ERGONOMIC RISK LEVEL AND MUSCULOSKELETAL COMPLAINTS DISORDERS (MSDS) IN GALLON SHUTTERS IN THE QUALITY AREA OF QUEEN AGUNG BENGKULU CITY

by Sri Mulyati

Submission date: 31-Mar-2023 11:13AM (UTC+0700)
Submission ID: 2051715332
File name: FILE_ASLI_T_4.pdf (138.43K)
Word count: 3954
Character count: 20368

JNPH

Volume 10 No. 1 (April 2022)

ERGONOMIC RISK LEVEL AND MUSCULOSKELETAL COMPLAINTS DISORDERS (MSDS) IN GALLON SHUTTERS IN THE QUALITY AREA OF QUEEN AGUNG BENGKULU CITY

SRI MULYATI, APLINA KARTIKA SARI
BENGKULU HEALTH POLYTECHNIC MINISTRY OF HEALTH,
DIII SANITATION STUDY PROGRAM DEPARTMENT OF ENVIRONMENTAL HEALTH
INDRAGIRI STREET NO. 3 PADANG HARAPAN, BENGKULU CITY
Email: sri.mulyatisoebarno@gmail.com

ABSTRACT

Ergonomics is a field of study that studies human interaction with elements in the system, so that various theories and methods will be produced to optimize the performance and performance of the overall system. While Musculoskeletal disorders (MSDs) are complaints felt by workers such as muscle pain, and cartilage pain. This study aims to determine the ergonomics and complaints of musculoskeletal disorders (MSDs). Based on an initial survey of 5 drinking water depot workers about whether they feel pain in the body when they work, it turns out there are complaints such as pain in some parts of their body such as back pain 3 people, neck 2 people, and others after they work. This research was a descriptive observational study, the sample in this study was 35 drinking water depot workers using total sampling. From the univariate results of 35 workers had a moderate level of ergonomic risk of 32 (91.4%), while complaints of Musculoskeletal disorders (MSDs) experienced by workers were more dominant while complaints of musculoskeletal disorders were 21 (60%). Workers are expected to pay attention to the ergonomics of work positions carried out when carrying out work activities that have a sufficiently long period of time, thereby reducing complaints of Musculoskeletal disorders experienced by workers.

Keywords: Ergonomics, Musculosceletal Disorders (MSDs), Drinking water depot workers

PRELIMINARY

According to the International Labor Organization (ILO, 2013), Ergonomicsis the application of human biology in line with engineering in order to achieve the optimal adjustment between work and humans in order to be useful for efficiency and prosperity. One that is learned in ergonomics is how work is done to fit human natural conditions.

Ergonomics is very important to learn because it can avoid the occurrence of fatigue and muscle injuries that can affect employee performance. One of the diseases caused by ergonomics is Musculosceletal Disorders

(MSDs) complaints. According to the International Labor Organization(ILO) in the program The Prevention of Occupational Diseases mentions in 27 European Union states, Musculoskeletal Disorders (MSDs) are the most common diseases associated with health problems at work (ILO, 2013).

Musculosceletal Disorders(MSDs) are complaints on the part of skeletal muscles that are felt by a person ranging from minor complaints to severe complaints, which generally occur due to muscle stretching that is too heavy and the duration of loading is too long, so that it can cause damage to the joints, ligaments and tendons. Initially, musculoskeletal complaints in the form of pain, pain, numbness, tingling, swelling, stiffness, trembling, sleep disturbances, and burning that result in the inability of a person to perform movements and coordination of limb movements so that the impact on less efficient and loss of work time and decreased work productivity (Utami, 2017).

According to data from the International Labor Organization in the program The Prevention Of Occupational Diseases said Musculoskeletal Diorders represent 59% of the total disease records found in Europe. And in a collaborative study on pain, the results show that 33% of the population in developing countries experience muscle pain. This pain will eventually be associated with depression so that it can interfere with quality of life and reduce the level of activity of workers. This statement is supported by research that provides an overview of the anatomical distribution of neuralgia. 56% occur in the thoracic region, 13% in the face, 13% in the lumbar region, and 11% in the cervical region (Purba 2015).

According to Sukania (2014) parameters that can be an influence in lifting activities are the horizontal distance between the burden lifted by the worker, the weight of the load in lifting, the ratio of the weight of the worker to the load lifted. One of the daily activities that is often done is material lifting activity and is often carried out manually with human labor, for example as in the work activities of lifting and transporting objects even in modern production systems even manual lifting activities are still practiced when the technical equipment used is not make it possible (Sukania., 2012).

From 2014-2017 according to the results of the National Occupational Health Strategy, the Ministry of Health of the Republic of Indonesia stated that if 40.5% of workers had 2 jobs that could cause a relationship with complaints of health problems, one of which was a musculoskeletal disorder of 16%.

At the mineral water depot there are workers serving the appointment of gallons. Lifting the gallon requires special attention from the technical lifting and the object being carried. Based on the results of research conducted by Hikmah.dkk (2015), it was found that only 3 depots applied for the correct lifting method of transporting information to their workers while the remaining 38 depots were known that their workers applied insecure work postures when carrying out gallons (Hikmah.dkk , 2015).

The difference in research conducted by researchers with the authenticity of researchers is starting from research methods such as quasi experiment methods conducted by Hikmah, et al (2015), Rapid Entire Body Assessment (REBA) and Biomechanics methods conducted by Setiawan (2019) and the Rapid Entire Body Assessment (REBA) cross sectional method conducted by Elty et al (2019). The difference found in this method is regarding the worker's criteria such as age, years of service and previous work history which can affect Musculoskeletal Disorders (MSDs) complaints.

The drinking water depot is one of the growing industries in Indonesia. This is also supported by the data of the Bengkulu City Industry and Trade Office in 2018 which states that 50 drinking water depots stand in Bengkulu with a total of 75 workers with 69 male workers and 69 6 female workers. Whereas there are 16 drinking water depots in Ratu Agung sub-district with approximately 28 male workers.

Based on an initial survey on 29

February 2020 in the Ratu Agung Subdistrict, researchers conducted interviews with 5 workers deprived of drinking water about whether they felt pain in the body while working, apparently there were complaints such as pain in some parts of their body such as back pain of about 3 people, aches in the upper arms about 2 people after they work. From 5 workers surveyed, it was found that when working, it turns out these workers still lack knowledge of the correct work position, due to lack of knowledge and information on the application of good ergonomics. As a result of this wrong working position, complaints will arise*Musculoskeletal disorders* (MSDs).

Based on the above background the researcher is interested in conducting research on "The level of ergonomic risk and Complaints of Musculoskeletal Disorders (MSDs) in Drinking water depot workers in the Ratu Agung District of Bengkulu City."

METHOD

Method This research uses Rapid Entire Body Assessment (REBA) method and complaints of musculoceletal disorders (MSDs) with the Nordic Body Map (NBM) method on gallon pick-up workers in the Ratu Agung Region of Bengkulu City.

RESULTS

1. Characteristics of drinking water depot workers in the District of Ratu Agung, Bengkulu City

Table 1. Frequency Distribution of Worker's Characteristics Drinking Water Depot in the District Area Ratu Agung Bengkulu City

No	Variable	Frequency	Percentage
1	Age		
	a.Teen (17 to 25 years)	9	26%
	b. Adult (25 to 50 years)	22	63%
	c. Elderly (50 years and above)	4	11%
2	Gender		
	a.Male	35	100%
	b.Girl	0	0
3	Period of time		
	a.New (<5 years)	11	31%
	b.Old (> 5 years)	24	69%
4	Job Experiences		
	a. Risk of MSDs	8	23%
	b. No risk of MSDs	27	77%

Based on table 1 it is known that more than a portion (63%) of workers aged 25 to 50 years; All (100%) workers are male; More than part (69%) of working period of 5 years and above; More than half (77%) with a work history are not at risk of MSDs.

2. Ergonomics risk for drinking water depot workers in the Ratu Agung District of Bengkulu City by measuring Rapid Entire Body Assessment (REBA)

Table 2. Frequency Distribution of Ergonomic Risk at Regional Water Supply Depot Workers
Ratu Agung District Bengkulu City

No	REBA score	The worker	Level of risk	Percentage
1	1	3	Was ignored	8.6%
2	2-3	9	Low	25.7%
3	4-7	15	Is	42.8%
4	8-10	5	High	14.2%
5	11-15	3	Very high	8.6%
	Total	35		100%

Table 2 shows that almost half (42.8%) drinking water depot workers in the Ratu Agung District of Bengkulu City with a moderate level of ergonomic risk with a REBA score of 4-7.

3. Complaints of Musculoskeletal Disorders (MSDs) in drinking water depot workers in the Ratu Agung District of Bengkulu City with the results of the NBM (Nordic Body

Map) questionnaire.

Table 3. Distribution of MSDS Complaints Frequency atRegional Water Supply Depot Workers Ratu Agung District Bengkulu City

No	MSDS Complaints	The worker	Percentage
1	No Complaints	0	0
2	Minor Complaints	12	34.3%
3	Medium Complaints	21	60%
4	High Complaints	2	5.7%
	Total	35	100%

Table 3 above shows that more than half (60%) of drinking water depot workers in the Ratu Agung sub-district of Bengkulu City with moderate MSDs level complaints.

DISCUSSION

1. Characteristics of Drinking Water Depot Workers

Based on the results of the questionnaire obtained the age of drinking water depot workers more than half 35 workers as many as 22 workers with a percentage of 63% aged adults with an age range from 25 to 50 years; Drinking water depot workers are 35 workers with a percentage of 100% male; the working period of drinking water depot workers is more than half of the 35 workers of 24 workers with a percentage of 69% having a working period of more than 5 years which varies, some are 6 years working even up to 11 years of work; And most of the workers have a history of work at risk of MSDs, namely 27 workers with a percentage of 77%. Some of the previous jobs have worked as construction laborers, furniture and other jobs.

2. Ergonomic Risks To Drinking Water Depot Workers

The results of research conducted in the District of Ratu Agung District and based on the results of the REBA assessment can be known that of the 35 drinking water depot workers in the region there are 32 workers who experience a moderate level of risk with a percentage of 91.4% due to the REBA assessment work in those who work has a moderate level of risk such as the position of the neck tends to be slightly down, the position of the feet parallel when the worker supports the load when standing, the position tends to bend slightly with the view down, so that makes them quickly feel tired and the position of the wrist, forearm and the upper arm turned out to be incompatible with the reba assessment, this resulted in this work position needing to be taken.

Whereas the other 3 workers who are categorized as high risk with a percentage of 8.6% with REBA assessment their position at work is a high risk potential work position such as the neck position that is too far down, the body is bent and the legs are too supportive so that it causes them to quickly tired and feeling achy in doing activities, which resulted in a decrease in productivity from drinking water depots.

The work of lifting gallons in drinking water depots is active work because of the movement of the working position that tends to move up and down the gallon with the movement of the hands, feet, back and head. The work of lifting the gallon is done by doing the same activity over and over for a long time can cause effects on the body parts of workers who were once perfect body parts or still standing sometimes turn into a bend because of the result of the wrong work position in a long time long. Workers should pay more attention to the position when lifting gallons to be more comfortable and not at risk of work accidents.

An unnatural work attitude or an awkward work posture is a work posture carried out with the body position moving away from the natural position such as the back being too bent, hands raised, and others. When working a good body is an upright body position with foresight and neck not bent. Body positions that deviate significantly

from their normal position while doing work can cause local mechanical stress on muscles, ligments and joints. This results in injuries to the neck, spine, shoulders, wrists, etc. But on the other hand, even though the posture looks comfortable at work, it can also be risky if they work for long periods of time.

In the position of drinking water depot workers who have been observed by researchers at the time of the study at the neck angle specified ie the angle of 200 according to the research of reba with a score of 1 and more than 200 has a score of 2 or face upwards more than 200 has a value of 2. While the working position other drinking water depot workers found that the neck position tended to be downward or formed an angle of> 200 with the neck position like this could result in complaints on the neck.

In the body position, the work position of workers tends to bend forward with this position. Drinking water depot workers can feel pain in the back that makes activities get tired quickly, then the position of the wrist when the worker is doing his work forms an angle of 150 upwards, while on the correct wrist is forming an angle of 150.

REBA research results obtained a percentage of 91.4% of drinking water depot workers who experience a moderate level of risk. Based on the existing theory, the level of risk of REBA is the level of risk that requires corrective action. One of the improvement factors is the worker who can improve the right work position when lifting the gallon. Because if the work position is not appropriate will make the position of the workers when lifting gallons tend to bend toward adjusting the load. The bending position will affect the score at the time of risk factor assessment, the more bent the working position of the drinking water depot worker, the higher the level of work risk. Work position adjustments that have an at-risk neck position and at-risk body positions that make this position ergonomic.
If this posture occurs for a long period of time it will cause complaints in the back pain, neck, wrists, body legs and others. Non-physiological attitude of the body when working and long lasting causes a burden on the musculoskeletal system and has a negative effect on health, In addition, workers are not able to exert their abilities optimally. If this happens, there is a lack of harmony between humans and their workers, so that things that are not desirable can be said to be short-term impacts such as the possibility of work mistakes or less productive.

One indicator that the work can be done well, when drinking water depot workers who want to work pay attention to aspects of work health and safety in general. But specifically to avoid injury or risk of work postures that can cause complaints Musculoskeletal Disorders (MSDS), workers should pay attention to ergonomic body posture in doing their work.

3. Musculoskeletal Complaints in Drinking Water Depot Workers

Based on the results of research conducted in the District of Ratu Agung Bengkulu City can be known from 35 drinking water depot workers showed that 100% experienced complaints of musculoskletal disorders ranging from minor complaints to high complaints. From the results of the Nordic Body Map assessment conducted by researchers, it was found that the level of complaints felt by workers experienced a low level of complaints 12 workers with a percentage of 34.3%, while the level of complaints was 21 workers with a percentage of 60% with more percentage compared to the high level of complaints namely as many as 2 workers with a percentage of 5.7%.

While the grouping of Musculoskeletal Disorders complaints from 35 workers who felt Musculoskeletal Disorders complaints based on body parts were obtained. Based on the results of data collection and analysis conducted by researchers, it was found that the complaints felt by workers were mostly felt to reach 100% or all workers with 35 workers with complaints on the shoulders,

back, right upper arm, back, waist, left forearm, hands, calves and right. There were also complaints felt by workers in the right forearm, upper neck of 34 workers with a percentage of 97.2%. For other complaints on the right wrist section reaching 30 workers with a percentage of 85.7%, complaints on the lower neck and left wrist reaching 28 workers with a percentage of 80%,

Workers who experience complaints of Musculoskeletal Disorders are all workers who experience complaints in the category of mild, moderate and there are experiencing very high complaints. However, due to economic demands that demand to keep working, in the end the complaints felt by the respondents at the time of the study were very dependent on the level of honesty and the level of perception of the complaints they felt.

CONCLUSION

Based on the results of research on 35 drinking water depot workers in the District of Ratu Agung Bengkulu City that have been conducted by researchers, it can be concluded.

1. More than half (63%) workers aged 25 to 50 years; All (100%) workers are male; More than part (69%) of working period of 5 years and above; More than half (77%) with a work history are not at risk of MSDs.
2. Nearly half (42.8%) of drinking water depot workers in the Ratu Agung District of Bengkulu City with a moderate level of ergonomic risk with a REBA score of 4-7.
3. More than half (60%) of drinking water depot workers in the Ratu Agung sub-district of Bengkulu City with moderate MSDs complaints.

SUGGESTION

1.For students

Students need to reproduce and expand reading about Ergonomics theory that focuses on Musculosceletal Disorders (MSDs) complaints through books and health journals on ergonomics, as well as this scientific paper can be used as a reference for further research.

2.For Mimun Water Depot Workers

Can be used as information about the importance of occupational health safety independently and is expected for drinking water depot workers in the Ratu Agung sub-district of Bengkulu City to pay more attention to the ergonomics of work positions when workers perform work activities that have a sufficiently long period of time, as well as to complaints of Musculoskeletal Disorders (MSDS) experienced by drinking water depot workers.

3. For Educational Institutions

This scientific paper is expected to provide information and knowledge about ergonomics theory and complaints *Musculoskeletal Disorders* (MSDS) which can be used for ieducational institutions and other students. So that they can apply and develop the results of this scientific paper further and as a reference in providing material or counseling about ergonomic positions that focus on complaints*Musculoskeletal Disorders* (MSDS) .

So.In addition, library facilities also play a role in several ways, namely by adding and providing the latest reference books and the latest health journals so that the knowledge gained is more developed. Then other facilities such as wifi also need to be improved because apart from books, knowledge can also be obtained by students through the internet.

4 For other researchers

Can be taken into consideration for other researchers who want to conduct further research on ergonomics with complaints of musculoskeletal disorders (MSDs) in other workers.

BIBLIOGRAPHY

Arikunto, S. 2013. Research Procedure: A Practical Approach. Jakarta: Rineka Cipta.

Bambang Suhardi, 2008. Work System Design and Ergonomics Book. Jakarta: Directorate of Vocational High School Development.

Federation of European Ergonomics Societies (FEES). 2009. European Euronomics: Know Your Economy. Available From: http://www.ergonomics-fees.eu/node/71 [Accessed December 26, 2019].

Fuady Ahmad Rifqy. 2013. Factors Associated with Musculoskeletal Disorders (MSDs) in Shoe Craftsmen in the Small Industrial Village (PIK) of Milling District of Cakung. Essay. Syarif Hidayatullah State Islamic University. Jakarta.

Ginting, Rosnani, 2010. Product design. Yogyakarta: Graha knowledge.

Giri, CRA 2013. Ergonomic Level Analysis of Employment Aspects in Informal Sector Laundry Workers in Ciputat Sub-district east of South Tangerang City. Scription, State Islamic University Syarif Hidayatulla. Jakarta.

Hasrianti, Yulvi. 2016. Relationship of Work Posture with Musculoskeletal Complaints in Workers at Pt. Maruki Internasional Indonesia Makassar. Thesis. Hasanudi University. Makassar.

Hikmah, Rizqi N.dkk. 2015. Work Posture Before and After Safety Training About Material Handling Manuals for Drinking Water Depot Workers (Case Study in Sumbersari District, Jember). Scientific Articles of Student Research Results. Pp. 1-5

Helmi Zairin Noor. 2012. Textbook for Musculoskelatal Disorders. Jakarta. Salemba Medika.

ILO, 2013. The Prevention Of Occupational Deaseas [Online]. Available.

Nurhikmah. 2011. Factors Related to Musculoskeletal Disorders (MSDs) in Furniture Workers in Benda Subdistrict Tangerang City in 2011. Thesis. Syarif Hidayatullah State Islamic University. Jakarta.

Nurliah, Aah. 2012. Musculoskeletal Disorders (MSDS) Risk Analysis in Forlift Operators at PT. LLI. Thesis. Indonesian University. Depok.

Niosh. Ergonomic Guidelines for Manual Material Handling. www.NIOSH.com/pdf. Accessed February 10, 2020.

Osni Mutia, 2012. Overview of Ergonomic Risk Factors and Subjective Complaints to Musculoskeletal Disorders (MSDS) Disorders in the Informal Sector Tailors in the Home Industry Area Rw 6, Cipadu Village, Larangan District, Tangerang City. Essay. University of Indonesia. Depok.

Priastika, TA (2012). Ergonomic Risk Level Analysis on Manual Handling Activities at Pt Ceva Logistik Indonesia Site Michelin Pondok Unggu Bekasi. Essay. University of Indonesia. Depok.

Purba, PN et al. (2015). Complaints of Musculoskeletal Disorders (MSDS) on Sales Promotion Girl (Spg) Users of High Heels at Suzuya Medan Plaza in 2015. Thesis, University of North Sumatra. Field.

Retno, Wulandari(2017) Relationship between Occupational Factors and Individual Factors with Musculoskeletal Disorders (MSDS) Complaints in DAMIU Gallon Shuttle Workers in the Ulak Karang Padang Public Health Center in 2016. Diploma thesis, Andalas University.

Rijanto, B. (2011). Accident Prevention Guidelines in Industry. Jakarta: Media Discourse Partner.

Sarvia & Willy, 2019. Proposed Design of Alternative Material Handling to Reduce the Risk of Pain Complaints and Determination of Rest Time for Gallon Lifting Operators. Vol. 4, No. 1, March 2019 pp. 7-15

Setiawan, Muhammad Safri, et al. 2019. Assessment of Worker Posture for Gallon

Lifting by REBA and Biomechanics Methods. Industrial Engineering Study Program, Faculty of Industrial Technology, Indonesian Islamic University.

Sritomo Wignjosoebroto, 2015. Ergonomics of Study of Motion and Time. Surabaya: For Wijaya.

Sukania, IW 2014. Ergonomic Analysis of Lifting Activities Load Case Study Lifting Water Gallons Over Dispensers. Scientific Work of a Tarumanegara University Lecturer.

Sulianta, Feri. 2010. IT Ergonomics. Jakarta: PT. Elex Media Komputindo.

Sugiyono 2012. Qualitative and R&D Quantitative Research Methods. Bandung: Alfabeta

Tarwaka, et al., 2016. Ergonomics for Safety, Occupational Health and Productivity. Surakarta: Uniba Press.

ERGONOMIC RISK LEVEL AND MUSCULOSKELETAL COMPLAINTS DISORDERS (MSDS) IN GALLON SHUTTERS IN THE QUALITY AREA OF QUEEN AGUNG BENGKULU CITY

ORIGINALITY REPORT

5%	2%	2%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Badan PPSDM Kesehatan Kementerian Kesehatan Student Paper	1%
2	Submitted to Universitas Lancang Kuning Student Paper	<1%
3	repository.umj.ac.id Internet Source	<1%
4	journal2.uad.ac.id Internet Source	<1%
5	Submitted to Universitas Pendidikan Ganesha Student Paper	<1%
6	ejournal.warmadewa.ac.id Internet Source	<1%
7	play.google.com Internet Source	<1%
8	S I Wahyuni, Dafik, M I Farisi. "The analysis of learning materials implementation based on	<1%

research-based learning to improve the elementary school student's creative thinking skills in solving "polamatika" problems", Journal of Physics: Conference Series, 2020
Publication

9	journal.unnes.ac.id Internet Source	<1%
10	www.neliti.com Internet Source	<1%
11	Anas Budi, Armawati Abidin. "DIMENSIONS OF ORGANIZATIONAL CULTURE (INVOLVEMENT, CONSISTENCY, ADJUSTMENT, AND MISSION) WITH NURSE WORK PRODUCTIVITY", Nurse and Health: Jurnal Keperawatan, 2021 Publication	<1%
12	Indah Pratiwi, Valeska Salsabil Kalyana. "Ergonomic Risk Evaluation of Manual Material Handling in Brick Production", Jurnal Ilmiah Teknik Industri, 2022 Publication	<1%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		