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Blood pressure and circulatory relationships with physical activity level in young normotensive individuals: IPAQ validity and reliability considerations

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Abstract: Physical activity (PA) reduces risk of cardiovascular diseases, including hypertension. However, the international physical activity questionnaire (IPAQ) relationships with blood pressure (BP) and flow (BF) and vascular resistance (VR) in healthy young individuals have not been studied. Therefore, BP, BF, and VR relationships with the IPAQ were evaluated in college normotensive students (18-23 yrs). Additionally, the IPAQ relationships with body fat (%BF), muscle mass (MM), body mass index (BMI), waist/hip (W/H) ratio, maximum walking distance in 6 min (6MWD), and handgrip strength (MHG) were examined to evaluate the questionnaire validity against fitness. Subsequently, the IPAQ was administered three times to examine its reliability. Walking, moderate, and total PAs correlated negatively with systolic blood pressure (SBP), diastolic blood pressure (DBP), and mean arterial pressure (MAP) (range: $r = -0.3$ to -0.5 , $p < 0.05$). Additionally, all BP measures were greater in least physically active individuals. In a subgroup of 42 students, IPAQ sitting time correlated with BF ($r = -0.3$) and VR ($r = 0.4$). The intraclass correlation coefficient (ICC) for walking, moderate, vigorous, and total PAs and sitting time/week were, 0.97, 0.96, 0.97, 0.97, and 0.96, respectively. The males scored greater vigorous PA ($p = 0.001$) than the females, while moderate, walking, and total PAs were the same ($p > 0.05$). Additionally, vigorous PA correlated with %BF ($r = -0.2$), MM ($r = 0.3$), MHG ($r = 0.3$), and 6MWD ($r = 0.3$) and total PA correlated with MM ($r = 0.2$), MHG ($r = 0.2$), and 6MWD ($r = 0.3$). The IPAQ association with the circulatory measures demonstrates PA importance for controlling BP and adds clinical value to the IPAQ. Additionally, the IPAQ is reliable, can discriminate between populations, and reasonably valid against health-related fitness.