

# FOCUS ON RESEARCH

## EFFECT OF EXERCISE ON COGNITIVE FUNCTION IN CHILDREN: A PILOT STUDY

### Researchers

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### Aim

This pilot study aimed to assess, in 6 year olds,

- the reliability and feasibility of a range of cognitive measures (of attention and working memory) and
- the feasibility of a physical education (PE) intervention (enhanced, more aerobic PE).

In the longer term this information will be used to design a randomised controlled trial (RCT) intended to provide a rigorous test of the hypothesis that exercise might improve attention and working memory in children.

### Project Outline/Methodology

This was a pilot RCT in 7 primary schools with 71 6 year olds. With the help of specialists in primary PE we adapted the existing curriculum to make it more aerobic. We then randomly allocated 3 schools to receive enhanced PE for 2 hrs/ week, the other 4 randomly allocated to the control group (standard PE curriculum 2 hrs/ week). This is known as a cluster RCT as individuals are not randomised.

A variety of outcome measures were made at the beginning and end of the 8 week intervention: measures of attention, working memory, behaviour; objectively measured habitual physical activity (accelerometry over 6 days); objectively measured physical activity during PE. We assessed the acceptability and feasibility of the PE intervention, and the intensity of activity which children reached during PE. We also measured the reliability of a variety of measures of attention and working memory).

### Key Results

Some of the candidate measures of attention and working memory were unsuitable in this sample and setting: children's results on some of the tests varied enormously from one measurement to the next, indicating that they measured children's attention and memory very poorly; some measures simply took too long to be acceptable to 6 year olds.

At least one, arguably two-three, of the candidate cognitive measures was suitable: provided stable and consistent measures each time a child was assessed; had a high completion rate; was completed easily and quickly by children.

Enhanced PE was enjoyed by children and they reached significantly higher physical activity intensities than children doing 'control' PE. The enhanced PE programme therefore seems to be a promising intervention to be tested in a future RCT.

### Conclusions

With the information available from this pilot study we are in a position to design a rigorous RCT which will test the hypothesis that exercise might improve attention and/or working memory in children. We have established appropriate outcome measures for these variables, and have developed an appropriate and potentially generalisable exercise intervention.

### What does this study add to the field

This study has shown that we can successfully increase the aerobic intensity of school PE, and has provided us with at least one good measure of attention and working memory which is suitable for use with children in the early years of primary school.

### Implications for Practice or Policy

Promotion of physical activity in children is an important strategy for the Scottish Government. In the longer term, if it becomes established that exercise really does improve attention, memory, or behaviour, then this would facilitate the promotion of physical activity in many settings, but particularly in health and education.

### Where to next?

We plan a full scale RCT based on this pilot study.

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