

## *The Effect of Family-Centered Empowerment Model on Self-Efficacy and Self-Esteem of the Children With Asthma*

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Received: 8 Nov 2016      Accepted: 21 June 2017

### Abstract

**Background:** Asthma is considered as the most common chronic disease of childhood that can cause missing school and daily limits. It can also have effects on physical, psychological, and social well-being in children. Therefore, improving two indicators of self-efficacy and self-esteem seem of utmost importance in this domain.

**Objectives:** The purpose of this study was to determine the effect of family-centered empowerment model (FCEM) on self-efficacy and self-esteem in children with asthma.

**Methods:** In this quasi-experimental study, 60 children along with their parents were randomly divided into two experimental and control groups. Then, family-centered empowerment model was implemented for the experimental group lasting seven 30-minute sessions. After that, self-efficacy and self-esteem were similarly evaluated by distributing questionnaires in both groups before and after the intervention. Moreover, the data were analyzed using the SPSS Software as well as descriptive statistics (frequency, mean, and standard deviation) and inferential statistics (Chi-square test, Fisher's exact test, independent t-test, and paired t-test).

**Results:** The self-efficacy scores of all children in the experimental group before ( $2.95 \pm 0.33$ ) and after ( $3.97 \pm 0.49$ ) the intervention showed a significant difference ( $P=0.0001$ ). Meanwhile, a significant difference was observed in the self-esteem scores of all children in the experimental group before ( $0.62 \pm 0.13$ ) and after ( $0.77 \pm 0.08$ ) the intervention ( $P=0.0001$ ), while self-efficacy scores of the individuals in the control group before ( $2.86 \pm 0.49$ ) and after ( $2.88 \pm 0.40$ ) the intervention suggested no significant difference ( $P=0.607$ ) in this respect. Furthermore, there was no significant difference in self-efficacy scores of the control group before ( $0.67 \pm 0.17$ ) and after ( $0.67 \pm 0.13$ ) the intervention ( $P=0.845$ ).

**Conclusion:** It seems that empowerment (FCEM) of children suffering from asthma can lead to increased self-efficacy and self-esteem and help them to have an efficient care, and also may result in improvements in their roles. Therefore, further studies are recommended in this domain.

**Key words:** Asthma, Self-efficacy, Self-esteem, family-centered empowerment model (FCEM)

### Introduction

Asthma is known as the most common chronic disease in childhood caused by inflammation as well as narrowing and spasm of the airways [1]. The prevalence of this disease in children across

the world has been reported by 5-10% [2]. Currently, it is estimated that 300 million individuals are suffering from asthma all over the world and it is expected to reach to 400 million people until 2025 [3]. In this respect, 2.7-35.4%

of Iranian children and adolescents are also affected with asthma [4]. According to a study conducted on school students in Tehran, the prevalence of asthma in primary schools was reported by 36.1%, and such values in middle schools and high schools were by 39.5% and 35.4%, respectively. Moreover, the rate of prevalence for boys was reported 1.2 times higher than that in girls [5]. Asthma can also have lots of impacts on physical, mental, and social growth as well as children grow up. [6,7]. It can similarly lead to constant school absenteeism, academic failure, less participation in school-related activities, anxiety about others' treatment with this disease especially peers, fear of rejection, low self-esteem, as well as feelings of inadequacy, helplessness, and depression [8].

Despite administration of appropriate treatments for asthmatic patients, the given disease is not well controlled [9,10]. This disease in children is also considered as one with growing prevalence [11]. The results of the related studies have shown that 32-64% of children with asthma could control their disease as weak as possible which is due to behavioral problems and low self-esteem [12]. Besides, the findings of another investigation revealed that 46% of asthmatic children used inhaled corticosteroids in inappropriate and incorrect manners which could lead to poor control of their disease [1].

The results of these studies have cited the importance of three major factors of knowledge, self-efficacy, and self-esteem in this respect [13]. According to Bandura's Social-Cognitive Theory (SCT), self-efficacy or self-assurance refers to feelings of adequacy, capability, and adaptability with life [10]. It also means an individual's ability to create a desired effect or result and it is defined as a person's understanding or belief in the ability to perform a specific action successfully through controlling the surrounding factors [1,4]. Bandura also believed that having information about a behavior does not change that behavior; thus, self-efficacy is regarded as the major pre-condition for changing a behavior [10], and empowerment is considered as the practical approach to build this capability in people. In addition, Seid (2008) introduced lack of skills and knowledge related to asthma as well as inattention by healthcare

personnel towards asthmatic children and their parents as the barriers to asthma control by children and families [15].

According to Maslow, self-esteem refers to the value given to oneself by a person. Considering the results of the related studies, individuals with higher self-esteem are endowed with higher problem-solving skills and high power of analysis in dealing with problems. High self-esteem can also lead to increased efforts, perseverance, and motivation in people and it is one of the most influential determinants of an individual's performance particularly in controlling, monitoring, and follow-up of the raputic programs [16].

Based on the results of the related investigations, mental-emotional disorders can be observed in 25-40% of children with asthma which mostly arise due to extreme dependency on their parents. This issue prevents emotional development and causes disorders in the development of self-confidence and independence in these children [17]. In this regard, the findings of a study by Amer et al. (2013) showed that 25% of children affected with asthma had low self-esteem and 25% of them were suffering from social isolation [18]. Moreover, asthma is considered among those diseases that can affect the entire family; therefore, tackling problems associated with asthma requires collaboration and team work between children, families, nurses, and other members of the healthcare team [19]. The ways to assist children and families to assume active roles in their healthcare needs should be focused on their empowerment but not mere help [20]. Empowerment is also defined as the process of behavior changing in which individuals become aware of their disease and gain a sense of control over it through acquisition of skills and its treatment. In other words, the process of activating the patient is the result of the acquisition of a sense of commitment to the treatment regimen and the final outcome of empowerment includes acquisition of self-efficacy, mastery over skills, a sense of self-esteem, and a sense of control [21]. The family-centered empowerment model (FCEM) is an Iranian model (Alhani, 2003) developed to prevent iron-deficiency anemia in adolescent girls

[20]. The given model was designed via the development of levels of knowledge, self-esteem, and self-efficacy in children; in a way that a child can participate in the care process, control their disease, meet healthcare needs efficiently through self-esteem and a sense of responsibility which are of utmost importance for promoting health and quality of life. Thus, the purpose of this study was to evaluate the effectiveness of the FCEM on self-efficacy and self-esteem in children with asthma.

### Methods

The present study was a quasi-experimental research conducted in 2008 on male primary school asthmatic students along with their parents in Tehran, Iran. To do this research, district 9 was randomly selected out of the 19 districts of Education Department in Tehran; then, 7 schools were randomly selected from the list of primary schools for boys in this district. Given the adequacy of the sample size, 4 schools were randomly assigned to the experimental group and 3 schools were placed into the control group. Then, all the children suffering from asthma in each school (according to its registration in school health records and physician approval) along with their parents were selected as the study participants through convenience sampling method. The researcher also started the sampling after obtaining a letter of introduction and written authorization from the Education Department. The research objectives, the importance of the study, and the research method were similarly explained to the participants after introductions and signing consent forms by children and their parents. Finally; the written informed consent forms associated with the study intervention, the right to enter and withdraw from the study, and the confidentiality of the data were submitted to the participants, their consent was obtained, and at the end the pre-test was administered, too.

The inclusion criteria in this study were willingness of children and their parents to participate in the study, the age range between 2 and 8 years, registered asthma based on physician's confirmation (at least 3 months ago) in the school health records, absence of specific mental-psychological illnesses, ability to

complete the questionnaire and participate in the empowerment program, as well as lack of other chronic diseases but asthma. The exclusion criteria also included willingness of children or parents to withdraw from the study, parents as a member of the healthcare team, and no infection with specific mental-psychological illnesses. According to the same study in this respect [22], the number of the samples in each group was determined to be 26 samples with 95% level of confidence and 80% test power. Calculating 10% of participant's loss for each group of 30 individuals, a total number of 60 children (along with their parents) were examined. Those participants who were remained in the study, completed it, and did not withdraw.

The research instrument used in this study was comprised of 3 parts. The first part was associated with demographic information including age, school grade, history of disease, the number of days being absent from school, and the parental education and occupation. The second part was the Self-Efficacy Questionnaire containing 11 items developed based on the review of the related literature by the researcher in which each item had four options scored from 1 to 4 (never=1, sometimes=2, usually=3, always=4) with a score range between 11 and 44. After calculating the mean for the items, the score range was variable between 1 and 4. The third part was the standardized Self-Esteem Scale by Rosenberg and Simon for children aged 8-12 years. Each questionnaire item included two options of agree and disagree in which the options agree and disagree were scored 1 and 0, respectively. Moreover, a reversed scoring was used for the items with negative states. The score range was between 0 and 13 and after calculating the mean for the items, the score range was variable between 0 and 1. The validity of the questionnaire was measured through content validity by 10 faculty members at Tarbiat Modarres University-Tehran-Iran and its reliability was measured via test-retest reliability method for 10 asthmatic students, and it was also recompleted after one week ( $r=0.863$  for self-efficacy) ( $r=0.797$  for self-esteem).

The study included two experimental and control groups. The intervention for the experimental

group lasted for 4 months, but the control group received no intervention. To meet the objectives of the present study, the FCEM was used [20] the four implementation steps of which were as follows.

The first step in the FCEM is increasing knowledge. To improve the level of knowledge, training sessions were held using group discussion and an educational booklet including the following topics. Accordingly, the children were divided into groups of 3-5 individuals and discussed the educational topics such as (1) physiology, symptoms, complications, prognostic factors; (2) asthma; (3) nutrition, physical activity, sports; and (4) medical treatment [23], for 4 to 5 sessions.

The second step was to promote self-efficacy for which two sessions of scientific demonstration were held. Thus, each of the required skills was demonstrated after explaining it to children under the theory of self-efficacy. Then, the researcher asked the children to practice and repeat its demonstration to become self-efficient or empowered to the extent that they could do it without the presence of the researcher.

The third step was to enhance the self-esteem through educational participation. In this step, the children were asked to participate in teaching their parents in terms of understanding the issues associated with asthma and encourage them to help. Accordingly, they could transfer the issues discussed in each session of group discussions from the second step and what they have learned through self-observation sessions to their parents. Moreover, an educational card about the content of each session was given to the children to deliver them to their parents to read. To ensure the empowerment, the parents discussed what they had learned from their children in 2-3 sessions.

The fourth step was the evaluation which includes the process of evaluation (during the empowerment sessions through assessment of knowledge, self-efficacy, and self-esteem) and final evaluation (after the completion of the empowerment sessions in the form of a post-test and one month after the intervention).

To observe the ethical issues and following the post-test, all the training issues associated with asthma were taught to the control group and the educational manual was delivered during 1-2 public sessions.

The data analysis was conducted through the SPSS Software (Version 16) using descriptive and inferential statistical tests (frequency, mean, standard deviation, paired t-test, independent t-test, Chi-square test, and Fisher's exact test). A  $p < 0.05$  significant level was also considered in this study.

### Results

The mean age of the children in the experimental group was  $10.16 \pm 0.98$  years and it was  $9.66 \pm 1.12$  in the control group. The mean scores for a history of asthma in childhood in both experimental and control groups were  $42.76 \pm 27.64$  and  $44.43 \pm 30.91$  months, respectively. The number of asthma attacks during the previous month in the experimental and control groups was  $0.76 \pm 0.77$  and  $0.43 \pm 0.89$ , respectively. Considering the mentioned cases, there was no statistically significant difference between both experimental and control groups and the given groups were homogeneous ( $p = 0.129$ ,  $p = 0.827$ ,  $p = 0.072$ ). Furthermore, the two groups were homogeneous in terms of school grade, number of missed school days, and parental education and occupation (Table 1).

*Table 1: Comparing frequency of demographic information in the study samples*

Demographic information	experimental		control		Statistical test	
	Frequency	Percentage	Frequency	Percentage		
School grade	second	1	3.3	8	26.7	*P=0.561
	third	15	50	12	40	
	fourth	10	33.3	5	16.7	
	fifth	4	13.3	5	16.7	
Number of missed school days	less than 2 days a month	21	70	28	93.3	*P=0.561
	2-5 days a month	7	23.3	2	6.7	
	more than 5 days a month	2	6.7	0	0	
Father's education	illiterate	0	0	1	3.3	*P=0.215
	primary school	4	13.3	0	0	
	middle school	9	30	6	20	
	high school diploma	15	50	19	63.3	
	associate's degree	1	3.3	1	3.3	
	bachelor's degree and higher	1	3.3	3	10	
Mother's education	illiterate	0	0	1	3.3	*P=0.631
	primary school	2	6.7	0	0	
	middle school	10	33.3	11	36.7	
	high school diploma	18	60	18	60	
Father's occupation	unemployed	3	10	1	3.3	*P=0.398
	worker	5	16.7	4	13.3	
	self-employed	6	20	12	40	
	employed	15	50	11	36.7	
	other occupations	1	3.3	2	6.7	
Mother's occupation	housewife	24	80	28	93.3	** P=0.254
	employed	6	20	2	6.7	

\*Based on the Chi-square test

\*\*Based on Fisher's exact test

According to Table (2), the results of the study indicated that the mean scores of self-efficacy and (self-esteem) before and after the intervention changed from 2.95±0.33 (0.62±0.13) to 3.97±0.49 (0.77±0.08) in the experimental group. In addition, the results of the paired t-test showed no statistically significant difference between the pre- and post-intervention mean scores in the

given group (P<0.0001, P<0.0001). However, the pre- and post-test mean scores of self-efficacy and self-esteem in the control group changed from 2.86±0.49 (0.67±0.17) to 2.88±0.40 (0.67±0.13). The results of the paired t-test also suggested no statistically significant difference between the pre- and post-intervention mean scores in the control group (P=0.845, P=0.607).

**Table 2: Mean, standard deviation, and paired t-test for self-efficacy and self-esteem scores in both experimental and control groups**

Variables	group	before the intervention	after the intervention	Paired t-test	Degree of freedom	Significance level
		Mean±standard deviation	Mean±standard deviation			
self-efficacy	experimental	2.95±0.33	3.97±0.49	-6.758	59	P<0.0001
	control	2.86±0.49	2.88±0.40	0.542	29	P=0.607
self-esteem	experimental	0.62±0.13	0.77±0.08	-3.275	59	P<0.0001
	control	0.67±0.17	0.67±0.13	0.197	29	P=0.845

Table (3) illustrated the examination and comparison of the mean scores of the experimental and control groups before and after the implementation of the FCEM. Moreover, the results of the independent t-test revealed no significant difference in both groups before the

intervention in terms of self-efficacy and self-esteem (P=0.865, P=0.827). However, a significant difference was observed between the two experimental and control groups in terms of the given variables (P=0.001, P<0.0001).

**Table 3: Mean, standard deviation, and independent t-test for self-efficacy and self-esteem scores in both experimental and control groups**

Variables	group	experimental	control	Independent t-test	Degree of freedom	Significance level
		Mean±standard deviation	Mean±standard deviation			
self-efficacy	before the intervention	2.95±0.33	2.86±0.49	-0.219	58	P=0.827
	after the intervention	3.97±0.49	2.88±0.40	8.709	58	P<0.0001
self-esteem	before the intervention	0.62±0.13	0.67±0.17	-0.170	58	P=0.865
	after the intervention	0.77±0.08	0.67±0.13	5/076	41/526	P= 0.001

**Discussion**

Considering the results of the present study, the implementation of the FCEM could increase self-efficacy and self-esteem in children with asthma. Therefore, the use of the given method for nurses as a way of thinking based on empowerment and emphasis on self-care could be considered as a new perspective in the issue of patient-family training. In this respect, several research studies have been conducted in Iran and other countries.

In a study on evaluating the impact of adoption of the FCEM on the quality of life of school-aged children with asthma, Rajabi et al. (2013) concluded that the use of the FCEM considering

the original dimensions of the model through discussion groups, scientific demonstrations, and educational participation could improve the quality of life of children in the three domains of physical symptoms, activity limitations, and emotional performance [6]. The results of the investigation by Graves & Shelton (2007) also showed that empowerment could cause positive changes in the performances of children and significantly improve the behavioral difficulties in children [24]. Likewise, Velsor-Friedrich et al. (2004) in a research study aimed at empowering children through teaching methods to prevent asthma attacks used focus group discussions,

stories, games, and role-plays for active participation of children in the learning process. The findings of this study showed an increase in the level of self-efficacy and reduced admission rates and number of days with asthma in the experimental group [25]. The results of this study also confirmed the findings of the present study, but no roles had been assigned to families specially parents and the training process was patient-centered. However, in the present study and in the third step (educational partnership), the children were encouraged to transfer what they had learned to their parents. In addition, two separate training sessions were held for parents. Zagrafos et al. (2010) also investigated the effect of teaching based on Bandura's SCT on self-efficacy and attitudes of asthmatic adolescents. This study was conducted within 6 high schools in California in which 3 high schools were assigned to the experimental group and 3 high schools were placed into the control group. The results of this study showed a significant increase in self-efficacy in adolescents immediately after the intervention, but no significant difference was observed after 5 weeks in the level of self-efficacy compared to that before the intervention. Furthermore, no difference was observed in the attitudes of the teenagers about taking medications and avoiding allergens in the presence of peers following the intervention [26]. In addition, the results of the study by Cicutto et al. (2005) in line with the investigation by Zagrafos et al (2010) revealed that educational interventions based on the SCT could increase self-efficacy and quality of life of school-aged children suffering from asthma [27]. The results of various studies also indicated a relationship between self-efficacy and prevention in a way that increased self-efficacy could reduce symptoms, enhance acceptance of and compliance with treatment, and promote self-care behaviors [10]. Furthermore, the results of the study by McPherson et al. (2009) showed that asthmatic

children who actively participated in their care programs could adapt with their disease and gain better control over their conditions that would increase their self-efficacy and self-esteem [28]. One of the other findings of this study was increased self-esteem in children following the implementation of the FCEM. In this respect, Kaslovsky Sadof (2011) suggested that self-confidence in children should be taken into account during the teaching of self-care techniques in children with asthma, so that children could find a positive self-image. This issue would enhance a sense of responsibility and acquisition of problem-solving skills in children [29].

The findings of the study by Trzcieniecka-Green et al. (2009) similarly revealed that asthmatic children compared with non-asthmatic ones had lower willingness to communicate with their peers. Since good social communication is an important factor in creating a sense of self-efficacy and self-esteem, establishment of communications with other children suffering from asthma could lead them to share their experiences with each other and find solutions to their conditions [17]. This important issue was also considered in the present study through holding group discussion sessions. Moreover, the results of some studies have shown that group discussions could reduce the feelings of despair and grief associated with the chronic nature of the disease and cause children to accept their disease conditions [10] which can shed light on the nature of group and collaborative trainings for chronic diseases in a way that individuals' educational needs are met. The individuals suffering from low self-esteem and self-confidence due to dealing with a chronic disease should not be abandoned and only treated via medications. Given the prevalence of asthma in children, they can be unconsciously affected by their disease and find their self-confidence and value partly damaged. Therefore, implementation of programs such as

the one adopted in the present study can illustrate and credit their potentials which is of utmost importance. One of the strengths of this study was the centrality of the family and one of its limitations was associated with the duration of follow-ups. Thus, it was recommended to implement such programs with six-month and one-year follow-ups.

In general, the results of this study demonstrated that the implementation of the principles of the FCEM could lead to the promotion of self-efficacy and self-esteem; therefore, this approach could be a suitable solution in care programs. Accordingly, it was recommended to conduct further studies in this domain.

#### Acknowledgments

We hereby express our gratitude to the respected officials in the Education Department as well as administrators and school health educators in District 9 in Tehran who helped us during the study. We also appreciate students and their parents as the study samples who cooperated in obtaining the given results in this research study. In addition, this study was extracted from a master's thesis in Pediatric Nursing at Tarbiat Modarres University with the code no.150.13757 and supervised by Dr. Fatemeh Alhani.

**Conflict of interest:** It should be noted that there is no conflict of interest in this article.

#### Funding:

Research and Technology Section of Tarbiat Modares University financially supported this study.

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