

The Effect of Active Rest on the Work Performance of Beverage Cup Packing Operators

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The Effect of Active Rest on the Work Performance of Beverage Cup Packing Operators

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Abstract: Packing work includes a finishing activity in the completion of a product. This work is carried out by several people as operators who are tasked with inserting beverage cups into the boxes of the conveyer machine that carries the drink cups and then arranges them in the boxes by the operators who are already standing by taking a collection of running cups. Then the workers will take the drinks one by one and then arrange them in the boxes that have been provided.

This work is included in monotonous and repetitive work, where to complete one activity, the same and repetitive movements are performed. This is what causes a lot of performance to decrease because of the boredom that arises so that the fatigue factor quickly occurs because there is no variation in work.

The purpose of this study was to determine the effect of resting between monotonous and repetitive jobs so that it is expected to reduce the feeling of boredom and boredom that leads to fatigue. There are three types tested on packing operators as research objects, namely type I0 with a regular work standard, type I1 with a 5-minute break after working for 1 hour, and type I2 with a 10-minute break after working 2 hours. This study used a descriptive statistical approach with a homogeneity test and one way ANOVA test to determine the effect of each type of treatment. From the research results, it is known that Type I2 provides increased performance and decreased fatigue levels than Type I0 and I1. Can be concluded that giving too frequent breaks for a short period of time can actually reduce operator performance so that giving breaks and their intervals must be considered appropriate to reduce fatigue and improve performance.

Keywords: active rest type, fatigue, IFRC questionnaire, performance

2 1. INTRODUCTION 2

Work that is carried out in a standing position all the time, such as in the beverage packaging section, is a job that involves quite tiring physical work. In the packaging process, an operator performs his activities in a permanent position throughout the working time [1]. Standing positions are suitable for jobs that require a lot of sideways, downward, and upward movement. Some of the health problems associated with prolonged standing are discomfort and the burden on the spine, the highest compared to work done sitting [2].

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The work of packing cup drinks is one of the jobs that is classified as repetitive and monotonous [3,4] because the same activity is carried out more than once in the process of finishing a product. And as a result, many workers complain that boredom and boredom are the sources of work fatigue. One of the factors of work performance becomes unstable or decreases due to fatigue and discomfort [5]. Fatigue at work contributes to a decrease in one's performance or performance [6,7]. Fatigue is a change that occurs in the body due to excessive physical or mental activity [8]. This will cause a bad impact in the form of losses for the industry.

Giving rest is one way to get rid of the fatigue that attacks. Because with adequate rest, it is hoped that stamina can recover as a result of the work done throughout the day. With the return of stamina of the operators, it is hoped that work can be completed more quickly so as not to disturb the amount of production that has become the company's target.

2. THEORETICAL FRAMEWORK

• Work Fatigue 2

According to [9], fatigue work is a protection mechanism to avoid further damage, so that there is recovery after resting. According to [10], fatigue in work is a condition accompanied by a decrease in efficiency and the need for work.

• Active Rest

Most people take breaks by simply relaxing, in the sense of not doing any work. However, such a model of rest does not relieve fatigue. The term active here is to provide a short break between routine work being carried out. It is hoped that this interlude can have a positive impact on the performance of operators

• IFRC

A special questionnaire was used to assess the subjective feelings of fatigue. Subjective Self Rating Test (SSRT) from the Japanese Industrial Fatigue Research Committee (IFRC), is a questionnaire created in 1967, which contains general fatigue symptoms that can be used to measure subjective fatigue levels [6]. This

questionnaire contains 30 questions as an indicator consisting of 10 questions as an indicator of weakening activities, 10 questions as an indicator about weakening motivation, and 10 questions as an indicator of a picture of physical fatigue. The higher the frequency of fatigue symptoms appearing, it means that the greater the level of fatigue that occurs.

• **Performance**

The performance of the packing operator is measured based on the speed during the packing process that is carried out during the job. The measurement of packing speed is measured using a stopwatch for each operator during the activity of packing the cup. The smaller the time produced during the packing process (in seconds), the greater the packing results produced by each packing operator.

• **One Way Anova test**

This test is used to determine whether or not there is a meaningful difference for more than two unrelated sample groups. If there are differences, whichever is higher. The data used is usually an interval or ratio scale.

3. RESEARCH METHODOLOGY

3.1. Types of research

This type of research is a type of experimental research, namely research to find a relationship or the influence of a certain thing on other things in natural conditions. The purpose of the natural conditions here is that in the research, there are no repeated actions which are in nature to improve the relationship that occurs. The purpose of experimental research is to investigate the presence or absence of a causal relationship and the extent of the causal relationship by giving certain treatments to several experimental groups and providing controls for comparison.

The action research / experiment carried out is to provide active rest between packing for operators in order to obtain maximum work results within a predetermined time. This action is taken to be able to know clearly what obstacles usually appear or occur during the packing process.

The hypothesis of this study is H0: there is no effect of active rest on fatigue and performance, and H1: there is an effect of active rest on fatigue and performance.

The regular work schedule for batik makers is at 07.00-15.00 with noon break from 11.00-12.00. This working hour is used as a work standard and is used as a model 1. The types of active rest that are given are:

- I0 → no active rest, (break 11.00 - 12.00)
 - I1 → after work 1 hour breaks 5 minutes
- During breaks, the operators can perform various movements that are considered comfortable in order to relax their tired limbs. Rest can be done flexibly in the sense of adjusting and taking turns.
- I2 → after working 2 hours a 10 minute break

Similar to model 2, operators can stand, walk, move the feet, hands and other limbs to relieve fatigue. For rest, it can be done flexibly alternately with other operators.

The selection after working for 1 hour and 2 hours being given a break is based on preliminary observations made before this experiment was carried out. Where when they are not given a break between work, it can be said that the performance of the operators is getting lower due to the lack of time to relax or move tired limbs. Because usually the operators will rest after working 4 hours, which is 11.00 for ishoma for 1 hour. Then the work will end at 3:00 p.m. or after they have worked for 3 hours. (10)

3.2. Data collection

Data collection was carried out through observation (direct observation), experiments, and questionnaires with statement items related to the effect of active rest on improving packing operator performance and fatigue levels using a Likert scale with a range of 1 to 4 (very not very sick - very sick). The increase in performance is measured from the packing speed of each operator using a stopwatch (dos / second). Meanwhile, the level of fatigue is measured by distributing the IFRC questionnaire to each operator to be filled in according to what they feel when doing work as usual, and after being given a break according to the existing types. The answer scores using the Likert scale for the IFRC questionnaire are:

- 1 = never feel, 2 = feel sometimes,
- 3 = Often feel, 4 = Often feel

The explanation for the data required for research can be seen in Table 1.

Table 1. Data for Research

Type of Treatment	Required Data	Collection Technique	Expected Output
Active Rest	Each time 1 packing box is completed, it will be recorded	Recording using a stopwatch	In the end we can know the packing result every hour
I0, I1, I2	Result of the IFRC questionnaire	Fill in directly by the operator/respondent	It can be seen the fatigue level of each operator

3.3. Population

The population of this research is the packing operators, amounting to 8 people. The population in question here is the entire research subject. Population can also be defined as a collection of all elements that have one or more attributes that are the goal. Or that the population is a generalization area consisting of objects / subjects that have certain qualities and characteristics that are determined by the researcher to be studied and then draw conclusions. The population in this study were the beverage packaging operators in the AMDK Pati company, Central Java.

3.4. Respondents

As previously mentioned, the respondents in this study were 8 cup packaging operators, consisting of 7 women and 1 male. Are between 20 - 45 years old and have worked as a cup packaging operator for at least 6 months. Not many special skills are needed in the process of packing the drink cup, so that with a minimum of 6 months of work it can represent all the activities carried out when the process of packing the cup is carried out, both the habits that are carried out and the level of speed which will increase over time the work is done

4. RESEARCH RESULTS AND DISCUSSION

4.1. Research result

The packing result data obtained by each operator (box/hour) during work is shown in Table 2.

Table 2. Results of Cup Drink Packing

Respondent	Type I0	Type I1	Type I2
	output (box/hour)	output (box/hour)	output (box/hour)
1	297	310	317
2	281	294	310
3	223	230	247
4	223	234	252
5	203	213	230
6	220	228	247
7	150	164	186
8	234	245	260

(source of processed)

The data in table 2 shows that the treatment with the best results in the beverage packaging process was produced when the application of type I2 was given by giving a break for 10 minutes after working for 2 hours. Where the results obtained are increasing compared to applying type I1 or no treatment at all. While the data from the IFRC (Industrial Fatigue Research Committee) questionnaire from each type of treatment and each operator is shown in Figure 1.

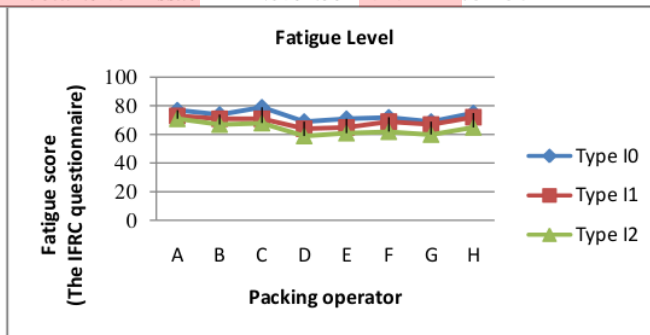


Figure 1. Graph of Fatigue Levels of All Types

Figure 2 shows that the level of fatigue experienced by each operator decreased after type I2 was applied, namely rest was given for 10 minutes after working for 2 hours. So it can be concluded that besides being able to improve performance by looking at the packing results in table 2, it turns out that the application of type I2 can also reduce the level of fatigue that has been experienced by cup packaging operators.

4.2. Discussion

As already stated, this study aims to see whether there is an effect of the application of active resting treatment of various types on the performance and level of fatigue experienced by the operators of beverage cup packaging. With the SPSS 20 tool, the analysis to see this effect was carried out using the One Way Anova test on the performance (speed of packing time) and the fatigue level of the operators, with $\alpha = 0.05$ the results were obtained as in Table 3.

Table 3. Test of Homogeneity of Performance Variances

Test of Homogeneity of Variances				
Packing speed	Levene Statistic	df1	df2	Sig.
	.145	2	21	.866

In Table 3, the Test of Homogeneity of Variances performance displays the results of the homogeneity of variance test as a prerequisite for using ANOVA. The test results found that F count = 0.145 with sig = 0.866. Because the sig value > 0.05, it can be concluded that the variance between groups is homogeneous. Thus the prerequisites to be able to use ANOVA are met.

Table 4. One Way Anova Performance Test Results

ANOVA					
Packing speed	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	89.333	2	44.667	5.989	.009
Within Groups	156.625	21	7.458		
Total	245.958	23			

Table 4: One Way Anova performance test result for the overall average difference test found that the F count is 5.989 with sig = 0.009. Because the sig value < 0.05, H_0 is rejected, so it can be concluded that there is a difference in the average time of packing speed between the types of rest given, namely types I0, I1, and I2.

Table 5. Test of Homogeneity of Variances in Level of Fatigue

Test of Homogeneity of Variances				
Fatigue level	Levene Statistic	df1	df2	Sig.
	.544	2	21	.588

In Table 5, the Test of Homogeneity of Variances, the fatigue level displays the results of the homogeneity of variance test as a prerequisite for using ANOVA. The test results found that F count = 0.145 with sig = 0.866. Because the sig value > 0.05, it can be concluded that the variance between groups is homogeneous. Thus the prerequisites to be able to use ANOVA are met.

Table 6. One Way Anova Test Results for Fatigue Level

ANOVA					
Fatigue level	4				
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	333.583	2	166.792	11.661	.000
Within Groups	300.375	21	14.304		
Total	633.958	23			

Table 6, the results of the One Way Anova test, the level of fatigue of the overall average difference test, found that the F count is 11.661 with sig = 0.000. Because the sig value < 0.05, H_0 is rejected, so it can be concluded that there is a difference in the average level of fatigue between the types of rest given, namely types I0, I1, and I2.

5. CONCLUSION

From the research conducted:

1. Type I2 provides improved performance for each packing operator as seen from the increasing speed of packing times, compared to types I0 and I1 as well as decreased fatigue levels after applying type I2 to the packing process.
2. According to the results of the one way ANOVA test, it can be concluded that there is a significant difference between the three applications of active resting treatment, namely types I0, I1, and I2 on the performance and fatigue level of each operator of cup beverage packaging.
3. From the last analysis it can also be seen that frequent breaks do not guarantee that someone can finish a job faster. On the other hand, getting more frequent breaks can cause them to have to re-concentrate frequently to carry out their routine activities, where it also takes time which they cannot immediately do. Thus, the provision of active rest treatment must be determined optimally so that the results obtained are maximized.

REFERENCES

- [1]. Dianne, A.C.M., et al. Effects of a standing and three dynamic workstations on computer task performance and cognitive function tests. *Applied Ergonomics*, Volume 45, issue 6, November 2014, pages: 1570-1578.
- [2]. Peter Le and William, S, Marras. Evaluating the low back biomechanics of three different office workstations: Seated, standing, and perching. *Applied Ergonomics*, Volume 56, September 2016, pages: 170-178.
- [3]. Septiari, R., Pratikto, Santoso, Purnomo., Tama, Ishardita. The Influence of Combining Sitting and Standing Position in Plastic Glass Packaging. *Journal of Engineering Science and Technology* vol.13 February 2018 no.2; 373-380.
- [4]. Sally Maynard, et al. Going underground: Fatigue and sleepiness in tunnelling operations. *Applied Ergonomics*, Volume 90, Januari 2021.
- [5]. Valerie Hervieux, et al. Active meetings on stationary bicycle: An intervention to promote health at work without impairing performance. *Applied Ergonomics*, Volume 90, Januari 2021.
- [6]. Kyle A Benhardt and Dmitri Poltavski. Symptoms of convergence and accommodative insufficiency predict engagement and cognitive fatigue during complex task performance with and without automation. *Applied Ergonomics*, Volume 90, Januari 2021.
- [7]. Sungryul Park, et al. Effects of display curvature and task duration on proofreading performance, visual discomfort, visual fatigue, mental workload, and user satisfaction. *Applied Ergonomics*, Volume 78, July 2019, pages: 26-36.
- [8]. Alexander Fidao, et al. Depression mediates the relationship between fatigue and mental health-related quality of life in multiple sclerosis. *Multiple Sclerosis and Related Disorders*, November 2020.
- [9]. Tarwaka. *Ergonomi Industri*. Surakarta : HARAPAN PRESS, 2010.
- [10]. Budiono, S .2003. Bunga Rampai Hiperkesdan Keselamatan Kerja. Semarang :Badan Penerbit Universitas Diponegoro.

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