

The Effects of Triggers' Modifying on Adolescent Self-Efficacy with Asthma: A Randomized Controlled Clinical Trial

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ABSTRACT

Introduction: The management of asthma during adolescence has specific challenges and is likely influenced, to some extent, by the patient's belief in their ability to affect change, their self-efficacy. Bolstering self-efficacy could potentially improve an adolescent's ability to self-manage their asthma. The aim of this study was to examine the effects of a triggers' educational-modifying intervention on self-efficacy among adolescents diagnosed with asthma living in Iran.

Methods: Sixty adolescents, aged 12 to 18 years, diagnosed with asthma participated in this randomized clinical trial. Participants randomly assigned to the control group received standard care while those assigned to the experimental group participated in a 5 week, nurse led, triggers modifying educational intervention in specialized clinics of lung in Tabriz, Iran. The self-efficacy scale developed by Bursh et al., was used for data collection.

Results: The level of self- efficacy in two groups before intervention was not statistically significant, while the post intervention measures were statistically significant. Intervention was effective in improving adolescents' self-efficacy.

Conclusion: Since this type of intervention has the potential to improve Self- efficacy in adolescents with asthma, it is suggested that adolescence directly education about asthma triggers along with modulating triggers will be of value and parent-centered could be diminished. The need for such interventions emphasizes in clinic and outpatient clinics.

Introduction

Asthma is one of the most common chronic illnesses affecting 5% to 10% of children and adolescents worldwide.^{1,2} Among Iranian children and adolescents 2.7%– 35.4% suffer from asthma.³

Asthma is a chronic inflammatory disease of the airways that causes shortness of breath, tightness in the chest, coughing and wheezing. Triggers that cause inflammation

of the airways vary from person to person and can include allergic triggers, such as animals, air pollutants, and molds, and non-allergic triggers, such as smoke and exercise.⁴ The most effective way to control asthma is to identify and avoid these triggers.⁵

Data from several studies suggest that asthma trigger management is suboptimal in clinical practice.⁶⁻¹²

Advice for managing asthma triggers was

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given in 30% of visits and adherence to trigger advice was evaluated at 6% of visits. Future interventions for improving asthma trigger management should be targeted to routine asthma outpatient visits, where trigger avoidance advice is infrequent and rarely addressed in follow-up visits.¹³

The condition is similar in Iran and the asthma trigger sheet is not included in patients file, and not applying the follow up program or patient education in outpatient clinics, There is limited support to assist children and adolescence to identify and modifying their specific asthma triggers.¹⁴⁻¹⁶

The goal of treatment in health psychology is to change individuals' behaviors in a way that influences their response to a disease or illness. It is widely recognized that knowledge alone is not sufficient to change health behavior.¹⁷ There is evidence that chronic disease self-management is influenced by an individual's beliefs about health, including self-efficacy.¹⁸ Self-efficacy is a person's belief in his/her ability to successfully organize, control his/her health habit, and achieve valuable health outcomes. It is one aspect of individual motivation.¹⁷⁻¹⁹ Improving self-efficacy might provide the foundation for long-term behavior change among adolescents with asthma by improving self-care skills which can lead to better control of asthma.²⁰

On the other hand, self-efficacy is an assurance that person to do a complementary behavior to achieve his desired goal.²¹ For improving the self-efficacy, educating about self-care is essential.^{21,22} Asthma self-management education is an essential component in improving quality of care in children with asthma. This kind of education can be carried out in different places like school, clinics, and home.²³

The most effective methods to control asthma are self-controlling programs. However, it should be noted that self-care is not self-treatment. Most self-control programs define several important bases for a child and his family. First, asthma is a

common and uncomfortable disease but not shameful. Second, patients with asthma can have active and productive life. Third, it is much easier to prevent than to treat an asthma attack. Cooperate with treatment programs and learning activities or stimulating factor for asthma is important. Appropriate treatment, environmental control, education and self-control skills can help prevent exacerbations.¹ Furthermore, education about changeable asthma trigger, life style, and attitude change in patients with asthma regarding their condition seems to be necessary to initiate health promotion behaviors.²⁴

Despite the advances made in the management of asthma but the disease and mortality rate and absence from school and community, poor sports activity, frequent emergency visits and hospitalization for adolescents has increased.²⁵

With an overview of published studies related to childhood asthma education programs were identified in most interventions not only didn't belong merely to the adolescent but also to different age groups. They were done mostly by school-based, peer or parents' participation has been not emphasis on asthma triggers. Educational interventions have been reported outcome variables, contradictory results. Modulating of individual stimulants along with telephone support in previous studies related to asthma in adolescents has not been considered. A preferred approach in child ages not been identified yet and they have been suggestions about finding a way out of parent orientation to train adolescents with asthma. There were not available experimental studies with control groups before and after the educational intervention with scale measuring self- efficacy of children with asthma by using Bursh scale in adolescents and self- reported.^{23, 26-36}

Therefore, in accordance with standard care for adolescents with asthma due to need to growth and development in this period, conducting supplementary researches proves

to be necessary.³⁷ Besides that, the importance of the issue, less conducted studies to identify and modulate asthma trigger among adolescent with asthma in outpatient clinics in Iran and other countries of asthma necessitates the conduction of related studies. Since one of the main roles of nurses as a member of health care teams are patient education, support information and qualitative care.³⁸ Therefore this study is performed to evaluate triggers educational-modifying intervention on adolescent self-efficacy with asthma visiting specialized clinics of lung.

Objectives/Hypotheses: the triggers modifying intervention is effective on self-efficacy among adolescent with asthma.

Materials and methods

This study of randomized clinical trial, parallel groups conducted in pediatric pulmonary clinic and the Sheikh- Alrayys Clinic in Tabriz, Iran.

All patients and their parents provided written informed consent. The project approved by the Ethics Committee of Tabriz University of Medical Sciences and health care services (code 9051). Also the Consolidated Standards for Reporting Trials (CONSORT) were met.

Participants selected from the university clinics in urban setting, from July.1, 2011, to Aug.30, 2011.

Adolescents 12 to 18 years from both genders and diagnosed with asthma one year ago or more, living in the city of Tabriz, moderate and severe asthma diagnosed by a physician were visiting once per month and literacy included. If any other concurrent acute diseases and gastro esophageal reflux, rhinitis and sinusitis and having mental problems excluded.

After the completion of data collection in the pre-intervention period, the educational intervention was performed in the experimental group, using the asthmatic children booklet. Considering the age range

of the participants, they were placed into two groups of 12-15 and 16-18 years of age and the educational sessions were designed based on it. Delay in or failure to come to the sessions at the determined time was expected; therefore, this was controlled through phone call reminders by the researcher. The intervention consisted of four sessions on the asthma triggers and their types, methods of determining triggers, and methods of control and avoidance of triggers through lectures, discussion, and questions and answers using power point slides and educational booklets twice in a week. During the additional session, the asthma triggers of each adolescent in the experimental group were individually identified and the necessary measures to control it were planned with the adolescents' partnership.

During each session, there was a 20-30 minute lecture and 10-15 minutes of discussion and answering of questions. Each adolescent of the experimental group was asked to identify, the triggers present in their living place, outside their home and in their school based on the triggers identification form. In the individual session, the necessary recommendations for the modification and controlling of these triggers were given. After the culmination of the sessions, two follow up phone calls were made for the implementation of the modification program.

Five weeks after the intervention, the self-efficacy scale was completed again. Other participants of this study (control group) had received routine treatments. The study duration was 4 months. For ethical, control group were given the educational booklet, identification form, modification methods of asthma triggers after the study completed.

Study outcome was the difference in self-efficacy of adolescents with moderate and severe asthma. Self-efficacy measured through the self-efficacy scale for children with asthma, was developed by Bursh et al., which consists of 14 statements. It completed at two periods of before and five-week after the intervention. It was scored from 1 to 5

representing the level of self-efficacy. That is, the higher scores, the more the level of self-efficacy.

A written permission was obtained from the original author of the tool in order to use it in the current study. It was translated and the accuracy of the translation was investigated and confirmed, in terms of the coordination between the English and Persian texts, by two persons with a master's degree in English, and two experts in the related field, who were familiar with the English language.

Demographic characteristics were added in study questionnaire. Content validity of instrument was investigated by 10 nursing, medical and psychologist faculty members. Reliability was calculated with participation of 10 adolescents with asthma. Cronbach's alpha for the scale was 0.85.

The pilot study was conducted on 10 eligible adolescents with asthma referring to the clinics. In the asthma self-efficacy variables, the mean and standard deviation of changes were calculated as 0.18 (0.16) in the control group and 1.10 (1.03) in the experimental group. Considering the power of 0.8, the sample size was determined 15 participants for each group. In order to increase the validity of the findings and considering the potential loss, this was increased to 30 participants. Sixty adolescents participated in the current study.

The list of adolescents whom referred to the clinics during one year ago was prepared. Sixty of them were randomly assigned and divided into the two controls and experimental groups using a computer-generated random numbers. Grouping and enrolling the participants was performed by one of the researchers and other researcher did intervention. The scale was completed self-administered at pre and post intervention. The analyser whom assessed outcome was not informed about groups.

The data were recorded in SPSS software version 13 (SPSS Inc., Chicago, IL, USA) and

the results were extracted using descriptive statistics, Student's t-test, and chi-square test.

Results

During the two months period, we identified eligible patients. Of the 84 adolescents who agreed to participate, 24 persons declined for some reasons shown in diagram. Through months 3 and 4, we conducted pretest, intervention (educational and modifying program and follow up for experiment group) and post test. We did not lose any of each group member after randomization.

Figure 1 shows the procedures through which the clinical trial was conducted. The demographic characteristics showed no significant difference between the control and experimental groups (Table 1) and two groups were matched.

Kolmogorov-Smirnov test confirmed the normality of the data. The level of self-efficacy in two groups before intervention was not statistically significant ($P=0.38$), while the post intervention measures were statistically significant ($P<0.001$).

The self-efficacy was significantly better in adolescents in intervention group at post test. A statistically significant difference between the amounts of change in of the two groups was found and self-efficacy scores was increased experimental group (Table 2).

Discussion

Triggers modification is one of the basic elements of asthma management. Therefore, the present study was conducted to investigate effects of triggers' educational-modifying intervention on self-efficacy among adolescents with asthma referred to university clinics.

The matched groups showed intervention on asthma trigger in outpatient clinics have improved self-efficacy in adolescents with asthma.

Shaw *et al.*,²⁶ and Pichora²⁷ studied the effect of class-based asthma education

program in high school and primary-secondary schools respectively. They showed this type of intervention is to increase self-efficacy among adolescents with asthma ($P \leq 0.001$ and $P < 0.01$).

Butz et al.,²⁸ study on the effect of a school based parent and child (6- 12 years) asthma education program (workshop for children and parents and coloring book for children) in rural areas showed increased children's self- efficacy in the experimental group after the intervention ($P = 0.005$), was consistent study.

Horner and Fouladi²⁹ study on the effect of school based (elementary) education by Lay health educators among rural children proved an increase of self-efficacy among asthma education group. On the other hand, it didn't show any change in self-efficacy among general health education group.

Parcel et al.,³⁰ Study in an educational program for children with asthma (kindergarten to grade 5 show increased self-efficacy in children ($P < 0.05$).

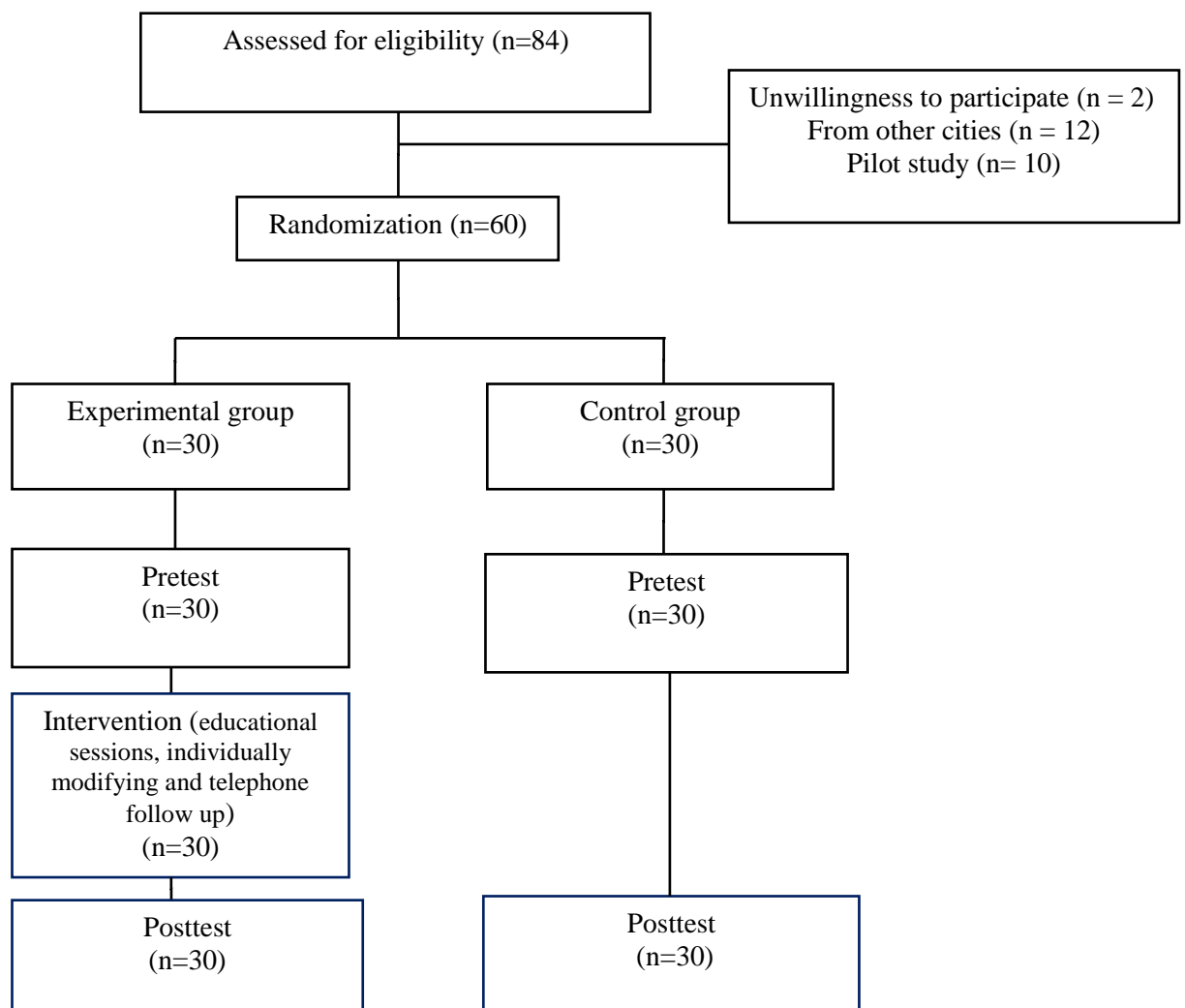


Figure 1: Flow chart of the study

Table 1. Distribution of adolescents' characteristics in control and experimental groups

Variable	Control N (%) [*]	Experimental N (%) [*]	P ^{**}
Gender			0.30
Girl	16 (53.3)	12 (40)	
Boy	14 (46.7)	18 (60)	
Education level			0.51
Elementary	3 (10)	6 (20)	
Guidance	15 (50)	13 (43.3)	
High School	12 (40)	11 (36.7)	
History of allergies in adolescents			1
Yes	21 (70)	21 (70)	
No	9 (30)	9 (30)	
History of allergies in the family			0.59
Yes	12 (40)	10 (33.3)	
No	18 (60)	20 (66.7)	
History of asthma in the family			0.39
Yes	7 (23.3)	10 (33.3)	
No	23 (76.7)	20 (66.7)	
Absence from school			0.78
Yes	9 (30)	10 (33)	
No	21 (70)	20 (66.7)	
Age[§]	14.4 (2.4)	13.8 (2.3)	0.33
Duration of asthma[§] (years)	4.0 (3.0)	4.43 (3.2)	0.65
Days of absence from school[§]	1.70 (0.46)	1.66 (0.47)	0.78

* Valid percentage is reported. **For age, duration of asthma and days of absence from school the t-test and for other variables the χ^2 test was used. [§] Mean (SD)

Table 2. Comparison of asthma self-efficacy in control and experimental groups

Variable	Time	Mean (SD)	95% CI ^{**}	P
Self-efficacy				
Control	Pre	2.49 (0.69)	2.23 , 2.75	0.029
	Post	2.34 (0.44)	2.17 , 2.50	
Experimental	Pre	2.67 (0.82)	2.36 , 2.98	< 0.001
	Post	4.45 (0.30)	4.33 , 4.56	
Changes in self-efficacy[*]				
Control	Post-pre	-0.15 (0.36)	-0.29 , -0.01	< 0.001
Experimental	Post-pre	1.78 (0.73)	1.50 , 2.05	

T- test was used for analysis. ^{*}The variability in group calculated as post-intervention score minus pre-intervention score. ^{**}Confidence interval

A study conducted by Bartholomew et al.,³¹ entitled "partners in school (elementary school) asthma management" showed significant statistical increase on self efficacy (P= 0.002). They involved school nurse, parents and clinicians with computer based tailored education program for children.

In addition, another RCT study by Cicutto et al.,³² evaluated an asthma center's efforts to provide education for children with asthma

in schools (grade 2 to 5) showed significant statistical differences regarding self-efficacy (P<0.05).

Velsor-Friedrich et al.,³³ study showed a practitioner- based asthma intervention program with African-American inner-city school children resulted to an increase of self-efficacy (P= 0.01).

Persaude et al.,³⁴ studied an asthma education program, with including peak flow

monitoring and individual sessions by school nurses in elementary school showed no significant statistical differences regarding self-efficacy ($P= 0.17$).

Velsor-Friedrich et al.,³⁵ study through a school-based asthma education program on psychosocial and health outcomes of 8-13 years showed the mean scores of the treatment group were higher than the control group on several of the psychosocial measures. These changes were not significant differences regarding self-efficacy. However, significant differences were found between the groups on health outcomes.

A systematic review by Coffman et al.,²³ 25 RCTs were studied upon children with asthma aged 4 to 17 years. In eight which studied self- efficacy, six studies showed significant difference. Two were not significant.

In summary, the results of Shaw et al.,²⁶ Pichora²⁷ , Butz et al.,²⁸ Parcel et al.,³⁰ Bartholomew et al.,³¹ Cicutto et al.,³² Velsor-Friedrich et al.,³³ and Evans et al.,³⁶ were consistent studies. On the other hand Persaud et al.,³⁴ and Velsor-Friedrich et al.,³⁵ are inconsistent with the study.

Conclusion

This study confirmed the hypothesis of "the triggers modifying intervention is effective on self- efficacy among adolescent with asthma". In the experimental group, there is statistically significant increase in self-efficacy.

A sudden seasonal weather change and lower temperature is occurred during the interval between the data collection before and after the intervention. This confounding factor caused a worsening of psycho-social functioning (e.g. self efficacy) in all subjects, but was clearly observed through scores in the control group. The researchers believe that this emphasizes the need for asthma triggers education-modifying intervention to lessen the adverse impact on the adolescent functioning.

The results of this study can be used for effective interventions to improve self-efficacy in adolescents with asthma subsequently disease control and reduce to emergency visits and hospitalization. It will be of value considering this intervention to be used by planners and decision makers in health services system.

Create the position, appropriate professional staff; space for training and facilities for follow up of adolescents with asthma in outpatient clinics is necessary. Sheets of individual asthma triggers, identification and modifying should be included in to the patient file. Thus the costs of the method should be ensured by patient and system.

Self- reporting in adolescents may not represent the complete truth, which is due to the characteristics of questionnaire based measures. At the beginning of the study the study goals were explained in order to solve this issue. Moreover, the sudden change of weather, becoming cold, was an inevitable factor in this study. It is re commended that future studies be conducted in other seasons.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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