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SPIRITUAL MINDFULNESS EFFECT ON ANXIETY, RESPIRATORY RATE AND OXYGEN SATURATION IN PNEUMONIA PATIENTS

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ABSTRACT
Pneumonia in addition to causing problems in the respiratory system, also causes psychological disorders, manifesting as anxiety, causing worry, instilling feelings of restlessness, and triggering constant fear that has implications for daily functioning. Supportive therapy is needed to provide a good impact on the respiratory system and patient anxiety. The purpose of this study was to analyze the effect of spiritual mindfulness on anxiety, respiratory rate and oxygen saturation of pneumonia patients. Quantitative research with a quasi-experimental approach (pre-post test with control group design) in one of the hospitals in Gresik Regency. The sample in the study consisted of 64 divided into intervention groups and control groups recruited using purposive sampling. The independent variable is spiritual mindfulness with a frequency of 3 days and an intensity of 15 minutes. The research instrument to measure anxiety used a questionnaire from Zung SARS, respiratory rate was measured using direct observation for 1 minute and oxygen saturation was measured by observation through pulse oximetry. The analysis used in the study used the paired T-Test and the Wilcoxon signed rank test with a significance level of $\alpha \leq 0.05$. Spiritual mindfulness intervention showed a significant effect on respiratory rate (p=0.000), oxygen saturation (p=0.000) and anxiety (p=0.000) in the intervention group, but in the control group all showed no significant effect. The results of the calculation of the effect size of respiratory rate showed a value of d = 1.059, oxygen saturation showed a value of d = 0.735 and anxiety showed a value of d = 1.436. Spiritual mindfulness showed effectiveness in reducing anxiety levels, reducing respiratory rate and increasing oxygen saturation in pneumonia patients.

Keywords: anxiety; oxygen saturation; pneumonia; respiratory rate; spiritual mindfulness

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INTRODUCTION

Pneumonia is characterized by an inflammatory response in the pulmonary system, resulting in the accumulation of exudate induced by various pathogens, including parasites, fungi, bacteria, and viruses. This condition is among the most deadly respiratory infectious diseases. Common manifestations of pneumonia include episodes of fever, chills, diaphoresis, cough (which can be classified as non-productive or productive, potentially producing thick, purulent sputum or hemoptysis), chest discomfort, and a feeling of constriction on breathing. Beyond physical symptoms, pneumonia can also cause psychological distress, manifesting as anxiety that disrupts sleep cycles, causes worry, instills feelings of restlessness, and triggers persistent fears that have implications for daily functioning (Li et al., 2020).

Many interventions have been implemented to reduce anxiety through pharmacological and non-pharmacological modalities. The need for non-pharmacological interventions arises from their inherent advantages, including ease of implementation, safety, cost-effectiveness, and avoidance of dependency-related complications. Various non-pharmacological approaches

have been established to reduce patient anxiety; However, only a few interventions have shown a statistically significant impact on reducing anxiety, changes in respiratory rate and oxygen saturation in patients (Ulfa et al., 2021). Among the non-pharmacological therapies that have been given are aromatherapy, music therapy, guided imagery, autogenic training, and virtual reality, but many of these interventions do not significantly affect respiratory rate and oxygen saturation in patients. One specific non-pharmacological strategy that can be used to reduce anxiety, improve adaptation, and positively affect respiratory rate and oxygen saturation in patients is spiritual mindfulness practice. Spiritual mindfulness prioritizes concentration of attention on current events (situations that occur in the immediate context), where this practice actively involves the emotional, cognitive, and physical aspects of the individual to foster self-awareness of the current state (Field et al., 2021). Until now, there has been no non-pharmacological intervention to treat anxiety and improve respiratory rate and oxygen saturation in Pneumonia patients. Thus, spiritual mindfulness is very possible to be used as one of the non-pharmacological interventions in conditions of psychological distress (Marciniak et al., 2020).

According to data from the World Health Organization, the number of people affected by the pandemic of foodborne illness in 2016 was 935,000, followed by 920,136 in 2017, and 880,000 in 2018 who died from pneumonia. In Indonesia, the prevalence of pneumonia in 2017 was 46.34%, or 2 out of every 447,431 people, whereas in the Pacific, the prevalence was 41.93%, or 65,139 out of every 65,139 people who had pneumonia. Based on data from the East Java Health Office in 2022, the prevalence of pneumonia in the eastern region was 76,697 cases, with the highest incidence occurring in Sidoarjo, Surabaya and Gresik. Data from the Internal Performance Evaluation Report of a hospital in Gresik Regency found that pneumonia was ranked second in the respiratory tract disease category with 287 cases. A preliminary study conducted in the patient's inpatient room in the form of interviews found that 71.4% stated that the anxiety they felt was related to with the situation and condition of the patient because the patient finds it difficult to breathe (shortness of breath) and the patient is afraid that his condition will get worse (Nursalam, Efendi, et al., 2020).

Determining the right action will be easy with a thorough and comprehensive patient assessment starting from physical and psychological conditions. Understanding the symptoms of pneumonia in patients can save the time needed for treatment and reduce the likelihood of complications (Nursalam, Kurniawati, et al., 2020). Treatment involves psychological aspects as well as treating the physical condition alone in treating pneumonia. A few things that should be considered when examining patients with pneumonia who have psychological problems include anxiety, which can be attributed to affective factors such as anxiety and depression, as well as physiological factors such as tense jaw muscles that are not stable in increasing the production of bone (Sulistyorini et al., 2022)(Priyantini et al., 2021). Excessive anxiety in these patients is at high risk of experiencing changes in the patient's respiratory rate and oxygen saturation. One aspect that can improve a person's perception of their ability to communicate about their illness is spirituality. Spirituality, as one of the ways to reduce negative psychological effects, can create positive learning mechanisms through the limbic system's functional mechanisms. When combined with mindfulness practices, it can affect several areas of the brain, including the prefrontal cortex (attention area), which can suppress emotional responses, activate the amygdala, and affect the brain's response to pain, anxiety, and sensitivity to touch (Cahyani et al., 2022).

The compensation offered to maximize the benefits of this spiritual mindfulness training can also be carried out through an adaptation model based on Sister Callista Roy's theory of care. The concept and theory of Roy emphasizes the importance of using the patient's psychological resources to support their physical and psychological development in order to enable adaptive behavior, or personal adaptation strategies (such as consistency, ideal behavior, and moral-ethic-spiritual behavior), which are necessary as a comprehensive and flexible system of adaptation. A functioning system is one that is impervious to changes in information, behavior, and energy between systems, which enables individuals to maintain their integrity by adapting continuously. The focus of spiritual mindfulness is on the psychological aspects of patient care, specifically the methodical execution of procedures to minimize patient discomfort through the use of motivational statements in the form of support sentences and statements, as well as religious beliefs, which is thought to increase patient comfort, bravery, and self-acceptance regarding the condition that they are suffering from (Tayyebi, 2020). Based on the information presented above regarding spiritual mindfulness methods combined with adaptation theory regarding patient condition. This study aimed to analyze the effect of spiritual mindfulness on anxiety, respiratory frequency and oxygen saturation in pneumonia patients.

METHOD

The study was conducted using a quantitative research design with a quasi-experimental approach (pre-post test with control group design) to analyze the effect of spiritual mindfulness on reducing anxiety, respiratory rate and oxygen saturation in pneumonia patients. The study was conducted at a hospital in Gresik Regency. The sample in the study consisted of 64 people divided into intervention groups and control groups recruited using purposive sampling. The research respondents were taken based on the following criteria: 1) Willing to be respondents and sign informed consent; 2) Patients aged > 18 years; 3) Patients who are conscious, cooperative and able to communicate fluently; 4) Patients with changes in the results of respiratory rate and oxygen saturation examinations; and 5) Patients experiencing anxiety (mild, moderate and severe) without being in an emergency condition. The independent research variable is spiritual mindfulness which is implemented with a guidebook and direct intervention to patients for 3 full days, with intervention given in the morning before the patient is active, the intervention is given for a duration of 15 minutes. The pretest measurement of the study was carried out on the first day before the intervention was given and the posttest was carried out on the third day after the intervention was completed. The research instrument to measure anxiety used a questionnaire from Zung SARS which has undergone validity and reliability testing and is declared valid (r count between 0.566-0.721) and reliable (Cronbach alfa = 0.988), respiratory rate was measured using direct observation for 1 minute and oxygen saturation was measured by observation through pulse oximetry. The research data was first analyzed using a normality test with data obtained that anxiety showed abnormally distributed data, while respiratory rate and oxygen saturation showed normal distribution. The analysis used in the study to determine the effect of the intervention used a paired T-Test for oxygen saturation and respiratory rate, while for anxiety using the Wilcoxon signed rank test with a significance level of $\alpha \leq 0.05$.

RESULT

Based on table 1, it is shown that the intervention group is mostly over 60 years old (28.1%), with male gender (75.0%), 25.0% of occupations are self-employed and private employees and the most education level is high school (66.7%). In the control group, 28.1% are also mostly over 60 years old, 68.8% are male with the most occupations being private employees (21.9%) and the majority education level is high school (37.5%).

Table 1.
Distribution of Demographic Characteristics of Respondents

Characteristics	category	Intervention		Control		*p-value*
		f	%	f	%	
Age	19-30 Years	4	12,5	6	18,8	0,204
	31-40 Years	4	12,5	3	9,4	
	41-50 Years	8	25	7	21,9	
	51-60 Years	7	21,9	7	21,9	
	>60 Years	9	28,1	9	28,1	
Gender	Male	24	75	22	68,8	0,129
	Female	8	25	10	31,3	
Work	Not Working	4	12,5	6	18,8	0,331
	Housewife	7	21,9	6	18,8	
	Private	8	25	7	21,9	
	Self-Employed	8	25	6	18,8	
	Students	2	6,3	3	9,4	
	Civil Servants	3	9,4	4	12,5	
Education	Elementary School	8	25	10	31,3	0,332
	Junior High School	5	15,6	7	21,9	
	Senior High School	16	50	12	37,5	
	College	3	9,4	3	9,4	

Table 2.
Distribution of Anxiety Variables Before and After Intervention (n=64)

Anxiety	Intervention				Control			
	Pretest		*Post Test*		*Pretest*		*Post Test*	
	f	%	f	%	F	%	n	%
Normal	0	0,0	22	68,8	0	0,0	0	0,0
Low	4	12,5	8	25,0	2	6,3	2	6,3
Medium	20	62,5	2	6,3	22	68,8	20	62,5
High	8	25,0	0	0,0	8	25,0	10	31,3

The anxiety of pneumonia patients before being given the intervention mostly showed moderate and high anxiety, after being given the intervention the influence value was more visible in the intervention group (Table 2), which showed a change in anxiety to normal by 66.7%.

Table 3.
Distribution of Respiratory Frequency and Oxygen Saturation Variables Before and After Intervention (n=64)

Variable	Pretest			Postest			Nilai Δ
	Mean	Min	Max	Mean	Min	Max	
Respiratory Rate							
Intervention	21,25	20	22	20,17	20	22	1,08
Control	21,58	20	24	21,92	20	24	0,34
Oxygen Saturation							
Intervention	96,96	93	100	98,04	95	100	1,08
Control	98,13	96	100	98,08	96	100	0,05

The respiratory rate of the intervention group showed a decrease from 21.25 times/minute to 20.17 times/minute and the patient's oxygen saturation showed an increase from 96.96% to 98.04% (table 3).

Table 4.
Test of the Effect of Intervention on Anxiety, Respiratory Rate and Oxygen Saturation

Variable	Intervention			Control		
	(Δ ± SD)	Effect size	*p*	(Δ ± SD)	Effect size	*p*
Pre and Posttest Respiratory Rate	1,08±1,02	1,059	0,000*	0,68±1,13	0,071	0,288*
Pre and Posttest Saturation	1,08±1,47	0,735	0,000*	0,04±1,55	0,026	0,987*
Pre and Posttest Anxiety	14,58±10,15	1,436	0,000**	0,208±4,31	0,048	0,830**

* Uji paired t-test ** Uji Wilcoxon Signed rank test

Spiritual mindfulness intervention showed a significant effect on respiratory rate (p=0.000), oxygen saturation (p=0.000) and anxiety (p=0.000) in the intervention group, but in the control group all showed no significant effect. The results of the calculation of the effect size of respiratory rate showed a value of d = 1.059, oxygen saturation showed a value of d = 0.735 and anxiety showed a value of d = 1.436. This shows that the effect size of all these variables has a very large value, it can be concluded that spiritual mindfulness clinically has an effect on respiratory rate, oxygen saturation and anxiety in pneumonia patients (Table 4).

DISCUSSION

Anxiety in pneumonia patients in the results of this study showed a significant decrease in the intervention group compared to the control group. From the results of the pretest and posttest values that have been carried out, it was found that most of the intervention groups experienced a decrease after the spiritual mindfulness intervention was carried out. Signs of decreased anxiety in pneumonia patients after being given intervention can be seen from the patients looking more comfortable and not feeling afraid due to the disease they are suffering from (Sulistyorini et al., 2022).The results of this study are in line with other studies which show that mindfulness interventions have an effect on anxiety levels in patients with respiratory system disorders. According to López-Lois et al., (2021) stated that giving mindfulness intervention can significantly reduce feelings of anxiety in patients with respiratory system disorders. Research that has been conducted also states that giving mindfulness interventions that focus on inner peace and spirituality is effective in regulating unpleasant emotions, reducing amygdala activation and increasing prefrontal integration (Drigas & Mitsea, 2020).

Mindfulness spiritual practice that is attentive and carried out continuously until the individual feels adapted to the therapy, the individual will be directed to the physical sensations due to relaxation with spiritual and inner peace. Practicing spiritual mindfulness that is given using the adaptation mechanism in a cognitive and regulatory manner can help someone to have a healthier life and not be easily anxious, not easily depressed, see life better, improve relationships with others, increase self-esteem, improve the function of the human body's resistance and can reduce the possibility of someone being dependent on drugs. Spiritual mindfulness therapy is an effective therapy for psychological problems (Alimuddin, 2020). The therapy is able to help individuals to withdraw from personal problems and inner conflicts. During the spiritual mindfulness process, several events occur that influence each other, including the experience of being present, which as a spiritual mindfulness experience becomes very subjective, but in general, spiritual mindfulness is the ability to maintain the quality of awareness, acceptance and attention at all times by focusing on inner peace (Alimuddin, 2020; Dye et al., 2020). Furthermore, spiritual mindfulness has awareness, with this awareness, it is suggested that individuals have a greater ability to reflect and respond by calming their minds and focusing on peace of mind towards their anxious experiences when they arise (Alimuddin, 2020; Dye et al., 2020; Kinsella et al., 2020).

Next in spiritual mindfulness is acceptance, which is being able to accept what happens without judging, rejecting, or avoiding. Attention is receiving with awareness where one can maintain focus on what arises without becoming distracted or losing what is on the mind. And finally is the process of transformation, where through mindfulness one gains direct access to powerful inner resources for insight, transformation, and healing (Alimuddin, 2020; Ramdhonia, 2022).Spiritual mindfulness that is carried out continuously so that it causes adaptation shows that it can affect the frequency of breathing and oxygen saturation in patients with pneumonia. The results of the study showed that the vital signs of patients related to the respiratory system due to pneumonia, namely the frequency of breathing and oxygen saturation, showed a decrease after being given spiritual mindfulness intervention (Nursalam et al., 2022). Through spiritual mindfulness techniques can increase the relaxed condition in the body, so that the tension in the body becomes more reduced, the impact is able to make shortness of breath become distracted. What happens during the mindfulness therapy process is very influential in reducing anxiety levels. When someone feels anxious, the body's system will work by increasing the work of the sympathetic nerves in response to stress. The sympathetic nervous system works through the activation of the adrenal medulla to increase the release of epinephrine, norepinephrine, cortisol and reduce nitric oxide (Emilia et al., 2022).

This condition will cause changes in the body's response such as increased heart rate, breathing, blood pressure, increased blood flow to various organs and increased body metabolism. The spiritual mindfulness technique that is carried out will stimulate the brain area, namely the prefrontal cortex, which is the center of emotional regulation and assessment to instruct emotional reactions which the body will then respond to by feeling accepting and not judging. While in the hippocampus and amygdala, in addition to being an area for regulating emotions, it is also an area of openness, extinction, and reinforcement which will provide instructions to be more open so that individuals are able to release themselves in awareness, refrain from internal reactivity and are able to increase self-acceptance so that they can improve the respiratory system in patients (Alimuddin, 2020).Spiritual mindfulness techniques given with breath relaxation can reduce the respiratory rate in pneumonia patients who experience anxiety. The results of the study showed that the respiratory rate showed no significant difference because almost all respondents showed the same respiratory rate, namely in the normal range of 20-22 times/minute, but before the intervention was given there were several patients with pneumonia who initially showed oxygen saturation of 96% and after the intervention was given oxygen saturation in pneumonia patients increased to 98% and no longer complained of shortness of breath. The anxiety felt by patients with pneumonia will cause changes in the respiratory rhythm and can cause someone to experience tachypnea due to decreased oxygen and feelings of anxiety they feel. One intervention that can be given is to provide spiritual mindfulness in improving the respiratory rhythm due to feelings of anxiety felt by pneumonia patients. Spiritual mindfulness therapy carried out by patients can balance the activity of the autonomic nervous system in patients and improve the respiratory system.

The results of a study obtained p value data of 0.000 that there was an effect of mindfulness therapy on the effectiveness of breathing patterns, so that the respiratory rate could be stabilized again. Through mindfulness, all organs in the respiratory system will coordinate to restore the stability of the patient's breathing pattern, so that the patient can breathe more relaxed and become calmer (Feng et al., 2020). Spiritual mindfulness is a development of a relaxation response method involving patient belief and spirituality factors, which can create an internal environment that can help patients achieve higher health and well-being, also

proving that mindfulness relaxation can reduce pain in patients with respiratory system disorders. Spiritual mindfulness is a cognitive behavioral intervention with passive relaxation techniques without using muscle tension so it is very fast to reduce anxiety in pneumonia patients, because muscle tension will increase vital signs in patients, especially in the respiratory system in patients.

CONCLUSION

Spiritual mindfulness shows a decrease in anxiety levels in pneumonia patients, indicated by anxiety scores indicating that respondents' anxiety shows a decrease for the better. In addition, spiritual mindfulness also has a positive impact on respiratory rate and oxygen saturation

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