
**ASSOCIATION OF WORKING HOURS, WORKING POSTURE,
LENGTH OF EMPLOYMENT, AND AGE WITH MUSCULOSKELETAL
DISORDER (MSD) COMPLAINTS AMONG RICE FARMERS IN
TEPPOE VILLAGE, EAST POLEANG DISTRICT, BOMBANA
REGENCY**

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ABSTRACT

Background: The agricultural sector is widely acknowledged as one of the occupations with a high susceptibility to work-related injuries and health problems, particularly Musculoskeletal Disorders (MSDs). Rice farmers regularly engage in various agricultural activities, including land preparation, planting, plowing, fertilizing, and harvesting, all of which require considerable physical exertion and extensive involvement of the musculoskeletal system. This study aimed to examine the relationship between work duration, work posture, length of service, and age with MSD complaints among rice farmers in Teppoe Village, Poleang Timur District, Bombana Regency. **Method:** This research employed an analytical quantitative method with a cross-sectional design. A total of 100 rice farmers were recruited using a simple random sampling technique. Data analysis consisted of univariate and bivariate statistical procedures. Associations between variables were examined using the Chi-square test, whereas the Fisher Exact Test was applied when the requirements for the Chi-square test were not satisfied. **Result:** The analysis indicated that work posture ($p = 0.011$), length of service ($p = 0.006$), and age ($p = 0.007$) were significantly associated with MSD complaints. However, work duration was not significantly related to MSD complaints ($p = 0.243$). **Conclusion:** Work posture, years of service, and age showed significant

relationships with musculoskeletal disorders complaints among rice farmers, whereas work duration was not found to have a significant relationship with MSD complaints.

KEYWORDS: Age, Years of Service, Musculoskeletal Disorders (MSDs), Work Duration, work posture.

INTRODUCTION

Musculoskeletal disorders have become a significant occupational health concern among agricultural workers worldwide. Findings from a recent systematic review and meta-analysis revealed that the average annual prevalence of musculoskeletal pain among agricultural workers reached 47.8%. The prevalence of low back pain varied across regions, accounting for approximately 62% in Africa, 54% in Asia, and 29% in Latin America. These conditions are largely attributed to the physically demanding nature of agricultural work, repetitive tasks, and prolonged exposure to non-ergonomic working postures. Consequently, farmers are more likely to experience musculoskeletal problems than the general population, which may adversely affect productivity and work performance[1].

The nature of agricultural activities exposes workers to numerous ergonomic hazards that can contribute to the development of MSDs. Farmers are often required to maintain awkward body positions, perform repetitive movements, and manually handle heavy loads during routine farming operations. Continuous exposure to these conditions may place excessive stress on the musculoskeletal system, leading to pain and discomfort in several body regions, including the back, neck, shoulders, knees, hands, wrists, thighs, and feet[2].

According to data from the 2018 Basic Health Research (Riskesdas) reported that the national prevalence of physician-diagnosed musculoskeletal disorders in Indonesia was reported at 7.30%. In Southeast Sulawesi Province, the prevalence reached 5.63%. Furthermore, the prevalence observed in rural communities (7.83%) was higher than that in urban populations (6.87%), suggesting that individuals engaged in physically demanding occupations are at greater risk of developing musculoskeletal problems. Based on physician-confirmed diagnoses, Southeast Sulawesi ranked 25th among Indonesian provinces in terms of MSD prevalence[3].

Among occupational sectors, agriculture is recognized as one of the most vulnerable to work-related health problems and injuries, particularly musculoskeletal disorders. Farming activities such as land preparation, planting, plowing, fertilizing, and harvesting generally require substantial physical effort and are frequently performed in awkward or sustained

postures. Long-term exposure to these working conditions may increase the risk of developing work-related MSDs among farmers[4].

Bombana Regency, located in Southeast Sulawesi Province, is one of the regions where rice farming serves as a major source of livelihood. The regency possesses approximately 10,000–15,000 hectares of rice fields distributed across coastal and lowland areas. In recent years, government initiatives aimed at strengthening food security, including the Food Brigade program, have encouraged increased agricultural production and farming activities. Nevertheless, rice farmers in the region continue to encounter various challenges, such as unfavorable climatic conditions and limitations in agricultural facilities and infrastructure. These challenges may further contribute to occupational health risks experienced by farmers.

METHOD

This study employed an analytical observational method with a quantitative approach and a cross-sectional design to examine the association between occupational and individual factors and musculoskeletal disorder (MSD) complaints among rice farmers. The research was conducted from April to May in Teppoe Village, East Poleang District, Bombana Regency, Southeast Sulawesi, Indonesia. The target population comprised rice farmers who lived and actively worked within the study area. A total of 100 participants were recruited through simple random sampling. Data were gathered on work duration, work posture, length of service, age, and MSD complaints.

RESULTS

Respondent Characteristics

Table 1. Age Distribution of Study Participants.

No.	Age	Amount (n)	Percentage (%)
1	20-44	41	41
2	45-64	59	59
Total		100	100

The distribution of respondents by age showed that the majority belonged to the older age group. Among the 100 participants, 59% were aged 45–64 years, while the remaining 41% were within the 20–44 years age range.

Table 2. Gender Composition of Respondents.

No.	Gender	Amount (n)	Percentage (%)
1	Male	100	100
2	Female	0	0

Total	60	100
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Regarding gender, all respondents were male, accounting for 100% of the study population. No female farmers participated in this research.

Table 3. Educational Attainment of Respondents.

No.	Educational Attainment	Amount (n)	Percentage (%)
1	Primary School	22	22
2	Lower Secondary School	47	47
3	Upper Secondary School	30	30
4	Bachelor's Degree	1	1
Total		100	100

Based on educational attainment, the majority of Junior high school graduates accounted for 47% of the respondents, followed by senior high school graduates at (30%), elementary school education (22%), and only 1% had attained a university degree.

Univariate Analysis

Table 4. Distribution of Respondents According to Musculoskeletal Disorder (MSD) Complaints.

No.	MSDs Complaints	Amount (n)	Percentage (%)
1	Low Risk	54	54
2	High Risk	46	46
Total		100	100

The distribution of musculoskeletal disorder complaints indicated that 54% of respondents were grouped into the high-risk category for MSD complaints, while 46% fell into the low-risk category.

Table 5. Distribution of Respondents by Daily Working Hours.

No.	Duration of Work	Amount (n)	Percentage (%)
1	≤ 8hours	93	93
2	>8hours	7	7
Total		100	100

With respect to work duration, most respondents (93%) worked for eight hours or less per day, while only 7% reported working more than eight hours daily.

Table 6. Classification of Respondents Based on Work Posture Risk Level.

No.	Working Postur	Amount (n)	Percentage (%)
1	High	56	56
2	Low	44	44
Total		100	100

Assessment of work posture revealed that 56% of Respondents were grouped into the high-risk posture category. whereas 44% were classified as having low-risk postures.

Table 7. Distribution of Respondents According to Length of Farming Experience.

No.	Years of Service	Amount (n)	Perccnetage (%)
1	≥ 5 year	53	53
2	< 5 year	47	47
Total		100	100

The distribution of length of service showed that 53% of respondents had been engaged in farming activities for five years or more, while 47% had worked for less than five years.

Bivariate Analysis

Table 8. Association Between Daily Working Hours and Musculoskeletal Disorder (MSD) Complaints Among Rice Farmers.

Work Duration	MSDs Complaints				Amount		P value
	High Risk		Low Risk				
	n	%	n	%	n	%	
working hours >8 hours per day	52	55,9	41	44,1	93	100	0,243
working hours <8 hours per day	2	28,6	5	71,4	7	100	
Total	54	54	56	46	100	100	

The analysis examining the relationship between work duration and MSD complaints revealed that 55.9% of respondents who worked more than 8 hours per day reported high MSD complaints, while 44.1% reported low MSD complaints. In comparison, among respondents who worked less than 8 hours per day, 28.6% experienced high MSD complaints and 71.4% experienced low MSD complaints. The results of the Fisher Exact Test produced a p-value of 0.243, which indicates that there was no statistically significant association between work duration and MSD complaints among rice farmers in Teppoe Village.

Table 9. Association Between Work Posture Risk and Musculoskeletal Disorder (MSD) Complaints Among Rice Farmers

Working posture	MSDs Complaints				Amount		P value
	High Risk		High Low				
	n	%	n	%	n	%	
High Risk	37	66,1	19	33,9	56	100	0.006
High Low	17	38,6	27	61,4	44	100	
Total	54	54	46	54	100	100	

The analysis of the association between work posture and MSD complaints revealed that 66.1% of respondents classified as having high-risk work postures reported high levels of MSD complaints. Conversely, among those with low-risk work postures, only 38.6% reported high MSD complaints. The statistical test yielded a p-value of 0.006, suggesting a significant relationship between work posture and MSD complaints.

Table 10. Association Between Length of Farming Experience and Musculoskeletal Disorder (MSD) Complaints Among Rice Farmers.

Years of Service	MSDs Complaints				Amount		P value
	High Risk		High Low				
	n	%	n	%	n	%	
work period > 5 years	36	67,9	17	32,1	53	100	0,002
work period < 5 years	18	38,3	29	61,7	47	100	
Total	54	54	46	46	100	100	

Regarding length of service, 67.9% of respondents who had been working for five years or longer reported high MSD complaints, while 38.3% of those with less than five years of work experience reported similar complaints. The results of the Chi-square test yielded a p-value of 0.002, indicating a statistically significant association between length of service and MSD complaints.

Table 11. Association Between Age Group and Musculoskeletal Disorder (MSD) Complaints Among Rice Farmers.

Age	MSDs Complaint				Amount		P value
	High Risk		High Low				
	n	%	n	%	n	%	
45-64	39	66,1	20	33,9	59	100	0,004
20-44	15	36,6	26	63,4	41	100	
Total	54	54	46	46	100	100	

Furthermore, age was significantly associated with MSD complaints. Among respondents aged 45–64 years, 66.1% experienced high MSD complaints, compared with 36.6% among those aged 20–44 years. The statistical analysis yielded a p-value of 0.004, indicating a significant relationship between age and MSD complaints.

DISCUSSION

a. Association Between Work Duration and Musculoskeletal Disorders (MSDs)

Work duration refers to the amount of time spent performing occupational activities within a given day. Generally, working hours range from six to eight hours daily. Extended working hours, particularly when accompanied by repetitive tasks and prolonged static postures, may increase muscular strain and contribute to fatigue. Such conditions can potentially elevate the risk of musculoskeletal complaint[5].

The bivariate analysis revealed no statistically significant association between work duration and Musculoskeletal Disorders (MSDs), with a p-value of 0.243 (>0.05). This finding indicates that the duration of daily work is not a determining factor for MSD complaints among rice farmers in Teppoe Village. Interestingly, the field data showed a higher proportion of MSD complaints among farmers who worked less than eight hours per day, with symptoms predominantly reported in the hands, calves, and back. This suggests that factors other than work duration may play a more substantial role in the occurrence of musculoskeletal complaints.

Field observations and information gathered from respondents indicated that most farmers who worked for more than eight hours per day did not perform farming activities continuously. Instead, they generally incorporated sufficient rest periods between tasks, such as resting in field shelters, having lunch, or temporarily suspending work during periods of high temperatures. In addition, farming activities involve a variety of body movements and positions, including walking, standing, sitting, and performing other agricultural tasks. Consequently, farmers are not continuously exposed to the same working posture for extended periods.

This finding is consistent with research [6] meaning there is no significant relationship between work duration and MSD complaints among manual handling workers at Warehouse X, Tangerang. This condition indicates that not all farmers who work more than 8 hours per day always experience MSD complaints, as these complaints are more influenced by other factors.

b. The Relationship between Work Posture and Musculoskeletal Disorders (MSDs)

Work posture is defined as the body position assumed by an individual while carrying out work-related activities. In ergonomics, adopting a proper posture is crucial for reducing physical workload and lowering the likelihood of occupational injuries. In contrast, awkward or non-neutral body positions may impose excessive biomechanical loads on muscles and joints, thereby increasing the risk of developing Musculoskeletal Disorders (MSDs) [7].

The findings of the bivariate analysis using the Chi-Square test demonstrated a statistically significant association between work posture and complaints of Musculoskeletal Disorders (MSDs), as indicated by a p-value of 0.011, which was lower than the significance level of 0.05. Therefore, it can be concluded that work posture is significantly related to MSD complaints among rice farmers in Teppoe Village. This result may be attributed to the non-ergonomic postures commonly adopted during farming activities. Field observations revealed that farmers often perform rice planting tasks with their necks slightly rotated backward while pulling planting equipment and with their knees partially flexed while moving through muddy fields. Such working positions can place additional stress on the musculoskeletal system, leading to MSD complaints. According to ergonomic principles, these postures are considered unsuitable because they deviate from recommended body positioning standards.

The results of this study align with the findings of a study conducted by [7], These findings are consistent with previous research demonstrating a significant association between work posture risk and musculoskeletal disorders among shallot farmers in Blumbang Lor, Blumbang Village, Tawangmangu District. The study further supports the evidence that workers who frequently perform tasks using non-ergonomic postures are more likely to develop musculoskeletal problems as a result of repetitive movements carried out over extended periods. Continuous exposure to such working conditions can increase strain on muscles and other supporting structures of the musculoskeletal system, thereby elevating the risk of MSD complaints.

c. Relationship between Length of Service and Musculoskeletal Disorders (MSDs)

Based on the results of the bivariate analysis using the Chi-square test, a statistically significant association was identified between length of service and Musculoskeletal Disorders (MSDs) complaints among rice farmers, as indicated by a p-value of 0.006 (<0.05). Therefore, it can be concluded that length of service is significantly related to MSD complaints among rice farmers in Teppoe Village. Farmers who have been engaged in farming activities for more than five years were more likely to experience MSD complaints compared with those who had shorter working periods. This finding may be attributed to the cumulative exposure to ergonomic risk factors over time. Prolonged involvement in farming

activities, including repetitive movements, awkward postures, and physically demanding tasks, can increase biomechanical stress on the musculoskeletal system. Consequently, farmers with longer work experience are more susceptible to developing MSD complaints, particularly in the upper back, lower back, and neck regions.

This study aligns with research conducted by [8] These findings are consistent with previous research conducted in 2024, which reported a statistically significant association between length of service and Musculoskeletal Disorders (MSDs) complaints among employees who routinely worked in front of computer monitor screens at University X.

d. Relationship between Age and Musculoskeletal Disorders (MSDs)

Age is defined as the period of time that has elapsed since a person's birth and is commonly regarded as a fundamental indicator of human growth and developmental progress. It has a considerable influence on multiple dimensions of life, including health status, educational attainment, social engagement, and economic performance. According to the World Health Organization (WHO), age represents the length of time an individual has lived since birth. Similarly, the United Nations (UN) recognizes age as an essential factor in determining an individual's entitlement to particular rights, obligations, and social functions within the community. Furthermore, age is generally categorized into several developmental stages, namely childhood, adolescence, adulthood, and older adulthood [9]

Bivariate analysis performed using the Chi-square test revealed a significant association between age and Musculoskeletal Disorders (MSDs) complaints among rice farmers. This finding was supported by a p-value of 0.007, which was below the significance level of 0.05. These results indicate that age is significantly related to the occurrence of MSD complaints among rice farmers in Teppoe Village.

The association between age and MSD complaints may be explained by age-related physiological changes that gradually reduce muscle strength, flexibility, and overall physical capacity. As individuals grow older, their musculoskeletal system becomes more vulnerable to strain and injury, increasing the likelihood of experiencing MSD symptoms. Farmers aged over 40 years are particularly susceptible to complaints involving the back, neck, arms, and calves. Furthermore, older farmers generally have a longer history of involvement in agricultural work compared with younger farmers, resulting in greater cumulative exposure to occupational risk factors. Prolonged exposure to physically demanding farming activities may contribute to the development and progression of musculoskeletal disorders over time.

This study aligns with research conducted by [10], with previous findings demonstrating a significant relationship between age and Musculoskeletal Disorders (MSDs) complaints

among healthcare workers at the NTB Provincial Hospital. This association suggests that advancing age may increase the risk of MSDs, as older farmers experience a gradual decline in physical function while remaining exposed to the physical demands of agricultural work over extended periods.

CONCLUSION

The results of this study showed that work duration was not significantly related to musculoskeletal disorder (MSD) complaints among rice farmers in Teppoe Village, East Poleang District, Bombana Regency. However, work posture, length of service, and age were found to have significant associations with MSD complaints. These findings indicate that ergonomic and individual characteristics contribute more strongly to the development of musculoskeletal disorders among rice farmers than the amount of time spent working each day.

RECOMMENDATION

Future studies are encouraged to examine additional variables that were not included in the present research, such as body mass index (BMI), smoking behavior, workload, repetitive motion frequency, physical activity level, and environmental working conditions. Investigating these factors may provide a more comprehensive understanding of the determinants of musculoskeletal disorder complaints among farmers.

REFERENCES

1. M. Shivakumar *et al.*, “*Musculoskeletal disorders and pain in agricultural workers in Low- and Middle-Income Countries: a systematic review and meta-analysis*,” *Rheumatol. Int.*, vol. 44, no. 2, pp. 235–247, 2024, doi: 10.1007/s00296-023-05500-5.
2. S. Ajhara, “Faktor Yang Mempengaruhi Musculoskeletal,” *J. Fisiotrapi Dan Kesehat. Indones.*, vol. 2, no. 2, pp. 150–162, 2022.
3. H. Lestari, “Gambaran Keluhan *Musculoskeletal* Pada Tukang Becak Di Kecamatan Kendari Barat,” vol. 6, no. 2, pp. 128–135, 2025.
4. T. A. N. Ramadhani, “Hubungan sikap kerja dan beban kerja terhadap keluhan musculoskeletal disorders (MSDs) pada petani bawang merah di Nganjuk,” *J. Lentera Kesehat. Masy.*, vol. 4, no. 1, pp. 1–10, 2025, [Online]. Available: <https://jurnalkesmas.co.id/index.php/jlkm>
5. N. U. T. Taufik Hilmi, “Hubungan Antara Postur Kerja Dan Durasi Kerja Dengan Keluhan *Musculoskeletal Disorders* (MSDs),” vol. 5, no. 5, pp. 1109–1118, 2025.

6. Azzahra and et. a. , Syaiful Bahri, “Hubungan Sikap Kerja , Masa Kerja Dan Durasi Kerja Dengan Keluhan Musculoskeletal Disorders (Msds) Pada Pekerja Manual Handling Di Gudang X . Tangerang Selatan,” vol. 1, no. 1, pp. 143–152, 2022.
7. W. Sandiyatun Daulay, “Keluhan Musculoskeletal Disorders Pada Petani Sawah,” vol. 6, pp. 15110–15121, 2025.
8. M. Yusup, Y. R. D. K. M. D. (M.) P. K. U. X. Ito2, and A. , Wishnu Uzma, A.P et, “Kerja Dengan Keluhan *Musculoskeletal Disorders* (Msds) Pada Karyawan Universitas X,” vol. 5, no. 2, pp. 16–26, 2025.
9. W. L. Seventeen, I. Arnova, and Y. Fitriano, “Pengaruh Faktor Demografis (Usia , Jenis Kelamin , dan Penghasilan) Terhadap Kepatuhan Wajib Pajak di Kota Bengkulu,” vol. 11, no. 2, pp. 1221–1226, 2023.
10. R. A. K Candra Dewi , Henry P, M, “Hubungan Umur, Jenis Kelamin Dan Masa Kerja Dengan Keluhan Musculoskeletal Disorders (MSDs) Pada Dokter, Bidan Dan Perawat Di RSUD Provinsi NTB,” vol. 10, no. November, pp. 167–186, 2021.