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Article

The Effect of Combination Acupuncture Therapy with Administration of Red Ginger Steeping on Changes in Pain Scale and BPFS in Patients with Low Back Pain at the Jakarta Hajj Dormitory

Ahnafa Aisya Al-Syarani Nazilah Ali[1], Imrok Atus Sholihah[2], Hanung Prasetya[3]

[1-3]Acupuncture Department, Health Polytechnic Ministry of Health Surakarta, Indonesia

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CORRESPONDENCE

Phone: 085326777902

E-mail: nafaaisya18@gmail.com

ABSTRACT

Low back pain is a musculoskeletal disorder that affects the muscles, bones, joints, and connective tissues, potentially impairing function and reducing quality of life. This study aims to determine the effect of a combination of acupuncture therapy with red ginger steeping on pain scale reduction and functional improvement in patients with low back pain. A quasi-experimental design with a two-group pretest-posttest approach was used, involving 32 participants selected through total sampling at the Jakarta Hajj Dormitory from October 2023 to May 2024. Participants were divided into two groups: one receiving acupuncture therapy alone, and the other receiving a combination of acupuncture and red ginger steeping. Statistical analysis using the Wilcoxon test yielded a p=0.010, indicating a significant improvement in pain scale and Back Pain Functional Scale (BPFS) scores in both groups after the intervention. The findings suggest that the combination of acupuncture and red ginger steeping is effecttive in reducing pain and enhancing functional ability in patients with low back pain.

I. INTRODUCTION

Health problems are prevalent in many countries in many people's lives(1). The pain experienced by sufferers has a high degree of subjectivity because many are felt as annoying to debilitating, and can feel like a sharp stab or dull pain(2). Some studies state that there are risk factors that cause low back pain, such as occupational factors, gender, age, lifestyle, psychosocial, and physical stress. One of the causes of low back pain is work factors. This can cause workers to lose time to work and reduce work productivity. Low back pain often occurs in various occupations, one of which is in office employees. Office employees can experience low back pain depending on the causes of work, including sitting position, sitting duration, work attitude, break frequency, and work chair design (3).

These habits affect the performance of the spine as it makes up 40% of human height. The spine is most instrumental in maintaining the body in a seated position as well as the organ most susceptible to

complications due to prolonged sitting, especially if movement is not used optimally, no stretching, and movement is not gradual [4]. The spinal joints are strengthened by various ligaments, injury to the ligaments is one of the causes of low back pain [5]. Based on their function, the spinal joints in the lower back receive a heavy enough load that they often cause abnormalities accompanied by various complaints. Thus, the normal movement ability of the spinal joints in the lumbar region is very limited [6].

This is supported by WHO, that a long sitting position for hours will cause a musculoskeletal disorder in the lower spine [7]. Currently, low back pain is a condition that can cause inefficiency of a job and requires quite a lot of treatment [3]. Due to biomechanical processes, repetitive pressure on the disc can cause annular disc tears and internal disc disruption [8]. A study conducted on workers in the PT.X Jakarta office who used computers during work shifts stated that the most common musculoskeletal complaints experienced by employees were low back pain at 53.8% [9].

Based on the results of observations, researchers have conducted a preliminary study at the Jakarta Hajj Dormitory. There are 32 employees who are willing to become research subjects, therefore researchers are interested in conducting research to determine the effect of a combination of acupuncture therapy with red ginger steeping on pain scale reduction and functional improvement in patients with low back pain.

II. METHODS

This study employed a quasi-experimental design with a two-group pretest-posttest approach. Participants were divided into two groups: Group 1 received acupuncture therapy only, while Group 2 received a combination of acupuncture therapy and red ginger steeping. The research was conducted at the Jakarta Hajj Dormitory over the period from October 2023 to May 2024.

Sampling was conducted using the total sampling method, involving all employees at the Jakarta Hajj Dormitory who experienced low back pain and voluntarily agreed to undergo acupuncture therapy and consume red ginger steeping. A total of 30 subjects met the inclusion criteria and participated in the study. The age distribution of participants ranged from 26 to 60 years, with an average age of 42 years. The age group 46–55 years represented the largest proportion (36.7%).

The interventions were as follows: acupuncture was administered at specific acupoints BL23 (Shenshu), BL24 (Qihaishu), BL25 (Dachangshu), and BL40 (Weizhong), which are believed to influence segmental transmission to the midbrain and stimulate endorphin release from the hypothalamus-pituitary axis. The second intervention involved oral administration of red ginger steeping, known for its ability to inhibit the formation of prostaglandin E2 (PGE-2), which contributes to pain reduction.

The measurement tools used were numeric Rating Scale (NRS) to assess pain intensity, with scores ranging from 0 (no pain) to 10 (unbearable pain). Back Pain Functional Scale (BPFS) to evaluate functional disability, with scores categorized as follows: 0 = paralyzed, 1–20 = very severe disability, 21–40 = severe disability, 41–59 = moderate disability, and 60 = minimal disability.

An acupuncture therapy log to record the therapy procedures and responses. Primary data was collected directly through interventions administered by the researchers. Equipment used included acupuncture needles (1 cun), sterile cotton, 70% alcohol, tweezers, hand scoops, glassware, red ginger sachets, spoons, and hot water. The data analysis was performed using the Shapiro-Wilk test for normality and Wilcoxon test to compare differences between the two groups. A p-

value of less than 0.05 was considered statistically significant.

III. RESULT

Table 1 shows that the total number of research subjects was 30 people. The age range with the highest frequency is at the age of 46-55 years, as many as 11 people (36,7%), and the lowest age range is in the age range 56-60 (6,7%) as many as 2 people. The research subjects with male gender are more than research subjects with female gender, namely 17 people (56,7%) are male while 13 people (43,3%) are female and the most common syndrome is Qi and Xue stagnation as many as 17 people (56,7%), and the least is kidney Yang deficiency as many as 2 people (6,7%).

Table 1. Characteristics of Respondents

Syndrome	N	%
Age (years)		
26-35	10	33.3
36-45	7	23.3
46-55	11	36.7
56-60	2	6.7
Gender		
Woman	13	43.3
Man	17	56.7
Differentiation syndrome		
Stagnasi Qi dan Xue	17	56.7
Cold Damp	3	10.0
Yang Kidney Deficiency	2	6.6
Yin Kidney Deficiency	8	26.7

Based on Table 2, it can be explained that the most pain scale before therapy was scale 5 as many as 8 people (26.7%) and the least pain scale was scale 3 and 4 as many as 1 person (3.3%). The mean value of NRS before intervention in the acupuncture and red ginger steeping groups was 5.40, the median value and mode value were 5. The acupuncture group on the pain scale before therapy was mostly scale 3 and 5, as many as 6 people (20.0%), and the least pain scale was scale 4, as many as 1 person (3.3%). The mean value of NRS before intervention in the acupuncture group was 4.27, the median value was 5, and the mode values were 3 and 5.

Table 2. Frequency Distribution of Research Subjects Based On Pain Scale Before Therapy

Scale	Group I		Group II	
	N	%	N	%
3	1	3.3	6	20.0
4	1	3.3	1	3.3
5	8	26.7	6	20.0
6	3	10.0	2	6.7
8	2	6.7	0	0.0

Based on Table 3, it can be explained that the acupuncture and red ginger steeping groups on the pain scale after the most therapy were scale 2 as many as 7 people (23.3%), and the least pain scale was scale 3 as many as 1 person (3.3%). The mean value of NRS after intervention in the acupuncture and red ginger steeping groups was 1.33, the median value and mode value were 2. The acupuncture group on the pain scale after the most therapy was scale 0 as many as 9 people (30.0%), and the least pain scale was scale 1 and 2, each as many as 3 people (10.0%). The mean NRS value after intervention in the acupuncture and red ginger steeping groups was 0.60, the median value and mode value are 0.

Table 3. Frequency Distribution of Research Subjects Based On Pain Scale After Therapy

Scale	Group I		Group II	
	N	%	N	%
0	4	**13.3**	9	30.0
1	**3**	10.0	3	10.0
2	7	23.3	3	10.0
3	1	3.3	0	0.0

Based on Table 4, it is known that of all 30 research subjects, the BPFS (Back Pain Functional Scale) score before

therapy was the most in the acupuncture and red ginger steeping groups in the BPFS before therapy the most was a score of 50 as many as 4 people (13.3%) and the least score was 46 and 48 as many as 1 person (3.3%). The mean value of BPFS before intervention in the acupuncture and red ginger steeping groups was 49.93, the median value was 50, and the mode value was 50. The acupuncture group in BPFS before therapy had the most scores of 50 and 54, as many as 4 people (13.3%), and the least scores were 44 and 48, as many as 1 person (3.3%). The mean value of BPFS before intervention in the acupuncture group was 51.00, the median value was 51, and the mode value was 50 and 54.

Table 4. Frequency Of Research Subjects Based On The BPFS (Back Pain Functional Scale) Score Before Therapy

Scale	Group I		Group II	
	N	%	N	%
44	0	0.0	1	3.3
45	2	6.7	0	0.0
46	1	3.3	0	0.0
48	1	3.3	1	3.3
50	4	13.3	4	13.3
51	2	6.7	3	10.0
52	2	6.7	2	6.7
53	3	10.0	0	0.0
54	0	0.0	4	13.3

Table 5, it is known that out of a total of 30 research subjects in the acupuncture and red ginger steeping groups on BPFS after therapy, the most scores were 59 and 60 as many as 5 people (16.7%) and the least score was 57 as many as 1 person (3.3%). The mean value of BPFS after the intervention was 58.93, the median value and the mode value were 59. acupuncture group in BPFS after the most therapy was a score of 58, as many as 7 people (23.3%) and the least score was 55 and 60 as many as 1 person (3.3%). The mean value of BPFS after intervention was 58.07, the median value and mode value were 58.

Table 5. Frequency Of Research Subjects Based On Pain Scale After Therapy

Scale	Group I		Group II	
	N	%	N	%
55	0	0.0	1	3.3
57	1	3.3	2	6.7
58	4	13.3	7	23.3
59	5	16.7	4	13.3
60	5	16.7	1	3.3

The average change in pain in the acupuncture group amounted to 3,67. So the data showed that the average acupuncture and red ginger steeping therapy group was greater than the acupuncture therapy group. This indicates that there are changes in the pain scale in each treatment group.

Table 6. Wilcoxon Test

Group	Mean Difference	p
Group I **Group II**	3.67	<0.001

IV. DISCUSSION

The results of the analysis based on age are mostly in the age range of 46-55 years. Age is one of the individual factors associated with the occurrence of low back pain. Bone degeneration begins to occur when a person is ≥ 30 years old. Over the years, this condition takes the form of tissue damage, scar tissue replacement, and fluid reduction, which can lead to reduced bone and muscle stability[10]. Age 46-55 years has a high risk of decreased elasticity in the bones, causing pain in the

lower back due to abnormalities in the intervertebral discs in old age [11]. The results of data analysis based on gender were mostly male, namely 17 research subjects. This was noted in a study, the population conducted on the island of Java showed that low back pain sufferers were more common in men, namely 18.2% and women as much as 13.6% [12]. Men are more susceptible to low back pain caused by trauma because in their physical activities they stretch more or use muscles excessively, such as lifting heavy objects, lifting weights with improper posture and repeatedly.

Acupuncture therapy using localized points can help treat low back pain effectively. It is said in a study that local acupuncture points have more effective results. The benefits of acupuncture therapy, in addition to increasing enkephalins and endorphins in the local area around the back, acupuncture can also affect the transmission of impulses segmentally to the midbrain, which can increase endorphins in the pituitary hypothalamus [13]. Acupuncture sends pain signals to the body's afferent nerve endings through three different types of pain receptors in the treatment of low back pain. The A delta nerve is a myelinated nerve that transmits taste, temperature, and pain quickly, while the A alpha nerve is a myelinated nerve that inhibits pain. The C nerve, on the other hand, conducts slow and sustained pain [14].

This study uses and the use of red ginger as a brew has the main content in red ginger is gingerol and shogaol which are flavonoid compounds that have the same effect as ibuprofen in overcoming pain symptoms because ginger has antioxidant, analgesic, antibiotic, anti-inflammatory, anti-allergic, diuretic, and antitumor properties. The content of red ginger, such as phenol and gingerol, in high percentages as a raw material for traditional medicine can affect the release of proinflammatory cytokines [15].

This study uses a pain scale measurement in the form of a Numeric Rating Scale (NRS) which is used to assess the intensity of pain severity and gives the research subject freedom in identifying it. In the NRS score category 0 (no pain), 1-3 (mild pain), 4-6 (moderate pain), 7-9 (severe pain), and 10 (severe uncontrolled pain) (16).

Before treatment, it can be seen that the average change in the pain scale owned by the research subjects was 5.40 (group I) and 4.27 (group II), while the average increase in functional ability in the research subjects was 49.93 (group I) and 51.00 (group II). To determine the effect of each treatment, after completing a therapy session consisting of 10 meetings, the researcher re-measured the research subject so that post-test data was obtained. Based on table 5, it can be seen that by being given therapy for 10 times the therapy, the average pain scale owned by the research subjects decreased to 1.33 (group I) and 0.60 (group II), while the average increase in functional ability increased the score on the research subject to 58.93 (group I) and 58.07 (group II). So it can be seen that the average decrease between the two treatment groups is 4.07 (group I) and 3.67 (group II) which is obtained from the results of reducing the mean pre- and post-pain scale therapy actions.

The results of the data analysis using Wilcoxon obtained a significance value of 0.001. It can be said that Ha is accepted and Ho is rejected, because the $p < 0.050$. From the results of these statistical tests, it is known that acupuncture therapy and red

ginger steeping affect changes in pain scale and increased functional ability for low back pain in office employees at the Jakarta Hajj Dormitory.

Factors that still affect the results of the study are in controlling the research subject, which is difficult to control factors that can cause bias in the study, such as daily activities both outside the office and in the office that can exacerbate complaints (posture, moving goods and heavy loads by lifting, pushing, or pulling, non-ergonomic positions, working hours, sitting duration, work environment, and lifestyle including rest patterns, sleeping positions, bedding used, and driving positions).

V. CONCLUSION

The majority of study participants were male (17 individuals), with the highest age distribution in the 46–55 year age group (11 individuals), and the most common syndrome differentiation identified was Qi and Xue stagnation. The average age across both groups was 42 years. The mean reduction in pain scale was greater in the group receiving a combination of acupuncture and red ginger steeping (4.07) compared to the acupuncture-only group (3.67). Similarly, the mean improvement in functional ability was higher in the combination therapy group (9.00) than in the acupuncture-only group (7.07). These findings indicate that the combination of acupuncture therapy and red ginger steeping is more effective in reducing pain and improving functional ability in patients with low back pain. Statistical analysis using the Wilcoxon test showed a significant difference before and after treatment in both groups, with a p-value of 0.001 ($p < 0.05$), confirming the effectiveness of the interventions.

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