

## Effect of Medical Rehabilitation Services on Pain Intensity in Low Back Pain Patients

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### ABSTRAK

**Background:** Low back pain is a symptom that is not directly related to mortality but is a cause of morbidity. The incidence of LBP was reviewed based on patient visits to several hospitals in Indonesia, ranging from 3-17%. The purpose of this research is to Effect of Medical Rehabilitation Services on Pain Intensity in Low Back Pain Patients.

**Method:** This type of research includes quantitative research with a cross sectional approach. Data collection is done through medical records. The research sample was all patients diagnosed with low back pain who were treated at the medical rehabilitation polyclinic at the Ibnu Sina Makassar Hospital within 4 years (2019-2022). Data analysis was carried out, namely univariate and bivariate analysis using the Paired t-test.

**Results:** The research results obtained 31 samples that met the inclusion criteria and showed that there was an effect of medical rehabilitation on reducing the low back pain scale in patients with low back pain ( $p=0.00$ ).

**Conclusion:** There is an effect of medical rehabilitation on decreasing the low back pain scale in patients with low back pain.

**Keywords:** Low back pain; medical rehabilitation; pain intensity



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## **INTRODUCTION**

A musculoskeletal disease known as low back pain (LBP) is brought on by poor ergonomics. LBP is characterized as localized discomfort that lasts more than a day and is located between the costal margin and the inferior gluteal fold. It does not include discomfort related to menstruation or pregnancy. However, it may be accompanied by numbness or leg pain.<sup>1</sup> One of the leading causes of disability affecting employment and overall health is low back pain. Everyone can complain of low back discomfort, regardless of gender, age, colour, educational attainment, or occupation.<sup>2</sup>

Low back pain is the leading cause of global disability, as measured by Years Lived with Disability (YLD), and ranks sixth in terms of the overall burden, as measured by the Disability-Adjusted Life Year (DALY), according to The Global Burden of Disease 2010 Study, which examined 291 diseases. Years of Life Lost (YLL) and Years Lived with Disability (YLD) are combined to create the DALY, a commonly used metric for evaluating burden.<sup>3</sup> In affluent nations, low back discomfort is a disorder that frequently prompts sufferers to seek medical attention. According to a study of community-dwelling adults, Italian researchers found that the prevalence of low back pain was about 32% in people over 65 and 36% in people between the ages of 70 and 79.

In contrast, it is estimated that between 18% and 29% of adults over 60 in poorer nations report having musculoskeletal disorders each month.<sup>4</sup> Regarding patient visits to various hospitals in Indonesia, the incidence of LBP ranges from 3–17%. After headaches, LBP is the second most common complaint among people. In the United States, more than 80% of the population has reported having LBP, whereas 10% of patients at various hospitals in Makassar, Indonesia, have LBP, which affects over 15 million people. The purpose of this research is to determine the Effect of Medical Rehabilitation Services on Pain Intensity in Low Back Pain Patients.

## **METHODS**

This study employed an observational analytic research approach as its research design. A retrospective study design on medical records was used for the research project. With no intervention in the variable being studied and no use of control variables, this design aims to investigate a variable by tracing the risks that led to an event. The Rehabilitation Polyclinic at the Ibnu Sina Hospital Makassar served as the site for this study. The time frame for this study is January through April 2023. Patients with low back pain seeking therapy at the medical rehabilitation polyclinic at Ibnu Sina Makassar Hospital over 4 years (2019–2022) make up the sample in this study. In this study, the medical rehabilitation polyclinic at Ibnu Sina Makassar Hospital treated any patients with low back pain within a 4-year period (2019–2022). This is known as the total sampling approach. Data analysis was done to analyze each research

variable's characteristics using percentages to explain and describe them in the form of tabulations or graphs. Additionally, a paired t-test employing bivariate analysis to ascertain the impact of medical rehabilitation treatments on the level of pain experienced by low back pain patients.

## RESULTS

### Characteristics of the Research Sample

In terms of age, gender, occupation, and diagnosis outcomes between January 2019 and December 2022, this study seeks to ascertain the impact of medical rehabilitation on the level of pain experienced by low back pain patients at the Ibnu Sina YW-UMI Hospital Makassar Medical Rehabilitation Polyclinic. 58 LBP patients underwent visits between January 2019 and December 2022, and 31 of those samples matched the criterion for selection.

**Table 1. Characteristics of the Research Sample**

<b>Characteristic</b>	<b>Classification</b>	<b>Total (n)</b>	<b>Percentage (%)</b>
<b>Age</b>	31-40 years	1	3,23
	41-50 years	6	19,35
	51-60 years	6	19,35
	61-70 years	11	35,48
	>70 years	7	22,58
<b>Gender</b>	Men	12	38,71
	Women	19	61,29
<b>Occupation</b>	Civil Servants and BUMN employees	7	22,58
	Private sector employee	7	22,58
	Housewife	8	25,81
	Retired	9	29,03
	<b>Frequency</b>	11-5	16
<b>Therapy</b>	6-10	8	25,81
	11-15	2	6,45
	>16	5	16,13
<b>VAS Before</b>	Mild Pain (VAS 1-3)	1	3,23

<b>Therapy</b>	Moderate pain (VAS 4- 6 6)	19,35
	Severe pain (VAS 7-10)	24 77,42

Following investigation, the following findings were made: The lowest incidence is in the age category of 31 to 40 years, while the maximum prevalence is up to 11 people (35.4%) in the age group of 61 to 70 years. There were 12 men (38.71%) and 19 women (61.29%), respectively. The highest proportion of patients who have retired from their employment is 29.03%. According to the number of times they received therapy, 16 people (51.61%) had the highest prevalence. Based on the degree of pain prior to therapy, it was discovered that the most common type of pain affected 24 persons (or 77.42%) with severe pain.

### Effect of Medical Rehabilitation on Pain Intensity of LBP Patients

The results showed that there was an effect of medical rehabilitation on reducing the low back pain scale in patients with low back pain ( $p=0.00$ ).

**Table 2. Effect of Medical Rehabilitation on Pain Intensity of LBP Patients**

Variable	Total (n)	Value	p
VAS Before therapy	31	6.94 ± 1.46	0.00
VAS After therapy	31	5.71 ± 1.71	

## DISCUSSION

### Characteristics by age

Data from WHO (2013) states that the incidence of LBP will continue to increase and peak at 35-55 years old. LBP complaints are growing with age. According to Pratiwi et al (in Wijayanti, 2017), the more you age, the risk of decreasing bone elasticity will increase due to bone degeneration, making it easier to experience skeletal complaints that cause pain. In addition, tissue damage, tissue replacement into scar tissue, and fluid reduction also cause reduced stability of bones and muscles. (6-8) On the contrary, according to Atthariq (2019), it is stated that there is no relationship between age and the incidence of LBP. This may be since the younger age group (<45 years) is of a productive age for work, causing complaints of pain in parts of the body that are frequently used, one of which is the lower back area.<sup>9</sup>

Based on the results of this study, the most common LBP sufferers were in the age group of 61-70 years with 14 patients (41.2%), followed by 51-60 years with nine patients (26.5%). This shows that there is harmony between the theory and the results obtained, namely, the older you are, the greater the possibility that someone will experience LBP complaints. Only 2 patients with LBP were in the age group >70 years.

### **Characteristics by Gender**

Based on gender, the results showed that the number and percentage of LBP patients with female sex were the same as male. The same. In a study conducted by Ramadhani and Wahyudati (2015), it was stated that women and men have the same risk of LBP complaints up to the age of 60 years. At the age of >60, women have a greater risk of LBP because they tend to have osteoporosis.<sup>10</sup> Several studies have stated that gender can affect the onset of these complaints. The National Institute for Occupational Safety and Health (NIOSH) says that gender can affect a person's risk level for skeletal disorders because physiologically, women's muscle abilities are lower than men.<sup>10</sup> LBP complaints usually occur in women during the menstrual cycle and the menopausal process which results in reduced bone density due to a decrease in the hormone estrogen so that you have the possibility of suffering from LBP.<sup>6</sup> Pregnancy is also one of the factors causing LBP in women. According to Amy (in Inding, 2016), around 70% of pregnant women complain of LBP, which may start from the beginning of the trimester, while the peak of its occurrence is at the gestational age entering the II-III trimester. This is due to changes in posture that occur due to the addition of an increasingly large content load. The increase in the angle of curvature due to the additional burden of the uterus causes the flexibility and mobility of the lumbar to decrease.

### **Characteristics by Occupation**

Armiza (2018) states that work factors that can influence the emergence of LBP complaints are attitude, duration, period, and workload.<sup>12</sup> Data from The Norwegian Back Pain Network states that heavy physical work such as putting much pressure on the spine, work related to prolonged static positions, repetitive bending or twisting movements, and sitting for long periods will burden the lower back and cause fatigue. If the wrong sitting position aggravates it, it will cause tension in the muscles of the lumbar region. It is suggested that the duration of a person's work should be 6-8 hours/day; excessive working time and lasting for an extended period without rest can impact the body's ability and cause pain.<sup>10</sup>

Based on the type of work, the results of this study stated that patients with jobs as civil servants suffered from the most LBP, namely 52.9%, 18 people, followed by private workers 38.5%, 13 people. This is caused by working with the bad ergonomics and sitting in a static position for a long time. This study's results align with Harrianto's opinion (in Armiza, 2018) that work attitudes such as sitting, bending,

bending the body, standing for too long or awkward posture can cause LBP complaints.<sup>12</sup>

A civil servant who has worked for more than one year with a working duration of >4 hours/day is likely to work in a high-intensity static work position. 44 Working in the wrong sitting position causes the back muscles to bear the burden and work hard to support the upper limbs, As a result, the lower back muscles will be exhausted and will cause complaints of pain. Static work attitude for a long time causes disturbances to the musculoskeletal system more quickly.(12,13) According to Suma'mur (in Armizi, 2018), the duration of a person's work should be 6-8 hours/day. Working for long periods and without rest will affect the body's ability and cause pain in the body.

### **Characteristics by Diagnosis**

Based on the diagnosis of LBP, the most common diagnosis was HNP patients by 55.9% for 19 people, followed by lumbar spondylosis at 29.4% for 10 people and lumbar spondylolisthesis at 14.7% for 5 people.

According to Widhiana (in Andi Y, 2017), aging plays an important role in bone degeneration. When entering the age of 30 years, little by little, changes occur in the annulus fibrosus and nucleus pulposus. In some areas, the fibres of the fibroblastic tissue are cut off and damaged and replaced by collagenous tissue. This process will continue so that cavities will form in the annulus fibrosus. The nucleus pulposus will infiltrate into the cavity and experience a decrease in water content. Therefore, a condition is formed where the volume of the nucleus pulposus material decreases and the volume of the vertebral cavity increases; then, there is a decrease in intradiscal pressure. When the volume of the nucleus pulposus continues to fill the cavity of the annulus fibrosus that is getting closer to the outermost layer, one day, when the intradiscal pressure increases, the nucleus pulposus can be pushed out. This is the beginning of the occurrence of lumbar HNP. As you get older, the ability of the discus will also decrease, and over time, it will become dry. The wall of the disc becomes non-fibrous and becomes weak. The water-holding capacity of the nucleus pulposus continues to decrease progressively with age.<sup>14</sup> According to Malanga (Anissa et al., 2015), the most frequent occurrence of HNP is at 20-50 years and peaks at 40-50 years. On the contrary, according to Moskovich (in Anissa et al., 2015) the incidence of HNP increases at the age of >50 years for the entire population in the United States. Increasing age, then in line with rising cases of HNP.<sup>15</sup> Apart from the age factor, several theories suggest that gender also influences the incidence of HNP. According to Franco et al (2019), the incidence of HNP is more in men than women, with a ratio of 2:1.<sup>16</sup> According to Bruce et al (in Andi Y, 2017), HNP in men is at risk two times greater than women. According to Kemuningtyas (in Andi Y, 2017), this is due to differences in the types of work between men and women. HNP generally occurs in individuals with jobs that often bend and lift because the middle part of the posterior longitudinal ligament is stronger, so disc protrusion often leads posterolaterally.<sup>14</sup>

According to Wong (in Anissa et al., 2015), HNP in men and women tend to have the same frequency. HNP is more likely to occur in someone with a job such as lifting heavy weights. Because more men work in industries with heavy work, there are more cases of men.<sup>15</sup>

Based on the discussion above, the results of this study only looked at the incidence of LBP patients based on diagnosis without analyzing other related factors such as age, gender and occupation, so the results obtained were not specific. This can be used for further research to determine the relationship between HNP diagnosis and age, gender and occupation.

### **Effect of Medical Rehabilitation on Pain Intensity of LBP Patients**

The results of this study are in line with previous research conducted by Niken (2015) entitled *The Effect of Slow Stroke Back Massage Cutaneous Stimulation on the Intensity of Lower Back Pain in the Elderly* with the results of respondents experiencing a decrease in pain scale at a moderate level (30%) and a mild level (30%) 70%). The reduction in the value of pain intensity for each individual is different even though the stimulus given is the same. This difference is caused because pain is subjective and individual so the response given between an individual and another individual is not the same depending on the factors that influence it, such as age, gender, experience and the meaning of pain and coping styles (Potter & Perry, 2005) The decrease in pain intensity is associated with the gate control theory of pain reduction mechanism, namely the decrease in pain intensity occurs because the transmission of pain impulses is blocked by activating A-beta fibres found in the skin. These fibres will respond when gently massaging the skin so that after giving a cutaneous slow-stroke back massage stimulus, there is a decrease in pain intensity. In addition, the results of the study are in line with the research of Anggaraeni (2015). The results of the study show that there are benefits of muscle stretching for complaints of lower back pain in workers in the hanging knitting section of PT. Royal Korinda Purbalingga ( $p < 0.05$ ). The results of the study are also in line with Kurniawan's research (2004) that there is an effect of Back Exercise in increasing the range of motion of the joints ( $P < 0.05$ ).

The study results were in line with Dachlan's opinion (2009), showing that the reduction of pain complaints in the treatment group with the Mc Kenzie method and the treatment group with the William Flexion method was said to be no different ( $P = 0.19$ ).

Flexion exercises for the muscles of the lower back using the William Flexion method increase the strength of the lower back muscles. Pain caused by weakening the lumbar muscles can be reduced by stretching exercises. This has to do with the work of forces that carry out their functions in pairs. The muscles carry out their functions in pairs; when the agonist group of muscles is contracting, the opposing antagonist muscles are relaxed. Exercise is a rehabilitation program to increase back and abdominal muscle

strength, as well as stretching exercises to increase flexibility and reduce body weight. According to Kisner (1990), the same thing is that back exercise, which is given properly and correctly, reduces pain, increases the range of motion of joints, improves tissue elasticity and improves blood circulation.

## **CONCLUSION**

Based on the results of the research and discussion, there is an effect of medical rehabilitation on reducing the pain scale in patients with low back pain at the Medical Rehabilitation Polyclinic at Ibnu Sina Hospital, Makassar. Further assessment is expected to use a questionnaire directly to patients.

## **Conflict of Interest**

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