Correlation between Individual Characteristics and Rest Break with Work-related Fatigue on Telecommunication Network Service Workers

Hubungan Karakteristik Individu dan Waktu Istirahat dengan Kelelahan Kerja pada Pekerja Servis Jaringan Telekomunikasi

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ABSTRACT

Introduction: Work-related fatigue on workers are usually caused by some factors such as individual characteristics (age, work period, nutritional status) and rest break. This research aims to analyze the correlation between individual characteristics and rest break with work-related fatigue on telecommunication network service workers. **Method:** This research used an observational analytic and a cross-sectional approach. The population and sample in this research were all 32 workers at I-OAN unit in a telecommunication network service company. The independent variables in this study were age, work period, nutritional status, and rest break, while the dependent variable was work-related fatigue. Data were obtained throughquestionnaires about individual characteristics (age, work period, nutritional status) and rest break filled by workers. The data were also obtained through the Industrial Fatique Research Committee (IFRC) questionnaires filled by workers. All of the data in this study were analyzed with the Spearman correlation test ($\alpha = 0.05$). **Results:** The majority of I-OAN unit workers are in the age range of 25-29 years (46.9%), have 3-4 years of work period (56.2%), and have normal nutritional status (40.6%). For the rest break variable, there are16 workers (50%) who have <30 minutes rest break and also 16 workers (50%) who have ≥ 30 minutes rest break. **Conclusion:** There is a correlation between individual characteristics and rest break with work-related fatigue on telecommunication network service workers.

Keywords: individual characteristics, rest break, work-related fatigue

ABSTRAK

Pendahuluan: *Kelelahan kerja pada pekerja biasanya disebabkan oleh beberapa faktor yaitu usia, masa kerja, status gizi, dan lamanya waktu istirahat pada pekerja. Penelitian ini bertujuan untuk mempelajari hubungan antara karakteristik individu (usia, masa kerja, status gizi) dan waktu istirahat dengan keluhan kelelahan kerja pada pekerja servis jaringan telekomunikasi.* ***Metode:*** *Penelitian ini termasuk dalam analitik observasional dan menggunakan pendekatan crosssectional. Populasi dan sampel penelitian ini adalah seluruh pekerja Unit I-OAN di perusahaan layanan jaringan telekomunikasi yang berjumlah 32 pekerja. Variabel bebas dalam penelitian ini adalah usia, masa kerja, status gizi, dan waktu istirahat, sedangkan variabel terikat adalah keluhan kelelahan kerja. Data dalam penelitian ini diperoleh dengan cara pengisian kuesioner tentang karakteristik individu (usia, waktu kerja, dan status gizi) dan waktu istirahat serta kuesioner Industrial Fatique Research Committe (IFRC) oleh pekerja. Seluruh data yang diperoleh dalam penelitian ini dianalisis menggunakan uji korelasi Spearman ($\alpha = 0.05$)* ***Hasil:*** *Sebagian besar pekerja unit I-OAN berusia 25-29 tahun (46,9%), memiliki masa kerja 3-4 tahun (56,2%), dan memiliki status gizi normal (40,6%). Terdapat 16 pekerja (50%) yang memiliki waktu istirahat <30 menit dan 16 pekerja (50%) juga memiliki waktu istirahat ≥ 30 menit.* ***Simpulan:*** *Terdapat hubungan antara karakteristik individu dan waktu istirahat dengan kelelahan kerja pada pekerja servis jaringan telekomunikasi.*

Kata kunci: *karakteristik individu, kelelahan kerja, waktu istirahat*

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INTRODUCTION

Basically, a workplace that wants to achieve its objectives optimally must pay attention to the most basic things, namely the quality of its human resources or labor. Based on Law No. 13 of 2003 about Manpower, a worker is every person who is

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able to afford some goods and/or services to fulfill the community needs and their own necessity. It is one important asset in the company because of its strategic activities in achieving the company's goals. Without a qualified workforce, the company will surely find it difficult to achieve its goals (President of the Republic of Indonesia, 2003).

The workers' important role in company's success has been proven by the existence of Law No. 13 of 2003 about Manpower which states that workplace managers are required to comply with occupational health standards and ensure a healthy work environment. Law No. 13 of 2003 about Manpower, Article 86 Paragraph 1 on Labour states that every worker has rights to occupational safety and health ((President of the Republic of Indonesia, 2003).

Therefore, a workplace must pay attention to occupational safety and health and do their best so that their workers are protected from work accidents and occupational diseases that could harm the workplace itself. Work-related fatigue is now included as a disease in the International Classification of Disease 11th Revision (World Health Organization, 2019). Thus, work-related fatigue can be said as one of the occupational diseases.

Work-related fatigue as a disease caused by work should not be underestimated as it could negatively impact workers' performance, safety, and health (Völker, Kirchner and Bock, 2016). Besides, fatigue is a human error that could lead to some accidents (Chang, Yang and Hsu, 2019). It also comes from a disproportion between work intensity, duration, and time with recovery period (Dawson et al., 2011).

The International Labour Organization (ILO) records over 250 million workplace mishaps and 160 million work-related illnesses caused by workplace hazards annually. Moreover, 1.2 million deaths are caused by work related mishaps and illnesses. A 2013 International Labour Organization research find that out of 58,118 samples, around 18,828 samples experience exhaustion, affecting 32.8% of their work productivity. One cause of the high number of work accidents is fatigue which contributes 50% to the occurrence of work accidents (Maurits, 2010).

Work-related fatigue is reportedly happens from around <10% to >40% (Ho et al., 2013). It can be caused by schedules, workloads, minimal or no recess time, and constant overtime (Hazzard et al., 2013). Work-related fatigue is a body defence mechanism to prevent further damage, resulting in recovery after rest. Fatigue usually displays different signs, but all lead to an efficiency, work capacity, and endurance deprivation (Tarwaka, 2015).

Work-related fatigue does not suddenly arise, but it is caused by numerous factors like age, work period, nutritional status, rest break, physical workload, mental workload, work environment, and health conditions, among many others. (Maurits, 2010). The inappropriate working hour is also being the one of the major factors that can cause a work-related fatigue (Ahmed et al., 2016). Work-related fatigue is dangerous for health if it is cumulative because it would lead to the weariness, blurred vision, followed by lethargy and a lack of motivation (Leme and Maia, 2015).

Every worker who experiences work-related fatigue would initially feel the symptoms of fatigue. However, the symptoms of work-related fatigue will differ from one individual to another because of different physical and mental capacities. In general, there will be several symptoms such as heavy head, physical fatigue, heavy legs, yawning, constant urge to lie down, chaotic mind, and so on with a total of 30 signs of work-related fatigue (Suma'mur, 2009).

If the company does not actively take measures to prevent work-related fatigue, it will adversely affect workers' health. Tarwaka (2015) states that there are several consequences arise when the workers feel some fatigue, like having low motivation and work performance, low work quality and productivity, low accuracy, work stress, work-related illnesses, injuries, and accidents. Work-related fatigue can also reduce workers' ability to perform their tasks well and also cause a decrease in motivation, which may affect their work abilities (Vasconcelos et al., 2011). To avoid various adverse effects on health due to work-related fatigue, it is necessary to take precautions. One of them is by measuring work-related fatigue in workers. This can be done by creating a program that can reduce the risk of work-related fatigue.

Measuring fatigue can be done through recording subjective feelings through questionnaires, such as The Subjective Self Rating Test (Tarwaka, 2015). This subjective fatigue measurement adopted from IFRC Japan is more to assess general fatigue, which includes 30 symptoms of fatigue experienced by workers, divided into three groups: activities weakening, motivation weakening, and physical weakness.

This research was located in a subsidiary of PT. Telekomunikasi Indonesia that focuses on the service for the telecommunication network. One of

the company's units in telecommunication network service is the Integrated Operation Access Network (I-OAN), which specializes in the operational field, so workers must directly go to the field. Workers in I-OAN unit work in teams, where 1 team consists of 2 people. All workers spend more time outside the office repairing damaged networks or doing network maintenance in accordance with customer complaints every day.

Workers in I-OAN unit at telecommunication network service company have uncertain working time due to the nature of their work, which has to meet daily targets. Therefore, workers are not allowed to go home if they have not achieved their daily targets. In addition, it is not uncommon for them to get additional assignments, so they have to work overtime.

Workers in I-OAN unit also have erratic rest break. This is because they work in the field, so their rest break is limited and varies every day depending on the conditions and their work progress on that day. Furthermore, they prefer to finish their work first and then take a break as not to disappoint the customer.

The purpose of this research is to study the correlation between individual characteristics and rest break with work-related fatigue among workers in telecommunications network service.

METHODS

This research was observational analytic research, conducted by observing or not giving treatment to respondents or research objects. This research also used a cross sectional study design because the data collectionwas done in a specific period.

This research was conducted in one telecommunication network service company in Madiun. The research and data collection were carried out in December 2019. The population and sample in this study were 32 workers in I-OAN unit at the telecommunication network service company. The variables studied were age, work period, nutritional status, rest break, and work-related fatigue.

The primary data were obtained by distributing questionnaires to workers and interviewing respondents directly for additional data. This study used research instruments such as questionnaires on individual characteristics (age, work period, nutritional status), questionnaires on rest break, and Industrial Fatique Research Committee (IFRC). Meanwhile, the secondary data were obtained from the data of the telecommunication network service companyand interviews to Health, Safety and Environment staff. The data were analyzed in two stages, descriptive analysis and analytic analysis. Descriptive analysis is a frequency distribution table of each research variable. Meanwhile, the analytic analysis tests the correlation between individual characteristics and rest break with work-related fatigue. This analytical or bivariate analysis used the Spearman correlation test with 95% significance level (CI). The ethical test for this research is No.760/HRECC.FODM/XII/2019.

This research used the all populated sampling method, so it can determine the strength of the correlation and the direction of the correlation between variables by looking at the correlation coefficient values obtained from the Spearman correlation test.

RESULTS

Age

As seen on Table 1, the age variable is divided into five groups. From these groups, it is found that the highest number of workers, 15 respondents (46.9%), is in the age group of 25 to 29 years old. It can also be seen that there are a small number of workers aged more than 30 years old.

Work Period

Table 2 shows that the work period from respondents is categorized into three groups. From these categories, it is found that the majority of respondents as many as 18 workers (56.2%) have a 3 to 4 year work period.

Table 1. Age Distribution of I-OAN Unit Workers in the Telecommunication Network S ervice Company in 2019

Age (year)	Frequency (n)	Percentage (%)
20-24	12	37.5%
25-29	15	46.9%
30-34	3	9.4%
35-39	1	3.1%
40-44	1	3.1%
Total	32	100%

Nutritional Status

Based on Table 3, the nutritional status is categorized into 4 groups: underweight nutritional status, normal nutritional status, class 1 obesity, and class 2 obesity. Based on the calculation results, the majority of workers, 13 respondents (40.6%), have normal nutritional status.

Rest Break

Based on Table 4, the rest break is classified into 2 categories: <30 minutes and ≥ 30 minutes. In addition, based on the questionnaire results, the number of workers who have a rest break <30 minutes and ≥ 30 minutes is 16 people each in each category.

Work-related Fatigue

Based on Table 5, there are 4 categories in work-related fatigue: low, moderate, high, and severe. Based on the calculation results, there are 18 workers (56.2%) who experience a high level of work-related fatigue, making it the highest number.

The Correlation between Age and Work-related Fatigue

From Table 6, the results show that in the age category of 20-24 years old, the highest number of workers experience a moderate levelof work-related fatigue, as many as 5 workers (41.7%) from the I-OAN Unit. Meanwhile, in the age category of 25-29 years old, the majority of workers, 12 workers (37.5%), experience a high level of work-related fatigue. Similarly, among workers aged 30-34 years old, about 2 of them (6.3%) have work-related fatigue on the high level. Meanwhile, among workers aged 35-39 years old and 40-44 years old, there is one worker who experiences a very high level of work-related fatigue.

Spearman's correlation test was used to analyze and find the strength of the correlation between age and work-related fatigue among I-OAN Unit workers. The results show the coefficient correlation between this variable is 0.718 (r = 0.718).It means that the correlation between age and work-related fatigue among I-OAN Unit workers is very strong. Furthermore, the results show a positive direction, which means the older the age of the workers, the higher the level of work-related fatigue.

The Correlation between Work Period and Work-related Fatigue

It can be seen from Table 7 that among workers having 1 to 2-year work period, the majority of them, 3 workers (9.4%), experience high work-related fatigue. Likewise, among workers having 3 to 4 year-work period, the majority of them, 10 workers (31.3%), also experience work-related fatigue in the high level. Similarly, among workers

Table 2. Work Period Distribution of I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Work Period (year)	Frequency (n)	Percentage (%)
1-2	6	18.8%
3-4	18	56.2%
5-6	8	25.0%
Total	32	100%

Table 3. Nutritional Status Distribution of I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Nutritional Status	Frequency (n)	Percentage (%)
Underweight	7	21.9%
Normal	13	40.6%
Class 1 Obesity	8	25.0%
Class 2 Obesity	4	12.5%
Total	32	100%

Table 4. Rest Break Distribution of I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Rest Break	Frequency (n)	Percentage (%)
< 30 minutes	16	50%
≥ 30 minutes	16	50%
Total	32	100%

Table 5. Work-related Fatigue Distribution of I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Work-related Fatigue	Frequency (n)	Percentage (%)
Low	3	9.4%
Moderate	6	18.8%
High	18	56.2%
Severe	5	15.6%
Total	32	100%

having 5 to 6 year-work period, the majority of whom, 5 workers (15.6%) experience a high levelof work-related fatigue.

The correlation value from Spearman correlation test shows the value of 0.454 (r = 0.454), which means that the correlation between work period and work-related fatigue among I-OAN Unit Workers is strong. Also, the direction of correlation is positive, which means the longer the service workers have, the higher the level of work-related fatigue they experience.

The Correlation between Nutritional Status and Work-related Fatigue

As seen on Table 8, in underweight nutritional status, the highest number of workers, 4 workers (12.5%), experience high work-related fatigue. Similary in normal nutritional status the highest number of workers, 6 workers (18.8%), also experience work-related fatigue on the high level. Furthermore, in class 1 obesity nutritional status, the highest number of workers, 7 workers (21.9%), experience a high level of work-related fatigue. Interestingly, in class 2 obesity nutritional status category, the highest number of workers, 2 workers (6.3%), have work-related fatigue on the very high level.

The value coefficient correlation between the variables is 0.371 (r = 0.371), which means that the nutritional status and work-related fatigue of I-OAN Unit workers in the telecommunication network service company has a weak correlation with positive direction. The higher the level of nutritional status, the higher the level of work-related fatigue

The Correlation between Rest Break and Work-related Fatigue

Based on the results that are shown in Table 9, the highest number of workers with <30 minutes rest break per day, 13 of them (40.6%), experiencehigh work-related fatigue. Meanwhile, the highest number of workers with ≥ 30 minutes rest break per day, 6 of them (18.8%), experienced moderate work-related fatigue.

Spearman correlation test results indicate a weak correlation between rest break with work-related fatigue in I-OAN unit workers in the telecommunication network service company with correlation coefficient value of -0.289 (r = -0.289). Thus, it can be concluded that, the less rest break taken by workers, the higher the level of work related fatigue.

Table 6. Correlation between Age and Work-related Fatigue on I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Age (years)	Work-related Fatigue								Total	
	Low		Medium		High		Very High			
	n	%	n	%	n	%	n	%	N	%
20 – 24	3	25	5	41.7	4	33.3	0	0	12	37.5
25 – 29	0	0	1	3.1	12	37.5	2	6.3	15	46.9
30 – 34	0	0	0	0	2	6.3	1	3.1	3	9.4
35 – 39	0	0	0	0	0	0	1	3.1	1	3.1
40 – 44	0	0	0	0	0	0	1	3.1	1	3.1
Total	3	9.4	6	18.7	16	56.3	5	15.6	32	100

Table 7. Correlation between Work Period and Work-related Fatigue on I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Work Period (years)	Work-related Fatigue								Total	
	Low		Medium		High		Very High			
	n	%	n	%	n	%	n	%	N	%
1 – 2	1	3.1	2	6.2	3	9.4	0	0	6	18.7
3 – 4	2	6.3	4	12.5	10	31.3	2	6.3	18	56.3
5 – 6	0	0	0	0	5	15.6	3	9.4	8	25
Total	3	9.4	6	18.7	18	56.3	5	15.7	32	100

Table 8. Correlation between Nutritional Status and Work-related Fatigue on I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Nutritional Status)	Work-related Fatigue								Total	
	Low		Medium		High		Very High			
	n	%	n	%	n	%	n	%	N	%
Underweight	1	3.1	2	6.3	4	12.5	0	0	7	21.9
Normal	2	6.3	3	9.4	6	18.8	2	6.3	13	40.6
Class 1 Obesity	0	0	0	0	7	21.9	1	3.1	8	25
Class 2 Obesity	0	0	1	3.1	1	3.1	2	6.3	4	12.5
Total	3	9.4	6	18.8	18	56.3	5	15.7	32	100

Table 9. Correlation between Rest Break and Work-related Fatigue on I-OAN Unit Workers in the Telecommunication Network Service Company in 2019

Rest Break (minute)	Work-related Fatigue								Total	
	Low		Medium		High		Very High			
	n	%	n	%	n	%	n	%	N	%
< 30	1	3.1	0	0	13	40.6	2	6.2	16	50
≥ 30	2	6.3	6	18.8	5	15.6	3	9.4	16	50
Total	3	9.4	6	18.8	18	56.2	5	15.6	32	100

DISCUSSION

The Correlation between Age and Work-related Fatigue

The worker's age in this research refers to the age of the individual from the time when he was born. The higher the workers' age, the higher the maturity and strength in thinking and working. In Indonesia, the productive age limit is between 15 to 64 years old (Sukmaningrum and Imron, 2017). Based on the research results of I-OAN unit workers in the telecommunication network service company, the youngest workers are in the range of 25-29 years old, while the oldest workers are in the range of 40-44 years old.

A very strong correlation between age and work-related fatigue is found in I-OAN unit workers in the telecommunication network service company. The most common work-related fatigues are in the 25-29 age range with a total of 12 workers experiencing high work-related fatigue. This is because this telecommunication network service company prioritizes the recruitment of young workers who are expected to be able to fulfill the high workload and physical demand to work in the field. In addition, the staffing system is using a contract system where contract extension is decided annually by reviewing the skills and integrity of workers in carrying out their tasks.

However, there are a few elderly workers who are still employed because they have more field experience, so they are expected to set an example for their juniors. Workers aged over 40 years old tend to experience increased fatigue when compared to workers under the age of 40 years old. This is due to the organ degeneration process. Someone at the age of 40-49 years old usually begins to suffer from a disease.

Work capacity, including mental and social function capacities, will decrease towards the age of 40 years old. This is in line with Maurits's study (2010) which states that the older a person is, the weaker his muscle strength, which results in fatigue. This is consistent with Suma'mur PK (2009) who says that age also causes work-related fatigue. This statement is further supported by previous research conducted by Kanajmi, Zuki and Uker (2017) which states that the correlation between age and work-related fatigue is strong. Meanwhile, the direction of the correlation coefficient in the study is also unidirectional, which means that the older the workers are, the hgher the the level of work-related fatigue they feel.

Budiman, Husaini and Arifin (2017)also state that correlation between age and the work-related fatigue occurrences is strong. The correlation is unidirectional or positive, so it is known that if the workers are getting older, their level of work-related fatigue would be higher.

The Correlation between Work Period and Work-related Fatigue

Work period is the time that has been calculated since the workers' first entrance until the research was carried out. From this research, it can be known that work period with work-related fatigue has a strong correlation. Furthermore, it is known that the most common work-related fatigue occurs in workers who have a work period of 3-4 years with high levels of work-related fatigue, as many as 10 people. Workers in the I-OAN unit in this telecommunication network service company are contract workers who have their contract renewed every year, so the average working period is 3-4 years.

Maurits (2010) states that someone who works in a long work period will be more experienced. People who work long hours are already accustomed, so it does not cause work-related fatigue for them

However, this opinion is not in accordance with the conditions of I-OAN unit workers in this telecommunication network service company. This is because they are still eager to complete all tasks in their work. Since they are young, their physical and mental capacity are still in top condition. This is consistent with the interview results.

Based on the observations, workers who have worked for 5 to 6 years are old enough, so they feel work-related fatigue quicker. The work period can also have a negative influence, like fatigue and boredom. The longer the work, the bigger the pressure that causes reduced muscle performance and lower movement (Melissa and Dwiyanti, 2015).

This corresponds with a research result by Pratiwi (2018), who states that the correlation between work period and work-related fatigue is also strong. In addition, in this study the correlation between these variables is positive, so the longer the work period of workers, the higher the level of work-related fatigue.

The Correlation between Nutritional Status and Work-related Fatigue

Nutritional status is measured by Body Mass Index (BMI). The lowest nutritional status possessed by workers in this research is underweight, while the highest nutritional status owned by workers is class 2 obesity. It can be seen that most of the I-OAN unit workers in the telecommunication network service company who experience work-related fatigue are workers who have normal nutritional status, as many as 13 people. In this study, it is known that nutritional status and work-related fatigue has a weak correlation.

This telecommunication network service company does not provide lunch for I-OAN unit workers, so their nutritional status varies due to the consumption differences each day. In addition, different body anthropometry also affects workers' nutritional status. They pay small attention to food intake because they must focus on achieving daily work targets. They also state that sometimes they skipp lunch while on a break.

Such conditions are harmful in the long term because according to Suma'mur PK (2009), providing opportunities to eat during break will help improve productivity and reduce the work-related fatigue occurences. Even though I-OAN unit workers who experience work-related fatigue are still categorized in a normal category, there is still a need for the company to give care about their workers' nutritional status.

This is consistent with the statement from Suma'mur PK (2009) which reveals that an underweight person is less likely to change the nutrient reserves into energy during activities. In fact, nutrition improvement and enhancement is very important in improving health and work productivity. Research by Verawati (2017) and Rahmawati and Tualeka (2019) also conclude a weak correlation between these variables.

The Correlation between Rest Break and Work-related Fatigue

A rest break is a period between shifts to get recovered from the mental and physical fatigue that has been accumulated during the workday (Wendsche et al., 2017). From this research, it is known that workers who have a rest break <30 minutes mostly experiencing work-related fatigue. This is in accordance with Maurits (2010), who states that one factor causing the emergence of work-related fatigue is the length of rest break given.

Half an hour rest after 4 hour work is very important for both the recovery of physical and mental capacity as well as energy replenishment from food (Suma'mur, 2009). Work activities cannot be carried out continuously, but they must be given interludes to give the body a chance to recover. When resting, the human body will replace the amount of energy that has come out.

The good rest break schedule should be implemented in this telecommunication network service company to prevent the work-related fatigue. The good rest break schedule is by giving ≥30 minutes rest break time after having 4 hour work to their (President of the Republic of Indonesia, 2003). For the effectiveness of a rest time schedule, the company should examine and control the nature activities conducted during the rest break (Sheahan, Diesbourg and Fischer, 2016).

The result of this study is similar to a research conducted by Rohmah (2017) that finds a weak correlation between a rest break and subjective work-related fatigue. However, there are differences in the direction of the correlation, where a research by Rohmah (2017) states that there is a positive direction between the two, so the longer the rest break taken by workers, the higher work-related fatigue experienced.

CONCLUSION

The I-OAN unit workers in the telecommunication network service company are mostly 25-29 years old. Most workers have a work period of 3-4 years and have a normal nutritional status. There is also the same number of workers in <30 minutes and ≥ 30 minutes of rest break. Furthermore, work-related fatigue that is most commonly experienced by workers is on a high level.

The correlation between age and work-related fatigue is very strong and direct. Besides, there is also a strong and direct correlation between work period and work-related fatigue. In contrast, the nutritional status has a weak and direct correlation with work-related fatigue. Meanwhile, the rest break and work-related fatigue has a weak correlation and is in the opposite direction.

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