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Correlation Subjective Workload With Productivity Of Spinning Workers In Pt. Delta Merlin Sandang Tekstil I Sragen

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ABSTRACT

Introduction: Workload is the burden that must be completed by workers of a job that is done, including the spinning workers. The excessive workload in the spinning section can be a trigger factor for the onset of stress, which can then have an impact on work productivity. The purpose of this research was to determine the relationship between subjective workload and work productivity in the spinning workers of PT. Delta Merlin Sandang Tekstil I Sragen. **Methods:** This is an observational research with a cross-sectional design. The research population was 202 spinning workers with a large sample of 133 spinning workers taken using the simple random sampling method. The independent variable of this research was subjective workload while the dependent variable was work productivity. Data collection was carried out using a questionnaire adapted from previous research. Data were analyzed with the spearman correlation test. **Results:** The result showed that 87.2% of respondents had a massive subjective workload level, and 68.4% of respondents have a moderate level of work productivity. Statistical test results showed that there was a relationship between subjective workload and work productivity (p = 0.000). **Conclusion:** The level of workload productivity and work productivity had a significant relationship. The relationship between subjective workload and work productivity was a moderate level relationship. The advice that can be given was that the company is expected to carry out work time following statutory regulations and take preventative measures against factors that cause a decrease in worker productivity.

Keywords: Subjective workload, Spinning workers, Productivity

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INTRODUCTION

The development of increasingly modern technology has led to the emergence of various industrial sectors. In order to survive in the business world, there was intense competition among the industry sectors. In the field of industry that produces an item, it is inevitable that in every production process uses sophisticated and modern machinery. The use of this sophisticated machine will undoubtedly generate products that are creative and innovative too. The products generated later will then compete with other products in the market. Products that can survive in the market with many enthusiasts will undoubtedly bring benefits to the company. Conversely, products that are less attractive to consumers and less competitive with other products in the market can have an impact on the bankruptcy of a company. Whether or not a product survives in the market is very dependent on consumers. The use of sophisticated technology does have a positive impact on the quality of the products generated. But if not correctly considered, it can harm human resources and the environment. Human resources, capital resources, production raw materials, machinery, work systems and markets are essential components in a company. A company can grow and develop well if all the components are used effectively and efficiently. From all of these components, human resources become the main component which becomes the driving force of the running of a company. Human resources need to be well considered because the high and low productivity of a company is very dependent on its workforce.

One problem that often occurs in human resources is the workload problem. The workload is the difference between the ability of workers and the demands of work for which they are responsible. In general, the definition of workload is the amount of work that must be done, the time used to complete the work, and the individual's subjective view of the work. This definition is in line with research conducted on workers in the spinning section, where the workers in the spinning section must complete the work according to the target within a specific time limit. Then the workload received by the spinning workers is measured through a questionnaire

that describes the subjective views of the individual. Munandar (2014) stated that workload is a task that must be completed by the workforce at a particular time with the capabilities possessed by the workforce (1). The workload is also one of the intrinsic factors of work in terms of tasks that can cause stress. The excessive workload can cause fatigue and vice versa too little workload can cause feelings of boredom. The effect of excessive or little workload is the occurrence of work stress which can ultimately affect company productivity.

Lusmana (2011) in her research said that workload is a problem that is not trivial and cannot be underestimated, given that the effect will have an impact on the productivity of the workforce (2). A company cannot achieve its goals if its labor productivity is low. Productivity is a measure of productive efficiency. Productivity according to Sutrisno (2009) is a comparison between output (goods or services) and inputs (labor, raw materials, money) is a measure of the existence of a company (3). Productivity can be seen from the performance of workers at work.

PT. Delta Merlin Sandang Tekstil I Sragen is a textile company that has many workers and also produces a large number of products. The company has four production units, namely AB, CD, EF and GH units. However, researchers are not given access to all the production rooms, it is feared that it could disturb workers. The researchers can only make observations on the spinning section of the AB unit. The yarn production stage consists of eight processes. The first stage, Blowing. is the stage of opening the clumps of fibers, separating the fibers and breaking down the fibers. In the second stage, Carding, the separation of long fibers from short fibers is then made into clumps that have been opened, and converted into an elongated shape called sliver card. Next the third stage is Drawing Breaker, a process of trapping several slivers by drawing and stretching the fibers. The fourth stage is Drawing Finisher, which functions the same as the process of drawing a breaker, where several slivers are trapped by drawing and stretching the fibers. The fifth stage is Roving; this stage begins to give torsion to the sliver so that its strength increases. The sixth stage of Ring Spinning is the pulling of the roving sliver, while at the same time offering further twisting according to the desired yarn count (fig. 1). In this process, the result is thread-shaped. To become yarn, Roving undergoes a stretching/winding process by turning it at 14,500 turns/minute. It is in this machine that the actual spinning process takes place in which the fine Roving is pulled into a fiber mass that corresponds to the desired number. The seventh stage of Winding is the process of re-winding the yarn from a bobbin spindle into a roll that is ready to be marketed, for example in the form of a cone. The eighth stage of Packing is the stage where the yarn is brought to the ultraviolet room, quality control to check the perfection of the yarn spools, and then the yarn is ready to be packed. From the whole production unit, the spinning part is the part that determines the number of products produced. Based on workers complaints, the spinning section is a challenging part of work because the work is done quickly and must also be thorough so that the quantity and quality produced continues to increase.

Figure 1: Spinning Stage

The work productivity of workers in this company is limited to achieving the targets set by the company. The company has a target which is every 8 hours of production can achieve an efficiency level of 92%. However, sometimes workers are not able to achieve the targets set by the company so that productivity in this company is not enough. This is because the workload received by workers is too heavy. The workload is categorized as heavy because many workers are unable to achieve the company's targets. An efficiency target of 92% every 8 hours of production was deemed too much for workers. The spinning section is the part that plays a vital role in determining company productivity. In this section, workers are required to work quickly to pursue the target of the company. The work is carried out quickly to follow the machine that continues to spin. If the machine is left behind and workers are unable to follow the machine, it will affect the number of products generated. In addition, the spinning work is carried out in a standing condition during work time so that this can accelerate the occurrence of errors. The existence of a workload that is too heavy will have an impact on company productivity.

The purpose of this research was to determine the relationship between subjective workload with work productivity in the spinning workers at PT. Delta Merlin Sandang Tekstil I Sragen.

MATERIALS AND METHODS

Research Background

This research includes observational research because it's not invloving any intervention on the research subjects. Based on the time of its implementation, this research was a cross-sectional approach because data collection was carried out at a particular period of time. This research is analytic, which aims to analyze the relationship between the variables studied. The location of this research was conducted at PT. Delta Merlin Sandang Tekstil I Sragen. The data was collected in January 2020. The population in this research were all employees of the spinning unit AB PT. Delta Merlin Sandang Tekstil I Sragen amounting 202 people. The sample of this research was 133 people selected using a simple random sampling technique. The independent variable in this research is subjective workload while the dependent variable is work productivity. This research only involved one dependent variable because the focus of this research was the level of worker productivity which was often below the target. From the many independent variables that may affect the productivity level, it is the workload variable that is considered the most influential on the level of work productivity. So this research involved an independent variable namely workload and a dependent variable namely work productivity. Data collection was carried out through questionnaire sheets distributed to workers to determine the level of subjective workload. This subjective workload questionnaire was adapted from the Spector and Jex's questionnaire, which had been tested for validity and reliability. The questionnaire was distributed directly to workers after they came home from work. While for the level of productivity of spinning workers carried out by conducting interviews with the company. Interviews were conducted to determine the level of productivity of workers who were respondents in this research. The result of the interview was in the form of productivity level data that had previously been processed by the company so that the authors could immediately carry out further data processing through statistic testing.

Ethical Clearance

This research was approved by Ethics Committee in Faculty of Dentistry, Airlangga University, Indonesia, with registration number No.023/HRECC.FODM/I/2020

Statistical Analysis

The data analysis technique of this research is univariate and bivariate analysis. Univariate analysis is the frequency distribution of each variable. Meanwhile, the bivariate analysis was conducted to examine the relationship of the subjective workload with work productivity using the Spearman correlation test.

RESULTS

Respondent Characteristics

Respondent characteristics of this research were obtained from the results of the distribution of questionnaires to workers consisting of age, gender, education level, years of service, and marital status. In this research, the relationship between respondent characteristics and work productivity variables was not directly sought. Still, the respondent characteristics of this research were only as a representation of the condition of the workers, which can affect the results of work productivity. Respondents of this research were workers in the spinning section of PT. Delta Merlin Sandang Tekstil I Sragen, who were willing to fill out the questionnaire when the research was conducted.

Based on the table I, the age distribution of spinning workers was obtained. From the age distribution of the respondents, it can be seen that the age of the respondents mostly was in the age category of 26-35 years (81.2%). In accordance with Badan Pusat Statistik (2019), the productive age is the population in the age range of 15-64 years (4). Where the age is classified as a productive age for work. As for the distribution of gender in the workers spinning section, it can be seen that the majority of workers were female as many as 98 people (73.7%). Besides, almost all respondents in this research had a high school education level as many as 132 people (99.2%). It also can be seen that the majority of spinning workers had a work period of 6-10 years as many as 102 people (76.7%). This long working period showed that workers have sufficient experience in working so they can adapt to the work environment. Apart from that, majority of the workers were married as many as 125 people (94%).

The subjective workload is the workload that must be completed by workers where the workload is measured subjectively. The level of subjective workload was categorized according to the questionnaire from Spextor and Jex (1998) (5). Based on table II, the distribution of subjective workloads, it can be seen that the majority of workers had heavy workloads as many as 116 people (87.2%). This showed that most workers feel their workload is too heavy.

Work productivity data from spinning workers was obtained through interviews with the company. The level of work productivity was measured from the efficiency target obtained during eight hours of production. Based on table III, it can be seen that the majority of workers had a moderate level of work productivity, as many as 91 people (68.4%). This showed that the production results of the workers had not met the target of the company. But even so, there were still workers who also

Table I: Characteristics of Respondents

Variables	Frequency (n)	Percentage (%)
Age		
17-25	2	1,5
26-35	108	81,2
36-45	23	17,3
46-55	0	0
56-65	0	0
Gender		
Male	35	26,3
Female	98	73,7
Education Level		
Primary School	0	0
Junior High School	1	0,8
Senior High School	132	99,2
Years of Service		
< 6 years	31	23,3
6-10 years	102	76,7
≥ 10 years	0	0
Marital Status		
Single	8	6
Marriage	125	94

Table II: Subjective Workload of Spinning Workers

Subjective Workload	Frequency (n)	Percentage (%)
Small	0	0
Medium	17	12,8
Large	116	87.2
Total	133	100

Table III: Work Productivity in Spinning Workers

Work productivity	Frequency (n)	Percentage (%)
Low	0	0
Medium	91	68.4
High	42	31.6
Total	133	100

have a high level of productivity so that the company's productivity was quite good.

The Relationship between Subjective Workload and Work Productivity

After knowing the level of the subjective workload of the spinning workers then related to the level of work productivity of workers to determine the strong relationship between the two variables. The following was cross-tabulation data between subjective workloads and work productivity.

Based on table IV, it can be seen that the majority of respondents with subjective weight workloads had moderate work productivity as many as 90 people (77.6%). Based on the results of statistical tests using the

Table IV: Cross Tabulation of Subjective Workloads with Work Productivity

Subjective Workloads	Work productivity						Total		*p-value*	*r*
	Low		Medium		High					
	n	%	n	%	n	%	n	%		
Small	0	0	0	0	0	0	0	0		
Medium	0	0	1	5.9	16	94.1	17	100	0.000	-0.515
Large	0	0	90	77.6	26	22.4	116	100		
Total	0	0	91	68.4	42	31.6	133	100		

Spearman correlation with α = 0.05, the results obtained p-value of 0.000, because the p-value < 0.05 so that it can be concluded that there was a relationship between subjective workload with work productivity in the spinning workers.

DISCUSSION

Subjective Workloads Identification

Based on the results of the research, it can be seen that as many as 116 people (87.2%) had subjective workloads in the heavy category. The spinning section was the part that has a heavier workload compared to other parts of the company. In this section, workers must work quickly following the machine that continues to rotate, and if a little left behind the machine can affect the amount of product produced. In addition to working fast, workers must also be thorough and skilful in working so that the quality of the resulting product was maintained. Besides that, the work in the spinning section was carried out in a standing condition continuously for a long time, so this could cause the occurrence of errors, and the work was also carried out repeatedly every day, causing boredom. This could affect the number of products produced. According to Santosa (2004) stated that excessive workload could cause discomfort at work, accident, injury, accident, pain, illness, and decreased productivity (6).

Work Productivity Identification

From the results of the research, it can be seen that the majority of spinning workers had a moderate level of productivity that is as many as 91 people (68.4%). This showed that there were production results that had not met the company's target. Work productivity that did not meet the company's targets due to the workload received by workers was too heavy, so this caused fatigue to workers. This fatigue could affect worker productivity. According to the opinion of Hasibuan (2010), the higher the level of fatigue the productivity can decrease (7).

The Relationship between Subjective Workload and Work Productivity

Based on the results of the research it can be seen that the majority of spinning workers who have a level of subjective workload had a moderate level of work productivity which as many as 90 people (77.6%). The results of statistical tests using the Spearman correlation with α 0.05 indicated that the results of the

p-value of 0,000, because the p-value < α so that it can be concluded that there was a relationship between subjective workloads with work productivity in the spinning workers. Based on the value of the correlation coefficient obtained a result of -0.515, which meant the relationship between subjective workload with work productivity had a moderate relationship strength. Based on the direction of correlation, the results show that the relationship between subjective workload with work productivity had a negative relationship (opposite direction) which meant the higher the level of workload, the lower the level of work productivity and vice versa.

The workload is a factor inherent in workers. Along with the development of the company, the workload received by workers was also increasing. One result of excessive workload is fatigue. The results of this research were in line with the statement of Hariyono, et al. (2009) which stated that excessive workloads both quantitatively and qualitatively can cause increased tension and cause mental and physical fatigue so that productivity decreases, conversely if the burden is less, then the possibility of productivity can increase (8). This research was also in line with the research of Ardiyanti and Sinaga in Matindas (2019), which found that there was a relationship between workload and work productivity (9).

However, the results of this research were not in line with Ashari's research in Matindas (2019) which stated that there was no relationship between workload and work productivity (9). This was due to different workloads, related to different levels of productivity.

Sometimes, productivity in this company was not reaching the target. This was because the workload received by workers was too heavy. Work must be carried out in a standing condition for a long time, and workers must also work quickly to pursue production targets so this can cause fatigue and stress that can have an impact on company productivity.

CONCLUSION

Based on the results of the research it could be seen that the majority of respondents aged between 26-35 years, female gender, had the last level of high school education, had a working period of between 6-10 years, were married, had a heavy subjective workload and had a moderate level of productivity. Spearman correlation test results indicated that there was a moderate relationship between subjective workload with work productivity in spinning workers at PT. Delta Merlin Sandang Tekstil I Sragen.

The company is expected to take action to control workloads such as carrying out work hours in accordance with applicable laws namely seven working hours in 1 day for six working days or eight working hours in 1 day for five working days (Law No. 13 of 2003) and increasing the number of workers so that work can be done lightly. The company must also pay attention to the welfare of workers, including identifying problems such as searching for and finding obstacles that occur with workers to immediately look for alternative solutions so that workers can work productively.

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