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Correlation between Age, Working Period and Working Posture with Musculoskeletal Complaints in Oil Palm Plantation Factory Workers at PT. X

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A R T I C L E I N F O

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A B S T R A C T

The purpose of this study was to determine the relationship between age, work period, and work posture with musculoskeletal complaints. This type of research is quantitative observational with a cross-sectional method, the study population is all workers in the production division of the oil palm plantations of PT. X totaled 35 workers, sampling was carried out using the total sample technique. Data collection methods used interviews and observation with the RULA (Rapid Upper Limb Assessment) instrument for assessing work posture and the Nordic Body Map questionnaire to assess the level of musculoskeletal complaints. Data analysis with chi-square test. The results showed that the proportion of Musculoskeletal Disorders Complaints (MSDs) showed there was a significant relationship between the age variable p-value: 0.000, work posture variable: 0.007 with musculoskeletal complaints while there was no significant relationship between years of service p-value: 0.176 and musculoskeletal complaints. There is a relationship between age and work posture with MSDs complaints. The need for education with good work posture in preventing MSDs complaint control

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INTRODUCTION

Indonesia is currently developing the industry is showing rapid development. One of the industries is oil palm plantations, it is stated that the plantation area is spread across 26 Indonesian Provinces of 16.38 million hectares. For Jambi Province in 2019 it reached 1.135 million hectares or around 6.9% of the total area. The large amount of growth is due, in part, to the ever-increasing market needs. To get maximum results in the palm oil industry, good human resources are needed in controlling potential risks of work-related accidents. One of the risk factors for work-related accidents is the work environment and will later affect productivity.

According to the International Labor Organization (2018), approximately 2.78 million workers die each year due to work-related accidents and diseases caused by their work, 2.4 million or 86.3 of these deaths are caused by diseases caused by their work and 380,000 or 13.7% of these deaths were caused by work-related accidents. Meanwhile, around 374 million workers experience non-fatal work accidents and this happens almost every year. As a result, the number of cases causes productivity at work to decrease.

According to the World Health Organization (2019), of all cases of illness caused by work, nearly 60 percent of these accidents originate from complaints of musculoskeletal disorders and cause nearly 49.9 percent of workers to experience absences from work, meanwhile, 60 percent cause workers to experience serious complaints. Thus affecting work productivity.

According to the International Labor Organization (2018) in Indonesia, the prevalence of musculoskeletal complaints shows that workers experience muscle injuries in the back (20%), back (40%), buttocks (20%), waist (40%), shoulders (20%), thighs (40%), knees (60%), neck (80%), and calves (80%)2. Data from Riskesdas (2018), states that the description of injuries that cause all types of daily activities to be disrupted is 9.2%, the proportion of body parts affected by injury is 32% in the upper limbs.

Data from Bereau of Labor (2015), states that musculoskeletal complaints caused by excessive workload amount to 365,000 cases or 32% of all work-related illnesses, according to him the number of complaints will continue to increase if companies provide excessive workloads without regard to work capacity.

According to data from the Labor Force Survey of Great Britain (2017), musculoskeletal complaints in recent years have ranked 2nd in cases with an average prevalence of 469,000 cases or 34.54% of all existing occupational diseases. Abdillah's research (2013), regarding the relationship between work posture and musculoskeletal complaints in porters, with the results of the analysis stating that 60% of respondents had work postures that were at level 4 and were at high risk of developing musculoskeletal complaints besides that as many as 75% of respondents felt complaints at the waist and shoulders.

Previous research in the palm oil industry by Margomgom, L (2019), stated that in the palm oil mill industry which has the highest percentage of accidents, namely in the pressing station section, as many as 12 cases or 42.5% have occurred in the last 10 years, these work accidents This is caused by

several factors, one of which is the work environment factor which results in workers and companies experiencing losses as a result of this work accident.

Palm Oil Plantation Company PT. X is a company engaged in oil palm plantations with a plantation area of 1,895 hectares and a production area of 829 hectares. In the production process, this company has 1 Palm Oil Mill which manages Fresh Fruit Signs (FFB) which are obtained from their own production and from local farmers to become palm oil products, namely Crude Palm Oil with a production processing capacity of 100 tons/day. In carrying out its production process, the company has a very high vision and efficiency and accuracy are the most focused in order to increase competitiveness in meeting market needs that exist throughout the world. This factory has 83 workers who are responsible for each production process, they work 42 hours in 1 week or 7-8 hours/day.

Improvements are needed to prevent occupational diseases, one of which is by improving in terms of human resources as factory workers and the design of the workplace by looking at the various factors that cause musculoskeletal complaints, therefore efforts are needed to improve occupational health and safety (K3) and also in increasing work productivity as included in Law No. 1 of 1970 concerning Occupational Safety with the aim that workers and everyone else who is in the workplace are always safe and healthy.

The importance of applying Ergonomics in the workplace aims to ensure that workers are always comfortable in carrying out their work activities, this can have a healthy, comfortable, safe, productive and prosperous impact on workers, but vice versa if the application of ergonomics in the workplace is carried out incorrectly, it can resulting in complaints because the position of workers is not good and can cause occupational diseases. A high level of ergonomic risk in carrying out work activities can cause health problems to workers, one of the health problems caused is musculoskeletal complaints.

Based on the above and the importance of knowing the factors related to musculoskeletal complaints in the workplace and traces researchers have never conducted research at that location, the researchers are interested in conducting research on the relationship between age, length of work and work posture with musculoskeletal complaints in coconut factory workers The palm oil processing division of PT. Palm Oil Plantation X Year 2021.

THEORETICAL REVIEW

According to the International Labor Organization (2018), approximately 2.78 million workers die each year due to work-related accidents and diseases caused by their work, 2.4 million or 86.3 of these deaths are caused by diseases caused by their work and 380,000 or 13.7% of these deaths were caused by work-related accidents. Meanwhile, around 374 million workers experience non-fatal work accidents and this happens almost every year. As a result, the number of cases causes productivity at work to decrease. According to the World Health Organization (2019), of all cases of illness caused by work, nearly 60 percent of these accidents originate from complaints of musculoskeletal disorders and cause nearly 49.9 percent of workers to experience absences from

work, meanwhile, 60 percent cause workers to experience serious complaints. Thus affecting work productivity.

METHODOLOGY

This type of research is quantitative observational with cross sectional design. The sample in this study is workers in the palm oil processing section. which amounted to 35 samples. The sampling technique is the total sample. Research conducted at PT. Oil palm plantation X time from January 2021 to March 2021. Collection by interview and observation. The instruments used were the Nordic Body Map Test MSD's questionnaire for and RULA for work postures, and checklists. The data analysis used was univariate and bivariate analysis with the Chi Square statistical test with SPSS software.

RESULTS AND DISCUSSION

The characteristics of the respondents which include Age, Mucoloskeletol Complaints, Work Period, Work attitude can be seen in Table 1 below.

Table 1. Description of Respondents' Characteristics

Variabel	N	%
Keluhan Musculoskeletal		
Rendah	8	22,9%
Sedang	15	42,9%
Tinggi	12	34,3%
Usia		
26 - 45 Tahun (Dewasa)	22	62,9%
46 – 65 Tahun (Lanjut Usia)	13	37,1%
Massa Kerja		
<20 Tahun	18	51,4%
≥20 Tahun	17	48,6%
Sikap Kerja		
Rendah (skor 1-2)	2	5,7%
Sedang (skor 3-4)	20	57,1%
Tinggi (skor 5-6)	6	17,1%
Sangat Tinggi (skor 7)	7	20%

Based on table 1. It was found that the most categories of musculoskeletal complaints experienced by workers were Moderate Complaints 15 (42.9%) categories, followed by 12 (34.3%) high categories of complaints and 8 (22.9%) low categories. The age variable found that the most age was in the 26-45 year old category with 22 (62.9%) the rest in the 46-65 year age category with 13 (37.1%). The working mass variable found that the highest working mass was in the <20 year old category with 18 (51.4%). The remaining ≥20 years of service category is 18 workers (48.6%).

For work posture variables, it was found that the most were 20 (57.1%) in the moderate risk Work Posture category (requires change). Followed by 7 (20%) very high-risk categories (Changes in Work Posture must be made), then 6 (17.1%) high categories (Changes in Work Posture are urgently needed), and 2 (5.7%) Low-Risk Work Posture (Acceptable).

To see the relationship between the variables age, Work Period, work posture and MSDS complaints, see table 2 below.

Table 2. Analysis of the Relationship between the Variables Age, Work Period and Work Posture with Musculoskeletal Complaints

Variabel	**Kategori Keluhan MSDs**						P value
	Rendah		Sedang		Tinggi		
	N	%	N	%	N	%	
Usia							
46 – 65 Tahun	1	7,7	0	0	12	92,3	*0,000*
26 - 45 Tahun	7	31,8	15	68,2	0	0	
Massa Kerja							
≥ 20 Tahun	7	20,6	3	8,6	4	11,4	*0,176*
< 20 Tahun	12	34,3	4	11,4	5	14,3	
Postur Kerja							
Risiko Rendah	1	50	1	50	0	0	
Risiko Sedang	6	30	12	60	2	10	0,007
Risiko Tinggi	1	16,7	1	16,7	4	66,7	
Risiko Sangat Tinggi	0	0	1	14,3	6	85,7	

Based on Table 2, shows that workers in the elderly category of 46-65 years tend to have MSDs complaints in the high category of 12 (92.3%) when compared to the adult age category of 26-45 years. The results of the statistical test with the Chi test obtained the results of a p-value = 0.000 where p <0.05 means that there is a significant relationship between age and musculoskeletal complaints in factory workers at PT. Palm Oil Plantation X Year 2021.

The length of service variable shows that those with less than 20 years of service receive more MSDs complaints in the Low category 12 (34.3%) and high category 5 (14.3%) when compared to the category of years of service > 20 years. The results of the statistical test using the Chi-square test obtained a p-value = 0.0176 where p> 0.05 means that there is no significant relationship between years of service and musculoskeletal complaints in factory workers at PT. Palm Oil Plantation X Year 2021.

The work posture variable shows that there are more workers in the very high-risk category 6 (85.7%) and high 4 (66.7%) when compared to the medium and low category work postures. Statistical test results with the Chis square test obtained p value = 0.007 where p <0.05 means that there is a significant relationship between work posture and musculoskeletal complaints in factory workers at PT. Nusantara Plantation VI business unit Tanjung Lebar in 2021.

Relationship between Age and Musculoskeletal Complaints

The results showed that there was a significant relationship between age and musculoskeletal complaints in factory workers at PT. Palm oil plantations X. In this study, the average age of workers was 44.2 years, the highest was 54 years, the lowest was 32 years, meaning that the age of the workers had passed the peak of their physical capacity, this condition was made clear from the statements of several factory workers who stated that they often experienced complaints at at

work, according to workers, complaints are felt as they get older, it's different when they are young, their physical strength when working is still maximum.

Most of the factory workers of PT. Palm oil plantations X are workers of mature age (62.9%) of workers of that age who experience more low musculoskeletal complaints than those who experience moderate musculoskeletal complaints, while older workers have more high complaints than low complaints. This shows the same results according to the theory, that musculoskelatal complaints are felt more by people of old age, however, it does not rule out the possibility for older workers to have musculoskelatal complaints because complaints can be influenced by many factors. Tarwaka (2008) in Helmina (2019), which states that age affects physical capacity in humans because it is inversely proportional to physical capacity, meaning that the older a person is, the less his physical capacity will decrease and at the age of 25 years is the peak. At the age of 50-60 years, sensory-motor abilities in humans have decreased by around 60%. And in this condition, human physical work ability at work still remains 50% compared to those who are 25 years old. It is this flexibility of the muscles and spine that is affected by physical conditions as you get older, so that musculoskeletal complaints will increase with age.

Relationship between Work Period and Musculoskeletal Complaints

The results showed that there was no relationship between work mass and musculoskeletal complaints in factory workers in the processing section of PT. Oil palm plantations X Year 2021. There is no significant relationship assumed to be due to other factors such as the adaptation process carried out on their work, this adaptation process aims to increase worker performance and reduce the tension felt because the average factory worker has a working life of 20.1 years so that the work adaptation process allows workers to adapt to their work environment, in this adaptation process not a few workers are able to manage work fatigue, take advantage of the break time to stretch muscles during work breaks.

The results of this study are in line with Suharyat (2015), there is no significant relationship between work mass and musculoskeletal complaints in workers, according to him no relationship is possible because workers are experienced at work so workers do not experience musculoskeletal complaints. In this adaptation process, not a few factory workers are able to manage fatigue quite well by doing a little stretching of the muscles or so-called stretching. Even though the duration of stretching can be said to be in a matter of a few minutes, if done repeatedly it can have an impact on reducing fatigue in the musculoskeletal system. Stretching is a way to minimize musculoskeletal complaints and is able to pressure workers to improve service quality, the working period in question is the accumulation of one's work activities carried out over a long period of time, if these activities are carried out continuously over a period of years, of course, this can lead to disturbances. on the body. Working period can cause continuous static load if workers do not pay attention to ergonomic factors, it can cause musculoskeletal disorders.

The results of this study are not by Tarwaka's theory (2004), which states that tenure is a risk factor for work accidents and can be related to musculoskeletal complaints experienced by workers, because this can occur due to workers often carrying out work activities that exceed working hours has been determined. Musculoskeletal complaints have a significant relationship with years of service because the longer a person works, the risk factor for complaints increases. Musculoskeletal complaints are complaints or disorders that take a long time to develop over time at work.

Relationship between Work Posture and Musculoskeletal Complaints

The results showed that there was a relationship between work posture and musculoskeletal complaints in factory workers at PT. Palm Oil Plantation PT. X Year 2021. Inappropriate work equipment and workstation design factors affect work posture and also musculoskeletal complaints. Inappropriate work posture will cause musculoskeletal complaints. In line with Santoso's opinion (2018), which states that work posture is an appropriate work process determined by the anatomy of the body, work equipment, and the size of the equipment used when carrying out work activities.

The working posture of factory workers at PT Perkebunan Sawit PT. X includes unnatural work postures. This can be seen from the working posture when operating factory machines with a continuous standing working posture and sometimes the body tilts slightly and tends to bend. Such a working attitude is the cause of complaints on the soles of the feet, back, waist, arms, shoulders, and calves. In a standing working position the leg muscles cannot relax, the muscles will hold the body's weight continuously and for a long time. Before the calculations were carried out, the activities of factory workers were observed by researchers to conclude how the positions, loads, and repetitive movements of the nurses. Then, the RULA score was determined through a calculation using the RULA score sheet by accumulating data taken from questionnaires related to musculoskeletal disorders, it was found that 12 workers who had a score or level of risk were experiencing moderate category musculoskeletal disorders. This can be caused by several factors, such as age, gender, length of service, and even position at work.

The results of Anggraini's research (2018), state that a working posture in a standing state requires more energy than a sitting posture, seeing the position of the legs while standing on the body's support so that blood piles and various other fluids can form in the legs, the work posture of workers factory is static because it is in a standing position for a long time and repeatedly.

CONCLUSIONS AND RECOMMENDATIONS

Musculoskeletal complaints felt by factory workers as much as 34.3%. There is a relationship between age and work posture variables with musculoskeletal complaints, companies need to provide information communication and education on the importance of knowing the impact of musculoskeletal and companies can evaluate workstation designs that are more ergonomic related to work posture and can reduce musculoskeletal complaints.

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