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Original Research

Effectiveness of Jin's 3 Needles and INMAS Acupuncture in Reducing Low Back Pain

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ABSTRACT

Background: *Low back pain is one of the musculoskeletal disorders caused by poor body activity. Acupuncture for low back pain can stimulate the body to secrete endorphins which cause the body to become comfortable and relaxed, so that the degree of pain in the low back can be reduced. This study aims to compare the effect of Jin's 3 needles acupuncture therapy with Integrative Neuromuscular Acupoint System (INMAS) on changes in the degree of low back pain.*

Methods*: This study used the two groups pre and post test design. The sample was 36 research subjects who met the inclusion and exclusion criteria and were selected using a simple random sampling technique, divided into 2 groups, namely the Jin's 3 needles group and the INMAS group. The data were analysed using the Wilcoxon test for changes within groups and the Mann–Whitney test for comparisons between groups.*

Results: *The acupuncture therapy intervention of the Jin's 3 Needles method and the INMAS method is effective in reducing the degree of low back pain (p-value:<0.001). There is no significant difference between acupuncture therapy interventions Jin's 3 Needles method and INMAS in reducing the degree of low back pain (p value 0.769).*

Conclusion: *There is an effect of acupuncture therapy Jin's 3 Needles and INMAS on changes in the degree of low back pain and there is no significant difference between the two interventions. Both interventions can be considered as non-pharmacological treatment options for lower back pain.*

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INTRODUCTION

Musculoskeletal disorders can appear varying from mild to severe degrees. These musculoskeletal disorders usually occur due to work factors or conditions at work such as improper posture, stasis and repetitive activities, can also come from physical exposure such as temperature and vibration (Tambuwun et al., 2020) Musculoskeletal disorders (MSDs) are a group term for several diseases and injuries to muscles, tendons, ligaments, joints, and bones. MSDs could affect the back, the cervical region, as well as upper and lower extremities, resulting in pain and disability (Bonfiglioli et al., 2022).

Low back pain (LBP) is a condition that can arise from a variety of factors including frequent repetitive movements with the trunk, working in the same positions at a high pace, trunk position, frequently turning around with your trunk, often working overtime, lifting heavy loads, education level, staff shortage, working age, cigarette smoking, use of vibration tools at work, body mass index, lifting heavy loads, and age (Jia et al., 2022). Acupuncture as a complementary medical treatment method to treat diseases has been widely researched and used as an alternative and complementary therapy to treat various diseases in various countries, including Indonesia. One of them is used as a therapy for low back pain cases. Acupuncture can contribute to an average decrease of 40% in lumbar pain, 42% for hip joint pathologies and knee pain, 43% for cervical pain, 44% for foot pain, 46% for shoulder pain, 51% for hand pain, and 55% for elbow pain (Fracchia et al., 2024).

Giving acupuncture therapy in cases of low back pain can stimulate the body to release endorphin hormones. This hormone will cause the body to be comfortable and relaxed, so that the degree of pain in low back pain complaints can be reduced. In acupuncture actions in service sometimes many needles are needed if the puncture is based on syndrome differentiation. On the other hand, the effect of acupuncture is sometimes temporary because it is intended to relieve complaints only. Jin's 3 Needles is considered a practical method using only 3 needles and Integrative Neuromuscular Acupoint System (INMAS) is considered a complete method because it aims to reduce complaints and at the same time restore body balance (Purwanto & Wahyudi, 2021).

The Jin's three needles method only uses three acupuncture points on a body part in its therapy. The acupuncture points used for low back pain complaints with this technique are BL 23 Shenshu, BL 25 Dachangshu, and BL 40 Weizhong. Research proved a decrease in the degree of pain in patients with low back pain after acupuncture therapy using Jin's 3-Needles method with acupuncture points: Shenshu, Dachangshu, Weizhong. These points can have an effect on the surrounding local area. also able to influence other areas that are far from the needle sticking location (Zhang et al., 2024).

INMAS or Integrative Neuromuscular Acupoint System is an acupuncture technique based on Homeostatic Acupoints (HA), Symptomatic Acupoints (SA), and Paravertebral Acupoints (PA). INMAS is effective for treating musculoskeletal disorders including low back pain. INMAS acupoints in cases of low back pain can improve the function and coordination of muscles and joints, especially the muscles in the waist area. Local HAs stimulation leads to increased blood circulation and energy metabolism in localized areas of pain (Liu et al., 2023; Purwanto & Wahyudi, 2021).

The purpose of this study was to determine the comparison of the effectiveness of acupuncture therapy Jin's 3 Needles method and acupuncture therapy INMAS method in changing the degree of low back pain. Jins’s 3 Needles method is considered advantageous due to its simplicity, ease of manipulation, and potential effectiveness in treating a wide range of conditions, while INMAS is considered to have a comprehensive therapeutic range because it uses HA for general homeostasis restoration, PA as segmental points at the nerve level of the painful area in the spinal cord, and SA which act as local points according to the location of the pain.

MATERIALS AND METHODS

This research is an experimental quantitative study with true experimental design with two groups pre and post test research design. The research conducted in Sepreh and Kliteh Hamlets, Selopuro Village, Pitu District, Ngawi Regency from October 2020 to

April 2021 with a population of 40 people with low back pain. Data were collected through pre-test and post-test assessments to determine changes in pain intensity following the intervention.

The sample in this study was taken by as many as 36 people who fit the inclusion and exclusion criteria determined by the researcher. The sample size was determined to meet the requirements of nonparametric statistical tests with a minimum power of 80% and taking into account the availability of the population at the research site (Dahlan, 2020). Inclusion criteria: men and women aged 25-65 years, not pregnant for women, not taking painkillers, back pain due to workload. Exclusion criteria: history of trauma and abnormalities in the spine, experiencing severe health problems or internal organ diseases. With the Simple Random Sampling technique, the sample was divided into 2 groups; group 1 as many as 18 patients received acupuncture therapy intervention with the Jin's 3 Needles method while group 2 as many as 18 patients received acupuncture therapy intervention with the INMAS methode.

The independent variables in this study were the acupuncture therapy methods, which consisted of two types, namely Jin's 3 Needles and INMAS. The dependent variable was the degree of lower back pain before and after 10 therapy sessions. This study aimed to analyse changes in pain intensity in each group and compare the effectiveness of the two acupuncture methods.

This study measures the degree of pain using the Numeric Rating Scale (NRS) value of each research subject which is calculated before and after being given acupuncture intervention both with the Jin's 3 Needles and INMAS methods after 10 treatments at acupuncture points BL 23 (Shenshu), BL 25 (Dachangshu), and BL 40 (Weizhong), and using the INMAS method according to the results of H1 and H4 palpation. The NRS instrument used has been tested for validity and reliability, with valid results and a high level of reliability (Cronbach's alpha > 0.80).

Data analysis began with a normality test using the Shapiro–Wilk test to determine the distribution of data. The test results showed that the data was not normally distributed. Therefore, the analysis was continued using nonparametric tests, namely the Wilcoxon test to see changes within groups and the Mann–Whitney test to compare between groups (Dahlan, 2021).

This study also obtained ethical approval from the Health Research Ethics Committee of the Surakarta Ministry of Health Polytechnic (LB.02.02/7.2/90/2021) on February 5, 2021, before data collection was carried out. All participants were informed about the study objectives, procedures, potential benefits, and their right to withdraw from the study at any time without consequences. Written informed consent was obtained from all participants before their involvement in the study, and confidentiality of their personal information was maintained throughout the research process.

RESULTS

Table 1. Changes in the Degree of Low Back Pain in Both Treatment Groups (n = 36)

Group	Pain Degree	Mean
Acupuncture *Jin's 3 Needles* Methode	Before	7.39
	After	2.50
	Change	4.89
Acupuncture INMAS Methode	Before	7.28
	After	2.28
	Change	5.0

From the Table 1, a reduction in pain levels occurred in both groups after 10 acupuncture treatments. The INMAS group showed a slightly greater average reduction in pain (5.00) than the Jin's 3 Needles group (4.89), although the difference was not statistically significant. This indicates that both acupuncture methods are equally effective in reducing lower back pain.

Table 2. Results of the Wilcoxon Test for Lower Back Pain Levels in Each Group Pre–Post Analysis (n = 36)

Group	Z	p-Value (Pre-Post)
Acupuncture *Jin's 3 Needles* Methode	-3.383	<0.001
Acupuncture INMAS Methode	-3.770	<0.001

Note: Z is the test statistic calculated from the Wilcoxon test, used to determine the significance (p-value) of the difference. Negative values indicate a decrease in pain scores after treatment.

The Wilcoxon test results showed that the significance value in each data was ρ-value <0.05. This shows that the acupuncture therapy intervention of Jin's 3 Needles method and INMAS method is effective in reducing the degree of low back pain (Table 2).

Table 3. Mann–Whitney Test Results for Changes in Lower Back Pain Levels between Groups (n = 36)

Group	Z	p-Value (Pre-Post)
Acupuncture Jin's 3 Needles Methode Acupuncture INMAS Methode	-0.294	0.769

Note: Z is the test statistic calculated from the Mann–Whitney nonparametric test, used to determine the significance (p-value) of the difference. Negative values indicate a decrease in pain scores after treatment

Based on the Table 3, it can be seen that the significance value of the data on changes in the value of pain is p-value > 0.05, so that in this study it shows that there is no significant difference between acupuncture therapy interventions in the Jin's 3 Needles method and acupuncture therapy INMAS method in reducing the degree of low back pain.

DISCUSSION

Based on the results of hypothesis testing, it can be seen that acupuncture therapy interventions in the Jin's 3 Needles method and the INMAS method are effective in reducing the degree of low back pain. Both the Jin's 3 Needles method and the INMAS method can reduce the degree of pain. In addition, it can also be seen that there is no significant difference between acupuncture therapy intervention in the Jin's 3 Needles method and acupuncture therapy INMAS method in reducing the degree of low back pain.

In the Jin's 3 Needles group, the 3 acupuncture points used are referred to as the 3 lumbar points, consisting of points (BL23) Shenshu, (BL25) Dachangshu, (BL40) Weizhong. Shenshu point (BL23) is the shu point of the kidney associated with the lumbar which is located in the area of lumbar vertebra 2, Dachangshu point (BL25) is the acidase meridian of the bladder in the muscle, located at the bottom of the lumbar serves to correct pathological changes in the lumbar vertebrae, and Weizhong point (BL40) is referred to as the distal point of the waist which is an important point for treating pain in the low back (Hu et al., 2021; Lin et al., 2022).

Abdullah and Prihatono (2021) reported that Jin's 3 Needles acupuncture can reduce pain intensity in LBP patients and is a non-pharmacological alternative to reduce LBP complaints. Study reported that the use of the Jin's 3 Needles method is effective in

reducing the scale of knee pain. Results of other studies indicate plasma adrenocorticotropic hormone (ACTH), plasma cortisol, and serum levels of interleukin-2 (IL-2) and interferon-gamma (IFN-γ) will be examined to determine whether the immune function and hypothalamic-pituitary-adrenal (HPA) axis of Chronic Fatique patients Syndrome (CFS) will be changed by Jin's Three Needle treatment (Keshavamurthy et al., 2023).

Acupuncture therapy can stimulate the body by releasing endorphin hormones which will cause the body to feel comfortable, thereby reducing the level of pain in low back pain patients. Six acupuncture treatments gave positive correlation in total protein, albumin, and globulin. Analysis of blood serum protein profiles using SDS-PAGE showed a protein band of about 12KDa and it might be an interleukin antiinflammatory protein (IL-13). The results of this study are in accordance with the theory that Jin's 3 needle method is one of the effective acupuncture therapy methods to reduce the degree of pain in low back pain (Japaries & Nando, 2022).

In the INMAS acupuncture therapy group, three types of acupuncture points are used, namely Homeostatic Acupoints (HAs), Symptomatic Acupoints (SAs), and Paravertebral Acupoints (PA). The HAs points used in cases of low back pain are the Superior Cluneal point (H14) at the upper edge of the crest iliaca, Posterior Cutaneous Lumbar 2 (H15) at the height of the Shenshu acupuncture point (BL 23), Inferior Gluteal (H16) at the height of the Huanzhong acupuncture point (Ex.LE) and Posterior Cutaneous Lumbar 5 (H22) at the height of the Guanyuanshu acupuncture point (BL 26). The SAs points used are local points or Ashe points where when palpated in the area, the research subject feels pain. While the PAs taken are the Huatuo Jiaji point in the L1 to coccyx area (Liu et al., 2023; Zhang et al., 2024).

Acupuncture therapy using the INMAS protocol is intended to restore the body's homeostatis due to a complaint or disease such as low back pain. INMAS method with symptomatic point puncture and the Jin's 3 Needle method include local point puncture. The needling will increase blood circulation and activate local immune reactions to reduce inflammation and promote healing (Purwanto & Wahyudi, 2021). INMAS is an innovative treatment protocol. The insertion of acupuncture needles creates small lesions in the muscles and surrounding tissues, triggering: (1) relaxation of tense muscles; (2) increased blood circulation; and (3) stopping the energy crisis cycle. The mechanism of INMAS is that the acupuncture needles send signals through the connective tissue, causing small lesions to produce electrical currents (Purwanto & Wahyudi, 2021).

The movement of the needles then triggers mechanical signal transduction that affects the connective tissue cells. Therapeutic effects of INMAS include: (1) cell cytoskeletal rearrangement; (2) cell contraction and migration; (3) protein synthesis; (4) release of growth factors and cytokines; and (5) modulation of the extracellular environment (Japaries & Nando, 2022; Purwanto & Wahyudi, 2021). The INMAS system offers local and long-distance therapeutic effects through the mechanism of mechanical connection of the needles with the connective tissue, triggering beneficial biological changes. The results of this study are in accordance with the theory above that the INMAS method is one of the effective acupuncture therapy methods to reduce the degree of pain in low back pain. Both Jin's 3 Needles and INMAS are punctured with retain needle technique for 20-30 minutes 2 times a week.

Purwanto and Wahyudi (2021) reported that INMAS acupuncture method twice a week for 5 weeks can improve pain and quality of life compared to acupuncture at local points in patients with shoulder pain. Although acupuncture has not become a primary

therapy in cases of LBP, it promises to be safe, effective and cost-effective (Sudhakaran, 2021). These findings support the potential of acupuncture as a complementary treatment option for managing musculoskeletal pain, including low back pain.

This research has limitations in its research methodology. The sample size in both groups remains limited. Future research is expected to have a larger sample size to better represent the population. This study can also be conducted in communities to obtain a larger sample size.

CONCLUSION

Acupuncture can be applied to musculoskeletal pain disorders, especially low back pain. Acupuncture therapy interventions with Jin's 3 Needles method and INMAS method are effective in reducing the degree of low back pain. There is no significant difference between the two acupuncture methods. Acupuncture Jin's 3 Needles method or INMAS method can be a consideration for choosing therapy management for low back pain cases. Both of these interventions are recommended in the management of patients experiencing low back pain.

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DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors disclose any AI use in manuscript preparation and take full responsibility for its content.

CONFLICT OF INTERESTS

The authors declare no conflicts of interest related to this study or its publication.

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