, so it can be concluded that there is an influence of early mobilization on the patient's pain level after laparotomy surgery. Based on the results of this research, early mobilization can help patients minimize pain so that the disease healing process will be shortened and it is hoped that hospitals will implement SOPs for early mobilization to reduce pain.

Keywords: laparotomy , early mobilization

INTRODUCTION

Laparatomy is a major surgical procedure that involves making an incision in the abdominal wall with the aim of reaching the problematic part of the abdomen such as cancer, obstruction, bleeding, and perforation. (Darmawidyawati et al. 2022) . Complications that occur in post- *laparotomy patients* can experience tissue perfusion disorders with thrombophlebitis, damage to skin integrity and nursing problems in the form of pain. Postoperative pain occurs due to an inflammatory process that can stimulate pain receptors, which release chemicals in the form of histamine, bradykinin, prostaglandins, which cause pain in patients. When suffering from pain, patients will feel uncomfortable, if not treated immediately, the pain will have a negative impact on the lungs, cardiovascular, digestive, endocrine, and immune systems (Butar-butar and Mendrofa 2023) . Pain management can be pharmacological, non-pharmacological and/or a combination of both. One non-pharmacological technique that can be used to reduce post-operative pain is the early mobilization technique. Early mobilization aims to prevent complications, depression, minimize pain,

accelerate healing, restore patient function as much as possible (Santoso, Firdaus, and Mumpuni 2022) . *The World Health Organization* (WHO) describes *laparotomy patients* in the world increasing every year by 10%. The number of laparotomy patients has reached a significant increase. Indonesia with the highest number of surgical patient cases in 2018 *laparotomy* is ranked 5th, recorded the total number of surgical procedures there are 1.2 million people and an estimated 42% of them are *laparotomy surgical procedures* (Darmawidyawati et al. 2022) . *The Royal Collage of Surgeons* (RCS) reported that postoperative pain was found in 30-70% of patients with moderate to severe degrees in 2010. Other studies have shown that although the incidence of postoperative pain has decreased by 2% each year over the past 30 years, 30% of patients still experience moderate pain and 11% of other patients complain of severe pain (Anita Holdcroft, 2005). Based on the results of a study conducted by Nurhafizah and Erniyati in 2012 at the H. Adam Malik General Hospital, Medan, it showed that most post-abdominal surgery patients experienced moderate pain intensity (57.4%), followed by mild pain intensity (22.2%), and the rest of the patients with pain intensity. The results of Inggrid Dirgahayu's study (2020) early mobilization has a significant effect on reducing pain intensity. Meanwhile, according to research conducted by Des Metasari (2018), it was concluded that there was an effect of early mobilization on reducing pain. From these two studies, it can be concluded that early mobility is effective in reducing the intensity of pain in patients after *laparotomy surgery* . The general objective of this study was to analyze the effect of early mobilization on the level of pain in post-laparotomy patients in the Surgical Outpatient Unit of Grati Hospital, to analyze the difference in pain levels before and after early mobilization in post-laparotomy patients in the experimental group, to analyze the difference in pain levels before and after deep breathing in hospital intervention in post-laparotomy patients in the control group, to analyze the difference in pain levels in post-laparotomy patients in the experimental group and the control group.

RESEARCH METHODS

Research Methods contains: type of research (quantitative, qualitative, Mix, R&D), sampling method, population and sample, analysis tools and reasons for their use. (Font: Book Antiqua 12) This type of research is quantitative research, this research method uses quasi-experiment. This study uses pre-test and post-test control group design, namely the experimental group was given early mobilization treatment, while the control group was given deep breathing treatment according to the hospital SOP, in both groups before and after mobilization, pain levels were measured (pre-post test) then the measurement results after the intervention were compared. The population in this study, the population is all post- *laparotomy patients* at Grati Hospital who meet the inclusion criteria. The sampling technique in this study was the *Purposive sampling technique* . The sample in this study was 16 respondents from each group. This study was conducted in the Bromo and Banyu Biru rooms of Grati Hospital. using the Paired T-Test test to see the level of pain before (pre-test) and after (post-test) in

the experimental and control groups, and the Independent T-Test test to see the difference in pain levels between the intervention and control groups.

RESEARCH RESULTS AND DISCUSSION

General Data

Respondent Characteristics

Table 4.1 Distribution of respondents based on age, education, gender in inpatient care at Grati Regional Hospital 2024 n=32

Variables	Category	Experimental Group		Control Group	
		amount	Presentation	amount	Presentation
Age	20-30	6	37.5	8	50.0
	31-40	2	12.5	5	31.3
	41-50	3	18.8	0	0
	51-60	3	18.8	3	18.8
	61-70	2	12.5	0	0
Education	SD	6	37.5	3	18.8
	JUNIOR HIGH SCHOOL	3	18.8	3	18.8
	SENIOR HIGH SCHOOL	5	31.3	9	56.3
	College	2	12.5	1	6.3
Gender	Man	5	31.3	4	25.0
	Woman	11	68.8	12	75.0

Table 4.1 shows the distribution based on age in the experimental group and control group with a total of 32 respondents . It can be seen that the age of respondents in the experimental group is mostly at the age of 20-30 years with a percentage (37.5%). And the age of respondents in the control group is the most at the age of 20-30 with a presentation (50.0%).

In the distribution based on education, it shows that in the experimental group and the control group, there are a total of 32 respondents . The largest education category is elementary school with (37.5 %) in the experimental group . In the control group, there are more high school respondents. with (5 6.3 %).

In the distribution based on gender, it shows that in the experimental group and the control group with a total of 32 respondents. The gender in the experimental and control groups is more female respondents, in the experimental group with a percentage of (68.8%) female respondents, and in the control group with a percentage of (75.0%) female respondents. However, in this study, the most respondents were female respondents because the most respondents were post-*cesarean section.*

Special Data

The specific data of this study explains the level of pain of post-laparotomy patients in the experimental group before and after being given early

mobilization, the level of pain of post-laparotomy patients in the control group before and after being given intervention according to the Hospital SOP and the difference in pain levels between the experimental groups and the control group of post-laparotomy patients.

Differences in Pain Levels of Post-Laparatomy Patients in the Experimental Group Before and After Early Mobilization

Table 4.2 Pain level of post-laparotomy patients in the experimental group before and after early mobilization in the surgical ward of Grati Hospital 2024

	N	*Minimum*	*Maximum*	*Mean*	*Std Deviation*	*Sig. (2-tailed)*
Pretest	**16**	**5**	**8**	**6.63**	**1 ,204**	
Posttest	**1 6**	**3**	**8**	**5 ,44**	**1, 711**	**0,000**
Valid N	**1 6**					

Table 4.2 shows that the distribution of the average pain level of the experimental group experienced a decrease in the level of pain, namely before early mobilization 6.63 to 5.44 after early mobilization and from the paired t-test difference test on the pre-test and post-test of the experimental group showed a significant result of p = 0.000 which means less than 0.05 so that H0 is rejected H1 is accepted which means there is an influence between the level of pain before and after early mobilization .

Differences in Pain Levels of Post-Laparatomy Patients in the Control Group Before and After Internal Respiratory Intervention at the Hospital

Table 4.3 Pain level of post-laparotomy patients in the control group before and after deep breathing was performed at the hospital intervention in the surgical ward of Grati Hospital 2024.

	N	*Minimum*	*Maximum*	*Mean*	*Std Deviation*	*Sig. (2-tailed)*
Pretest	**16**	**4**	**9**	**6.25**	**1 ,291**	
Posttest	**1 6**	**3**	**9**	**5 ,63**	**1, 408**	**0.003**
Valid N	**1 6**					

Table 4.3 shows that the distribution of the average pain level of the control group experienced a decrease in the pain level, namely before the hospital intervention from 6.25 to 5.63 after the hospital intervention and from the paired t-test on the pre-test and post-test of the control group showed a significant result of p = 0.003 which means less than 0.05 so that H0 is rejected H1 is accepted which means there is an influence of the pain level between before and after the hospital intervention .

Differences in Pain Levels in Post-Laparatomy Surgery Patients Between the Experimental Group and the Control Group

To see the difference in early mobilization on pain levels in post-laparotomy patients, it is seen from the independent t-test difference test between the post-

experimental group and the post-control group. The independent t-test is used to determine the difference in pain levels between respondents with the experimental group and respondents with the control group.

Table 4.4 Analysis of differences in pain levels after post-laparotomy surgery patients between the experimental group and the control group in the surgical ward of Grati Hospital 2024

Group		N	Mean	Sig. (2-tailed)
Post Pain Level	Experimental Group	16	5,438	0,000
	Control Group	16	5,438	

Table 4.5 It can be seen that the results of the Independent T test in the experimental group and the control group obtained a result of p = 0.000, which means it is less than 0.05 so that H0 is rejected and H1 is accepted, which means there is Differences in pain levels in post-laparotomy patients in the experimental group and control group in the surgical ward of Grati Regional Hospital, Pasuruan Regency 2024.

Discussion

Differences in Pain Levels of Post-Laparatomy Patients in the Experimental Group Before and After Early Mobilization.

The results of this study indicate that the difference test of paired t test on the pre-test and post-test of the experimental group showed a significant result of p = 0.000 which means less than 0.05 so that H0 is rejected H1 is accepted which means there is an influence between the level of pain before and after early mobilization . The level of pain in the experimental group decreased, namely before being given early mobilization with an average value of 6.63 to 5.44 after being given early mobilization, which indicates a decrease in the level of pain after being given early mobilization.

Based on the results of this study, from the analysis of the general distribution based on the experimental group, the analysis based on age showed that the age of 20-30 years experienced the most pain with a percentage (37.5%), age is one of the factors that affects a person's pain level because the older the person is, the more they can control the pain they experience. In adults, neurological changes can occur and there is a decrease in sensory perception of stimuli and an increase in pain threshold with age. where age indicates a measure of the growth and development time of an individual. Age correlates with experience, experience correlates with knowledge, understanding and views on a disease or event so that it will form perceptions and attitudes. It was found that most younger age groups tend to experience severe pain responses compared to adult age groups (Lukman, 2011). According to the description based on age, it can be concluded from the results of the study that researchers in the 20-30 year old age group feel more pain because of the experience of never having had surgery before, experience correlates with knowledge, understanding and views on a disease or event so that it will form perceptions and attitudes.

In the analysis based on education, the most results were in elementary school education who experienced pain with a percentage of 37.5% with 6 respondents. In the big Indonesian dictionary, education is the process of changing a person's attitude and behavior in an effort to mature humans through teaching and training efforts. This is related to coping strategies, namely the consequences of each individual to assess a situation. According to Notoadmodjo (2010), the level of education is one of the determining factors for behavioral changes, where the higher the level of education of a person, the more materials, materials and knowledge they have to achieve good behavioral changes. According to Lukman (2011), respondents with higher education are better able to use their understanding in responding to events adaptively compared to groups of respondents with lower education. The level of education has a negative relationship with the perception of pain, the lower the education causes an increase in pain intensity and disability due to pain. In nursing assessments, the level of education is needed because it is closely related to the level of patient knowledge about pain management. The level of education is often associated with knowledge, therefore someone with higher education is assumed to be easier to absorb information, so that in providing nursing care it can be adjusted to the level of education. Education level is one of the factors that determines the patient's level of understanding in dealing with the pain they experience.

In the analysis based on gender, male respondents with a percentage of 31.5% with 5 respondents while female respondents with a percentage of 68.8% with 11 respondents. Previous studies have stated that gender has an important role in pain perception. In general, women feel more pain than men. Biological and psychological factors are considered to play a role in influencing differences in pain perception between genders. Hormonal conditions in women also affect pain. In women, it was found that the hormones estrogen and progesterone play a major role in patient pain sensitivity. The hormone estrogen is known to have a pronociceptive effect that can stimulate the central and peripheral sensitization process, the hormone progesterone has an effect on reducing the pain threshold (Joiyce, 2020). This shows the reason why women tend to feel more pain than men.

There are non-pharmacological management for pain, pharmacological and non-pharmacological pain management, including non-pharmacological management is Early mobilization is one way to relax muscles and get used to doing activities from simple to more complex. Post-laparotomy patients feel healthier and stronger with early mobilization or early ambulation. With right and left tilting movements 5 hours after surgery, the abdominal and pelvic muscles will return to normal, so that the abdominal muscles become strong again and can reduce pain (Pristahayuningtyas, 2015). Early mobilization is carried out after the patient is conscious from the effects of anesthesia and immediately after surgery. Mobilization exercises are carried out to prevent complications, prevent decubitus, stimulate peristalsis and reduce pain (Hidayat, 2006).

Based on the description above, according to the researcher's opinion, early mobilization is basically a non-pharmacological management that has a major influence on the level of pain with simple movements with strength originating from within that helps restore stiff abdominal muscles after surgery, thus triggering the release of norepinephrine and serotonin. The release of these compounds stimulates or modulates the descending control system. In the descending control system there are two things, the first is the release of substance P by delta-A and delta-C neurons. The second thing is that mechanoreceptors and beta-A neurons release endogenous opiate inhibitory neurotransmitters such as endorphins and dynorphins. This becomes more dominant in closing the defense mechanism by inhibiting substance P. Inhibition of substance P reduces nerve transmission to the central nervous system, thereby reducing pain perception (Smeltzer & Bare, 2002). then the pain experienced after surgery can be reduced.

Differences in Pain Levels of Post-Laparatomy Patients in the Control Group Before and After Internal Breathing Intervention at the Hospital.

The results of this study indicate that the difference test of paired t test on the pre-test and post-test of the experimental group showed a significant result of *p* = 0.000 which means less than 0.05 so that H0 is rejected and H1 is accepted which means that there is an influence between the level of pain before and after the hospital intervention, the level of pain in the control group only decreased slightly, namely from an average value of 6.25 before the hospital intervention and to 5.63 after the hospital intervention was given.

Based on the results of this study, from the analysis of the general distribution based on the control group, the analysis based on age showed the same results as in the experimental group showing that at the age of 20-30 years the most experienced pain with a percentage (50.0%) with 8 respondents, based on the description above it can be concluded from the results of the study that the 20-30 year old age group felt more pain due to experience, experience correlates with knowledge, understanding and views on a disease or event so that it will form perceptions and attitudes. But in the control group the pain decreased due to the influence of the hospital intervention given.

In the analysis based on education showed the most results in high school education who experienced pain with a percentage of 56.3% with 9 respondents, the level of education is one of the factors that determine the level of patient understanding in dealing with the pain experienced. But in the control group the pain decreased due to the influence of the hospital intervention given.

In the analysis based on gender in male respondents with a percentage of 25.0% with 4 respondents while in female respondents with a percentage of 75.0% with 12 respondents the data shows similarities with the experimental group which shows women tend to feel more pain than men. But in the control group the pain decreased due to the influence of the hospital intervention given.

Seeing the interventions given according to the hospital SOP for non-pharmacological pain management by providing deep breathing relaxation.

According to Potter & Perry (2012) Relaxation techniques can provide individuals with self-control when there is discomfort or pain, physical and emotional stress on pain (Smeltzer & Bare, 2002).
Based on the description above, according to the researcher's opinion, patients in the control group received deep breathing intervention according to the hospital's nursing SOP, namely being taught deep breathing relaxation in order to increase alveolar ventilation, maintain gas exchange, reduce lung atelectasis, make coughing more effective, reduce stress and reduce anxiety so that some patients experienced a decrease in pain. However, in the control group, respondents did not receive special assistance from the room nurse so that the effectiveness of deep breathing relaxation was less.

Differences in Pain Levels in Post-Laparatomy Surgery Patients Between the Experimental Group and the Control Group

To find out whether early mobilization affects the level of pain in postoperative patients, the researcher conducted an Independent T test on the experimental group with the control group as listed in table 4.5. The results of the study on the level of pain in the experimental and control groups showed that the *p value* = 0.000 was less than 0.05 so that H0 was rejected H1 was accepted, which means that there was a difference in the level of pain in the experimental group after being given early mobilization with the control group who were given deep breathing intervention according to the SOP at the hospital. This is in accordance with the research conducted by Sri Wahyuni 2017 in a journal entitled "The Effect of Early Ambulation on the Recovery of Post Abdominal Surgery Patients at Medan City Hospital" where the research showed that there was an effect of early ambulation on reducing pain.
Respondents in the control group and experimental group after *laparotomy* surgery receive painkillers that work by blocking the production of natural substances in the body that cause inflammation. This effect helps reduce pain through the mechanism of inhibiting pain stimuli both centrally and peripherally. It is suspected that one of the factors that influences the decrease in pain levels is the painkiller given to the respondents (Potter & Perry, 2012).
According to the researcher's opinion, after conducting an independent t-test, it can be concluded that the early mobilization experimental group is an effort to maintain independence as early as possible by guiding patients to maintain physiological functions. The influence of early mobilization plays an important role in reducing pain levels, namely triggering the release of norepinephrine and serotonin. The release of these compounds stimulates or modulates the descending control system. In the descending control system, there are two things, the first is the release of substance P by delta-A and delta-C neurons. The second thing is that mechanoreceptors and beta-A neurons release endogenous opiate inhibitory neurotransmitters such as endorphins and dynorphins. This becomes more dominant in closing the defense mechanism by inhibiting substance P. Inhibition of substance P reduces nerve transmission to the central nervous system, thereby reducing pain perception, which seems to invite

patients to do activities by doing some movements so that patients forget about pain.

In the control group, deep breathing distraction technique is a form of nursing care, in which the nurse teaches deep breathing techniques, slow breathing and exhaling gradually, this can reduce pain, increase lung ventilation and increase blood oxygen. Deep breathing relaxation can increase alveolar ventilation, maintain gas exchange, reduce lung atelectasis, make coughing more effective, reduce stress and reduce anxiety so that patients experience decreased pain.

It is concluded that in the experimental group early mobilization affects the level of pain in post-laparotomy patients with special assistance so that early mobilization can minimize the level of pain with the knowledge provided by researchers about the benefits and objectives of early mobilization that will be given so that patients no longer complain about the bad effects that will be caused when doing early mobilization, the benefits of mobilization can also accelerate patient recovery when doing early mobilization to smooth blood circulation so that the abdominal muscles and return to normal so as to accelerate wound healing. In the control group, patients did not get special assistance from the room nurse so that the effectiveness of deep breathing relaxation on the pain felt by patients after surgery was lacking.

CONCLUSION

The conclusion describes the answer to the hypothesis and/or research objectives or findings obtained. The conclusion does not contain a repetition of the results and discussion, but rather a summary of the findings as expected in the objectives or hypotheses. In the conclusion, also write suggestions and limitations of the research related to the research that has been carried out.

Based on the results of the research and discussion and answering the research objectives regarding the effect of early mobilization on the level of pain in post-laparotomy patients in the Surgical Care Unit of Grati Regional Hospital, Pasuruan Regency in 2024, the following conclusions can be drawn from this study:

There is an effect of decreasing the level of pain with the result of $p = 0.000$ which means less than 0.05 which means there is an effect between the level of pain before and after early mobilization. With an average level of pain in the experimental group before and after being given early mobilization from 6.63 to 5.44. There is an effect of decreasing the level of pain with the result of $p = 0.003$ which means less than 0.05 which means there is an effect between the level of pain before and after the intervention of the hospital, with an average level of pain in the control group before and after being given the intervention of 6.25 to 5.63. There is a difference in the level of pain in post-laparotomy surgery patients in the experimental group and the control group with the result of $p = 0.000$ which means less than 0.05 which means there is a difference in the level of pain in the experimental group and the control group.

The limitation of this study is that early mobilization was only carried out once and the pain level was immediately measured so that early mobilization only

minimized the pain level by diverting the patient's focus of attention from the pain.

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