Can schoolyard improvements increase physical activity for the least active students, or just provide better opportunities for the most active?

Christiansen, Lars Breum Skov

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Can schoolyard improvements increase physical activity for the least active - or just provide better opportunities for the most active
Lars Breum Christiansen1, Mette Toftager1,2 & Jens Troelsen1

1Department of Sports Science and Clinical Biomechanics, University of Southern Denmark
2National Institute of Public Health, University of Southern Denmark
Contact: lbchristiansen@health.sdu.dk or tel. +45 6550 4468

Introduction:
Interventions can improve the outdoor physical and organizational environment of schools to increase the opportunities for physical activity (PA) in recess. The purpose of this study was to evaluate if such improvements had equal impact on recess PA of all students regardless of their leisure PA.

Methods:
The SPACE-study used a cluster randomized controlled study design with 14 schools and a 2-year follow-up. A web-based questionnaire was used to obtain knowledge of PA during recess and in leisure time. The multi-component intervention comprised a combination of changes to the physical environment and organizational changes (Fig. 1).

Results:
At follow-up most students perceived their leisure PA as very high (51%) and very few considered it as low (sedentary) (7%). The mean age was 14.5 years and 55% of the students stated to be active daily during recess. Adjusted for age, gender and baseline recess PA the multilevel logistic regression analysis showed that the odds ratio of daily recess PA was significantly higher in the intervention group (OR 2.15 95%CI 1.16-3.97). The students with higher self-rated leisure PA were also more often active during recess (64%, 51%, 48% and 32%), and the intervention effect was equivalent across the four activity levels (Fig. 2).

Conclusion:
The intervention produced considerable changes to the environment of all seven intervention schools, and had a positive impact on self-rated recess PA independent of leisure PA.

Fig 1. Intervention components

Teacher-initiated play  School outdoor area upgrade  Access to unfixed equipment  Mandatory outdoor recess

Fig 2. Odds ratio for being physical active daily during recess (mean age=14.5 years).
For groups defined by self-rated leisure PA and adjusted for age, gender and baseline recess PA (C=comparison & I=Intervention).

<table>
<thead>
<tr>
<th>Self-rated leisure activity level</th>
<th>C (n=216)</th>
<th>I (n=198)</th>
<th>C (n=90)</th>
<th>I (n=91)</th>
<th>C (n=76)</th>
<th>I (n=77)</th>
<th>C (n=31)</th>
<th>I (n=28)</th>
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<tbody>
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<td>Very high</td>
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<td>Odds ratio</td>
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