

PROGRESSIVE MUSCLE RELAXATION IMPLEMENTATION ON ANXIETY LEVEL OF PRE OP AV SHUNT SURGERY PATIENTS

Anita Fatarona^{1*}, Ina Martiana², Hendra Dwi Cahyono³, Diana Cholida⁴

^{1,2,3} Department Medical Surgical Nursing, Faculty of Health Sciences, dr. Soebandi University, Jember, Indonesia

⁴ Nursing Science Study Program, Faculty of Health Sciences, dr. Soebandi University, Jember, Indonesia

***Correspondence: Anita Fatarona**

Email: anitafatarona4@gmail.com

ABSTRACT

Chronic Kidney Disease (CKD) affects over 10% of the global population (>800 million people) and increases the risk of cardiovascular diseases such as coronary artery disease, heart failure, and stroke. One of the primary treatments for CKD is hemodialysis, with arteriovenous (AV) shunt access used in approximately 92% of procedures. AV shunt installation is a surgical procedure often associated with increased patient anxiety. In addition to pharmacological treatment, non-pharmacological approaches such as Progressive Muscle Relaxation (PMR) can be effective in reducing anxiety. This study aimed to determine the effect of PMR on the anxiety levels of patients undergoing pre-operative AV shunt installation. A quasi-experimental pretest-posttest design with a control group was used, involving 70 respondents at Jember Klinik Hospital, divided equally into intervention and control groups (n=35 each). Sampling was conducted using sequential sampling. The State-Trait Anxiety Inventory (STAI) was used to measure anxiety levels, and data were analyzed using the Wilcoxon Signed Rank Test. Results showed a significant decrease in anxiety in the intervention group after receiving PMR. The median anxiety score in the experimental group decreased from 42.66 (pre-test) to 29.57 (post-test), moving from moderate to mild anxiety. In contrast, the control group showed no significant change (pre-test median = 38.06; post-test = 40.03). The Wilcoxon test yielded a p-value of 0.000 in the intervention group, indicating a significant difference before and after the intervention. These findings support the use of PMR as an effective complementary therapy to reduce anxiety in pre-operative CKD patients undergoing AV shunt surgery.

Keywords: Progressive Muscle Relaxation; Anxiety; AV Shunt; CKD

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INTRODUCTION

Chronic kidney (CKD) is a progressive conditions affect > 10% of general population world wide, which is > 800 million peoples. CKD is generally one of the leading causes of non-communicable death worldwide. This disease is believed to be the cause of global death because its cases are increasing. CKD can have a devastating impact so it is important to develop and implement effective prevention and therapy efforts aimed at reducing morbidity and mortality of this disease (Kovesdy, 2022). The results prevalences of CKD in Indonesians

was 3.8%. The prevalence of CKD in East Java is around 2% with a total of 113,045 people and 20% of the total prevalence of CKD are undergoing hemodialysis therapy. The incidence of CKD continues to increase with the number of kidney patients in Indonesia. 1,526,022 CKD patients have been fitted with AV Shuntss (Indonesia Renal Registry, 2024).

Data from the Jember Clinic Plantation Hospital, the number of AV Shunt operations in the last three years has increased significantly. In 2021, there were 816 AV Shunt surgery patients recorded in one year, while in 2022 the number increased to 888 AV Shunt surgery patients. This number increased in 2023 with the number of AV Shunt surgery patients reaching 924 patients. CKD patients who have AV shunts installed and have undergone hemodialysis ≤ 1 year who describe that they say they have difficulty sleeping and feel anxious and afraid of failing in undergoing treatment because of the clinical symptoms that appear such as itching, physically good and some experience unhealthy bodies. (Rasianti Puspita Sari & Sitti Rahma Soleman, 2024). The results of a preliminary study of 10 people interviewed, 8 (80%) people said they felt anxious, 2 (20%) people were worried that the operation would not be successful before the AV Shunt operation was carried out.

High prevalence of CKD in Indonesian adverse outcomes, and high costs, especially in end-stage renal failure, due to the need for dialysis, health care in several countries has developed public health program for treatment of CKD, early identification and its complication. The health, social, and economic impacts of CKD are quite extensive and large, so early detection, prevention, and management of CKD in Indonesia currently still need to be a top priority (Kementerian Kesehatan, 2020). The dialysis process requires the installation of an AV fistula which can cause pain (Kassim et al., 2023).

Intensity of the pain will also have an impact on feelings of worry or anxiety so that it will also greatly assist the implementation of the AV shunt puncture procedure (Rahman et al., 2020). A person's anxiety is related to an uncomfortable emotional condition, the cause of which is usually thoughts that are considered disturbing, which can be seen through physical and psychological responses (Xi, 2020). CKD is a chronic disease that can require hemodialysis which will later require the installation of an AV shunt, thus causing anxiety due to physical limitations and recovery. In previous studies, there have been discussions related to PMR on anxiety (Nurhayati & Ritianingsih, 2022). However, there has been no discussion of PMR intervention on anxiety in preop AV shunt patients. Progressive Muscle Relaxation in several sources is believed to provide a sense of comfort holistically, namely biopsychosocialspiritual, so that it can provide a sense of comfort and is expected to later affect anxiety (Holis et al., 2024). PMR in reducing stress, anxiety, and depression especially in adults. PMR intervention can also be applied to the entire population so that it can be one of the alternative choices in conducting health care interventions so that it can perfect the implementation other than pharmacological drugs in overcoming anxiety (Muhammad Khir et al., 2024).

METHODS

Study Design.

This researchs quantitative research use quasi experimental design and with pretest posttest design approach, namely by revealing cause and effect by involve experimental group and then control group.

Setting

This study was conducted in the stable wards of Privat Hospital in Jember, Central Java, Indonesia, for 1months, from November to Desember 2024

Research Subject

The number of respondents in this study was 70 people divid into an intervention group of 35 respondent and a 35 respondents of control group. The sampling technique used was consecutive sampling. The inclusion criteria in this study were, Clients aged 19-70 years,

Understand instructions both verbally and in writing, Can speak Indonesian and read. Exclusion criteria, Suffering from hearing disorders, Patients under the influence of sedatives, Emergency clients, Clients who experience decreased consciousness.

Instruments

The measuring tool used to obtain data about the degree of anxiety uses the STAI (State Trait Anxiety Inventory) questionnaire. The STAI anxiety instrument uses a standard instrument that has a calculated r value $> r$ table a significance level of 5 % ($r = 0.444$). it can be concluded that the statement is invalid. on each item has been questioned by the statement of another item, then the invalid item statement is not used. The alpha coefficient of this questionnaire is 0.881, indicating that the STAI anxiety instrument can be used. The results of the reliability test of the STAI anxiety instrument based on the calculation of the Cronbach Alpha value showed a result of 0.782 which is above the r table (0.444) so it can be concluded that this STAI anxiety instrument is reliable. Categorization of anxiety score < 30 is called mild anxiety, score 30-45 is moderate anxiety, score > 45 is high anxiety. The data collection method in this study was determined by consecutive sampling taken for 1 month from one of the private hospitals in Jember.

Intervention

This study was conducted by describing the differences in anxiety levels before and after the Progressive Muscle Relaxation (PMR) intervention in the intervention group. The intervention in the control group received other treatments, namely deep breathing relaxation. The intervention was carried out by nurses as enumerators.

Data Analysis

Analysis techniques include univariate analysis displayed in table form which describes the characteristics of respondents and levels of anxiety. Bivariate analysis is used to find out how the independent variable influences dependent variable. Before data analysis is carried out, a normality test is first carried out, to ensure that data is normally distributed using the Shapiro Wilk normality test. The distribution of data obtained a value of $p < 0.05$ for the experimental group and $p > 0.05$ for the control group, so it can be concluded that the data is not normally distributed because it is said to be normal if a significance value of $p > 0.05$ is obtained. Bivariate analysis used the Wilcoxon Signed Ranks Test, and further analysis using the Mann-Whitney test to compare the level of anxiety after the intervention between the intervention group and the control group

Ethical Consideration

Ethical permission for this research was obtained granted by the ethics board commission from the Faculty of Health Sciences, Dr. Soebandi University, with number: No. 107/KEPK/UDS/II/2024

RESULTS

Table 1. Characteristics of the respondents (n=70)

Characteristic	Category	Control Group		Intervention Group	
		Total (n)	%	Total (n)	%
Gender	Male	15	42,8	14	40
	Female	20	57,2	21	60
	Total	35	100	35	100
Age	19 years	2	5,7	2	5,7
	20 - 44 years	11	31,4	10	28,6
	45 – 59 years	12	34,3	12	34,3
	> 60 years	10	28,6	11	31,4
	Total	35	100	35	100
Education	No school	2	5,7	3	8,6
	early school	11	31,4	7	20

	Primery school	13	37,1	16	45,7
	Secondary School	7	20	6	17,1
	College	2	5,7	3	8,6
	Total	35	100	35	100
Employment	No Work	9	25,7	7	20
	employed	20	57,1	19	54,3
	ASN	4	11,4	5	14,3
	Pension	2	5,7	4	11,4
	Total	35	100	35	100

Many as 35 respondents in control group, majority were female, 20 respondents (57.2%), and in the experimental group, the majority were female, 21 respondents (60%) of the total 35 respondents. frequency distribution respondent by age. In the control group of a total of 35 respondents, the most were aged 45-59 years, as many as 12 respondents (34.3%). In experimental group, the most respondents were aged 45-59 years, as many as 12 respondents (34.3%). In terms of education, majority of control group had a junior high school education level of 13 respondents (37.1%) of the total 35 respondents. In the experimental group, the majority also had a junior high school education level of 16 respondents (45.7%) of the total 35 respondents. The occupation category in the control group was that most respondents worked as self-employed, as many as 20 respondents (57.1%) 35 respondents. Likewise, in the experimental group of a total of 35 respondents, the majority worked as self-employed, as many as 19 respondents (54.3%).

Table 2. Distribution preoperative anxiety level in control and experimental groups (n=70)

Intervention Group	N	Median	P value
		Minimum- Maximum	
Pre test	35	42,66 (19-58)	P = 0,000
Post test	35	29,57 (15-54)	
Total	70		
Control Group	N	Median	P value
		Minimum-Maximum	
Pre test	35	38,06 (17-59)	P = 0,0830
Post test	35	40,03 (20-58)	
Total	70		

In the experimental group, the results obtained in the pre-test were a minimum maximum score of 19-58 with a median score of 42.66. The post-test distribution data in the experimental group showed a minimum maximum score of 15-54 with a median score of 29.57, a decrease to the mild anxiety level category. The pre-test results in the control group were a minimum maximum score of 17-59 with a median score of 38.06, the sample had an average level of moderate anxiety. Meanwhile, the post-test results of the control group were a minimum maximum score of 20-58 with a median score of 40.03, indicating that the majority had an average level of moderate anxiety.

The results of the Wilcoxon test in the experimental group showed that 22 subjects experienced a decrease in anxiety, 13 subjects experienced constant anxiety, and zero subjects had high anxiety. The results of the Wilcoxon test in the control group showed that 3 subjects experienced a decrease in anxiety, 32 subjects experienced constant anxiety, and zero subjects had high anxiety. The result Wilcoxon Signed Ranks Test for the anxiety level variable in the pre-test and post-test phases of the experimental and control groups. The result of the Wilcoxon Signed Ranks Test showed in experimental group the p value <0.05, namely p = 0.000, which means that the pretest and posttest value in experimental group had a significant difference in value, meaning that there was a difference in the anxiety level of experimental group before Progressive Muscle Relaxation intervention and after intervention. Meanwhile, the result of data obtained used Wilcoxon Signed Ranks Test on the pre-test and post-test of the control group showed that the p value > 0.05, namely p = 0.083, which means

that there was no difference in the anxiety level in the pretest and posttest of control group before and after deep breathing relaxation intervention was given.

Table 3. The Effect of Progressive Muscle Relaxation (PMR) On Anxiety In Pre-Op AV Shunt Patients

Test	Pre test	Post test
Mann-Whitney	P = 0,150	P = 0,001

Based on the result the Man Whitney test, it was found that there was no difference between the control and treatment groups before the intervention was carried out because the P value > 0.05, namely with a p value of 0.150, while the post-test value between the control and treatment variables obtained a p result <0.05, namely with a pvalue 0.001, namely there was significant difference after intervention was carried out.

DISCUSSION

The result of study showed that control group and intervention group had the same number, namely the most respondents aged 45-59 were 12 respondents (34.3%). The most gender in the control group were 20 respondents (57.2%), the intervention group 21 respondents (60%). Other studies have suggested that gender and age have a moderate relationship with level of anxiety in pre-operative patients with spinal anesthesia because the older the age, the higher the anxiety and it decreases in the elderly when facing pre-operative conditions (Gumilang et al., 2022). Other studies have shown that progressive muscle relaxation, can effectively reduce anxiety levels significantly in pre-operative patients, influenced by one of the factors, namely age, especially older age. In addition, the most education level was junior high school level in control group, 13 respondents (37.1%) and in intervention group 16 respondents (45.7%). Combination of progressive muscle relaxation technique is effective in reducing anxiety found other factor as age, education and previous surgical experience can affect the level of patients anxiety (Widiyawati et al., 2024).

For work, most worked as entrepreneurs. in the control group there were 20 respondents (57.1%) while in the intervention group there were 19 respondents (54.3%). Other research results show that entrepreneurship has a positive relationship with stress and will also affect anxiety. This is because there are demands of work accompanied by mental fatigue so that it can affect the role if proactive handling of stress is not immediately carried out which will affect psychology (Kiefl et al., 2024). There is a relationship between work and a person's level of anxiety. This is closely related to income. The lower the income, the higher the level of anxiety (Millizia et al., 2024). This is closely related to the influence of a person's psychological factors related to decision making, especially surgery that requires a lot of money.

The results of the Wilcoxon Signed Ranks Test showed that in the experimental group the p value <0.05, namely p = 0.000, which means that the pre-test and post-test values in experimental group, have a significant difference in value, meaning that a difference in level of anxiety of the experimental group before being given Progressive Muscle Relaxation, intervention and after being given the intervention. the process of providing PMR relaxation techniques to each respondent was carried out for ten minutes, then the researcher assessed the level of anxiety of the participants. Furthermore, before receiving PMR relaxation therapy, participants were given a break for 30 to 40 minutes after the initial anxiety assessment. Before the second anxiety assessment, participants were instructed to rest for thirty to forty minutes after the PMR relaxation therapy session. After PMR relaxation therapy, the researcher used State Trait Anxiety Inventory (STAI) form Y instrument from the questionnaire sheet to remeasure the respondents' anxiety. Meanwhile, data result is obtained use Wilcoxon Signed Ranks Test on pretest and posttest of the control group showed a value of p > 0,05, namely p = 0.083, which means that there was no difference in the level of anxiety in the pre-test and post-test of the control group before and after being given deep breathing relaxation intervention with the same process as PMR. The next analysis was using the Mann-Whitney

test to compare the level of anxiety after the intervention between the intervention group and the control group. The results obtained were significant $p = 0.001$, which mean $p < 0,05$, namely there was a difference in level of anxiety after PMR intervention was carried out in intervention group and control group.

Other research results on progressive relaxation training on preoperative anxiety in aneurysm patients found that patients who had high levels of anxiety before surgery experienced a significant decrease due to the effects of progressive relaxation training (Uysal et al., 2023). Combination of RB and PMR is effective in reducing acute pain (Bagheri et al., 2024). This exercise also has a positive impact, namely it can reduce pre-operative stress, which is indicated by stable vital signs after progressive muscle relaxation exercises (Uysal et al., 2023). In this condition, if stress relaxation training is carried out routinely, it can effectively increase the relaxation conditions to the maximum in psychological and physiological conditions (Toussaint et al., 2021). other studies discuss factors related to patients that affect preoperative anxiety, namely there are significant differences in anxiety related to things that will happen in the future, especially women in this case due to psychological and biological factors. the role of preoperative education which is often overlooked even though it is very important proactively in preoperative preparation. education is something that supports reducing patient anxiety and improving patient perioperative outcomes, especially female patients who are more susceptible to mood disorders due to hormones (Oh et al., 2024). When anxiety decreases, it will affect the balance of the sympathetic nervous system, which can cause a relaxing effect on the body, thereby improving blood circulation and causing muscles to relax (Luo et al., 2024). Progressive muscle relaxation, can low blood pressure so that it can improve circulation (Amalia & Susaldi, 2024).

This physiological condition is intended during the intervention process When given progressive muscle relaxation can increase breath relaxation and mind relaxation and can be given positive sentence reinforcement regularly can provide a relaxed state in the body so that body responds by releasing endorphins that provide a state of relaxation and can reduce feeling of anxiety so that when brain reaches alpha waves will release serotonin and endorphin hormones so that humans become relaxed. Interventions that can also be applied safely to patients without worrying about age and education factors (Widiyawati et al., 2024). Anxiety in early adulthood is usually due to previous experiences. People who have their first experience of undergoing surgery are more afraid of what will happen during surgery, such as anxiety about the anesthesia procedure, anxiety after the effects of anesthesia, anxiety about the length of recovery or not, and anxiety about whether they can do their activities as before (Anwar et al., 2024).

Another factor is the level of education of a person undergoing surgery which can help improve positive patient outcomes and increase patient involvement in ongoing care, which can influence their decision-making in improving health care (Alsufyani et al., 2024). This intervention can be a choice of intervention that is helpful in reduce anxiety (Widiyawati et al., 2024). Other studies also reveal that progressive muscle relaxation therapy can be a safe option for non-pharmacological therapy in reducing anxiety in pre-operative patients (Aristiani & Heri Susanti, 2022). Anxiety will cause physiological tension characterized by muscle tension. PMR will reduce physiological tension which will ultimately reduce anxiety. PMR therapy can be used as one of the therapies to reduce anxiety (Lizawati et al., 2022). combination progressive muscle relaxation with other non-pharmacological methods can also reduce anxiety (Simarmata et al., 2022). It is hoped that nurses will be able to implement PMR interventions to reduce and lessen anxiety levels before surgery (Winarni et al., 2022).

CONCLUSION

The use of PMR shows that can be concluded that, there is a significant difference in anxiety level of pre-AV shunt surgery patients with a p value $< 0,05$ in the post-test value of the

intervention group and the control group. It is hoped further research can increase the frequency or duration of research and the number of samples so that it can determine how effective PMR is in reducing anxiety levels. Further researchers can also combine interventions as a new research.

SUGGESTIONS

This study has some limitations. The provision of intervention has time limitations so further research is needed to determine how effective progressive muscle relaxation is in overcoming anxiety, especially in pre-op AV shunt patients in CKD patients.

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DECLARATION OF INTEREST

The authors, declare that there is no conflict of interest.

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This research is an independent research conducted by the researcher

AUTHOR CONTRIBUTION

Author 1: The first author prepares the research proposal, Conducts a preliminary study, Leads the data collection process, Leads the data analysis process up to interpretation, Prepares the results and evaluation report.

Author 2: Second author Helps to compile research proposals, helps to collect data, operational monitoring.

Author 3: Third author Helps to compile research proposals, Submit and manage ethical clearance, Collect data, Compile reports on results and evaluations.

Author 4: helps to collect data, operational monitoring.

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BIOGRAPHIES OF AUTHORS






Ns. Anita Fatarona, M.Kep. Affiliation of dr. Soebandi University Jember. I am a lecturer who is active in teaching and research at the Department of Medical Surgical Nursing. Currently I am the secretary of the nursing study program at Dr. Soebandi University Jember. For more complete information about me, you can visit my account below:

: [GPHms2IAAAAJ](https://scholar.google.com/citations?user=GPHms2IAAAAJ)
: anitafatarona4@gmail.com





Ns. Ina Martiana, M.Kep. Affiliation in dr. Soebandi University Jember. I am a lecturer in the Department of Medical Surgical Nursing. There are several research i have done in many aspect. For more information about me, you can visit my account below:

: [gje1BZUAAAAJ](https://scholar.google.com/citations?user=gje1BZUAAAAJ)
: [57209500603](https://scopus.com/authid/detail.uri?authorid=57209500603)
: martiana.im@gmail.com



Ns. Hendra Dwi Cahyono, M.Kep. Affiliation in dr. Soebandi University Jember. I am a lecturer in the Department of Medical Surgical Nursing. For more information about me, you can visit my account below:

: [XyokAAAAJ&hl](https://scholar.google.com/citations?user=XyokAAAAJ&hl=id)
: hendradwicahyono2492@uds.ac.id



Ns. Diana Cholida, S.Kep. Affiliation in dr. Soebandi University Jember. For more information about me, you can visit my account below:
✉: dianaahadiyanto@gmail.com