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RISK FACTOR OF LOW BACK PAIN COMPLAINTS AMONG FARMERS IN BELAPUNRANGA AND BELABORI VILLAGE

Dwi Santy Damayati[1], Alya Fatihah Rachmat[1], Nurbaiti Azizah[1], Anifa Tadzlila Faza[1], Susan[1], Dhini Nackita Majid[1], Nur Annisa Hafid[1], & Nur Hafizah[1]

[1]Universitas Islam Negeri Alauddin Makassar, Indonesia
Correspondence Email: santy@uin-alauddin.ac.id

ABSTRACT

Musculoskeletal complaints are complaints that affect skeletal muscles or the musculoskeletal system experienced by workers, ranging from mild to severe. Several factors cause musculoskeletal complaints, including individual factors such as gender, age, length of employment, anthropometry, smoking status, alcohol consumption, and exercise habits, as well as occupational and environmental factors. This study aims to determine the relationship between occupational factors and individual characteristics on back pain complaints among workers in Belapunranga Village and Belabori Village. This research is an analytical observational study with a cross-sectional design. The population in this study consisted of all farmers living in Belapunranga Village and Belabori Village. The sample consisted of 595 people selected using purposive sampling. Data were collected using questionnaires and interviews, then analyzed using univariate and bivariate analysis (Chi Square) with the SPSS application. The results of this study indicate that age, length of employment, and work posture, such as bending, stooping, and lifting loads, are associated with back pain complaints among farmers. The results of this study are expected to encourage farmers to pay more attention to their work posture when performing agricultural activities.

Keywords: Musculoskeletal complaints, work posture, back pain

1. INTRODUCTION

Musculoskeletal complaints are health problems that affect muscles, bones, joints, ligaments, and tendons, with symptoms ranging from mild discomfort to severe pain that limits daily activities. These complaints often arise when muscles and skeletal structures are exposed to repetitive movements, heavy loads, awkward postures, and prolonged physical strain over a long period of time. If this condition continues without adequate prevention and management, it can lead to tissue damage, inflammation, and decreased functional capacity. Musculoskeletal disorders are therefore one of the most common occupational health problems, especially among workers whose jobs require physical labor.

According to (Tarwaka, 2015), the occurrence of musculoskeletal complaints is influenced by several factors, which can be grouped into individual factors, occupational factors, and

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environmental factors. Individual factors include gender, age, length of service, anthropometry, smoking status, alcohol consumption, and exercise habits. Occupational factors are related to work characteristics such as work posture, workload, duration of work, repetitive movements, and the use of work equipment. Environmental factors include workplace conditions such as temperature, vibration, and work surface. The interaction of these factors can increase the risk of musculoskeletal disorders, particularly in jobs with high physical demands.

The World Health Organization (WHO) reported in 2014 that more than half of work-related illnesses in developing countries occur among workers in the informal sector. This sector generally lacks adequate occupational safety and health protection, leading to serious health consequences, including more than 12 million deaths per year. In Indonesia, the informal sector employs a large proportion of the workforce, including farmers, who are often exposed to unsafe working conditions and heavy physical workloads. These conditions make farmers particularly vulnerable to musculoskeletal problems, especially those related to the back.

However, to date, epidemiological data describing the prevalence and characteristics of low back pain in Indonesia remain limited. There is no comprehensive national report that specifically presents the incidence or prevalence of low back pain by age group, occupation, or geographic region. This condition causes the picture of the problem of lower back pain in Indonesia to not be comprehensively documented.

The lack of national epidemiological data does not necessarily indicate a low occurrence of low back pain in Indonesia. Findings from this study conducted in Belapunranga Village and Belabori Village, Parangloe District, Gowa Regency, show that the majority of respondents are engaged in agricultural work that involves heavy physical activities, prolonged working hours, and non-ergonomic working postures, such as bending, lifting, and carrying loads manually. These working conditions suggest a substantial risk of low back pain among farmers in both villages. This local evidence supports the assumption that low back pain may represent a significant occupational health problem among informal sector workers, despite the limited availability of national-level epidemiological data.

One of the most common musculoskeletal complaints experienced by farmers is low back pain (LBP). Low back pain has a significant impact on farmers' productivity and overall well-being. In addition to causing physical discomfort, LBP can limit functional activities such as bending, lifting, standing for long periods, and carrying loads. It can also lead to sleep disturbances and psychosocial stress due to ongoing pain and reduced work ability. If left untreated, low back pain may develop into a chronic condition that causes long-term disability and a decline in work capacity, which in turn threatens farmers' livelihoods and economic stability (Aseng & Sekeon, 2021).

Several previous studies have shown that low back pain in farmers is caused by multidimensional factors. A study conducted in Buahkapas Village, Majalengka Regency, found that age, gender, length of service, work period, work posture, and smoking habits were all significantly associated with low back pain complaints (Assegaf, Zakaria, & Prakoso, 2025). Similarly, a study among rubber farmers in Tanah Periuk Village, Jambi, reported a significant relationship between age ($p = 0.018$), length of service ($p = 0.000$), and risky work posture with low back pain complaints ($p = 0.001$) (Rosa, 2024). These findings highlight that both individual characteristics and occupational factors play an important role in the occurrence of back pain among farmers.

The geographical conditions and work patterns of farmers in rural areas often require them to work for long hours in non-ergonomic positions, such as bending, squatting, and lifting heavy

loads manually. Despite this high risk, back pain complaints among farmers are often considered a normal part of work and tend to be overlooked, both by workers themselves and by health services. As a result, preventive efforts and early interventions are still limited.

Belapunranga and Belabori villages were chosen as research locations because they are characterized by rural areas, with a majority farming population, and relatively similar work patterns and types of agricultural activities. Furthermore, initial observations indicate that farmers in both villages still employ traditional work methods with a low level of ergonomic principles. This makes these two villages relevant and representative for examining factors associated with back pain among farmers.

Based on this background, this study aims to determine the relationship between occupational factors and individual characteristics with back pain complaints among farmers in Belapunranga Village and Belabori Village. This research is expected to provide a clear overview of the factors associated with low back pain and serve as a basis for developing preventive strategies, ergonomic improvements, and health promotion programs to reduce back pain complaints and improve the health and productivity of farmers.

2. METHODS

This study was conducted in Belapunranga Village and Belabori Village, Parangloe Subdistrict, Gowa Regency, South Sulawesi. The research was carried out over a period of 14 days, from June 19 to July 2, 2025. This study employed a quantitative approach with a cross-sectional design. The cross-sectional design was used to identify the relationship between independent and dependent variables measured at the same point in time. This approach was considered appropriate for describing community health conditions and factors associated with low back pain complaints among farmers within a specific observation period. Through this design, the relationship between occupational factors and individual characteristics with the occurrence of low back pain could be analyzed without long-term follow-up.

The study population consisted of all farmers living and working in Belapunranga Village and Belabori Village, Parangloe Subdistrict, Gowa Regency. The population included farmers who met the research criteria, namely individuals with characteristics relevant to the variables studied. All farmers in both villages were included in the population because they have a relatively high risk of experiencing low back pain due to the physically demanding nature of their daily work activities.

The sample was selected from the population using a non-probability sampling method with a purposive sampling technique. This technique was chosen because respondents were selected based on specific criteria relevant to the objectives of the study. The selected respondents were farmers who were actively working and willing to participate in the research. Based on the sample size calculation, a total of 595 respondents were included in this study. This number was considered sufficient to represent the population and to accurately describe the relationship between individual characteristics and occupational factors with low back pain complaints in the study area.

Data collection is a crucial stage that greatly determines the quality of research results. In this study, data collection was carried out through several stages, starting with the identification of respondents who met the inclusion criteria, followed by direct interviews. Data were collected using an electronic questionnaire administered through the KoboCollect application. Interviews were conducted directly at the respondents' homes to facilitate data collection and ensure that

each question was clearly understood by the respondents. This interview method was also used to minimize errors in questionnaire completion and to improve data completeness.

Data processing was performed using statistical software (SPSS). The data processing stages included data editing to identify incomplete or inconsistent data, coding of each variable, data entry into the statistical software, and data cleaning to ensure data accuracy prior to further analysis. These procedures were conducted carefully to minimize errors that could affect the research findings.

Data analysis consisted of univariate and bivariate analyses. Univariate analysis was used to describe the frequency distribution and characteristics of respondents as well as each research variable. Bivariate analysis was then conducted to examine the relationship between independent variables, namely gender, age, length of service, and work posture, and the dependent variable, which was low back pain complaints. The statistical test used was the Chi-Square test with the assistance of SPSS software. The results of this analysis are expected to provide a clear description of the factors associated with low back pain among farmers in Belapunranga Village and Belabori Village.

3. RESULTS AND DISCUSSION

Results

1) Univariat Analysis

This analysis was conducted to determine the frequency distribution based on respondent characteristics and also based on independent variables (gender, age, length of service, duration of work, work posture) and dependent variables (back pain).

Table 1. Frequency Distribution of Gender Among Farmers in Belapunraga Village and Belabori Village in 2025

Gender	n	%
Male	423	71.1
Female	172	28.9
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 1, which shows the distribution of respondents by gender, out of a total of 595 respondents, 423 (71.1%) were male and 172 (28.9%) were female.

Table 2. Frequency Distribution of Worker Age Categories Among Farmers in Belapunraga Village and Belabori Village in 2025

Worker Age Category	n	%
Young Workers	18	3.0
Adult Workers	577	97.0
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 2, which shows the distribution of respondents by worker age category, out of a total of 595 respondents, 18 (3.0%) respondents were in the young worker age category and 577 (97.0%) respondents were in the adult worker age category.

Table 3. Frequency Distribution of Low Back Pain Among Farmers in Belapunraga Village and Belabori Village in 2025

Low Back Pain	n	%
Complaints	382	64.2
No Complaints	213	35.8
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 3, which shows the distribution of respondents based on low back pain, out of a total of 595 respondents, 382 (64.2%) reported back pain, while 213 (35.8%) reported no back pain.

Table 4. Frequency Distribution of Length of Service Among Farmers in Belapunraga Village and Belabori Village in 2025

Length of Service	n	%
New Workers	46	7.7
Old Workers	549	92.3
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 4, which shows the distribution of respondents based on length of service, out of a total of 595 respondents, 46 (7.7%) were male and 172 (28.9%) were female.

Table 5. Frequency Distribution of Working Hours Among Farmers in Belapunraga Village and Belabori Village in 2025

Working Hours	n	%
Normal	459	77.1
Longer	136	22.9
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 5, which shows the distribution of respondents based on working hours, out of a total of 595 respondents, 459 (77.1%) had a normal length of employment, and 136 (22.9%) had an excessive length of employment.

Table 6. Frequency Distribution of Work Postures Among Farmers in

Belapunraga Village and Belabori Village in 2025

Working Posture	n	%
Bending Over		
Ergonomics	48	8.1
Non Ergonomics	547	91.9
Bending the Head Forward		
Ergonomics	153	27.4
Non Ergonomics	432	72.6
Prolonged Sitting		
Ergonomics	459	77.1
Non Ergonomics	136	27.4
Lifting		
Ergonomics	265	44.5
Non Ergonomics	330	55.5
Total	**595**	**100**

Source: Primary Data 2025

Based on the data in Table 6, which shows the distribution of respondents based on their work posture, out of a total of 595 respondents, 547 (91.9%) respondents had a bending over posture, 432 (72.6%) respondents had a bending the head forward posture, 136 (77.1%) respondents had a prolonged sitting posture, and 330 (55.5%) respondents had a lifting posture.

2) Bivariat Analysis

Analysis of the relationship between independent variables and dependent variables to determine the relationship between the two variables in accordance with the research objectives.

Table 7. Bivariat Analysis of Gender with Low Back Pain among Farmers in Belapunranga Village and Belabori Village in 2025

Gender	Low Back Pain				Total		P - value
	Complain		No Complain				
	n	%	n	%	n	%	
Male	272	64,3	151	35,7	423	100	**0.936**
Female	110	64,0	62	36,0	172	100	
Total	**382**	**64,2**	**213**	**35,8**	**595**	**100**	

Source: Primary Data 2025

Table 7 shows that back pain among farmers is more commonly experienced by men, with 272 (64.3%) respondents reporting this condition. However, based on the statistical test results, a

p-value of 0.936 (p > 0.05) was obtained, which means that there is no significant relationship between gender and back pain among farmers in Belapunranga Village and Belabori Village.

Table 8. Bivariat Analysis of Worker Age Categories with Low Back Pain among Farmers in Belapunranga Village and Belabori Village in 2025

Working Age Category	Low Back Pain				Total		P - value
	Complain		Non Complain				
	n	%	n	%	n	%	
Young Workers	5	27,8	13	72,2	18	100	**0.001**
Old Workers	377	65,3	20	34,7	577	100	
Total	**382**	**64,2**	**213**	**35,8**	**595**	**100**	

Source: Primary Data 2025

Table 8 shows that back pain among farmers is more commonly experienced by adult workers, with 377 (65.3%) respondents. However, based on the statistical test results, a p-value of 0.001 (p < 0.05) was obtained, which means that there is a significant relationship between the age category of workers and back pain among farmers in Belapunranga Village and Belabori Village.

Table 9. Bivariat Analysis of Length of Service with Low Back Pain among Farmers in Belapunranga Village and Belabori Village in 2025

Length of Service	Low Back Pain				Total		P - value
	Complain		Non Complain				
	n	%	n	%	n	%	
New Workers	23	50,0	23	50,0	46	100	**0.036**
Old Worker	359	65,4	190	34,6	549	100	
Total	**382**	**64,2**	**213**	**35,8**	**595**	**100**	

Source: Primary Data 2025

Table 9 shows that back pain among farmers is more commonly experienced by farmers with length of service, with 259 (65.4%) respondents. However, based on the statistical test results, a p-value of 0.036 (p < 0.05) was obtained, which means that there is a significant relationship between length of service and back pain among farmers in Belapunranga Village and Belabori Village.

Table 10. Bivariat Analysis of Working Hours with Low Back Pain among Farmers in Belapunranga Village and Belabori Village in 2025

Working Hours	Low Back Pain				Total		P - value
	Complain		No Complain				
	n	%	n	%	n	%	
Normal	299	65,1	160	34,9	459	100	**0.380**
Longer	83	61,0	53	39,0	136	100	
Total	**382**	**64,2**	**213**	**35,8**	**595**	**100**	

Source: Primary Data 2025

Table 10 shows that back pain among farmers is more commonly experienced by farmers with normal working hours, with 299 (65.1%) respondents. However, based on the statistical test results, a p-value of 0.380 (p > 0.05) was obtained, which means that there is no significant relationship between working hours and back pain among farmers in Belapunranga Village and Belabori Village.

Table 11. Bivariat Analysis of Work Posture with Low Back Pain among Farmers in Belapunranga Village and Belabori Village in 2025

Working Posture	Low Back Pain				Total		P - value
	Complain		Non Complain				
	n	%	n	%	n	%	
Bending Over							
Ergonomic	24	50.0	24	50.0	48	100	0,032
Non Ergonomic	358	65.4	189	34.9	547	100	
Bending the Head Forward							
Ergonomic	89	54.6	74	45.4	163	100	0,003
Non Ergonomic	293	67.8	139	32.2	432	100	
Prolonged Sitting							
Ergonomic	304	66.2	155	33.8	459	100	0,058
Non Ergonomic	78	57.4	58	42.6	136	100	
Lifting							
Ergonomic	150	56.5	115	43.4	265	100	0,001

Non Ergonomic	232	70.3	98	29.7	330	100
Total	**382**	**64,2**	**213**	**35,8**	**595**	**100**

Source: Primary Data 2025

Table 11 shows that back pain among farmers was more commonly experienced by farmers with a bending over working posture (358 or 65.4%), 293 (67.8%) with a bending the head forward posture, 78 (57.4%) with a prolonged sitting posture, and 232 (70.3%) with a lifting posture. However, based on the statistical test results, a p-value ($p < 0.05$) was obtained, which means that there is a significant relationship between bending over, bending the head forward, prolonged sitting, and lifting work postures and back pain among farmers in Belapunranga Village and Belabori Village.

Discussion

The working conditions and culture of farmers in Belapunranga Village and Belabori Village are still dominated by traditional farming systems with a low level of mechanization. Most agricultural activities are carried out manually, from land preparation and planting to crop maintenance and harvesting. This work is carried out for long periods of time, with high levels of physical activity and less ergonomic working positions, such as bending, squatting, and manual lifting. Furthermore, awareness of occupational health risks, particularly musculoskeletal disorders, remains limited, as back pain is often considered a normal part of farming. This work culture leads to ongoing exposure to ergonomic risk factors and has the potential to increase back pain among farmers in both villages.

The results of this study indicate that the prevalence of low back pain is higher among male respondents. Statistical tests show that there is no relationship between gender and back pain among farmers in Belapunranga Village and Belabori Village. The results of this study are consistent with previous studies that show statistical test results, namely analysis using Kendall's tau, with a p-value of 0.384>0.05. Thus, it is proven that there is no correlation between gender and BM in weaving workers at PT. Apac Inti Corpora (Bantoro et al., 2024). This insignificant relationship may be due to the fact that other factors, such as work posture, workload, duration of physical activity, age, and individual health conditions, are more influential in causing back pain. These factors tend to play a more dominant role than biological differences between men and women.

The results of this study indicate that the prevalence of low back pain is higher among adult workers. Statistical tests show that there is a relationship between age and back pain among farmers in Belapunranga Village and Belabori Village. The results of this study are consistent with previous studies that show statistical test results, namely using the Chi-Square test, obtained a value of $p=0.029$ ($p<0.05$), so it can be concluded that age has a relationship with low back pain among batik craftsmen in Seberang Kota Jambi (Faridah & Hadi, 2024). Lower back pain is a complaint closely related to age. Previous research has shown that lower back pain is more common in people aged 50 and over. This is because as age increases, the risk of lower back pain increases. This is due to bone degeneration, and muscle strength and endurance begin to decline due to reduced fluid levels in the body.

The results of this study indicate that the prevalence of low back pain is higher among long-term workers. Statistical tests show that there is a relationship between length of service and back pain among farmers in Belapunranga Village and Belabori Village. The results of this study are

consistent with previous studies that show statistical test results, namely using the Chi-Square test, obtained a value of p=0.029 (p<0.05), so it can be concluded that length of employment is related to low back pain among batik craftsmen in Seberang Kota Jambi (Faridah & Hadi, 2024). Work period is a worker with a work period of 1-5 years who is a worker in the transition year from new worker to long-term worker, meaning that those who have worked for that work period feel experienced and want to do everything quickly, on time, in a hurry, and forget about their own safety. Meanwhile, workers with a longer work period increasingly understand the work and conditions of the work environment, so that their quality and quantity can increase.

The results of this study are consistent with previous studies that show statistical test results, namely using the Chi-Square test, obtained a value of p=0.029 (p<0.05), so it can be concluded that working hours is related to low back pain among batik craftsmen in Seberang Kota Jambi (Faridah & Hadi, 2024). Working hours are a calculation of the total time a worker spends (measured in hours) performing activities during a single day, excluding rest periods. The results of this study indicate that the prevalence of back pain is higher among long-term workers. Statistical tests show that there is a relationship between length of service and back pain among farmers in Belapunranga Village and Belabori Village.

The results of this study indicate that the prevalence of low back pain is higher in male respondents. Statistical tests show no relationship between gender and back pain among farmers in Belapunranga and Belabori Villages. These results are consistent with previous studies that showed statistical test results using the Chi-Square test obtained a p value of 0.001 (p <0.05), so it can be concluded that there is a relationship between work posture and complaints of back pain (Baihaqi et al., 2024). Unnatural or awkward working postures can put more stress on the muscles when they are used. Bending, looking down, sitting, and lifting for prolonged periods are all awkward work positions. These positions can cause injuries and low back pain.

4. CONCLUSIONS

The results of this study indicate that age, length of service, and working postures such as bending over, bending the head forward, prolonged sitting, and lifting are associated with back pain complaints among farmers with a p-value < 0.05. Based on the results of the study regarding the relationship between gender, age, length of service, working hours, and work posture with back pain complaints among farmers in Belapunranga Village and Belabori Village, the researchers provided several recommendations. Farmers are advised to pay more attention to their work posture when performing farming activities, particularly by reducing the habit of working in bending over, bending the head forward, prolonged stting, and lifting position repeatedly without rest.

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