e-ISSN 2985-4156
JOURNAL OF INTERNATIONAL PUBLIC HEALTH

The Relationship Between Workload And The Incidence Of Musculoskeletal Disorders In Textile Industry Workers In West Java

Budi Prasetyo [1]
[1] Poltekes Tanjung Karang

Corresponding Author:
budi@gnail.com

ARTICLE HISTORY
Received[22 November 2023]
Revised[26 December 2023]
Accepted[30 December 2023]

Keywords :
Workload, Cardiovascular LoaD, Musculoskeletal, Disorders.

ABSTRACT

Musculoskeletal disorders are occupational diseases that are often suffered by workers. Symptoms can include pain, swelling and even numbness. Cardiopulmonary endurance also plays an important role in the occurrence of musculoskeletal disorders. The heavier a job, the more oxygen the body needs to oxidize and the more blood flow carries oxygen. In people with heavy workloads, the heart's pumping activity changes, so that when the person works, oxygen transport to the muscles is disrupted. Objectives: The purpose of this study was to determine the relationship between workload and musculoskeletal complaints in workers at PT. Kerta Rajasa Raya Sidoarjo. Design: The research design used a cross-sectional approach. The number of samples obtained was 43 respondents in 2 work divisions, namely the extruder division and ABM. Respondents' workload was measured based on cardiovascular load (CVL) and musculoskeletal complaints were measured using the Nordic Body Map (NBM). Results: The results of the Pearson correlation test, obtained a p value = 0.002 where p <0.05. From the results of the statistical test, it was stated that there is a positive relationship between workload and musculoskeletal complaints. Conclusions: Based on the results of the study, it is recommended that companies reduce the workload so that it can reduce the occurrence of musculoskeletal disorders.

INTRODUCTION

Musculoskeletal disorders are closely related to physical hazards in the workplace, such as extreme room temperatures, vibrations, static postures, excessive use of force, high repetitions and unnatural work postures. Workload and stress as well as other psychosocial factors are also factors that increase the occurrence of these disorders (Kroemer, 2001). Cardiovascular endurance also plays an important role in the occurrence of musculoskeletal disorders. Cardiovascular endurance is the ability to continuously undergo physical work that involves a large number of muscles in a certain time which is the ability of the circulatory system and respiratory system to adapt to the effects of all physical work (Bridger, 2003). Many studies have been conducted on musculoskeletal disorders. Several risk factors that can cause MSD complaints include work factors, environmental factors and individual factors. In a study conducted by Setyowati, et al. (2017), 87.2% of porter workers at the Ferry port with a high workload experienced musculoskeletal disorders. Meanwhile, workers with a low workload who experienced musculoskeletal disorders were only 63%. This indicates that there is a relationship between workload and the emergence of musculoskeletal problems. According to Tarwaka (2004), musculoskeletal disorders are complaints in the skeletal muscle parts felt by a person ranging from very mild complaints to very painful. If the muscles receive static loads repeatedly and for a long time, it can cause complaints in the form of damage to joints, ligaments and tendons. Musculoskeletal disorders are disorders of the soft tissue in the musculoskeletal system which includes muscles, joints, tendons, ligaments and nerves that occur due to activities over a certain period of time.

Often when a body part is moved excessively (overused), the body will give a warning, such as the emergence of local fatigue or discomfort. Although these manifestations seem harmless, they are early indicators of a more serious injury. Winter et. al. (2007) stated that the symptoms that appear include pain, tingling, numbness, swelling, inflammation, stiffness, cramps and decreased range of motion of the joints. To determine the occurrence of musculoskeletal disorders, the Nordic Body Map (NBM) can be used. NBM is very subjective because it is based on the perception of individuals who experience musculoskeletal disorders.

The existing data is used to show the specific part of the body that is experiencing disorders by using a body map image that has been divided into several segments. PT. Kerta Rajasa Raya is one of the companies engaged in the production of sacks. The raw material used in the production process is plastic ore. In its production process, PT. Kerta Rajasa Raya implements a work shift system. Although in its production process, this company has used many machines, the role of humans is still very important, including as operators. The activities of these operators are very likely to cause musculoskeletal disorders. Based on an initial survey conducted by researchers, 14 out of

15 respondents admitted to having experienced musculoskeletal disorders while working at PT Kerta Rajasa Raya Sidoarjo. This can be caused by various problems in the production process. Among them are excessive workload and non-ergonomic work attitudes and the fitness conditions of the workers themselves. The high workload is characterized by, among others, decreased concentration levels, fatigue and stress. Static and monotonous work attitudes result in excessive work of certain muscles. Meanwhile, the level of fitness of workers can affect muscle endurance while working.

RESEARCH METHODS

The research design used in this study is analytical correlation using a cross-sectional approach. The study population was 48 people from the extruder division and the ABM division. The samples obtained were 18 people from the extruder division and 25 people from the ABM division. Data collection techniques with complaints of musculoskeletal disorders using the Nordic body map questionnaire and workload measurements based on cardiovascular load (CVL).

RESULTS AND DISCUSSION

The results of the study on workers in the cutting section of the Shoe Factory in Nganjuk, found that 62.2% of workers experienced mild subjective MSDs complaints and 13.5% experienced moderate subjective MSDs complaints. The majority of workers who experienced musculoskeletal complaints were Operator workers because the operator's work was done in a standing position and there was a repetition of work, namely 12 times per minute, so there was a risk of experiencing muscle fatigue which could cause MSDs complaints for workers.

The results of further interviews, complaints were felt in several parts of the body such as the legs, arms, waist and neck. Of the several parts of the body, the location of the complaints felt by the respondents the most was in the legs because all respondents worked in a standing position. The standing position is often done with a position that is not perfectly straight, sometimes bent flexed to balance when pulling and pushing the work platform. Based on the opinion of Darlis (2009) in Zakaria (2016), work with a standing work position can cause the feet to become the support of body weight. If the work is done for a long period of time, it can cause leg cramps, aches and pains, swelling, varicose veins, general muscle weakness, back pain, and neck and shoulder stiffness. Tarwaka (2010) stated that MSDs are not a clinical diagnosis but rather a label for the perception of pain or pain in the musculoskeletal system, as well as MSDs complaints in this study are highly dependent on the subjectivity of the perception of pain experienced by workers. Supported by Zakaria (2016) who stated that 9 out of 10 people consider themselves to be in good health, but it turns out that 1 in 4 people suffer from chronic diseases. In line with this, this study also resulted in researchers being able to assume that there was a possibility that respondents experienced MSDs complaints but stated that there were no complaints.

Thus, the data obtained by researchers is highly dependent on the perception of complaints felt by respondents, so that in writing the researcher added the word subjective in MSDs complaints felt by workers. The results of the test of the relationship between physical workload and subjective musculoskeletal complaints showed that there was a fairly strong relationship as evidenced by the contingency coefficient value of 0.452. The results of this study are in accordance with the research conducted by Evadarianto (2016) which showed that there was a very strong relationship between physical workload and Musculoskeletal Disorders (MSDs) complaints. The severity of a worker's workload can determine how long a worker performs their work activities according to their ability or work capacity. So in other words, the heavier the workload, the shorter the person's working time to work without significant fatigue and physiological disorders or vice versa (Evadarianto, 2016). In line with this study, Rodahl et al (1989) quoted from Tarwaka (2010) stated that physical tasks related to spatial layout, work facilities, workload conditions, lifting methods and others affect a person's fatigue, the accumulation of this physical workload can cause muscles to contract more and result in musculoskeletal complaints. Workload is the amount of physical, mental and social work done by a worker in the workplace.

Heavy workload can cause MSDs complaints. The work of street sweepers in Medan Johor District is included in the category of not too heavy, but the movements that street sweepers in Medan Johor District do repeatedly, no holidays and the distance traveled for sweeping are triggers for workers to experience MSDs complaints. MSDs complaints that occur in street sweepers in Medan Johor District are caused by workload, because work activities are carried out dynamically and continuously. The measurement results in table 6 are P-value = 0.000 <0.05 which indicates a correlation between workload and MSDs complaints in street sweepers in Medan Johor District. This

is in line with Sondi's research (2020) which found a significant correlation between workload and MSDs complaints in cleaning staff at Sibuhuan Regional Hospital, Padang Lawas Regency with a P-value = 0.000 or p-value <0.05.

The results of the study were also supported by Sharon, et al. (2018) on pottery craftsmen in Pulutan Village, Ramboken District, Minahasa Regency who found that there was a significant correlation between workload and MSDs complaints with a p-value = 0.000. Dhiemas's research (2018) in his research also found a relationship between workload and MSDs complaints in porters at Pasar Gede Surakarta using the Spearman rank test with a p-value = 0.019 or p value <0.05. Primalia's research (2018) with the title of the relationship between physical workload and MSDs complaints of cutting workers in shoe factories in Nganjuk, found a relationship between workload and MSDs complaints with a p-value of 0.009 or p <0.05. And research conducted by Tri Niswati, et al. (2022) revealed that there are several factors related to MSDs complaints, namely length of service (0.049), work attitude (0.000) and smoking habits (0.034). The results of previous studies stated that workload is significantly related to MSDs complaints, with heavy workloads causing higher levels of MSDs complaints.

CONCLUSIONS AND RECOMMENDATIONS

Physical workload has a significant relationship with musculoskeletal disorders complaints felt by workers. In other words, the heavier the workload will increase the severity of musculoskeletal disorders complaints felt by workers. Companies can provide seating for workers so that workers can take a break to stretch their muscles and provide time to stretch their muscles every 2 hours of work for 5-10 minutes along with playing work music to relieve worker boredom.

REFERENCES

Mangkunegara. A. A Prabu. 2004. Manajemen Sumber Daya Manusia. Bandung: PT Remaja Rosda Karya

Y. Chung et al., “Risk of musculoskeletal disorders among Taiwanese nurses cohort : a Nationwide population-based study BMC Musculoskeletal Disorders,” vol. 14, no. 144, 2013.

M. I. Sari, “Hubungan Postur Kerja dan Faktor Individu Dengan Keluhan Musculoskeletal Disorders Pada Pekerja Nelayan Di Desa Nenassiam Kecamatan Medang Deras. (Skripsi Fakultas Kesehatan Masyarakat, Universitas Islam Negeri Sumatera Utara),” 2020.

Tarwaka, Dasar-dasar Pengetahuan Ergonomi Dan Aplikasi di Tempat Kerja. Ergonomi Industri. Harapan Press Solo. 2015.

S. Alhamda and Y. Sriani, Bukuajar kesehatan masyarakat. Jakarta: Depublish. 2015.

ILO, “Menuju Budaya Pencegahan Keselamatan dan Kesehatan Kerja yang Lebih Kuat di Indonesia.,” 2018.

S. M. Hasibuan, “Hubungan Beban Kerja dengan Keluhan Musculoskeletal Disorders Pada Petugas Kebersihan Di RSUD Sibuhuan Kabupaten Padang Lawas. (Skripsi Fakultas Kesehatan Masyarakat, Universitas Islam Negeri Sumatera Utara),” 2020.

S. G. Patricya Kattang, P. A. T. Kawatu, and A. A. T. Tucunan, “Hubungan Antara Masa Kerja dan Beban Kerja Dengan Keluhan Muskuloskeletal Pada Pengerajin Gerabah di Desa Pulutan Kecamatan Remboken Kabupaten Minahasa. (Fakultas Kesehatan Masyarakat, UNSRAT),” Kesehetan Masy., vol. 7, no. 4, 2018.

D. Mahardika, “Hubungan Beban kerja Dengan Keluhan Muskuloskeletal Pada Kuli Panggul di Pasar Gede Surakarta. (Skripsi Fakultas Kesehatan Masyarakat, Universitas Muhammadiyah Surakarta),” 2018.

P. S. Putri and (Universitas Airlangga), “Hubungan Beban Kerja Fisik Dengan Keluhan Musculoskeletal Disorders Pada Pekerja Di Pabrik Sepatu di Nganjuk.,” vol. 4, 2019.

.T. N. Utami and D. L. N. Nasution, “Faktor-faktor yang Mempengaruhi Keluhan Musculoskeletal Disorders (MSDs) Pekerja Pengaduk Dodol di Kabupaten Langkat. (Universitas Islam Negeri Sumatera Utara),” Kesehatan, vol. 13, no. 2, 2022.

Chairana, Fadilla Nela. 2015. Analisis Faktor Risiko Gangguan Musculoskeletal pada Pekerja Shift Pagi Assembling 1 Di PT. X Sunter Assembly Plant Jakarta Utara. Jurnal Kesehatan Masyarakat . Universitas Diponegoro vol. 03 no.03 pp. 410-418

Departemen Kesehatan RI. 2003. Indikator Indonesia Sehat 2010 dan Pedoman Penetapan Indikator Provinsi Sehat dan Kabupaten/Kota Sehat. Jakarta.

Evadarianto, Nurdian. 2017. Postur Kerja dan Beban Kerja Fisik dengan Kejadian Keluhan Musculoskeletal Disorders (MSDs) pada Pekerja Bagian Rolling Mill di PT. Ispat Indo Sidoarjo. Skripsi. Fakultas Kesehatan Masyarakat Universitas Airlangga

Kroemer, K. H. E, E. Grandjean. 1997. Fitting The Task To The Human: A Textbook of Occupational Ergonomics, Fifth edition. London: Taylor and Francis e-Library

Laksana, Dian Puspitaningtyas. 2015. Faktor-Faktor yang Berhubungan dengan Keluhan Musculoskeletal Disorders (MSDs) pada Kuli Angkut Kayu Tahun 2015 (Studi di Perusahaan Kayu PT X, Lumajang). Skripsi. Fakultas Kesehatan Masyarakat Universitas Airlangga Lestari, Kinanti. 2016. Hubungan Karakteristik Individu Dan Stasiun Kerja dengan Keluhan Subyektiif Musculoskeletal (Studi pada Pekrja Di PT. PLN-APD Jawa Timur). Skripsi. Fakultas Kesehatan Masyarakat Universitas Airlangga