

# Relationship between Labor Factor and Work with Complaints Relations between Labor and Employment Factors with Complaints Musculoskeletal Disorders in Workers at the Cable Product Plan in PT. JJ-Lapp Cable SMI (Factory) Tangerang 2019

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**Abstract:** One of the occupational health and safety issues that are often experienced by workers is ergonomic. Musculoskeletal Disorder is one of them and very important because it is the biggest cause of working days lost due to injury. The purpose of this study was to analyze the relationship between Factor Labor and Employment with Musculoskeletal Disorders in workers at the Cable Product Plan in PT. JJ-Lapp Cable SMI (Factory) Tangerang in 2019. The study used a cross-sectional study design to assess the problem or situation. A total sampling technique with 60 workers. The results of this study stated 41.7% of 25 respondents at risk of MSDs complaint. The results of this study indicate that there is a relationship of age ( $p = 0.001$ ), Working period ( $p = 0.033$ ), Body mass index ( $p = 0.044$ ), duration ( $p = 0.003$ ), with symptoms of MSDs. To reduce the risk of MSDs complaint, it is advisable to add insight knowledge of ergonomics, doing stretching, and gymnastics at a certain time to relax the back muscles monitors the health of the workers on a regular basis of the activities of medical check-ups as well as to evaluate the program of the company concerned with health.

## 1 PRELIMINARY

Occupational safety and health issues are one of the world's problems. It has been widely known that the work wherever there is always a risk of occupational diseases (Kurniawidjaja, 2010). According to the ILO (2013) estimated 2.34 million people die annually due to occupational diseases and work-related accidents, most of the estimated 2.2 million died of various diseases of employment.

Occupational diseases (PAK), according to Presidential Decree No. 22 of 1993, is a disease caused by work or the working environment. Occupational diseases occur as risk factor exposure, chemical, biological, or psychological ergonomics in the workplace.

One of the occupational diseases is a musculoskeletal disorder, the musculoskeletal complaint is a complaint on the part of the skeletal muscles felt someone start complaints very mild to severe. If in this case the muscle receives a static load repeatedly

and for a long time, it can cause damage to muscles, nerves, tendons, joints, cartilage and disc invertebrates (Tarwaka, 2004). Musculoskeletal complaints often also called MSDs (Musculoskeletal Disorder), RSI (Repetitive Strain Injuries), CTD (Cumulative Trauma Disorders) Work-related Musculoskeletal Disorders (WMSDs), RMI (Repetitive Motion Injury) (Tarwaka, et al., 2004).

According to European agency for safety and health at work (2005) who conducted a survey in 12 countries in 2005 in Europe obtained the data contained 35.4% of workers suffering from musculoskeletal complaints, according to European Foundation for the Improvement of Living and Working (2007) who conducted a survey on 235 million workers in 31 countries of Europe and America in 2007, data on complaints Musculoskeletal disorder as much as 30%.

In Indonesia based on the results of a study Department of Health the profile of health problems in Indonesia in 2005, showed that about 40.5% of

illnesses suffered by workers in connection with his work. Health problems experienced workers, according to a study of 9482 workers in 12 counties or cities in Indonesia, mostly in the form of diseases of musculoskeletal disorders (16%). Musculoskeletal disorders could be influenced by several factors such as age, years, body mass index, smoking habits, workload, duration of action, and work posture. This is according to research conducted by Anggraini (2017); Zulfiquor (2010); Rahayu (2012); Handayani (2011); Marcilin (2018).

According to Pheasant (1991) The impact caused by Musculoskeletal Disorder on the economic aspects of the company that is the aspect that is the reduced production output, material damage, a product which eventually led to not meeting deadlines/targets production, unsatisfactory service, etc., fee arising from worker absenteeism to be led to a fall in profits, the cost of training new employees who replace workers who are sick, the cost to hire a consultant or agency, cost worker turnover (turnover) for the recruitment dan training, insurance costs, other costs (opportunity cost). Meanwhile, according to Bird and Germain (2005), Musculoskeletal Disorder can be an important issue for working time lost due to illness is generally caused by skeletal muscle diseases, Lowers labor productivity, handling high costs, is multicausal making it difficult to determine the proportion that is solely due to the employment relationship, Decline vigilance, and increasing the risk of accidents. PT. JJ-Lapp Cable SMI (Factory) Tangerang is a joint venture between Jebsen and Jessen (SEA), which provides cable technology in various industries engaged in manufacturing and production activities. Broadly speaking, there are several processes are carried out in producing the wiring in PT. JJ-Lapp Cable SMI (Factory) like activity of drawing is a process to reduce the size of raw material, bunching activity is the conductor twisting, stranding event is the process of combining multiple conductors, insulation activity is the process of giving an insulating material on the conductor, and others.

Units/sections in PT. JJ-Lapp Cable SMI (Factory) is divided into several parts, namely the production of CPP (Cable Product Plant), part of the production of CWP (Cable Wire Plan), Logistics, Quality & EHS, Engineering and Maintenance, Technical Management And Product Design Costing (PDC).

Based on clinical data in PT. JJ-Lapp Cable SMI (Factory) 44.35% recorded in the year 2018 with complaints of musculoskeletal disorders in workers. In the CPP (Cable Product Plan) amounted to 19.35%

MSDS complaint, the impact caused by musculoskeletal complaints is about 32 times the worker confirms their attendance for one year due to feeling the pain and other muscular complaints. With that based on the data and problem, researchers want to discuss the relationship between Factor Labor and Employment with complaints Musculoskeletal Disorders in workers at the Cable Product Plan in PT. JJ-Lapp Cable SMI (Factory) Tangerang 2019.

## 2 RESEARCH METHOD

This research uses a quantitative approach to aim to get an idea by studying the correlation or relationship between the independent variables of this dependent. this research using a cross-sectional design for this study data collection is done at the same time. The population in this study were workers at the Cable Product Plan with a sample size of 60 respondents. Sample calculations performed using two different formulas proportions. The sampling technique in this study using Non-Probability Sampling with the Total Random Sampling technique.

The collection of data that will be used resources in the form of primary data through interviews using a questionnaire for age, years, body mass index, and duration of action. Furthermore, the data were analyzed using univariate performed each variable, while bivariate analysis was done with a chi-square test using SPSS with a significance level of  $p = 0.05$  ( $CI = 95$ ).

## 3 RESULTS

The result showed that the variables of workers MSDs complaint The highest proportion of respondents who are not at risk ( $\leq 20$ ) as many as 35 people (58.3%), the lowest proportion of respondents who are at risk ( $> 20$ ) as many as 25 people (58.3%).

Results of research on variable age highest proportion of respondents who are not at risk ( $< 35$  years) by 31 (51.7%) and the lowest proportion of respondents who are at-risk age ( $\geq 35$  years) as many as 29 people (48.3%).

Results of research on variable working time gained the highest proportion of respondents who have a long working life ( $< 3$  years) as many as 40 people (66.7%) and the lowest proportion of respondents who have a past that is new work ( $\leq 3$  years) as many as 20 people (33.3%).

Table 1: An overview of each variable on the Cable Product Plan in PT. JJ-Lapp Cable SMI factory Tangerang 2019.

Variables	Frequency	Percentage (%)
Complaints MSDs (4 categories)		
Very High (63-84)	0	0.0
High (42-62)	1	1.7
Medium (21-41)	24	40.0
Low (0-20)	35	58.3
Complaints MSDs (2 categories)		
Risk of > 20	25	41.7
Not Risk ≤ 20	35	58.3
Age		
Risk of ≥ 35	29	48.3
Not at Risk < 35	31	51.7
Years of service		
Older > 3 years	40	66.7
New ≤ 3 years	20	33.3
Body mass index (4 categories)		
Obesity (> 30)	4	6.7
Obese (25-30)	20	33.3
Normal (18.5 to 25)	32	53.3
Petite (<18.5)	4	6.7
Body mass index (2 categories)		
Not Normal (<18.5 and > 25)	28	46.7
Normal (18.5 to 25)	32	53.3
Working Length		
Risky	31	51.7
Not at Risk	29	48.3

Results of research on the working duration variable obtained the highest proportion of respondents who are at-risk category of work duration (> 8 hours) 31 (51.7%), while the proportion was lowest for the duration of the respondents who are not at risk category (≤ 8 hours) as much as 29 people (48.3%).

## 4 DISCUSSION

### 4.1 Age

Based on the survey results revealed there is a relationship between the age of workers with MSDs complaint. This study is in line with research Angraini (2017) which explains that there is a relationship between age and Disorders Musculo-

skeletal Disorders (MSDs). Then supported research Hendra & Rahardjo (2009) workers aged 35 years or older has 2,556 times greater risk for experiencing MSDs than workers with less than 35 years of age. In line with the research of Septiani (2017) that there is a significant relationship between age with symptoms of MSDs. Osborne (1995) explained that the skeletal muscle complaints usually experienced person at working age is 24-65 years old and the first complaint commonly experienced at the age of 35 years and the rate of complaints will increase with age.

Based on the research of Guo et al. in Bridger, 1995 said that at the age of 35, a person's first episode will experience back pain, it may be because at the age of 35 years a process of degeneration and tissue damage that cause reduced muscle and joint stability.

Table 2: Proportion of workers with MSDs complaint Independent variables Cable Product Plan section PT. JJ-Lapp Cable SMI factory Tangerang 2019.

Variables	Complaints MSDs				Total		P-Value	OR (95% CI)
	Risky		Not at Risky					
	N	%	N	%	N	%		
Age								
Risk ≥35 years	19	65.5	10	34.5	29	100.0	0.001	3.385 (1,574 – 7,278)
No risk <35 years	6	19.4	25	80.6	31	100.0		
Years of service								
Older <3 years	21	52.5	19	47.5	40	100.0	0.033	2.625 (1,041-6,618)
New ≤3 years	4	20.0	16	80.0	20	100.0		
Body mass index								
Abnormal	16	57.2	12	42.9	28	100.0	0.044	2.032 (1,071-3,853)
Normal	9	28.1	23	71.9	32	100.0		
Working Length								
Risk of >8 hours	19	61.3	12	38.7	31	100.0	0.003	2.962 (1,378-6,370)
Less risky ≤8 hours	6	20.7	23	79.3	29	100.0		

Increasing the age of the person, the higher the risk of a decrease in the elasticity of the bone or musculoskeletal abnormalities disorder. From the observation Workers at PT. JJ-Lapp cable SMI factory found more workers at a young age is not affected by MSDs, this is caused because of workers at young age is a fresh graduate and he was very productive, while workers with old age/risk will experience a decline in physiological function, the inner function, and physical (Hurlock, 1994 and Hellyanti, 2009).

#### 4.2 Years of Service

Based on the survey results revealed a significant correlation between work period workers with MSDs complaint. This is in line with research Zulfiqor (2010), Handayani (2011), Amalia (2010) and Rahman (2017) stating that there is a significant correlation between working period with symptoms of MSDs. Research conducted by Rihimaki et al (1989) in Tarwaka (2004) explains that the work period has a strong relationship with muscle complaints. Cohen et al (1997) revealed that the disruption of illness or injury on the system MSDS rarely occurs directly but rather an accumulation of collisions of small and large continuously and in a relatively long time, the longer

service life of someone, can lead to saturation of the muscles and bones endurance physically and psychically. Thus, the accumulation of injuries from such long tenure has an important role to cause MSDs. Based on the observation that workers in the cable product plan have an average service life long and MSDs occur with long periods, during the work-injury has occurred accumulation of minor injuries which have been considered by the worker is trivial.

#### 4.3 Body Mass Index

Based on the results the research there is a significant relationship between body mass index MSDS. research workers with complaints are in line with research Rahayu (2012) stating that there is a relationship between nutritional status (BMI) with symptoms of musculoskeletal disorder. Condition one's body is too fat to be increasingly at risk for musculoskeletal complaints. A person with overweight will strive to support the weight of the front of the lower back muscles contracting. If the condition persists continuously, there will be an emphasis on cushioning the spinal cord that causes spinal disc herniation (Tan HC and Horn SE. 1998). Tarwaka (2011) says that the complaint related to the musculoskeletal system of the human body size is more due to equilibrium conditions in the frame

structure to receive the load, either the heavy burden of the human body itself, as well as other additional loads. Based on observations PT. JJ-Lapp Cable factory SMI no associated program to establish the worker's body with a normal body mass index and workers admitted many workers are seeing eat haphazardly and do not move/exercise outside of working hours.

#### 4.4 Duration of Action

Based on the survey results revealed that there is a significant relationship between the duration of the complaint MSDS. This study is in line with research Angraini (2017) and Maula et al (2017) which states there is a relationship between the duration of action with Disorders Musculoskeletal Disorders (MSDs) According to humantech (1995) work that uses the same muscles for a long duration may increase the potential for fatigue and cause MSDs when a rest/recovery is not sufficient. The longer the duration of doing the job is at risk then the time required for recovery (the recovery) will also be longer.

PT. JJ-Lapp Cable SMI factory in the past 2 years several workers doing part Cable Product Plan 2-hour shift job entry 6:45 am and return 19:15 the night with a duration of working time of 11 hours and 30 minutes with a break of only 30 minutes, for a worker with 3 shift workers; 1 entry-hour shifts 06:45-15:

15 Shift 2 entrance hours 15: 15-23: 15, entrance-hour shift 3 23: 15-07: 15, on the second shift workers this happens because the production targets every month settlement increased and supported by many of its orders or requests of customers in the purchase of cable.

## 5 CONCLUSIONS

The results of this study showed there is a relationship between age, years, body mass index, and duration of action with MSDs to workers complaints Cable Product Plan Section in PT. JJ-Lapp Cable SMI factory in 2019.

## 6 SUGGESTIONS

To reduce the complaints of MSDs to workers at the Cable Product Plan in PT JJ- Lapp Cable SMI 2019 the factory Tangerang Companies need to evaluate

health programs talk to run optimally, Creating a new program in the form of stretching time, Enabling morning exercise program every 1-2 weeks and start doing the job rotation system, The enterprises should pay more attention to workers at risk to do a special inspection on the activities of medical check-up and examination of blood sugar levels for workers. Our need to add shifts to three shifts for workers who perform two shifts in a day and add breaks to workers and company needs regard to work with manual handling (Scrapping) to replace the process or stages of work by using tools/machines.

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