

**ANALYSIS OF WORK DURATION AND WORK LOAD WITH COMPLAINTS OF MUSCULOSCELETAL DISORDERS (MSDs) ON LAUNDRY WORKERS IN DUNGINGI DISTRICT THE CITY OF GORONTALO**

**Irwan<sup>1</sup>, Juwita Suma<sup>2</sup>, Deliyana I.Katili<sup>3</sup>, Tirsia Khairunisa Madjowa<sup>4</sup>**

<sup>1,4</sup>Department of Public Health, State University of Gorontalo, Indonesia

<sup>2</sup>Poltekkes Kemenkes Gorontalo, Indonesia

<sup>3</sup>. Puskesmas Kabila Bone Bolango, Gorontalo, Indonesia

email: [irwandel@gmail.com](mailto:irwandel@gmail.com),

**Abstract**

*Musculoskeletal Disorders (MSDs) are disorders of the musculoskeletal system that cause symptoms such as pain. MSDs complaints occur in parts of the skeletal muscles that a person feels, ranging from very mild to very painful. The novelty of this research is that it examines the length of work and workload with complaints of Musculoskeletal Disorders (MSDs). This study aimed to analyze the relationship between work duration and workload with complaints of Musculoskeletal Disorders (MSDs) among laundry workers in Duingingi District, Gorontalo City. This study uses quantitative research with an analytic survey approach with a cross-sectional design. The sample in this study was 82 respondents, namely laundry workers with a working period of  $\geq 2$  years in Duingingi District, Gorontalo City. Data analysis using Chi-Square test analysis. The results show a relationship between the length of work and complaints of Musculoskeletal Disorders with a value ( $p = 0.006 < 0.05$ ). There is also a relationship between workload and complaints of musculoskeletal disorders with a value ( $p = 0.007 < 0.05$ ). In conclusion, the longer the duration of a person's work can increase the incidence of MSDs complaints, and the heavier the workload workers receive can raise MSDs complaints.*

**Keywords:** *Duration of Work, Laundry worker, Musculoskeletal Disorder, Workload.*

**INTRODUCTION**

Musculoskeletal disorders (MSDs) are a form of occupational disease that affects the musculoskeletal system and results in symptoms including pain at different body sites such as the neck, shoulders, wrists, hips, knees, and heels owing to injury to neurons and blood vessels (1). The skeletal muscles that make up a person's musculoskeletal system are the subject of complaints, which can range in severity

from very mild to quite severe. Complaints up to this damage usually result in decreased work productivity so that workers cannot do their work optimally and then this will have an impact on the workers' economy (2) (3).

According to Joice Tampubolon in her 2014 research, it was stated that laundry workers in the South Denpasar sub-district, Bali experienced musculoskeletal complaints in the right shoulder 22 people

(73.33%), left and right calves 17 people (56.66%) as well as the waist and hips. left shoulder 16 people (53.33%) (4).

Based on the initial observations of researchers conducted on 10 laundry using manual machines in Duingi District, Gorontalo City. Choose a laundry business that uses a 2-tube manual machine and has a minimum of 2-3 workers because it does work by lifting manually such as 5 parts of work, namely weighing, washing, drying, ironing and packing. Workers carry out various activities such as lifting, pushing, and folding plus additional work if there is only a small number of workers in the laundry allowing one worker to do 2-3 jobs at once such as washing also weighing and drying so that it can increase MSDs complaints by working more than 4 hours per day without non-stop and the number of clothes being processed is more than 40 Kg per day, so the longer the working time, the more the workload of the workers.

Based on interviews with 20 laundry workers, data obtained that 16 workers experienced complaints of pain with MSDs symptoms such as the back of 8 people (50%), 6 people's shoulders (62.5%), 12 people's arms (75%), 12 people's neck

(75%), waist 14 people (87.5%), calves 10 people (62.5%) and legs 6 people (37.5%). The results of interviews with 20 laundry workers, who experienced the most complaints, were in the laundry business which had few workers so that this led to an increase in work duration and workload on workers which could increase muscle pressure so that it exceeded maximum muscle strength.

Based on this background, the authors are interested in knowing more about MSDs complaints in laundry workers with the title "Analysis of Work Duration and Workload With Complaints of Musculoskeletal Disorders (MSDs) in Laundry Workers in Duingi District, Gorontalo City".

### **RESEARCH METHOD**

This research was conducted at the Laundry in Duingi District, Gorontalo City. This research was conducted on March 26 to April 14, 2021. This study used a quantitative type of research with an analytical survey approach with a Cross Sectional design. The population in this study were all laundry workers who worked in the washing, ironing, drying, drying and or packaging sections in Duingi District,

Gorontalo City, totaling 104 workers from 39 laundry. The sample in this study amounted to 82 laundry workers. Purposive sampling is the sampling technique

employed in this study, in which the researcher selects the sample by identifying distinctive traits that are consistent with the study's goals.

## RESULTS AND DISCUSSION

### Working Duration

**Table 1.** Distribution of Respondents by Duration of Work in Duingi District, Gorontalo City

Working Duration	Amount	
	n	%
No Risk (< 2 Jam)	8	9,8
at risk ( $\geq$ 2 Jam)	74	90,2
Total	82	100,0

Source: Primary Data, 2021

Based on Table 1, the distribution of respondents based on duration of work in Duingi District, Gorontalo City shows that the most respondents work 2 hours with a total of 74 respondents (90.2%). While the least respondents are working <2 hours with a total of 8 respondents (9.8%).

The results in this study obtained the duration of work, because the workers who did the washing performed several stages of washing, namely rinsing dirty, giving soap, rinsing thoroughly, and rinsing a second clean and then drying, this could prolong the duration or working hours of workers. The irons who work standing or sitting can work

more than 2 hours, namely because the laundry that has been washed in the morning will pile up during the day to be ironed, so the iron has a fairly long time to complete its work with a small number of workers in one laundry business.

The work productivity of each respondent begins to decline when he has worked 4 hours. Therefore, workers need to rest and eat for at least 30 minutes to restore the worker's body condition. When doing monotonous, static and repetitive work, workers will experience excessive muscle contractions which results in complaints of shoulder pain in workers.

**Workload****Table 2.** Distribution of Respondents by Category of Workload (Pulse/Minute) in Duingi District, Gorontalo City

Workload Category (Pulse/Minute)	Amount	
	n	%
Light Workload	60	73,2
Medium Workload	16	19,5
Heavy Workload	6	7,3
Total	82	100,0

Source: Primary Data, 2021

Based on Table 3.2, the distribution of respondents based on the Workload Group with Pulse/Minute in Duingi District, Gorontalo City shows that most respondents have a light workload with a total of 60 respondents (73.2%). While the least respondents have a heavy workload with a total of 6 respondents (7.3%).

The findings of this study demonstrate that our actions and the oxygen we release while working have an impact on the pulse.

**Complaints of Musculoskeletal Disorders****Table 3.** Distribution of Respondents Based on Complaints of Musculoskeletal Disorders in Duingi District, Gorontalo City

Workload Category (Pulse/Minute)	Amount	
	n	%
Low (0-25%)	40	48,8
Currently (26-50%)	34	41,5
Tall (51-75%)	8	9,8
Total	82	100,0

Source: Primary Data, 2021

The pulse can increase because the worker is doing work such as ironing, lifting dry laundry to a fairly large clothesline and lifting wet laundry to the dryer.

This study is in line with Kattang's theory (2018) which states that respondents who have a light workload mostly experience moderate-risk musculoskeletal complaints, others experience mild complaints and no respondents experience high-risk complaints (5).

Based on Table 3.3, the distribution of respondents based on Musculoskeletal Disorders Complaints in Duingi District, Gorontalo City shows that the most respondents have complaints of Musculoskeletal Disorders in the low category with a total of 40 respondents (48.8%). While the least respondents experienced complaints of Musculoskeletal

Disorders in the high category with a total of 8 respondents (9.8%).

Based on the results obtained in this study, complaints that occur because workers do work repeatedly in the same frequency or monotone can cause respondents to experience MSDs complaints or respondents who work without regard to ergonomics and safety at work.

**The Results of the Analysis of the Relationship Between Work Duration and Complaints of Musculoskeletal Disorders**

**Table 4.** Analysis of the Relationship between Work Duration and Complaints of Musculoskeletal Disorders in Laundry Workers in Duingi District, Gorontalo City

Working Duration	Complaints of Musculoskeletal Disorders						Amount		P-value
	Tall		Currently		Low		n	%	
	n	%	n	%	n	%			
at risk (< 2 Jam)	8	10,8	34	46	32	43,2	74	100,0	0,006
No Risk (≥ 2 Jam)	0	0	0	0,0	8	100,0	8	100,0	
Total	8	9,8	34	41,5	40	48,8	82	100,0	

Source: Primary Data, 2021

Based on Table 4, it shows that the majority of respondents have work duration in the non-risk category with complaints of Musculoskeletal Disorders in the moderate category with a total of 34 respondents (46%). Meanwhile, the least respondent has the working duration in the risky category with complaints of Musculoskeletal

Disorders in the low category with a total of 8 respondents (100.0%).

Based on the results of the Chi-square test analysis, the p value obtained is 0.006. Where the P-value is smaller than ( $\alpha = 0.05$ ) which means that there is a relationship between work duration and complaints of musculoskeletal disorders in laundry

workers in Duingi District, Gorontalo City.

Based on the results of the study, it showed that respondents who had a work duration in the risky category with complaints of Musculoskeletal Disorders in the high category with a total of 8 respondents (10.8%) and the duration of work in the non-risk category with complaints of MSDs with a total of 8 respondents (100.0%). This is because the workers adjust to the incoming laundry and the sun in the morning until the afternoon so that the workers have to work from morning to evening, especially the washing respondents plus almost all the washers are laundry owners so they can work from morning to wash and when the cloth comes in. in the afternoon there are also some who choose to wash it at night.

The results of statistical analysis between duration of work and musculoskeletal complaints have a relationship. This can be influenced by the long duration of work at work. So the longer the duration of work or the longer the respondent is exposed to these risk factors for Musculoskeletal Disorders (MSDs), the greater the risk of developing MSDs (6).

The worker's physical health has an impact on the duration. The body's ability will decline if the work is done for an extended period of time without rest, and it may result in limb pain. Extending working time beyond capacity leads to decreased productivity. This can risk the occurrence of muscle pain which will cause musculoskeletal complaints (7).

Based on the results of the study, it was obtained data that 74 respondents had a risky work duration. This happened because most of the laundry businesses that were sampled only had a minimum of 2-3 workers so that workers had to work longer than the standard set. If a laundry business has more workers doing a job, it will reduce the risk of an occupational disease.

This is in line with the research of Wicaksono, et al (2016) showing the results that there is a relationship between work duration and musculoskeletal complaints in engineering students majoring in architecture at Diponegoro University and respondents who work with laptops 2 hours are 13.5 times more at risk than respondents who work with laptops. laptop < 2 hours. Static muscles can cause blood flow to

decrease, so that lactic acid accumulates and causes local muscle fatigue (8).

### The Results of the Analysis of the Relationship Between Workload and Complaints of Musculoskeletal Disorders

**Table 5.** Analysis of the Relationship between Workload and Complaints of Musculoskeletal Disorders in Laundry Workers in Duingingi District, Gorontalo City

Workload	Complaints of Musculoskeletal Disorders						Amount		<i>P-value</i>
	Tall		Currently		Low		n	%	
	n	%	n	%	n	%			
Heavy Workload	2	33,3	4	66,7	0	0,0	6	100,0	0,007
Medium Workload	1	6,3	9	56,3	6	37,5	16	100,0	
Light Workload	5	8,3	21	35	34	56,7	60	100,0	
Total	8	9,8	34	41,5	40	48,8	82	100,0	

Source: Primary Data, 2021

Based on Table 5, it shows that the majority of respondents have a light workload with complaints of Musculoskeletal Disorders in the low category with a total of 34 respondents (56.7%). While the least respondents have a heavy workload with complaints of Musculoskeletal Disorders in the moderate category with a total of 4 respondents (66.7%).

Based on the results of the Chi-square test analysis, the p value obtained is 0.007. There is a correlation between workload and complaints of musculoskeletal diseases among laundry employees in Duingingi District, Gorontalo City, where the p value is less than ( $= 0.05$ ).

Complaints of musculoskeletal disorders are complaints in the form of pain, injury, or abnormalities in the skeletal muscle system, including nerve tissue, tendons, ligaments, muscles or joints (9). Laundry employees sometimes complain about overstretching their muscles or doing repetitive tasks, such as ironing, transferring clothes to the dryer, and lifting cloth baskets. Laundry employees in Duingingi District, Gorontalo City, complain of musculoskeletal ailments due to the consistent performance of jobs with light and heavy workload categories. Based on the results of the study, the most common complaints experienced were complaints of

pain in the waist, pain in the shoulder, and pain in the right wrist.

This study is in line with the research of Wiyatno (2011) which shows that the results of statistical tests obtained a p value of  $0.020 > 0.05$ . This means that there is a relationship between workload and hand musculoskeletal complaints on pelvic workers in the Pucung group in the Candi Industrial Area of Semarang. The contingency coefficient value is 0.446, so it can be concluded that there is a moderate relationship between workload and hand musculoskeletal complaints by using a pulse calculation method using a stopwatch with the category of Mild = 75-100 DN (Pulse Rate)/min, Medium = 100 -125 DN (Pulse)/min, Weight = 125-150 DN (Pulse Rate)/min. Heavy physical work will affect the work of the muscles, cardiovascular, respiratory system, and others, then will return to normal when rested (10).

The outcomes of this study agree with those of Utami et al. Workload and musculoskeletal symptoms among farmers in Ahuhu Village, Meluhu District, and Konawe Regency are significantly correlated in 2017, according to research. (11).

## CONCLUSION AND RECOMMENDATION

In the Dungi District of Gorontalo City, there is a connection between the amount of time spent working and complaints of musculoskeletal ailments among laundry workers. Based on the chi-square test analysis findings, the p value obtained is 0.006, which is less than ( $= 0.05$ ). Workload and complaints of musculoskeletal diseases among laundromat employees in Dungi District, Gorontalo City, are related. Based on the chi-square test analysis findings, the p value obtained is 0.007, which is less than ( $= 0.05$ ).

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