

DAILY PHYSICAL ACTIVITY AND BONE HEALTH AMONG HIGH SCHOOL STUDENTS

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ABSTRACT

The primary focus of this study was to quantify the association between pedometer-based physical activity and various measures of bone mass in adolescents. A secondary purpose of this investigation was to determine if adolescents who took at least 10,000 steps per day exhibited higher bone mass compared to those who took less than 10,000 steps per day. Participants (N = 46) included boys and girls averaging 16 (± 0.9) years. Daily step accounts were tallied by using NL-2000 pedometers for a 7-day period, while areal bone mineral density (aBMD, g/cm^2) and content (BMC, g) were measured at the hips and lumbar spine with a Hologic dual energy x-ray absorptiometry (DEXA) machine. Average daily step counts were significantly ($p < .05$) correlated to total hip ($r = .36$) ($r = .37$), femoral neck ($r = .31$) ($r = .36$), and trochanteric ($r = .35$) ($r = .29$) aBMD and BMC, respectively. Total hip, femoral neck, and trochanteric aBMD, and total hip along with femoral neck BMC, were significantly higher ($p < .025$) among participants who achieved 10,000 steps or more per day compared to those who were not successful in achieving this step activity goal. When data were stratified by sex, total hip and trochanteric aBMD were significantly higher for girls who accumulated 10,000 or more steps per day. Taken together, these findings suggest that a significant positive relationship exists between accumulated step activity and bone mass in adolescent youth. Furthermore, the 10,000 step per day criterion appears to adequately discriminate group differences in bone health in this pediatric population.