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RESEARCH ARTICLE

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The Determinant of The Slaughterhouse Workers' Work Fatigue at The slaughterhouse in Situbondo and Jember

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ABSTRACT

The factor causing work accident at the slaughterhouse is one of them, work fatigue. Work fatigue is influenced by internal and external factors, such as age, job tenure, sleep quality, and workload. This research aimed to analyze the determinant factor affecting work fatigue suffered by the workers of the slaughterhouse in Situbondo and Jember, such as age, job tenure, sleep quality, and workload. Also, an analysis was carried out to determine the main dominant factor affecting work fatigue of the slaughterhouse workers. The design of the research used analytic observational and cross-sectional research. The population consisted of 51 workers determined by using census sampling technique, in which all the population was used as the samples. The analysis techniques used were logistic regression. The result of the research revealed that there was an effect of age, job tenure, and workload on work fatigue. Meanwhile, no significant effect found in the sleep quality toward work fatigue. Age was the main dominant factor affecting work fatigue.

Keywords: age; job tenure; sleep quality; workload; work fatigue

INTRODUCTION

Background

The livestock industry almost never thinks of work safety, even though the number of accidents and even deaths in the industry, one of which is in the abattoir (RPH). One of them is in the slaughterhouse. It is a unique workplace that connects workers to the challenges of specific physical and psychological health. Work accident often occurs in the slaughterhouse, but it does not get more attention due to a small number of workers in comparison to other industries. The workers' high workload should be the reason to pay more attention to the workers' health and safety of the industry⁽¹⁾.

The research result by Komalig et al. (2018) showed the factor that causes work accident in the slaughterhouse, namely work fatigue. The result showed that, of the 30 respondents who experienced high work fatigue, 48.9% had a work accident. It means that the respondents who suffer high work fatigue are likely to experience work accident by 5.5 times compared to respondents who experience low work accident⁽²⁾. Work fatigue can be influenced by internal and external factors (Ningsih & Nilamsari, 2018). Several studies have shown that the determinants of work fatigue include internal factors (age, gender, education level, nutritional status, work stress, and disease profile) (Rahmawati & Tualeka, 2019; Setyawati, 2010; Suma' mur, 2013) and external factors (job tenure, workload, sleep quality, work variation, lighting, noise) (Atiqoh, Wahyuni, & Lestantyo, 2014; Azwar, et al., 2018; Rahmawati & Tualeka, 2019; Suma' mur, 2013)⁽³⁾.

The preliminary study was done in investigating the dominant determinant of work fatigue in 51 workers which 35 people in Jember slaughterhouse and 16 people in Situbondo slaughterhouse. It was known that the age, job tenure, sleep quality and workload could affect workers' fatigue. Gender does not have any effect since the workers were men, with only a few disease profile, in terms of work stress all of them stated that they does not experience it, they also still experience work variation (not monotonous), the lighting is excellent, and the noise does not bother the workers⁽⁴⁾.

The general objective of this research was to analyze the determinant factor affecting work fatigue of the slaughterhouse workers in the area of Situbondo and Jember. Specifically, this study aimed at analyzing the effect of age, job tenure, sleep quality, and workload on work fatigue of the slaughterhouse workers in Situbondo and Jember as well as the main dominant factor affecting work fatigue of Slaughterhouse workers⁽⁵⁾.

The hypothesis proposed in this study was that there is an effect of age, job tenure, sleep quality, and workload on work fatigue suffered by the workers of the slaughterhouse in Situbondo and Jember and job tenure is the main dominant factor affecting work fatigue in Slaughterhouse workers⁽⁶⁾.

Purpose

The general objective of this research was to analyze the determinant factor affecting work fatigue of the slaughterhouse workers in the area of Situbondo and Jember. Specifically, this study aimed at analyzing the effect of age, job tenure, sleep quality, and workload on work fatigue of the slaughterhouse workers in Situbondo and Jember as well as the main dominant factor affecting work fatigue of Slaughterhouse workers.

METHODS

The research approach used was quantitative with analytic observational and cross-sectional study to know the determinant of work fatigue suffered by the slaughterhouse workers in Situbondo and Jember. The population in this research was that all of the slaughterhouse workers in the area of Situbondo (16 people) and Jember (35 people), therefore the total number of population was 51. The sampling technique used in this research was total sampling with a total of 51. The data were collected through a structured questionnaire. The data analysis technique used was logistic regression because the independent variable was the combination of metric and non-metric.

RESULTS

Based on the observation result, the determinant of work fatigue suffered by the slaughterhouse workers in the area of Situbondo and Jember is as follow:

Table 1. The effect of age on work fatigue suffered by the slaughterhouse workers in Situbondo and Jember

Age	Work fatigue						B	Sig.	OR (95 % CI)
	Not tired		Tired		Total				
	n	%	n	%	n	%			
< 30 years old	5	20	3	11.5	8	15.7	2.772	0.038	15.994 (1.164-219.790)
≥ 30 years old	20	80	23	88.5	43	84.3			
Total	25	100	26	100	51	100			

Based on Table 1, it was shown that eight respondents aged < 30 years old who did not suffer work fatigue was 20%, while those who suffered work fatigue were 11.5%. The data also showed that 43 respondents aged ≥ 30 years old who did not suffer work fatigue were 80%, while those who suffered work fatigue were 88.5%. It was known from the significance value of 0.038 ($0.038 < 0.05$) with the total number of respondents of 51, the H1 was accepted, meaning that there was a significant effect of age on work fatigue suffered by slaughterhouse workers in Situbondo and Jember. It was known from the value of OR; the respondents aged ≥ 30 years old may suffer work fatigue 15.9 times in comparison to the respondents aged < 30 years old.

Table 2. The Effect of job tenure on work fatigue suffered by slaughterhouse workers in Situbondo and Jember

Job tenure	Work fatigue						B	Sig.	OR (95 % CI)
	Not tired		Tired		Total				
	n	%	n	%	n	%			
< 5 years	5	20	13	50	18	35.3	-3.537	0.005	0.029 (0.002-0.344)
≥ 5 years	20	80	13	50	33	64.7			
Total	25	100	26	100	51	100			

Based on Table 2, it was known that from 18 respondents whose job tenure is < 5 years, 20% of them did not suffer work fatigue, while those who suffered work fatigue was 50%. The data also showed that from 33 respondents whose job tenure is ≥ 5 years, 80% of them did not suffer work fatigue while 50% did. It was known from the significance value of 0.005 ($0.005 < 0.05$) with the total number of respondents of 51, the H2 was accepted, meaning that there was an effect of job tenure on work fatigue suffered by slaughterhouse

workers in Situbondo and Jember. In addition, from the value of OR, the respondents whose job tenure is < 5 years tend to suffer work fatigue 0.029 times in comparison to those whose job tenure is ≥ 5 years.

Table 3. The effect of sleep quality on work fatigue suffered by slaughterhouse workers in Situbondo and Jember

Sleep quality	Work fatigue						B	Sig.	OR (95 % CI)
	Not tired		Tired		Total				
	n	%	n	%	n	%			
Low	22	88	22	84.6	44	86.3	1.015	0.320	2.760 (0.373-20.400)
High	3	12	4	15.4	7	13.7			
Total	25	100	26	100	51	100			

Based on Table 3, it was known that 44 respondents whose sleep quality is low and did not suffer work fatigue were 88%, while those who suffered work fatigue were 84.6%. The data also showed that seven respondents whose sleep quality is high and did not suffer work fatigue were 12%, while those who suffered work fatigue were 15.4%. By looking at the significance value of 0.320 (0.320 > 0.05) with the total number of respondents of 51, the H3 was rejected, meaning that there was no significant effect of sleep quality on work fatigue suffered by slaughterhouse workers in Situbondo and Jember. It was known from the OR value that the respondents whose sleep quality is low might suffer work fatigue 2.76 times in comparison to those whose sleep quality is high.

Table 4. The effect of work load on work fatigue on slaughterhouse workers in Situbondo and Jember

Work load	Work fatigue						B	Sig.	Or (95 % ci)
	Not tired		Tired		Total				
	n	%	n	%	n	%			
Low	11	44	7	26.9	18	35.3	1.654	0.046	5.228 (1.027-26.617)
High	14	56	19	73.1	33	64.7			
Total	25	100	26	100	51	100			

Based on Table 4, it was shown that from 18 respondents whose workload is low and did not suffer work fatigue were 44%, while those who suffered work fatigue were 26.9%. The data revealed that 33 respondents whose workload is high and did not suffer work fatigue were 56%, while 73.1% suffered work fatigue. It is known from the significance value of 0.046 (0.046 < 0.05) with the total number of respondents of 51, the H4 was accepted, meaning that there was a significant effect of workload on work fatigue suffered by slaughterhouse workers in Situbondo and Jember. The value of OR revealed that the respondents whose workload is high tend to suffer work fatigue 5.22 times higher than those whose workload is low.

Table 5. The main determinant factor affecting work fatigue on slaughterhouse workers in Situbondo and Jember

Variable	B	Sig.	OR (95 % CI)
Age	2.772	0.038	15.994 (1.164-219.790)
Job tenure	-3.537	0.005	0.029 (0.002-0.344)
Sleep Quality	1.015	0.320	2.760 (0.373-20.400)
Workload	1.654	0.046	5.228 (1.027-26.617)

Based on Table 5 pertinent to the main determinant factor affecting work fatigue on the slaughterhouse workers in Situbondo and Jember, it was obtained there was a strong correlation of age with the highest exponent value of OR (OR=15.994). The result of the test revealed that the most affecting variable on work fatigue was age. It is not in line with the hypothesis proposed, which claimed that job tenure was the main dominant factor affecting work fatigue on the slaughterhouse workers. It means that H5 was rejected.

DISCUSSION

The Effect of Age on Work Fatigue

The research result showed that there was an effect of age on work fatigue suffered by the slaughterhouse workers in Situbondo and Jember. It was known from the OR value that the respondents aged ≥ 30 years old

may suffer work fatigue 15,9 times in comparison to the respondents aged < 30 years old. It explained that the older the age, the higher the risk of suffering work fatigue⁽⁷⁾.

The most optimum physical capacity possessed by individual is in the age of 25-30 years old and over 30 years old, physical capacity will reduce 1% per year (Tarwaka, 2014). The result of this research supported the previous research result which revealed that age has significant effect on work fatigue (Atiqoh et al., 2014; Bongakareng, Layuk, Pesak & Danial, 2019; Rahmawati & Tualeka, 2019). This research result was not in line the research conducted by Putri (2018), Saftarina et al. (2018), and Yogisutanti et al, (2020) that there was no relationship between age and work fatigue⁽⁸⁾.

The Effect of Job Tenure on the Working Fatigue

The results of this research revealed that there was an effect of job tenure on working fatigue suffered by the workers of the slaughterhouse in Situbondo and Jember. As seen from OR value, the respondents whose job tenures were <5 years had more working fatigue by 0.029 times compared to the ones who had ≥ 5 year-job tenure⁽⁹⁾.

The results were at the same track with a research done by Bongakaraeng *et al.* (2019) which stated that there was an effect of job tenure on working fatigue. The findings obtained by Saftarina *et al.* (2018) and Putri (2018) also supported this research results as they found that job tenure had a significant relationship with working fatigue ($p = 0.041$). The longer job tenure obtained a positive effect as the workers get more experiences; on the other hand, it brought a negative effect as the fatigue and boredom increased (Rahmawati & Tualeka, 2019). In line with the opinion of Atiqoh et al. (2014), tenure is closely related to the adaptability of a worker to work and the work environment (Rahmawati & Tualeka, 2019). As in accordance with a research done by Atiqoh *et al.* (2014), job tenure is closely related to the adaptability of a worker with his job and working environment⁽¹⁰⁾.

The Effect of Sleep Quality on Working Fatigue

The results of this research showed that there was no effect between the sleep quality on working fatigue of the workers at slaughterhouses in *Situbondo* and *Jember*. It happened as they were used to doing slaughtering work and daily works in the afternoon as farmers or other activities, it made sleepless and affected the working fatigue. They became more relaxed if they worked at night as in a team, during the beginning of slaughtering process until *finishing*⁽¹¹⁾.

The results of this research were not in line with the findings obtained by Azwar *et al.* (2018) which pointed out that sleep quality had no relation with job tenure done by the workers. The workers who suffered poor sleep quality were three times more at risk in having the working fatigue than the ones who had good quality. This results also had no relation with the research conducted by Skinner & Dorrian (2015) stating that sleep quality affected working fatigue greatly⁽¹²⁾.

The Effect of Workload on Working Fatigue

The results showed that there was an effect between workload and working fatigue suffered by the workers at slaughterhouse in Situbondo and Jember. Regarding the OR value, it showed that the respondents who had high workload were likely to experience working fatigue by 5.22 times compared to the ones who had light workload. It means that the higher the workload was taken, the more working fatigue increased. According to Atiqoh et al. (2014), there was a relationship between workload and working fatigue. This research results were in line with the one carried out by Fan & Smith (2017) as the workload became one of several predictors of working fatigue. In relation to the research done by Setyowati *et al.* (2014), it stated that the relationship between workload and working fatigue obtained a moderate and positive correlation coefficient with working fatigue. Research done by Blafoss *et al.* (2019) showed that high workload increased working fatigue⁽¹³⁾.

The Main Determinant Factor Affecting Working Fatigue suffered by The Workers at Slaughterhouses in Situbondo and Jember

Based on the results of the logistic regression test, the main determinant of working fatigue suffered by the workers at slaughterhouse in Situbondo and Jember referred to age. It explicated that the older the age, the more risk of working fatigue would be suffered. 84.3% respondents were at the age of 30 years and over. It pointed out that the work of animal slaughtering was unique and special which most people did not have, so that more people were dominated by the old age as it required extra experience which everyone would not be able to do it. It was also supported by the description that 51% workers at the slaughterhouse in Situbondo and Jember were tired while working⁽¹⁴⁾.

This research was in line with Oentoro (2004) who stated that workers at the age of 40-50 years suffered from fatigue faster than the workers who were relatively younger. It was based on what Setyawati (2010) pointed out that the older a person was, the lower his muscle strength would be. According to Sumamur (2013), the factor of person's age affected the basal metabolism of the individual. The older the individual, the lower the basal metabolism would be and the individual easily suffered fatigue. According to Tarwaka (2014), the physical capacity of a person was optimal when they were at the age of 25-30 years, and the physical capacity decreased by 1% every year afterwards. According to Hsu (2019), the old age was associated with the worse health⁽¹⁵⁾.

CONCLUSION

Age, job tenure, and workload had significant effects on working fatigue. Meanwhile, sleep quality had no effect on working fatigue. The variable which affected the working fatigue the most was age.

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