

THE EFFECTS OF WORK ENVIRONMENT CONDITIONS ON ENERGY EXPENDITURE OF SEALER MACHINE WORKERS AT PT. MANNASATRIA KUSUMAJAYA PERKASA

Yustin Farah Aulia, Teguh Oktiarso

Universitas Ma Chung

Abstract

The purpose of this study is to determine whether the environmental conditions of the work environment in the form of ambient temperature, humidity, and light intensity affect the energy expenditure of sealer machine workers at PT. Mannasatria Kusumajaya Perkasa. The working environment of sealer machine workers was very dependent on the weather conditions in the area, so there was no fixed temperature, humidity, and light intensity. The analytical method in this study used analysis of variance (ANOVA), using a factorial experiment with randomized block design. Each factor of temperature, humidity, and light intensity has two levels. These three factors will be tested on four age groups of workers, namely workers aged 20-25 years old, 26-30 years old, 31-35 years old, and 36-40 years old.

The results of the ANOVA test stated that there was an influence of humidity factor and the interaction of temperature and humidity factors on the energy expenditure of workers. The LSD test on the humidity factor stated that a humidity level of $\geq 71\%$ caused a higher number of worker calories (223.250 kcal) than a humidity level of 53.8-70% (205.625 kcal). The LSD test of the interaction of temperature and humidity factors concluded that at a humidity level of $\geq 71\%$, a temperature of 29-32°C caused a higher average energy expenditure of workers than at a temperature of 24-28.9°C. The level of reliability and accuracy of the results of the analysis of variance in this study was 84.592%.

Keywords: *energy expenditure*, ANOVA, temperature, humidity, light intensity