

BMI Superior to Fat-Free Mass Index and Fat Mass Index for Predicting Arterial Stiffness in College Students

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ABSTRACT

Arterial stiffness is a significant predictor of cardiovascular disease and mortality. Body mass index (BMI) has been used to predict cardiovascular disease outcomes but does not consider fat and lean mass. Fat mass index (FMI) and fat-free mass index (FFMI) may be superior to BMI in predicting arterial stiffness because it considers body composition. **PURPOSE:** This study aims to determine if FFMI and FMI are superior to BMI at predicting arterial stiffness in college students. **METHODS:** Participants came into the exercise physiology lab, signed consent, and then had anthropometric measurements of height and weight taken, as well as a body fat assessment (BOD POD, COSMED). Carotid-femoral pulse wave velocity (cfPWV), pulse wave analysis, and brachial and central blood pressure (BP) were then measured. Linear regression was used to determine if BMI, FFMI, and FMI predict BP and arterial stiffness. **RESULTS:** 237 college-aged (20.1 ± 3.3 yr.) participants ($n = 122$ males, $n = 115$ females) with an average BMI of 25.4 ± 4.1 kg/m² completed this study. Results did not differ based on biological sex; thus, male and female data were aggregated. BMI significantly predicted brachial systolic BP (SBP) ($r = .324$), diastolic BP (DBP) ($r = .223$), central SBP ($r = .374$), DBP ($r = .270$), Augmentation pressure (AP) ($r = .282$), Augmentation index (AIX) ($r = .213$), and cfPWV ($r = .258$) (all $P < .05$). FFMI significantly predicted brachial SBP ($r = .395$), central SBP ($r = .320$), and cfPWV ($r = .224$) (all $P < .05$), but did not predict brachial or central DBP, AP or AIX. FMI significantly predicted central SBP ($r = .143$), brachial and central DBP ($r = .329$, $r = .318$, respectively), AP, ($r = .275$), and AIX ($r = .328$) (all $P < .05$), but did not predict brachial SBP, or cfPWV. **CONCLUSION:** BMI appears to be a superior predictor of BP and arterial stiffness than FFMI and FMI in healthy college-aged adults.