

# THE EFFECT OF ADDITIONING CORE STABILITY EXERCISE IN THE YOGA EXERCISE MODIFICATION INTERVENTION ON REDUCING FUNCTIONAL PAIN IN PATIENTS NON SPECIFIC LOW BACK PAIN IN THE GROUP WOMEN ROSE FARMERS IN THE DISTRICT SIDENRENG RAPPANG

Hasbiah <sup>1\*</sup>, Tiar Erawan <sup>2</sup>, Sudaryanto <sup>3</sup>, Din Amaliah Kartika <sup>4</sup>,  
Rahmat Nugraha <sup>5</sup> and Andi Halimah <sup>6</sup>

<sup>1,2,3,4,5,6</sup>Department of Physiotherapy, Poltekkes Kemenkes Makassar, Indonesia.

\*Corresponding Author Email: [hasbiahfisiopoltekkes@gmail.com](mailto:hasbiahfisiopoltekkes@gmail.com)

DOI: [10.5281/zenodo.13318901](https://doi.org/10.5281/zenodo.13318901)

## Abstract

Low back pain results in obstruction of the patient's functional activities which occurs due to spasm or tightness of the erector spine and quadratus lumborum muscles without any nerve root involvement. Complaints arise such as pain when bending or when moving certain objects. This study aims to determine the effect of adding core stability to the modified yoga exercise intervention on reducing functional pain in non-specific low back pain patients at KWT Mawar. This type of research is a quasi-experiment with a randomized Pre test-Post test two group design, using 2 sample groups, namely the treatment group given modified yoga exercise with additional core stability exercise, and the control group given modified Yoga Exercise. The sample for this study was 40 people who met the inclusion criteria, randomized into 2 groups, namely 20 people in the treatment group and 20 people in the control group. Data collection was obtained through measuring the Oswestry Disability Index on each sample during the pre-test and post-test. Based on the analysis of the paired sample t test, the value of  $p = 0.000$  ( $p < 0.05$ ) in the treatment group and  $p = 0.000$  ( $p < 0.05$ ) in the control group, which means that there is a significant effect of modification of yoga exercise and core stability exercise. and modification of yoga exercise to reduce functional pain, then based on the independent t test, the value of  $p = 0.000$  ( $p < 0.05$ ) was obtained with a mean difference of 11.50 (treatment) > 5.70 (control), which means there is a significant difference between the treatment group and the control group. Control of functional pain reduction in non-specific Low Back Pain patients. The conclusion of this study is that the addition of core stability exercise to the modified yoga exercise intervention has a more significant effect than the modified yoga exercise on reducing functional pain in Low Back Pain patients.

**Keywords:** Core Stalility Exercise and Yoga Exercise, Modified Yoga Exercise, Functional Pain, Low Back Pain.

## INTRODUCTION

Human activities are closely related to the problem of low back pain, which is often a common health problem experienced by millions of people around the world. Pain, stiffness and muscle tension in the lower back can interfere with daily activities and negatively affect the quality of life of many patients.

Non-specific Low Back Pain is low back pain associated with muscle and tendon disorders in the lower back, caused by excessive daily activity. Disorders that occur in Non Specific Low Back Pain are pain and spasm in the lumbar region without accompanying neurological disorders between the 12th thoracic vertebra to the bottom of the hip and anus.

Every year around one million people lose productivity in the UK due to disability from Non Specific Low Back Pain. The National Safety Council concluded that the largest number of occupational accidents are caused by work, which is about 22 out of 1,700,000 cases. About 80% of the population in developed countries have

experienced non-specific low back pain. The incidence of non-specific low back pain in the United States varies from 15% to 20% per year, about 14.3% based on the number of new patient visits to the doctor [1].

The prevalence of people affected by Non Specific Low Back Pain is greatly increasing globally recorded at 7.3% which occurs in 540 million people and often occurs in women. In Indonesia, it is recorded at 24.7%, of which almost 75% are work-related [2]. In Sidrap Regency, the number of sufferers of non-specific low back pain is estimated at 5.1% of the total population of 319 thousand people, while for the Women Farmers Group there are 25 sufferers of non-specific low back pain out of 32 members.

Non-specific Low Back Pain can be caused by work activities. Work activities with a bent position for a long time can cause eccentric contraction of the lumbar erector spine and quadratus lumborum muscles, this causes easy injury to both muscles. In addition, static slouching can cause overstretch of the capsule, ligaments and facet joints, resulting in facet joint injuries. Injury to the facet joints and lumbar muscles will cause non-specific complaints of Low Back Pain, this is experienced by members of the Women Farmers Group.

Women Farmers Groups (KWT) are often involved in strenuous physical activities such as gardening/planting, and harvesting plantation products. These activities can cause excessive mechanical stress on the trunk especially the lumbar. As a result, the women may experience non-specific low back pain.

Based on initial observations and interviews with several members of the Mawar Women Farmers Group who are patients with non-specific low back pain, including complaining of pain when bending but the pain is only local and does not radiate to the legs. In addition, it is also known that patients also visit health facilities and only get physiotherapy treatment in the form of physiotherapy modalities and medical treatment to reduce pain, so it is necessary to provide physiotherapy treatment that is quite effective based on evidence based in the form of core stability with modified Yoga exercise.

Yoga modification is considered the most effective for reducing pain in non-specific low back pain. The exercise will flex and strengthen the bone system, muscles and joints to be more flexible so they are not easily injured. Yoga exercises can also prevent osteoporosis of the spine, therefore the left and right parts of the bone building are rows of sympathetic and parasympathetic nerve nodes that work autonomously, so that when practicing yoga the nerve nodes will be massaged intensely which makes them healthier [3].

One other physiotherapy intervention that is effective for reducing non-specific low back pain is the use of core stability exercise, as in Arifiyanto's 2022 study, Core Stability Exercise was shown to reduce non-specific low back pain, and Hasmar, et al 2023 showed functional improvement against non-specific low back pain, even CSE is an effective method for increasing core muscle strength in patients with non-specific low back pain [4]; [5]. Several studies have shown that together yoga exercise and core stability are effective and beneficial for maintaining core muscle stability, so as to prevent the appearance of Non Specific Low Back Pain. Based on the description of the problem above, the researcher is interested in knowing about "The effect of adding core stability to modified yoga exercise interventions on reducing functional pain in patients with non-specific low back pain in members of the Mawar Farmer Group.

## METHODS

### Type of Research

In this study, the type of research used was Quasi Experiment, using the research method randomised Pre test - Post test two group design. In this study, the research subjects, the treatment group were given Modified Yoga Exercise + Core Stability Exercise and the control group was given Modified Yoga Exercise. Where each group before being given intervention or treatment is given a pre-test to determine the level of functional pain felt. After the intervention is given, then the post test is given to determine the effect of giving the intervention.

### Place and Time of Research

This research was conducted from February to March 2024 at the Mawar Women Farmers Group in Majelling Village, Maritengngae District, Sidenreng Rappang Regency, South Sulawesi.

### Population and Sample

The population in this study were all members of the Mawar Women Farmers Group. The sample of this study were members of the rose farmer women's group who experienced non-specific low back pain in accordance with the inclusion criteria in sampling. The sampling technique used was purposive sampling.

### Data Analysis

**In analysing the research data that has been obtained, the researcher will use several statistical tests as follows:**

1. Descriptive statistical test, to describe sample characteristics based on gender
2. Data normality test, using the Shapiro Wilk test to determine whether the data is normally distributed ( $p > 0.05$ ) or not normally distributed ( $p < 0.05$ ) [6].
3. Comparative analysis test (hypothesis testing), using parametric statistical tests, namely paired t test and independent t test, because the data is normally distributed.

## RESULT

### Sample Characteristics

Based on table 1, it was found that more people aged 41-45 years suffered from non-specific low back pain than other age groups.

**Table 1: Distribution of Respondents by Age Group**

Variable	Frequency	Percentage (%)
<b>Age</b>		
30-35	10	25
36-40	10	25
41-45	11	26.5
46-50	5	13.5
51-52	4	10
Total	40	100

The data normality test is used to determine the choice of using statistical tests in hypothesis testing. The data normality test used is the Shapiro-Wilk test to test the normal distribution of data.

**Table 2: Data Normality Test**

Normality with Shapiro-Wilk test				
Data Group	Treatment Group		Control Group	
	Statistics	P	Statistics	P
<i>Pre test</i>	0,933	0,175	0,963	0,595
<i>Post test</i>	0,946	0,315	0,902	0,046

Based on the results of the Shapiro Wilk test for data normality, all data groups including the treatment group and control group, showed a p value > 0.05 before and after the intervention, indicating that all data groups were normally distributed. This research data is the value of the measurement of the Oswestry Disability Index (ODI). The research data consisted of before, after, and difference values both in the treatment group and in the control group, which will be presented below:

**Table 3: Analysis of the mean functional pain in the treatment group and control group**

Data Group	Pre Test		Post Test		t	p
	Mean	SD	Mean	SD		
Treatment	42.90	6.307	32.10	6.758	15.069	0,000
Control	39.00	5.171	33.30	5.704	11.213	0,000

**Analysis of non-specific functional low back pain before and after being given modified yoga exercise and core stability exercise**

Based on table 3, the p value = 0.000 ( $p < 0.05$ ) was obtained in the treatment group, which means that the intervention of core stability exercise and modified yoga can produce a significant decrease in functional pain in patients with non-specific low back pain. Then, the p value = 0.000 ( $p < 0.05$ ) was obtained in the control group, which means that the modified yoga exercise intervention can produce a significant decrease in functional pain in patients with non-specific low back pain. Analysis of the decrease in non-specific low back pain functional pain between yoga modification training groups and yoga modification training with core stability exercises. To determine the difference in the mean Oswestry Disability Index between the treatment group and the control group, and to prove the statement of the hypothesis of this research, the independent sample t test was used. The results of the independent sample t test will be described in the table below:

**Table 4: Analysis of functional pain difference between treatment group and control group**

Data Group	Difference after intervention		
	Mean	SD	P
Treatment	11.50	2.328	0,000
Control	5.70	2.273	

Based on table 4 above, the p value = 0.000 ( $p < 0.05$ ) means that there is a significant difference in the mean difference between the treatment and control groups. Judging from the mean value of the difference, the mean value of the difference between the treatment groups of 11.50 was greater than the mean value of the difference between the control groups of 5.70. This shows that core stability exercise and modified yoga

exercise interventions are more influential in producing a decrease in functional pain than modified yoga exercise interventions in patients with non-specific low back pain.

## DISCUSSION

Based on hypothesis testing using the paired sample t test, the p value  $<0.05$  is obtained, which means that giving core stability exercise and modified yoga exercise can provide a significant decrease in functional pain in patients with non-specific low back pain. Low back pain arises due to spasm or tightness in the erector spine and quadratus lumborum muscles without nerve root involvement, where the condition of spasm or tightness can inhibit the patient's functional activities such as bending and moving objects. The use of yoga modifications can reduce functional pain but not significantly, this is reinforced by research by Kreiner, et al 2020, saying functional pain can be overcome using modified yoga exercise but its effectiveness in improving pain can vary [7]. The use of core stability with added yoga exercise modifications makes patients feel the effects of therapy in the long term compared to only using yoga exercise modifications. This is evidenced by Colgrove's 2019 research, Modified yoga exercise can help in reducing pain similar to the concept of post isometric relaxation, the technique focuses on relaxation and development of muscle flexibility [8]. In addition, a modified yoga exercise consisting of a series of movements with the aim of relaxing the muscles and improving flexibility. Furthermore, the application of core stability exercise by providing movements that focus on improving the body's core muscles can allow to strengthen the body's core muscles and improve posture control. Thus, core stability exercise and modified yoga exercise techniques can be part of a comprehensive rehabilitation programme to reduce muscle spasm.

Based on hypothesis testing using the paired sample t test, the p value  $<0.05$  is obtained, which means that modified yoga exercise can provide a significant decrease in functional pain in patients with non-specific low back pain. Low back pain arises due to spasm or tightness in the erector spine and quadratus lumborum muscles without nerve root involvement, where the condition of spasm or tightness can inhibit the patient's functional activities such as bending and moving objects.

In modified yoga exercise practice, these techniques can help improve flexibility and muscle strength, but their effectiveness in relieving pain may vary depending on the individual's condition. The contractions that occur during modified yoga exercise stimulate muscle receptors, and post-contraction stretching can help reduce muscle tension. This process can be performed on the quadratus lumborum muscle in the side lying position, by contracting for 6-8 seconds and repeating it twice. However, the results may also depend on other factors such as the severity of the spasm and the individual's response to the technique. Even yoga can offer medium-term improvements in pain and improved muscle function compared to other treatments [7].

Chaitow thinks that the effect of decreased muscle tone will not occur in a muscle or muscle group after a short period of isometric contraction. The concept of RI (Reciprocal Inhibition) is actually that when a muscle contracts isometrically, its antagonist will experience temporary inhibition, but it does not necessarily cause a rapid decrease in tone after the contraction. Therefore, the application of yoga exercise modifications to antagonistic muscle groups can help extend the range of motion with proper isometric contraction, achieve a degree of comfort in the muscle, and allow for additional movement potential in shortened tissues [9].

Based on hypothesis testing using the independent sample t test, it shows that there is a significant difference between the treatment group and the control group on functional pain reduction. Judging from the mean value of the difference shows that the mean value of the difference of the treatment group is greater than the mean value of the difference of the control group. Thus it can be concluded that core stability exercise and modified yoga exercise interventions have a significant effect on functional pain improvement compared to modified yoga exercise interventions in patients with non-specific myogenic low back pain. The results of this study showed that core stability exercise and modified yoga exercise produced a greater functional pain reduction effect than modified yoga exercise.

## CONCLUSIONS

Based on the objectives and results of the above research, it can be concluded that the provision of modified yoga exercise and core stability exercise can produce a significant decrease in functional pain in patients with non-specific low back pain. Giving modified yoga exercise can produce a significant decrease in functional pain in patients with non-specific low back pain. The addition of core stability exercise to yoga exercise modification intervention is more influential in producing a decrease in functional pain than yoga exercise modification intervention alone in non-specific low back pain patients.

## Reference

- 1) Buchbinder, Rachele. (2013). *Best Practice & Research Clinical Rheumatology Placing the global burden of low back pain in context.* Best Practice & Research Clinical Rheumatology 27 (5): 575–89. <http://dx.doi.org/10.1016/j.berh.2013.10.007>.
- 2) Hikhmah, Sabilla Nur; Noviana, Mita; and Pahlawi, Riza (2022) "Efektivitas Pemberian Lumbar Stabilization Exercise terhadap Peningkatan Kemampuan Fungsional pada Kasus Low Back Pain Myogenic: Literature Review," Indonesian Journal of Applied Physiotherapy: Vol. 1: Iss. 1, Article 14. DOI: 10.7454/jfti.v1i1.1028 Available at: <https://scholarhub.ui.ac.id/jfti/vol1/iss1/14>
- 3) Chang DG, Holt JA, Sklar M, Groessl EJ. (2016). *Yoga as a treatment for chronic low back pain: A systematic review of the literature.* J Orthop Rheumatol. 2016 Jan 1;3(1):1-8. PMID: 27231715; PMCID: PMC4878447.
- 4) Arifiyanto, Ahmad Syarwani. (2022). *Pengaruh Core Stability Terhadap Penurunan Nyeri Punggung Bawah Pada Penderita LBP Myogenic di RSUD dr. R. Soedarsono Kota Pasuruan.* Jurnal Keperawatan Muhammadiyah 7 (1).
- 5) Hasmar, Wanti. (2023). *Perbedaan Pengaruh Core Stability Exercise Dan William Flexion Exercise Terhadap Low Back Pain Myogenik.* Quality : Jurnal Kesehatan. Volume 17, Nomor 1, pp 64-71. DOI: 10.36082/qjk.v17i1.908
- 6) Ariyani, dkk. (2023). *Metodologi Penelitian Kesehatan dan Statistika.* Padang: Global EKsekutif Teknologi.
- 7) Kreiner, D.S. et al. (2020). Guideline summary review: An evidence-based clinical guideline for the diagnosis and treatment of low back pain. Spine J, 20, 998–1024.
- 8) Colgrove YM, Gravino-Dunn NS, Dinyer SC, Sis EA, Heier AC, Sharma NK. (2019). Physical and physiological effects of yoga for an underserved population with chronic low back pain. Int J Yoga 2019;12:252-64.
- 9) Bhavanani A. B. & Ramanathan M. (2018). *Psychophysiology of Yoga Postures: Ancient and modern Perspective of Asanas.* ISSN: 2475-6628; eISSN: 2475-6636. DOI: 10.4018/978-1-5225-2788-6.ch001.