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The Effect of Passive Range of Motion on Recovery Time in Post-Operative Patients in the Recovery Room of Brawijaya University Hospital Malang

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ABSTRACT

Recovering from general anesthesia is a risk factor for morbidity and mortality in any operation. One of the main complications after anesthesia is delayed recovery. This study aims to determine the effect of passive ROM mobilization on the recovery time of post-operative patients with general. This type of research is quantitative with a research design quasy experienceuse Post-test Only non-equivalent Control Group Design. The population is patients who underwent surgery with general anesthesia, amounting to 40 people. Sampling using consecutive sampling with a total sample of 40 people divided into 2 groups, the control group of 20 people and the experimental group of 20. Measuring tool using observation score Aldred and patient recovery time. The data was analyzed using Paired T-test. The results of the study showed that most of the control group respondents experienced recovery time of >15 minutes (65%) and most of the experimental group respondents experienced <15 minutes of recovery time (70%). The nurse immediately did Range Of Motion Passive after the patient finished surgery with general anesthesia in order to help expel secretions in the respiratory tract, accelerate peripheral circulation to support optimal respiratory function, and improve the body's metabolism and physiology of vital organs that affect recovery.

Keywords: Range of motion, General anesthesia, Recovery time, Consiousnes

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1. INTRODUCTION

The post-operative nursing process is the final period of perioperative nursing with the aim of stabilizing the patient's condition in a state of physiological equilibrium of the patient so that the patient avoids pain and complications. (Perry and Potter, 2019). Recovery of patient consciousness after surgery with general anesthesia should be carried out in an appropriate and correct way in the recovery room. The action aims to maintain

the respiratory system and hemodynamics of the patient's body so as to avoid complications. Unpleasant conditions due to post-surgical stress that are likely to be experienced by patients can be in the form of respiratory problems, cardiovascular system disorders, feelings of anxiety, pain, nausea, vomiting, chills and bleeding. Within 30 minutes after the administration of the anesthetic drug was stopped and the patient was not conscious, it can be said that a delayed conscious recovery occurred. Patients who experience post-operative complications with general anesthesia who are not treated properly will have an impact on patient death. Complications that often occur include airway obstruction, bronchospasm, nausea, vomiting, hypertension, tachycardia, hypothermia, hyperthermia and restlessness. (Brunton, 2015).

The prevalence of death in the United States averages 0.2 - 0.6% from surgery and death caused by anesthesia is around 0.03 - 0.1% of all anesthesia given. (Nainggolan, 2016). According to the results of Sudiono's research (2018) that there are differences in the alderete score in post-operative patients with general anesthesia who are given physical movement or early mobilization treatment in the 5th minute of the patient in the recovery room with a score of 8, in the 10th, 15th and 20th minutes a score above 8 was obtained, and at 25 and 30 minutes it was at a score of 10. The time to recover to consciousness needed by each post-operative patient is different; some recover quickly and some are late.

The post-operative nursing process is the final period of perioperative nursing with the aim of stabilizing the patient's condition in a state of physiological equilibrium of the patient so that the patient avoids pain and complications. (Perry and Potter, 2019). Recovery of patient consciousness after surgery with general anesthesia should be carried out in an appropriate and correct way in the recovery room. The action aims to maintain the respiratory system and hemodynamics of the patient's body so as to avoid complications. Unpleasant conditions due to post-surgical stress that are likely to be experienced by patients can be in the form of respiratory problems, cardiovascular system disorders, feelings of anxiety, pain, nausea, vomiting, chills and bleeding. Within 30 minutes after the administration of the anesthetic drug was stopped and the patient was not conscious, it can be said that a delayed conscious recovery occurred. Patients who experience post-operative complications with general anesthesia who are not

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treated properly will have an impact on patient death. Complications that often occur include airway obstruction, bronchospasm, nausea, vomiting, hypertension, tachycardia, hypothermia, hyperthermia and restlessness. (Brunton, 2015).

Positioning or passive range of motion in post-operative patients with general anesthesia should be done every 15-30 minutes so that patients avoid complications. One of the fundamental complications experienced by patients after administration of anesthesia is the delay in recovering consciousness, approximately 90% of patients will experience a full conscious recovery within 15 minutes. Patients who recover consciousness more than 15 minutes after the anesthesia is stopped will experience prolonged periods where patients usually have a slow response stimulant around 30-45 minutes after anesthesia. This condition is due to the influence of residual sedation from inhalation of anesthetic drugs, a long surgical process, and obese patients which causes patients to experience delays in recovering consciousness. (Mecca, 2016).

Early mobilization is a positional movement performed on patients after surgery. This early mobilization can be done in bed by doing simple movements such as tilting right and left and sitting exercises until you can get out of bed, practice walking to the bathroom and leave the room. Not all patients will dare to do it, most patients are afraid of the stitches bleeding and being damaged. It should be noted that a number of things can happen if mobilization is not as early as possible, including inhibiting the wound healing process, the skin on the back becoming chafed due to prolonged pressure lying down, the body becomes more easily tired and feeling sore due to lack of movement, these conditions will add to the long day of hospitalization. (Pristahayaningtyas, 2015).

Moving all joints both passively and actively will help prevent muscle atrophy, prevent pressure sores, increase digestive tract muscle tone, stimulate intestinal peristalsis, increase metabolic rate, and improve cardiovascular and lung circulation so that it will prevent postoperative complications and speed up the recovery process. (Saryono, 2015).

2. METHODS

This research design is quantitative with quasy experimental design using a post-test only non-equivalent control group design. The research was conducted in the recovery room of the Brawaijaya University Hospital, Malang. The population is all post-operative patients

and the sample is post-operative patients with general anesthesia. The sample consisted of 40 patients which were divided into 2 groups, namely the control group of 20 patients and the treatment group of 20 patients. The sampling technique used is consecutive sampling.

The data collection instrument used the Aldrete score sheet checklist to measure the time to recover to consciousness and the ROM observation checklist sheet to assess passive mobilization performed on patients. Data analysis used univariate and bivariate percentage frequency distributions. The univariate analysis produces each variable's frequency and percentage distribution, while the bivariate analysis analyzes the 2 related variables. This study uses analysis with the Paired T-test, this analysis is to determine whether there is an effect of passive ROM mobilization on the conscious recovery time of post-operative patients with general anesthesia.

3. RESULTS

Characteristics of Respondents

Table 1. Characteristics of Respondents Based on Gender, age, and type of work (n control = 20, n treatment = 20)

Characteristics of Respondents	Control		Treatment	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Gender				
Male	12	60	10	50
Female	8	40	10	50
Age				
25 - 35	6	30	9	45
36 - 45	10	50	5	25
46 - 55	4	20	6	30
Work				
Private	9	45	10	50
civil servant	8	40	3	15
Doesn't work	3	15	7	35

Based on Table 1, it was found that the gender in the treatment group was the same number of males and females, while in the control group most of the respondents were male. In the treatment group, almost half of the respondents were aged 25-35 years and half were over 36 years old. The type of work in the treatment group was mostly private and almost half of the 7 respondents (35%) did not work, while in the control group, the numbers were balanced between private and civil servants.

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Table 2. Characteristics of respondents based on Aldrete Score (n control = 20, n treatment = 20)

Recovery time (minutes)	Control		Treatment	
	Frequency	Percentage (%)	Frequency	Percentage (%)
‹ 15	7	35	14	70
›15	13	65	6	30

Based on Table 2, it was found that the results of the Aldrete score in the treatment group were mostly 14 respondents (70%) had a conscious recovery time of less than 15 minutes and as many as 6 respondents (30%) had a conscious recovery time of more than 15 minutes. In the control group, most 13 respondents (65%) had time to recover more than 15 minutes, while 7 respondents (35%) had less than 15 minutes.

The effect of passive ROM on conscious recovery time

Table 3. The average value using the T-Paired test (n = 84)

Recovery time	Mean	t	Sig.	α = 5%
Treatment	13.55	3.929	0.001	0,05
Control	18.15			

In Table 3, it was found that the results of the paired T-test showed a value of p = 0.001 (p ‹0.005) thus there was a difference in the time to recover to consciousness between the treatment group and the control group.

4. DISCUSSIONS

The analysis of recovery time in post-operative patients with general anesthesia in the treatment group based on the Aldrete Score

The results of the aldrete score in the treatment group, show most of the 14 respondents (70%) had a conscious recovery time of less than 15 minutes and as many as 6 respondents (30%) had a conscious recovery time of more than 15 minutes. In this group, the researchers gave the same treatment to 20 respondents in the form of passive exercises or passive ROM according to the SOP from the hospital. Giving passive ROM is carried out in the recovery room after the patient has undergone surgery, so the patient is still unconscious. Giving passive ROM is done slowly and carefully while still paying attention to the patient's respiratory system and hemodynamics. Giving passive ROM is carried out for 5-10 minutes per patient, starting from the movement of the

shoulder joint, movement of the elbow joint, movement of the forearm, movement of the wrist and fingers, movement of the groin joint, knee joint, ankle and toes.

This is in accordance with Budi's opinion (2015) Passive range of motion can affect systems in the body, starting from the cardiovascular system, respiratory system, metabolic system and musculoskeletal system so that it can stimulate conscious recovery time in patients undergoing post-surgery. Some of the benefits of motion exercises are to increase muscle strength and endurance and improve blood flow and oxygen supply to the tissues to speed up the wound healing process. Passive ROM exercises can be done with a range of motion exercises for all joints within their normal range, what needs to be considered is the need to do it intensively to maintain muscle tone and function, prevent joint disability and help improve motor function.

However, the results were that not all 20 respondents had time to recover consciously above 15 minutes, most of the 14 respondents (70%) were able to recover consciously in less than 15 minutes, this was because the 14 respondents were dominated by female respondents and were under 45 years old, where this age still in the young adult category where the hemodynamic system is still good so that the response is fast to the effects of anesthetic drugs. One factor that influences ROM results is gender, where ROM performed on female patients is better and more effective than male patients so the impact is faster when they recover (Pristahayuningtyas Rr,c.Y. (2015).

Whereas 6 respondents (30%) were patients aged over 46 years who were already in the pre-elderly category, where there was a physiological setback so that their response to anesthetic drugs was getting slower, and some respondents were in an unemployed status so that daily physical activity was also very light and will affect the strength of the muscles and the respiratory and cardiovascular systems. The ability to mobilize a person is influenced by several factors, including the age factor. The older a person is, the muscle tone will decrease so the ability to mobilize will decrease. The older a person is, the more it will affect his recovery time. In old age there will be an increase in sensitivity to anesthetic drugs, namely opioids and benzodiazepines, due to a decrease in the function of the central nervous system resulting in a decrease in the process of drug metabolism, the impact is a slowed response to conscious time after administration of anesthetic drugs. (Permatasari, 2017).

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The analysis of recovery time in post-operative patients with general anesthesia in the control group based on the Aldrete Score

The results of the Aldrete score in the control group were mostly 13 respondents (65%) had a conscious recovery time of more than 15 minutes, while 7 respondents (35%) had a recovery time of less than 15 minutes. In this group, researchers did not provide passive ROM treatment to patients but still provided supervision of the respiratory system and its hemodynamics so that the patient remained under the monitoring of the duty officer. The respondent will be assessed for recovering consciousness and the score will be recorded using the Aldrete score and the time for recovering consciousness will be recorded.

The result was that 13 respondents had a conscious recovery time of more than 15 minutes and only 7 respondents were able to be conscious in less than 15 minutes. This is because of the 7 respondents, most of the patients were female and young, ranging from 25-35 years and the average patient was an active worker before getting sick. Patients who were active workers before will determine their level of physical endurance. Every movement will increase muscle tone so that the muscles in the respiratory system and the muscles in the cardiovascular system are maintained. When you are sick and the body receives side effects from anesthetic drugs, the body quickly responds to them and recovers quickly when it wakes up. Some of the risk factors that can affect the recovery time of post-operative patients with general anesthesia are age, ASA drugs and the type of anesthetic drug used. At a young age, the side effects of anesthetic drugs can be quickly recovered by the body's hemodynamic system properly so as to speed up metabolic processes and recover consciously after anesthesia. At a young age, pathological mobility in the musculoskeletal system can respond quickly by accelerating the time to recover consciousness. (Agustin, 2017)

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The results of the paired T-test showed a value of $p = 0.001$ ($p < 0.005$) thus there was a difference in the time to recover to consciousness between the treatment group and the control group. So it can be concluded that there is an effect of passive ROM on conscious recovery time.

In this study, it was shown that there was an influence between passive ROM performed by nurses in post-operative patients with general anesthesia on their recovery time. Nurses always provide

passive ROM measures on an ongoing basis so that it has an impact on the speed of recovery time. That passive ROM will accelerate blood circulation in the patient's body so as to help the effects of anesthesia gradually subside or disappear in the body and this condition will change the Aldrete score to be better and the patient will immediately move to the treatment room.

The results of this study are supported by the results of research from Permatasari (2017) which said that passive range of motion in post-operative patients with general anesthesia can increase respiration rate and increase oxygen saturation. Passive ROM exercises after surgery patients that are performed as early as possible and are carried out correctly and on an ongoing basis will have an impact on the flexibility of the joints, increase the patient's muscle strength and functional abilities. (Permana, Nurchayati, Herlina, 2015).

Post-surgical mobilization helps restore physiological functions that have been disrupted due to the effects of anesthetic drugs. Mobilization exercises have a good effect on the speed of recovery of intestinal peristalsis, with an average speed of 18 minutes faster than in patients who were not mobilized early. (Promono, 2015)

According to researchers, giving passive ROM to post-operative patients with general anesthesia is very important to minimize the occurrence of complications due to the impact of anesthetic drugs. Many factors influence the success of passive ROM, including the limited number of nurse human resources, the level of knowledge of nurses about ROM, the availability of SOPs in each hospital and the role of hospital management.

5. CONCLUSIONS

Most of the 13 respondents (65%) in the control group who were not given passive ROM treatment had a conscious recovery time of more than 15 minutes. Most of the 14 respondents (70%) in the group that were given passive ROM treatment had a conscious recovery time of less than 15 minutes. The results of the paired T-test showed a value of p = 0.001 (p <0.005) thus there was a difference in the time to recover to consciousness between the treatment group and the control group, so it can be concluded that there is an effect of passive ROM mobilization on conscious recovery time.

AUTHOR CONTRIBUTIONS

Substantial contributions to conception, data collection, and analysis:

Mujiadi and Atikah Fatmawati. Writing manuscript: Atikah Fatmawati. Manuscript revisions: Mujiadi.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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