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High Complaints of Lower Back Pain Related to Length of Service Among Workers at the Ud. Berkah Gemilang Magetan Bread Factory

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ABSTRACT

Low back pain (LBP) is a musculoskeletal disorder frequently experienced by workers, primarily due to ergonomic factors and work duration. This study aims to analyze the relationship between work duration and low back pain complaints among workers at the UD. Berkah Gemilang Magetan bakery. The study design used a quantitative approach with a cross-sectional design. The study sample consisted of 35 workers, selected using a simple random sampling technique. Data were collected through the Nordic Body Map (NBM) questionnaire and analyzed using the Kendall Tau-b correlation test. The results showed that the majority of workers had a work period of ≥ 3 years (54.3%) and experienced low back pain complaints in the moderate risk category. Statistical analysis showed a significant relationship between work duration and low back pain complaints ($\rho = 0.003$; CC = 0.491). The longer the work period, the higher the risk of workers experiencing low back pain complaints, especially in the thighs, knees, and feet. The conclusion is that a longer work period increases the risk of low back pain in workers. Suggestions include the application of ergonomic principles, training in correct work postures, and regular health checks to prevent and reduce these risks.

Keywords: Low back pain, work life, ergonomics, factory workers

INTRODUCTION

Low back pain (LBP) is a musculoskeletal disorder frequently experienced by workers in various occupations. This disorder is characterized by pain or discomfort in the lower back, which can be caused by physical factors such as poor working posture, prolonged work hours, and a lack of ergonomic principles. Globally, the prevalence of LBP is quite high, reaching 15-45% of workers annually, with rates continuing to rise due to increasing working age and prolonged exposure to risk.

According to Wu et al, the number of low back pain sufferers globally is estimated to increase from 619 million in 2020 to 843 million people in 2050, making LBP a major cause of disability worldwide, especially in low-middle income countries.

In Indonesia, Ministry of Health data shows that the prevalence of musculoskeletal disorders, including LBP, reaches 24.7% among workers. Jobs involving repetitive activities and static work positions, such as those performed by workers in the bakery industry, carry a high risk of LBP. These activities involve continuous muscle use, which can ultimately lead to muscle fatigue and chronic musculoskeletal disorders.

Based on the results of a preliminary survey by researchers, observations, and interviews with factory employees, it was revealed that UD. Berkah Gemilang Magetan had 48 workers in March 2024. Of the 10 workers interviewed, 7 complained of lower back pain experienced while working with the same activities continuously. These activities include tasks in the packaging department, which assembles and packs products into containers, and in the production department, which makes or shapes bread.

Length of service is a significant risk factor influencing the occurrence of LBP. The longer a person works with exposure to ergonomic risk factors, the greater the chance of developing LBP. This aligns with Rohayani's research, which shows that long working hours trigger static loads on the body, increasing the risk of musculoskeletal disorders. Tarwaka also stated that work with repetitive static loads without considering ergonomic principles can put pressure on the spinal discs, ultimately triggering LBP.

This study aims to analyze the relationship between tenure and low back pain complaints among workers at UD. Berkah Gemilang, and to provide recommendations that can improve work health and productivity. Furthermore, this study provides an important contribution by adding scientific evidence regarding the relationship between tenure and the risk of low back pain in the bakery industry, and offers practical recommendations in the form of the application of ergonomic principles and work posture training that can be used for musculoskeletal disorder prevention programs in similar work environments.

METHOD

This study used a cross-sectional design and was conducted in 2024 at UD. Berkah Gemilang. The study population consisted of 38 workers, with 35 respondents selected using a simple random sampling technique based on the Slovin formula. Inclusion criteria included workers who had been actively working for at least one year and were willing to complete the research questionnaire.

Data collection was conducted using the Nordic Body Map (NBM) questionnaire to identify the level of NPB complaints in respondents. The independent variable was the length of service, which was categorized into ≤ 3 years and ≥ 3 years. The dependent variable was the level of NPB complaints, which was classified based on the risk level: low, medium, high, and very high. Data analysis was performed univariately to describe the frequency distribution, and bivariately using the Kendall Tau-b test to examine the relationship between variables. The significance level was set at $\alpha < 0.05$.

RESULTS

a. Frequency Distribution Based on Length of Service

Table 1. Frequency Distribution of Respondents Based on Length of Service

No	Length of Service (Years)	*f* (frequency)	Percentage (%)
1	≤ 3 Years	16	45.7
2	≥ 3 Years	19	54.3
Total		35	100.0

Source: Primary Data, 2024

Based on table 4.1, it can be seen that the variable of work period ≤ 3 years was 16 respondents with a percentage of 45.7%, work period ≥ 3 years was 19 respondents with a percentage of 54.3%.

b. Frequency Distribution Based on Low Back Pain Variables

Table 2. Frequency Distribution of Respondents Based on the Risk of Low Back Pain Complaints

No	Lower Back Pain	*f* (frequency)	Percentage (%)
1	Low Risk	9	25.7
2	Moderate Risk	19	54.3
3	High Risk	7	20.0
4	Very High Risk	0	0.0
Total		35	100.0

Source: Primary Data, 2024

Based on table 4.2, it can be seen that in the variable of low back pain, there were 9 respondents with a percentage of 25.7% at low risk, 19 respondents with a percentage of 54.3% at medium risk, and 7 respondents with a percentage of 20.0% at high risk.

c. Relationship between Length of Service and Low Back Pain Complaints

Table 3. Relationship between length of service and low back pain

Years of service	Lower Back Pain								Total		Sig	CC
	Low Risk		Moderate Risk		High Risk		Very High Risk					
	N	%	N	%	N	%	N	%	N	%		
≤ 3 Years	7	43.8	9	56.3	0	0.0	0	0.0	16	100.0	0.003	0.491
≥ 3 Years	2	10.5	10	52.6	7	36.8	0	0.0	19	100.0		

Source: Primary Data, 2024

Based on table 4.3 above, it can be seen that 16 respondents had a working period of ≤ 3 years. Seven (43.8%) of these respondents experienced complaints of low-risk lower back pain, while nine (56.3%) respondents experienced complaints of high-risk lower back pain.

There were 19 respondents with a working period of ≥ 3 years. Two (10.5%) of them experienced complaints of low-risk lower back pain, 10 (52.6%) of them experienced complaints of moderate-risk lower back pain, and 7 (36.8%) of them experienced complaints of high-risk lower back pain.

The results of the Kendall's Tau-b Correlation Test analysis obtained a sig value (0.003) (<0.05) which means that there is a relationship between work period and complaints of lower back pain in workers at the UD. Berkah Gemilang Magetan bakery and a Correlation Coefficient (CC) value of 0.491.

DISCUSSION

The results of this study indicate that length of service is significantly associated with low back pain (LBP) complaints among bakery workers at UD. Berkah Gemilang. Workers with longer service periods (≥ 3 years) tend to experience LBP complaints with moderate to high risk levels. This indicates that the duration of exposure to ergonomic risk factors plays a significant role in increasing the incidence of LBP.

Physiologically, repetitive activities and non-ergonomic work postures over long periods can cause pressure on the spinal discs (intervertebral discs). This can lead to damage to the musculoskeletal structure, particularly in the lower back. This study shows that workers with longer working hours experience more severe complaints, such as stiffness, pain, and weakness in the lower back, knees, and legs. These findings are consistent with a previous study by Rohayani, which found a relationship between work duration and low back pain (LBP) complaints in informal sector workers.

The results of this study are in line with the research conducted by Sri Herawati with a value (ρ value of 0.010) and smaller than α (0.05) which means there is a significant relationship between work period and Low Back Pain (LBP) in rubber farmers in Megang Sakti District, Musi Rawas Regency, South Sumatra.

In addition, according to research by Chowdhury et al (2023), the results of logistic regression showed that age, type of work, length of working hours, use of inappropriate body mechanics, repetitive bending or twisting movements, and sitting for too long were significantly related to the incidence of lower back pain ($p \leq 0.05$).

Work at UD. Berkah Gemilang involves repetitive tasks, such as assembling products in the packaging department and molding bread in the production department. These activities increase static and dynamic loads on the body, which, if performed continuously without adequate rest, can exacerbate the risk of LBP. Tarwaka explained that prolonged static loads put pressure on muscle and nerve tissue, accelerating the degeneration of spinal structures.

Workers with shorter tenure (≤ 3 years) generally show a lower risk of LBP. This may be due to their shorter exposure to ergonomic risk factors. However, even though their complaints tend to be mild, it is important to continue to pay attention to the application of ergonomic principles early on to prevent future musculoskeletal disorders.

Although several previous studies, such as Chowdhury et al.'s study in Bangladesh and Herawati's study of rubber farmers, have identified risk factors for low back pain (LBP), research on the relationship between tenure and LBP complaints in the Indonesian bakery industry remains very limited. This creates a knowledge gap, particularly in the context of repetitive work with specific ergonomic characteristics, such as those found in bakeries.

CONCLUSION

This study concluded that there is a significant relationship between length of service and LBP complaints in bakery workers at UD. Berkah Gemilang. Workers with a service period of ≥ 3

years have a higher risk of experiencing LBP complaints with a moderate to high risk level. Implementation of ergonomic principles, work posture training, and regular health checks are crucial to improve occupational health and reduce the prevalence of LBP. Further recommendations are to conduct further research with a larger population and additional variables to strengthen these findings.

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