

The Relationship Between Body Fat Percentage And Diet Quality with VO2Max among Middle-Distance Runners

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ABSTRACT

VO2Max is an important indicator of cardiorespiratory fitness that plays a significant role in supporting the performance of middle-distance runners. Aerobic capacity can be influenced by various factors, including body fat percentage and diet quality. A high body fat percentage may increase the body's workload during physical activity and reduce the efficiency of oxygen utilization. Meanwhile, good diet quality can support adequate intake of macro- and micronutrients required for energy metabolism, recovery, and physical performance. Therefore, body composition and diet quality are important factors in optimizing athletes' aerobic capacity. This study employed an observational analytic design with a cross-sectional approach. The aim of this study was to analyze the relationship between body fat percentage and diet quality with VO2Max among middle-distance runners. The study was conducted among athletes affiliated with the Indonesian Athletics Association (PASI) in Probolinggo City, Jember Regency, Bondowoso Regency, Situbondo Regency, and Banyuwangi Regency. Body fat percentage was measured using Bioelectrical Impedance Analysis (BIA), diet quality was assessed using the Diet Quality Index-International (DQI-I) based on the Semi Quantitative Food Frequency Questionnaire (SQ-FFQ), and VO2Max was measured using the Multistage Fitness Test (Bleep Test). Data were analyzed using the Spearman correlation test. The results showed that the mean body fat percentage was 19.15%, the mean diet quality score was 75.82, and the mean VO2Max was 45.33 ml/kg/min. Spearman correlation analysis revealed a strong and significant negative relationship between body fat percentage and VO2Max ($r = -0.771$; $p < 0.001$). In addition, there was a significant positive relationship between diet quality and VO2Max ($r = 0.329$; $p = 0.038$). Body fat percentage was negatively associated with VO2Max, while diet quality was positively associated with VO2Max among middle-distance runners. Higher body fat percentage tended to be associated with lower VO2Max, whereas better diet quality tended to be associated with higher VO2Max.

Keywords : *body fat percentage, diet quality, DQI-I, VO2Max, middle distance runners.*