

Learning about asthma

Educational programmes improve the ability of children and teenagers to manage their asthma

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No limits: programmes helping children to monitor their asthma reduced the need to restrict activities

ELPS

This is an experimental style of writing up a research paper, which is being tried out for this issue.

P+

The traditional style, in both long (EL, electronic long) and short (PS, paper short) versions appears on bmj.com, with additional references (indicated by P+)

Educational programmes to help children and teenagers monitor and manage their asthma themselves achieve significant improvements in measures of lung function and reduce symptoms, time off school, days with restricted activities, and the need to go to hospital because of asthma – according to a review of research studies investigating this issue.

Why carry out the study?

The study was carried out to see if educational programmes designed to help children and teenagers to monitor their asthma and adapt treatment appropriately had improved their lung function and reduced symptoms associated with asthma. It also looked to see if asthma education reduced time off school and the need to see a doctor or visit a hospital because of asthma.

The background

It would seem common sense to think that educating children and teenagers about their asthma and how to treat it should help them to cope better with their condition, and might even improve their symptoms. In adults, asthma programmes including self-monitoring

(simple tests to check how the lungs are working), regular medical review, and an asthma action plan – personalised instructions outlining what a person should do if their lung function or asthma symptoms change – have been shown to reduce illness and symptoms and use of health services. However, evidence on the effectiveness of educating children about their asthma has been conflicting.

A previous meta-analysis – a review of all relevant research studies on asthma education programmes for children published before 1992 – found no evidence that education reduced illness associated with asthma or use of healthcare services. But this has been questioned over the past few years by a large number of studies of asthma education showing that it does improve children's ability to manage their asthma.

How was this study done?

The research group searched relevant collections of research papers likely to include studies on asthma education in children and teenagers. These collections included the Cochrane Airways Group specialised register (a database of studies of controlled trials in airways disease such as asthma) and hand-searched journals containing research papers on airways diseases. It also included PsychINFO – research published in educational or behavioural journals. Finally, the researchers went through reference lists from relevant review articles and all eligible studies they had identified. Any research studies that were not in English were translated into English.

Studies were included in the systematic review if the participants were aged 2 to 18 years and had asthma. They had to be randomised controlled trials

(meaning that study participants were randomly allocated to an education programme or to usual care) or controlled clinical trials (in which the impact of education programmes on children was compared to a group of control children having usual care). These study designs are considered to provide more accurate results by trying to remove bias – for example, the researchers might inadvertently study the effect of an education programme during the summer, when asthma symptoms might have improved anyway. To accurately test the effect of an education programme, they need to compare its impact with a group of similar children not receiving the programme.

To be included in the review, studies had to test self-management educational programmes designed to help prevent asthma attacks, improve the ability of children to manage attacks, or improve their social skills. They also had to measure effects on factors that the researchers were interested in. These included lung function, measured as forced expiratory volume in one second – FEV₁, the amount of air a person can force out of their lungs in one second, and peak expiratory flow rate – PEF, the fastest speed at which a person can blow air out of their lungs. The researchers also looked for days absent from school due to asthma, days when asthma restricted activities, and nights disturbed by asthma. In addition, they included measures of children's ability to cope with their asthma (coping scores, health locus of control scales – how much children felt in control of their health), asthma symptoms scores, visits to emergency departments, and hospital stays.

The researchers used statistical methods to compare the results from the studies they included in their review. These allowed them to compare studies which had measured results by using different scales or at different time intervals.

The study was funded in part by a grant from the National Institutes of Health Fogarty International Center and the National Heart, Lung, and Blood Institute.

What were the main findings?

The researchers found a total of 32 trials – out of 45 they had identified – that met their selection criteria. These included 3706 children and adolescents with asthma, aged 2 to 18 years. Most of the

studies were relatively small randomised controlled trials and included children with severe asthma. Fifteen studies included teenagers aged 13 to 18 years, while 12 studies included children aged 2 to 5 years.

The educational programmes used in the studies were very diverse and targeted children, parents or both groups. Most were based on several sessions and taught strategies based on asthma symptoms.

Lung function

Four studies (including 258 children and teenagers) with complete lung function measurements showed that education moderately improved a combined measure of lung function (for details see the bmj.com).

Effects of educational programmes in self management of asthma on lung function

Illness, symptoms and disturbances to daily activities

Eighteen trials (1649 children and teenagers) had complete results on measures of illness. These showed that education was associated with a small reduction in days absent from school (–0.14, 95% confidence interval –0.23 to –0.04). In addition, the researchers found that education reduced the number of days where activity was restricted by asthma (–0.29, –0.49 to –0.08) and the number of nights disturbed by asthma (–0.34, –0.62 to –0.05).

The results generally showed more marked improvements in measures of illness associated with asthma for children with moderate to severe asthma than in those with mild to moderate asthma.

Children's ability to cope with their asthma

Nine trials (522 children and teenagers) reported measures of children's ability to cope with their asthma. Results showed that education moderately improved self efficacy (0.36, 0.15 to 0.57).

Use of health services

Eighteen trials (1899 children and teenagers) showed a small reduction in visits to emergency departments (–0.21, –0.33 to –0.09) in children receiving educational programmes. The study found no effect of education on hospital admissions. Children with moderate to severe asthma showed greater reductions in use of health services with education

than those with mild to moderate asthma.

Effects of educational programmes in self-management of asthma on number of visits to an emergency department

What type of educational programme worked best?

Single session educational programmes had the greatest reductions in measures of illness and symptoms associated with asthma, while programmes based on several sessions achieved the greatest improvement in children's ability to cope with their asthma and the greatest reduction in emergency department visits. However, no studies included in the review directly compared single session programmes with multi-session programmes.

Programmes in which children and teenagers were taught to measure their peak flow to monitor their asthma and to guide changes in their therapy, as well as programmes using individualised interventions achieved the greatest improvements in illness and symptoms due to asthma.

Why are these results important?

The study shows that education about self-management of asthma is effective in improving lung function and children's ability to look after their asthma themselves. It also reduces symptoms and illness associated with asthma and use of healthcare services.

Take home message

On the basis of their findings, the researchers recommended that educational programmes for self-management should be included in the routine care of children and teenagers with asthma. This education should be provided on a long-term basis to meet changing needs as children grow up. Priority should be given to children with severe asthma.

In the future, the researchers suggested, studies of asthma education should more carefully test its impact on illness and symptoms associated with asthma. Research should also compare different ways of teaching children and teenagers about asthma to find out which methods are most effective.

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