

Research Article

The Effect of William Flexion Exercise on Low Back Pain in Farmers in Lembor District, West Manggarai Regency

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Abstract: Low back pain (LBP) is a health problem that is often experienced by farmers due to lifting activities, bending over a relatively long time, and carrying loads with an unergonomic attitude. One of the efforts to deal with the problem of low back pain is ergonomics intervention through the William Flexion Exercise method. This study aims to determine the effect of William Flexion exercise on reducing low back pain. This research is a quasi-experimental study with one group pre test post test design. William flexion exercise is given in the form of abdominal strengthening movements with a duration of 30-40 minutes. The research sample consisted of 23 people determined by random sampling technique from a population of rice farmers in Lembor Selatan District, West Manggarai Regency. The measurement of LBP levels using the Oswestry questionnaire was carried out before and after the intervention. Data differences before and after the intervention were tested using the Wilcoxon sign rank test. The results showed that William Flexion exercise can reduce low back pain of farmers from an average score of 64.26 to 47.96 or a decrease of 25.36% with $p = 0.000$. The conclusion of this research is william flexion exercise can reduce Low back pain.

Keywords: Farmer's LBP, william flexion exercise.

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INTRODUCTION

Low back pain (LBP) is a pain syndrome that occurs in the lower back and is a work-related musculoskeletal disorder. The most common causes of LBP are muscle tension or improper posture. Things that can affect the onset of LBP are the habit of sitting, working hunched over for a relatively long time, lifting and carrying loads with an unergonomic attitude, abnormal spine, or due to certain diseases such as degenerative diseases [1].

One of the occupational diseases that is a common health problem in the world and affects almost the entire population is low back pain. Low back pain (LBP) is pain that is felt in the lower back, is not a disease or a diagnosis for a disease, but is a term for pain felt in the affected anatomic area with varying length of occurrence of pain. Lower back pain is a major cause of disability affecting work and general well-being. LBP complaints can occur to everyone, whether gender, age, race, educational status, and profession. There are several important risk factors associated with the incidence of LBP, namely age over 35 years, smokers, work period of 5-10 years, work

position, obesity, and family history of sufferers of musculoskeletal disorders [1].

The world agency ILO (International Labor Organization) in 2013 noted that one worker in the world dies every 15 seconds due to work accidents, 160 workers experience illness due to work [2]. The previous year (2012) the ILO recorded 2 million deaths due to accidents and occupational diseases per year (Ministry of Health of the Republic of Indonesia, 2014). The highest prevalence of musculoskeletal diseases by occupation was in farmers, fishermen or laborers, namely 27.8 percent. Based on research in Indonesia, the highest prevalence of musculoskeletal disease by occupation is farmers [3].

In general, the factors associated with the incidence of LBP include individual characteristics such as age, gender, body mass index (BMI), height, exercise habits, length of work. The job factor is one of the factors that cause LBP. Wrong work position / work posture such as sitting static for a long time and an ergonomic sitting position is one of the factors in the occurrence of LBP. To reduce LBP complaints, it can be done in various ways, one of which is by applying

ergonomic principles at work. Ergonomics is how work is done to suit human natural conditions, striving to keep the posture in a position or return to a neutral position easily, which is a position that gives muscles a relaxed attitude. International Labor Organization (ILO) [2], defines ergonomics as a science that finds and collects information about human behavior, abilities, limitations and characteristics in designing machines, equipment, work systems, and environments that are productive, comfortable, safe and effective for humans.

The main goals in the management of LBP are to relieve pain, increase mobility, increase flexibility, and prevent disability. The management of LBP can be pharmacological and non-pharmacological. Therapy using pharmacology uses drugs such as analgesics, muscle relaxants. Non-pharmacological therapy uses a variety of therapy methods such as ultrasound, transcutaneous electrical nerve stimulation (TENS), short waves, acupuncture and exercise [4]. One of the therapies that are inexpensive, easy to do and proven to be effective is back exercise, the Williams Flexion Exercise and the McKenzie Exercise are the most common types of back exercise.

Williams Flexion Exercise is a back exercise (a form of exercise aimed at the back muscles) which aims to reduce pain in LBP by balancing the flexorpostural muscles and postural extensor muscles so as to reduce pressure by body weight on the facet joints (articular weight bearing stress), stretching muscles and fascia (increasing soft tissue extensibility) in the dorsolumbal area, opening up the intervertebral toramen, and also useful for correcting wrong posture [5]. Many studies have shown that Williams flexion exercise is effective in reducing pain in LBP.

Based on the results of a preliminary study in the Watutiri farmer group, it is known that the number of farmers who experience LBP is 256 people from 420 farmers. The results of interviews conducted with farmers in the Watutiri farmer group, from 10 farmers found that 8 farmers experienced low back pain caused by lifting, bending, pushing, and turning activities with a long duration without appropriate rest periods. Farmers who experience LBP rarely seek treatment because the pain can disappear at any time. The methods farmers use to relieve pain are by massaging, applying pain relief patches or allowing them to go away on their own. Some farmers already know how to deal with low back pain, but the methods used are not yet effective. So from the survey above, the researchers are interested in conducting research with the title "William Flexion Exercise Intervention to Reduce Low Back Pain and Work Fatigue in Farmers in South Lembor District, West Manggarai Regency".

METHODS

This study uses a quantitative approach. The type of quantitative method used is a quasi-

experimental method. The research design used in this study was the onegroup pretest-posttest design. This method is to test the effect of one or more variables on other variables. The research was conducted at the Puskesmas Lembor Selatan District, Manggarai Barat Regency for 1 month (August - September) since the letter was issued by the University of Nusa Cendana. The sample in this study were 23 farmers who experienced back pain and were taken using random sampling. The number of samples in this study can be determined by the following calculations:

$$n = \frac{N \cdot z^2 \cdot p \cdot q}{d(N-1) + z \cdot p \cdot q}$$

The data analysis used in this study was bivariate and univariate analysis with different tests using the Wilcoxon sign rank test with the criteria for acceptance of the research hypothesis. If the p value $\leq \alpha$ ($p \leq 0.05$), then the hypothesis (Ho) is rejected, it means William Flexion exercise can reduce low back pain and work fatigue in farmers in South Lembor District by showing a significant difference.

The instruments used in this study were: Questionnaire, in this study the questionnaire used was the Oswestry Disability Index (ODI) to measure the scale of back pain experienced by farmers. This research has received approval from the Health Research Ethics Commission issued by the Faculty of Medicine, University of Nusa Cendana Kupang on July 30, 2020.

RESULT

Table-1: Distribution of Respondents by Gender, Age, Body Mass Index, Length of Work.

Characteristics of Respondents	Total (n)	Percentage (%)
Gendel		
Male	20	87
Female	3	13
Age		
20-25	1	4
26-30	7	30
31-35	4	17
36-40	5	22
41-45	6	27
BMI		
Normal	18	78
Overweight	2	9
Obesity	3	13
Length of Work		
8 Jam	23	100
>8 Jam		

Table-1 shows that most of the respondents, namely 20 people (87%) were male and 3 (13%) female. The age of the respondents in this study were 1 person (4%) 20-25 years old, 7 (30%) 26-30 years old, 4 (17%) 31-35 years old, 36-40 years old 5 (22%), and

41-45 years as many as 6 (27%). Body mass index of respondents is detailed as follows: Normal as many as 18 people (78%), Fat body 2 people (9%), and Obesity

3 people (13%). The average respondent works 8 hours a day.

Table-2: The Distribution of Respondents' LBP Levels in Period 1 and Period 2

Period	LBP Complaint level	Total	Percentage (%)	The average of LBP Complaints	Minimum	Maximum
Before	moderate pain	7	30	64.26	48	79
	severage pain	16	70			
After	mild pain	7	30	47.96	37	59
	moderate pain	16	70			

The distribution data of respondents' LBP levels before being given William flexion exercise in period 1 were detailed as follows: the mean score of LBP in period 1 was 64.26 with 7 people (30%) moderate pain, 16 people (70%) severe pain. And the

distribution data of respondents' LBP levels after being given William flexion exercise in period 2 are detailed as follows: the mean score of LBP in period 2 is 47.96 with 7 people with mild pain (30%) and 16 people with moderate pain (70%).

Table-3: The Difference of LBP Period 1 and Period 2 Levels

Variable	Period I	Period II	Difference	p value	Percentage of decrease
LBP Petani	64.26	47.96	16.3	0,000	25,36%

Based on Table-3 the average period 1 64.26 and period 2 47.96 and a difference of 16.3 so that there is a difference in the LBP of farmers in period 1 and period 2. Based on the Wilcoxon Ranks Test, the value of $p = 0,000$ was obtained so that the decision of the H_0 hypothesis was rejected, meaning that there was a significant effect on low back pain of farmers in South Lembor District before and after receiving William flexion exercise with a large decrease in LBP after the intervention of William Flexion Exercise was 16.3 or decreased. 25.36%.

with Maria Pombu's research [9] which states that there are several movements or work attitudes of farmers that can cause Low Back Pain, namely: standing work attitude, bending work attitude, work attitude lifting weights, carrying loads.

DISCUSSION

The Intensity of LBP Complaints by Farmers in South Lembor, West Manggarai

LBP is pain that is felt in the lower back area, which is on the L4 / L5 or L5 / S1 disk, it can be local pain or radicular pain or both. This pain is often accompanied by the spread of pain to the legs and feet [6]. LBP is one of the complaints felt by most workers, generally starting at the age of 25 and increasing at the age of 50 [7]. The intensity of pain that is felt varies from mild to severe pain [8].

The assessment of the functional ability of farmers in Lembor Selatan District using the Oswestery Disability Index (ODI) questionnaire, which includes: pain intensity, self-care, lifting activities, walking, sitting, standing, sleeping, sexual activity, social life and traveling. Most of the farmers in Lembor Selatan Subdistrict work standing, bending, lifting weights and carrying weights. Farmers in Lembor Selatan sub-district work in a bent position using their back as the main support, in this position the muscles receive static loads continuously for a long time. The attitude of bowing to farmers continuously allows farmers to experience low back pain (LBP). This is in accordance

The results showed that the LBP intensity experienced by farmers in period 1 was mostly in very severe pain experienced by 16 people (70%), and period 2 after giving William Flexion exercise, LBP was mostly felt in moderate pain experienced by 16 people (70%). The LBP experienced by farmers from observations is caused by the working position and lifting activities. Working in a bent and squatting position is a farmer's job position that cannot be avoided, especially when planting rice and cleaning pests by spraying pesticides. The same thing was also found by Rachmani S [5], that most farmers work in a squatting position which results in shifting the fulcrum to the lower back so that usually there are complaints of pain in that part. The pathophysiology that causes this condition is that when there is a change in the fulcrum in the body, the muscle structure will be stretched and stimulate the surrounding pain receptors, besides that over time there will be deformities in the intervertebral discs and an increase in tension in the posterior annulus pulposus resulting in pressure on the nucleus pulposus.

Another corroborating study is that according to research conducted by Sutajaya [10], analysis based on body position at work using the chi-square statistical test by looking at the continuity correlation shows that there is a relationship between work position and complaints of low back pain in brick workers in the urban village. Lawawoi, Sidrap Regency in 2007 with p value = $0.042 < 0.05$. Seeing the results shown, it can be said that the LBP experienced by farmers in South

Lembor District is in the weight range due to the bending position.

The Effect of William Flexion Exercise on the Decrease in LBP of Farmers in Lembor Selatan, West Manggarai

LBP is a health problem that is often found in society and is of global concern [11]. Until now, various ways have been done to help reduce the number of LBP complaints, including improving work posture, redesigning work equipment, using physical exercises such as fitness and back exercise. The most common causes of LBP are muscle tension or improper posture. Things that can affect the emergence of NPB are the habit of sitting, bending over for a relatively long time, lifting and carrying loads with an un-ergonomic attitude, abnormal spine, or due to certain diseases such as degenerative diseases [12].

The results of the analysis showed differences in scores before and after William Flexion exercise. The average LBP score for period 1 was 64.26, influenced by a variety of strenuous activities undertaken such as spraying pesticides, lifting rice, cleaning rice pests. In addition, the LBP of farmers is also influenced by the bending and repeated work position for a long time, coupled with the habits of farmers who never exercise, thereby increasing muscle stiffness. such work attitudes increase auto injuries and complaints [13, 6].

The results in period 2 after being given William Flexion exercise the mean LBP score decreased by 47.96 and was statistically significant ($P = 0.000$). The reduction in LBP of farmers after William Flexion exercise intervention was 16.3 or decreased by 25.36%. LBP decreased due to the provision of intensive training in the form of william flexion exercise. William flexion exercises help relax tense muscles, reduce weakness and increase muscle strength [14]. Manuaba [15] states that flexor movements cause stretching of the flexor muscles so that they can produce a balance between the postural flexor muscles and the muscles. The postural extensor can thus reduce pressure on the lumbar spine.

Another research that is in line is that which was carried out continuously [16] in this study to strengthen (strengthening) the abdominal muscles and gluteus maximus, as well as stretching the back extensor muscles. The stretching of the lower back muscles causes an increase in local temperature, increases muscle cell metabolism, so that metabolites are easily transported. Strengthening the abdominal muscles acts as a support to support the spine, so that the posture of the spine remains straight. Although the LBP score decreased after William Flexion exercise, the LBP score decrease was still in the severe category. The results of this study prove hypothesis 1.

CONCLUSION

This study resulted in the following conclusions: The intensity of the LBP of farmers in period 1 was in the heavy category with a mean score of 64.26, Period 2, the farmer's LBP was in the moderate pain category with a mean score of 47.96. William flexion exercise has a significant effect on reducing LBP by 16.3 with a large reduction of 25.36%.

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