

Effect of Age, Work Period, and Work Duration on Musculoskeletal Disorders in Laundry Workers

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Abstract—Ergonomics is one of the factors that can provide comfort and safety for workers who are then able to increase company productivity. Neglecting ergonomic factors can cause the risk of Musculoskeletal Disorders (MsDs) that can damage tissues such as muscles, nerves, tendons, joints and cartilage. Based on the prevalence of musculoskeletal disease in Indonesia, obtained data show as much as 11.9% are fishermen, farmers while 31.2% are labourers, including laundry workers. This study aimed to investigate the effect of age, work period and duration of work on Musculoskeletal Disorders (MsDs) in laundry workers. This study is observational analytic with a cross-sectional approach. This work was conducted in February to March 2019 in sub-District of Tembalang, Semarang City, Indonesia, with a total sample of 43 respondents. Data was collected using a questionnaire about the characteristics of respondents and Nordic Body Map. Data were analyzed using the Kruskal-Wallis test. There was no influence of age, work period and duration of work on Musculoskeletal Disorders (MsDs) with values of 0.531, 0.385 and 0.660 respectively; and 4) Conclusion: There is no effect of age, work period and duration of work on musculoskeletal disorders (MsDs) in laundry workers.

Keywords: OSH, Musculoskeletal Disorders, laundry

I. INTRODUCTION

Occupational Safety and Health (OSH) is an activity that aims to guarantee and protect the health and safety of workers to prevent work-related accidents. OSH functions so that the workforce can carry out tasks properly, safely and comfortably so that the productivity of a job can be stable or even increase. One of the factors assessed on OSH is ergonomic factor. The ergonomics factor assesses the work environment, work equipment, and labor. A job that does not consider ergonomic factors will potentially cause complaints of musculoskeletal disorders (MsDs) [1].

Based on data from the International Labor Organization in 2013 [1], it was found that deaths from accidents and work-related diseases amounted to 2 million cases every year (International Labour Organization, Keselamatan dan Kesehatan Kerja, 2013), and based on the prevalence of musculoskeletal disease in Indonesia, data was obtained as much as 11.9% are work based on for fishermen, farmers

while 31.2% of it are labourers, including laundry workers [2].

Pratama and Dimas [3] have reported that the complaints felt by workers due to non-ergonomic work positions mostly have moderate Musculoskeletal Disorders (MsDs) complaints of 53%. Other studies [4] also reported that there was a relationship between age and posture with complaints of musculoskeletal disorders, while gender, work period, duration and repetitive movements did not have a significant relationship. In terms of no relationship between duration and musculoskeletal disorders, Pratiwi's study also confirmed it [5].

The objective of this study was to determine the effect of age, work period and duration of work on Musculoskeletal Disorders (MsDs) in laundry workers.

II. METHOD

This is descriptive - analytical study with a cross-sectional approach. This work was carried out from February to March 2019 in Tembalang sub-District, Semarang City, Indonesia. Sampling is determined according to the inclusion and exclusion criteria. The inclusion criteria includes (i) laundry workers who were willing to become respondents, (ii) no history of MsD disorders before working as laundry workers, (iii) age of respondents were 20 - 55 years old. The exclusion criteria were laundry workers suffering from MsDs such as CTS, LBP, Tennis elbow, and Thoracic Outlet Syndrome. The samples studied were 43 respondents and the Lemeshow formula was used to determine their size. Data on individual characteristics and Nordic Body Map of respondents were collected through questionnaires. The collected data were analyzed using univariate and bivariate analysis with the Kruskal-Wallis test.

III. RESULTS

Data on respondents who have complaints on parts of their body are presented in Fig. 1. It is clearly shown that laundry workers complained of discomfort in his body; at the top and bottom of the neck is 85%, for back is 70%, and for back waist is 60%. For other body parts are 15% for the wrist, 10% for the left foot and left shoulder, 7% for the right elbow, and 5% for the right knee.

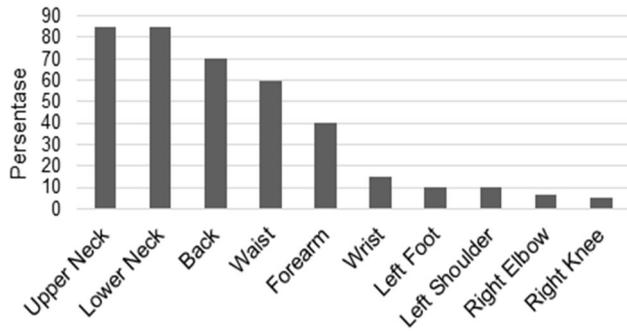


Fig. 1. Distribution of Complained Body Parts

TABLE I. OVERVIEW OF MUSCULOSKELETAL DISORDERS COMPLAINTS

Complaints	Amount of respondents	%
Very Severe	0	0
Severe	0	0
Mild	43	100

The characteristics of workers are shown in Fig. 2. Figure 2a shows that the age of laundry workers are between 20 and 25 years old is 18%, between 26 and 30 is 9%, between 31 and 35 years old is 13%, between 36 and 40 years old is 32%, between 41 and 45 years old is 11%, between 46 and 50 years old is 9%, and only 4% are over 50 years old. In the work period, most of them (50%) are workers with a work period of less than 1 year. However, there are 5% of workers who have a working period of more than 5 years (see Fig. 2b).

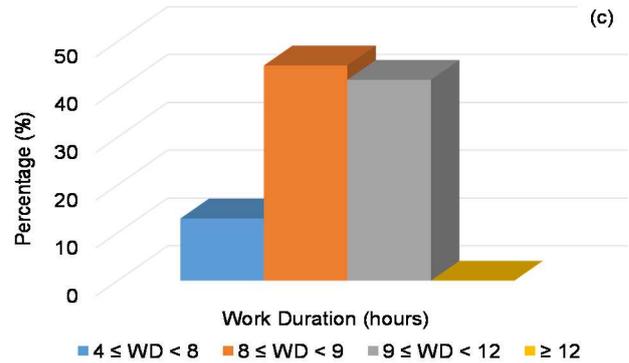
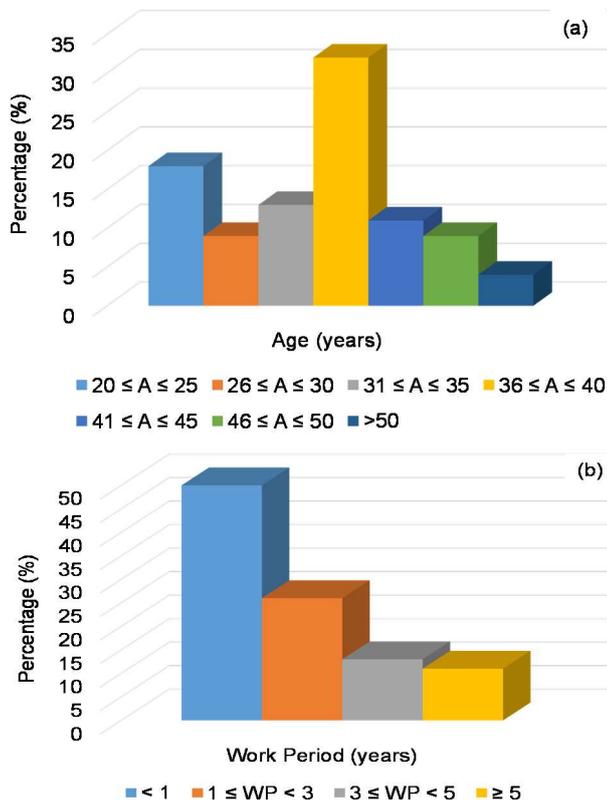


Fig. 2. Characteristics of Respondents

In the duration of work (WD) variable, the percentage of workers who work with a duration of $8 \leq WD < 9$ hours is not much different from workers who work with a duration of $9 \leq WD < 12$ hours. There were no respondents who worked for 12 hours or longer. Kruskal-Wallis Test results are presented in Table 2. Bivariate analysis as shown in Table 2 shows p values for variables of age, work period, and work duration are 0.531, 0.385 and 0.660, respectively. Those three variables have a value of $p > 0.05$. This means that age, work period, and work duration do not affect the Musculoskeletal Disorder (MsDs) of laundry workers.

TABLE II. KRUSKAL-WALLIS TEST

Variable	df	Asymp. Sig.
Age	6	0,531
Work Period	3	0,385
Work Duration	2	0,660

IV. DISCUSSION

The results of the study showed that 43 respondents experienced mild Musculoskeletal Disorders (MsDs) complaints and the most complained parts of the body including the upper and lower neck and back. According to one study, sitting position while working puts pressure on the back [6]. If the sitting position is not ergonomic and too long, it can cause contractions of the back muscles causing pain [7].

A. Effects of Age on Musculoskeletal Disorders (MsDs)

In this study, the age factor had no significant association with complaints of Musculoskeletal Disorders (MsDs) with a p-value of 0.531 ($p > 0.05$). Other studies suggest that there is no association between age and complaints of Musculoskeletal Disorders (MsDs) [8]. Another study also stated that there was no relationship between age and MsDs with a p-value of 0.683 [9]. It is possible that there is no significant relationship because if in theory, at >30 years of age, bone degeneration will begin, making it easier for complaints of MsDs to arise. However, in this study, the age of <30 also experienced complaints of MsDs so that in this study the results were not significant. According to Stanton, <30 years of age can also complain of Musculoskeletal Disorders (MsDs). This is due to work before becoming a laundry worker who does the work of using excessive muscle, repetitive work positions and movements [10].

Research conducted by Sari [11] showed that there was a relationship between age and complaints of Musculoskeletal Disorders (MsDs) with a p-value of 0.005. In addition, muscle strength decrease is also due to decreased muscle fibers at the age above 25 years, but if the size of large muscles will be relatively the same. [11].

B. Effect of Work Period on Musculoskeletal Disorders (MsDs)

It was shown that there was no relationship between work period with Musculoskeletal Disorders (MsDs) with a p-value of 0.385 ($p > 0.05$). This study's result is the same with the work conducted by Manengkey [12] that there was no relationship between work periods with Musculoskeletal Disorders (MsDs). Another research also states that there is no significant relationship between a work period and complaints of MsDs [13]. The work conducted by Novianti [14] also shows that there is no relationship between work period factors with Musculoskeletal Disorders (MsDs) with a value of $p > 0.05$ [14]. Other studies also show that there is no significant relationship between years of service and complaints of MsDs with a p-value of 0.434. This is probably due to the lack of time to work in a laundry place and adaptation in the workplace. Good adaptation will have a good impact, such as reducing tension and increasing work productivity [15]. In addition, laundry workers are also given a break time by the laundry owner on average 30 minutes to 1 hour so that they can do a little stretching of the muscles. In the research conducted by Yanti and Muliawan, it was shown that many sun sellers in Bandung who had recently been engaged in their jobs experienced disorders of Musculoskeletal Disorders (MsDs). This is due to a lack of work experience and is not familiar with the conditions faced at this time [16]. Work period is also influenced by the workload produced. The workload in question is work activities carried out during working hours. If you have been working for a long time but the workload is small (such as the lack of ironing and washing), musculoskeletal complaints will not appear

C. Effect of duration of work on Musculoskeletal Disorders (MsDs)

There was no relationship between duration of work with Musculoskeletal Disorders (MsDs) with a p-value of 0.660 ($p > 0.05$). This is in line with the work by Randang [17] which shows that there is no relationship between the work duration with MsDs [17]. Another study also showed that there was no association between work duration with MsDs [18]. Other studies also show that long working factors have no effect on musculoskeletal complaints [19]. This is because many laundry workers have more rest time than work, and also laundry workers do not have other activities except work in a laundry place. According to Tarwaka [19], the probable cause is that there is no relationship between the duration of the musculoskeletal complaint and the condition of a comfortable work environment by having a seat to rest and having a normal temperature because high temperatures can cause work stress. The more time to rest, the less exposure that gives the body weight and this is the same as short breaks, but often and more effective than long breaks but rarely [20]. Duration of work affects a person's physical; and work that requires strong physical will cause muscle complaints. On the job of laundry, laundry workers

also need a strong physical because they have to move their limbs often, but if the laundry worker does not do the work more than the provisions and during work does not do heavy work then muscle complaints do not arise.

V. CONCLUSION

Investigations of the effect of age, work period, and work duration toward musculoskeletal disorders (MsDs) on laundry workers have been carried out. It can be concluded that there is no effect of age, work period and work duration work toward Musculoskeletal Disorders (MsDs) in laundry workers with p-value of 0.531, 0.385 and 0.660, respectively.

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