

Analysis of factors related to work stress in workers at PT. Hisar Makmur

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ABSTRACT

The purpose of this study is to analyze factors related to work stress in workers at PT. Hisar Makmur. This research is a quantitative research with an analytical observational research type using cross sectional study research design. This research was conducted on the Construction Work Project of PT. Hisar Makmur, Construction of the Integrated Lecture Building of IAIN Manado located in Wori District, North Minahasa Regency, in January - March 2025. The respondents in this study were 93 respondents. The independent variables in this research are workload, work fatigue, age, and salary satisfaction. The dependent variable in this research is work stress. The data analysis conducted was univariate which explains the frequency distribution of research variables, bivariate analysis using the Spearman-rank test, and the multivariate analysis using the Multiple Logistic Regression test. The result of the bivariate analysis using Spearman-rank test showed that there is a significant relationship between workload and work stress ($p < 0,001$), there is a significant relationship between work fatigue and work stress ($p < 0,001$), there is no relationship between age and work stress ($p = 0,847$), and there is a significant relationship between salary satisfaction and work stress ($p = 0,001$). The result of the multivariate analysis show that the work fatigue variable has the most dominant influence on work stress with an Exp(B) value of 12,200, which means that respondents who experience work fatigue are 12,2 times more at risk of experiencing work stress. The conclusion of this research is that workload, work fatigue and salary satisfaction are related to work stress in workers at PT. Hisar Makmur. While age is not related to work stress in workers at PT. Hisar Makmur.

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Introduction

Occupational Health and Safety (K3) does not only focus on limiting work accidents in the workplace but also functions to improve the welfare of workers in all positions through efforts to improve occupational health. According to the ILO, more than 160 million workers become ill due to workplace hazards each year, and 1.2 million die from workplace accidents and illnesses. Protecting the health of workers and providing a safe working environment for their work is an important part of all construction projects (Novy M. & J. Novakova, 2023).

Construction workers are required to perform repetitive and strenuous work with high job demands, long working hours, job insecurity and poor job satisfaction. These factors have a significant impact on the physical and mental well-being of construction workers. Mental health encompasses all aspects of a person's growth, both physical and psychic. This includes efforts in overcoming stress, difficulty adjusting, relationships with others, and in decision-making (Retnosari, 2023).

Currently, work stress is one of the problems in human resource management that organizations pay attention to (Sya'Bani H. 2024). Work stress is noticed because of the many impacts caused by work stress. Based on a Health and Safety Executive (HSE) survey, there were 595,000 cases of work-related stress and depression in 2017/2018 with a prevalence rate of 1,800

per 100,000 workers (Singal, E. M., et al. 2020). Every worker is at risk of being exposed to work stress in doing their job. According to the ILO in 2021, there were 23 percent who reported that they were often or always stressed, and the majority (58 percent) were worried about whether or not there was enough work in the future (ILO, 2021).

Worker stress in the workplace is a condition of emotional tension that has an impact on the worker's anxiety, depression, mental exhaustion, and emotions. Too high stress can make it difficult for workers to deal with the environment, can affect interpersonal relationships and also makes it difficult to complete the tasks assigned (Maghfirah N., 2023). Zainal H & A. Ashar (2023) mentioned that there are several symptoms of a person feeling work stress, namely feelings of restlessness, irritability, difficulty sleeping, excessive fatigue, decreased motivation and productivity.

Work stress arises due to several triggering factors. According to Robbins in Tampombebu A. & S. Wijono (2022), the factors that can trigger work stress are organizational factors, individual factors, and environmental factors. In addition to these three factors classified by Robbins, there are factors that can be the cause of work stress in modern work era. These factors include workload and work fatigue (Zainal, H & A. Ashar, 2023), age of workers (Azizah N, et al. 2023), and income or salary (Bahri S. & O. Nurmalasary, 2023). Compared to environmental factors and organizational factors which are external and more general, these factors are pressures which are more personal, relevant, and often cannot be observed directly.

Building construction workers are a job that is at risk of experiencing high work fatigue. This is because workers must meet the job target within a certain period of time. This can cause a physical and mental workload on workers which can further lead to the appearance of work fatigue (Sihotang K. M. S., et al. 2021). Excessive workload is one of the main causes of stress in workers. Workers can find it difficult to complete tasks given by their superiors and many responsibilities with limited time (Zainal H&A. Ashar, 2023). This is in line with research conducted by Tonapa E. P., et al. (2022) which showed a significant relationship between workload and work fatigue and work stress in health workers at the Bandar Khalipa Health Center, Deli Serdang Regency. Research by Relitasari N. A. (2022) on workers at PT Adhi Persada Gedung also showed a significant relationship between work fatigue and work stress. Dihartawan, et al. (2024) in their research showed that there is a relationship between workload and work stress with construction workers for the construction of the Cinere-Jagorawi Toll Road in 2023.

The age of the worker is also included as one of the risk factors for workers to experience work stress. Age is closely related to stress, because the older a person gets, the physical condition and internal organs of the person will decrease, so it is very easy to be attacked by stress. Meanwhile, the vulnerable age of individuals faces stress at the age of 21-40 years and can also occur at the age of 40-60 years (Irawati I., et al. 2023). In line with research conducted by Azizah N., et al. (2023), which stated that there was a significant relationship between age and work stress in New Makassar Mall traders, Makassar City. Irawati I, et al. (2023) also stated in their research that there is a meaningful relationship between age and work stress in construction workers at PT. X Batam City.

Cooper said that salary is one of the factors that affect work stress (Zikrul, 2021). The perception of whether or not the salary is appropriate or not for each worker is also influenced by the dependents that each individual has. Safitri I A. (2020) in his research on nurses at Jepara Hospital stated that nurses who have an appropriate salary ($\geq$ UMK Jepara) but experience work stress are nurses who have many dependents. These dependents are in meeting family needs, such as the number of children who are more than 2, living with parents or meeting the needs of parents, and monthly installments.

In recent years, research related to work stress has been conducted on health workers during COVID-19 and during social restrictions, so that most work stress arises due to the effects of the COVID-19 pandemic. In this study, the author conducted research on construction workers, where so far research on construction workers is more likely to lead to work accidents. Meanwhile, work stress has a lot of impact on a person's work. If a person is distracted and feels stressed by his

work, then the worker cannot concentrate and be careful in his work and the worker is at risk of having a work accident.

The initial observation made by the author on one of the construction projects of PT. Hisar Makmur in Wri District, North Minahasa Regency showed that construction workers are all male and around 20-50 years old with working hours from 08.00-17.00 WITA. Based on the risk factors in the background that have been described, the author wants to research on Factors Related to Work Stress in Workers at PT. Hisar Makmur.

Research methods

This research is a quantitative research with a research type, namely an observational analysis using a cross-sectional study. This research was carried out on the Construction Research Project of PT. Hisar Makmur, the Construction of the Gedung Kuliah Terpadu Kampus IAIN Manado which is located in Wori District, North Minahasa Regency which will be held in January - March 2025. The research population is the construction workers of the construction Gedung Kampus IAIN Manado, PT. HISAR MAKMUR has a total of 93 people. The research sample was 93 respondents. The sampling method in this research is using total sampling technique,

The data analysis in this research is as follows:

The purpose of the analysis is to collect information from the responden that has been entered into the application to become data. The data are classified based on the characteristics of the responden and variables according to the nature of the research.

This research uses data analysis techniques, namely:

a. Univariate Analysis

The univariate analysis is to describe each variable, namely the workload, work fatigue, age, and salary.

b. Bivariate Analysis

The bivariate analysis in this study used Spearman-rank test to see the relationship between workload and work stress, the relationship between work fatigue and work stress, the relationship between age with work stress, the relationship between salary satisfaction and work stress (Sugiyono, 2020).

c. Multivariate Analysis

This study also used multivariate analysis to see which variables had the most influence between independent variables (workload, work fatigue, age, and salary satisfaction) for dependent variables (work stress). The variables assessed were those with a p-value of < 0.25 in bivariate analysis. If there is an independent variable that has a p-value > 0.25 , then the variable is considered not significant and is not included in the model. Multivariate analysis uses the multiple logistic regression method with significant values to see which independent variables are dominant to the dependent variable and the Exp(B) value to see how much the risk of the independent variable affects the dependent variable.

Results and Discussion

1. Univariate Analysis

a. The Respondents' Age

Table 1. Respondents' Age Distribution

Age	n	%	Mean	Std. Deviation
≤33 years	54	58,1	33,19	9,382
>33 years	39	41,9		
Total	93	100		

The results of the univariate analysis in table 1 above illustrate that as many as 54 people (58.1%) of respondents were aged 30 years and under, while as many as 39 people (41.9%) of respondents were aged over 30 years.

b. The Respondents' Type of Residence

Table 2. The Respondents' Type of Residence

Type	n	%
Mess	64	68,8
Owned House	24	25,8
Others	5	5,4
Total	93	100

Based on the data in table 2, it can be shown that the most respondents live in dormitories, namely 64 people (68.8%), then live in private homes as many as 24 people (25.8%), and the fewest are others (boarding houses and rented houses) as many as 5 people (5.4%).

c. The Respondents' Gender

Table 3. The Respondents' Gender

Gender	n	%
Male	93	100
Female	0	0
Total	93	100

Table 3 above shows that as many as 93 people (100%), which is all respondents in this study were male.

d. The Respondents' Marital Status

Table 4. The Respondents' Marital Status

Marital Status	n	%
Married	54	58,1
Not Married	39	41,9
Total	93	100

The results in table 4 above show that 54 people (58.1%) of respondents were married and 39 people (41.9%) were not married.

e. Distribution of Workstress

Table 5. Distribution of Workstress

Stress Level	n	%
Normal	29	31,2
Mild	19	20,4
Moderate	30	32,3
Severe	15	16,1
Extremely Severe	0	0
Total	93	100

Table 5 shows that the highest level of stress among respondents was at a moderate level, as many as 30 people (32.2%) and the lowest level of stress among respondents was 15 people (16.1%), while there were no respondents who experienced very severe stress.

f. Distribution of Workload

Table 6. Distribution of Workload

Categories	n	%
Very Low	0	0
Low	4	4,3
Moderate	16	17,2
High	42	45,2

Very High	31	33,3
Total	93	100

The data obtained from table 6 shows that the most experienced a high workload, namely 42 people (45.2%), and the least experienced a low workload, namely 4 people (4.3%), while there were no respondents who experienced a very low workload.

g. Distribution of Work Fatigue

Table 7. Distribution of Work Fatigue

Work Fatigue Level	n	%
Low	27	29,0
Moderate	59	63,4
Severe	7	7,5
Total	93	100

The description of work fatigue in table 7 shows that the most respondents felt work fatigue at a moderate level, namely 59 people (63.4%) and the lowest felt fatigue at a severe level, namely 7 people (7.5%).

h. Distribution of Salary Satisfaction

Table 8. Distribution of Salary Satisfaction

Categories	n	%
Very Dissatisfied	0	0
Dissatisfied	0	0
Neutral	18	19,4
Satisfied	50	53,8
Very Satisfied	25	26,9
Total	93	100

Table 8 above shows that the majority stated that they were satisfied with the salary they received, namely 50 people (53.8%), and the fewest stated that they were neutral, namely 18 people (19.4%), while there were no respondents who were very dissatisfied or dissatisfied with the salary they received.

2. Bivariate Analysis

a. The Relationship of Workload and Work Stress

Table 9. The Relationship of Workload and Work Stress

Variable	n	r _{count}	p-value
Workload and Workstress	93	0,360	<0,001

The results of the Spearman-rank correlation test in table 9 show that from 93 respondents, a p-value of <0.001 or less than α , namely 0.05, was obtained. This means that there is a relationship between workload and work stress, with a correlation coefficient value (r count) of 0.360, meaning that it has a weak correlation strength and shows a positive direction of the relationship where if the workload increases, it will be accompanied by an increase in work stress.

i. The Relationship between Work Fatigue and Work Stress

Table 10. The Relationship between Work Fatigue and Work Stress

Variable	n	r _{count}	p-value
Work Fatigue and Workstress	93	0,618	<0,001

The Spearman-rank correlation test in table 10 above shows that from 93 respondents, a p-value of <0.001 or less than α of 0.05 was obtained, this means that there is a relationship between work fatigue and work stress. The correlation coefficient value (r count) obtained is 0.618, which means that it has a strong correlation strength with a positive relationship direction, namely if there is an increase in work fatigue, it will be accompanied by an increase in work stress.

j. The Relationship of Age and Work Stress

Table 11. The Relationship of Age and Work Stress

Variable	n	r _{count}	p-value
Age and Workstress	93	-0,020	0,847

Table 11 data shows the results of the Spearman-rank test to see the correlation between age variables and work stress, where from 93 respondents a p-value of 0.847 was obtained or greater than α , namely 0.05, this means that there is no relationship between age and work stress, and a correlation coefficient value (r count) of -0.020 was obtained, meaning that it has a very weak correlation strength with a negative relationship direction where the older the age, the lower the work stress will be.

k. The Relationship of Salary Satisfaction with Work Stress

Table 12. The Relationship of Salary Satisfaction with Work Stress

Variable	n	R _{count}	p-value
Kepuasan Gaji dengan Stres Kerja	93	-0,327	0,001

The results of the analysis in table 12 show that based on the results of the Spearman-rank test from 93 respondents, a p-value of 0.001 or less than α , which is 0.05, is obtained, this means that there is a relationship between salary satisfaction and work stress. The correlation coefficient value (r count) of -0.327 means that it has a weak correlation strength with a negative relationship direction, namely if salary satisfaction increases, the work stress felt will be lower.

3. Multivariate Analysis

Multivariate analysis in this study aims to determine the relationship between which independent variables exert the most dominant influence on the dependent variables. In this study, multiple logistic regression analysis was used. Some of the steps taken are as follows:

- 1) Perform a selection of variables that are potentially included in the model. Variables that are selected as candidates or that are considered significant based on the results of bivariate tests (Spearman-rank test) with a p value of < 0.05 . The independent variables chosen are workload, work fatigue, salary satisfaction.
- 2) In the double logistics regression test, a significant value ($p < 0.25$) was selected in the bivariate test (Spearman-rank test). In this study, there was an age variable that had a p-value of 0.847 where $p > 0.25$, so it was not included in the multivariate analysis.

Table 13. Logistic Regression Test Results (Step 1)

Variabel	Itself.	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
Workload	0,207	1,507	0,797	2,852
Work Fatigue	0,000	10,364	3,227	33,285
Salary Satisfaction	0,908	0,946	0,368	2,433

Variable(s) entered on step 1: workload, work fatigue, salary satisfaction.

Based on table 13, a multivariate analysis was carried out with a double logistics regression test in step 1, namely the variables of workload, work fatigue, and salary satisfaction. And a p-value was obtained for the variables of workload and salary satisfaction ($p > 0.25$) so that it was continued for logistical regression analysis in the second step by issuing the salary satisfaction variable with a p-value of 0.908 which is the variable with the largest p-value.

Table 14. Logistic Regression Test Results (Step 2)

Variabel	Itself.	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
Workload	0,196	1,516	0,807	2,848
Work Fatigue	0,000	10,662	3,670	30,981

Table 14 above is a multivariate analysis of the step 2 double logistics regression test on the variables of workload and work fatigue and obtained a p-value of < 0.25 . Furthermore, the

multivariate analysis was continued to the logistic regression analysis in step 3 by removing the workload variable with a p-value of 0.196 which is the variable with the largest p-value.

Table 15. Logistic Regression Test Results (Step 3)

Variabel	Sig.	Exp(B)	95% C.I. for Exp(B)	
			Lower	Upper
Work Fatigue	0,000	12,200	4,299	34,623

Table 15 data shows a multivariate analysis conducted using a multiple logistic regression test on the work fatigue variable. Based on the results of the statistical test carried out, the variable of work fatigue is the most dominant variable affecting work stress in workers at PT. Hisar Makmur with an Exp(B) value of 12,200 which means that respondents who experience work fatigue are 12.2 times more at risk of experiencing work stress.

The results of the statistical test used the Confidence Interval (CI) value or the range of the difference value that was tolerated using the 95% confidence level, so that the value range between work fatigue and work stress in workers at PT. Hisar Makmur is 4.3 to 34.6.

1. Bivariate Analysis

a. The Relationship of Workload and Work Stress

This study showed the results of the Spearman-rank test in 93 respondents with a p-value < 0.001 ($\alpha < 0.05$) which means that there is a relationship between workload and work stress with a correlation coefficient value (r count) of 0.360, it means that it has a weak correlation strength and shows a positive relationship direction where if the workload increases, it will be accompanied by an increase in work stress.

This research is in line with previous research that mentioned workload as a trigger for work stress. According to Riznanda, W. M. and D. Kusumadewi (2023) in their research on "The Relationship between Workload and Work Stress in Employees of the Production Division of PT. X" indicates a significance value of 0.000 ($\alpha < 0.05$) which proves the existence of a relationship between the workload variable and work stress. According to research by Dihartawan, et al. (2024) on construction workers, the results of the Chi-square test showed a p-value of 0.006 ($\alpha < 0.05$) which means that there is a relationship between workload and work stress. However, this study is not in line with the research conducted by Pasang, M. T. I., et al (2022) which stated that there was no relationship between workload and work stress with a p-value of 0.153 ($\alpha > 0.05$).

Work stress can be triggered by many factors, one of which is workload. The high and low workload felt by individuals is in accordance with their capacity and ability to complete the work. The relationship between workload and work stress in workers at PT. This Hisar Makmur can occur because construction workers are usually required to complete work within a predetermined time limit. So that the workload felt over time also increases and triggers pressure and increases the level of stress in the worker.

b. The Relationship between Work Fatigue and Work Stress

The results of the Spearman-rank test in this study showed that from 93 respondents, a p-value < 0.001 ($\alpha < 0.05$) was obtained, which means that there is a significant relationship between work fatigue and work stress. Furthermore, the correlation coefficient value (r count) was obtained as 0.618, which means that it has a strong correlation strength with a positive relationship direction, namely if there is an increase in work fatigue, it will be accompanied by an increase in work stress.

This study is in line with previous research that stated that there is a relationship between work fatigue and work stress. In a study by Wijayanti R., et al (2024) on field workers of PT. X states that there is a significant relationship between workload and work stress, with a p-value of 0.001 ($\alpha < 0.05$). This study is also in line with the research of Fatin H. K., et al (2023) on construction workers, and obtained a p-value of 0.045 ($\alpha < 0.05$) which means that there is a relationship between work fatigue and work stress. However, this study is not in line with Artawan I (2022) who in his study stated that there was no relationship between work fatigue and work stress with a p-value of 0.471 ($\alpha > 0.05$).

Fatigue will decrease performance and increase the level of work fatigue. If the demands of work or physical demands are higher, it will have an impact on greater fatigue (Dewi L, 2024). According to researchers, work fatigue in workers can be caused by a perceived workload. Construction workers tend to expend considerable physical force in doing their work so that workers feel tired, this fatigue can make the emotional state felt less stable and then cause work stress to increase.

c. The Relationship of Age with Work Stress

This study showed the results of the Spearman-rank test to see the relationship between the variables of age and work stress from 93 respondents with a p-value of 0.847 ($\alpha > 0.05$) so that it was measurable that there was no relationship between age and work stress. The correlation coefficient value (r count) obtained was -0.020, meaning that it has a very weak correlation strength with a negative relationship direction where the older the age, the lower the work stress will be.

The results in this study are in line with the research conducted by Rambe H. and S. Bahri (2022) on "Factors Related to Work Stress in Production Workers at PT. Tri Teguh Manunggal Sejatikota Tangerang". The study showed that there was no significant relationship between age and work stress with a p-value of 0.565 ($\alpha > 0.05$). In a study by Maranden A. A., et al (2023) also showed that there was no relationship between age and work stress, where the p-value was 0.816 ($\alpha > 0.05$). However, it is not in line with the research conducted by Akbar H., et al (2024) which stated that there is a significant relationship between age and work stress with a p-value of 0.003 ($\alpha < 0.05$).

This study shows that there is no relationship between age and work stress. Age is not one of the causes of stress in workers, because stress can be experienced by individuals of all ages. The appearance of stress also depends on how each person manages the perceived stress. The age of construction workers at PT. Hisar Makmur is generally over 20 years old, so they tend to have a lot of experience and knowledge in adapting to their work environment.

d. The Relationship of Salary Satisfaction with Work Stress

The results of the Spearman-rank test from 93 respondents in this study showed a p-value of 0.001 ($\alpha < 0.05$) which means that there is a relationship between salary satisfaction and work stress. The correlation coefficient value (r count) of -0.327 means that it has a weak correlation strength with a negative relationship direction, namely that if salary satisfaction increases, the work stress felt will be lower.

The results of this study are in line with previous research by Bahri S. and O. Nurmalasary (2022) which stated that there is a significant relationship between salary and work stress with a p-value of 0.009 ($\alpha < 0.05$) where project workers who feel dissatisfied with their salary will be more likely to experience heavy work stress. In a previous study conducted by Zikrul, et al (2021) showed that there was a relationship between salary and work stress with a p-value of 0.006 ($\alpha < 0.05$). However, it is not in line with the research conducted by Safitri I. A. (2020) which states that there is no relationship between salary and work stress with a p-value of 0.856 ($\alpha > 0.05$).

Table 12 in this study shows that most workers expressed satisfaction with the salary received with the highest levels of work stress, namely moderate and normal. According to the researcher, the salary earned by workers is in accordance with the work done and can meet the needs of workers, the facilities provided by the company are considered sufficient for workers so that the work stress felt due to salary satisfaction received is also not heavy.

2. Multivariate Analysis

In this study, the researcher also conducted a multivariate test to see which independent variables had a dominant effect on the dependent variables. Based on the Spearman-rank test conducted previously, there were three variables (workload, work fatigue, and salary satisfaction) that were eligible for a double logistics regression test with a significant value of $p < 0.25$, while the age variable was not included in the model because the p value > 0.25 . In finding out which variables are the most dominant affecting work stress, a multivariate analysis was carried out using a double logistics regression test, based on the results in the first step, the following data were obtained: workload with a p-value of 0.207, work fatigue with a p-value < 0.001 , and salary

satisfaction with a p-value of 0.908. Based on these results, the second step of logistical regression was carried out by removing the unqualified variable, namely salary satisfaction because the p-value > 0.25 .

Based on the test in the second step, the following results were obtained: workload with a p-value of 0.196 and work fatigue with a p-value < 0.001 . Based on these results, the third step of logistical regression was carried out by removing the workload variable. The results of the third step multiple logistics regression test showed that the most dominant independent variable had an effect on the work stress variable, namely work fatigue with a p-value of < 0.001 and an Exp(B) value of 12.200, which means that respondents who experienced work fatigue were 12.2 times more at risk of experiencing work stress.

The results of the statistical test using the Confidence Interval (CI) for Exp(B) value or the range of differences that are tolerated using the 95% confidence level, so that the value range between work fatigue and work stress in workers at PT. Hisar Makmur is 4.3 to 34.6. These results are also in line with research conducted by Nainggolan L. E. (2022) which states that work fatigue has a significant effect on work stress.

Conclusion

The results of the research on "Analysis of Factors Related to Work Stress in Workers at PT. Hisar Makmur" can be concluded that: This study shows that there is a significant relationship between workload and work stress in workers at PT. Hisar Makmur. This study shows that there is a significant relationship between work fatigue and work stress in workers at PT. Hisar Makmur. This study shows that there is no relationship between age and work stress in workers at PT. Hisar Makmur. This study shows that there is a significant relationship between salary satisfaction and work stress in workers at PT. Hisar Makmur.

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