

## **The Role of Body Fat Percentage and $VO_{2MAX}$ in Predicting Arterial Stiffness in Female College Students**

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### **ABSTRACT**

Within the college population, high blood pressure (BP), as well as obesity and sedentary lifestyles, are seen. Bodyfat influences these outcomes. Much of the literature ignores the possible effects that fitness may have on these outcomes, specifically in females. **PURPOSE:** The intent of this study was to determine if  $VO_{MAX}$  can predict arterial stiffness after adjusting for body fat% in college females. **METHODS:** Healthy young females were recruited from Grand Canyon University. Subjects came to the lab for a single visit for the following assessments: height, weight, waist circumference, hip circumference, aortic BP, augmentation pressure (AP), augmentation index adjusted at a heart rate of 75 (Aix@75), carotid-femoral pulse wave velocity (cfPWV) and a  $VO_{2MAX}$ . Hierarchical regression was used with body fat% entered into the first block and  $VO_{2MAX}$  entered into the second block. **RESULTS:** 92 female college students completed the study. The mean BMI was  $25.4 \pm 5.1$  kg/m<sup>2</sup>, and the mean age was  $20.5 \pm 2.2$  years. Body fat% and  $VO_{2MAX}$  did not statistically predict brachial systolic BP ( $P=0.137$ ) or cfPWV ( $P=0.439$ ). Body fat % significantly predicted brachial diastolic BP ( $R^2=0.047$ ,  $P=0.040$ ), and  $VO_{2MAX}$  significantly explains 4.4% more of the variance ( $P=0.043$ ). Body fat % significantly predicted central systolic BP ( $R^2=0.126$ ,  $P<0.001$ ), but  $VO_{2MAX}$  did not significantly add to the model ( $P=0.320$ ). For central diastolic BP, body fat % was not an independent predictor ( $P=0.075$ ); however,  $VO_{2MAX}$  was found to be an independent predictor ( $R^2=0.100$ ,  $P=0.015$ ). Body fat % was not an independent predictor ( $P=0.075$ ) of AP; however,  $VO_{2MAX}$  was found to be an independent predictor of AP ( $R^2=0.113$ ,  $P=0.008$ ). Body fat % significantly predicted Aix@75 ( $R^2=0.067$ ,  $P=0.014$ ), and  $VO_{2MAX}$  was an independent predictor ( $R^2=0.193$ ,  $P<0.001$ ). **CONCLUSION:** After adjusting for body fat%,  $VO_{2MAX}$  significantly predicted measures of arterial stiffness in college aged females. Additionally,  $VO_{2MAX}$  seemed to be a better predictor of arterial stiffness than body fat%. It is crucial to also consider physical fitness when considering body fat% and health.