

Relationship between working period and nutritional status with work fatigue workers in PT X production unit

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Abstract

Work fatigue is still prevalent both in the world and Indonesia. International Labour Organization (ILO) data in 2016 shows that 32% of workers in the world experience work fatigue. Workers with more nutritional status and long working period feel headaches, fatigue all over the body, anxiety, legs in the shoulders and back pain during work. This condition is a symptom of work fatigue. This study included quantitative research with an analytical observational type of research. The research design used was cross sectional. The population of this study was all workers of line V production unit at PT X with a total sample of 34 people. The results showed that 26.47% of workers experienced mild work fatigue, 61.77% of workers experienced moderate work fatigue and 11.76% of workers experienced severe work fatigue. There is a significant relationship between working time and work fatigue with a p-value of 0.000 with a value of $r = 0.752$ which shows a strong correlation. In addition, there is also a significant relationship between nutritional status and work fatigue with a p-value of 0.009 with a value of $r = 0.443$ which shows a weak correlation. There is a relationship between the variables of working time and nutritional status with work fatigue. Companies are expected to rotate work by paying attention to the length of work and nutritional status of workers, so as to minimize the occurrence of work fatigue.

Keywords: Working Period; Nutritional status; Work Fatigue; Production unit

1. Introduction

Occupational Safety and Health (OSH) is something that needs to be considered in the workplace. Occupational Safety and Health (K3) aims to create a safe, healthy and comfortable work environment in order to prevent work accidents and occupational diseases (1). The implementation of occupational safety aims to protect and ensure the safety of every worker and other people in the workplace, ensure that every source of production materials can be used safely and efficiently, and to improve national welfare and productivity (2).

The application of occupational safety and health (OSH) needs attention. According to the Work Safety Law Number 1 of 1970, it is stated that every worker has the right to protection for their safety in doing work for the welfare of life and increasing production and work productivity. This is in line with the concept of ergonomic balance which explains that good work capacity can create optimal performance. However, there are still many gaps between work capacity and task demands, causing suboptimal performance such as fatigue, discomfort, stress, injury, etc. (3).

Work fatigue is still prevalent both in the world and Indonesia. Work fatigue is defined as a protective mechanism for the body to be free from further damage so that repair occurs after rest (3). *International Labour Organization* (ILO) data in 2016 shows that 32% of workers in the world experience work burnout. The complaint rate of severe fatigue in workers in the world ranges from 18.3-27% and the prevalence rate in industry is 45% (4).

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Work fatigue is the body's initial response and mechanism in providing protection to avoid interference or more fatal damage. If this situation is not treated immediately, it will lead to worse conditions. The causative factors of work fatigue are divided into internal and external factors. Internal factors include age, nutritional status, length of service as well as external factors namely work environment and workload (5).

Research conducted at PT. Adhi Persada Gedung Bekasi Year 2018 shows that there is a significant relationship between age, length of work, marital status and type of work with work fatigue. The length of work has an influence on a person's performance. The longer the respondent's working period means the heavier the level of work fatigue felt by workers (6). Then, research conducted in the production department at PT X showed that there was a significant relationship between nutritional status and work fatigue. Workers with less nutritional status will experience fatigue faster, drowsiness and less focus in carrying out activities (7). In addition, workers with more nutritional status experience a slowdown in movement which can hamper the workforce in carrying out activities. Workers with abnormal nutritional status are at 5.19 times greater risk of experiencing high category work fatigue than workers with normal nutritional status (4).

PT X is a company engaged in the manufacturing industry, especially the manufacture of concrete. Based on the results of interviews with health and safety environment officers at PT X, it is known that the danger in the production unit is very high, one of which is in line V. Line V is a pile production site with a rotary method. This pathway poses a high risk of physical, psychological and ergonomic hazards. Based on the results of interviews with workers, there are several conditions experienced by workers while doing work such as headaches, fatigue all over the body, anxiety, legs in the shoulders and back pain. This condition is a symptom of work fatigue. Based on the description above, the author is interested in conducting research on the relationship between age and working period with work fatigue in workers in line V production unit PT X.

2. Material and methods

This research includes quantitative research. This type of research is observational analytic. This study aims to analyze the strength of the relationship between variables, namely working period and nutritional status with work fatigue. The research design used was *cross sectional* because independent (free) and dependent (bound) variables were collected and measured at one time period.

This research was conducted at PT X located on Jalan Raya Kejawanan No. 323, Melikan, Kejawanan, Gempol District, Pasuruan, East Java. The study time starts from December - March 2023. The population of this study was all workers of the production unit in line V PT X. The number of samples was 34 taken by *simple random sampling* technique. Data collection is carried out using primary and secondary data. Primary data is obtained from questionnaires, while secondary data is obtained from company profiles. Data processing techniques are carried out by univariate and bivariate analysis using the spearman correlation coefficient test to analyze the strength of the relationship between variables presented in the form of cross-tabulations. The spearman correlation coefficient test is symbolized by rho (ρ) with a classification of strong values of relationships between variables according to Sugiyono (2011) (8).

3. Results and discussion

3.1. The Relationship between Working Period and Work Fatigue

Table 1 Distribution of Work Fatigue by Working Period

Working Period	Work Fatigue						Total	
	Light		Keep		Heavy		n	%
	n	%	n	%	n	%		
≤ 4 years	7	20.59	0	0.00	0	0.00	7	20.59
≥ 4 years	2	5.88	21	61.77	4	11.76	27	79.41
Total	9	26.47	21	61.77	4	11.76	34	100.00

Source: Primary Data, 2023

Based on the results of the study, it can be seen that workers of line V production unit PT X who have a working period of ≤ 4 year's experience mild work fatigue, which is as many as 7 people or 20.59%. Workers who have a working period of ≥ 4 year's experience mild, moderate and severe levels of work fatigue. Workers who experienced mild work fatigue as many as 2 people or 5.88%, moderate fatigue as many as 21 people or 61.77% and workers who experienced severe work fatigue as many as 4 people or 11.76%.

Table 2 The Relationship between Working Period and Work Fatigue

		Working Period	Work Fatigue
Working Period	Correlation coefficient	1.000	0.752
	<i>p-value</i>	34	0.000
	N		34
Work Fatigue	Correlation coefficient	0.752	1.000
	<i>p-value</i>	0.000	
	N	34	34

Source: Primary Data, 2023

Based on the results of the study, it shows that there is a relationship between working period and work fatigue in workers in the PT X production unit. This can be known from the results of the spearman correlation test which obtained a *p-value* of 0.000 (< 0.05) so that statistically it shows that there is a significant relationship between working period and work fatigue. The two variables have a strong correlation as evidenced by the value of $r = 0.752$.

In this study, it can be seen that respondents who experience the most work fatigue have a working period of ≥ 4 years. Fatigue that is felt is light, moderate and severe work fatigue. Respondents who had a working period of ≤ 4 years only felt mild levels of work fatigue. This study shows that there is a significant relationship between working time and work fatigue felt by workers of line V production units at PT X.

Working period is the period of time someone works somewhere. The length of service can affect a person from both sides. The positive side of increasing working years has an influence on one's performance because they have more experience. Conversely, working period can also have a negative influence because the increasing working period can cause boredom in the workforce so that they feel tired of the activities carried out (9).

The results of this study are in line with research conducted by Agustin (2018) which explains that the longer a person works in an agency, during that time feelings of boredom will arise. This will affect the level of fatigue felt by workers (6). This study also agrees with research conducted by Jalil (2019) which states that there is a relationship between working period and work fatigue in PT Nindya Karya Manado construction workers (10). Research conducted by Utami (2018) also states that there is a strong relationship between working period and work fatigue. This was tested on aluminum smelters (11).

This study is different from research conducted by Larasati & Wahyuni (2019) which states that there is no significant relationship between working period and work fatigue. There is no significant relationship between working time and work fatigue because the situation is balanced by existing experience and mental maturity of the worker (11).

3.2. The Relationship between Nutritional Status and Work Fatigue

Based on the results of the study, it shows that workers have diverse nutritional status categories, ranging from thin, normal, fat, and obese. Workers who have underweight nutritional status experience mild and moderate levels of work fatigue. Workers who experienced mild fatigue by 2.94% or as many as 1 person and who experienced moderate work fatigue by 8.83% or as many as 3 people. Workers with normal nutritional status experienced mild and moderate levels of work fatigue. Workers who experienced mild fatigue by 23.53% or as many as 8 people and who experienced moderate work fatigue by 41.18% or as many as 14 people. Workers with obese nutritional status experience moderate and severe work fatigue. Workers who experienced moderate work fatigue by 2.94% or as many as 1 person and who experienced severe work fatigue by 8.82% or as many as 3 people. Workers with obese nutritional status experience

moderate and severe work fatigue. Workers who experienced moderate work fatigue by 8.82% or as many as 3 people and who experienced severe work fatigue by 2.94% or as many as 1 person.

Table 3 Distribution of Work Fatigue by Nutritional Status

Nutritional Status	Work Fatigue						Total	
	Light		Keep		Heavy			
	n	%	n	%	n	%	n	%
Thin	1	2.94	3	8.82	0	0.00	4	11.76
Usual	8	23.53	14	41.18	0	0.00	22	64.72
Fat	0	0.00	1	2.94	3	8.82	4	11.76
Obesity	0	0.00	3	8.82	1	2.94	4	11.76
Total	9	26.47	21	61.76	4	11.76	34	100.00

Source: Primary Data, 2023

Table 4 The Relationship between Nutritional Status and Work Fatigue

		Nutritional Status	Work Fatigue
Nutritional Status	Correlation coefficient	1.000	0.752
	<i>p-value</i>		0.000
	N	34	34
Work Fatigue	Correlation coefficient	0.752	1.000
	<i>p-value</i>	0.000	
	N	34	34

Source; Primary Data 2023

Based on the results of the study, it shows that there is a relationship between nutritional status and work fatigue in workers in the PT X production unit. This can be known from the results of the spearman correlation test which obtained a *p-value* of 0.009 (< 0.05) so that statistically it shows that there is a significant relationship between nutritional status and work fatigue. The two variables have a weak correlation as evidenced by the value of $r = 0.443$.

Based on the results of data analysis, it can be seen that there is a relationship between nutritional status and work fatigue with a strong relationship, which is weak. Most of PT X's production unit workers have normal nutritional status. People with normal nutritional status have better working abilities and capacities and vice versa. Normal nutritional status makes energy that can provide motivation to do activities so that it is not easy to experience fatigue, and remains productive. The body's abnormal nutritional status will be weak and lack of energy so that work ability decreases, easily tired and unproductive and infected with disease and even experience work accidents that have a bad impact on themselves and the company (12). The combination of normal nutritional status and good body condition can help reduce the impact of fatigue on workers so they do not easily feel exhausted. The greater the body mass index (BMI), the faster you will feel work fatigue, the relationship between nutritional status and fatigue has a positive relationship direction (13). So that nutritional status is more caused by the absorption of excess nutritional intake that occurs over a long period of time (9). Workers who have more nutritional status will feel fatigue faster because in the worker's organs there are excessive fat deposits so that when doing work will be more limited due to obstacles in moving, the heart organ can work longer because of the accumulation of fat in blood vessels. While people with malnutrition status have limited energy reserves which will cause insufficient energy needed when working (12). This study is different from Kowaas (2019) which states that there is no relationship between nutritional status and work fatigue. This is known from the results of the spearman rank test with a value of $r = 0.132$ and $p = 0.294$ on fishermen workers in Uwaran Satu Village, Amurang District, South Minahasa Regency (14).

4. Conclusion

Based on the results of research that has been conducted, it can be concluded that workers of line V production units at PT X mostly have a working period of ≥ 4 years with normal nutritional status. The majority of line V production unit workers at PT X experience moderate work fatigue. There is a significant relationship between length of service and nutritional status with work fatigue. Working years have a strong correlation with job burnout, while nutritional status has a weak correlation with work fatigue. Companies are expected to rotate work by paying attention to the length of work and nutritional status of workers, so as to minimize the occurrence of work fatigue.

Compliance with ethical standards

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Conflict of interest statement

No potential conflict of interest was reported by the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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