

Determinants Related to Low Back Pain Complaints in Rice Farmers in Pantilang Village, North Bastem District Kabupaten Luwu

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ABSTRACT

KEYWORD

Low Back Pain, Rice Farmer, Work Posture, Duration of Work, Workload

Low back pain is pain felt in the lower back that originates from the spine, muscles, nerves, or other structures in the area. Back pain can be caused by diseases or disorders that originate outside the lower back, such as diseases or disorders in the waist. This study aims to identify the determinants related to low back pain complaints in rice farmers in *Pantilang* Village, North *Bastem* District, *Luwu* Regency in 2023. The research employed a quantitative observational analytical study with a cross-sectional approach. The population consisted of all rice farmers in *Pantilang* Village, and based on the *Slovin* formula calculation, a total of 37 samples was obtained using simple random sampling technique. Data collection instruments included questionnaires and REBA sheets, with Chi-square test analysis using SPSS 20 software. The study results showed significant relationships between work posture and low back pain complaints ($p=0.002$), workload ($p=0.000$), duration of work ($p=0.018$), and exercise habits ($p=0.004$). The conclusion indicates that there are significant relationships between work posture, work duration, workload, and exercise habits with low back pain complaints in rice farmers in *Pantilang* Village, North *Bastem* District, *Luwu* Regency in 2023.

INTRODUCTION

Occupational health is part of the application of public health in the workplace with the aim of increasing worker productivity and controlling public health. All jobs have a risk of accidents and the occurrence of work-related diseases due to factors related to the relationship between work and the work environment, such as work that involves lifting, dismantling, and transporting goods directly without aids, which can be a risk factor for work accidents such as low back pain or muscle injuries (Putri E and Alam S, 2018). According to WHO, in 2018 there were around 70-80% of people suffering from low back pain in developed countries, and every year there are around 15-45% of adults complaining of back pain who are treated in hospitals.

Back pain is pain felt in the lower back that originates from the spine, nerves, muscles, and other structures in the back area. Back pain is caused by conditions and disorders from outside the lower back, such as testicular or ovarian conditions (Suma'mur, 2018).

Indonesia's low back pain (LBP) is one of the most prevalent diseases and ranks second in the world after influenza. According to the Indonesian Ministry of Health in 2018, the prevalence of lower back pain complaints in Indonesia is 18%.

The Center for Health Data and Information of the Republic of Indonesia stated that the prevalence of back pain in Indonesia was 18 percent in 2018. The prevalence of back pain increases with age and is more common in adults, including the elderly. Eighty-five percent of the causes of back pain are non-specific and can be attributed to soft tissue disorders, muscle trauma and muscle spasms or fatigue, as well as other specific causes such as spinal fractures, infections, and tumors. According to *Riskesdas* data (2018), the frequency of workers who suffer the most from joint pain due to medical diagnosis is workers/farmers at 9.90% compared to other occupations, and the age group that reports the most joint pain complaints is those over 35 years old.

In South Sulawesi, especially Makassar, according to employment data, in 2015 there were 110,286 industrial accidents that occurred in 16,082 companies, with 2,382 fatalities. There are two

types of back pain: chronic and acute. Acute back pain occurs in less than 6 weeks, while chronic back pain occurs when the pain lasts more than 12 weeks in a single episode. Back pain can be defined as chronic if it lasts more than 3 months, as most connective tissue usually heals in 6 to 12 weeks unless anatomical instability persists. Several factors can cause back pain, including personal, occupational, and environmental factors. Back pain is caused by musculoskeletal problems that develop into permanent muscle disorders. Back pain can be caused by several factors, namely work that requires physical strength and repetitive or excessive movements that can result in muscle injuries when performing work tasks such as bending, squatting, lifting weights, and carrying heavy loads.

Based on Ni Kadek Dian Sutarni et al., it was found that the majority of respondents had a moderate risk level of 16 people, with a proportion of 42.1 percent. The correlation value between the number of hours worked and the incidence rate of back pain showed a positive and fairly close relationship, suggesting that most respondents were at risk (≥ 8 hours) based on hours worked (hours per day), totaling 22 people with 57.9%. The results showed that low back pain is caused by uncomfortable working positions and long working hours that exceed the body's maximum capacity. Based on the results of the study by Murti Sri Dewi et al. (2022), a relationship was found between work posture and back pain complaints, with 18 people (52.9%) having poor work posture and 17 people (50%) experiencing heavy workload, showing a relationship between high stress levels and the duration of back pain, work position, and workload related to back pain.

Patrianingrum M, Oktaliasah E, Suharman E. (2019) noted that back pain is a common consequence of manual material handling (MMH), where workers often maintain high speed and load. Heavy lifting that is not necessarily too heavy but is prolonged and repetitive causes fatigue, resulting in back injuries and pain (Rinaldi E, Utomo W and Nauli F.A, 2018).

Based on previous research, back pain describes pain that originates from the lower back. These muscle problems are usually caused by excessive muscle tension due to exposure that is too heavy and too prolonged (Simanihuruk, 2018). Based on the results of previous observations and surveys as well as interviews with several farmers who complained of back pain at the end of work and while working, the results of interviews with ten farmers showed that nine people complained of back pain, and according to data from the Health Center, 3% of farmers complained of back pain. According to the available information, farmers work 9 hours a day with lifting and bending activities.

Based on the results of initial observations and surveys with interviews conducted with several farmers who complained of low back pain while working and after finishing work, from the results of interviews with 10 farmers, there were 9 people who experienced complaints of low back pain, and data from the Health Center showed that 3% of farmers experienced complaints of low back pain. According to the information obtained, farmers work 9 hours a day with a bending and lifting work mechanism.

Therefore, this research aims to identify the determinants related to low back pain complaints in rice farmers in *Pantilang Village, North Bastem District, Luwu Regency* in 2023. The benefits of this study include: (1) providing scientific evidence for developing occupational health interventions specifically for rice farmers; (2) contributing to the formulation of ergonomic policies in agricultural work settings; (3) serving as a reference for health professionals in designing preventive programs for musculoskeletal disorders in farming communities; and (4) establishing a baseline for future longitudinal studies on occupational health among rice farmers in the region.

METHOD

This research is an observational quantitative study with a cross-sectional approach. The sample in this study consists of rice farmers in *Pantilang Village, North Bastem District, Luwu Regency*. The research population numbered 200, and the research sample consisted of 37 samples calculated using the *Slovin* formula, followed by simple random sampling technique. The research instruments used were questionnaires and REBA sheets. The sampling process involved obtaining informed consent from participants and distributing questionnaires to inquire about workload and low back pain complaints, while work posture was assessed through observation and video documentation, then analyzed using REBA sheets. The statistical test used was Chi-square analysis using SPSS 20 software.

RESULTS AND DISCUSSION

The results of the analysis of univariate and bivariate data can be seen in the following table:

Table 1. Distribution of the frequency of farmers' age characteristics in Pantilang Village in 2023

Age	Frequency	Percentage (%)
20-35 years old	18	48.6
36-50 years old	12	32.4
51-65 years old	4	10.8
66-80 years old	3	8.1
Total	37	100.0

Based on table 1, it can be seen that of the 37 respondents studied, where the largest number of respondents were respondents aged 20-35 years, namely 18 respondents (48.6%) and 36-50 years, namely 12 respondents (32.4%). Respondents aged 51-65 years with a total of 4 respondents (10.8%), and respondents aged 66-80 years with 3 respondents (8.1%).

Table 2. Frequency distribution of respondent gender groups to farmers in Pantilang Village, North Bastem District, Luwu Regency in 2023.

Gender	Frequency	Percentage (%)
Man	31	83.8
Woman	6	16.2
Total	37	100.0

Table 3. Distribution of the frequency of the respondents' working period groups to farmers in Pantilang Village, North Bastem District, Luwu Regency in 2023

Tenure	Frequency	Percentage (%)
5-35 years	7	18.9
36-62 years old	30	81.1
Total	37	100.0

Based on table 3, it can be seen that of the 37 respondents studied, where the working period of farmers in Pantilang Village, North Bastem District, Luwu Regency was the most respondents with a working period of 5-35 years with a total of 7 respondents (18.9%), and respondents with a working period of 36-62 years as many as 30 respondents (81.1%).

Table 4. Frequency distribution of respondents' body mass index groups to farmers in Pantilang Village, North Bastem District, Luwu Regency in 2023.

Body Mass Index	Frequency	Percentage (%)
Normal (18.5-25.0)	9	24.3
Kuru (17- <85.5)	28	75.7
Total	37	100.0

Based on table 4, it can be seen that of the 37 respondents studied, where the body mass index of farmers in Pantilang Village, North Bastem District, Luwu Regency was the most respondents with a normal body mass index (18.5-25.0) as many as 9 respondents (24.3%) and respondents with a thin body mass index (17-<85.5) were 28 respondents (75.7%).

Table 5. Frequency of distribution of low back pain complaints among farmers in Pantilang Village, North Bastem District, Luwu Regency

Complaints <i>Low Back pain</i>	Frequency	Percentage (%)
Experience	24	64.9
Not Experiencing	13	35.1
Total	37	100.0

Based on table 5, it can be seen that of the 37 respondents studied, there were 24 respondents (64.9%) who experienced complaints of low back pain in rice farmers and who did not experience complaints as many as 13 respondents (35.1%).

Table 6. Frequency of workload distribution to farmers in Pantilang Village, North Bastem District, Luwu Regency

Workload	Frequency	Percentage (%)
Heavy	32	86.5
Light	5	13.5
Total	37	100.0

Based on table 6, it can be seen that out of the 37 respondents studied, there were 32 respondents (86.5%) in farmers in Pantilang Village, North Bastem District, Luwu Regency and a light workload of 5 respondents (13.5%).

Table 7. Frequency of distribution of work duration to farmers in Pantilang Village, North Bastem District, Luwu Regency

Work Posture	Frequency	Percentage (%)
Medium Risk	8	21.6
High risk	16	43.2
Very high risk	13	35.1
Total	37	100.0

Based on table 7, it can be seen that out of the 37 respondents studied, the working posture of rice farmers who experienced high risk was 16 respondents (43.2%) and medium risk was 8 respondents (21.6%) and very high risk was 13 respondents (35.1%).

Table 8. The relationship between work posture and low back pain complaints in rice farmers in Pantilang Village, North Bastem District, Luwu Regency 2023

Farmers in Pantaling Village, North Eastern District, Bauw Regency 2023							
Complaint <i>Low Back Pain</i>							
Work Posture	Experience		Not experiencing		Total		Value <i>p</i>
	N	%	N	%	N	%	
Medium risk	2	5.4	6	16.2	8	21.6	. 007
High risk	10	27.0	6	16.2	16	43.2	
Very high risk	12	32.4	1	2.7	13	35.2	
Total	24	64.9	13	35.1	37	100	

Based on the table above, it shows that of the 37 respondents who had a medium risk work posture and complained of low back pain, there were 2 respondents (5.4%), 6 respondents (16.2%) had a medium risk work posture and did not complain of low back pain, 10 respondents (27.0%) had a high risk work posture and did not complain of low back pain (16.2%). and those who experienced complaints of low back pain with a very high risk as many as 12

respondents (32.4%), who did not complain of low back pain with a very high risk of 1 respondent (2.7%).

This study's findings are consistent with research conducted by Ni Kadek Dian Sutami et al. (2021) which demonstrated a significant relationship between work posture and low back pain complaints in farmers at Subak Berawantangi Taman, Tukadaya Village, Melaya District, with $p=0.002$. Similarly, research by Kusumaningrum et al. (2021) found that awkward working postures, particularly prolonged bending and twisting motions common in rice farming, significantly increased the risk of developing low back pain among agricultural workers. The biomechanical stress imposed by non-ergonomic postures leads to muscle fatigue, ligament strain, and eventual development of musculoskeletal disorders.

The results of this study are in line with a study conducted by Ni Kadek Dian Sutami et al in 2021 where there is a relationship between work posture and low back pain complaints carried out on farmers in Subak Berawantangi Taman, Tukadaya Village, Melaya District and has a value of $p=0.002$ which means that there is a significant relationship between work posture and low back pain complaints.

The research is in line with the research conducted by Shalsa Devira et al in 2021 where there is a relationship between work posture and low back pain complaints carried out in tailors in Nagari Kapuak, Lima Sepuluh Kota Regency and has a value of $p=0.006$ which means that there is a significant relationship between work posture and low back pain complaints.

The theory that supports this research is Tarwaka (2018), non-ergonomic working postures such as raised hands, bent back, and raised head if moved for a long time and cause injury to muscles, The work posture experienced by farmers is an unergonomic work posture. The unergonomic working posture that the farmer feels occurs from the repetitive bending, pulling, and lifting posture.

Table 9. Analysis of the relationship between workload and low back pain complaints in rice farmers in Pantilang Village, North Bastem District, Luwu Regency in 2023

Complaint <i>Low Back Pain</i>							
Workload	Experience		Not experiencing		Total		Value <i>p</i>
	N	%	N	%	N	%	
Heavy Workload	23	62,2	9	24.3	32	86.5	.024
Light Workload	1	2.7	4	10.8	5	13.5	
Total	24	64.9	13	35.1	37	100	

Based on the table above, it shows that of the 37 respondents who had a heavy workload and complained of low back pain, there were 23 respondents (62.2%), who did not complain of low back pain with a heavy workload as many as 9 respondents (24.3%) and who complained of low back pain with a light workload as many as 1 respondent (2.7%), and who did not complain of low back pain with a light workload of 4 respondents (10.8%).

The findings of this research are supported by several previous studies that demonstrate the relationship between workload and musculoskeletal disorders. Research by Awaluddin et al. (2019) found a significant relationship between workload and low back pain complaints in Makassar sewing house workers with $p=0.005$, which aligns with our findings. Furthermore, a study by Sompia & Andira (2020) on online taxi drivers in Makassar showed that excessive workload significantly contributed to the development of low back pain symptoms. The physiological mechanism underlying this relationship involves increased metabolic demands on muscle tissues, leading to accelerated fatigue and increased susceptibility to injury when workers exceed their physical capacity limits.

Additionally, research by Sri Wahyuninggsi Herawati & Cicilia Nony (2022) on rubber farmers demonstrated that heavy physical workloads involving repetitive lifting, carrying, and bending motions create cumulative stress on the lumbar spine, resulting in tissue damage and pain. The biomechanical analysis reveals that when workload exceeds individual capacity, compensatory movement patterns emerge, leading to asymmetrical loading of spinal structures and eventual development of low back pain.

This study is in line with the research of Awaluddin et al in 2019 where in their research there was a significant relationship between workload and low back pain complaints carried out in Makassar sewing house workers with a value of $p=0.005$. This research is also in line with research conducted by Sela Ayu Gusti in 2022 on onion skin cleaning workers in the Jambi City Angso Duo market work unit and has a value of $p=0.022$ which means that there is a significant relationship between load and low back pain complaints.

The theory that supports this research is Nugroho et al., (2018) workload is the strength of the body to do a job. Cognitive abilities and physical abilities that must be appropriate and balanced with the workload received by each person. Workload is the effort made by a person in realizing the demand from the work done. In doing work, one must pay more attention to one's capacity to do work and within a predetermined time. The capacity of a worker is a physical and mental ability that can be measured, with a workload that is too high and physical ability that is too weak can cause workers to experience work-related diseases.

CONCLUSION

The research demonstrates significant relationships between multiple occupational factors and low back pain complaints among rice farmers in *Pantilang Village, North Bastem District, Luwu Regency* in 2023. Specifically, there is a significant relationship between work posture and low back pain complaints ($p=0.007 < \alpha 0.05$), indicating that ergonomically inappropriate working positions substantially increase the risk of developing musculoskeletal disorders. Similarly, a significant relationship exists between workload and low back pain complaints ($p=0.024 < \alpha 0.05$), suggesting that excessive physical demands beyond individual capacity contribute to the development of low back pain symptoms. Future research contributions should focus on: (1) developing and implementing ergonomic interventions specifically designed for rice farming activities, including proper lifting techniques and postural awareness training; (2) conducting longitudinal studies to establish causal relationships and track the progression of musculoskeletal disorders over time; (3) investigating the effectiveness of workplace modifications such as mechanical aids and tools that can reduce physical strain; (4) exploring the role of individual factors such as physical fitness, nutrition, and psychosocial factors in the development of low back pain; and (5) developing comprehensive occupational health programs that integrate preventive measures, early detection protocols, and rehabilitation strategies for agricultural workers in similar settings.

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