

Ergonomics Analysis on Women Workers in Wigs Industries in Penarukan Village Buleleng

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ABSTRACT

Making wig is an industry that has an important role in the development in the Penarukan village, Buleleng. In the process of making wigs, workers carry out their monotonous and repetitive work, and are required to work only one without any variation of tasks in a professional manner to meet the quality of production. The situation is exacerbated by working conditions and the ways they work were less ergonomic, causing workers complaining workload, eyestrain and musculoskeletal disorders. This study was done to prevent workload, eyestrain, and musculoskeletal disorders, so that the health and safety of workers can be improved and the industrial productivity of wigs in Penarukan village, Buleleng, can be improved. The results showed that the fatigue score was 22.22%, high scores 33.33% and a very high score 44.44%. Eye fatigue scores were 61.11%, a high score 27.78% and a very high score 11.11%. Musculoskeletal disorders score 33.33%, while the high score 66.67%. It's required improvements to the work environment and standards of ergonomic in the way of working, which is given to workers or attached to the workspace.

KEYWORDS

Analysis of Ergonomics; Fatigue; Eyestrain; Musculoskeletal Disorders.

INTRODUCTION

Economic development of a region is essentially an interaction of various groups of variables such as human resources, natural resources, capital, technology and others. Therefore, the production of which is produced out of the role of man in which humans are managing labor, construction input, are also customers of production itself.

One attempt was made to produce a quality product of which attention to the hazards and risks of factors such as how work is not ergonomic, and environmental organizations. The application of ergonomics needs attention due to a lack of attention

to the application of ergonomics can lead to accidents and health problems in workers. Problems accidents and health problems in workers can be anticipated by applying ergonomics in the workplace so that the existing risks can be reduced. One of the products of concern is wig industry in Penarukan village, Buleleng. With the support of human resources, especially the increasing demand for wigs, the company imposed a shift to three shifts. The production process wig almost entirely done by human power so that this industry has a huge potential to develop family economy.

In the process of making wigs, workers perform jobs that are monotonous and repetitive. In other words, workers are required to work only one kind of task without any variations in a professional manner to meet the quality of production. The situation is exacerbated by working conditions and how to work less ergonomic. Workers sit in chairs made of plastic and has no armrest so that during work, the hand cannot rely causing workers complain of pain in the shoulder, arm and waist.

Wig industry employs female workers from the near local villages. Activities carried out for 24 hours of work each day with currently operate three shifts. Morning shift starts at 06.00 s / d 13:30 pm, afternoon shift at 13.30 s / d 20:30 pm and night shift at 20.30 s / d 16:30. They given a break for an hour on each shift. The production of wigs is exported to overseas countries such as China, America and Europe. To produce a single wig, completed within one week undertaken by three workers

In the wig industry, almost all work is done by hand and requires a high accuracy. Workers using both hands and at the same time they pinned the hair on a filet net by using ventilating needle. This is done continuously and repeatedly so that it can lead to fatigue, eyestrain, and musculoskeletal disorders in workers

Based on the description of the background of the problem, then a study of ergonomics analysis in industrial women workers wigs in Penarukan village, Buleleng, is done. This study was done to prevent fatigue, eyestrain, and musculoskeletal disorders, so that the health and safety of workers can be improved and the industrial productivity of wigs in the village could be improved.

METHODS

This research was conducted in the industry of wigs in the Penarukan village, Buleleng. Data were collected by interview and fill out a questionnaire about the Nordic Body Map fatigue and eyestrain, given to 18 respondents. The observations were made in the workplace to observe the process of making wigs and the working position. Psychrometer used to measure temperature and humidity in the workspace, while Lux meter is used to measure light in the workspace.

RESULTS

Working Conditions in Wigs Industry

Environmental conditions greatly affect the comfort and health of workers resulting from the influence of physical and psychological condition. If the environmental conditions are not good will cause health problems, dissatisfaction, decreased motivation and low productivity of labor.

The mean temperature in the workspace is 31.7°C. The temperature is out from the comfort zone for people in Indonesia, ranging from 26-28°C, but Grandjean (2000) provides a high temperature tolerance limits in the working environment of 35-40°C. Thus the temperature in the workplace is categorized comfortable in performing work activities.

Ergonomics Analysis of Fatigue on Women Workers in Wigs Industries

Fatigue is a protective mechanism of the body or a signal that suggests someone in order to get some rest, usually associated with working for a long time. Fatigue in the industry refers to three related symptoms are: (1) tiredness; (2) The physiological changes in the body such as nerve and muscle is not functioning properly; and (3) decrease in working capacity (Barnes, 1980).

From the results of the fatigue questionnaire, obtained the data that employees who had fatigue with the medium scores by 4 workers (22.22%), a high score by six workers (33.33%) and a very high score by 8 workers (44.44%) (Table 1)

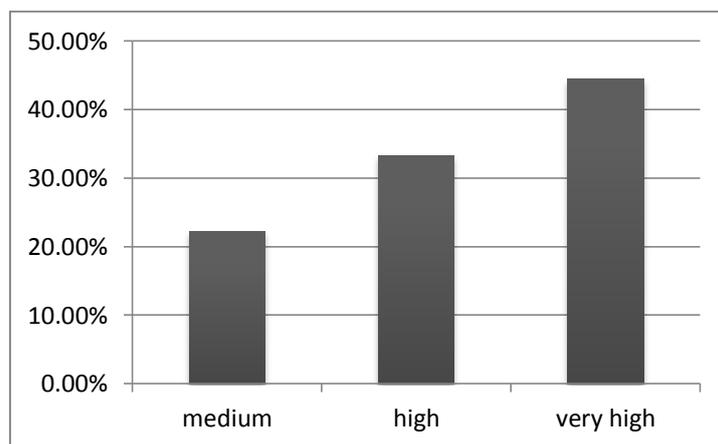


Table 1. Fatigue Diagram

Ergonomics Analysis of Eyestrain on Women Workers in Wigs Industries

Eye fatigue that arising from the ciliary muscle tensions that have to work continuously for long periods of time and do thorough (Suma'mur, 2009). This usually occurs in the wig industry workers because they work for a long time, a short distance and it also

requires careful observation. From the eye fatigue questionnaire by wig workers is obtained that workers with the medium score is 11 workers (61.11%), a high score by 5 workers (27.78%) and a very high score is 2 workers (11.11%) (Table 2).

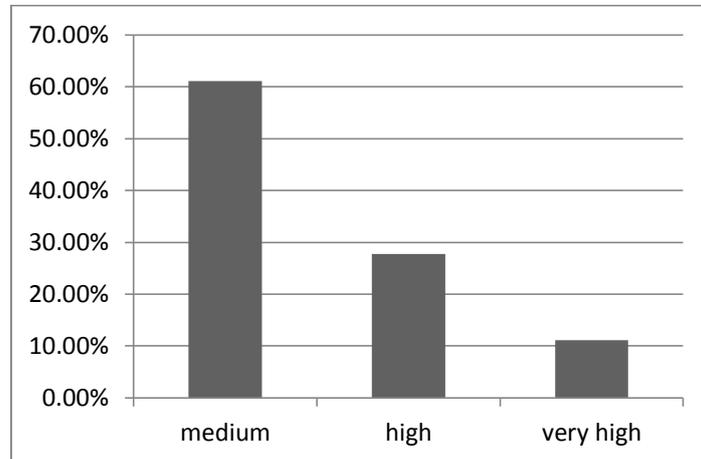


Table 2. Eyestrain Diagram

Ergonomics Analysis of Musculoskeletal Disorders on Women Workers in Wigs Industries

Musculoskeletal disorders caused by working attitude that is not natural, static work, excessive work and repetitive work. Works that are not ergonomical often associated with the onset of complaints or musculoskeletal injuries. This complaint is characterized by discomfort, rigid to severe pain in muscles and joints area.

The results of the Nordic Body Map questionnaire to wig-makers workers, obtained that medium score is 6 workers (33.33%), while the high score is 12 workers (66.67%) (Table 3).

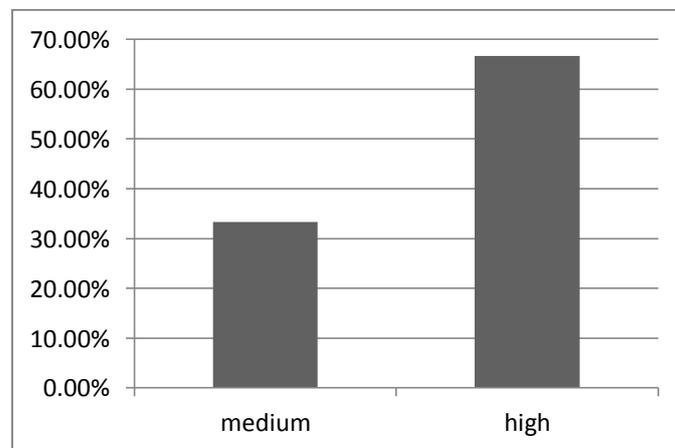


Table 3. Musculoskeletal disorders Diagram

DISCUSSION

Air humidity affects transpiration through the pores of the skin. Transpiration is influenced by the speed of the air. Moist air causing delays to sweat. Average humidity in the workplace was 65.4%. Average humidity at the workplace is considered inconvenient where the average humidity in the workplace for people in Indonesia by (Manuaba, 2005) is 70-80%.

Average lighting at the making-wigs place is 270 lux. Lighting that adequate and can be arranged properly will help create a work environment that is comfortable and enjoyable so that it can maintain the excitement of working. Almost all of the implementation of the work involves the function of the eye, which is an often encountered type of jobs that require a certain level of illumination so that the workers can clearly observe the object that is being done. Armstrong (2009) states that the light intensity is less visibility and can cause eyestrain. Conversely, excessive lighting intensity can also cause glare, reflections, excessive shadows, visibility and eyestrain. The finer details and lacking in contrast, the higher the illumination is needed, which is between 500 lux to 1000 lux (Suma'mur, 1996).

From the results of research and interviews, workers often complain about the burden on the eyes, a headache, feel stiff in the shoulder and felt pain in the back. This is due to the workers doing the same job every day where employees work with raising both shoulders together while inserting the hair into the hole-filet net. This is done repeatedly, so that the complaints in the shoulder and the back are often felt by workers. Besides, the rest is only given at meal time without a short break interrupted during work

From the research and interviews can be found that workers often complain of eyes that are watery, tired, sleepy and strained. It's because the object is small and thin enough so that the required accuracy is quite high. Besides, the lightings in the workplace those are not qualified to work with high precision caused eyes being forced to look at objects in the lighting conditions that are inadequate.

Workers often feel aches in the left and right shoulder, the left and right arms, upper and lower waist, on the back and on the buttocks. It can be seen when workers perform activities that frequently and repeatedly using two hands at the same time. Embedding a filet hair in nets, works by using non ergonomic chairs, and other factors caused by the position and posture of work, which is unnatural, so the muscles receive pressure from the ongoing workload without the opportunity of relaxation.



Picture 1. Unnatural working position in which the worker bent at work



Picture 2. Workplace conditions with inadequate lighting

CONCLUSIONS

From the analysis above, it can be concluded that:

1. Fatigue scores are very high by 4 workers (22.22%), a high score by six workers (33.33%) and a very high score by 8 workers (44.44%).
2. Eyestrains are medium score by 11 workers (61.11%), a high score by 5 workers (27.78%) and a very high score by 2 workers (11.11%).
3. Musculoskeletal disorders are medium score by 6 workers (33.33%), while the high score by 12 workers (66.67%).

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