
THE EFFECT OF COMBINED ULTRASOUND AND MC KENZIE ON IMPROVING FUNCTIONAL ABILITY IN PATIENTS WITH MYOGENIC LOW BACK PAIN

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ABSTRACT

Low back pain is a musculoskeletal disorder with signs of pain in the area around the lower back, the incidence is mostly myogenic low back pain, it increases with age. Physiotherapy interventions used to improve functional ability with a combination of ultrasound and mc kenzie. The purpose of this study was to determine the effect of a combination of ultrasound and mc kenzie on improving functional abilities in patients with myogenic low back pain. This research design uses a type of quasi-experimental with a one group pretest and posttest approach, this study has 20 respondents using a sampling technique, namely purposive sampling. The effect of the combination of ultrasound and mc kenzie on functional ability in myogenic low back pain patients with a p-value = 0.001 ($p < 0.05$). Based on the results of this study, it is stated that the combination of ultrasound and mc kenzie can improve functional ability in myogenic Low Back Pain patients performed 2 times a week for 4 weeks.

Keywords: Low Back Pain, Ultrasound, Mc Kenzie, Functional ability

INTRODUCTION

Clinicalbiopsychosocial symptoms of myogenic low back pain include pain that limits physical activity and a modern neurophysiological pain model that distorts pain perception. In addition to causing discomfort, low back pain also affects function and productivity at work, and it becomes expensive to treat by Halimah et al. (2022). It has been suggested that static sitting or passive work situations reduce the flexibility and usefulness of the back muscles. Sitting for a long time can strain the muscles in the lower back. The back muscles might become fatigued and lose their flexibility as a result of the constant strain placed on them, which makes the lumbar back muscles behave as a load-bearing body. Sitting position, static sitting time, posture, and improper chairs can increase lumbar muscular diseases, which are a condition of body weight loading by Tansil et al. (2019). Age, gender, occupational history, tenure, and length all have an impact on myogenic low back pain by Amiriati et al. (2021). Patients with low back pain can benefit from a variety of physiotherapy treatments, including electrotherapy, manual therapy, kinesiotherapy, and specialized exercise therapy. The growth of conservative physiotherapy in the delivery of therapies nowadays leads to the use of electrotherapy by Pradita et al.(2021). One of these is the ultrasound and McKenzie combination. McKenzie Extension therapy's guiding principles Exercise treatment helps to address bad posture and reduce lumbar hyperlordosis by relaxing the muscles, releasing tension in the intervertebral joints, and reducing muscle spasm. Back exercise using the McKenzie Extension Exercise has been shown to relieve back pain by relaxing tense muscles and restoring normal lumbar function. It also increases spinal mobility and improves posture by Suputri et al.(2018).

METHOD

This study was conducted at the Physiomar clinic in March 2023 as a quasi-experimental study employing a one group pretest post test design technique. The improvement in functional capacity in low back pain patients is the dependent variable in this study, and the ultrasound and McKenzie combo is the independent variable. 25 patients made up the study's population. In this study, ultrasonography and Mc Kenzie workouts are used. 20 respondents were sampled for this study, which used the purposive sampling method. Participants had to have low back pain, be between the ages of 25 and 60, experience myogenic low back pain, have chronic low back pain (lasting longer than three months), and be willing and cooperative to act as research subjects for the duration of the study while completing an inform consent. The exclusion criteria for respondents included sensory impairment, lumbar open wounds, and a history of lumbar fractures and bulging nucleus pulposus. Resignation from the respondents or inability to complete the exercise are grounds for dismissal. Physiotherapy sessions twice a week were used to collect research data for 4 weeks. using the Oswestry Disability Index (ODI) scale to measure functional capacity scale. Primary data were employed in this study's data collecting. Researchers questioned respondents about their gender, age, and pain level assessments, among other variables. Scientists employed the Wilcoxon test.

RESULT AND DISCUSSION

a. Result

Table 1. Frequency Distribution of Demographic Indicator (n=20)

	n	%
Gender:		
- Men	7	35,0
- Women	13	65,0
Aged:		
- 21-30 years old	6	30,0
- 31-40 years old	13	65,0
- 41-50 years old	1	5,0
Total	20	100,0

The Result table 1 above, it can be seen that for respondents based on gender, there are more women than men. For the age group, respondents aged 31-40 years old dominated the incidence of low back pain.

Table 2. Functional ability scale before and after the combined administration of Ultrasound and Mc Kenzie

	n	Median (minimum- maksimum)	Rerata±s.b	Nilai P
ODI before <i>treatment</i>	20	23,55 (21-26)	23,55±1,356	0.000
ODI after <i>treatment</i>	20	19,20 (18-20)	19,20±0,894	
Difference ODI	20	4,00 (3-7)	4,35±1,268	

The Result table 2 above, Comparison of functional ability before and after the combination of Ultrasound and Mc Kenzie in the Wilcoxon test results showed a

significance value of 0.000 ($p < 0.005$), it can be concluded that there is a significant difference in functional ability between before and after the combination of Ultrasound and Mc Kenzie. For the image inclusion format, the image title is below the image and is numbered according to the image sequence, as in the example below:

b. Discussion

The result to the study's findings, more female respondents than male reported having low back pain. This is consistent with research done in 2022 by Tang et al., who received responses from 60% female and 40% male respondents. This study diverges from Tansil et al. (2019) research, which used more male samples than female ones.

Age also influences the occurrence of low back pain in this study, in addition to gender. The result to Table 1's data, people between the ages of 31 and 40 years old experience the most low back discomfort. This study is consistent with studies by Tansil et al. (2019), which found that 73% of low back pain sufferers were under the age of 40 years old.

Comparison of functional abilities before and after the combination of Ultrasound and Mc Kenzie in the Wilcoxon test results showed a significance value of 0.000 ($p < 0.005$), pre-test value of 23.55 ± 1.356 , post-test value of 19.20 ± 0.894 , and a difference of 4.35 ± 1.268 . The results showed that there was an effect of the combination of Ultrasound and Mc Kenzie on functional ability in myogenic low back pain patients.

This research supports Namnaqani et al.'s (2019) research, which found that Mc Kenzie is successful in enhancing functional capacities in low back pain patients. This research is also consistent with research (Sardianti, 2022) that demonstrates how ultrasound can increase functional abilities while reducing pain.

The heat produced by ultrasound can also result in increased cell activity, dilatation of blood vessels, which allows for the movement of metabolic waste products and extra nutrients, oxygen, and heat (Sardianti, 2022). Functional abilities will increase as pain levels drop.

This result is also consistent with studies by Wibawa et al. (2018), which found that individuals with low back pain had improved functional abilities following ultrasonography and Mc. Kenzie exercise. By combining thermal effects, such the absorption of sound waves, which improves blood flow, with non-thermal effects, like cavitation and microflow, which speed up cell recovery, ultrasound therapy can alleviate pain. In addition to increasing cell activity, ultrasound causes blood vessels to dilate, allowing for the easier movement of metabolic waste as well as more nutrients and oxygen (Sardianti, 2022). Through relaxation and active movement in the lumbar erector spine muscles, McKenzie exercise can alleviate pain. The stimulation of muscle spindles, which influences the activity of the gamma efferent system (gamma motorneuron), is the cause of this. The presence of relaxation combined with vigorous movement can result in a reduction in gamma motorneuron activity, which in turn will gradually lessen the tension in the lumbar erector spine muscles, thereby reducing pain. Additionally, the McKenzie exercise's active extension movement can mobilize the bulging disc toward the posterior so that it will lessen its size or even exert a pushing force on the nucleus pulposus toward the

anterior. This lessens irritation of the posterior longitudinal ligament's nerve root and pain-sensitive sensory fibers (Wibawa et al., 2018). Mc Kenzie exercise uses body movements mainly in the direction of extension, usually used to strengthen and stretch the extensor and flexor muscles of the lumbosacral joint and can reduce pain. The principle of mc kenzie exercise is to improve posture, to reduce lumbar hyperlordosis. While operationally giving exercises for extensor muscles and for stretching is aimed at back flexor muscles (Mentari, 2018). Therefore, the two physiotherapy procedures combined have a beneficial effect. A mix of thermal effects, such sound wave absorption, which improves blood flow, and non-thermal effects, like cavitation and microflow, which speed up cell healing and lessen pain, are responsible for the improvement in functional capacity following ultrasound administration. Pain relief promotes greater functional activity. By giving the muscles more support, Mc. Kenzie increases the muscle pump, which improves the flow of nutrients and oxygen into the tissue and preserves the physiological characteristics of the muscles. Patients with low back pain often struggle with their functional abilities due to pain and muscle strength issues. Giving Mc Kenzie will improve functional ability, strengthen muscles, and relieve discomfort.

CONCLUSION

This research can be concluded that the combination of ultrasound and mc Kenzie can improve functional ability in patients with myogenic low back pain.

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