Analysis of Factors Associated with Work Fatigue of Maintenance Workshop Workers at PTPN XIV Nusantara Camming Sugar Factory

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A R T I C L E I N F O	A B S T R A C T
  	This research is a descriptive study, aiming to determine the relationship between nutritional status, work attitudes, workload and work period on work fatigue of PG Maintenance Workshop employees. Camming. The sample was 80 respondents selected by random sampling. The data collected includes work fatigue, nutritional status, work attitudes, and length of service. Data were analyzed using the Chi-Square test to see the relationship between each variable. The research results showed that high fatigue was 60.63% of respondents and moderate fatigue was 39.37% of respondents. Thus, there is a relationship between nutritional status (p = 0.016), work attitude (p = 0.024), workload (p = 0.044) and length of service (p = 0.021) with work fatigue of PG Camming Maintenance Workshop employees. Shows that there is a significant relationship between nutritional status, work attitude, workload and work period on work fatigue of PG Maintenance Workshop workers. Camming

INTRODUCTION

Technological developments that have occurred in the millennial era have increased very rapidly in almost all aspects of people's lives, especially in the industrial sector. The era of industrialization that is experiencing the industrial revolution 4.0 requires companies and workers/employees to adapt quickly so that they are not left behind in the use of more sophisticated production equipment and work tools. The industrial revolution 4.0 does not only refer to technological tools but also touches on the occupational health and safety aspects of OHSAS (Occupation Health and Safety Assessment) which are increasingly being improved.

Philosophically, occupational safety and health is defined as an idea and effort to ensure the integrity and perfection of the workforce and humans in general (both physical and spiritual), the results of work and culture towards a just, prosperous and prosperous society. Scientifically, occupational safety and health is defined as a science and its application in efforts to prevent accidents, fires, explosions, pollution, disease, and so on (Budiono, et al. 2018).

Article 1 of the Employment Law No. 13 of 2003 concerning Employment confirms that everything related to workers before, during and after the period of employment. Employment aims to empower and utilize the workforce optimally and humanely, realizing equal employment opportunities and providing labor in accordance with national and regional development needs, providing protection to workers in realizing prosperity, and improving the welfare of workers and their families. Management of the implementation of K3 can be carried out if in a company there is cooperation between the leadership and the workforce to minimize the occurrence of work accidents, work-related accidents do not only occur from external factors but are sometimes influenced by internal factors for each employee who does not comply with the management of implementing K3 In companies, the implementation and supervision of K3 is not yet optimal, as well as people's behavior which is not yet optimal, which is one of the causes of work accidents that are often encountered, namely fatigue.

Based on data from the International Labor Organization (ILO) (2018), it is estimated that every year 2.78 million workers die due to workplace accidents or occupational diseases, and more than 374 million people are injured or fall ill every year due to work accidents. Based on the National Labor Force Survey, it shows that as many as 38.29 million people work in the industrial sector, on average most of them experience work fatigue due to various factors (Central Statistics Agency, 2016). Work accident data based on BPJS Employment in the last 3 years, in 2017 there were 123,367 work accident cases, in 2018 there were 173,415 work accident cases, while in 2019 there were 130,432 work accident cases. Work accident cases in the plantation sector averaged 47,5400 cases (35%), work accidents caused by work fatigue were around 43% (BPJS Employment, 2019).

Research results show that excessive work fatigue can cause a worker to experience a work accident, either light or serious (Ningsih and Neffrety (2018). A worker at the Camming Sugar Factory plantation had a work accident while lifting sugar cane because of fatigue resulting in a fall from the car resulting in fractures in the calf, apart from that, sometimes employees slip in the Maintenance Workshop area when carrying out repairs and lifting work objects (PG Camming Polyclinic (2020). Research conducted by Saris, et al (2017) shows that out of 60 PT plantation workers .Ogan Sekayu Mitra Plantation, 70% of the workforce experienced fatigue and 30% did not experience fatigue.

Based on the results of initial observations carried out at PT. Perkebunan Nusantara XIV PG Camming, data was obtained regarding work accidents in the company caused by fatigue. From the data obtained in 2016-2018, there were 8 work accidents. 3 people had sprained ankles, 2 people had broken arms, and 3 people had scratches on their arms. Accident insurance provided by the Company in total is 15 million PG Camming Polyclinics (2020). There have been 5 work accidents that occurred in 2019 until now. 2 people suffered broken legs, and 3 people suffered minor injuries to their hands. Work accident guarantee of 8 million (PG Camming Polyclinic, 2020).

The work fatigue experienced by every worker at PG Camming in the Maintenance Workshop sector is of course influenced by several factors. The results of previous research show that work fatigue generally occurs in companies in the work environment inside and outside the factory. Based on the background that has been stated, the formulation of the problem in this research is, is there a relationship between nutritional status and work fatigue of Workshop sector workers in PG Camming, is there a relationship between work attitudes and work fatigue of Workshop sector workers in PG Camming, is there a relationship with load status? work and work fatigue of Workshop sector workers in PG Camming, is there a relationship between work experience and work fatigue of Workshop sector workers in PG Camming.

LITERATURE REVIEW

In general, work fatigue is a condition that arises due to individual activities so that the individual is unable to work. Work fatigue is a condition experienced by workers which can result in a decrease in work vitality and productivity. Fatigue is a common complaint in the general public and the working population. Work fatigue can be characterized by decreased work performance or all conditions that affect all organism processes, including several factors such as feelings of work exhaustion (subjective feeling of fatigue), decreased motivation, and decreased mental and physical activity (Setyowati, et al. 2015). In the Big Indonesian Dictionary (KBBI, 2020), fatigue comes from the word tired which means tired, tired, tired, lethargic and lack of energy. Fatigue is a matter (state of) tiredness, tiredness, exhaustion. Work fatigue cannot be defined clearly but can be felt as a feeling of work fatigue accompanied by a prominent change in reaction time, so indicators of feelings of work fatigue and reaction time can be used to determine the presence of work fatigue. Feelings of

work fatigue are subjective symptoms of work fatigue that employees complain about, which are all unpleasant feelings (Tarwaka, 2015).

According to Ningsih and Neffrety (2018), work fatigue is one of the problems in the K3 sector which is a risk factor for work accidents. Factors that cause fatigue include individual workforce factors, work factors and also environmental factors. A very large workload sometimes requires long working hours so that sometimes the workforce ignores the work fatigue they experience. The problem of work fatigue deserves special attention. Fatigue in the workforce that is not resolved will have a negative effect on the company, work and the workforce itself. Work fatigue can result in work accidents which result in personal losses, losses to the company and decreased work motivation for other workers. This correlates with the amount of compensation paid by companies through the BPJS Employment program, in 2015 the compensation paid was around 9.6 billion, in 2016 around 10.37 billion and in 2017 there was an increase of 12.09 billion. This data shows that the impact of work accidents does not only harm the individual physically but also harms the company in quite large material ways and reduces the company's productivity.

According to Budiono, et al (2018), based on the process of work fatigue, it can be divided into two, namely muscle fatigue and general fatigue. Muscle Fatigue Muscle fatigue can be seen in external signs. This is because muscle performance decreases with increasing muscle tension so that stimulation no longer produces a certain response. General fatigue is a feeling of extreme tiredness that feels unusual. All activities become disrupted and hampered due to the appearance of symptoms of fatigue. There is no passion for work both physically and psychologically, everything feels heavy. More clearly, Sedarmayanti (2015) stated that basically work fatigue experienced by every individual is caused by two factors, namely; Physical fatigue is fatigue that arises due to physical changes in the body where the human body can be considered as a machine that can make fuel and provide useful output for carrying out activities. Fatigue due to psychological factors can be interpreted as false fatigue, which arises in the feelings of the person concerned and is seen in his behavior or opinions that are no longer consistent, as well as his soul being unstable with changes even in environmental conditions or his own condition. Amalia & Widajati (2019), fatigue can occur as a result of various factors which may be related to work, lifestyle, or a combination of both.

The occurrence of work fatigue is influenced by several factors resulting from the individual himself, both internal and external factors that can indirectly influence work fatigue. According to Suma'mur (2014) there are several factors that influence work fatigue, namely; Internal factors include age, gender, nutritional status and health status, while external factors include work period, work load, work shifts and physical work environment. According to Budiono, et al (2018) work fatigue experienced by each worker causes different symptoms depending on the condition of each individual, the symptoms that often occur are as follows; feelings of lethargy, sleepiness and dizziness, no or less ability to concentrate, reduced level of alertness, poor and slow perception, no or reduced passion for work, and decreased physical and spiritual performance.

Work fatigue can be minimized or even eliminated from each workforce through various approaches or ways of dealing with the impact of work fatigue, but there needs to be continuous cooperation between the company and the workforce. According to Tarwaka (2015), ways to prevent work fatigue can be done in the following ways; according to physical work capacity, according to mental work capacity, redesign of ergonomic work stations, natural work attitudes, more dynamic work, more varied work, redesign of the work environment, reorganization of work, balanced calorie needs, and rest every 2 hours. Nutritional status is a factor that exists at the individual level, a factor that is directly influenced by the number of types of food intake and infection conditions. It is also defined as the physical condition of a person or group of people which is determined by a combination of certain nutritional measurements, Supariasa (2016). One of the occupational health and safety problems that workers often experience is ergonomics, especially in terms of work attitudes. The application of ergonomics has the principle that all work activities can cause workers to experience physical and mental stress. Ergonomics ensures that this pressure remains within tolerance limits, performance results are satisfactory, and the health and welfare of the workforce can improve. If the pressure experienced by workers is excessive, undesirable things can happen, such as errors, accidents, injuries, or an increase in physical and mental burden Budiono, et al (2018).

Meanwhile, according to Suma'mur (2016), workload is something that arises from the interaction between the demands of work environment tasks which are used as co-workers, skills, behavior and perceptions of the workforce. Workload can take the form of task or job demands, organization and work environment. If the workforce's abilities are higher than the job demands, feelings of boredom will arise. Work period is the length of time a worker works in a company from the first time the worker comes to work until the time the research takes place. According to Sedarmayanti (2015) length of service is one of the factors included in the occupational health science component.

METHODOLOGY

This research is a descriptive study which aims to determine the relationship between nutritional status, work attitudes, workload and length of service with work fatigue of the workforce. This research took place at PG Camming, Bone Regency, carried out from 7 September 2023 to 7 October 2023. The sample for this research was 80 PG Camming Maintenance Workshop workers using proportional random sampling techniques. Instrument validation uses content validation and a reliability test is carried out. Data collection uses questionnaires, documentation and observation. The data analysis used is descriptive analysis techniques to determine the description of each variable, and inferential analysis techniques to determine the correlation and significance of the two variables using normality tests, linearity tests and hypothesis tests.

RESULTS AND DISCUSSION

1. Respondent Characteristics

The characteristics of respondents include gender, age group, and the respondent's latest education can be seen in the following table.

A. Characteristics of Respondents Based on Gender

Table 1. Distribution of Respondents Based on Gender at the PG Camming Maintenance Workshop

Jenis Kelamin	(n)	(%)
Laki – Laki	74	92,5
Perempuan	6	7,5
Total	80	100

Source: Primary Data, 2023

Shows that the greater number of respondents were male, 74 respondents (92.5%), while the number of female respondents was 6 respondents (7.5%).

B. Characteristics of Respondents Based on Age

Table 2. Distribution of Respondents Based on Age at the PG Camming Maintenance Workshop

Umur	(n)	(%)
Muda (Umur <35 Tahun)	36	45
Tua (Umur ≥35 Tahun)	44	55
Total	80	100

Source: Primary Data, 2023

Shows that the most common age group is old age with 44 respondents (55%), while the young age group has 36 respondents (45%).

C. Characteristics of Respondents Based on Education

Table 3. Distribution of Respondents Based on Education at the PG Camming Maintenance Workshop

Pendidikan Terakhir	(n)	(%)
SD	13	16,3
SMP	19	22,8
SMA	25	31,3
S1	23	28,8
Total	80	100

Source: Primary Data, 2023

Shows that the highest level of education is high school, 25 respondents (31.3%), 23 (28.8%) have a bachelor's degree, 19 (22.8%) have a junior high school education, while 13 (16.3%) have an elementary school education.).

2. Univariate Analysis
a. Distribution of Respondents According to Work Fatigue

Figure 1. Respondents According to Work Fatigue
Source: Primary Data, 2023

Figure 1. Shows that 37 respondents (46.3%) experienced high fatigue, while 43 respondents (53.7%) experienced fatigue.

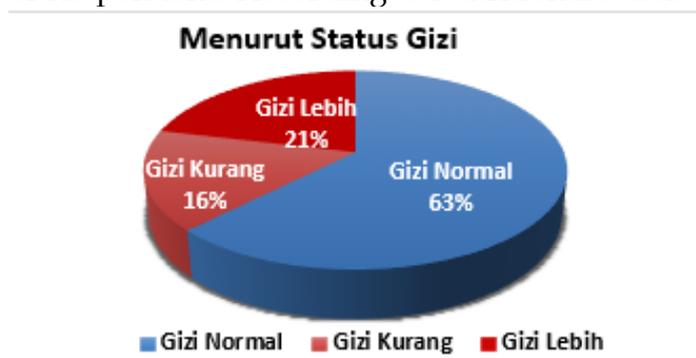B. Distribution of Respondents According to Nutritional Status

Figure 2. Respondents According to Nutritional Status
Source: Primary Data, 2023

Figure 2. Shows that there were 50 respondents (62.5%) in the normal nutrition category, 17 respondents (21.3%) in the over-nutrition status category, and 13 (16.3%) in the under-nutrition category.

C. Distribution of Respondents According to Work Attitudes

Figure 3. Respondents According to Work Attitudes
Source: Primary Data, 2023

Figure 3 shows that 41 respondents (51.25%) worked with non-ergonomic work attitudes, and 39 respondents (48.75%) worked with ergonomic work attitudes.

D. Distribution of Respondents by Workload

Figure 4. Respondents by Workload
Source: Primary Data, 2023

Figure 4. Shows that there are 35 respondents in the light workload category (43.75%), the workload category is 25 respondents (25%) and the high workload category is 20 respondents (25%).
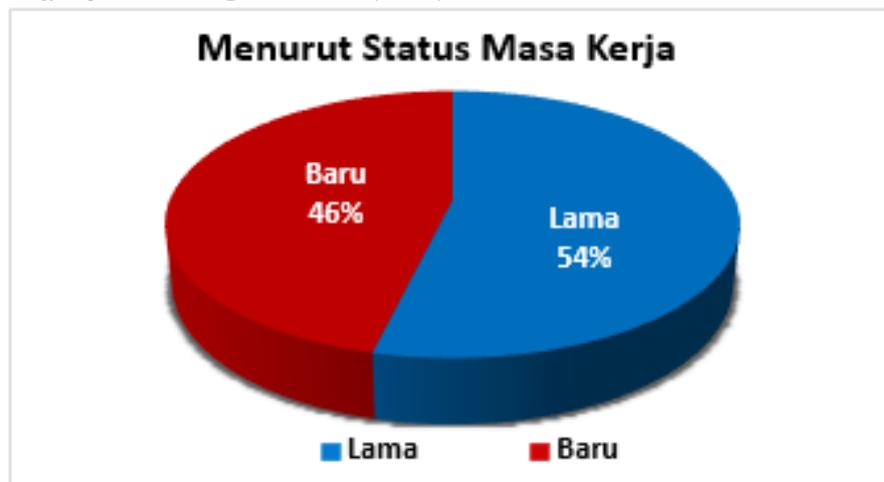

Figure 5. Respondents by Years of Work
Source: Primary Data, 2023

Figure 5. Shows that there were 43 respondents in the new work period category (53.75%), and 37 respondents in the long work period category (46.25%).

3. Bivariate Analysis

a. Relationship between Nutritional Status and Work Fatigue

Table 4. The Relationship Between Nutritional Status and Work Fatigue of Manitenence Workshop Workers P.G. Camming

Status Gizi	Kelelahan Kerja						p value
	Sedang		Tinggi		Jumlah		
	N	%	N	%	n	%	
Gizi Kurang	9	69,2	4	30,8	13	100	
Gizi Normal	30	60	20	40	50	100	0,016
Gizi Lebih	4	23,5	13	76,5	17	100	
Total	43	53,8	37	46,2	80	100	

Source: Primary Data 2023

The results of statistical tests using Chi-Square analysis obtained a value of p = 0.016 because p < 0.05, so it can be concluded that there is a relationship between nutritional status and work fatigue of PG Maintenance Workshop workers. Camming.

b. The Relationship between Work Attitudes and Work Fatigue

Table 5. The Relationship Between Work Attitudes and Work Fatigue of Manitenence Workshop Workers P.G. Camming

Sikap Kerja	Kelelahan Kerja						p value
	Sedang		Tinggi		Jumlah		
	N	%	n	%	N	%	
Ergonomi	26	66,7	13	33,3	39	100	
Tidak Ergonomi	17	41,5	24	58,5	41	100	0,024
Total	43	53,8	37	46,2	80	100	

Source: Primary Data 2023

The results of statistical tests using Chi-Square analysis obtained a value of p = 0.024 because p < 0.05, so it can be concluded that there is a relationship between work attitudes and work fatigue among workers in the PG Manitenence Workshop. Camming.

c. The Relationship between Workload and Work Fatigue

Table 6. The Relationship between Workload and Work Fatigue of Manitenence Workshop Workers P.G. Camming

Beban Kerja	Kelelahan Kerja						p value
	Sedang		Tinggi		Jumlah		
	N	%	N	%	N	%	
Ringan	24	68,6	11	31,4	35	100	
Sedang	12	48	13	52	25	100	0,044
Berat	7	35	13	65	20	100	
Total	43	53,8	37	46,2	80	100	

Source: Primary Data 2023

The results of statistical tests using Chi-Square analysis obtained a value of p = 0.044 because p < 0.05, so it can be concluded that there is a relationship between workload and work fatigue of workers in the PG Maintenance Workshop section. Camming.

d. The Relationship between Work Period and Job Fatigue

Table 7. The Relationship between Work Period and Work Fatigue of Manitenence Workshop Workers P.G. Camming

Masa Kerja	Kelelahan Kerja						p value
	Sedang		Tinggi		Jumlah		
	n	%	N	%	N	%	
Baru	18	41,9	25	58,1	43	100	
Lama	25	67,6	12	32,4	37	100	0,021
Total	43	53,8	37	46,3	80	100	

Source: Primary Data 2023

The results of statistical tests using Chi-Square analysis obtained a value of p = 0.021 because p < 0.05, so it can be concluded that there is a relationship between work experience and work fatigue of workers in the Maintenece PG Workshop section. Camming.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the research and discussion, it can be concluded that there is a significant relationship between nutritional status, work attitude, workload and work period with work fatigue of workers at the PG Maintenance Workshop. Camming based on the results of the Chi-Square analysis for nutritional status obtained a p value of = 0.016, the results of the Chi-Square analysis for work attitudes obtained a p value of = 0.024, the results of the Chi-Square analysis for workload obtained a p value of = 0.044, and the results of the analysis Chi-Square for workload obtained a p value of = 0.021, indicating that each variable obtained a Chi-Square analysis result < 0.05 so it can be stated that there is a strong relationship between the dependent variable and the independent variable.

FURTHER STUDY

This research still has limitations, so it is necessary to carry out further research related to the topic of Analysis of Factors Associated with Work Fatigue of Maintenance Workshop Workers at PTPN XIV Nusantara Camming Sugar Factory in order to improve this research and add insight to readers.

REFERENCES

Amalia, I & Widajati. N. 2019. Analisa Kelelahan Kerja Objektif Berdasarkan Reaction Timer. Journal Of Health Science And Prevention. ISSN 2549-919X. (Online). (https://jurnalfpk.unisby.ac.id. Diakses 2 Juni 2020).

Badan Penyelenggara Jaminan Sosisal BPJS Ketenagakerjaan. 2017. Jaminan Kecelakan Kerja. Situs Online BPJS Ketenagakerjaan. (https://www.bpjsketenagkerjaan.go.id. Diakses, 10 Juni 2020).

Badan Pusat Statistik. Penduduk 15 tahun ke Atas yang bekerja menurut Lapangan Pekerjaan Utama 1989 – 2016. Jakarta: Badan Pusat Statistik; 8 November 2016. Diakses pada 11 Oktober 2020.

Budiono, A. M. S,. Jusuf, R. M. S & Pusparini, A. 2018. Bunga Rampai Hiperkes & KK: Higene Perusahaan, Ergonomi, Kesehatan, kerja, Keselamatan Kerja. Semarang: Badan Penerbit Universitas Diponegoro.

ILO. 2018. Internasional Labour Organization.Article Terjemahan.

Kamus Besar Bahsasa Indonesia Daring. 2020. (Online). (https//kbbi.kemdikbud. go. id.

Ningsih, S. N & Neffrety, N. 2018.Faktor Yang Berhubungan Dengan Kelelahan Kerja. Journal of Industrial Hygiene and Occupational Health Vol. 3, No. 1, Oktober 2018. ISSN 2541-5727 (Online). (http://ejournal.unida.gontor.ac.id. Diakses 23 Mei 2020).

Poliklinik PG Camming. 2020. Dokumen kecelakaan kerja perusahaan.

Saris, N,. Kusmindari, D & Hasnawati, H. 2017. Hubungan Lingkungan Fisik Dan Beban Kerja Dengan Kelelahan Kerja Tenaga Kerja Perkebunan PT Perkebunan Mitra Ogan. Jurnal Ilmiah Tekno. Vol. 15. No. 2 Oktober 2017.(Online).(https://journal.binadarma.ac.id. Diakses 9 Oktober 2020).

Sedarmayanti. 2015. Tata Kerja Dan Produktifitas Kerja. Bandung: Mandar Maju.

Setyowati, D. L,. Zahroh, S,. & Widjasena, B. 2015. Penyebab Kelelahan Kerja Mabel. Jurnal Kesehatan Masyarakat Nasional Vol. 8, No. 8, Mei 2015. (Online). Diakses Juli 2020.

Suma'mur. S. 2014. Kesehatan Kerja Dalam Perspektif Hiperkes Dan Keselamatan Kerja. Jakarta: CV. Sagung Seto.

Supariasa, D. N,. Bachyar, B & Ibnu, F. 2016. Penilaian Status Gizi. Yogyakarta: Penerbit EGC.

Tarwaka. 2015. Ergonomi Industri: Dasar-Dasar Ergonomi dan Impelementasi Tempat Kerja. Surakarta: Harapan Press.

Undang-Undang Republik Indonesia No.13 tahun 2003 tentang ketenaga kerjaan, BAB I Pasal 1.

Undang-Undang Republik Indonesia No.13 tahun 2003 tentang ketenaga kerjaan, BAB I Pasal 1.