

Analysis of Relationship between Work Attitudes and Repetitive Activities with Subjective Complaints on Musculoskeletal Disorder in Circular Loom Division workers PT. Kerta Rajasa Raya Sidoarjo Indonesia

Yuly Eka Saputri¹, Y. Denny Ardyanto W²

¹Department of Occupational Health and Safety, Public Health Faculty, Airlangga, University, 60115, Surabaya, East Java, Indonesia; ² Department of Occupational Health and Safety, Public Health Faculty, Airlangga, University, 60115, Surabaya, East Java, Indonesia

Abstract

The Musculoskeletal System Disorders (MSDs) are one of the most common occupational diseases experienced by workers. This disorder is influenced by several factors, such as repetitive activity factor and unnatural work attitude factor. The purpose of this study was to analyze the strong relationship between work attitude and repetitive activity with subjective complaints of musculoskeletal disorder in the circular loom division of PT. Kerta Rajasa Raya Sidoarjo, Indonesia.

This study used observational techniques with cross-sectional design. Respondents in this study were workers in the circular loom division of PT. Kerta Rajasa Raya, Sidoarjo, that consisted of 14 people based on the researchers' inclusion criteria. The data were obtained from the results of questionnaires and field observations. Work attitude data were analyzed using OWAS; MSDs subjective complaint data were investigated using NBM checklist sheets; and repetitive activity data were analyzed based on the results of questionnaires, interviews, and observations.

The results showed that the majority of respondents have subjective complaints of musculoskeletal disorder with high severity. The work attitude variable has a very strong correlation with subjective complaints of MSDs, and repetitive activity variable has a strong correlation with subjective complaints of MSDs.

The company are advised to provide training related to safe lifting method, provide information related to MSDs in the form of posters or providing specific material. Companies are also advised to add the expedition personnel to reduce the repetition of lifting activities.

Keywords: *Subjective complaints of MSDs, Work Attitudes, and Repetitive Activities*

Introduction

The Musculoskeletal System Disorders are one of the most common occupational diseases experienced

by workers. According to Tarwaka, Musculoskeletal disorder is a complaint in the part of the skeletal muscle that is felt by a person ranging from very mild to very painful complaints⁽¹⁾. MSDs are the biggest cause of absence in almost all parts of Europe⁽²⁾. According to the Labor Force Survey (LFS), the prevalence of musculoskeletal cases (MSDs) in the year 2016/2017 amounted to 507,000⁽³⁾.

NIOSH worker health chartbook of musculoskeletal cases (MSDs) shows that manufacturing industry ranks second after the service industry⁽⁴⁾. The manufacturing industry is an industry that converts raw materials into a

Corresponding author:

Y.Denny Ardyanto W,

Department of Occupational Health and Safety, Public Health Faculty, Airlangga University, Surabaya, East Java, Indonesia.

Email: denny.ardyanto@fkm.unair.ac.id

Telp. (+6281330061765)

product. In the manufacturing industry, there are many manual handling activities that can cause the emergence of MSDs subjective complaints. Evadariato found that the majority of manual handling workers as much as 73.34% in the rolling mill section experienced MSDs complaints⁽⁵⁾. Peter Vi in Tarwaka explained that the emergence of MSDs subjective complaints are influenced by several factors such as excessive muscle stretching, repetitive activity, unnatural work attitudes; secondary factors, the combination causes and individual factors⁽¹⁾.

PT. Kerta Rajasa Raya Sidoarjo, Indonesia, is one of the manufacturing industries concerned in producing packaging that still has a lot of manual handling activities such as lifting, pushing, moving, or pulling heavy loads. One division with the most lifting activities is the circular loom division. Workers of the circular loom division regularly lift as much as 40-160 baskets per day. The weight of each basket is 17 kg. In addition, the work attitudes in lifting activities are often unnatural.

Based on the explanation, it means that workers who carry out manual handling activities have the potential to experience MSDs subjective complaints. Therefore the researcher is interested in conducting research related to the analysis of the strong relationship between work attitudes and repetitive activities with subjective complaints of musculoskeletal disorder in the circular loom division workers of PT. Kerta Rajasa Raya Sidoarjo, Indonesia.

The purpose of this study is to analyze the strong relationship between work attitude and repetitive activity with subjective complaints of musculoskeletal disorder in circular loom division workers of PT. Kerta Rajasa Raya Sidoarjo, Indonesia.

Material and Method

The type of research was observational with a cross-sectional approach. The study population is 14 workers, with the inclusion criterias of workers aged ≥35 years, doing manual handling activities, and do not have a medical history of back pain, pain in the waist, sprains, and HNP (Hernia Nucleus Pulposus). The sample in this study is the total population.

Research variables are work attitudes, repetitive activities and subjective complaints of MSDs. The instruments used in the study are questionnaires, OWAS observation sheet (Ovako Working-Postur Analysis System), and NBM (Nordic Body Map) checklist sheets.

Analysis of the data used in this study is an analysis of the contingency coefficient for nominal scale data and correlation analysis of Spearman’s rho’sfor ordinal scale data. The relationship between the dependent and independent variables will be classified according to Sarwono (2006)⁽⁶⁾:

Tabel 1. Koefisien Kontingensi

| Contingency Value | Level of Relationship |
|-------------------|---|
| 0 | There Is No Correlation Between The Two Variables |
| >0,00 – 0,25 | Very Weak Correlation |
| >0,26 - 0,50 | Medium Correlation |
| >0,51 – 0,75 | Strong Correlation |
| >0.75 - 0.99 | Very Strong Correlation |
| 1 | Perfect Correlation |

Findings

The circular loom division has three job sections, namely the expedition section which lifts a basket weighing 17 kg as much as 100-160 times, then the operator section of the circular loom that must lift and move the basket weighing 17 kg which is done 30-50 times in a working day, and the maintenance section of the equipment that is responsible for checking and repairing the machine

Table 2. Distribution of Frequency of Severity of MSDs Subjective Complaints to Workers in the Circular Loom Division of PT Kerta Rajasa Raya Sidoarjo in 2019

| MSDs Complaints | Frequency | Percentage (%) |
|-----------------|-----------|----------------|
| Medium | 6 | 42,9 |
| High | 8 | 57,1 |
| Total | 14 | 100 |

The data above shows that all respondents experienced MSDs subjective complaints. As many as 57.1% experienced musculoskeletal subjective complaints with a high category and 42.9% of

respondents in the medium category.

Table 3. Frequency Distribution of Risk level of work attitude and repetitive activity in Workers of the Circular Loom Division of PT Kerta Rajasa Raya Sidoarjo in 2019

| Variable | Category | n | (%) |
|---------------------|-----------|---|------|
| work attitude | Medium | 3 | 21,4 |
| | High | 4 | 28,6 |
| | Very High | 7 | 50,0 |
| repetitive activity | 10 - <40 | 6 | 42,9 |
| | 40 - <200 | 8 | 57,1 |

Based on table 3, it was found that 50,0 % of workers in the circular loom division had a very high-risk work attitude. The most repetitive activities carried out are 40 - ≤ 200 times every working day or 8 hours with a percentage of 57.1%.

The results of the analysis carried out between work attitude variables with MSDs subjective complaints give the Spearman Correlation value of 0,876. So, it can be concluded that there is a very strong correlation between work attitudes and subjective complaints of MSDs. The relationship direction is positive, which means that the relationship goes in the same direction or the higher the risk level of the workers' attitude in doing their work, the higher the severity of subjective complaints of MSDs.

On analysis of repetitive activity variables, the closeness value of the relationship is 0.708 which is between the numbers 0.51-0.75. Thus, it can be interpreted that the relationship that occurs is strong. These values also provide information that the relationship between the variables of repetitive activity with subjective complaints of MSDs run in line for positive values. So that, the more repetitive lifting activities performed by workers in a day, then the severity of MSDs subjective complaints will also be higher.

Discussion

Musculoskeletal Disorders (MSDs) are a type of pain complaint that is felt in the skeletal muscle system. The pain is usually emerged in the joints, ligaments, or

tendons. Complaints in the musculoskeletal system are usually in the form of chronic complaints that are often felt sometime after the worker does his activities and often leaves traces or residues that continue to be felt the next day. MSDs can be caused or aggravated by various risk factors in the workplace such as work attitudes, repetitive activity, vibration, and temperature ⁽¹⁾.

Based on the results of research conducted at the circular loom division of PT. Kerta Rajasa Raya Sidoarjo, it was found that the majority of respondents experienced MSDs subjective complaints in the high category. All workers who experienced MSDs subjective complaints were operator workers and expedition workers who both carried out manual handling activities in the form of lifting baskets containing plastic thread rolls. The results of interviews conducted further found that the complaints felt by workers were spread almost throughout the body parts of workers. The location of complaints on the body felt by all workers respondents is the left and right shoulder, left and right upper arm, left and right forearm, and both legs.

Based on the results of the research and data processing of attitude variables with the OWAS method, it is known that all expedition workers have very high category of work attitudes whereas for the operator section 3 people have a medium risk, 4 people have a high risk, and 4 people have a very high risk. This is because the work of lifting in the expedition section is carried out with the body bent and twisted aside forming flexion. Moreover, the position of the hand when taking the basket is above shoulder height with a weight of 17 kg. So that, the value obtained by all expeditions is 4 (very high). This is different from the 3 operator workers who have a medium work attitude, even though the burden to be lifted is the same yet the lifting method is different. As many as 3 operators who have medium category of work attitudes are carrying out lifting activities without twisting their bodies so that for the back side get to point 2. Besides, the position of the two arms of the operator is also below the shoulder height so that his working attitude is in the medium category.

The results of the analysis get a very strong relationship between work attitude variables and MSDs subjective complaints experienced by workers. Therefore, the higher the risk of work attitude, MSDs subjective complaints will also increase. The results of interviews and observations were made found that all workers did not know about MSDs and work attitudes

matters. This was due to the education of workers who were mostly only up to high school. In addition, workers had never received information regarding good and correct work attitudes when doing work from the company. This research is in line with the research conducted by Purwosusilo (2015) which states that there is a significant relationship between work attitudes and subjective complaints of MSDs in traditional sand miners in Srumbung district, Magelang regency⁽⁷⁾.

Repetitive activity or repetitive movement is an activity carried out continuously⁽¹⁾. In the circular loom division of PT. Kerta Rajasa Raya Sidoarjo, the effect of repetitive activity is extremely felt in the expedition section. This is due to the expedition workers who are on average lifting 100-160 baskets daily. Expedition workers complain of pain in the shoulder, upper arm, forearm, calf, leg, and waist. The expedition section also did a basket arrangement on pallet truck as 5 tall stacks with a twisting body position that caused complaints on the workers' waist.

Muscles complaints can occur when the muscles receiving pressure due to lifting the load continuously without obtaining sufficient relaxation time⁽¹⁾. This theory is in line with the results of research which state that there is a strong correlation between repetitive activity variables and MSDs subjective complaints. hence, the higher number of repetitions carried out, the subjective complaints MSDs will also increase. This study is not in line with the research conducted by Purwosusilo (2015) in traditional sand miners in Srumbung district, Magelang regency, which states that there is no relationship between the frequency of swinging with complaints on upper limbs; or in other words, there is no relationship between repetitive activity and musculoskeletal disorders.⁽⁷⁾

Conclusion

Based on the explanation above, it can be concluded that:

1. The majority of respondents have subjective complaints of musculoskeletal disorder with high severity.
2. There is a very strong relationship between work attitude variables with subjective complaints of musculoskeletal disorder.
3. There is a strong relationship between repetitive

activity variables with subjective complaints of musculoskeletal disorder.

Recommendation

1. The company is advised to provide training regarding how to lift in the right position or attitude to reduce the risk of unnatural work attitudes.
2. The company is advised to provide information in the form of posters or work instruction procedures as a workers reminder related to the dangers of MSDs and safe lifting method to reduce the level of MSDs subjective complaints and risk of unnatural work attitude.
3. The company is advised to increase the number of expedition personnel by assisting operator section to reduce repetitive movements by expedition workers.

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