CRD summary
This review assessed whether computerised asthma patient education programmes (CAPEPs) can improve objective clinical outcomes and/or asthma symptoms and knowledge. The authors concluded that CAPEPs improve asthma symptoms and knowledge, but their effect on objective clinical outcomes is not consistent. Given several limitations of the review methodology, the results of the review are unlikely to be reliable.

Authors' objectives
To evaluate the effectiveness of computerised interactive asthma patient education programmes (CAPEPs).

Searching
PubMed, CINAHL, ERIC, PsycINFO and ClinicalTrials.gov were searched up to October 2005; the search terms were listed. The bibliographies of identified trials were checked, and investigators were contacted about ongoing trials and to obtain further data. Only papers published in English were eligible for inclusion.

Study selection
Randomised controlled trials (RCTs) were eligible for inclusion.

Inclusion criteria for the intervention stipulated the use of an interactive computerised education programme. Studies that used computers for personalising information for patients or appointment reminders were not eligible for inclusion. In the included studies, CAPEP exposure ranged from a single use for 22 minutes to daily use for 12 weeks. No inclusion criteria for the control were listed. The control interventions in the included studies were normal care, daily recording of symptoms and peak flow measures, a computer programme with the respiratory component removed, provision of verbal or written information on asthma management or house dust mite avoidance, other asthma education plus a non-educational computer game.

Asthma patients of any age were eligible for inclusion. The participants in the included studies were aged from 3 to 75 years, with most studies only including children aged under 18 years; there was a mix of ethnicities (primarily white and African American, but also Hispanic and other ethnicities). The authors noted a basic lack of computer literacy in one of the included studies. All except one of the studies was based in the USA. The presence of asthma was defined differently in each of the included studies, and was primarily mild to moderate.

The primary outcomes were objective clinical measures such as hospitalisations, acute care visits, use of short-acting β-agonists and changes in lung function. The secondary end points were change in asthma knowledge and asthma symptoms. Studies of asthma knowledge alone, behaviour, self-efficacy and/or patient self-confidence were excluded. In the included studies, the duration of follow-up ranged from 4 to 12 months and the proportion of drop-outs ranged from 0 to 32%.

Two reviewers made decisions on relevance, but it is not clear if this was done independently or not.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
The studies were combined using a narrative.

**Results of the review**
Nine RCTs (957 participants) were included in the review.

Hospitalisations (6 studies): the CAPEP intervention was associated with a reduction in the number of hospitalisations in one study (p=0.02).

Acute care visits (7 studies): the CAPEP intervention was associated with a reduction in the number of acute care visits in one study (p<0.01), but the effect was seen only in children under 12 years.

Short-acting β-agonist use (3 studies): the CAPEP intervention was associated with a reduction in the daily use of inhaled bronchodilator drugs in one study (p=0.02).

Lung function (5 studies): the CAPEP intervention was associated with an improvement in lung function in 2 studies, though in one study the effect was limited to atopic patients.

Asthma symptoms (9 studies): the CAPEP intervention was associated with an improvement in asthma symptoms in 5 studies.

Asthma knowledge (7 studies): the CAPEP intervention was associated with an improvement in asthma knowledge in 4 studies. These 4 studies all involved a relatively long CAPEP exposure.

**Authors' conclusions**
CAPEPs improve asthma symptoms and knowledge, but their effect on objective clinical outcomes is not consistent.

**CRD commentary**
The review question and inclusion and exclusion criteria were stated clearly, which means that subjective decisions during the study selection process were unlikely. Although the authors searched several databases, the search terms listed in the paper were limited and it is possible that relevant trials were missed. The restriction of the review to trials in English also means that the results are likely to have been affected by language bias. The authors contacted two groups about ongoing trials but made no further attempts to identify other unpublished data, so the results could be affected by publication bias. Since the authors did not assess validity, it is not possible to comment on the reliability of the results.

There were sufficient data on each of the included studies to assess the generalisability of the results. The synthesis was not adequate: the authors did not highlight the better quality evidence and, since the magnitude of the effect of the intervention was not given and only p-values for significance were reported in the review, it is not possible to assess the real effect of the intervention.

Given the limitations highlighted, the results of the review are unlikely to be reliable.

**Implications of the review for practice and research**
Practice: The authors stated that the cost and benefit should be considered when implementing future CAPEPs.

Research: The authors stated that patients and physician literacy must be addressed when evaluating and implementing CAPEPs. Future research should concentrate on the type of information and method of delivery that will result in improved clinical outcomes.

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