

TACSM Abstract

Age-associated Changes in Training Volume and Athletic Performance: Cross-sectional and Longitudinal Analyses of Masters Swimmers

STEPHANIE S. LAPIERRE, BRETT D. BAKER and HIROFUMI TANAKA

Cardiovascular Aging Research Lab; Exercise Science; The University of Texas at Austin; Austin, TX

Category: Masters

Advisor / Mentor: Tanaka, Hirofumi (htanaka@austin.utexas.edu)

ABSTRACT

Masters athletes make every effort to maintain or even improve the athletic performance they accomplished when they were young. However, a decline in athletic performance is one of the inevitable consequences of aging. Precise physiological mechanisms of age-related decrease in athletic performance are not known but it is thought to be driven by decreases in exercise training stimuli. **PURPOSE:** We determined the influence of changes in training volume with aging on swimming performance by using both cross-sectional and longitudinal approaches. **METHODS:** Competitive swimmers who were members of the US Masters Swimming association were included if they had logged their yearly training volume and had participated in 50m freestyle events at a USMS meet between 2011 and 2015. A total of 692 and 98 swimmers aged 20-88 years were studied in the cross-sectional and longitudinal analyses. Multiple regression and mixed effects multiple regression models were used with gender as a covariate. The longitudinal data was then centered around different ages to find the age at which training is a significant predictor of performance. **RESULTS:** Both cross-sectional and longitudinal analyses showed no significant associations between swimming training volume and age. In the longitudinal analyses, training volume was not significant as a predictor in swimming performance for younger swimmers (53 years and younger). In middle-aged swimmers (54-79 years), increases in training volume resulted in mildly better swimming performance (i.e., 3 miles/month increases in training volume were related to .05 sec better swimming time). Increases in training volume with advancing age had more significant effects on swimming performance in older swimmers (80 years and older) (i.e., 3 miles/month increases in training volume were associated with .27 sec better swimming time). **CONCLUSION:** In younger swimmers, changes in training volume did not have any significant impact on swimming performance. However, in middle-aged and older swimmers, there was a graded relationship between yearly increases in training volume and swimming performance such that the impact of training volume on swimming performance appears to become greater with advancing age.