

iCAHE JC Critical Appraisal Summary

Journal Club Details

Date of submission	November 2011
Journal Club location	Barossa
JC Facilitator	Kirsty McCulloch
JC Discipline	Physiotherapy

Clinical Scenario

In school age children, can physical activity improve learning outcomes?

Review Question/PICO/PACO

- P** School age children
- I** Physical Activity
- C** control
- O** any learning outcome

Article/Paper

Fedewa, A and Ahn, S (2011) The Effects of Physical Activity and Physical Fitness on Children's Achievement and Cognitive Outcomes: A Meta-Analysis.

Please note: due to copyright regulations CAHE is unable to supply a copy of the critically appraised paper/article. If you are an employee of the South Australian government you can obtain a copy of articles from the [DOHSA librarian](#).

Article Methodology:	Systematic Review
Returned JC on:	2011
By CAHE staff member:	Dr. Suchi Garg



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Ques No.	Yes	Can't Tell	No	Comments
1	✓			<p>Did the review ask a clearly-focused question? The study has a clearly focused question. The aim of the study is to quantitatively synthesize the research on physical activity and children's cognitive outcomes and to discuss implications for educators and other stakeholders in children's academic achievement.</p>
2	✓			<p>Did the review include the right type of study? Yes, clinical trials were sort. This meant that 76 studies were identified. However, only 60 were included as others did not sufficient information or there were other reasons which are listed on page 523.</p> <p>Is it worth continuing? YES the studies which have been looked at are relevant in addressing the study aims.</p>
3	✓			<p>Did the reviewers try to identify all relevant studies? The reviewers did a thorough search including both published and unpublished literature based on manual and computerised search of the following databases PsychLit, PyschInfo, Dissertation Abstracts, MedLine, and ERIC. In addition to these databases, general search engines were also searched using the same search terms. Finally, effort was made to look for any bibliographic information by searching literature reviews, ancestry searches and comprehensive analysis. Exclusion criteria was applied to the studies that were retrieved which is given on page 523.</p>
4			✓	<p>Did the reviewers assess the quality of the included studies? The quality of each article was not reported.</p>
5		✓		<p>If the results of the studies have been combined, was it reasonable to do so? The studies were coded on the basis of study design, participant characteristics, physical activity/exercise and cognitive measure characteristics. The approach used for combining the studies is unclear.</p>
6				<p>How are the results presented and what is the main result? The results were analysed using random-effects and mixed-effects model. The results are presented in the</p>

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				<p>form of tables.</p> <p><i>Bottom Line Result:</i> Physical activity benefits those children who need it most, especially in areas where high stakes testing demands proficient achievement: mathematics and reading. Programs emphasising aerobic training had the maximum effect on children’s cognitive and achievement outcomes. Additionally, activities provided three times a week were found to have strongest influence on children’s cognitive and achievement outcomes.</p> <p><i>Journal club answer:</i></p> <p>Quality of Study</p> <ul style="list-style-type: none"> • Comprehensive search method • Coding system for consideration of multiple issues • Searched only articles in English – possibly missing learning from other countries • Clear research question • Appears to consider Physical Activity (what you do) as distinct from Physical Fitness (the outcome of physical activity) • Very complex statistics with an ES figure created to compare disparate studies <p>Results</p> <ul style="list-style-type: none"> • More physical activity appears to produce better cognitive outcomes • Most schools face pressures to reduce physical activity time / funding and increase “teaching” time • Health versus Education – the education system does not appear to value physical activity having a contribution to learning outcomes and is therefore see it as less important • Benefits appear to be higher for those with higher needs • Page 531: Why PA may increase outcomes: improved arousal levels, decreased fatigue, decreased boredom, increased self esteem, neuro theories (PA affects brain structure, function and neurotransmitters) • PA vs Fitness – the amount of effort expended during PA may account for differing fitness results • ES decreases with age – may be linked to opting out of sports, ? links to mood and adult / adolescent PA
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				<p>Discussion</p> <ul style="list-style-type: none"> • Younger active children tend to stay active and have good outcomes • For those with poor GM skills – do delayed skills lead to decreased learning outcomes? • Important to build skills to facilitate active play and participation • Need a balance between achieving specific skills and being able to participate in lifelong PA • Helps to break skills down and teach prior to ‘game play’ • Sometimes useful to teach ‘splinter skills’ to facilitate participation in a particular interest area • Work with families to develop an ‘active family culture’ – what can they do together? • Discussion of developmental milestones vs PA vs disability / delay
7				<p>How precise are these results?</p> <p>The study is quite precise considering the confidence intervals alone.</p>
8	10	Journal club answer		<p>Can the results be applied to the local population?</p> <p>Can the results be applied to the local population?</p> <ul style="list-style-type: none"> • Yes, the study population included a wide spectrum of children (from delay to normally functioning) • Also looked at a universal group – ie those attending an education setting • Findings around lack of perceived importance of PA in schools (as a learning tool) also appears to be representative of anecdotal experience <p>Were all important outcomes considered?</p> <ul style="list-style-type: none"> • The paper considered most of the important outcomes • Some other areas which could be investigated include: <ul style="list-style-type: none"> o How much PA and how often? o Is intensity important? o What is the impact on child mood / mental health?
9				

		<ul style="list-style-type: none"> o What is the impact of PA on a child’s ability to self modulate / self regulate? o What is the impact of PA on attention / learning behaviours? <p>Should policy or practice change as a result of the evidence contained in this review?</p> <ul style="list-style-type: none"> • Supports the need for PA in the early years • Could apply by modifying existing teacher workshops to highlight PA as a learning tool, not just a ‘health’ activity • Need to build PA in for children with difficulties – not just skills training but fitness and activity levels with a focus on participation • We can have an advocacy role in schools / education settings • These findings could link to previous JC article which suggested that teacher-led programs can improve motor skills • Also applicable to child care and younger settings • Need to consider using outdoor / active play as an educational opportunity as well as an opportunity to develop skills and better health
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