THE EFFECT OF DEEP BREATH RELAXATION TECHNIQUE ON PAIN REDUCTION IN FRACTURE PATIENTS

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ABSTRACT
Deep Breathing Relaxation Technique is a nursing action to teach patients how to take deep breaths from the nose and exhale through the mouth slowly. Besides being able to reduce pain intensity, deep breathing relaxation techniques can also reduce anxiety levels. Fracture or better known as a broken bone is a condition when a bone becomes cracked, broken or broken so that it changes the shape of the bone itself. The aim of this study was to determine the effect of deep breathing relaxation techniques on reducing pain in fracture patients at SALAK Hospital, Bogor City in 2022. This type of research was a quasi-experimental with a pretest – posttest with group design. Each treatment group is different, the intervention group received the Deep Breathing Relaxation Technique intervention, while the control group received therapy according to hospital standards. The method of sampling in this study used a purposive sampling technique with a total sample of 32 patients with each group consisting of 16 respondents in the intervention group and 16 respondents in the control group. Based on the results of the Hypothesis Test using the Independent T-test and Paired T-test with a P Value of 0.00 (P Value <0.05) and the mean mean in the group before the Deep Breathing Relaxation Technique was 3.13 while the group after performed Deep Breathing Relaxation Technique, namely 2.31, it means that Ho is rejected, Ha is accepted.

Keywords: Deep Breathing Relaxation, Reduction of Pain, Fractures

INTRODUCTION

Fracture or better known as a broken bone is a condition when a bone becomes cracked, broken, or broken so that it changes the shape of the bone itself. Most cases of fracture occur due to strong pressure on the bone.[1]

According to the World Health Organization, the World Health Organization (WHO) in 2019 stated that the incidence of fractures is increasing, approximately 15 million people have recorded fractures with a prevalence rate of 3.2%. Fractures in 2018 there were approximately 21 million people with a prevalence rate of 4.2% and in 2017 it increased to 20 million people with a prevalence rate of 3.8% due to traffic accidents.[3]The number of patients with pain in fractures, in 2019 stated that pain in fractures was 135 million people with a prevalence rate of 1.3%. Pain in fractures in 2018 there were 148 million people with a prevalence rate of around 1.9% and in 2017 there were 140 million people with a prevalence rate of around 2.1%.

According to Riskesdes (2018), the parts of the body that were most injured were the lower extremities (67%), upper extremities (32%), head injuries (11.9%), back injuries (6.5%), chest injuries (2). .6%), and abdominal injuries (2.2%). The three most common sequences of permanent

physical disability due to injury are permanent scars/disturbing comfort (9.2%), loss of part of the body (0.6%), and loss of senses (0.5%). According to Desiartama & Aryana (2018), in Indonesia the most common fracture cases are femur fractures by 42% followed by humerus fractures by 17%, tibia and fibula fractures by 14% where the biggest cause is traffic accidents which are usually caused by car, motorcycle accidents or recreational vehicles by 65.6% and fell by 37.3%,[4]The number of patients with fracture pain, namely those who experience moderate to severe pain, is 41%.

In West Java, the most common cases of femur fracture were 39%, followed by humerus fractures (15%), tibia and fibula fractures (11%), where the biggest cause of femur fractures was traffic accidents which were usually caused by car, motorbike, or car accidents. or recreational vehicles (62.6%) and falls from heights (37.3%) and the majority are men (63.8%). The incidence of femoral fractures in women is the second highest (17.0 per 10,000 person-years) and seventh in men (5.3 per person-year). The peak age distribution of femoral fractures is in adults (15-34 years) and the elderly (over 70 years). Whereas in Bogor City it is (8.0%) and in Bogor Regency it is (3.5%). Acute pain in West Java reaches 42% with an incidence of 17% in men and 25% in women.

In Bogor City, fracture cases were 67% for male sex and 33% for female sex. Based on age, most of 81% are aged 21-40 years, a small portion of 17% are aged 41-65 years. While pain in fractures based on the type of fracture, namely lower extremity pain as much as 73% and upper extremity pain as much as 27%.

Data were obtained from patients at SALAK Hospital, Bogor City, which caused fractures, including 3.8% falling events, 1.7% being stabbed by a sharp or blunt object which can occur in domestic or household accidents which have a prevalence, work accidents and sports accidents.

The main causes of fractures are single trauma events such as impact, beating, fall, irregular position or tilt, dislocation, pulling, abnormal weakness in the bone (pathological fracture). Another impact that arises in fractures is that they can experience changes in the part of the body affected by the injury, feel anxious due to pain and pain.[2]

Fracture patients who usually experience pain will be seen from the increase in the pain scale. The way to find out the pain scale can use a numerical measuring instrument or the Numerical Rating Scale (NRS) is used instead of a descriptive tool. Clients rate pain using a scale of 0-10.[5]

Pain management can be carried out with pharmacological and non-pharmacological measures. Some of the medicine used to treat pain requires a doctor's prescription, the use of drugs is included in the management of clients for pharmacological therapy, while non-pharmacological interventions can be given to reduce the pain of clients who suffer from pain. Non-pharmacological therapy includes deep breathing relaxation techniques.

Deep breathing relaxation technique is a nursing action to teach patients how to take deep breaths from the nose and exhale slowly through the mouth. Besides being able to reduce pain intensity, deep breathing relaxation techniques can also reduce anxiety levels.[6]

This deep breathing relaxation technique can be trusted to reduce pain intensity by relaxing the spasmodic skeletal muscles caused by increased prostaglandins resulting in vasodilation of blood vessels and will increase blood flow to spasmodic and ischemic areas. Deep breathing relaxation involves the musculoskeletal system and respiration and does not require tools, so it is easy to do

whenever or whenever pain occurs.[7]Relaxation techniques can reduce pain by relaxing the muscle tension that supports pain. The relaxation technique consists of slow, rhythmic abdominal breathing. The patient can close his eyes and breathe slowly and comfortably.[8]The purpose of deep breathing relaxation techniques is to increase alveoli ventilation, maintain gas exchange, prevent lung atelectasis, increase cough efficiency, reduce physical and emotional stress, namely pain intensity and reduce anxiety.

Deep breathing exercises are an effective way of breathing through inhaling and exhaling to achieve slow, relaxed breaths. Provide a sense of comfort to patients who experience pain by guiding patients to perform relaxation techniques.[9]Of the 45,987 falls, 1,775 people (3.8%) suffered fractures, 1,770 people (8.5%) of 20,829 traffic accident cases suffered fractures, of 14,127 sharp/blunt trauma, 236 people suffered fractures (1, 7%).[10]

Non-pharmacological pain therapy such as deep breathing relaxation techniques has a very low risk. Handling pain by performing relaxation techniques is a nursing action taken to reduce pain. Several studies have shown that deep breathing relaxation is very effective in reducing postoperative pain.[11]

The purpose of this research isto knowThe Effect of Deep Breathing Relaxation Techniques on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.

RESEARCH METHODS

This research is a type of quasi-experimental research with the form of pretest – posttest with group design. In this design the respondents used for research were not selected randomly. This study seeks to reveal a causal relationship by involving a control group in addition to the experimental group. Before being given the intervention the respondent measured the pain scale first (pretest), then the respondent was given an intervention or treatment, after that the respondent was measured again on the pain scale after a few days of being given the intervention.

This research was carried out on August 18 2022 – August 26 2022 in the Mawar Room of SALAK Hospital, Bogor City. The population in this study were all inpatient fracture patients in the Mawar Room of SALAK Hospital, Bogor City, totaling 80 patients. For the sampling technique using purposive sampling, namely the sample size in which respondents who meet the research criteria are included in the study for a certain period of time, so that the required number of patients is met. Each treatment group was different, the intervention group received the Deep Breathing Relaxation Technique intervention, while the control group received therapy according to hospital standards, totaling 16 respondents to the intervention group and 16 respondents to the control group.

The variables studied included Deep Breathing Relaxation Techniques (Independent Variable) and Reduction of Pain (Dependent Variable). Data processing in this study was carried out using a computer unit using the Microsoft Excel 2010 software program or IBM SPSS Statistics 2.5.

The analysis consists of the characteristics of the respondents which contain the biodata of the respondents and the research results which consist of the Normality Test, Homogeneity Test and Hypothesis Test.

RESEARCH RESULT

Table 1: Frequency Distribution of Respondents' Characteristics

No	Classification	Group			
		F	Percent Relaxation Technique	F	Percent Control Technique
1	Age				
	12-16 years	2	12.5%	1	6.3%
	17-25 years	6	37.5%	8	50.0%
	26-35 years	4	25.0%	3	18.8%
	36-45 years	2	12.5%	1	6.3%
	46-55 years	1	6.3%	2	12.5%
	56-65 years	1	6.3%	1	6.3%
	Total	16	100%	16	100%
2	Gender				
	Man	12	75.0%	14	87.5%
	Woman	4	25.0%	2	12.5%
	Total	16	100%	16	100%

Source : SPSS Version 25

Table 1 can be seen that the results of the characteristics of the respondents with the following classification:

a. Age

Most of the respondents' ages in the Deep Breathing Relaxation Technique group were 17-25 years with a frequency value of 6 and 37.5% percent while for the control technique group were 17-25 years with a frequency value of 8 and 50.0% percent.

b. Gender

Most of the sexes of the respondents in the Deep Breathing Relaxation Technique group were men with a frequency value of 12 and 75.0% percent while for the control technique group were men with a frequency value of 14 and 87.5% percent.

Table 2: Before being given the Deep Breathing Relaxation Technique for Reducing Pain

No	Intervention	N	*Means*	*SD*	*P Value*
1	Before doing deep breathing relaxation techniques	16	3.63	0.500	0.03

Source : SPSS Version 25

Based on table 2, it is known that the results of the hypothesis test in the group before being given the Deep Breathing Relaxation Technique for Reducing Pain, the average value (mean) before the intervention was carried out obtained a result of 3.63 and a standard deviation value of 0.500. The results of the Independent test obtained a P value = 0.03, which means that there is an influence of Deep Breathing Relaxation Techniques on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022 with a p value ≤ 0.05.

Table 3: After being given the Deep Breathing Relaxation Technique for Reducing Pain

No	Intervention	N	*Means*	*SD*	*P Value*
1	After doing a deep breathing relaxation technique	16	3,25	0.214	0.01

Source : SPSS Version 25

Based on table 3 it is known that the results of the hypothesis test in the group after being given the Deep Breathing Relaxation Technique for Reducing Pain obtained an average value (mean) after being given the intervention to get a result of 3.25 and a standard deviation value of 0.214. The independent test results obtained a P value = 0.01, which means that there is an effect of deep breathing relaxation techniques on reducing pain in fracture patients at SALAK Hospital, Bogor City in 2022 with a p value ≤ 0.05.

Table 4: Before the Deep Breathing Relaxation Technique and the group After the Deep Breathing Relaxation Technique is done

No	Intervention	N	*Means*	*SD*	*P Value*
1	Before doing deep breathing relaxation techniques	16	3,13	0.806	0.00
2	after deep breathing relaxation techniques	16	2,31	0.602	0.00

Source : SPSS Version 25

Based on table 4, it is known that the results of hypothesis testing in the 2 treatment groups before deep breathing relaxation techniques were carried out and after deep breathing relaxation techniques were carried out, the average value (mean) in the group before deep breathing relaxation techniques was carried out was 3.13 and the value the standard deviation was 0.806 while the average value (mean) in the group after deep breathing relaxation techniques was obtained was 2.31 and the standard deviation value was 0.602. The results of the Paired t-test obtained a P value = 0.00, which means that there is an influence of Deep Breathing Relaxation Techniques on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022 with a p value ≤ 0.05.

DISCUSSION

1) To find out before being given the Deep Breathing Relaxation Technique for Reducing Pain

Based on the table, it shows that the average value (mean) before the intervention of the Deep Breathing Relaxation Technique for Reducing Pain resulted in a result of 3.63 and a standard deviation value of 0.500. The results of the Independent Test test obtained a P value = 0.03, which means that there is an effect of the Deep Breathing Relaxation Technique on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.

This research is in line with research conducted by Lela Aini and Reza Reskita (2018) with the title "The Effect of Deep Breathing Relaxation Techniques on Reducing Pain in Fracture Patients at RSI Siti Khadijah Palembang" with the result P Value = 0.001 where (P Value <0.05).

In general, there are two factors that affect the Deep Breathing Relaxation Technique for Reducing Pain, namely by relaxing the skeletal muscles that experience spasm caused by an increase in prostaglandins so that vasodilation occurs in blood vessels and will increase blood flow to areas experiencing spasm and ischemia, relaxation techniques Deep Breath is believed to be able to stimulate the body to release endogenous opioids, namely endorphins and enkephalins.

Another statement states that reducing pain by deep breathing relaxation techniques is caused when a person performs deep breathing relaxation to control the pain felt, then the body will

increase the parasympathetic nerve component in a stimulant manner, then this causes a decrease in levels of the hormones cortisol and adrenaline in the body which affect stress levels. someone so as to increase concentration and make the client feel calm to regulate the rhythm of breathing to be regular. This will encourage an increase in PaCO2 levels and will lower pH levels resulting in increased oxygen (O2) levels in the blood.

In the intervention of deep breathing relaxation techniques that are prioritized are reducing pain intensity, increasing lung ventilation and increasing blood oxygenation. Deep breathing for relaxation is easy to learn and contributes to reducing or relieving pain by reducing muscle tension and anxiety.

Deep breathing exercises are also to provide comfort to patients who experience pain by guiding patients to do relaxation techniques.

From the description above, it can be concluded that the Deep Breathing Relaxation Technique is considered effective in reducing pain because this technique is able to reduce or eliminate pain, increase peace of mind and reduce anxiety.

2) To find out after being given the Deep Breathing Relaxation Technique for Reducing Pain

Based on the table, it shows that the average value (mean) after the intervention of the Deep Breathing Relaxation Technique for Reducing Pain was obtained with a result of 3.25 and a standard deviation value of 0.214. The results of the Independent Test test obtained a P value = 0.01, which means that there is an effect of the Deep Breathing Relaxation Technique on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.

This research is in line with research conducted by Andi Nuraina Sudirman and Inne Ariani Gobel (2021) with the title "Musical Techniques and Deep Breathing Relaxation for Reducing Post Op Fracture Pain in Gorontalo City Hospital" with the result P Value = 0.000 where (P Value < 0 , 05).

In general, there are two factors that affect the Deep Breathing Relaxation Technique for Reducing Pain, namely: by relaxing the skeletal muscles that experience spasm caused by an increase in prostaglandins resulting in vasodilation of blood vessels and will increase blood flow to areas experiencing spasm and ischemia, technique deep breathing relaxation is believed to be able to stimulate the body to release endogenous opioids, namely endorphins and enkephalins.

Another statement states that reducing pain by deep breathing relaxation techniques is caused when a person performs deep breathing relaxation to control the pain that is felt, then the body will increase the parasympathetic nerve component in a stimulant manner, then this causes a decrease in levels of the hormones cortisol and adrenaline in the body which affect stress levels. someone so as to increase concentration and make the client feel calm to regulate the rhythm of breathing to be regular. This will encourage an increase in PaCO2 levels and will decrease pH levels resulting in increased levels of oxygen (O2) in the blood.

Exercise Deep Breathing Relaxation Techniques with the aim of increasing alveoli ventilation, maintaining gas exchange, preventing lung atelectasis, increasing cough efficiency, reducing physical and emotional stress, namely pain intensity and reducing anxiety.

This is because deep breathing relaxation techniques can reduce or eliminate pain, increase peace of mind and reduce anxiety.

From the description above, it can be concluded that the Deep Breathing Relaxation Technique is considered effective in reducing pain because this technique is able to reduce or eliminate pain, increase peace of mind and reduce anxiety.

3) To find out the Effect of Deep Breathing Relaxation Techniques on Reducing Pain

Based on the table shows that the average value (mean) in the group before the Deep Breathing Relaxation Technique intervention was carried out, the average value (mean) was 3.13 and the standard deviation value was 0.806 while in the group after the Deep Breathing Relaxation Technique intervention. the average value (mean) is 2.31 and the standard deviation value is 0.602. The results of the Paired t-test obtained a p value = 0.00, which means that there is an effect of deep breathing relaxation techniques on reducing pain in fracture patients at SALAK Hospital, Bogor City in 2022.

This research is in line with research conducted by Prita Devy Igiany (2018) with the title "Differences in Pain in Post-Extremity Fracture Surgery Patients Before and After Performing Deep Breathing Relaxation Techniques at Arifin Achmad Hospital" with the average (mean) before doing the Breath Relaxation Technique In is 6.33 while after the Deep Breathing Relaxation Technique is done it is 2.13 with the result P Value = 0.00 where (P Value <0.05) which means that there is an Effect of Deep Breathing Relaxation Technique on Reducing Pain in Fracture Patients.

In general, there are two factors that affect the Deep Breathing Relaxation Technique for Reducing Pain, namely: by relaxing the skeletal muscles that experience spasm caused by an increase in prostaglandins resulting in vasodilation of blood vessels and will increase blood flow to areas experiencing spasm and ischemia, technique deep breathing relaxation is believed to be able to stimulate the body to release endogenous opioids, namely endorphins and enkephalins.

Another statement states that reducing pain by deep breathing relaxation techniques is caused when a person performs deep breathing relaxation to control the pain that is felt, then the body will increase the parasympathetic nerve component in a stimulant manner, then this causes a decrease in levels of the hormones cortisol and adrenaline in the body which affect stress levels. someone so as to increase concentration and make the client feel calm to regulate the rhythm of breathing to be regular. This will encourage an increase in PaCO2 levels and will lower pH levels resulting in increased oxygen (O2) levels in the blood.

In the intervention of deep breathing relaxation techniques the priority is to reduce pain intensity, increase lung ventilation and increase blood oxygenation. Deep breathing for relaxation is easy to learn and contributes to reducing or relieving pain by reducing muscle tension and anxiety.

Deep breathing exercises are also to provide comfort to patients who experience pain by guiding patients to do relaxation techniques.

Deep breathing relaxation is breathing into the abdomen with a slow and slow frequency,

rhythmic and comfortable by closing your eyes while inhaling. The effect of this therapy is distraction or diversion.

This is because deep breathing relaxation techniques can reduce or eliminate pain, increase peace of mind and reduce anxiety.

From the description above the researcher concluded that judging from the 2 treatment groups before the Deep Breathing Relaxation Technique was carried out and the treatment group after the Deep Breathing Relaxation Technique was carried out that the Deep Breathing Relaxation Technique exercise was considered effective in reducing pain because this technique was able to reduce or eliminate pain, increase peace mood and reduced anxiety.

CONCLUSION

1. It is known before administration of Deep Breathing Relaxation Technique on Reducing Pain with P value = 0.03 (P value ≤ 0.05). There is an effect of the Deep Breathing Relaxation technique on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.
2. It is known that after administration of Deep Breathing Relaxation Technique for Reducing Pain with P value = 0.01 (P value ≤ 0.05). There is an effect of the Deep Breathing Relaxation Technique on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.
3. It is known that the effect of Deep Breathing Relaxation Techniques on Reducing Pain with the results of the average value (mean) in the treatment group before the Deep Breath Relaxation Technique was carried out obtained results of 3.13 and the results of the average value (mean) in the treatment group after the Breath Relaxation Technique was carried out In getting a result of 2.31 with a P value = 0.00 (P value ≤ 0.05). There is an effect of the Deep Breathing Relaxation Technique on Reducing Pain in Fracture Patients at SALAK Hospital, Bogor City in 2022.

SUGGESTION

1. For Researchers
   It is recommended to be knowledgeable and provide information about reducing pain in fracture patients.
2. For Respondents
   It is recommended to increase knowledge and understanding, especially in fracture patients by actively doing deep breathing relaxation techniques as an alternative to reducing pain.
3. For SALAK Hospital, Bogor City
   It is suggested that it can increase knowledge and insight about the effect of deep breathing relaxation techniques on reducing pain in fracture patients, as well as input material or data sources for SALAK Hospital for the development and improvement of service quality, especially nursing services for reducing pain in fracture patients.
4. For STIKes Wijaya Husada
   It is recommended as reading material and reference for STIKes Wijaya Husada Bogor students,

especially for emergency department nursing courses concerned with deep breathing relaxation techniques for reducing pain in fracture patients.

BIBLIOGRAPHY

1. Budhiarta, Arif. 2013. Pocket Book of Musculoskeletal Disorders. Jakarta: EGC Medical Book Publisher.
2. Noorisa, R., Apriliwati, D., Aziz, A., & Bayusentono S. 2017. The Characteristic Of Patients With Femoral Fracture In Department Of Orthopedic And Traumatology Rsud Dr. Soetomo Surabaya 2013-2016. Journal of Orthopedics & Traumatology Surabaya. 6(1): IS.
3. Mardiono et al, 2018. Fracture Incident accessed April 2, 2022
4. Basic Health Research (Riskesdas) 2018. Indonesian Ministry of Health Research and Development Agency 2018.
5. Pinzon Rizaldiy. Pain Assessment. Yogyakarta: Betha Graphics. 2014;
6. Hardiyati. (2020). Anxiety During the Covid 19 Pandemic. Gowa: Jariah Publishing Intermedia
7. Igiany PD. Differences in Pain in Postoperative Limb Fracture Patients Before and After Deep Breathing Relaxation Techniques. J Manaj Inf and Health Adm J-MIAK. 2018;1(1):2621–6612.
8. Ayudianningsih NG, Maliya A. The Effect of Deep Breathing Relaxation Techniques on Reducing Pain Levels in Postoperative Femur Fracture Patients at Karima Utama Hospital, Surakarta. UMS FIK Public Manuscript. 2015;1(2):191–9.
9. Priliana, WK, & Kardiyudiani NK. The Effect of Deep Breathing Relaxation Techniques on Reducing Pain in Fracture Patients. J Nursing. 2016;
10. Riskesdas. health research and development agency. Science (80-). 2018;127(3309):1275–9.
11. Nurgiwiati, Endeh. 2015. Alternative & complementary therapy in the field of nursing. Bogor: In Media.
12. LeMone, et al. 2016. Textbook of Medical Surgical Nursing. Vol.1, Wdisi.5. Jakarta: EGC.
13. Rendy, C., & Margareth. (2019). Internal Medicine Surgical Nursing Care. Yogyakarta: Nuha Medika.
14. Sulistyaningsih. Description of quality of life in patients after open reduction internal fixation (orif) of the lower extremities at the orthopedic polyclinic orthopedic prof. dr. r. Soeharso Surakarta. 2016;
15. Kenneth A. Egol, Kenneth J. Koval JDZ. Handbook of Fractures 5th Edition. New York. Wolters Kluwer. 2015;
16. Apleys GA, Louis S. System of Orthopedics and Trauma, 10th edition. Taylor & Francis Group, CRC Press. 2018.
17. Brunner S. Textbook of medical surgical nursing, edition 8 vol.3. EGC. Jakarta. 2015;
18. Muttaqin. A. Integumentary Disorders Nursing Care. Jakarta: Selemba Medika Palembang in 2012. J Medicine and Health. 2015;2(3):253–60.
19. Sjamsuhidayat J. Textbook of Surgery. Edition 3. Jakarta: EGC. 2015;
20. Nanda. Nanda-I Nursing Diagnosis: Definition and Classification 2018-2020 (11th ed). Jakarta: EGC. 2018;
21. Black. Medical Surgical Nursing: Clinical Management of Expected Results. Translated by Nampira R. Jakarta: Salemba Emban Patria. 2014;
22. Smeltzer, SC & Bare BG. Textbook of Brunner & Suddarth Medical Surgical Nursing, edition

8. Jakarta: EGC. 2013;
23. Sugiyono. Quantitative Qualitative Research Methods and R&D, 14th edn.Alfabeta.Bandung. 2014;
24. Nursalam. Concepts and Application of Nursing Research Methods: Thesis Guidelines, Nursing Research Thesis and Instruments. New York: Salemba Medika. 2014;