

The Relationship between Energy Intake and Hydration Status with Cardiorespiratory Fitness among Taekwondo Athletes in Jember

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ABSTRACT

Cardiorespiratory fitness is an essential component of athletic performance, particularly in taekwondo, which requires high-intensity physical activity. Cardiorespiratory fitness may be influenced by several factors, including energy intake and hydration status. Inadequate energy intake and poor hydration can impair aerobic capacity, resulting in reduced training and competition performance. This study aimed to analyze the relationship between energy intake, hydration status, and cardiorespiratory fitness among taekwondo athletes in Jember. This study employed a cross-sectional design with a simple random sampling technique. A total of 71 taekwondo athletes aged 12–18 years who met the inclusion and exclusion criteria participated in the study. Energy intake was assessed using a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ), hydration status was evaluated using the *Periksa Urin Sendiri* (PURI) urine color method, and cardiorespiratory fitness was measured using the Multistage Fitness Test (Beep Test) to estimate VO_{2max} . Data were analyzed descriptively and statistically using the Spearman rank correlation test with a significance level of $\alpha = 0.05$. The findings indicated that most athletes had inadequate energy intake, while the majority demonstrated moderate cardiorespiratory fitness. Spearman correlation analysis revealed no significant relationship between energy intake and cardiorespiratory fitness ($p = 0.222$; $r = 0.147$). In contrast, hydration status was significantly associated with cardiorespiratory fitness ($p < 0.001$; $r = -0.638$). The negative correlation indicated that poorer hydration status was associated with lower levels of cardiorespiratory fitness. In conclusion, hydration status was significantly associated with cardiorespiratory fitness among taekwondo athletes in Jember, whereas energy intake was not significantly associated with cardiorespiratory fitness. Therefore, maintaining adequate hydration should be prioritized to support optimal cardiorespiratory fitness, accompanied by appropriate energy intake and well-planned training programs to optimize athletic performance.

Keywords: *energy intake, hydration status, cardiorespiratory fitness, VO_{2max} , taekwondo athletes.*