

The Relationship Between Work Stress and Work Fatigue Among Laundry Workers in The Muhammadiyah University of Surakarta Area

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Abstract.

Workers in the unorganized sector, such as laundry workers, commonly face occupational safety and health concerns related to work stress and work exhaustion. Repeatedly performing physically taxing tasks and working long hours can lead to increased stress and weariness at work. The purpose of this study was to ascertain the connection between work-related stress and weariness among laundry workers near Muhammadiyah University in Surakarta. This study included a cross-sectional methodology, a quantitative approach, and an analytical observational design. All laundry workers in the Muhammadiyah University of Surakarta region made up the research population, and 50 respondents were selected using the total sampling technique. The Industrial Fatigue Research Committee (IFRC) questionnaire was used to quantify work weariness, while the National Institute for Occupational Safety and Health (NIOSH) Generic Job Stress questionnaire was used to gather data on work stress. The chi-square test was used for both univariate and bivariate data analysis. According to the findings, 44% of respondents reported having high levels of job tiredness and 50% reported high levels of work stress. There is a strong correlation between job stress and work tiredness among laundry workers in the Muhammadiyah University of Surakarta area, according to the findings of the chi-square test, which indicated a p-value < 0.05. Workers are more likely to develop job tiredness if they are under a lot of stress at work.

Keywords: Work Stress; Work Fatigue; NIOSH; IFRC and Laundry Workers.

I. INTRODUCTION

Globalization has led to rapid technological development, providing convenience for everyone in carrying out various activities, especially in the world of work. In the 21st century, the role of technology has become very important, but on the other hand, it also presents challenges for humans in creating high work productivity. In this context, human resources play a very important role in actively completing work, as the success of an enterprise is largely determined by the performance of the human resources involved [1]. However, the demand to achieve high productivity is often accompanied by an increased workload, which can lead to occupational health problems, specifically work stress and work fatigue. Both conditions can hinder work progress as they directly impact workforce efficiency and capability.

Stress can be defined as a stimulus or action from inside or outside the human body that can disturb physical, psychological, and behavioral aspects, thus directly affecting productivity levels [2]. A severe disturbance of the body's homeostasis can cause anguish, which triggers a stress reaction and has negative consequences. Therefore, stress can be characterized as the adverse physiological and psychological responses that occur when a person is unable to manage the demands made of them [3].

Work stress can arise not only from the worker themselves but also from the work environment situation and conditions or from outside the work environment. Job demands such as completing work within set deadlines and having no break time can make workers prone to work stress [4]. Work stress not only affects mental aspects but also causes real physical responses as the body's reaction to excessive pressure. Physical stress symptoms include increased heart rate and blood pressure, dry mouth and throat, cold sweats, shortness of breath, headaches, stomach aches, pale face, trembling, difficulty sleeping, and decreased appetite [5].

Work fatigue consists of an occupational health and safety issue for workers at risk of injury, as they are unable to avoid the working conditions that cause such fatigue [6]. Fatigue at work is a feeling described as abnormal tiredness or sleepiness and is generally considered a more acute condition. However, over time,

this condition can become chronic and cause physical and mental disturbances [7]. Fatigue is a condition where one feels tired, lethargic, or lacking energy. Fatigue is a common symptom of many medical conditions, from mild to serious even leading to death [8]. Fatigue is the process of declining work efficiency and decreasing strength or physical endurance to continue necessary activities [9].

Persistent work stress can develop into work fatigue. Work fatigue can manifest as physical, mental, or emotional fatigue due to excessive work activities, unsupportive work environments, and lack of rest time. Fatigue can lead to various adverse outcome, including an increased risk of health problems such as sleep disorders, depression, obesity, and musculoskeletal disorders. In addition, fatigue negatively affects work efficiency, job satisfaction, and employees intention to leave their jobs [10]. Work stress triggers physiological responses such as decreased concentration, increased muscle tension, and reduced body endurance. If this stressful condition is not managed well and persists for a long time, the body will experience a decline in adaptive capacity. This condition causes physical energy to be excessively depleted, leading to excessive stress, so work stress develops into work fatigue.

The number of laundry businesses in the Muhammadiyah University of Surakarta area is quite high and has a high level of activity due to the significant demand for laundry services from students. The situation causes laundry workers to work with high intensity. Laundry workers in Indonesia are frequently subjected to substandard and hazardous working conditions, such as the use of malfunctioning machinery, inadequate work equipment and materials, congested work environments with insufficient ventilation, prolonged and irregular working hours, and insufficient occupational safety and health regulations and enforcement [11]. These circumstances may raise the likelihood of experiencing stress and exhaustion at work. Washing, drying, ironing, and packaging are all steps in the laundry service process that call for quickness, accuracy, and a lot of physical stamina. Numerous studies examine the connection between work-related stress and weariness in the formal sector, but there are currently few studies on laundry workers in the informal sector, particularly in the vicinity of Muhammadiyah University of Surakarta. In order to investigate the relationship between job stress and work tiredness among employees in the laundry industry, study on the topic is pertinent to Muhammadiyah University of Surakarta. The purpose of this study is also to demonstrate that there is a connection between the degree of work tiredness experienced by local laundry workers and work stress.

II. METHODS

In order to ascertain the connection between job stress and work weariness among laundry service personnel at Muhammadiyah University in the Surakarta region, this study used a quantitative technique with an observational analytical design. The research was conducted at laundry businesses located on campus 1 and campus 2, which are characterized by high work intensity due to the substantial demand for laundry services from students.

Measurements of job stress and work fatigue were obtained concurrently as part of a cross-sectional strategy to data collecting. The population of this study comprised all laundry employees at Muhammadiyah University in the Surakarta region who were willing to participate as respondents. A total sampling technique was applied, thus all 50 laundry workers in the population were included as the study sample.

Both primary and secondary sources of data were employed in this investigation. Respondents' answers to questionnaires were used to collect primary data. The *National Institute for Occupational Safety and Health* (NIOSH) Generic Job Stress questionnaire, which focuses on employees' physiological reactions to work pressure, was used to quantify work stress. In the meantime, the *Industrial Fatigue Research Committee* (IFRC) questionnaire was used to gauge work fatigue. Key signs including decreased motivation, lessened activity, and physical exhaustion are included in this tool.

The data was analyzed in phases. The frequency distribution of respondent characteristics, work stress levels, and work tiredness levels were first described using univariate analysis. The chi-square test was then used in bivariate analysis to ascertain the connection between job stress and work tiredness. This study has obtained approval from the Health Research Ethics Committee of the Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, with approval number No. 1740/KEPK-FIK/XI/2025

III. RESULT AND DISCUSSION

Respondent Characteristics

Table 1. Age

Age	n	%
19-29 years	11	22
30- 44 years	22	44
45-62 years	17	34
Total	50	100

Based on the univariate analysis results, most respondents were in the 30-44 year age group, amounting to 44%. This age is considered productive, but these laundry workers engage in repetitive physical activity. This result aligns with a study titled “The Effect of Working Hours Length on Physical and Psychological Fatigue of Home Based Laundry Workers” which shows that most respondents (45%) were in the 30-40 year age range, which is a productive and economically active age group in household economic activities like laundry businesses. That study explains that despite being of productive age, laundry workers remain at risk of physical and psychological fatigue if working hours are long and continuous [12].

Table 2. Gender

Gender	n	%
Male	10	20
Female	40	80
Total	50	100

Based on the univariate analysis results, most respondents were female, amounting to 80%. Female workers in laundry businesses were associated with job characteristics that require precision and diligence. Research by Rosiana and Saskara focusing on female workers in the home based laundry industry showed that home based laundry sector was one of the work sectors that heavily involves female labor. Women not only played roles as housewives, but social economic household demands pushed women to seek income [13].

Table 3. Work Shift

Work Shift	n	%
Morning	16	32%
Afternoon	7	14%
Night	1	2%
Full shift	26	52%
Total	50	100

Based on the univariate analysis of work shift, most respondents worked full shifts, amounting to 52% or 26 respondents. A full shift meant working from morning to night. Long working hours reduced rest time, decreased workers rest and increased the risk of work fatigue. This result aligned with research conducted on laundry workers at the Mandau District Hospital, which showed that laundry workers work in a shift system, namely morning and afternoon. In that research, workers had no specific break time and only utilized waiting time for washing linen, while most work activities were performed standing, especially involving the legs. This condition can cause work fatigue in laundry workers [14].

Table 4. Education Level

Education Level	n	%
Junior High School	6	12
Senior High School	22	44
Vocational High School	10	20
D3	2	4
S1	10	10
Total	50	100

Based on the univariate analysis results, most respondents had a Senior High School as their last education level, totaling 22 respondents (44%). This indicates that most laundry workers have a secondary education background, which aligns with the characteristics of laundry work that emphasize practical skills and physical activity over high formal education. Therefore, the education level in this study is used to describe respondent characteristics and not as a primary factor directly influencing work fatigue.

Univariate Analysis

Table 5. Distribution Based on Work Stress Among Laundry Workers in

Muhammadiyah University of Surakarta Area

Work Stress	Frequency	%
Low	25	50
High	25	50
Total	50	100

Based on the univariate analysis results, it is known that respondents work stress was divided equally between low and high categories, each at 50%. The measurement of work in this study used the NIOSH physiological stress questionnaire, which assesses the effects of work pressure. Several complaints include headaches, sleep disturbances, heart palpitations, muscle tension, shortness of breath, etc. Laundry workers generally perform fairly heavy and repetitive physical activities. Their working conditions can be a source of work stress.

Table 6. Distribution Based on Work Fatigue Among Laundry Workers in Muhammadiyah University of Surakarta Area

Work Fatigue	Frequency	%
Low	28	56
High	22	44
Total	50	100

Based on the univariate analysis results for work fatigue, 44% of respondents experienced high work fatigue, while 56% of respondents were in the low fatigue category. Work fatigue measurement used the IFRC questionnaire, which assesses fatigue from aspects of activity weakening, motivation weakening, and physical fatigue. Based on this questionnaire, fatigue is characterized by complaints such as tiredness throughout the body, heavy legs, back pain, drowsiness while working, etc.

Table 7. Bivariate Analysis

Work Stress	Work Fatigue						p-value
	Low		High		Total		
	n	%	n	%	n	%	
Low	21	84%	4	16%	25	100%	0.000
High	7	28%	18	72%	25	100%	
Total	28	56%	22	44%	50	100%	

According to the analysis of the association between workers' work stress and weariness, a p-value of less than 0.05 was found, indicating a substantial relationship between the two. This suggests that employees' levels of stress at work have an impact on how exhausted they feel at work.

Based on the respondent distribution, workers with low work stress mostly experienced low work fatigue, totaling 21 people (84%), while those experiencing high work fatigue were only 4 people (16%). This shows that low levels of work stress tend to be followed by low levels of work fatigue. Conversely, among workers with high work stress, most experienced high work fatigue, totaling 18 people (72%), while those experiencing low work fatigue were only 7 people (28%). This issue serves as an example of how employees are more likely to feel job tiredness the more stress they are under at work.

Overall, out of 50 respondents, 28 people (56%), experienced low work fatigue and 22 people (44%) experienced high work fatigue. This result strengthens the finding that work stress is one of the factors related to the occurrence of work fatigue among workers. Therefore, among laundry workers at the Muhammadiyah University of Surakarta area, work stress is associated with work weariness.

The working conditions experienced by laundry workers can accelerate the occurrence of work fatigue because physical energy is used continuously during work. If this condition lasts for a long time, workers will be more prone to fatigue. Factors such as work pressure, excessive workload, routine overtime hours, shift work systems, target-based work, and limited leave and leisure time are consistently associated with the emergence of fatigue [15].

The association is consistent with a study that revealed a p-value of 0.028 (<0.05) for "The Relationship Between Work Stress and Work Motivation with Feelings of Work Fatigue Among Laundry Workers in Kleak and Bahu Subdistrict, Manado City." This indicates that among laundry workers in Kleak and Bahu Subdistrict, Manado City, there is a correlation between work stress and feelings of work fatigue. [16].

Work tiredness and work stress were shown to be significantly correlated ($p = 0.027$) in the study "The Relationship between Work Fatigue and Work Motivation with Work Stress among Special School

Teachers in Surakarta City." The findings are important as a reference for research on laundry workers because of the comparability of the factors analyzed, despite the fact that the research participants and the direction of the variables differ [17].

Numerous factors, including work-related ones like workload and stress, have an impact on work tiredness. With a r value of 0.662 and a p -value of 0.00 ($p < 0.05$), the research findings demonstrate a substantial and positive correlation between workload and work tiredness. A heavy workload can put employees under more mental and physical strain, which can lead to work-related stress. Constantly experiencing stress at work will affect one's ability to work and physical endurance, which will ultimately raise the danger of work tiredness [18].

IV. CONCLUSION

From the results obtained in this study, it can be inferred that most respondents were in the productive age group, dominated by age 30-44 years, female, working full shift (morning-night), and having a Senior High School as their last education level. Work stress among laundry workers in the Muhammadiyah University of Surakarta area was split equally between low and high work stress groups, with each at 50%, according to the results of a univariate study. At 56% and 44%, respectively, the low and high fatigue categories dominated job exhaustion. The chi-square test yielded bivariate data with a p -value < 0.05 , suggesting a strong correlation between work-related stress and weariness. Thus, among laundry workers at the Muhammadiyah University of Surakarta area, work stress is associated with work weariness.

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