

Occupational heat stress and physiology parameters of male workers in a steel plant factory at Pasir Gudang, Johor

Abstract

A cross-sectional study was conducted in a steel plant in Pasir Gudang, Johor. The main objective of this study was to determine heat stress and its effect on physiological changes such as body core temperature, blood pressure, pulse rate and heart rate recovery among male workers steel plant. A total of 60 workers from steel plant were selected. Physiological parameters such as body core temperature, blood pressure, pulse rate and heart rate recovery were measured by standard and systematic technique. Environmental parameter such as WBGT(in) and WBGT(out) was measured by using QUESTEMP^o 34 Thermal Environment and meanwhile for air velocity was measured by using Velocicheck Model TSI 8850. Self-administered questionnaire was used to determine respondents' socio-economic background, daily activities and status of health. The range of body core temperature was between 36.0°C to 37.6°C. The range of systolic blood pressure and diastolic blood pressure was between 100 to 120 mmHg and 60 to 90mmHg. The mean for WBGT (in) is 29.1°C and the mean for air velocity is 0.23m/s. The One-Way ANOVA shows that there were no significant differences for heat stress index between before, 2 hours after and 8 hours after work. The Pearson Correlation Test showed that there are weak correlation between heat stress index and body core temperature and also body core temperature and blood pressure. There are strong significant relationship ($p < 0.05$) between body core temperature (8 hours after work) and pulse rate (8 hours after work). This study revealed that workers should be working based on 50% work and 50% rest hourly because they are at the risk of heat stress.