

Forced Vital Capacity in Swimmers

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Swimmers have superior pulmonary capacity (Lazovic-Popovic et al., 2016; Sable, Vaidya, & Sable, 2012; Vaithyanadane, 2012). The purpose of this study was to compare differences in the lung capacity of competitive swimmers to (a) predicted pulmonary volumes and (b) age-matched controls. Given that swimmers differ from land-based athletes due to horizontal body position and breathing against water pressure, it is important to identify whether differences in pulmonary function exist in the healthy swimmer as compared to age-matched controls. In this study, non-swimmers and swimmers, ages 19 to 40 with no history of asthma or active allergies at the time of data collection were recruited to participate. Participants' forced vital capacity (FVC), or maximum expiration, was measured using a medical-grade spirometer, which is the device typically used for assessing respiratory function and diagnosing pulmonary disease. It was hypothesized that FVC would be greater in swimmers than in non-swimmers and greater than the spirometer-predicted volumes due their unique pulmonary abilities.

Preliminary findings indicate that many swimmers demonstrate a higher FVC than is predicted for their height, weight, sex, age, and ethnicity. The findings from this study will provide evidence for how general pulmonary function in swimmers is measured and interpreted by health-care professionals. Because swimmers train in water, these athletes experience resistance in the area of the ribs and lungs, which may result in their higher lung capacity. Should a competitive swimmer produce a FVC volume within the predicted range, the swimmer may actually be under-functioning for what is required for the sport. Underestimation of swimmer's FVC values on the spirometer may result in under-diagnosis of pulmonary disorders in this population. Health professionals such as pulmonologists and speech-language pathologists must be aware of these differences when diagnosing respiratory disorders and behavioral breathing disorders, such as paradoxical vocal fold motion (Sandage & Zelazny, 2004), in competitive swimmers.

Statement of Research Advisor

Empirical research that characterizes differences between swimmer pulmonary function versus non-swimmer pulmonary function fills an important gap in our current understanding of swimmer pulmonary function in health and disease states. The findings from this investigation merge the disciplines of exercise science and speech language pathology in a novel manner to provide a more thorough understanding of the pulmonary function characteristics of aquatic athletes.

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References

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