

ORIGINAL MANUSCRIPT

Effect of disease management education on the quality of life and self-efficacy levels of children with asthma

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Abstract

Purpose: The aim of this study was to determine the effects of disease management education provided to children with asthma on their quality of life and self-efficacy levels.

Methods and Design: The study design was a quasi-experimental design with The One Group Pretest-Posttest design. This study was conducted on 60 children with asthma between 10 and 18 years of age. Data were collected by "Information Form", "Pediatric Asthma Quality of Life Questionnaire", and "Self-Efficacy Scale for Children and Adolescents with Asthma". Children's quality of life and self-efficacy levels were assessed before receiving an individual asthma education intervention and then children were informed with an asthma management education book individually. Two months after the education intervention, the quality of life and self-efficacy levels of the children were re-evaluated.

Results: The children's quality of life and self-efficacy levels increased significantly after education ($p = 0.014$). Maternal age, number of siblings, number of family members living in the same house, activity status, the frequency of experiencing symptoms, and the ability to use the inhalers on their own affected children quality of life. Child's age, knowledge about factors causing asthma, and ability to use medication on their own affected their self-efficacy ($p < 0.05$).

Practice Implications: According to these results, planned asthma education program and provided continuity of this education by nurses would be effective to improve the quality of life and levels of self-efficacy. Asthma management education for children with asthma by nurses after diagnosis is beneficial for improving the quality of life and levels of self-efficacy.

KEYWORDS

asthma management, childhood asthma, education, nurse, quality of life, self-efficacy

What is already known about this topic? Asthma is a common health problem in the world; its morbidity, mortality, and prevalence has been increasing among children. Asthma affects the physical, mental, social, and emotional development of children and adolescents, compromising their quality of life. Asthma management education programs can reduce asthma signs/symptoms, morbidities, school absenteeism, number of days of restricted activity, can increase self-efficacy levels, and can improve quality of life.

What this paper adds? Self-management education improved children's quality of life and self-efficacy levels significantly.

Implications for Practice These results supported that an individual asthma management education by nurses is beneficial to increase children/adolescents self-efficacy in managing asthma. Children need to be taught how to manage asthma, recognize and respond to asthma triggers and asthma symptoms. Nurses will be able to prevent advanced complications/exacerbation with effective education (with lifestyle changes, allergen control, proper medication techniques, etc.). Specific health education programs could be developed on the basis of these results.

1 | INTRODUCTION

Asthma is a chronic inflammatory disease; its morbidity, mortality, and prevalence among children have been increasing (Global Initiative for Asthma, 2018) in the last 20 years, especially in developed countries (Liu, Kieckhefer, & Gau, 2013). As per the estimate of the World Health Organization (2017), almost 235 million people are currently affected by asthma, and 338,000 asthma-related deaths were reported in 2015, regardless of the level of development. The Center for Disease Control and Prevention reports that in 2016, the incidence of asthma was 8.3% in children between 0 and 17 years of age, 9.2% in boys younger than 18 years of age, and 7.4% in girls younger than 18 years of age (Centers for Disease Control and Prevention, 2016). In Turkey, generally three different methodologies have been used for the epidemiological studies of childhood asthma (Ministry of Health of Turkey General Directorate of Primary Health Care, 2014): (a) "The International Study of Asthma and Allergies in Childhood (ISAAC)" questionnaire; (b) the ATS questionnaire adapted by Turkish National Society of Allergy and Clinical Immunology; and (c) Aberg's questionnaire. These studies showed that, depending on the geographical region, the prevalence of asthma varies between 5% and 10% in children (Ministry of Health of Turkey General Directorate of Primary Health Care, 2014).

The quality of life in children is defined as an individual's overall satisfaction or happiness with life within the areas such as games, school work, sports, the ability to interact with family and peers, sleep disorders as well as anxiety, and physical consequences of the disease (Bowling, 1997). The quality of life is an important indicator of childhood asthma. Because, asthma is a disease that affects the physical, mental, social, and emotional development of children and adolescents, compromising their quality of life (Cevik & Celebioglu, 2012; Van den Bemt et al., 2010). The constant fear of an asthma attack, disease-related anxiety, fear of death, and lack of information about the disease process causes stress in children (Thabrew et al., 2017). This may lead to sleep fragmentation, school absenteeism, poor school performance, social restrictions, and a feeling of being different from other children (Al Aloola, Nissen, Alewairdhi, Al Faryan, & Saini, 2017; Fagnano, Bayer, Isensee, Hernandez, & Halterman, 2011; Hawkins, Painter, & Richter, 2011; Tsakiris et al., 2013). Asthma can be controlled with an effective disease management education program that allows children and families to manage the disease with self-monitoring, lifestyle changes, allergen control, and proper medication treatment (Butz et al., 2005). Adoption of healthy asthma management practices; adjustment of the children to the disease, using the education provided; and improvement in the communication between children and healthcare professionals enhance the child's self-confidence (Kakumanu, Antos, Szefer, & Lemanske, 2017). Previous research shows that disease management education improves quality of life measured by Pediatric Asthma Quality of Life Questionnaire (Almomani et al., 2017; Cano-Garcinuno et al., 2007; Gumus, 2010; Payroovee, Kashaninia, Mahdavian, & Rezasoltani, 2014).

Self-efficacy is defined by social psychologist Albert Bandura as one's belief in one's fundamental ability to cope, perform, and succeed in specific situations, or to accomplish a task (Bandura, 1977). Perceived self-efficacy, as in a child or adolescents belief in their own ability to manage their asthma, is important in guiding their self-management related decision-making (Cevik, 2011). Previous research show that disease management education develops perceived self-efficacy in children/adolescents and reduces morbidities (Cevik, 2011). While negative feelings such as despair, lack of self-esteem and depression are observed in children with low perceived self-efficacy, children with high perceived self-efficacy exhibit perseverance, lack of fear in trying new things and ability to deal with problems easily (Cevik, 2011). Other studies have also shown that disease management education increases self-efficacy levels (Butz et al., 2005; Cevik, 2011; Cicutto et al., 2005). Although in Turkey, descriptive studies aimed at determining the educational needs of children with chronic diseases are common, the number of studies that have provided planned education is insufficient (Bozkurt, & Yildiz, 2004; Demirci, 2011). Few studies have tested disease management educational interventions in increasing self-efficacy and quality of life in pediatric populations. In addition, the main objectives of successful asthma management that have been established and published in national and international asthma guidelines emphasize that the most important objective is disease management education (National Heart, Lung, and Blood Institute, 2007). For these reasons, asthma management education plays an important role in empowering children's asthma control, better managing asthma and preventing its exacerbation. It also improves the self-efficacy of the children in control of disease symptoms. The goal of this study was to determine the effectiveness of a disease management educational intervention in improving asthma self-efficacy and quality of life in children.

1.1 | Study questions

1. Does the educational intervention affect the quality of life of children with asthma?
2. Does the educational intervention affect the self-efficacy levels of children with asthma?

2 | METHODS

2.1 | Study design

This study is an experimental research method using a quasi-experimental design. This study used a pretest and posttest, with a design that is used is the one group pretest–posttest design. It was conducted on children who were diagnosed with asthma and were followed up in an Outpatient Pediatric Allergy-Immunology Clinic of a university hospital in Edirne, a province located in western Turkey

between February 2015 to July 2016. The children were selected using eligibility criteria and the study was performed in three steps (Preintervention testing session, education session, and postintervention testing session). In the first step, "Information Form", "Pediatric Asthma Quality of Life Questionnaire", and "Self-Efficacy Scale for Children and Adolescents with Asthma" questionnaires were applied to children. In the second step an individual education was conducted by the researcher using the education book. In the third step, the scales were reapplied after 2 months.

2.2 | Sample size and power

The study subjects were 60 children between the ages of 10 and 18 years. The study sample size was determined by the free-software G*Power (Version 3.1. 9.2, by Franz Faul, University of Kiel, Kiel, Germany: 2014). The study had an effect size of 0.490, the confidence interval of 95%, and power of 80% for the sampling, according to the study by Bozkurt and Yildiz (2004).

The study sample was selected with inclusion and exclusion criteria that have been set. The inclusion criteria were:

- The children had an asthma diagnosis determined by an allergy specialist;
- The children had needed daily asthma medication during the preceding week;
- The age of the children was 10–18 years and who were literate;
- The children did not have any communication problems;
- Informed consent was obtained from both the children and their parents.

2.3 | Instruments

2.3.1 | Information form

The information form was developed by the researchers on the basis of previous literature (Bozkurt, & Yildiz, 2004; Cevik, 2011; Demirci, 2011). It comprised 46 questions, including questions about sociodemographic characteristics of the child (such as age, sex, grade level, and duration of disease), sociodemographic characteristics of the family (such as age, education level, employment status of parents, smoking near the child with asthma and number of children in the family), living conditions (such as heating condition, presence of moisture/humidity, and ventilation in the house), factors triggering asthma (smoke, exposure to allergens [such as animal dander, dust mites or pollen], strong smells [perfumes or other odors], changes in weather; cold air, running or playing hard, respiratory virus infections, effect of asthma on the child (such as school absenteeism and feeling of being different from other children), and factors related to asthma treatment (such as being able to take medications independently, timeliness of medication, asthma medications used, continuity of medication, and frequency of drug administration).

2.3.2 | Pediatric Asthma Quality of Life Questionnaire (PAQLQ)

This quality of life questionnaire consists of 23 items and was developed by Juniper, Guyatt, Feeny, Ferrie, Griffith, and Townsend in (1996). It was developed to measure the functional problems (disease-specific physical, mental, and social) that children with asthma between 7 and 17 years of age. The Turkish validity and reliability study of the questionnaire was performed by Bozkurt, and Yildiz (2004) and the Cronbach's α value was found to be 0.83. In the present study, the Cronbach's α value of the questionnaire was found 0.95 both, before and after the education intervention. The questionnaire includes questions about the asthma-related experiences of children over the last week. The PAQLQ is consisted of three forms. The self-administered form of the PAQLQ was used in this study. This form can be fill out by children and adolescents up to 17 years of age who are able to understand and complete the questionnaires independently. It was included three subscales; activity limitation, symptoms, and emotional function. The "activity limitation" subscale comprised five items related to play, sports and other daily activities. The "symptoms" subscale comprised 10 items related to cough, wheezing, and nocturnal awakening. The "emotional function" subscale comprised eight items related to frightened, frustrated or feeling different, being irritable or worried, and so forth. Each question was scored between 1 and 7 (7 = *not bothered at all*; -1 = *extremely bothered*), and the total score ranged from 23 to 161. Quality of life score was calculated using the average of the total field scores of the subscales.

2.3.3 | A Self-Efficacy scale for children and adolescents with asthma

This scale was developed in 1992 by Schlösser & Havermans (1992) to measure the perceived self-efficacy in children and adolescents (10–18 years) with asthma and to improve their ability to cope with the disease. The Turkish validity and reliability study of the scale was performed by Cevik and Celebioglu (2012) and the Cronbach's α reliability coefficient was 0.89. In the present study, the Cronbach's α value of the scale was 0.89 both, before and after the education intervention. This scale was a five-point Likert-type scale wherein the responses were scored from a range varying from "*totally agree* (1)" to "*strongly disagree* (5)"; the lowest and highest possible scores were 22 and 110, respectively. Scores above 88 were considered to indicate sufficient (high) self-efficacy, while scores below 88 indicated insufficient (low) self-efficacy.

2.3.4 | Asthma management book and procedure

The asthma management book was the intervention of this study. The asthma management education book titled "I am Learning to Live with Asthma", was prepared according to previous studies by the researchers (Figure 1; Bozkurt, & Yildiz, 2004; National Heart, Lung, and Blood Institute, 2007). The educational design for children was



FIGURE 1 The cover page of asthma management education book

based upon the Expert Panel Report-3 (EPR-3) of the National Heart, Lung, and Blood Institute (2007). Five expert opinions were consulted for the understandability of the book before the study. Two of them were doctors specializing in Child Immunology and Allergy Diseases and three of them were the lecturers of the nursing department. The language used for administration of the instruments and the language used in education book was Turkish.

The colorful asthma management education book consisted of 18 pages. It included these topics; general care-related matters such as the definition of asthma; pathophysiology of asthma; factors leading to asthma; characteristics of an asthma attack and actions to be taken during an asthma attack (instruction of pursed-lip breathing etc.); factors triggering asthma attacks; control of asthma triggers both indoor and outdoor; protection against asthma attack; most common asthma medications; how to use inhalers; correct usage of devices used for treatment; as well as clothing, exercising, and bathing of children with asthma (Figure 2).

This study was performed in 3 steps:

Step 1 (preintervention testing session): Data collection was performed face-to-face interview conducted with children and their parents in a room allocated to the interview in the Outpatient Asthma Clinic. First, the "Information Form", "PAQLQ", and

"Self-Efficacy Scale for Children and Adolescents with Asthma" scales were administered with the parents present before education. Filling the data collection tools took 10–15 min.

Step 2 (education session): The education was given individually by the researcher (first researcher/author), before the child visited his/her doctor and in the absence of his/her parents. The interactive education was completed in 40–50 min, using questions-answers, and demonstration methods (regarding the use of the meter-dose inhaler, spacers, and asthma medications). The education was conducted by the researcher using the education book. These books topics were discussed page by page by showing images and practical demonstration by the researcher. Also, questions of the children were fully answered during the education. All children were asked to show how they use their spray and inhaler one by one (Like shaking the inhaler, taking the cap, deep breathing, putting the mouthpiece between the lips and rounding the lips around the mouthpiece, doing a deep breath and slowly press the spray cylinder, keeping your breath a period of 10 s). The researcher corrected them if they were using them wrong. After the education session, the books were given to the children by the researcher. This study was performed under the supervision of the second author who served as an associate professor in Child Health and Disease Nursing and as the thesis advisor to the first researcher.

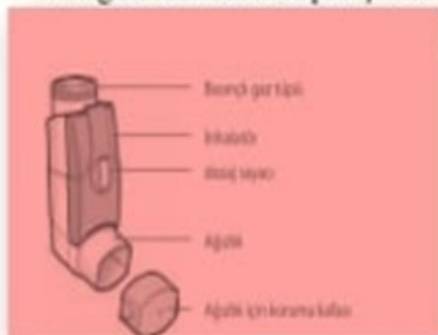
Step 3 (postintervention testing session): The next session date of the children was recorded by the researcher. Generally, children come to the clinic every 2 months. Therefore, the postintervention testing session held 2 months after the intervention session. "PAQLQ", and "Self-Efficacy Scale for Children and Adolescents with Asthma" scales have applied the children to assess the effectiveness of education. Also, when the children had any questions, the researcher answered them.

2.3.5 | Statistical analysis

Statistical analysis was performed by using the SPSS (Statistical Package for Social Sciences) 20.0 (IBM SPSS Statistics for Windows, Version 20.0. Armonk, New York: IBM Corp., 2011). Number, percentage, means, and standard deviation distributions were used for the evaluation of the descriptive statistics. Normally distributed variables were evaluated by Kolmogorov Smirnov test. The Mann-Whitney *U* test, were used for the comparison of independent (age, gender, educational status, economic status, asthma symptoms, triggering factors, school absenteeism, hospitalization, feeling different from other children, etc.) variables and dependent (PAQLQ' scores, Self-Efficacy Scale for Children and Adolescents with Asthma' scores) variables according to the normal distribution variance homogeneity results. Spearman Correlation Analysis was applied to examine the relationship between the continuous variables of the study. The Wilcoxon test was used to determine the relationship between the study variables and pre-posttest scores. The results were evaluated at a 95% confidence interval and a significance level of $p < 0.05$.

C-DOZAJ AEROSOL (ÖLÇÜLÜ DOZ İNHALER-ÖDİ) NASIL KULLANILIR?

1. Ağız kısmındaki kapak çıkarılır ve ÖDİ kuvvetlice sallanır.



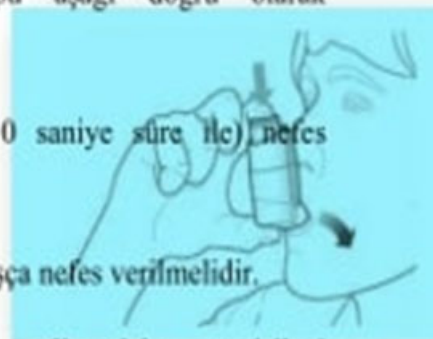
2. Düz oturulur veya ayakta durulur. Yavaş ve derinden nefes alınır.

3. Alet dikey biçimde yukarıdan ağıza doğru tutulmalıdır. Kafa hafifçe arkaya doğru tutulmalı ve ağızlık dudaklarla sıkı biçimde kapatılmalıdır.

4. Yavaş (yaklaşık 5 saniye) boyunca ağızdan nefes alınmalı ve solumaya başlarken basınçlı gaz tüpü aşağı doğru olarak bastırılmalıdır (püskürtme yapılır).

5. Mümkün olduğu kadar (yaklaşık 10 saniye süre ile) nefes tutulmalıdır.

6. Dozaj aerosolü ağızdan çıkartarak yavaşça nefes verilmelidir.



7. İkinci bir inhalasyon için 30 saniye beklenmeli ve daha sonra 1 ila 6 arası adımlar tekrarlanmalıdır.

8. İşlem bitince koruyucu kafa yeniden yerine takılır.

FIGURE 2 A page of asthma management education book

2.3.6 | Ethical considerations

Before the study, written consents for the study were obtained from the Trakya University Medical Faculty Deanery, Ethics Committee for Scientific Research (the Consent No. 14/07, dated 29/07/2015), Trakya University, Health Research and Application Center (the Consent No. 37864143-302.14-306, dated 13/10/2015). Managers and physicians of the Pediatric Allergy-Immunology Department

were informed about the study to be carried out. The study objective was disclosed to the children who participated in the study and their parents; their written and verbal consents were obtained. They were explained that the data obtained would be reported anonymously and only be used for scientific purposes. The children were asked to write a nickname which they want on the information form and the questionnaires/scales instead of their own names to maintain

TABLE 1 Some characteristics of children with asthma and their families ($n = 60$)

Characteristics	n (%)	
Age (years; mean $\pm$ SD)	11.30 $\pm$ 1.79	
Gender		
Girl	23	38.3
Boy	37	61.7
Duration of asthma diagnosis (years; mean $\pm$ SD)	4.46 $\pm$ 2.38	
Number of people living in the house (mean $\pm$ SD)	4.51 $\pm$ 1.21	
Number of smokers in the family		
Yes	45	75.0
No	15	25.0
Smoking near the child with asthma		
Yes	17	28.3
No	43	71.7
Received information about asthma		
Yes	33	55.0
No	27	45.0
Limitation in activities of daily living		
Yes	12	20.0
No	48	80.0

Note. The range of age is 10–17; the range of duration of asthma diagnosis 1–10; the range of number of people living in the house is 3–9 SD, standard deviation.

anonymity while facilitating subject identification for comparison of the pre- and post-education data.

3 | RESULTS

3.1 | Some characteristics of children with asthma and their families

The mean age of the children in this study was 11.30 ± 1.79 (10–17) years; 61.7% were boys, the mean duration since disease diagnosis was 4.46 ± 2.38 years. Further, the average number of family members living in the house was 4.51 ± 1.21 (3–9); 75% of the children had smokers in their families, and 28.3% of these smokers smoked near the child with asthma. It was determined that 45% of the children in this study had received no information about asthma before. Moreover, 20% of the children experienced difficulty in performing routine daily activities (Table 1).

3.2 | Distribution of the scales scores

A statistically significant difference was found between the pre- and post-education mean scores total PAQLQ and all the subscales of “activity restriction”, “emotional function”, and “symptoms” ($p < 0.001$). The total and mean (average of all subscale scores) PAQLQ scores increased after the education intervention (Table 2).

A statistically significant difference was found between the pre- and post-education mean “A Self-Efficacy Scale for Children and Adolescents with Asthma” scores ($p = 0.014$). The mean “A Self-Efficacy Scale for Children and Adolescents with Asthma” scores increased after the education sessions (Table 2).

3.3 | Distribution of some characteristics of the children between the scales scores before and after education

There was a statistically significant difference between the children’s ability to perform daily activities and total PAQLQ scores, subscales of activity restrictions, symptoms scores before and after the education intervention ($p < 0.05$). There were significant differences between children’s ability to independently use asthma medications and the total PAQLQ scores, the subscale of emotional function before ($p = 0.028$) and after ($p = 0.015$) the education (Table 3).

TABLE 2 Comparison of the PAQLQ scores and “A Self-Efficacy Scale For Children and Adolescents with Asthma” scores of children with asthma before and after education

Scale	Mean $\pm$ SD		p value ^a
	Before education	After education	
Total PAQLQ	104.75 $\pm$ 19.62	113.51 $\pm$ 18.39	–6.519 $p < 0.001$
Activity restrictions	18.95 $\pm$ 4.38	21.33 $\pm$ 4.19	–5.732 $p < 0.001$
Emotional function	40.71 $\pm$ 6.56	42.70 $\pm$ 6.11	–5.070 $p < 0.001$
Symptoms	45.08 $\pm$ 10.56	49.48 $\pm$ 9.95	–6.402 $p < 0.001$
Self-Efficacy Scale	78.61 $\pm$ 13.42	80.93 $\pm$ 11.75	–2.450 $p = 0.014$

Note. PAQLQ: Pediatric Asthma Quality of Life Questionnaire; SD: standard deviation.

^aWilcoxon test.

TABLE 4 Some variables and correlation coefficients between children's PAQLQ total and "Self-Efficacy Scale" scores before and after education and their significance levels ($N = 60$)

Variables	Before education					After education				
	Activity restrictions	Emotional function	Symptoms	Total PAQLQ	Self-Efficacy Scale	Activity restrictions	Emotional function	Symptoms	Total PAQLQ	Self-Efficacy Scale
Child's age	r_s -0.068 p 0.603	0.221 0.090	0.008 0.952	0.073 0.578	0.277 0.032	-0.096 0.468	0.245 0.059	0.040 0.763	0.066 0.616	0.270 [*] 0.037
Maternal age	r_s 0.363 p 0.004	0.310 0.016	0.248 0.056	0.320 0.013	0.103 0.433	0.334 0.009	0.355 0.005	0.314 0.015	0.356 0.005	0.190 0.146
Number of siblings	r_s 0.257 p 0.048	0.284 0.028	0.037 0.780	0.176 0.179	0.212 0.105	0.249 0.055	0.204 0.119	0.004 0.974	0.133 0.311	0.306 0.017
Number of people living in the house	r_s 0.188 p 0.150	0.303 0.019	0.148 0.260	0.233 0.073	0.157 0.232	0.206 0.114	0.201 0.124	0.106 0.422	0.193 0.140	0.221 0.090

Note. PAQLQ, Pediatric Asthma Quality of Life Questionnaire; r_s : Spearman's Correlation Analysis.

that this education may provide self-management behaviors to children about disease.

In this study, while the total mean "A Self-Efficacy Scale for Children and Adolescents with Asthma" score of the children was 78.61 ± 13.42 before the education, it was found to be 80.93 ± 11.75 after the education intervention. The children's self-efficacy levels also increased after the education intervention (Table 2). This study's result is similar to the literature. In our country, Cevik (2011) reported that the "A Self-Efficacy Scale for Children and Adolescents with Asthma" scores in the experimental group were 78.25 ± 7.95 before and 96.75 ± 10.32 after the education intervention. In many studies conducted to assess the self-efficacy levels of children diagnosed with asthma Bartholomew et al. (2000), Butz et al. (2005), Cicutto et al. (2005), Tzujung, Chang, and Wu (2017) found that the self-efficacy levels of children diagnosed with asthma were higher after the education intervention. Studies have shown that children/adolescents who have received individual or group education intervention managed their diseases better, and the clinical course of their diseases improved (Bartholomew et al., 2000; Gibson et al., 2003; Tzujung et al., 2017). Findings from this study suggest that improved child self-efficacy scores to allowing children to demonstrate use of medication as well as receive corrective instruction when inaccurate use was detected. Children with asthma can gain the sense of control and manage their disease by education (Table 2).

In this study, the quality of life of the children improved as the maternal age increased; this was true for the quality of life levels assessed after the education intervention (Table 4). In their study, Rydström, Dalheim-Englund, Holritz-Rasmussen, Möller, and Sandman (2005) found that the quality of life levels was higher in children with asthma whose mothers were >40 years old. Similarly, Osman, Baxter-Jones, and Helms (2001) determined that the quality of life of children with asthma with mothers aged <30 years old was poorer than that of the children with asthma with mothers aged >30 years. This was attributable to the fact that younger mothers were less experienced and less knowledgeable about

asthma than older mothers; their lack of knowledge about the disease increased their anxiety, making them more protective.

In this study, as the age of the children increased, the levels of self-efficacy increased (Table 4). Similarly, Orrell-Valente, Jarlsberg, Hill, and Cabana (2008) also found that as the children's age increased their self-efficacy behavior increased, too. This result may be showed that children want to be more independent as they mature, they take more responsibility in asthma management, and families transfer the responsibility for asthma management to their children.

In this study, as number of siblings increased the activity restrictions reduced, self-efficacy levels increased. In addition, as the number of people living in the house increased the emotional functions improved with in the the quality of life (Table 4). Although previous studies associate a large number of people living in the house with poor living conditions, we found that a higher number of people living in the house and the higher number of siblings had a positive effect on the quality of life of children with asthma. This suggests that family support is important for children to cope with asthma and positively affects the aspects of emotional functions and activity restrictions with respect to quality of life. Similarly, in their study conducted in Turkey, Yuksel et al. (2009) determined that the scores obtained by children with asthma with more than sibling brother from each of the three subscales and their total scores received from the PAQLQ scale were higher.

The quality of life of children who experienced difficulty in performing daily activities was poorer than that of those who were able to perform daily activities easily and independently (Table 3). Cicutto et al. (2005) found that the rates of asthma-related movement restrictions were lower in the children of the experimental group than in those of the control group. Similarly, Butz et al. (2005) and Velsor-Friedrich, Pigott, and Louludes (2004) found that the number of days on which the children experienced asthma symptoms decreased more in the experimental group after the education intervention than in the control

group. Restricting their activities due to the fear of triggering an asthma attack and avoiding participation in outdoor games may lead to the isolation of children with asthma from friends. Given that the children in the study group are school children, physical activities, games, sports, competitions and other social activities constitute an important part of their daily lives; therefore, this condition seriously affects the children's quality of life and restricts their daily lives. It is recommended that education programs address this issue and explain that although asthma is a chronic disease, children with asthma can perform all routine daily activities like other children by avoiding the triggering factors, taking the necessary precautions and applying the knowledge provided about symptom management.

5 | CONCLUSION

The education given to children with asthma increased children's self-efficacy and quality of life. Based on these results, it can be recommend that providing planned education to children with asthma from the beginning of diagnosis is important for improving the quality of life and levels of self-efficacy of these children. Nurses should take responsibility for educating children about the disease, correct usage of medications, control of asthma triggers, protection against asthma attack and other important information. Larger scale programs are recommended to be performed on children with asthma in all age groups.

6 | LIMITATIONS OF THIS STUDY

The small sample size and not having a control group for comparison were two limitations of the current study. With a larger sample, more significant results can be achieved statistically. A larger sample size and other sophisticated tests would be helpful in determining the importance of the subject.

ACKNOWLEDGMENT

We are grateful to Professor Necdet Sut for data analyses.

CONFLICT OF INTERESTS

We are grateful to Professor Necdet Sut for data analyses. This study was prepared as a Ph.D thesis and was presented as a verbal declaration at the 21st International Nursing Research Conference. Madrid-Spain (14–17 November, 2017).

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How to cite this article: Kocaaslan EN, Akgün Kostak M.

Effect of disease management education on the quality of life and self-efficacy levels of children with asthma. *J Spec Pediatr Nurs*. 2019;e12241. <https://doi.org/10.1111/jspn.12241>