Is device-measured vigorous-intensity physical activity associated with health-related outcomes in children and adolescents? A systematic review and meta-analysis

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Abstract
Objective: This study sought to analyze the prospective association between vigorous-intensity physical activity (VPA) and health-related outcomes in children and adolescents. Methods: Studies reporting associations between device-measured VPA and health-related factors in children and adolescents aged 3–18 years were identified through database searches (MEDLINE, EMBASE, and SPORTDiscus). Correlation coefficients were pooled if outcomes were reported by at least 3 studies, using DerSimonian–Laird random effects models. Results: Data from 23 studies including 12,056 participants were pooled using random effects models. Significant associations were found between VPA at baseline and overall adiposity ($r = -0.09$, 95% confidence interval (95%CI): −0.15 to −0.03, $p = 0.002$; $I^2 = 90.4\%$), cardiometabolic risk score ($r = -0.13$, 95% CI: −0.24 to −0.02, $p = 0.020$; $I^2 = 69.6\%$), cardiorespiratory fitness ($r = 0.20$, 95%CI: 0.13−0.28, $p < 0.001$; $I^2 = 0\%$), and total bone mineral density ($r = 0.16$, 95%CI: 0.06 to 0.25, $p = 0.001$; $I^2 = 0\%$). Conclusion: VPA seems to be negatively related to adiposity and cardiometabolic risk score and positively related to cardiorespiratory fitness and total body bone mineral density among children and adolescents at follow-up. Therefore, our findings support the need to strengthen physical activity recommendations regarding VPA due its health benefits in children and adolescents.

Author keywords
Accelerometry
Adiposity
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