



Analysis of Factors Affecting the Work Stress in Workers at PT. X, An Oil and Gas Company

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Abstract

Work stress is a very important problem in various countries and types of work. Many factors trigger work stress, such as work factors, outside work, individuals, and support. This study aims to determine the factors that influence work stress among workers at PT. X, an oil and gas company. The quantitative with a cross-sectional study design was conducted in this research. The research was conducted on 80 workers using simple random sampling techniques. Variables were measured using the NIOSH Generic Job Stress Questionnaire. Data were analyzed through univariate, bivariate and multivariate approaches using the chi-square test and linear regression test. The study found that there was a significant relationship between the marital status ($p=0.009$), work period ($p=0.015$), role conflict ($p=0.021$), and interpersonal conflict ($p=0.002$) on work stress in workers. The study results also show that interpersonal conflict is the factor that has the most influence on work stress (estimate=0.64, $p=0.049$). The findings of this study support the importance of stress management programs implemented in the workplace by paying attention to the factors that influence it.

Keywords: Work stress, role conflict, interpersonal conflict, marital status, work period

Full length article *Corresponding Author, e-mail: kpwardhana@gmail.com

Doi # <https://doi.org/10.62877/30-IJCBS-24-25-19-30>

1. Introduction

Work stress is a very important problem in various countries and types of work. In the UK, stress is the leading cause of absenteeism from the workplace [1]. Apart from its impact on employee health and well-being, the impact of work stress on the economy is also quite prominent [2]. As the ILO reports, the estimated total annual cost to employers of mental health disorders among their staff is almost £26 billion in the UK, and €617 billion in Europe. Another example, problems arising from stress cost US companies approximately USD 300 billion in healthcare [3]. Similar to other countries, in Indonesia the problem of work stress is still widely encountered. The results of a survey conducted by Mercer Marsh Benefits in 2021, involving more than 1,000 workers in Indonesia, found that 2 out of 5 workers experienced stress due to work [4]. Andriani's (2012) research on non-managerial employees of PT. AstraZeneca found that workers' stress levels were in the medium category with the most dominant factor being work time pressure [5]. In research conducted by Siregar in 2018 on online

transportation workers in Medan, it was found that 66.7% of workers experienced mild stress, 31.3% experienced moderate stress, and 2.1% experienced heavy stress [6].

Many factors trigger work stress. The National Institute for Occupational Safety and Health (NIOSH) divides factors that influence work stress into work, non-work, individual and support conditions. Exposure to stressful working conditions (so-called occupational stressors) can have a direct impact on worker safety and health. Other individual and situational factors may intervene to strengthen or weaken this influence. Based on research conducted by Kelly et al. (2020), workload is the main factor causing work stress, burnout and work-life balance. Other causal factors include organizational factors, namely values, aspects of the learning environment and personal factors such as work-life integration [7]. In line with that, other studies also found that workload and gender had a significant relationship with work stress [8]. Other research states that the main causes of high levels of stress in prison staff are high job demands and low control over work [9].

PT. X is a state company in the oil and gas sector which is tasked with running the chain of downstream business activities in Sulawesi. Based on the results of stress screening conducted by PT. X in 2022, the results showed varying levels of stress. The results showed that 4% of workers had low stress levels, 92% had moderate stress, and 4% had high stress. Based on these results, to find the root of the problem as evaluation material, it is important to carry out research related to the factors that influence worker stress among workers at PT. X.

2. Materials and methods

This is a quantitative research with a cross-sectional study design. The research was conducted at PT. X which is a state company in the oil and gas sector located in Sulawesi in October-November 2023. The study was conducted on 80 workers of PT. X by determining the sample size using the Lemeshow (1990) formula. In this research, sampling was carried out using the simple random sampling method. The independent variables in this research are individual factors consisting of gender, age, marital status, work period and work factors consisting of role conflict, interpersonal conflict, workload, work shifts. Next, work stress becomes the dependent variable. Primary data collection was carried out by filling out questionnaires by workers at PT. X. The data collection technique was carried out by distributing questionnaires to workers who were the research samples. At the beginning of the questionnaire, the aims and objectives of the research are explained and how to fill out the questionnaire. The instrument used in this research is the NIOSH Generic Job Stress Questionnaire which has been translated into Indonesian. This questionnaire was chosen because it has good and complete variables for measuring work stress as well as indicator variables that influence it. Apart from that, the validity and reliability of this questionnaire have also been tested. From the test results, the Cronbach Alpha value obtained for all question items for the dependent variable and independent variables was more than 0.7 and the calculated R value was greater than the R table value = 0.190 or the overall p-value < 0.05.

The data underwent processing using Statistical Product and Service Solutions (SPSS) software. Data were analyzed through univariate, bivariate and multivariate approaches using the chi-square test and linear regression test. The results of the study will be presented in the form of tables and narratives. This study has received approval from the health research ethics commission (KEPK) Faculty of Public Health, Hasanuddin University on 22 November 2023 with protocol number: 161123062260 and letter number: 164/UN4.14.1/TP.01.02/2023.

3. Results and Discussions

The subjects of this research consisted of 80 PT. X workers. Table 1 shows the characteristics of respondents based on individual factors and work factors. The majority of respondents were men (75%), the average age was over 35 years (56.2%), 87.5% of respondents were married, and 65% of respondents had worked for more than 5 years. From work factors, it is known that more than half of the respondents

stated that it was quite appropriate to have role conflict, namely 56.3%, 2.5% of respondents said it was appropriate, and some others stated that it was not appropriate (no role conflict occurred), namely 41.2%. For interpersonal conflict, it is known that the majority of respondents agree regarding the existence of interpersonal conflict, namely 63.8%, and those who disagree regarding the existence of interpersonal conflict are 36.2%. For workload, the majority have a heavy workload, namely 75%, 16.3% have a medium workload, 7.5% have a very heavy workload, and a small portion have a light workload (1.2%). For work shifts, the majority of respondents work with non-shift work arrangements, namely 85% of respondents. The distribution of respondents based on work stress can be seen in Table 2. It is known that the majority of respondents had mild work stress, namely 46 workers or 57.75%, while respondents with moderate levels of work stress were 30 workers or 37.5% and the others were in the heavy work stress category, namely as many as 4 workers or 5%.

3.1. The Effect of Gender on Work Stress

Work stress can occur in both men and women. Men and women have different types and levels of psychosocial exposure in the workplace [10]. Certain psychosocial exposures in the workplace have a stronger impact on perceived stress among women, while other psychosocial exposures are more associated with stress among men [11]. In this study, from the results of the bivariate test it can be seen that there is no significant relationship between gender and work stress ($p= 0.495$). This could be due to the imbalance in the number of respondents between men and women. The majority of respondents in this study were male (75%). When viewed from population data, the ratio of male workers at PT. X is indeed more than female workers. From the multivariate test, the gender variable was also not included in the variables that significantly influenced work stress (Table 4). Several previous studies also showed that there was no significant relationship related to work stress between men and women. Research from Karima (2014) conducted at a mining company showed that there was no relationship between gender and work stress [12]. Likewise, research conducted by Shintyar et al. (2021) who found that there was no significant relationship between gender and work stress [13]. Other research states that there is no significant relationship between gender and work stress levels because every employee, both men and women, has the same responsibilities and tasks [14].

3.2. The Effect of Age on Work Stress

From the research results, there was no significant relationship between worker age and work stress that occurred in PT. X workers ($p= 0.080$). Furthermore, from the pattern of relationships formed, it is known that the majority of mild work stress occurs in workers aged 35 years and over, the majority of moderate work stress occurs in workers aged less than or equal to 35 years, and heavy work stress all occurs in workers aged less than 35 years old. Based on this pattern, it can be seen that workers who are less than 35 years old tend to be at risk of having higher work stress than workers who are more than 35 years old.

Table 1. Characteristics of Respondents

	Characteristics	n	%
Individual Factors	Gender		
	Woman	20	25.0
	Man	60	75.0
	Age		
	<35 years	45	56.2
	>35 years	35	43.8
	Marital status		
	Marry	70	87.5
	Not Married	10	12.5
	Work period		
	≤5 years	28	35.0
>5 years	52	65.0	
Job Factors	Role Conflict		
	Not exactly	33	41.2
	Exactly enough	45	56.3
	Appropriate	2	2.5
	Very precise	0	0.0
	Interpresonal Conflict		
	Don't agree	29	36.2
	Agree	51	63.8
	Workload		
	Light	1	1.2
	Moderate	13	16.3
	Heavy	60	75.0
	Very heavy	6	7.5
	Shift work		
	Shifts	12	15.0
No Shifts	68	85.0	

Table 2. Distribution of Respondents Based on Work Stress

Work Stress	n	%
Mild	46	57.5
Moderate	30	37.5
Heavy	4	5.0

Table 3. Bivariate Analysis

Variables	Work Stress						p-value
	Mild		Moderate		Heavy		
	n	%	n	%	n	%	
Gender							
Woman	11	13.7	7	8.8	2	2.5	0.495
Man	35	43.7	23	28.8	2	2.5	
Age							
≤ 35 years old	22	27.5	19	23.7	4	5.0	0.080
> 35 years	24	30.0	11	13.8	0	0.0	
Marital status							
Marry	44	55.0	24	30.0	2	2.5	0.009*
Not Married	2	2.5	6	7.5	2	2.5	
Work period							
≤ 5 years	13	16.2	11	13.8	4	5.0	0.015*
> 5 years	33	41.2	19	23.8	0	0.0	
Role Conflict							
Not exactly	26	32.5	7	8.7	0	0.0	0.021*
Exactly enough	19	23.7	22	27.5	4	5.0	
Appropriate	1	1.3	1	1.3	0	0.0	
Interpersonal Conflict							
Don't agree	24	30.0	4	5.0	1	1.3	0.002*
Agree	22	27.5	26	32.5	3	3.7	
Workload							
Light	1	1.3	0	0.0	0	0.0	0.941
Moderate	8	10.0	4	5.0	1	1.3	
Heavy	34	42.5	23	28.8	3	3.7	
Very heavy	3	3.7	3	3.7	0	0.0	
Shift work							
Shifts	8	10.0	4	5.0	0	0.0	0.613
No Shifts	38	47.5	26	32.5	4	5.0	

*p-value < 0.05: there is a significant relationship

Table 4. Regression Analysis

Variables	Parameter		Partial Testing		Concurrent Testing	
	Estimate	Std error	t count	p-value	F count	p-value
Constant	36.21	15.90	2.28	0.026	4.941	0.000
Gender	-4.98	4.73	-1.05	0.296		
Age	-7.92	4.66	-1.70	0.094		
Marital status	4.12	6.36	0.65	0.521		
Work period	-2.95	4.93	-0.60	0.552		
Role conflict	0.76	0.45	1.68	0.098		
Interpersonal conflict	0.64	0.32	2.00	0.049		
Workload	-0.12	0.41	-0.29	-0.292		
Shift work	5.66	6.03	0.94	0.351		

The results of this research are in line with several previous studies. Research from Adiba (2022) conducted at a Wardhana et al., 2024

company in Tangerang City stated that there was no significant relationship between age and work-related stress

[15]. Likewise, research by Yuliani (2021) did not find any relationship between age and the incidence of work stress [16]. Research from Hidayat in 2019 on the relationship between age and work experience on stress levels also showed the same results, namely that there was no significant relationship between age and work stress [17]. Research from Rauschenbach et al. (2013) stated that age is not related to stress at work. This is because the disadvantages and advantages associated with different ages can offset each other. However, in this study it is known that aspects of cognitive irritation tend to be higher in young and old age than in middle age [18].

3.3. The Effect of Marital Status on Work Stress

Based on the results of the analysis in this study, a significant relationship was found between workers' marital status and work stress ($p= 0.009$). Furthermore, from the relationship patterns formed, it is known that the majority of mild and moderate work stress occurs in married workers, whereas the majority of unmarried workers have moderate work stress. The results of this research are in line with research from Adiba (2022) which found a significant relationship between marital status and work stress. Married workers tend to have greater work stress than unmarried workers. Problems in the household can be carried over to work, thus influencing stress events [15]. Ogden (2012) suggests that individuals who have unhappy marriages tend to have high levels of stress [19]. A less harmonious married life can make workers less focused at work. However, on the contrary, a harmonious married life can actually relieve work stress. So it can be said that married life can have both positive and negative impacts on work [14]. Similarly, research from Nagra (2013) found that married teacher workers had higher stress levels than unmarried teachers. This can be caused by the dual responsibilities that must be carried out, namely work and family [20]. When viewed from the results of the multivariate analysis, marital status is not a factor that influences work stress. This can be interpreted as work stress among PT. X workers is not dominant or solely influenced by marital status (Table 4).

3.4. The Effect of Work Period on Work Stress

In this study, it was found that the working period factor was related to work stress in PT. X workers. ($p= 0.015$). Furthermore, from the pattern of relationships formed, it is known that heavy stress occurs in workers with less than 5 years of work, while workers with longer work periods only have mild and moderate work stress. Similar to the marital status variable, from the multivariate analysis the work experience factor was not included as the dominant factor influencing work stress (Table 4). If we look at this research, heavy stress tends to occur in workers with less than 5 years of work. This could be related to work experience. Workers with longer tenure have accumulated more job-related knowledge and experience. When they experienced more difficult situations in terms of work, this group was more calm about it [21]. The results of this research are also in line with research conducted by Sinaga (2022) which states that there is a relationship between work experience and work stress. In this research, it is known that workers with less than one year of service are vulnerable to experiencing work stress. This can be caused by the process of adaptation or adjustment of workers to the job, both in terms of the scope

of work, the social scope of work, or the regulations that apply in the workplace [22]. Other research states that one of the causes of new employees experiencing work-related stress is a lack of experience in the field of work they are working in [23].

3.5. The Effect of Role Conflict on Work Stress

For the role conflict factor, in this study a significant relationship was found with work stress in PT. X workers. ($p= 0.021$). From the relationship patterns formed, it is known that work stress increases when role conflict also increases. Role conflict can occur when there are two different commands at one time and the two commands are contradictory [24]. This can happen at PT. X especially for workers at staff and junior staff levels who will receive orders from several levels above. Apart from that, the existence of several vacant positions at entry level means that job requests are increasing from several superiors. Of course, this condition will cause workers to carry out work from two or more different orders and perhaps complete it in different or unusual ways. In line with this research, research from Damayanti et al. 2020 found a significant relationship between role conflict and work stress in librarian workers and library staff. In this study, almost all work stress levels of librarians and library staff were at medium to high levels related to role conflict factors. This occurs when workers feel they are performing unnecessary tasks. Apart from that, formal command channels are also often not obeyed, and they often receive orders from other parties who are often at odds [25]. Another study conducted at a hospital in Iran also showed a strong relationship between role conflict and work stress. From this research, it is known that 37% of work stress incidents are caused by role overload, role conflict and role ambiguity. Role conflict is the strongest predictor factor for predicting work stress. Workers who face different tasks at the same time will experience greater stress [26]. Furthermore, in multivariate testing, role conflict factors are not included in the factors that influence work stress. So the work stress that occurs in workers at PT. X is not dominantly influenced by role conflict factors in the workplace (Table 4).

3.6. The Effect of Interpersonal Conflict on Work Stress

Based on the results of the analysis in this research, it is known that there is a significant relationship between interpersonal conflict and work stress in PT. X workers ($p= 0.002$). From the relationship patterns formed, it is known that if interpersonal conflicts increase, work stress also tends to increase. The majority of workers with interpersonal conflict problems at work assume that there are differences of opinion between members in their division. This can of course lead to disharmony between workers or between teams which ultimately leads to interpersonal conflict in the workplace. Lack of openness between divisions can also trigger this conflict at PT. X. From the results of multivariate testing (Table 4), there is a significant influence of interpersonal conflict on work stress. Workers who have interpersonal conflicts are 64% more likely to experience work stress than workers who do not experience interpersonal conflicts. Interpersonal conflict is the single most dominant factor influencing work stress in PT. X workers.

There are several factors that influence interpersonal conflict, one of which is communication. Ineffective communication can trigger interpersonal conflicts due to

misunderstandings. This can happen not only in the socialization process in the work environment, but can also occur in the deliberation or decision-making process. Another factor that can influence an organization's interpersonal conflict is the structure and influence of the individuals themselves. The structure in question is how an organization is structured with a system of relationships between positions in the organization. Planning responsibilities and division of tasks must be clear so that there is no overlapping of work which will trigger conflict. Individual factors include a person's personality, emotions and values. Differences in opinions and thoughts due to background between individuals and other individuals can be one of the causes of interpersonal conflict in an organization [27]. These results are in line with research conducted by Nappo N. in 2020 regarding the analysis of the relationship between work stress and interpersonal relationships inside and outside work in Europe. In this research, it is known that there is a significant correlation between interpersonal relationships inside and outside work and work stress. Support or assistance from superiors can reduce the possibility of stress at work. Cooperating and maintaining good relationships with colleagues will reduce the possibility of experiencing stress at work [28]. Other research from Arif et al. (2021) also shows a significant relationship between interpersonal relationships and work stress. This tends to be related to poor communication between workers and superiors. Reprimands or punishments given to workers if they do not achieve the given work targets also make the relationship between workers and superiors more tense [14].

3.7. The Effect of Workload on Work Stress

In this study, there was no significant relationship between workload and work stress that occurred in PT. X workers ($p=0.941$). The workload factor is also not a factor that is included in the factors that influence work stress based on multivariate analysis (Table 4). The majority of PT. X has a heavy workload, namely 75% of the research sample. Uniquely, 56% of workers with heavy workloads have mild work stress, others have moderate work stress (38%) and the remaining 5% have mild work stress. This could be because the majority of workers have worked for more than 5 years. If we look at this research, the majority of workers with more than 5 years of work experience have mild work stress. Workers with longer tenure will have a greater understanding of their work. They have more work-related experience [23]. Workers with deeper experience tend to have a broader view in solving problems and making the right decisions [29]. This research also strengthens the results of Jefri's previous research in 2017 which was carried out in one of the production departments of a furniture company. In this study it was said that there was no influence of workload on work stress [30]. Other research from Ningshi (2020) also shows the same results that there is no relationship between workload and work stress. The ability of workers to distribute workload makes workers able to adapt to changes that occur in the workplace. The experience possessed by workers also makes it easy for workers to adapt to work and the work environment [31]. In contrast to this research, research on outpatient nurses in Ghana found that workload had a positive effect on workload. This is related to the large working time pressure and the large number of additional tasks given. These conditions have an impact on workers' health both

physically and psychologically [32]. Likewise, research from Manabung (2018) also states that there is a significant relationship between workload and work stress in workers [23]. High work demands are related to the emergence of stress and symptoms of depression so that good work arrangements are needed and avoiding long working hours [33].

3.8. The Effect of Work Shifts on Work Stress

From the results of this study, there was no relationship between work shifts and work stress in PT. X workers ($p=0.613$). Likewise, according to the results of the multivariate tests that have been carried out, the work shift factor is not included in the factors that can influence work stress in PT. X workers (Table 4). The majority of workers at PT. X works on a non-shift work schedule. Jobs with a shift schedule are only found at fuel oil terminals, LPG terminals and aircraft filling terminals. In this study, 85% of the sample had a non-shift work schedule, and the remainder worked on a shift schedule. Shift work schedule at PT. X has also been adjusted to the working time provisions regulated in statutory regulations, namely 8 hours for 5 working days in 1 week.

These results are in line with research by Pradina et al. (2022) who did not find a significant relationship between work shifts and work stress. This is closely related to the regulation of working hours and rest times for workers [34]. Research from Sinaga (2022) found that the relationship between work shifts and work stress was low. Workers who work in the morning shift, afternoon shift and night shift are all susceptible to experiencing work stress, but there are other factors that influence a worker to experience work stress [22].

4. Conclusions

The study found that there was a significant relationship between the marital status, work period, role conflict, and interpersonal conflict on work stress in workers. Interpersonal conflict is the factor that has the most influence on work stress. The findings of this research support the importance of stress management programs implemented in the workplace by paying attention to the factors that influence it. Companies can carry out regular evaluations regarding employee duties and responsibilities, evaluate the organization's structure and manpower needs, provide mentoring programs especially for new workers such as employee assistance programs, create good relationships and communication between workers through formal or informal forums, provide training or education to workers, especially regarding conflict management and stress management.

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