

The Respiratory Muscle Strength and Pulmonary Functions of Athletes at Sabaragamuwa University: Differences by BMI Classification

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The respiratory system is pivotal for athletic performance. Factors such as Respiratory Muscle Strength (RMS) and Pulmonary Function (PF) are integral components influencing athletes' performance, with diverse Body Mass Index (BMI) profiles and sport-specific characteristics impacting respiratory capabilities. The study aimed to compare RMS and PF according to BMI classification and to compare the RMS and PF among different team sports. A descriptive cross-sectional design was utilized under a quantitative approach. The sample of seventy female athletes, within the age range of 21 to 28 years were divided into four groups according to Asian Pacific BMI ranges (<18.5, 18.5–22.9, 23 – 24.9, ≥ 25) and six groups (Hockey, Football, Elle, Kabaddi, Netball, Volleyball) by using a multi-stage sampling technique. Data were collected using the pulmonary function test and the standard formula for calculating RMS. The data were analyzed utilizing ANOVA, employing the Minitab 19 software. According to BMI categories, there were significant differences in Maximum Inspiratory Pressure (MIP) (cmH₂O), Maximum Expiratory Pressure (MEP) (cmH₂O), Force Vital Capacity (FVC) (L), Force Expiratory Volume in one second (FEV₁) (L), and Maximum Voluntary Ventilation (MVV) (L/min) scores ($P < 0.05$). FVC, FEV₁, and MVV were highest in the BMI categories of 23–24.9 kg/m² and ≥ 25 kg/m². The category of > 25 kg/m² exhibited the highest RMS scores. However, PF and RMS scores did not significantly differ across team sports ($P > 0.05$). In conclusion results suggest athletes achieve optimal PF scores in the BMI categories of 23–24.9 and ≥ 25 kg/m², while the BMI category of ≥ 25 kg/m² achieves maximum RMS scores. Results underscore the intricate connection between PF, RMS and BMI in athletes. Further research is needed to better understand the ideal BMI ranges for athletes while considering health outcomes and other determinants as well.

Keywords: *athletes, body mass index, pulmonary function, respiratory muscle strength*