The association between physical activity, cognitive performance, and academic achievement in adolescents

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Background

- Adolescents as a group did not get much attention
- The brain of adolescents is still in development until the age of 20 years

Previous studies in adolescents

- Self-reported sport participation associated with better cognitive performance

- Physical activity has a positive effect on cognitive performance in older adults

Background

- Physical activity is positively associated with cognitive performance in adults
- Little research has been done in adolescents
- Brain of adolescents is still in development
- The association between physical activity and cognitive performance in adolescents is interesting and important to investigate

Previous studies in adolescents

- Self-reported active commuting to school positively associated with cognitive performance
Previous studies in adolescents

- Vigorous physical activity was positively associated with academic achievement.
- Threshold level of intensity is necessary to produce beneficial effects.

Kroek et al., 2009

Limitations previous research

- Not all studies measured physical activity objectively.
- None of these studies include both cognitive performance and academic achievement.
- No inclusion of other interesting variables (sleep duration, computer gaming and television viewing).
- Lack of other relevant outcomes (mood, self-esteem).
- No longitudinal perspective.

Research questions

What is the effect of:
- Physical activity
- Commuting to school
- Sleep duration
- Computer gaming and television viewing

On:
- Cognitive performance
- Academic achievement
- Mood
- Self-esteem

Methods

- Longitudinal observational study.
- 360 students, aged 12-17 years.
- University preparatory education level.
- Secondary schools in Zuid-Limburg.

Procedures

- Physical activity
  - Accelerometer
  - Self-reported questionnaire
- Sleep duration
- Computer gaming
- Television viewing

Independent variables
Dependent variables

- Cognitive performance
  - Letter-Digit Substitution Test
  - The D2 test of Attention
  - Fluency test
- Academic achievement
  - Dutch, English, Mathematics
- Mood
  - Self-report scale (CES-D)
- Self-esteem
  - Rosenberg self-esteem scale

Covariates

- Body mass index
- Alcohol consumption
- Smoking
- Socioeconomic status
- Pubertal phase
- Aerobic fitness

Thank you for your attention!