

The Effect of Spirotive Relaxation Techniques in Reducing the Level of Osteoarthritic Pain in the Elderly: Quasi Experiment Design

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Abstract

Introduction: *Pain* is a common issue in the elderly. Osteoarthritis is often encountered in the elderly and contributes significantly to pain. Pain complaints involve multifactorial and often face many hindrances in the management.

Objective: This study aims to determine the effect of spirotive relaxation techniques in reducing osteoarthritis pain scale in the elderly.

Methods: This quasi-experimental study used the Pre-Post Test Control Group Design, conducted in the Penyengat Olak and Sungai Duren Community Health Center, Jambi Province, Indonesia, from September to November 2021. Sixty-four elderly participants in this study were divided into Spirotive relaxation exercise and dhikr as the intervention group and the control group given Spirotive relaxation exercise only. Data analysis used t-test and independent t-test at a significant level of 95%.

Results: There are differences in pain levels of the intervention group before and after Spirotive relaxation exercise and dhikr. Before the intervention, pain levels were moderate to severe, and pain levels were mild to moderate after the intervention. Similar results were also obtained in the control group given Spirotive relaxation exercise only with a significant reduction in pain. The independent test results showed a p-value = 0.207, indicating no difference in osteoarthritis pain in the intervention and control groups.

Conclusion: Spiritual relaxation exercises have been shown to reduce pain levels in the elderly with osteoarthritis. There are also differences in the level of joint pain scale in the intervention and control groups. It suggests that public health centers provide non-pharmacological inspirational interventions as an additional therapy for the elderly.

Keyword: Osteoarthritic, Pain, Spirotive, Elderly

Introduction

Various health problems will arise along the ageing process and rising age. It is mainly a physical inconveniences problem, such as ailments of musculoskeletal function [1]. Pain in the joints frequently becomes an obstacle for the elderly to carry out daily activities [2,3]. Osteoarthritis is the most common joint disease, which increases in age. The ageing process exerts a shrinking effect on human muscle fibres. Muscle strength will undoubtedly decrease due to the shrinkage of muscle mass impacting the weakness in activity or movement, thereby reducing the quality of life. In addition, it also affects bone mass diminishes. The elderly with regular exercise do not encounter the same loss as the sedentary elderly [4].

Approximately 20% of the world's population obtains joint pain at 55 years old. The current increase in the elderly population goes hand in hand with an increase in the number of cases of joint pain [5,6]. Accordingly, the prevalence of joint disease in Indonesia is 7.3%, of which 45.58% arises in the 56-65 age group, 82.54% is discovered in the female group, and 53.26% complains of knee pain [7].

Knee Osteoarthritis (OA) is a common progressive multifactorial joint disease characterized by chronic pain and functional disability [4]. Knee OA accounts for almost four-fifths of the burden of OA worldwide and increases with obesity and age [6]. Knee arthroplasty is considered an effective treatment at an advanced stage of the disease. However, which is responsible for substantial health costs [5]. Many researchers have shifted their focus to the prevention and treatment in the early stage of the disease [2]. Accordingly, it is essential to understand the prevalence, incidence, and modifiable risk factors of knee OA to provide efficacious preventive strategies [3,8].

Non-pharmacological management of osteoarthritis pain in the elderly include Spirotive Relaxation Exercise (SRE) and dhikr [9]. Spirotive relaxation is a combination and modification of progressive muscle relaxation and spiritual relaxation (dhikr) interventions. Relaxation begins with dhikr, then relaxes muscle tension. Those activities are expected to obtain His grace in the form of peace,

tranquillity, happiness, health and physical fitness. [10].

Spiritual Relaxation (Dhikr) involves praising, remembering, and submitting supplications to God in resignation [11]. Medically, it has been proven that dhikr will automatically stimulate the secretion of endorphins to feel happiness and comfort [12]. Yusuf et al. [11] found changes in psychological well-being in the treatment group before and after the dhikr intervention.

The Spirotive Relaxation Exercise (SRE) is based on the Comfort theory of Kolcaba [13]. Comfort is the main goal in nursing because it is closely related to healing [14–16]. According to Yusuf, et al [11] Spiritual Relaxation intervention can provide comfort by doing SRE and spiritual relaxation (dhikr). Sound waves during dhikr will stimulate auditory receptors. Furthermore, the stimulus will be forwarded to the temporal lobe to catch the point of God (circuit of God). The prefrontal cortex will respond to stimuli at the point of God for the process of forming positive perceptions, both emotionally and spiritually. The amygdala will respond to the prefrontal cortex to the hippocampus as feedback. In addition, the amygdala also stimulates the hypothalamus through the hypothalamic-pituitary-adrenal (HPA) axis to secrete corticotrophin-releasing factor (CRF).

SRE induces muscle contraction of the skeletal fibers, leading to muscle tension [17,18]. In this case, the central nervous system (CNS) involves the sympathetic nervous system and the parasympathetic nervous system [19]. Several organs are affected by these two nervous systems [20]. Sympathetic and parasympathetic nerves work reciprocally. Activation of the parasympathetic nervous system, also called Trophotropic, provides a desire to rest and physical improvement of the body [20,21]. The feeling of comfort and relaxation may reduce even eliminate pain [18,22–24].

Gonçalves, et al [25] stated that dhikr could reduce joint pain in the elderly with knee osteoarthritis. Another study stated that being more active may reduce pain and the risk of functional impairment or disability [26].

Joint pain is a subjective experience that impacts the quality of life and impaired functional activities of the elderly. Therefore, adequate treatment is needed. Non-pharmacological intervention

SRE has the potential to reduce the intensity of osteoarthritis pain. To the best of our knowledge, this has never been studied. Therefore, this study aims to determine the effectiveness of Spirotive Relaxation Exercises to reduce osteoarthritis pain in the elderly.

Methods

Research design

The research design used in this study was Experimental with a Quasi Experiment Design in Pre-Post Test Control Group approach. This study revealed a causal relationship by involving the control group and the experimental group.

Research Time and Place

The study was conducted in the working area of the *Penyengat Olak* and *Sungai Duren* Community Health Center, Jambi Province, Indonesia, from September to November 2021.

Participants

The participants in this study were all the elderly in the *Penyengat Olak* Health Center (n=32 people) and the elderly at the *Sungai Duren* Health Center (n=32 people).

Intervention

SRE is administered independently for 45 minutes twice a week for four weeks. SRE measurement used SOP, While the pain level was measured using the WOMAC Questionnaire. In this index, 24 parameters consisting of pain, stiffness, physical and social function were evaluated using WOMAC. The higher value obtained indicates the magnitude of the patient's functional limitations. The higher the value obtained indicates the magnitude of the patient's functional limitations. In comparison, the lower value indicates improved functional ability. WOMAC parameters include

(1) the presence of pain, which aspects are assessed when walking, climbing stairs, doing activities at night, at rest and when supporting (2) the presence of stiffness in the morning and stiffness throughout the day (3) the state of physical function Patients have difficulty going downstairs, difficulty going upstairs, difficulty from sitting to standing, difficulty standing, difficulty sitting on the floor, difficulty walking on a flat surface, difficulty getting in and out of a vehicle, difficulty shopping, difficulty wearing socks, difficulty lying in bed, difficulty taking off socks, difficulty sitting, difficulty doing heavy tasks and difficulty doing light tasks. WOMAC produces an algorithmic value obtained from a questionnaire to measure pain and disability in patients' knees. In the questionnaire, the answers were given a 0 - 4. Each score represents the patient's perceived state. Details of the WOMAC questionnaire can be seen in the table. Furthermore, the scores of the 24 questions are added up divided by 96 and multiplied by 100% to find out the total score and categorized as Mild (0-40%), moderate (40%-70%), and severe (70%-100%). The greater the score, the more severe the pain and disability of the knee [27,28].

The Assessment of pain is based on stiffness and physical function with mild, moderate, and severe categories. The intervention group was given SRE and reciting dhikr, while the control group only received SRE.

Outcomes

The output of this study was to determine the level of pain and the differences in pain levels before and after giving spirotive relaxation exercises.

Sample size

The sample in the current study was 64 participants divided into two groups, 32 participants as group intervention and 32 participants as group control. The minimum sample size was determined using the GPower software version 3.1.9.4, where the effect size $d = 0.63$, $\alpha = 0.05$, at power

0.80 with a sample ratio of 1:1. The sample size for group 1 was 32 and group 2 was 32 for a total of 64. The sample was randomly selected. The sample size in the study initially involved 124 potential participants, whereas 60 people did not meet the criteria. The inclusion criteria for the sample were 45-80 years old, a minimum education level of Elementary School (SD), and no cognitive impairment (MMSE score >23). At the same time, the elderly with limited range of motion and bed rest were excluded.

Randomisation

Participants were selected from the total population using a simple random technique. Sample selection includes determining prospective participants, selecting participants, and reporting participants to researchers. Enumerators received a briefing on applying the sample selection mechanism for the provision of SRE and dhikr.

Blinding

The included samples were selected blindly. The enumerator who had been assigned by the researcher did not previously know the potential participants.

Ethical Consideration

No economic incentives were offered or provided for participation in this study. The study was performed under the ethical considerations of the Helsinki Declaration by the Health Research Ethics Commission of the Ministry of Health, Jambi, and registration number: LB.02.06/2/59/2021.

Statistical analysis

Description of participant characteristics (age, gender, education level, and occupation) and osteoarthritis pain before and after the intervention is based on univariate analysis results. Data are

presented as numbers and percentages for categorical variables. Continuous data were expressed as mean \pm standard deviation (SD) or median with Interquartile Range (IQR). The normality test used the Kolmogorov-Smirnov test with Lilliefors significance correction.

In bivariate analysis, a t-test was used to assess the effect of spiritual healing and dhikr in the intervention and control groups. In contrast, an independent t-test was used to determine differences in osteoarthritis pain intensity between the two study groups. All tests with p-value (p)<0.05 were considered significant. Statistical analysis was performed using SPSS version 16.0.

Results

The characteristics of respondents are presented in table 1 below :

<i>Characteristics of Respondents</i>	Group			
	Intervention		Control	
	N	%	N	%
Sex				
Man	12	37.5	10	31.3
Female	20	62.5	22	68.7
Age				
45-59 y.o	12	37.5	14	43.8
60-74 y.o	18	56.3	17	53.1
75-90 y.o	2	6.2	1	3.1
Education Level				
Primary school	6	18.8	9	28.1
Junior high school	17	53.0	16	50.0
Senior High School	6	18.8	5	15.6
College	3	9.4	2	6.3
Occupation				
Work	4	12.5	3	9.3
No work	28	87.5	29	90.7

Table 1. *Characteristics of Respondents*

Characteristics of respondents from the two groups are based on gender, primarily female, 62.5% from the intervention group, and 68.7% from the control group. The characteristics of respondents based on age were mainly in the elderly group (60-74) years, 56.3% in the intervention group, and 53.1% in the control group. Based on education level, most respondents were junior high school, as

much as 53% in the intervention group and 50% in the control group. Characteristics of respondents based on the type of work show that most respondents did not work, as much as 87.5% in the intervention group and 90.7% in the control group.

The description of osteoarthritis pain in the intervention group before and after the intervention presented in table 2 below:

Pain scale	Pre test		Post test	
	n	%	n	%
Mild	2	6.3	12	37.5
Moderate	15	46.9	18	56.2
Severe	15	46.9	2	6.3

Table 2. Description of pain scale before and after spirotive intervention in the intervention group

Table 2 shows that the scale of osteoarthritis pain before the SRE was mild pain (6.3%), moderate pain (46.9%), and severe pain (46.9%). The osteoarthritis pain scale felt by respondents after the SRE was mild pain (37.5%), moderate pain (56.3%), and severe pain (6.3%).

The description of osteoarthritis pain in the control group before and after the intervention presented in table 3 below:

Pain scale	Pre test		Post test	
	n	%	n	%
Mild	5	15.6	19	59.4
Moderate	21	65.6	12	37.5
Severe	6	18.8	1	3.1

Table 3. Description of pain scale before and after spirotive intervention in the control group

Table 3 shows that the scale of osteoarthritis pain before SRE was 15.6% in mild pain, 65.6% in moderate pain, and 18.8% in severe pain. After the intervention, it was found that participants felt

mild pain (59.4%), moderate pain (37.5%), and severe pain (3.1%).

Furthermore, the data normality test was carried out using the Kolmogorov-Smirnov test to determine the distribution of research data. The results of the data normality test are presented in table 4 below:

Group	N	mean±SD	Kolmogorov-Smirnov test p-value
Intervention	32	58.26±14.86	0.801
Control	32	47.58±7.26	0.424

Table 4. *Data Normality Test*

Table 4 shows that the p-value of the intervention group > 0.05 , as well as the p-value of the control group > 0.05 , so it can be concluded that the data is normally distributed.

The condition of painful scale before and after the intervention in Group 1 and Group 2 can be seen in the table 5 below:

Interventions Group 1 and 2	N	t test		independent t test
		Group intervention Mean±SD Median (IRQ)	Group control Mean±SD Median (IRQ)	Group intervention vs. Group control
Pre-test	32	68.31±18.28 68.5 (55-82)	54.56±19.64 56 (44.75-69.25)	p-value = 0.005
Post-test	32	48.21± 26.35 46 (23-74.5)	40.59±21.16 34 (23-56)	p-value = 0.207
p-value		0.0001	0.001	

Table 5. *Frequency distribution of Group Intervention and Group Control before and after interventions*

Table 5 shows a significant decrease in pain level in both groups before and after the intervention with a p-value < 0.05 . Based on the t independent test, it was found that the p-value for the pre-test (< 0.005) and the post-test was 0.207. The post-test value showed no difference between the two

research groups.

Discussions

The t-test result of pre-post intervention revealed a decrease in pain. In both the intervention and control groups, the p-value was <0.05 . The independent t-test showed differences in the two groups before the intervention with a p-value <0.05 , but after the intervention (post-test), the p-value was >0.05 . It indicates that SRE and dhikr therapy may reduce knee OA pain in the elderly.

Older people with osteoarthritis often run into joint pain [29,30]. These complaints are often found in geriatric care in the community and clinic. This study provides an SRE intervention with a combination of spiritual techniques: dhikr (spiritive) to reduce joint pain in the elderly with osteoarthritis [24]. Joint disease is a degenerative process and causes pain in the elderly [31]. Pain itself can be caused by several conditions, including rheumatoid arthritis, gout (uric acid), and osteoarthritis [32]. SRE is a technique for reducing muscle tension by a simple and systematic process of stretching a group of muscles and then relaxing back [33].

SRE focuses on maintaining a deep form of relaxation, applying contraction and relaxation of various muscle groups from the feet up or from the head down. This method will realise where the muscles are located and increase awareness of the body's muscle response [34,35]. SRE may reduce pain, anxiety, depression, improve sleep quality, and reduce fatigue [36].

Religious relaxation (dhikr) is a technique that includes a belief factor. In this study, we used the element of Islamic belief with the repeated praise of God's name submissively [11]. Religious relaxation: dhikr is one of the efforts to meet the psychological needs of the elderly through the fulfillment of spiritual needs. It is also a practice of prayer to God by continuously remembering God name submissively. The essence of dhikr is praying for forgiveness, praising and glorifying God, being grateful, takbir to humble before God. Finally, eliminate ourselves and our ego against God's ego in all the activities we do [37].

Dhikr relaxes the body and produces impulses sent through afferent nerve fibers. Physiologically, spiritual therapy by *dhikr* or remembering God's name causes the brain to work. When the brain gets external stimulation, it will produce neuropeptides chemicals to provide comfort. The substances will be involved and absorbed in the body, providing feedback in comfort. Psychologically *dhikr* will balance serotonin and norepinephrine levels in the body. This phenomenon is natural morphine that works in the brain and will cause the heart and mind to feel calm compared to before *dhikr* [37].

The results of this study must be interpreted cautious because the limitations of this study are: the patient was not directly supervised by the researcher in doing *dhikr*. It is difficult to determine the quality of *dhikr* performed by a person, and there are no clear parameters to determine it. Supposedly, the acceptable quality of *dhikr* will give a calming effect. It could result in no difference in pain levels between the two groups after the intervention. In future studies, supervision should be conducted strictly when the intervention ensues. The strength of this study lies in its RCT design, using an intervention that has never been done before in patients with osteoarthritis pain.

Conclusion

SRE has been proven to reduce joint pain scale in the elderly with osteoarthritis, and there are also differences in joint pain scale levels in the intervention and control groups.

It is suggested that the community health centers may use SRE as an additional therapy for the elderly. Increasing the capacity of elderly health assistance needs to be carried out by the community health centers to increase the knowledge and behavior of the elderly in overcoming problems related to their degenerative conditions.

The limitations

The limitations of this study include a small sample and only involving respondents in one country, namely Indonesia, so it cannot compare the intervention responses in each different ethnic group.

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Competing interests statement

There are no competing interests for this study.

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