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The Effect of Progressive Muscle Relaxation on Pain Reduction And Sleep Quality in Dyspepsia Functional Patients in the Inpatient Room of Muhammadiyah RSU Lumajang

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Abstract
Often, these health problems are linked to unhealthy lifestyles. However, the consumption of food and beverages, as well as side effects from medications, also contribute to functional dyspepsia. One of the symptoms that appears is heartburn. Inadequate pain management and care can be unbearable for patients with functional dyspepsia, interfering with daily activities and affecting sleep quality at night. The research design employed a pre-experimental approach using a cross-sectional design. The population in this study consisted of inpatients with an average monthly visit during January-April 2024, with 74 functional dyspepsia patients. The sampling technique used Accidental Sampling over 14 days, resulting in a sample of 27 respondents. To determine the relationship between the two variables, the Wilcoxon Signed Rank Test was used with a significance level of 0.05. The research results showed that almost all respondents experienced mild pain (25 respondents, 92.6%) and almost all respondents experienced an improvement in sleep quality (26 respondents, 96.3%) after progressive muscle relaxation. After conducting the Wilcoxon Signed Rank Test, the results showed a Sig. value (2-tailed) of 0.000 < 0.05, so H0 was rejected and H1 was accepted, meaning that there is a significant correlation between progressive muscle relaxation and the reduction of pain and improvement in sleep quality in patients with functional dyspepsia in the inpatient ward of Muhammadiyah General Hospital Lumajang. It is hoped Muhammadiyah General Hospital Lumajang can implement progressive muscle relaxation as a non-pharmacological therapy for patients with pain and decreased sleep quality due to functional dyspepsia or other diseases with similar symptoms.

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1. INTRODUCTION

Dyspepsia is a condition that can cause discomfort in the upper stomach due to stomach acid problems or stomach ulcers. Dyspepsia is not actually an indication of a disease, but rather a symptom of health problems that occur in the digestive system. You need to be careful, dyspepsia that does not receive immediate treatment can develop into a more serious health condition (Fadli, 2022).

According to Abdeljawad, Wehbeh, and Qayed (2017), it was found that dyspepsia is often found in younger age groups, the prevalence is 66% in the age group under 55 years (Gustaman, 2023). About 80% of dyspepsia sufferers have no structural abnormalities that can explain their symptoms, so they are diagnosed with functional dyspepsia. Functional dyspepsia may affect approximately 16% of healthy individuals in the general population.

Large population-based studies reveal that the prevalence of functional dyspepsia ranges from 10% to 30% worldwide (Kim, 2018). Indonesia is ranked third after the United States and England in terms of the highest number of dyspepsia sufferers. Dyspepsia cases in the world reach 13-40% of the total population in each country. The results of this study show that in Europe, the United States and Oceania, the prevalence of dyspepsia varies widely between 5-43%. Not only abroad, cases of dyspepsia in big cities in Indonesia are quite high.

The prevalence of dyspepsia in Indonesia reaches 40-50%, where dyspepsia itself is included in the top 10 diseases in Indonesia. In Indonesia, it is estimated that almost 30% of dyspepsia patients who come to general practice are patients whose complaints are related to dyspepsia cases (Gustaman, 2023). The prevalence of dyspepsia (gastritis) in East Java in 2019 reached 44.5% (Afida, Nugraheni, & Ningsih, 2023).

From the results of a preliminary study on January 21 2024 at RSU Muhammadiyah Lumajang, there were 389 patients diagnosed with dyspepsia. In 2023, there were 89 outpatients and 300 inpatients. Dyspepsia can occur due to various conditions. Often, these health problems are associated with an unhealthy lifestyle. However, consumption of food, drinks and side effects from drugs also have an influence on this condition. Patients with functional dyspepsia experience weakness in the proximal stomach after gastric dilation and after eating. This is indicated by insufficient fundus relaxation. The result is a disproportionate distribution of stomach contents, with a greater volume in the antrum (upper part) than in the fundus (lower part). The extent of expansion of the antrum correlates with increasing severity of symptoms (symptoms of early satiety, epigastric pain, bloating, and nausea or vomiting). In addition, patients with functional dyspepsia also show irregular fundus relaxation after duodenal expansion. Both on an empty stomach and after eating, patients with functional dyspepsia suffer from visceral hypersensitivity when the gastric fundus dilates (Gustaman, 2023). Some of the symptoms felt by people with dyspepsia are feeling full quickly when eating, bloating and bloating after eating, discomfort that arises in the pit of the stomach, accompanied by pain and burning, nausea and vomiting (Somad, 2021).

Other signs and symptoms of dyspepsia include pain in the upper stomach or stomach pit. Pain is the most common symptom found in functional dyspepsia. Pain is a sensory or emotional experience related to actual or functional tissue damage, with sudden or slow onset (SDKI, 2016; Risnah, 2019). The pain felt by dyspepsia sufferers can be unbearable, disrupting daily activities and sleep quality. People with dyspepsia often have difficulty getting restful sleep due to persistent acid reflux. The hot sensation from heartburn does not make the sufferer's efforts to sleep easier (Fadli, 2022).

Pain that can reduce sleep quality in dyspepsia sufferers can be treated with pharmacological therapy and non-pharmacological therapy. Pharmacological therapy in the form of drugs apart from providing the expected therapeutic effect, drugs can also cause undesirable effects, namely drug side effects. This can occur due to interactions between drug molecules and their site of action. So, a drug that works on our body does not always work specifically, it can work on a certain receptor that is widely distributed in the body's tissues. If this interaction occurs, other effects can arise (Nuryati, 2017). Non-pharmacological therapies such as relaxation techniques, massage, compresses, music therapy, murottal, distraction, and guided imagery (Smeltzer et al., 2008; Risnah, 2019) can provide benefits, namely increasing drug efficacy, reducing side effects, and restoring blood vessels and heart (Palupi, Kameliawati, Andriyanti, Hidayah, Ikhsan, & Umami, 2023). Non-pharmacological techniques are one of the independent nursing interventions to reduce pain felt by the patient. Relaxation techniques give individuals self-control when pain occurs and can be used on healthy or sick people (Perry & Potter, 2005; Risnah, 2019).

There are many types of relaxation related to pain and sleep quality, one of the relaxations that can be done is progressive muscle relaxation.

Progressive muscle relaxation is a form of therapy in the form of giving instructions to a person in the form of systematically arranged movements to relax the mind and body parts such as muscles and return the condition from a tense state to a relaxed, normal and controlled state, starting from movement. hands to leg movements (Azizah et al, 2021).

In previous research, it was found that progressive muscle relaxation carried out in 3 sessions with a duration of 30-45 minutes could reduce the average systolic blood pressure by 123.85 mmHg (Basri, Rahmatia, Baharuddin, & Akbar, 2022). The pain scale before progressive muscle relaxation intervention was given to elderly PM.P and PM.A was on a scale of 4 moderate pain (1-10 VAS). The pain scale after being given progressive muscle relaxation intervention in elderly PM.A decreased to 3 mild pain (1-10 VAS). Progressive muscle relaxation technique is one of the non-pharmacological measures in pain management. Progressive muscle relaxation has an effect on reducing the scale of joint pain in the elderly (Wijaya & Nurhidayati, 2020). There is an effect of progressive muscle relaxation on reducing the lower back pain scale in third trimester pregnant women, as evidenced by the ρ value of less than α (0.05) (Dewi, Patimah, & Khairiyah, 2018).

Based on the description above, the author is interested in reporting further on the research "The effect of progressive muscle relaxation on reducing pain and sleep quality in functional dyspepsia patients in the inpatient room at RSU Muhammadiyah Lumajang".

2. RESEARCH METHOD

The design used in this research was pre-experimental which only involved one group and there was no comparison or control group. The form of pre-experiment used in this research is a single group design with pretest – treatment – posttest (Rukminingsih, Adnan, & Latief, 2020). The approach taken in this research is a cross-sectional study method, that is, each research subject is only observed once and measurements are made on the subject's character status or variables at the time of examination. This does not mean that all research subjects were observed at the same time (Siyoto & Ali, 2015). This research design aims to determine the effect of progressive muscle relaxation on reducing pain and sleep quality in functional dyspepsia patients in the inpatient room at RSU Muhammadiyah Lumajang.

3. RESEARCH RESULTS AND DISCUSSION

3.1.Research result

Table 1 Characteristics of Respondents based on pain before ROP Therapy

Pain Level	Frequency (f)	Percentage (%)
No pain	0	0
Mild pain	0	0
Moderate pain	27	100
Severe pain	0	0
Total	27	100

It was found that all respondents experienced moderate pain (100.0%).

Table 2 Characteristics of Respondents Based on Sleep Quality Before ROP Therapy

Sleep Quality Level	Frequency (f)	Percentage (%)
Very good	0	0

Pretty good	4	14.8
Bad enough	23	85.2
Very bad	0	0
Total	27	100

The majority of respondents experienced sleep quality in the quite poor category, namely 23 respondents (85.2%) and a small number of respondents experienced fairly good sleep quality, namely 4 respondents (14.8%).

Table 3 Characteristics of Respondents Based on Pain After ROP Therapy

Pain Level	Frequency (f)	Percentage (%)
No pain	0	0
Mild pain	25	92.6
Moderate pain	2	7.4
Severe pain	0	0
Total	27	100

The majority of respondents experienced mild pain after the intervention, namely 25 respondents (92.6%) and a small number of respondents experienced moderate pain, 2 respondents (7.4%).

Table 4 Characteristics of Respondents Based on Sleep Quality After ROP Therapy

Sleep Quality Level	Frequency (f)	Percentage (%)
Very good	0	0
Pretty good	26	96.3
Bad enough	1	3.7
Very bad	0	0
Total	27	100

The majority of respondents experienced quite good sleep quality after ROP therapy, namely 26 respondents (96.3%) and a small number of respondents experienced quite poor sleep quality, 1 respondent (3.7%).

Table 5 Data Analysis of Progressive Muscle Relaxation on Reducing Pain in Functional Dyspepsia Patients

Cross Tabulation (*Cross Tabulation*)		Posttest				Total
		No Pain	Mild Pain	Moderate Pain	Severe Pain	
Pre-test	No Pain	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Mild Pain	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Moderate Pain	0 (0.0%)	25 (92.6%)	2 (7.4%)	0 (0.0%)	27 (100.0%)
	Severe Pain	0	0	0	0	0

	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
Total	0 (0.0%)	25 (92.6%)	2 (7.4%)	0 (0.0%)	27 (100.0%)
WITH					-4.604
Asymp. Sig. (2-tailed)					.000

There were all respondents on the Pretest side who experienced pain of moderate quality. Meanwhile, after ROP therapy (Posttest), there were 2 respondents who remained in moderate pain quality. The two respondents have the initials Mr RO and Mrs NU. Mr RO said that the pain he felt was still moderate pain as proven by a pressure pain examination by researchers. Meanwhile, Mrs NU said that the pain she felt had started to decrease since she first came to the hospital, but she still felt a slight pain in the pit of her stomach.

Table 6 Data Analysis of Progressive Muscle Relaxation on Sleep Quality in Functional Dyspepsia Patients

Cross Tabulation (*Cross Tabulation*)		Posttest				Total
		Very good	Pretty good	Pretty Bad	Very bad	
Pre-test	Very good	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Pretty good	0 (0.0%)	4 (14.8%)	0 (0.0%)	0 (0.0%)	4 (14.8%)
	Pretty Bad	0 (0.0%)	22 (81.5%)	1 (3.7%)	0 (0.0%)	23 (85.2%)
	Very bad	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total		0 (0.0%)	26 (96.3%)	1 (3.7%)	0 (0.0%)	27 (100.0%)
WITH						-4.537
Asymp. Sig. (2-tailed)						.000

There was pretest sleep quality with sleep quality in the quite good category as many as 4 respondents (14.8%), while in the quite poor category there were 22 respondents (81.5%). After ROP therapy (Posttest) there was sleep quality in the quite good category for 26 respondents (96.3%), while in the quite poor category there was 1 respondent (3.7%). There is a respondent with the initials Mr Ro, 41 years old, male, with no previous education or not finishing elementary school and working as an entrepreneur. Mr. Ro did not experience a change in the sleep quality category because his score was not enough to increase to good enough even though there was a change in the score on the sleep quality instrument. Mr. Ro experienced an increase in sleep efficiency scores on the PSQI instrument due to other sleep disorders such as difficulty initiating sleep.

Mr. Ro had difficulty getting to sleep because he had to repair an IV drip due to phlebitis.

3.2.Discussion

a. Identifying Pain and Sleep Quality Before ROP Therapy in Functional Dyspepsia Patients

All respondents experienced moderate levels of pain, 27 respondents (100%) this was because the inclusion criteria taken by researchers was the moderate pain range. In table 5.6, the majority of respondents experienced sleep quality in the quite poor category, 23 respondents (85.2%). Meanwhile, a small number of respondents experienced sleep quality in the quite good category, namely 4 respondents (14.8%).

The definition of dyspepsia itself is a collection of symptoms from the upper digestive tract which include pain or discomfort in the gastro-duodenal area (epigastrium/ulu heart), fullness, burning sensation, nausea or vomiting, and feeling full quickly (Lee et al., 2014 in (Habibie, 2021). Several risk factors that play a role in dyspepsia are diet factors, namely fast food (burnt, spicy, fatty foods, coffee and tea) and lifestyle such as alcohol, smoking, lack of exercise, drugs (NonSteroid Anti-Inflammatory Drugs). (NSAIDs/aspirin) is believed to contribute to dyspepsia. Cigarettes can reduce the protective effect on the gastric mucosa, while NSAIDs and alcohol play a role in increasing acid production in the stomach (Schellack, 2012 in (Habibie, 2021).

Pain is an unpleasant sensory and emotional experience, related to actual or potential tissue damage, or describes the conditions in which it occurs (Utami, 2016 in Ningtyas, 2023). The occurrence of pain in dyspepsia patients is caused by weakening of the proximal stomach which results in the stomach expanding after eating. So, the disproportionate distribution of stomach contents causes the antrum to be larger than the fundus, causing various kinds of symptoms, one of which is heartburn which is accompanied by pain and soreness (Ningtyas, 2023).

The pain felt by dyspepsia sufferers is sometimes unbearable to carry out daily activities and the quality of sleep can be disrupted. Dyspepsia sufferers often have difficulty getting restful sleep due to persistent acid reflux. The hot sensation from heartburn in the stomach does not make the sufferer's efforts to sleep easier (Fadli, 2022).

Inadequate pain management and treatment has a major impact on patients, such as sleep disturbances, difficulty mobilizing, restlessness and aggression (Asdar, 2018 in Kazharo, 2020). Even though many are treated with analgesics, around 50% of patients still experience pain so that their comfort is disturbed. A person who experiences pain often wakes up because of the pain they feel, so that their sleep is disturbed and this can worsen their condition and cause other diseases (Kazharo, 2020).

From the research results, the researchers found that all respondents experienced pain of moderate quality and sleep quality of quite poor category. The conditions experienced by respondents in this study were caused by decreased appetite, causing stomach acid to increase which could erode the stomach walls. Apart from the respondent's decreased appetite, another cause experienced by the respondent was eating food that was too spicy and sour, which caused pain. There were also respondents who looked for their own medicine, such as buying medicine at a pharmacy or food stall, and others came to the nearest clinic or health center and in unbearable conditions, respondents came to the hospital to receive treatment. Respondents with pain that persisted for days said their daily activities were

disturbed and at night they were unable to sleep peacefully because of the pain felt by the respondents.

b. Identifying Pain and Sleep Quality After ROP Therapy in Functional Dyspepsia Patients

The majority of respondents experienced mild pain after ROP therapy, namely 25 respondents (92.6%) and a small number of respondents still experienced moderate pain, namely 2 respondents (7.4%). In table 5.8, the majority of respondents experienced fairly good sleep quality after ROP therapy, namely 26 respondents (96.3%) and others still experienced fairly poor sleep quality after ROP therapy, 1 respondent (3.7%).

In research (Wasijati, 2022) the effect of providing progressive muscle relaxation on the pain scale from the research results showed that there was an effect of providing progressive muscle relaxation on reducing the pain scale in patients after Coronary Artery Bypass Graft (CABG) in the Adult Pre and Post Surgery Room at the Heart Hospital and Our Hope Blood Vessels before and after progressive muscle relaxation with a p value of 0.0005. The progressive muscle relaxation technique involves sequential contraction and relaxation of skeletal muscle groups and relaxation of the main skeletal muscle groups with the aim of reducing tension, reducing stress, and inducing central nervous relaxation and increasing activity. Progressive muscle relaxation can reduce autonomic nervous and central nervous system excitability and increase parasympathetic activity. The physiological theory that explains the phenomenon of relaxation training is through the body's own analgesic system. This theory states that relaxation has an effect on the body's natural analgesics, namely endorphins. Endorphins are nerve hormones associated with the sensation of pleasure. When released by the brain, pain can be reduced by increasing the pain threshold and activation of the parasympathetic nervous system to relax the body and lower blood pressure, breathing, and heart rate.

From the research results, it was found that the majority of respondents experienced a decrease in pain with a mild quality and an increase in sleep quality with a fairly good category after ROP therapy was carried out on the respondents. Respondents felt comfortable after being given ROP therapy as evidenced by the reduction in pain and improvement in sleep quality. Respondents can feel the pain they cause throughout the night if the pain does not decrease. Apart from pharmacological therapy such as painkillers given to respondents, non-pharmacological therapy can also provide the effect of reducing pain without side effects. Non-pharmacological therapy such as progressive muscle relaxation can be given to respondents without getting out of bed and does not make respondents feel excessively tired due to the therapy. By providing therapy regularly to respondents, it is hoped that it can reduce pain and make respondents sleep without any pain disturbance throughout the night.

c. Analyzing the Effect of ROP on Pain Reduction in Functional Dyspepsia Patients

From the test results using the Wilcoxon Signed Rank Test, it was obtained that the p value = 0.000, which means that there is an influence between progressive muscle relaxation and pain in the inpatient room at RSU Muhammadiyah Lumajang.

As stated by (Wasijati, 2022), the progressive muscle relaxation technique involves sequential contraction and relaxation of skeletal muscle groups as well as relaxation of the main skeletal muscle groups with the aim of reducing tension, reducing stress, and inducing central nervous relaxation and increasing activity. Progressive muscle relaxation can reduce autonomic nervous and central nervous

system excitability and increase parasympathetic activity. Progressive muscle relaxation is a form of therapy in the form of giving instructions to a person in the form of systematically arranged movements to relax the mind and body parts such as muscles and return the condition from a tense state to a relaxed, normal and controlled state, starting from movement. hands to leg movements (Azizah, Hasanah, & Pakarti, 2021).

After the intervention was carried out for 2 x ± 20 minutes, the researcher began observing and filling out questionnaires on respondents. The results from pain observation showed a decrease in pain from moderate pain to mild pain in almost all respondents. There were 2 respondents who experienced a decrease in pain scores but did not experience a change in the quality of moderate pain to mild pain like most other respondents. This is because the respondent experienced other sleep disorders such as difficulty initiating sleep which was found in the respondent with the initials Mr Ro, 41 years old, male, with no previous education or not having finished elementary school and working as an entrepreneur. Mr Ro did not experience a decrease in the quality of pain due to disturbances in sleep or rest at night in accordance with the theory explained by (Manueke, 2023) that pain is sometimes rarely experienced after adequate sleep and rest. Likewise, Mrs Nu, who is 24 years old, female, with a high school education and working as an entrepreneur, complained of sleep disturbances such as frequent urination at night, making her sleep quality slightly disturbed, thereby preventing the quality of pain from decreasing.

d. Analyzing the Effect of ROP on Sleep Quality in Functional Dyspepsia Patients

From the test results using the Wilcoxon Signed Rank Test, the value of p = 0.000 was obtained, which means that there is an influence between progressive muscle relaxation and sleep quality in the inpatient room at RSU Muhammadiyah Lumajang.

Increasing the fulfillment of sleep needs can be done in ways that can stimulate and motivate sleep. One way that can be done is relaxation. Relaxation is a form of technique that involves movement of the body parts and can be done anywhere. Progressive muscle relaxation is a technique for reducing muscle tension. Then relax it again, starting with the facial muscles and ending with the leg muscles (Gurning, 2020 in Wardana & Machmudah, 2023).

Progressive muscle relaxation is a deep muscle relaxation technique using two steps, namely by stopping the tension and then focusing on how the muscle relaxes, feeling the physical sensation and the tension disappears (Wayan, 2017 in (Amanda, 2019). Relaxation is a self-management technique based on how the sympathetic and parasympathetic nervous systems work, this technique has been proven to be effective in reducing tension and anxiety and improving sleep quality (Siregar, 2016 in Amanda, 2019).

The working mechanism of progressive muscle relaxation is to influence the need for sleep because there are muscle contraction and relaxation movements which can stimulate physical and psychological responses (Javaheri, 2009 in (Amanda, 2019). The trophotropic relaxation response will stimulate the nerves, so that in a relaxed state it will be transmitted to the hypothalamus, so that the hypothalamus will produce Corticotropin Releasing Factor (CRF). as a result of decreased system activity in the brain stem. A relaxation response will occur if there is activity of the parasympathetic autonomic nervous system. Hormones that regulate circadian rhythms that influence sleep are the hormones melatonin and cortisol, melatonin usually starts being produced by the body around 20.00-21.00 and stops around 07.00. -08.00 (Mardjono, 2009 in Amanda, 2019).

Based on the results of research (Amanda, 2019) conducted at the Gondokusuman II Yogyakarta Community Health Center regarding the influence of progressive muscle relaxation on sleep quality in menopausal women, the results showed that there was an influence of progressive muscle relaxation with a p value of 0.000.

In this study, there was an improvement in sleep quality for the majority of respondents from quite bad to quite good. One of the respondents with the initials Mrs Nu experienced a decrease in sleep quality due to sleep disorders such as frequent urination at night. Even though the respondents are still in the same category, namely quite good, it is proven in table 5.12 that there is 1 positive rank value which indicates an increase in value. In contrast to Mrs Nu, the respondent with the initials Mr Ro is 41 years old, male, with no previous education or not having finished elementary school and working as an entrepreneur. Mr. Ro did not experience a change in the sleep quality category because his score was not enough to increase to good enough even though there was a change in the score on the sleep quality instrument. Mr. Ro experienced an increase in his sleep efficiency score on the PSQI instrument due to other sleep disorders such as difficulty initiating sleep. Mr. Ro had difficulty getting to sleep because he had to repair an IV drip due to phlebitis.

4. CONCLUSION

There is an effect of progressive muscle relaxation on reducing pain and sleep quality in functional dyspepsia patients in the inpatient room at RSU Muhammadiyah Lumajang, which can be proven by the Wilcoxon Signed Rank Test, which obtained a Z value of -4,604 for pain and a Z value of -4,537 for sleep quality. Asymp value. Sig. (2-tailed) of 0.000<0.05 means that H0 is rejected and H1 is accepted.

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