



THE CORRELATION BETWEEN EXERCISE HABIT AND WORKING PERIOD AND WMSDS COMPLAINT ON BRICKMAKERS

Asyhora Naela Arifin^{1*}, Dita Kristiana², Maya Shyntya Dewi³

¹ Lecturer of Universitas 'Aisyiyah Yogyakarta

² Lecturer of Universitas 'Aisyiyah Yogyakarta

³ Student of Physiotherapy Study Program, Universitas 'Aisyiyah Yogyakarta

*Corresponding author: asyharanaelaarifin89@gmail.com

Abstracts

Introduction: The study aims to determine the correlation between exercise habit and working period and complaints of work-related musculoskeletal disorders in brickmakers, Work Related Musculoskeletal Disorders are complaints felt by workers on skeletal muscles, resulting in damage to ligaments, joints, and tendons. Brickmakers create bricks for use as building materials, the workers must perform difficult tasks for extended periods of time in uncomfortable positions, and they are not ergonomically at risk of developing WMSDS complaints, these activities require a healthy body which can be obtained from regular exercise habits, brickmakers exercise infrequently and regularly, the average working period of brickmakers is 20 years, a minimum of 3 years and a maximum of 50 years, with a working duration of 10 hours. **Methodology:** The study was quantitative research with analytical observational method. This research design was cross-sectional with total sampling method. The samples were brickmakers in Potorono Village, Banguntapan, Bantul, Yogyakarta. The total respondents were 30 people. The statistical test used Chi – Square. The variables studied were exercise habits, working period, and WMSDS complaints. The research instrument employed Nordic Body Maps. **Research findings:** Respondents with moderate WMSDS complaints were 8 respondents (26.7%), respondents with high complaints were 8 respondents (26.7%). The results of the Chi-Square test showed that there was no significant correlation between exercise habits ($0.302 > 0.05$), working period ($0.172 > 0.05$) and WMSDS complaints in brickmakers. **Conclusions:** There is no significant correlation between exercise habits and working period and WMSDS complaints on brickmakers. In field of Physiotherapy, can provide knowledge related to the dangers of work that is not ergonomic, and explanations about the prevention of WMSDS.

Keywords: working period, exercise habits, WMSDS.



1. Introduction

Every work sector can have health hazards, especially occupational accidents and occupational diseases. The magnitude of the hazard depends on the type of production, the materials used, and the activities carried out by the workers (Mindayani 2018).

Work Related Musculoskeletal Disorders or work-related musculoskeletal disorders are complaints that a person feels in the skeletal muscles, which are felt gradually, ranging from very mild complaints to very painful complaints that manifest as damage to ligaments, joints, and tendons. This can happen when the muscles are under static load for a long time. Risk factors for diseases of the musculoskeletal system in workers affect the cause of this disease, which causes work accidents. Individual factors, biomechanical factors and psychosocial factors are risk factors that cause WMSDS complaints.

Worldwide, WMSDS is a major health problem in industrialized countries especially in countries with more small and medium industries. In the UK, WMSDS are reported as one of the largest categories of work-related disorders. In the European Union, WMSDS affects millions of workers and has been declared the most common work-related illness. The study found that in the EU, 25% of workers reported suffering from back pain and 23% muscle pain. OSHA lists WMSDS as a high cost, with an estimated 34% of all workplace injuries and illnesses lost to WMSDS. Around 600,000 workers affected by WMSDS take time off work each year. For every \$3 spent on workers' compensation, WMSDS contributes \$1. Annual worker compensation costs exceed \$15 billion to \$20 billion (Ahmad 2017)

The Employment Social Security Administration (BPJS) noted that in 2016, work accident cases in Indonesia occurred around 101,368 cases (BPJS Ketenagakerjaan 2017). Then, work accident cases increased in 2017 as many as 123,041 cases, then in 2018 work accidents increased again to 173,105 cases (Akhzirizal 2020)

Based on a preliminary study conducted on February 24, 2022 in the brick industry in Sanggrahan Hamlet, Potorono Village, Banguntapan District, Kabupaten Bantul, with 30 employees aged 25 to 72 years. Interviews using



the Nordic Body Map (NBM) questionnaire on 30 workers found 100% of respondents experienced WMSDS events. WMSDS complaints in various parts of the body of brick workers occur due to long work duration, working in awkward positions, frequent bending, lifting, pushing and pulling, repetitive work, and carrying

heavy loads which in this case must require a healthy and fit body, this is obtained by exercising habits that are carried out regularly, based on preliminary studies that have been carried out in terms of sports, some of them often exercise and some rarely exercise, due to busyness in achieving brick printing targets.

Based on the description above, the researcher is interested in compiling a study entitled The Relationship Between Exercise Habits and Work Period With Complaints of Work Related Musculoskeletal Disorders in Bricks Making Workers.

2. Methods

2.1 Nordic Body Maps Index (NBM) and Observational analytic cross sectional

2.1.1. Nordic Body Maps Index (NBM) to determine the level of complaints WMSDS.

2.1.2. Observational Analytical, cross sectional to determine the relationship between the independent variables and the dependent variable in the study.

2.2 Data Analysis

2.2.1 Univariate analysis with frequency distribution table.

2.2.2 Bivariate analysis with Chi Square (χ^2) statistical test on SPSS 26 with the hypothesis being tested is the null hypothesis (H_0) and the alternative hypothesis (H_a). The significance level chosen is alpha (α) = 0,05.

3. Results

The results of the data collection that has been coded in this study, performed a univariate analysis in the form of a frequency distribution based on WMSDS complaint on brick makers and then performed bivariately using the Chi Square Statistical Correlation Test using IBM SPSS Statistic 26 to determine the correlation between variables with independent Analysis.



Table 1. Frequency distribution based on WMSDS complaints on brick makers

No.	WMSDS Complaint	Frequency (f)	Percentage (%)
1.	Low (NBM score 0-20)	7	23.3
2.	Moderate (NBM score 21-41)	8	26.7
3.	High (NBM Score 42-62)	8	26.7
4.	Very High (NBM Score 63-84)	7	23.3
	Total	30	100

Source: Primary Data, 2022.

Table 2. The Relationship Between Sports Habits and WMSDS Complaints

Sports Habits	WMSDS Complaint Rate								Total	P Value	Correlation coefficient	
	Low		Currently		Tall		Very high					
	F	%	F	%	F	%	F	%				
<3x/ Week	2	6.7	4	13.3	4	13.3	0	0.0	10	33.3	0.302	0.195
3-5x/ Week	5	16.7	4	13.3	4	13.3	7	23.3	20	66.7		
Total	7	23.3	8	26.7	8	26.7	7	23.3	30	100		

Source: Primary Data, 2022.

Table 3. Relationship Between Work Period and WMSDS Complaints

Years of service	WMSDS Complaint Rate								Total	P Value	Correlation coefficient	
	Low		Currently		Tall		Very high					
	F	%	F	%	F	%	F	%				
>3 years	7	23.3	8	26.7	8	26.7	6	20.0	29	96.7	0.172	0.256
3 years	0	0.0	0	0.0	0	0.0	1	3.3	1	3.3		
Total	7	23.3	8	26.7	8	26.7	7	23.3	30	100		

Source: Primary Data, 2022.

**Table 4. Relationship between Exercise Habits and Working Period with WMSDS Complaints on Bricks Making Workers**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.268	2	1,634	1.369	0.271 ^b
	Residual	32.232	27	1.194		
	Total	35,500	29			

Source: Primary Data, 2022

Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.303 ^a	.092	.025	1.093

Source: Primary Data, 2022

4. Discussion

The results of the study related to WMSDS complaints on brick-making workers. Based on table 1. it is found that respondents with moderate WMSDS complaints are 8 respondents (26.7%), respondents with high complaints are 8 respondents (26.7%), respondents with low WMSDS complaints are 7 respondents (23.3%), and respondents with very high complaints were 7 respondents (23.3%).

Work Related Musculoskeletal Disorders or work-related musculoskeletal disorders are complaints that a person feels in the skeletal muscles, which are felt gradually, ranging from very mild complaints to very painful complaints that manifest as damage to ligaments, joints, and tendons. This can happen when the muscles are under static load for a long time. Risk factors for diseases of the musculoskeletal system in workers affect work accidents. Individual factors, biomechanical factors and psychosocial factors are risk factors that cause WMSDS complaints. (Bukhori, 2010; Mayasari and Saftarina, 2016; Santosa and Ariska, 2018; Rahmah and Herbawani 2022)

The results of observations at the research site obtained that



WMSDS complaints might occur due to non-ergonomic work factors such as standing work positions, bending work positions, lifting - transport positions, lifting hand positions for too long during the process of stacking bricks, and repetition of movements and length of work. The average brick-making worker works for 8 hours per day, by performing repetitive activities that are not in accordance with work SOPs related to K3. Workers do not know about work SOPs related to K3 that must be implemented, which are not in line with the provisions of the law related to employment. In the Law of the Republic of Indonesia of 2003 number 13 concerning Manpower article 86 paragraph 1 it is explained that every worker/labor has the right to obtain protection for occupational safety and health. This is reinforced by the issuance of the Republic of Indonesia Law No. 36 of 2009 concerning Health Articles 164 - 165 which explains about Occupational Health where the workplace is obliged to implement health efforts both for formal and informal sector workers including the Indonesian National Army, Police, and Civil Apparatus and is responsible for responsible for accidents at work.

The calculation results from table 2 show that the correlation between exercise habits and WMSDS complaints is 0.195, with a significant (P) of $0.302 > 0.05$ which means that there is no significant relationship between exercise habits and WMSDS complaints. The correlation result of this study is 0.195 which means that the strength of the relationship between exercise habits and WMSDS complaints in brick-making workers is indeed very low. with complaints of musculoskeletal disorders is indeed low.

The period of work which is the accumulation of one's work activities carried out over a long period of time, if these activities are carried out continuously over a period of years, of course, it can cause disturbances to the body. The working period can cause a continuous static load if the worker does not pay attention to ergonomic factors it will cause musculoskeletal disorders (Ayuningtyas 2012).

The average working for 20.56667 years with a median of 20 years. From the results of the Chi Square test calculation, it was found that the significant value (P) $0.172 > 0.05$, then H_0 was rejected and H_a was accepted, which means that there is no significant relationship between work period and WMSDS complaints on brick-making workers. The results of this



study also explain that the correlation value between exercise habits and WMSDS complaints in brick-making workers is 0.256, which means that there is a very low relationship between work experience and WMSDS complaints and the direction of the relationship is positive.

From the results of this study, it was found that the significance value for the relationship between exercise habits and working period simultaneously with WMSDS complaints was $0.271 > 0.05$ and the calculated f value was $1.369 < F$ table 3.34, so it can be concluded that there is no relationship between exercise habits and work period with WMSDS complaints. The magnitude of the relationship between exercise habits and years of work with WMSDS complaints calculated by the correlation coefficient is 0.303, this shows a low relationship, while the variable contribution of exercise habits and years of work with WMSDS complaints is 9.2% while 90.8% is determined by other variables.

5. Conclusions

The following are the result obtained including

1. There is no significant relationship between exercise habits ($0.302 > 0.05$) with WMSDS complaints in brick-making workers.
2. There is no significant relationship between years of work period ($0.172 > 0.05$) with WMSDS complaints on brick-making workers.
3. There is no significant relationship between exercise habits and work period with WMSDS complaints in brick-making workers ($0.271 > 0.005$).

Acknowledgment

Alhamdulillah rabil 'alamin, researchers say the highest Praise and gratitude to Allah subhanahu wa ta'ala who has given mercy, love, opportunity, health, and grace to complete the manuscript for publication. This manuscript entitled " The Correlation Between Exercise Habit And Working Period And WMSDS Complaint On Brickmakers" was proposed as a task in completing education at the Physiotherapy Study Program S1 Faculty of Health Sciences, 'Aisyiyah University. The researcher expresses his sincere appreciation to Asyhara Naela Arifin, SSt.Ft., M.Kes for his guidance, direction, and guidance since the beginning of this research as well as providing extraordinary



experiences over the last few years. Then to his second advisor, Dita Kristiana, S.ST., M.HKes who has helped patiently complete this publication by providing suggestions, guidance, and corrections until the completion of this publication.

Finally, I would like to thank everyone who was important to the successful realization of the manuscript for publication. This publication is still far from perfect, but it is hoped that it will be useful not only for researchers, but also for readers. For this reason, suggestions and constructive criticism are most welcome.

Reference

- [1] Ahmad, Sk Akhtar. 2017. "Work-Related Musculoskeletal Disorders Among the Head-Load Brickfield Workers." (October).
- [2] Akhrizal. 2020. "Keselamatan, Kesehatan, Keamanan Kerja Dan Lingkungan Dalam Praktik Keinsinyuran."
- [3] Ayuningtyas, Sante. 2012. "Hubungan Antara Masa Kerja Dengan Risiko Terjadinya Nyeri Punggung Bawah (Npb) Pada Karyawan Pt. Krakatau Steel Di Cilegon Banten." *Skripsi*: 1–12.
- [4] Mindayani, Sri. 2018. "Perbaikan Fasilitas Kerja Untuk Mengurangi Keluhan Muskuloskeletal." *Jurnal Endurance* 3(2): 313.
- [5] Rahmah, Sayyidah, and Chahya Kharin Herbawani. 2022. "Faktor Risiko Penyebab Keluhan Musculoskeletal Disorders (MSDs) Pada Pekerja: Tinjauan Literatur." *Jurnal Kesehatan Masyarakat* 6(April): 1–14.