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Effectiveness of Combined Zhu's Scalp Acupuncture Therapy on Pain Scale Changes in Radiating Low Back Pain in The Independent Practice of Acupuncture Ism Gresik

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ABSTRACT

Radiating low back pain (ischialgia) is a common condition caused by nerve root compression and may lead to functional impairment if not adequately treated. Long-term pharmacological therapy is associated with adverse effects, emphasizing the need for effective non-pharmacological interventions. This study aimed to evaluate the effectiveness of Zhu's Scalp Acupuncture combined with local body acupuncture compared to local body acupuncture alone in reducing pain intensity in patients with radiating low back pain. A quasi-experimental design with a non-equivalent control group was applied. Thirty participants were selected using purposive sampling and divided into two groups. Group I received local body acupuncture, while Group II received a combination of local body acupuncture and Zhu's Scalp Acupuncture. The intervention was administered over six sessions, twice weekly. Pain intensity was measured using the Visual Analogue Scale (VAS) before and after treatment. The analysis revealed a statistically significant difference between the two groups, with a $p < 0.001$. Although both interventions reduced pain intensity, the combined therapy demonstrated greater effectiveness than local body acupuncture alone. In conclusion, Zhu's Scalp Acupuncture combined with local body acupuncture is more effective in reducing pain intensity in patients with radiating low back pain.

I. INTRODUCTION

Pain is a body's response indicating a disorder in an organ or metabolic process, such as in inflammatory conditions. Pain can be temporary, but in some cases, it can last for a longer period of time⁽¹⁾. Some common complaints experienced by individuals with musculoskeletal disorders

include neck pain, back pain, Carpal Tunnel Syndrome, stiff neck syndrome, lower back pain, Tennis Elbow, and Ischialgia⁽²⁾.

Ischialgia is a condition characterized by pain radiating from the lower pelvic area to the lower extremities, following the distribution pathway of the lumbar nerves.

This condition is generally caused by compression of the nerve roots at the L4 to S3 segments due to intervertebral disc herniation and is often accompanied by motor or sensory disturbances as well as reflex changes⁽³⁾. Ischialgia typically begins in the lumbosacral area and radiates to the buttocks, the back of the thigh, the calf, and the lateral side of the foot. If left untreated, this condition can lead to muscle weakness accompanied by atrophy of the lower limb muscles⁽⁴⁾.

According to the World Health Organization (WHO) in 2022, approximately 1.71 billion people worldwide suffer from musculoskeletal disorders, including low back pain, neck pain, fractures, and other injuries. Musculoskeletal conditions are a leading cause of disability worldwide, with low back pain being the primary cause of disability in 160 countries. In Indonesia, based on the 2018 report from the Basic Health Research (Riskesdas) by the Indonesian Ministry of Health, the prevalence of musculoskeletal issues in Indonesia is 7.3%⁽⁶⁾. Meanwhile, the 2018 Basic Health Research (Riskesdas) in Indonesia shows the prevalence of Ischialgia at 18-21%⁽⁴⁾. In East Java, an estimated 40% of the population aged 65 years and above have experienced Ischialgia, with incidence rates of 18.2% in males and 13.6% in females⁽⁷⁾. The number of Ischialgia patients at the ISM Gresik Independent Acupuncture Practice in 2024 ranked 5th highest, with Ischialgia sufferers accounting for 16% of the total 1,728 patients. The treatment for patients with Ischialgia aims to alleviate pain, restore movement and mobility function, and prevent recurrence and chronic pain. One option is pharmacological therapy (medication). However, long-term use carries the risk of side effects such as stomach issues and constipation. Moreover, the frequent consumption of medications without a doctor's prescription or proper usage guidelines can lead to side effects, drug resistance, and dependency. Therefore, non-pharmacological therapies

such as acupuncture have become an ideal choice for both patients and clinicians in managing Ischialgia. Nevertheless, acupuncture may be less favored by those who have a fear of needles⁽⁴⁾.

Acupuncture therapy, as a non-pharmacological treatment from Chinese Medicine, is an established modality for pain management. Modern research indicates acupuncture provides analgesic effects by regulating microglial activation, inhibiting inflammation, and modulating pain pathway receptors in both the central and peripheral nervous systems. Clinical studies also confirm that acupuncture is effective in alleviating symptoms of Ischialgia⁽⁸⁾.

Several acupuncture methods include Scalp Acupuncture. One such method is Zhu's Scalp Acupuncture, which is based on the neuroanatomical functions of the brain, with all points on the scalp representing brain functions⁽⁹⁾. Zhu's Scalp Acupuncture is a method of inserting acupuncture needles at specific points within eight distinct zones on the head. The needles are inserted subcutaneously into the subaponeurotic layer of the scalp, with manipulations including the sedating Chou Qi method and the tonifying Jin Qi method⁽¹⁰⁾. Among the eight zones in Zhu's Scalp Acupuncture, there is the Anterior Vertex Zone (Dingjie depan), located along the line from GV-20 to BL-7. This area is used to treat pelvic pain (Ischialgia/Sciatica, Neuralgia, Piriformis Syndrome, trauma) and the inguinal region⁽⁹⁾.

This research will be conducted at the ISM Gresik Independent Acupuncture Practice, located in Dsn. Kedungsekar Lor, RT/RW.05/02, Ds. Kedungsekar, Kec. Benjeng, Kab. Gresik, with a patient volume of 144 people per month. Preliminary research conducted by the researcher found that cases of radiating low back pain accounted for 16% of the total number of patients treated.

This study aimed to determine the effectiveness of combined acupuncture therapy with Zhu's Scalp Acupuncture on

changes in pain scale in cases of radiating low back pain at the ISM Gresik Independent Acupuncture Practice.

II. METHODS

This research employs a quantitative design with a Quasi-Experimental approach, specifically a Non-Equivalent Control Group Design. The study population consists of all patients with radiating low back pain (sciatica) at the ISM Gresik Independent Acupuncture Practice. A sample of 30 subjects who meet the inclusion criteria (such as chronic pain ≥ 3 months, VAS score ≥ 7 , age 40-65 years) was selected using purposive sampling and divided into two groups. The control group (Group I) received standard body acupuncture therapy at specific points (GB30, BL23, BL25, BL40, BL57), while the experimental group (Group II) received the same therapy combined with Zhu's Scalp Acupuncture.

The research procedure included initial (pre-test) and final (post-test) pain scale measurements using the Visual Analogue Scale (VAS). The intervention was administered over 6 sessions. The independent variable is the combined Zhu's Scalp Acupuncture therapy, and the dependent variable is the change in the pain scale. Data collection instruments included assessment forms, informed consent, and observation sheets, with the therapy procedure standardized in an SOP.

III. RESULT

The study was conducted from February 2025 to September 2025. After the research proposal was approved, sample recruitment was carried out, resulting in a population of 36 individuals experiencing radiating low back pain. To ensure sample homogeneity and research validity, further selection was performed using a purposive sampling method in accordance with the predetermined inclusion and exclusion criteria. Based on this

process, a total of 30 subjects met the eligibility criteria and were included in the study. Meanwhile, six individuals were excluded due to reasons that met the exclusion criteria, including two participants who did not complete the six therapy sessions, two who declined to participate, and two who withdrew from the study due to fear of needles.

Table 1. Characteristics of Respondents

Characteristics	n	%
Gender		
Female	17	56.3
Male	13	43.3
Age (years)		
41-50	9	30
51-60	17	56.7
61-70	4	13.3
Occupation		
Farmer	9	30.0
Civil Servant	2	6.7
Trader	5	16.7
Housewife	7	23.3
Teacher	3	10.0
Entrepreneur	4	13.3

Table 1 shows the characteristics of the participants. A total of 30 participants were involved, with females outnumbering males. Most participants were aged 51–60 years, followed by those aged 41–50 years and 61–70 years. In terms of occupation, farmers constituted the largest group, followed by housewives, traders, entrepreneurs, teachers, and civil servants.

Table 2. Pain Scale Scores of Group I and Group II Before and After Intervention

Characteristics	Group I		Group II	
	n	%	n	%
Pain Scale (Pretest)				
6	1	6.67	0	0
7	8	53.3	5	33.3
8	6	40.0	10	66.7
Pain Scale (Posttest)				
0	2	13.3	7	46.7
1	2	13.3	5	33.3
2	11	73.3	3	20.0

Table 2 shows the distribution of pain scale scores in Group I and Group II before and after the intervention. Before

treatment, most participants in Group I reported pain scales of 7 and 8, while Group II predominantly reported a pain scale of 8. After treatment, pain scores in both groups decreased, with Group I mainly reporting a pain scale of 2, whereas Group II showed a greater proportion of participants reporting pain scales of 0 and 1.

Table 3. The Results of the Wilcoxon Test

Group	n	p
Group I	15	0.001
Group II	15	<0.001

Table 3 shows the results of the Wilcoxon test for both groups. The Asymp. Sig. (2-tailed) value in Group 1 was $p = 0.001$ and in Group 2 was $p < 0.001$, demonstrating that local point acupuncture therapy in Group 1 and combined Zhu's Scalp acupuncture therapy in Group 2 were effective in reducing pain scale in pain cases.

Table 4. The Results of Mann-Whitney Test

Group	Mean Rank	p
Group I	20.83	0.000
Group II	10.17	

Table 4 shows the results of the Mann-Whitney test comparing Group I and Group II on the Visual Analogue Scale (VAS) for radiating low back pain. The Asymp. Sig. (2-tailed) value was $p = 0.000$, indicating a significant difference between the two groups. The mean rank for local point acupuncture therapy was 20.83, while the mean rank for combined Zhu's Scalp acupuncture therapy was 10.17, demonstrating that the combined Zhu's Scalp acupuncture therapy was more effective than local point acupuncture alone in reducing pain intensity.

IV. DISCUSSION

Based on the results of the present study, combined Zhu's Scalp acupuncture therapy administered in six sessions with a frequency of twice weekly was effective in reducing pain scale changes

in cases of radiating low back pain. This therapy helps alleviate pain by modulating neurochemical activity in the brain and spinal cord. Needle stimulation induces the release of serotonin and opioid peptides, while neuro acupuncture activates endorphins and monoamines that reduce pain perception⁽¹⁰⁾. Needling at BL23 and BL25 increases interleukin-13 (IL-13) as an anti-inflammatory mediator and activates heat shock proteins Hsp20 and Hsp27, which contribute to muscle relaxation and cellular protection⁽¹¹⁾. Scalp acupuncture, including the Zhu's Scalp method, enhances cerebral blood flow and neural plasticity, making it effective in pain management and in supporting rehabilitation of neurological disorders⁽⁹⁾.

Acupuncture is effective in various musculoskeletal and neurological conditions, such as fibromyalgia, migraine, chronic pain, and stroke. This technique elicits the De Qi sensation, characterized by dull aching or pricking sensations, which activates peripheral neural pathways and produces analgesic effects through modulation of the central nervous system⁽¹²⁾. Numerous recent clinical trials and meta-analyses have also demonstrated that acupuncture is effective for radiating low back pain. This therapy is able to stimulate the sciatic nerve, relieve discogenic sciatica, reduce pain intensity, improve pain tolerance, and enhance responsiveness to pharmacological treatment⁽¹²⁾.

Segmental effects of acupuncture in radicular pain provide analgesia through activation of A δ and C afferent fibers that transmit sensory impulses to the dorsal horn of the spinal cord. This stimulation enhances inhibitory interneuron activity and triggers the release of endogenous opioids such as enkephalins and endorphins, which inhibit nociceptive transmission at irritated nerve roots, thereby explaining the segmental analgesic effect of acupuncture in radicular pain⁽¹³⁾. In addition, acupuncture produces peripheral analgesia through the release of β -

endorphins from local immune cells, particularly macrophages. These β -endorphins bind to opioid receptors at nerve endings and reduce hypersensitivity caused by neurogenic inflammation, indicating that the analgesic effects of acupuncture involve not only central neural mechanisms but also peripheral immune modulation contributing to local pain reduction⁽¹⁴⁾. At the central level, acupuncture alleviates neuropathic pain through both peripheral and central modulation by activating descending pain inhibitory pathways to the spinal cord, thereby suppressing pain impulses before they reach the

brain, along with alterations in pain perception at the cortical level⁽¹⁵⁾.

V. CONCLUSION

Based on the results of the research it described in the previous chapter, it can be concluded that Zhu's Scalp Acupuncture combined with local body acupuncture is more effective in reducing pain intensity than local body acupuncture alone in patients with radiating low back pain.

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