Do school-based asthma education programs improve self-management and health outcomes?
Coffman JM, Cabana MD, Yelin EH

CRD summary
This review assessed school-based asthma education programs and concluded that they improved knowledge of asthma, self-efficacy and self-management behaviours. Given some limitations for the review process and the poor quality of many of the included studies, the authors' conclusions, although cautious, should be interpreted with care.

Authors' objectives
To assess school-based asthma education programs.

Searching
MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL) and CINAHL were searched for English-language studies; neither search dates nor search terms were reported. Reference lists of included studies were searched for additional studies.

Study selection
Randomised controlled trials (RCTs), cluster RCTs, controlled clinical trials and observational studies with a concurrent control group that evaluated asthma education programs conducted in schools were eligible for inclusion. Studies needed to target children aged four to 17 years who had a clinical diagnosis of asthma, symptoms consistent with asthma and/or at least one asthma-related hospitalisation or emergency department attendance. Interventions in the included studies comprised: group classes (either for children with asthma, all children or all children plus separate classes for those with asthma); group classes plus individual education; interactive computer programs; and individual education. Most interventions were compared with usual care for asthma. Outcomes included: knowledge of asthma; self-efficacy; self-management behaviours; quality of life; days of symptoms; nights of symptoms; and school absences. In the included studies, where stated, the most frequently used personnel for delivery of interventions were nurses, peer counsellors and teachers. Target populations for the interventions varied: interventions were most frequently directed exclusively to children with asthma; also included were parents, school personnel and/or children who did not have asthma. In half of the included studies most of the children were either black or latino. Boys outnumbered girls in nearly all studies. Where reported, the proportion of children with moderate-to-severe asthma ranged from 9% to 62%; most children in most studies had mild asthma. Where stated, the median number of sessions was six (range two to 34) and the median duration of the intervention was six weeks (range two weeks to one year).

Two authors independently selected studies for inclusion in the review. Disagreements were resolved through consensus.

Assessment of study quality
Study quality was assessed using the 10-point Physiotherapy Evidence Database (PEDro) score (maximum score 10).

The authors did not state how many authors performed the validity assessment.

Data extraction
Data on study characteristics and outcomes were extracted.

The authors did not state how many authors performed the data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis, arranged by outcome. Sensitivity analysis was undertaken by analysing
studies according to study design (RCT or observational) and separately analysing studies that scored 5 or more on the PEDro scale. Publication bias was assessed through funnel plots.

**Results of the review**

A total of 24 studies were included (n=9,030, range 20 to 3,443); two were RCTs, 16 were cluster RCTs and six were observational studies. Eleven studies scored less than 5 on the PEDro scale and 13 scored between 5 and 7. Common methodological flaws included: lack of allocation concealment; lack of blinding; and data lacking for at least one outcome for more than 85% of children. There was no suggestion of publication bias for school absences, but it was likely for other outcomes.

**School-based asthma education**: Significantly improved knowledge of asthma (seven out of 10 studies), increased self-efficacy (six out of eight studies) and improved self-management behaviours (seven out of eight studies). Favorable effects were less commonly reported for improved quality of life (four out of eight studies), reduced number of days (five out of 11 studies) and nights (two out of four studies) with asthma symptoms, and fewer school absences (five out of 17 studies).

**Sensitivity analysis**: For RCTs, school-based asthma education was significantly associated with improved quality of life (four out of five studies); other findings were largely unchanged. For sensitivity analysis of study quality (PEDro scores ≥5) fewer studies reported improvements for knowledge of asthma (two of three studies).

**Authors’ conclusions**

Although findings regarding effects of school-based asthma education programs on quality of life, school absences and days and nights with symptoms were not consistent, our analyses suggested that school-based asthma education improved knowledge of asthma, self-efficacy and self-management behaviours.

**CRD commentary**

The review question and inclusion criteria were clear. The literature search for English-language publications was limited to three databases and it was unclear whether unpublished studies were sought; language bias could have been present and some studies may have been missed. Publication bias was assessed and found to be probably present for most outcomes. Appropriate methods to minimise error and bias were applied for study selection, but it was unclear whether this extended to both data extraction and study quality. An appropriate assessment of the quality of the included studies was undertaken and found that most studies were of poor methodological quality. Given the heterogeneity across studies for interventions, populations and outcomes, the decision to employ a narrative synthesis was appropriate. In light of the some limitations for the review process and the poor quality of many of the included studies, the authors’ conclusions, although cautious, should be interpreted with care.

**Implications of the review for practice and research**

**Practice**: The authors stated that greater efforts were needed to disseminate self-management asthma programmes for children and integrate these with medical care and environmental management.

**Research**: The authors did not state any implications for further research.

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