

ABSTRACT

Factor Influencing Physiological Response of Workers due to Heat Stress in the Confined Space (Studi in Heater Unit Superabsorbent Polymer Plant PT. Nippon Shokubai Indonesia)

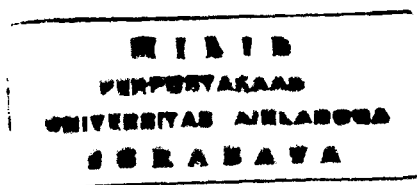
Hot work environment is additional workload for workers. Heat stress is the limit of ability to accept heat workers received from the combination of body metabolism, clothing and environmental factors such as temperature, humidity, air movement, radiation. Heat stress can cause physiological response such as increase the body temperature, pulse rate and blood pressure (systole and diastole) and decrease the weight.

The aim of this study is to measure heat stress and workload and analyze factors influencing physiological response in workers exposed to heat in confined space heater PT. Nippon Shokubai Indonesia. This was an observational study with cross-sectional research design. The sample was all of population (10 workers). Data was collected by measuring physiological response before and after working, heat stress with ISBB measurement and workload. Workload was calculated based on SNI 7269-2007 about calorie needs according to energy expenditure.

The result of heat stress measurement show that value of ISBB is above the Threshold Limit Value established by PER.13/MEN/X/2011 (34,9°C) with the workload of the workers was in the heavy category (461,94 ccal). Based on data analysis, there was difference in the result of body temperature, pulse rate, blood pressure and weight measurement before and after working. Based on analysis using regression logistic statistical test, it was discovered that factors influencing physiological response was worker's age, smoking behavior and consume water.

The suggestion is the workers drinking small amount of water 250 ml every half hour or so, avoid beverages such as tea and coffe, avoid eating hot, and heavy meals. Do training and education about heat stress and make schedule to charging water in drinking room.

Keyword: Heat stress, confined space, physiological response.



ABSTRAK

Faktor Yang Mempengaruhi Respon Fisiologi Tenaga Kerja Akibat *Heat Stress* di *Confined Space* (Studi di Unit *Heater Superabsorbent Polymer Plant* PT. Nippon Shokubai Indonesia)

Lingkungan kerja panas merupakan beban tambahan bagi tenaga kerja. *Heat stress* adalah batasan kemampuan penerimaan panas yang diterima tenaga kerja dari kombinasi metabolisme tubuh, pakaian kerja dan faktor lingkungan seperti temperatur udara, kelembapan, kecepatan udara dan suhu radiasi. *Heat stress* dapat menyebabkan respon fisiologis tenaga kerja seperti meningkatnya suhu tubuh, denyut nadi, tekanan darah (sistolik dan diastolik) dan menurunnya berat badan.

Tujuan dari penelitian ini adalah untuk mengukur iklim kerja dan beban kerja serta menganalisis faktor yang mempengaruhi terjadinya respon fisiologis tenaga kerja akibat *heat stress* di *confined space* unit *heater* PT. Nippon shokubai Indonesia. Jenis penelitian ini bersifat observasional dengan desain *cross-sectional*. Jumlah sampel adalah keseluruhan populasi yaitu 10 orang. Data didapatkan dari pengukuran respon fisiologis sebelum dan sesudah bekerja, *heat stress* dengan pengukuran ISBB dan pengukuran beban kerja. Beban kerja dihitung berdasarkan SNI 7269-2007 tentang tingkat kebutuhan kalori menurut pengeluaran energi.

Hasil pengukuran *heat stress* didapatkan rerata nilai ISBB adalah 34,9°C sehingga telah melebihi Nilai Ambang Batas berdasarkan PER.13/MEN/X/2011 dengan beban kerja termasuk dalam kategori berat yaitu 461,94 kkal. Berdasarkan analisis, diperoleh data bahwa terdapat perbedaan antara suhu tubuh, denyut nadi, tekanan darah (sistolik dan diastolik) dan berat badan sebelum dan sesudah bekerja. Berdasarkan uji statistika regresi logistik didapatkan pula hasil bahwa faktor yang mempengaruhi terjadinya respon fisiologis tenaga kerja adalah umur, kebiasaan merokok dan *intake* cairan tenaga kerja.

Disarankan pekerja mengkonsumsi air minum secara rutin setiap setengah jam sekali minimal 250 ml atau lebih, menghindari konsumsi teh, kopi, makan makanan panas dan berat. Dilakukan pula pelatihan dan edukasi mengenai *heat stress* dan membuat jadwal pengisian air minum yang terdapat di ruang minum.

Kata kunci : Tekanan panas, ruang terbatas, respon fisiologis.

