# Evaluating a school community linked physical activity intervention programme: a multi-level analysis.

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## PURPOSE OF THE STUDY

The purpose of this study was to evaluate a multicomponent PA intervention programme delivered to pupils aged 7-12 years in three urban primary schools in the UK. The intervention was designed by local health agencies in partnership with the school district, which aimed to raise awareness of the importance of PA and increase PA levels.

## METHODS

**INTERVENTION:**
- A matched-control study, involving one control (n=123) and three intervention (n=436) schools, was conducted over a seven month period.

- PA intervention programme was separated into two phases: (1) motivation DVD and 10 days of circuit based exercise sessions; (2) maintenance phase incorporating PA reward programme and use of specialist children's gym equipment in each school for a 4 wk period. Post intervention, children's exercise equipment was relocated to local community facilities.

**EVALUATION ANALYSIS:**
- Implementation process was evaluated using a mediated-variable (Baranowski & Jago, 2005) and content, process and outcome (CPO) model (Fridrich et al., 2015) (see Fig. 1). Change process was considered through the Logic Model (W.K. Kellogg Foundation, 2001) (see Table 1). Questionnaires and semi-structured interviews addressed the fidelity of the programme in terms of process and context.

- Outcome measures assessed the children's physical fitness levels (FITNESSGRAM test battery), and attitudes towards physical activity (CATPA inventory; Schutz et al., 1985) pre- and post-intervention. A 7-day recall questionnaire (PAQ-C; Kowalski et al., 2004) was used to form a composite PA score to assess change in PA levels.

## RESULTS

- As shown in Table 2, both groups increased PA levels (p<0.05); however, no improvement was observed in the intervention group for attitudinal components or physical fitness (p>0.05), except improved trunk strength/flexibility (p=0.005). Control group improved some fitness parameters including cardiovascular fitness, strength and flexibility (p<0.05).

- Overall, pupils and teachers enjoyed the programme; however findings did not support intervention aims. The theory of behavioural change for PA was not explicit which led to unrealistic programme goals. Programme implementation was inconsistent, lacked teacher 'buy-in', and did not incorporate pedagogical underpinning.

## IMPLICATIONS

- Greater focus was needed between different phases of the intervention: preparation, implementation, and appropriation.

- In considering outcomes, stakeholders need to make explicit the mechanisms of change and how this will be assessed e.g. agency, advocacy, and self-confidence.

- The lack of improvement supports the importance of grounding PA interventions using appropriate learning models that conceive learning as a form of participation, rather than acquisition.

- PA intervention programmes need to be designed to facilitate greater engagement of family and community interaction which underpins the environmental context in which children engage in PA.
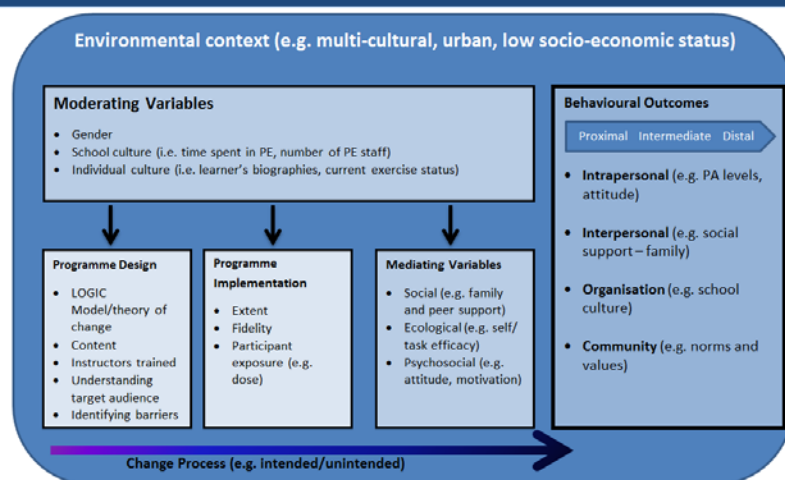


**Figure 1. Contextual model to evaluate physical activity intervention program.**

**Table 1. Programme Logic Model**



**Table 2. Comparison of mean, standard deviation and P values of anthropometric, physical fitness, PAQ-C, and CATPA data by gender.***

| | Gender | N | Baseline | Follow-up | P | N | Baseline | Follow-up | P |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Intervention Group** | | | | **Control Group** | | |
| **Anthropometric Data** | | | | | | | | | |
| Age (yr) | Boys | 240 | 9.3 (1.2) | 9.8 (1.2) | 0.005* | 66 | 9.5 (1.3) | 10.0 (1.2) | 0.005* |
| | Girls | 231 | 9.3 (1.1) | 9.8 (1.1) | 0.005* | 58 | 9.7 (1.1) | 10.2 (1.1) | 0.005* |
| Height (cm) | Boys | 223 | 136.9 (9.2) | 139.1 (9.3)* | 0.005* | 72 | 137.4 (6.9) | 140.2 (7.4) * | 0.005* |
| | Girls | 216 | 136.2 (9.4) | 138.5 (9.6)* | 0.005* | 55 | 139.2 (9.8) | 141.8 (10.2)* | 0.005* |
| Body mass (kg) | Boys | 223 | 34.1 (9.2) | 35.8 (9.7)* | 0.005* | 72 | 34.2 (7.8) | 36.7 (8.3)* | 0.005* |
| | Girls | 216 | 34.5 (10.1) | 36.2 (10.5)* | 0.005* | 55 | 36.2 (8.7) | 38.4 (9.1)* | 0.005* |
| BMI (kg·m²) | Boys | 223 | 18.0 (3.2) | 18.3 (3.5)* | 0.005* | 72 | 18.0 (3.0) | 18.6 (3.2)* | 0.005* |
| | Girls | 216 | 18.3 (3.5) | 18.6 (3.5)* | 0.005* | 55 | 18.6 (3.1) | 19.0 (3.0)* | 0.005* |
| BMI percentile | Boys | 223 | 64.1 (30.3) | 64.5 (30.1) | 0.495 | 72 | 63.2 (31.7) | 66.8 ( 29.1)* | 0.033* |
| | Girls | 216 | 66.3 (30.7) | 67.4 (30.1) | 0.055 | 55 | 69.9 (30.1) | 73.3 (27.2)* | 0.082* |
| **Physical Fitness Data** | | | | | | | | | |
| VO₂max (ml·kg·min⁻¹) | Boys | 214 | 31.9 (17.1) | 33.0 (17.7) | 0.219 | 53 | 31.0 (16.4) | 40.3 (19.1) | 0.005* |
| | Girls | 209 | 24.7 (11.8) | 25.4 (12.8) | 0.354 | 51 | 27.0 (12.3) | 32.7 (15.6) | 0.005* |
| Push-ups | Boys | 175 | 8.0 (6.9) | 7.7 (7.2) | 0.260 | 52 | 4.8 (3.6) | 6.6 (4.3) | 0.005* |
| | Girls | 169 | 5.1 (4.6) | 5.2 (4.5) | 0.438 | 35 | 4.8 (3.4) | 5.5 (3.6) | 0.117 |
| Curl-ups | Boys | 207 | 11.8 (9.1) | 11.7 (8.8) | 0.928 | 67 | 5.4 (4.6) | 8.76 (5.3) | 0.005* |
| | Girls | 202 | 11.1 (8.3) | 10.02 (8.5) | 0.045* | 49 | 5.3 (3.9) | 8.43 (5.8) | 0.002* |
| Trunk lift (in) | Boys | 215 | 4.8 (1.6) | 5.5 (1.6) | 0.005* | 64 | 4.3 (1.6) | 5.1 (1.8) | 0.001* |
| | Girls | 214 | 5.6 (1.8) | 6.1 (1.7) | 0.005* | 47 | 5.7 (1.6) | 6.1 (1.6) | 0.240 |
| Sit and Reach Right (ins) | Boys | 235 | 8.1 (2.4) | 7.8 (2.5) | 0.008 | 68 | 8.2 (1.8) | 7.5 (2.3) | 0.001* |
| | Girls | 221 | 9.1 (2.3) | 9.1 (2.3) | 0.477 | 59 | 9.5 (2.2) | 9.0 (2.3) | 0.019* |
| Sit and Reach Left (ins) | Boys | 236 | 7.9 (2.4) | 7.8 (2.5) | 0.401 | 68 | 7.5 (1.9) | 7.6 (2.3) | 0.940 |
| | Girls | 219 | 9.1 (2.4) | 9.1 (2.3) | 0.975 | 59 | 9.2 (2.1) | 9.0 (2.3) | 0.426 |

*Wilcoxon signed rank was used to determine changes over time within groups.

**REFERENCES**
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