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Research Article

The Effect of Health Education to Caregivers of Children with Asthma Seen in the Paediatric Emergency Department (PED)

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Abstract

Aim: To determine if provision of health education in Emergency Department to caregivers of children with asthma, will improve parental knowledge and management of asthma.

Background: Improving knowledge of caregivers is an important factor in asthma control which may directly lead to improved quality of life.

Design: This is a quasi-experimental, one group design using convenience sampling.

Methods: This study was conducted from in the paediatric emergency department. We included children aged 2 - 12 years old with a definite diagnosis of asthma. Standardised teaching information was given by paediatric emergency nurses. Caregivers were asked to complete a questionnaire, which included 33 asthma knowledge questions, using 3 point Likert scale, pre and post the intervention. Data was analysed by SPSS version 20 using descriptive analysis and Pearson Chi Square.

Results: Twenty-five caretakers were recruited in this study. Baseline characteristics of gender, age, level of education, ethnic group (caregiver), age of asthma, history of asthma, diagnosed centre, follow-up centre and medication of asthma (child's information). On pre-teaching, only 16% of caregivers had good knowledge and this increased to 68% post-teaching. Level of education and age of caregivers has no statistically significant association with the pre and post teaching.

Conclusion: Asthma knowledge among caregivers of children with asthma is poor. However, this can be improved by teaching in the ED. There were no factors associated with poor knowledge and demographic data.

Relevance to Clinical Practice: Health care providers should take every opportunity to educate caregivers of children with asthma.

Keywords: *Asthma; Education; Emergency Department (ED)*

What does this paper contribute to the wider global clinical community?

- Knowledge about asthma remains poor among caregivers.
- Improvement of knowledge about asthma is attainable.
- The importance of empowering caregivers of children with asthma.

Introduction

Acute exacerbation of asthma is one of the major reasons why children use acute care services worldwide. In 2004 USA had 198000 hospitalizations for asthma and 754000 visited the Emergency Department (ED) with total annual cost of $14.7 billion [1]. In Malaysia the prevalence of asthma ranges from 4.2 - 13.1% and a local study found that 13.8% of primary school children in Kuala Lumpur have asthma [2].

Asthma is associated with high morbidity that eventually can lead to a high rate of ED admissions [3]. The symptoms of asthma may vary over time among individuals with different daily and seasonal symptoms patterns [4,5]. A comprehensive asthma treatment plan should include preventive actions, suitable pharmacotherapy and asthma education programmes for patients and caretakers [6]. Overall, this treatment plan is implemented to achieve good long-term asthma control.

Aziz., *et al.* found that parents who attend follow-up and have difficulties in administering the medication (device) to their children, do not seek help from their attending doctors [7]. Asthma education would have helped these parents. Asthma education is one of the most effective and long lasting interventions. By implementing this method, parents would be motivated, gain skills and increase their confidence in controlling their children's asthma [8]. Through active at-home management of asthma, 72% of acute asthma attacks which were of moderate to severity could avoid a visit to hospital [9]. Hence, this would eventually lead to economic benefit and improved outcome by asthma intervention in ED, asthma knowledge and control improved [2,8].

Methods

Design

This is a quasi-experimental, one group design using convenience sampling.

Participants

This study was conducted in a Paediatric Emergency Department (PED) in a tertiary hospital. Inclusion criteria will caregivers that did not consent, exclusion criteria will be parents of caregivers of patient with severe asthma and newly diagnosed asthma. Time of study is during the 3 working shift.

Demographic data regarding gender, age, level of education, ethnic group (caregiver), age of asthma, history of asthma, diagnosed centre, follow-up centre and medication of asthma (child's information) in table 1. Data was collected using a data collection sheet.

Characteristic		Value
Variables	**Frequency (f)**	**Percent (%)**
Gender (n = 25)		
Male	2	8
Female	23	92
Age Group (n = 25) (1.88 ± .726)		
Less than 30	8	32
31 - 40	12	48
41 - 50	5	20
Education (n = 25)		
Primary	8	32
Secondary	12	48
Tertiary	5	20
Age of patient when first diagnosed asthma (n = 25)		
1 - 6 years old	25	100
Ethnic group (n = 25)		
Malay	18	72
Indian	6	24

Chinese	1	4
Follow up (n = 25)		
Government	9	36
Private	10	40
Both	2	8
No	4	16
Diagnosed asthma (n = 25)		
Government	14	56
Private	11	44
History of family asthma (n = 25)		
Yes	21	84
No	4	16
Asthma Medication (n = 25)		
Ventolin	14	56
Atrovent	8	32
No medication	3	12

Table 1: *Demographic information.*

Instrument

A questionnaire was developed by the authors for the use in this study. It assessed the following domains: Basic asthma knowledge, sign and symptoms, triggers and medication shown in table 2. It was completed by the caregivers pre and post-teaching. Teaching was carried out by nurses in the PED using pre-prepared flip charts which covered the above mentioned domains. Nurses involved with the teaching underwent formal training before the study commenced. Nurses gave "one-to-one" teaching to caregivers.

No	Items	Indicator
B1	Asthma cannot be treated	
B2	Asthma is an inherited disease	
B3	A vaporizer is good treatment for asthma	
B4	Asthma is a common reason for many school absences	Asthma basic knowledge
B5	When a child asthma is under control they do not need to go to their doctor	
B6	Asthma can be precipitated by emotions	
B7	Asthma is caused by allergic reaction of a respiratory tract?	
B8	If your child has an asthma attack (e.g. blue lips, cannot eat, unable to sleep or play, shortness of breath), do you know where to go for treatment	
B9	Asthma can spread to another person	
B10	Asthma can be precipitated by an infection of the respiratory tract	
B11	Asthma is caused by the constriction of the airway	
B12	Common cold can lead to an asthma attack	

B13	Is shortness of breath a sign of asthma attack?	Sign and symptoms
B14	Could cough at night a sign of asthma attack?	
B15	Asthma attack is more common at night and early mornings	
B16	Is wheezing/cough after exercise a sign of asthma attack?	
B17	Is headache a sign of asthma attack?	
B18	Asthmatic children might have attacks that might cause death?	
B19	Are pets with fur a trigger of asthma?	
B20	Are mosquito bites a trigger of asthma?	Trigger
B21	Is cold a trigger of asthma?	
B22	Are dust a trigger of asthma?	
B23	Is cigarette smoke a trigger of asthma?	
B24	Is pollen a trigger of asthma?	
B25	Inhaler preventer or relievers use can lead to addiction	
B26	Inhalers preventer or relievers can have an effect on the heart or damage it.	
B27	Prolong use of Inhaler preventer or relievers are harmful to the child	Medication
B28	Some medications for asthma don't work unless they're administered every day.	
B29	After a child's asthma attack, once the coughing has stopped all inhaler medications should be stopped.	
B30	Children with asthma should use asthma medications only when they have symptoms (coughing, congestion, or wheezing).	
B31	Young children can use their inhalers directly through the mouth.	
B32	Asthma attacks can be prevented if preventer medication is taken even when there are no symptoms-between attacks.	
B33	If an asthmatic child gets the flu, the child should use the inhalers (relievers) even if there's no coughing or wheezing.	

Table 2: *Asthma knowledge.*

Validity and reliability

Pilot study was done to test the reliability and validity. The pre-teaching questionnaires were done on 10 nurses that attended the training program. Cronbach's Alpha coefficients showed the value of 0.78.

Data collection and analysis

Data was collected. Once signed consent was obtained, questionnaires were given in an envelope and given a maximum of 20 minutes to complete the questionnaire pre and post teaching (one to one teaching). Data were analysed using the Statistical Package of Social Sciences" SPSS version 20.0. Descriptive and Pearson's Chi Square were used. Cut of point is set are counted from 80 - 100% as good knowledge and < 80% as poor knowledge. Blooms cut points were used which was adopted from Nahida's KAP (Knowledge, Attitude and Practice) [10].

Ethical considerations

Ethical approval was obtained from the Research Medical Ethics Committee with the MEC Ref. No: 968.17.

Results

Twenty-five children with confirmed asthma, and their caregivers, participated in the study. Demographic data is shown in table 1. In this study, 40% of the patients had follow up with the private healthcare services, 36% were with the government, 8% utilise both services with only 16% who do not have any follow up. More than half of the patients (56%) were diagnosed with asthma in government healthcare facilities and 44% at private healthcare services. Fifty-six percent of children were on asthma controller medication i.e. salbutamol while the other 32% were currently taking ipratropium bromide and 12% were not taking any medication for asthma.

Based on the results of pre-teaching, 40% had satisfactory knowledge in asthma, 64% had satisfactory knowledge in the signs and symptoms of asthma, 92% of the respondents had good knowledge of trigger in asthma but only 12% had satisfactory knowledge of the medications used in asthma.

The results on post-teaching showed improvement in all categories: 84% had good knowledge in basic asthma, 92% had good knowledge in the sign and symptoms of asthma, 100% had good knowledge in the trigger of asthma and 48% had satisfactory knowledge in the medication of asthma.

Description analysis showed that on pre-teaching assessment, 16% of the respondent had good knowledge of asthma and it increased into 68% during post-teaching assessment.

Association between five domains and demographic variables

There is no significant association between level of education and age of caregivers with the pre and post teaching values.

Discussion

Knowledge is the soul mate in the improvement of self-management and control of asthma disease. Hence, this study aimed to improve asthma knowledge and method in managing asthma by providing health education to parents/guardian in paediatric emergency. The results showed an increased knowledge among parents post-teaching. On pre-teaching assessment, 16% has good knowledge of asthma and it increased to 68% during post-teaching assessment. Similar study by Volsko., *et al*. [11] done on eighty-six girls found that the post-test scores (mean ± SD 89.6 ± 9.0) were significantly higher ($p < .001$) than the pre-test scores (62.5 ± 20.8). There was a significant ($p < 0.001$) improvement between pre- and post-test scores of asthma education [12].

Parent's knowledge was unsatisfactory on both recommended asthma practice with actual practice of asthma and need of education to improve this [13,14]. At the same time parents assessment of asthma control has high rate of inconsistency compare to the symptom they report [3], but after providing the health teaching, 92% of the respondent had good knowledge in asthma management. Similar to the study by Cano-Garcinuño., *et al*. [15] showed that the caregiver's knowledge had improved at 1 month and 6 month post intervention. According to the study conducted by Roach and Bhaskaranand [16], there was an increase in knowledge during post teaching where the mean percentage of the pre-test was 51% and it increased to 80% in post-test.

In this study, demographic data of parents/caretaker and asthma knowledge had no significant association between the two variables. Similar to the study by Brooten., *et al*. [17] showed that gender, age and education give no significant differences in pre and post-test.

Knowledge and understanding about a disease can help in managing and controlling asthma which indirectly will result in reduced visits to ED and readmissions to the hospital. A study in the USA showed that 47.8% ED visits and 34.6% get hospitalization are children below the age of eighteen.

Limitations of the Study

The most important limitations of this study is the inability to detect which children benefit most from asthma education where this studies did not measure the severity and persistence of asthma symptoms consistently. One study showed that there is no significant differences for children with persistent asthma but found that education was associated with a reduction in ED visit for children with intermittent asthma [18].

It is important to note that this study was conducted in Paediatric Emergency Department University Malaya Medical Center with small sample size and the generalizability of our findings may be limited to the children in this hospital. To overcome these limitations and assess the generalizability of our findings to children in other hospital and nations, we obtained studies conducted in other hospital and nations. The additional pooled estimates for hospitalizations and PED visits were incorporated into these studies and it was similar regardless of whether the studies from other nations were included [19-21].

Future Directions

In this study, we found that providing a brief paediatric asthma education can be implemented successfully in Emergency Department. These intervention may lead to short-term improvements in asthma knowledge and control. However, to sustain these improvements, ongoing asthma education needs to be implemented in an Emergency Department setting. Future research should focus on the benefits of doctor and nurses involvement in the education process. As asthma patient had a seasonal appointment with doctors, the checklist format of the intervention can be prepared to be delivered to each patient. This allowed for flexibility in delivery of knowledge and information to the caregivers and ongoing education can be sustained.

Conclusion

This study found that educational intervention able can increase knowledge of asthma among caregivers, from 16% to 68%. In this study, we also found that the level of education and age of caregivers was not associated improved knowledge. Providing education in the form of pamphlet, booklet and follow-up with doctors may able to help caregivers to understand the disease and manage it accordingly.

Relevance to Clinical Practice

In this study, the asthma education program was implemented to improve asthma knowledge. This program has the potential to educate the caregivers about the management of asthma in children and may lead into the improvement of quality of life and self-care.

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Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publications of this article.

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