Jurnal Kesehatan Masyarakat

Low Back Pain: Based on Age, Working Period and Work Posture

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Article Info

Abstract

Low back pain is one of the health risks for workers. Age, years of work and work posture that are not ergonomic are associated with complaints of low back pain. This study aims to determine the relationship between age, work period, and work posture on complaints of low back pain in rice mill workers. This study used an analytical observational study, with a cross sectional approach. Samples were taken of 50 respondents using total sampling. Research instrument with a questionnaire to determine data on age, years of service and assessment of complaints of low back pain. The RULA checklist method for measuring body posture. The data analysis technique used the Pearson test and multiple linear regression. The results showed that there was a significant relationship between age, years of service and work posture with complaints of low back pain with a p value <0.05. The conclusion of this study is that there is a relationship between age, years of service and work posture with complaints of low back pain.

Introduction

Low back pain is a costly and prevalent global health issue (Hartvigsen et al., 2018) . Among the general population, low back pain is a common non-fatal condition with a point prevalence of 9.4 % and a lifetime prevalence of approximately 85 % (Hoy et al., 2014). It was estimated that about one-third of low back pain is attributed to occupation (Driscoll et al., 2014) Manual work is still commonly found in various work activities. Manual work that is done repeatedly or repetitively with monotonous work movements and long working times has the potential to cause work fatigue. Muscles have the ability to contract, relax, expand and contract, allowing for many body movements. Work tools and the physical environment that are not in accordance with the natural abilities of the workforce will cause work results to be not optimal, and even have the potential to cause health complaints and occupational diseases. Low back pain is a common health problem in the workplace and most workers experience low back pain during their work (Hoy et al.,2010)

Low back pain has a huge impact both directly and indirectly on individual workers and their families, industry and government (Haldeman et al., 2012; Lewis & Battglia, 2019). The ILO reports that Musculoskeletal disorders are currently experiencing an increase in cases in many countries. For example, in the Republic of Korea Musculoskeletal disorders have increased by about 4,000 cases in a period of 9 years and in the UK, 40% of cases of occupational diseases are Musculoskeletal disorders.

Musculoskeletal disorders (MSDs) are disorders of the body's structures such as muscles, joints, tendons, ligaments, nerves,

bones, and the local circulatory system. In addition, back pain is defined as chronic or acute pain, pain or problems in the waist or buttocks area sometimes called the lumbago, or in the upper leg area which is a major work-related disorder in almost any physically demanding job (Meucci et al., 2015) . Rice mill work is a job that has a low back pain risk. The way of working that raises the load to the mill is a risk factor in low back pain. In many studies, various factors associated with low back pain have been identified. Among them; lifting and carrying heavy objects (Yang et al., 2016; Gawde, 2018), awkward posture, psychosocial work demands and job dissatisfaction (Pillastrini et al., 2010; Khalid et al., 2017; Lewis & Battglia, 2019). Repetitive motion, static workload reported as a major risk factor for LBP. The work posture of rice mill workers at Karangrejo Village, Kerjo Subdistrict, Karanganyar is classified as unsafe because there are various insecure attitudes in the form of improper transport, excessive workloads and excessive muscle stretching. Complaints of Low back pain are characterized by physical complaints in the form of low back pain.

Methods

This study uses an observational analytic design with a cross-sectional study design that explains the differences between the variables through testing previously formulated hypothesis. This research approach uses a cross sectional approach in which cause / risk and causal / causal variables are measured or collected at the same time and carried out at the same time. The research was conducted in the range of February - September 2020. The sampling technique used a total sampling of 50 workers in all rice mills in Kerjo District, Karanganyar Regency. The independent variables in this study are age, years of service and work posture. The dependent variable in this study is complaints of Low back pain in workers in the rice mill, Kerjo Karanganyar District. Age, years of work and work posture were measured using a questionnaire to respondents, complaints of low back pain were measured using the RULA checklist.

This analysis is used to see the description and characteristics of each independent variable and the dependent variable. The variables of this study were analyzed using the frequency distribution of SPSS version 23 data tendencies to describe the characteristics of each study variable. Bivariate analysis is used on two variables that are thought to have a relationship or mutual correlation. Bivariate analysis uses the Spearman correlation. The strength of the relationship of a variable obtained from the direction of the correlation that has positive (+) and negative (-) values. A positive value (+) means that the greater the value of one variable, the greater the value of other variables. Conversely, for negative values (-), if the greater the value of one variable, the other variables will be smaller. suggests that the correlation strength number (r) is divided into: 1) 0.00 - 0.199: very weak, (2) 0.20 - 0.399: Weak, (3) 0.40 - 0.599: (4) Medium 0.60 - 0.799: (5) Strong 0.80 - 1,000: the significance value of p is as follows: a) If p value <0.05, the test results have a significant correlation. b) If the p value is 0.05, the test results have no significant correlation. and multivariate analysis to find out which variables are the most influential among the variables that have a P-value <0.25 and multivariate analysis using multiple linear regression with the provisions of the p-value <0.25. Multivariate analysis aims to determine the most influential variables and the ability of these independent variables to affect the independent variables.

Result and Discussion

The rice mill area in Kerjo Karanganyar District is a home industry that processes rice into rice Kerjo Karanganyar Subdistrict has 25 rice milling units spread across 7 villages, such as Botok Village with 2 rice mills, Karangrejo Village with 10 rice mills, Kutho Village with 1 rice mill, in Tawangsari Village with 4 rice mills, Ganten Village with 6 rice mills, Kwadungan Village with 1 rice mill and Sumberejo Village with 1 rice mill. The production process at 25 rice milling units in Kerjo Karanganyar Subdistrict is carried out indoors for 6 working days, namely Monday to Saturday, where Sundays and holidays are red. This rice mill operates for 8 hours / day from 07.00-16.00 WIB with a rest time of 1 hour from 12.00-13.00 WIB. Judging from the location, this rice

mill is located in the middle of a residential area close to rice fields, making it easier for farmers after harvesting because the distance between the fields and the rice mill is not too far away. All workers in the rice mill are male with a total number of workers in the rice milling area of Kerjo Karanganyar District of 50 people. Every rice mill in Kerjo Karanganyar Subdistrict has less ergonomic workplace conditions and causes workers to experience complaints of low back pain. Complaints of pain are caused by factors

of age, years of service, and work posture.

Table 1 describes the characteristics of research respondents which consist of variables of age, years of service, work posture and LBP complaints. Age and work period are categorized based on 5 years, work posture is based on measurement results using the Rula method and LBP complaints based on the Oswestry Disability Index (ODI) Questionnaire. Table 1 shows that the majority of workers are in the age range 46-55 years

Table 1. Characteristics Distribution of Research Respondents

Variable	Category	n	Max	Min	Rata-rata
Age	26-35	6	28	57	45,66
	36-45	16			
	46-55	24			
	56-65	4			
Work period	<5 year	18	2	14	7,2
	>5 year	32			
Work Posture	Low	10			
	Moderate	21			
	High	19			
LBP	low Disability	10			
	moderate Disability	23			
	high Disability	17			

Source: Primary Data, 2020

Table 2 explains the relationship between the dependent variable and the independent variable. At the age of workers aged 46-55 years, the majority of complaints of LBP in the moderate and severe categories, as well

as at work> 5 years and in the work posture, the results of the assessment using the Rula method, the majority are in the moderate risk work posture.

Table 2. About Cross Tabulation Between Dependent and Independent Variables

Variable Dependent	LBP Complaints			p-value	r
	Low Disability	Moderate Disability	High Disability		
Age					
26-35years old	2 (33.3)	2 (33.3)	2 (33.3)		
36-45 years old	5 (31.3)	8 (50.0)	3 (18.8)	0.013	0.349
46-55 years old	3 (12.5)	12 (50.0)	9 (37.5)		
56-65 years old	0 (0)	1 (25.0)	3 (75.0)		
Work Period					
<5 years	8 (44.4)	8 (44.4)	2 (11.1)	0,000	0,481
>5 years	2 (6.3)	15 (46.9)	15 (46.9)		
Work Posture					
Low	5 (50.0)	3 (30.0)	2 (20.0)		
Moderate	2 (14.3)	14 (66.7)	4 (19.0)	0,000	0,496
High	2 (16.7)	6 (50.0)	4 (33.3)		

Source: Primary Data, 2020

Based on the results of the multiple linear regression test, it was found that the p-value = 0.000 <0.05, which means that age, years of service, and work posture together have an effect on complaints of low back pain with an adjusted R2 value of 0.305, which means the size of the influence of age, tenure and work posture for complaints of low back pain is 30.5%.

This study involved 50 rice mill workers in Kerjo Karanganyar Subdistrict. The results of this study indicate that 48% of respondents aged 46-55 years of workers in rice mills, Kerjo Karanganyar District experience complaints of moderate low back pain. This indicates that a person's age is one of the factors causing complaints of low back pain which will increase with age (Karwowsky, 2011). Other studies have shown that people over 29 are at risk of low back pain For example, other studies have shown that those over 60 have a prevalence of low back pain> 60% (Ikeda et al., 2019). Respondents who had a service period of <5 years experienced complaints of low back pain in the amount of 36%, while respondents who had a service period of> 5 years experienced complaints of low back pain in the amount of 64%. This shows that there is a significant relationship between work tenure and complaints of low back pain, because the longer the working period the muscles will weaken.

The results of work posture measurements that have been carried out, the average score of work posture is 4.08. A total of 20% of respondents had acceptable work posture scores, 42% of respondents had scores of postures that needed change, and 38% of respondents had unacceptable work posture scores. Based on the results of these measurements, the work posture of rice mill workers is classified as unsafe because there are various insecure attitudes in the form of improper load transport, excessive workload and excessive muscle stretching. (Meucci et al.,2015). In addition, other studies have shown that there is a significant effect between sitting posture and complaints of low back pain (Pillai & Haral, 2018; Bontrup et al., 2019; De Carvalho et al., 2020)

The results of measurements of low back pain that have been carried out, the average score of low back pain experienced by respondents is 32.94. A total of 22% of respondents had a low back pain score with mild disability, 46% of respondents had a moderate low back pain score, and 32% of respondents had a low back pain score with severe disability. This shows that there is a relationship between age, years of service, and work posture on complaints of low back pain. The risk of these complaints will increase if the age is getting older, the long working period and the position of the body further away from the center of gravity are factors that cause low back, research shows that long standing work posture has a higher risk than sitting people. (Goswami et al., 2016; Hasegawa et al., 2018)

There are relationship between age, years (length) of work, and work posture on complaints of low back pain in rice mill workers in Kerjo Karanganyar District. The results of the statistical test of the relationship between age and complaints of low back pain show that there is a significant relationship between age and complaints of low back pain in rice mill workers in Kerjo District that the older person is, the flexibility of the muscles decreases, causing low back pain (Hoy et al., 2012; Asghari et al., 2019). This indicates that a person's age is one of the factors causing complaints of low back pain which will increase with age (Karwowsky, 2011; Blanchette et al., 2016).

The statistical test results of the relationship between working tenure and complaints of low back pain indicate that the tenure with complaints of low back pain in rice mill workers in Kerjo Karanganyar District with moderate correlation strength in a positive direction. The positive direction means that the increasing work period will also increase the score of complaints of low back pain for rice mill workers in Kerjo Karanganyar District. The results of statistical tests of the relationship between work posture and complaints of low back pain in rice mill workers in Kerjo Karanganyar District with moderate correlation strength with a positive direction. The positive direction means that increasing age will also increase the score of complaints of low back pain in rice mill workers in Kerjo Karanganyar District.

The results of multiple linear regression tests, age, years of service, and work posture together have an effect on complaints of low

back pain. This shows that there is a relationship between age, years of service, and work posture on complaints of low back pain. This is due to the increasing age and working period of the workers which means that they are more prone to complaints of low back pain, and poor work posture will also result in complaints of low back pain, especially in the agricultural sector. (Blanchette et al., 2016; Bontrup et al., 2019; De Carvalho et al., 2020). Research on ergonomic interventions for low back pain shows that there is a significant reduction in complaints of low back pain in the age group given the intervention and those not given the intervention. (Pillastrini et al., 2010). Apart from these factors, it is possible that there are socio-economic factors that affect the incidence of low back pain. Workers who are agricultural laborers with continuous and repetitive standing work postures are more at risk of experiencing low back pain (Tissot, Messing and Stock, 2009; Goswami et al., 2016; Pillai and Haral, 2018). As well as research in Japan, shows that there is a significant relationship between socio-economic factors and the incidence of low back pain (Ikeda et al., 2019). There are many other factors that influence low back pain in workers, such as socio-economic conditions, wages received and psychosocial factors. This significantly affects the complaints of low back pain in workers (Yang et al., 2016; Ikeda et al., 2019; Wami et al., 2019).

Conclusion

The risk factors for workers experiencing complaints of low back pain consist of individual risk factors and factors from work. The results showed that individual risk factors and length of service were associated with low back pain and factors from work such as non-ergonomic work posture were also associated with low back pain.

Acknowledgment

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