

Assessment of Heat Stress Exposure Among Military Reserve Cadets During Training

Nur Rania Hussin^a, Nurulain Mustafa Udin^{a*}

Structured Abstract

Background: Military reserve cadets in tropical climates, such as Malaysia, are particularly vulnerable to heat stress due to prolonged exposure to high temperatures and humidity during intensive physical training. These environmental conditions, combined with the physical demands of training, often lead to heat-related illnesses, which can severely impact cadets' health, safety, and performance. This study aims to assess heat stress exposure among cadets by evaluating self-reported symptoms, measuring WBGT index levels, and providing practical recommendations to mitigate these risks.

Methods: A cross-sectional study was conducted at UiTM Puncak Alam, involving 106 cadets undergoing outdoor training. The study utilized the Wet Bulb Globe Temperature (WBGT) index to measure heat stress levels during peak heat hours (2:11 PM to 4:50 PM), reflecting environmental risks. Data on self-reported symptoms of heat stress were collected through a validated questionnaire, including symptoms such as fatigue, muscle cramps, headaches, and tachycardia. Descriptive analysis of the data was performed using SPSS software to summarize the findings.

Results: The results indicated that 99.1% (n = 105) of cadets reported experiencing fatigue, while muscle cramps (91.5%, n = 97), tachycardia (85.8%, n = 91), and headaches (84.9%, n = 90) were also prevalent. WBGT readings 32.0°C consistently exceeded the Threshold Limit Value (TLV) of 29.0°C, demonstrating that the training environment posed a high risk of heat stress. Furthermore, 81.1% (n = 86) of cadets consumed less than 2 liters of water daily, pointing to inadequate hydration as a major risk factor.

Conclusion: In conclusion, this study highlights the critical need for improved heat stress management in cadet training programs. Recommendations include rescheduling training sessions to cooler periods of the day, implementing hydration protocols to ensure adequate water intake, and educating trainers on emergency response procedures to address heat-related incidents. By implementing these measures, heat stress risks can be significantly reduced, safeguarding cadet health and improving overall training safety.

Keywords: Heat Stress, WBGT Index, Cadet Health, Military Training, Heat-related Illness

*Correspondence: nurulainmustafa@uitm.edu.my

^a School of Chemistry & Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia