

Objectively measured physical activity is negatively associated with academic achievement in adolescents

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Abstract

Background: An increasing amount of literature supports the beneficial effects of physical activity on cognitive performance and academic achievement. Only a small number of studies investigated this association in adolescents and reported mixed results. Most of these studies measured physical activity by self report, however self report has several limitations. Therefore, this studies investigated the association between objectively measured physical activity, cognitive performance and academic achievement in adolescents, controlling for confounding variables and interaction effects..

Methods: Cross sectional study in grade 7 and 9 (n = 441; 218 boys; mean age 13.3). Physical activity was measured with an ActivPAL3™ accelerometer, attached on the right thigh. Cognitive performance (three commonly used neuropsychological tests), academic achievement (mean school ratings Dutch, English, mathematics), body mass index and aerobic fitness were measured objectively. Socioeconomic status, pubertal phase, studying at home and team sport participation were self-reported. Results were controlled for interaction and outlier effects. Data was analysed with multiple regression analysis.

Results: After controlling for confounding factors and interaction effects, no significant association between physical activity and cognitive performance has been found. A significantly negative association between physical activity and academic achievement has been found. Besides, simple slopes analysis showed that the association between physical activity and academic achievement and mathematics performance is significantly negative in grade 7, while no significant association exists in grade 9.

Conclusion: This study showed that physical activity is negatively associated with academic achievement and not significantly associated with cognitive performance in adolescents. Interestingly, we found a negative association between physical activity and academic achievement in students in the onset of adolescence, but no significant association in students later in adolescence. Future studies should use longitudinal designs to investigate the role of physical activity in the development of cognition and academic achievement in adolescents.