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ORIGINAL ARTICLE

The Effect of Nursing Training Given to Parents of Asthmatic Children on Home Design Awareness and the Child's Quality of Life: A Quasi-experimental Study

Astımlı Çocuğu Olan Ebeveynlere Verilen Hemşirelik Eğitiminin Ev Dizaynı Farkındalığı ile Çocuğun Yaşam Kalitesi Üzerine Etkisi: Yarı Deneysel Çalışma

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Abstract

Objective: This study aimed to examine how nursing training provided to parents of asthmatic children affects the child's quality of life by increasing their awareness of home environment arrangements.

Method: This study using a single-group pre-test-post-test design, was conducted in a training and research hospital in a province of Turkey. The study included 35 asthmatic children and their parents who were hospitalized in the pediatrics polyclinic and inpatient ward, during the pandemic period between March and July 2021. The data were collected with the "asthmatic child information form", "pediatric asthma quality of life questionnaire", and "home design awareness scale in children with asthma". Frequency, percentage, mean, standard deviation, paired samples t-test, Wilcoxon sign test, independent t-test, and Mann-Whitney U test were used to evaluate the data.

Results: The asthmatic children included in the study had sub-dimension and total score averages of the pediatric asthma quality of life questionnaire and the published home design awareness scale in children with asthma as pre-test-post-test measurements. The post-test score averages of all sub-terms improved after the trainings ($p<0.05$).

Conclusion: It has been observed that with the nursing training given to the parents of asthmatic children, parents' home design awareness increases and children's quality of life improves by protecting them from indoor factors that trigger asthma attacks.

Keywords: Asthmatic child, home design, nursing, quality of life

Öz

Amaç: Bu çalışma, astımlı çocukların ebeveynlerine yönelik verilen hemşirelik eğitiminin, ev ortamı düzenlemesi konusunda farkındalıklarını artırarak çocuğun yaşam kalitesini nasıl etkilediğini incelemeyi amaçlamıştır.

Yöntem: Tek gruplu ön-test-son-test tasarımı kullanılarak yapılan bu çalışma Türkiye'nin doğusunda yer alan bir ilde eğitim ve araştırma hastanesinde yürütülmüştür. Çalışmanın örneklemini Mart ve Temmuz 2021 tarihleri arasında pandemi döneminde çocuk hastalıkları polikliniğine başvuran ve yataklı servisinde yatan 35 astımlı çocuk ve ebeveynleri oluşturmuştur. Veriler araştırmacılar tarafından oluşturulan "astımlı çocuk bilgi formu", "astımlı çocuk yaşam kalitesi ölçeği" ve "astımlı çocuklarda ev dizaynı farkındalığı ölçeği" ile toplanılmıştır. Verilerin değerlendirilmesinde frekans, yüzde, ortalama, standart sapma, paired samples t-testi, Wilcoxon işaret testi, independent t-testi ve Mann-Whitney U testi kullanılmıştır.

Bulgular: Çalışmaya dahil edilen astımlı çocukların astımlı çocuk yaşam kalitesi ölçeği ile ebeveynlerin astımlı çocuklarda ev dizaynı farkındalığı ölçeği alt boyut ve toplam puan ortalamaları ön-test-son-test olarak karşılaştırıldığında yapılan eğitimler sonrasında son-test puan ortalamalarının bütün alt boyutlarda yükselme olduğu görülmüştür ($p<0,05$).

Sonuç: Astımlı çocuğun ebeveynlerine çocuğun astım atağını tetikleyen ev içi faktörlerden korunmaya yönelik verilen hemşirelik eğitimiyle ebeveynlerin ev dizaynı farkındalıklarının arttığı ve çocukların yaşam kalitelerinin de arttığı görülmüştür.

Anahtar Kelimeler: Astımlı çocuk, ev dizaynı farkındalığı, hemşirelik, yaşam kalitesi

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Introduction

According to the World Health Organisation (WHO): "Asthma is an important long-term public health problem affecting children and adults." The airways in the lungs narrow due to inflammation and contraction of the muscles around the small airways. This causes asthma symptoms such as coughing, wheezing, shortness of breath, and chest tightness. These symptoms are intermittent and usually increase in severity at night or during exercise. Factors that trigger asthma vary from person to person and may include allergens , such as dust, grass and tree pollen, animal fur and feathers, and strong soaps and perfumes, as well as irritants like viral infections, smoke, and changes in the air (1).

It is thought that the prevalence of asthma in the world is between 1% and 18%, and approximately 300 million people are affected. Despite the measures taken for the prevention and control of the disease, asthma is still an important health problem (2). According to WHO 2023 data, it is estimated that 262 million people in the world have a diagnosis of asthma and there are approximately 455 thousand asthma-related deaths (1). According to the Global Asthma Network 2022 report, when people affected by asthma worldwide are classified according to age, the 10-14 age group is reported as the most affected in childhood (3).

Although there are significant differences in the causes, triggers, age at diagnosis, symptoms, and signs of childhood asthma, the prevalence of childhood asthma among countries and regions has been reported to be approximately 9.4% worldwide and 13.36% in Turkey (4). The prevalence of asthma varies significantly between cities and regions in Turkey, and asthma is more common in coastal areas, cities, large metropolises, and low socio-economic living conditions (2). When the number of children diagnosed with asthma at the age of one and the number diagnosed at the age of five are analyzed together, fewer children are diagnosed with asthma at the age of one, as it is more challenging to diagnose asthma in younger children. It is reported that the prevalence of asthma is increasing every year (5).

Asthma is affected by many factors such as gender, genetics, immunological factors, psychological factors, and seasonal factors, etc. Since there are anatomical and immunological differences in children compared to adults, the course of the disease can be markedly different. When the child encounters allergens, symptoms such as wheezing, chest tightness, cough, and dyspnoea occur. The general cause of asthma attacks in children is exposure to allergens. Factors that cause asthma attacks in the home environment are house dust mites, moisture/mould, pollen, cockroaches, tobacco, chemical products, some drugs and animals (1,6). In the study of Zeytun et al. (7), it was determined that factors such as dust, pollen, and animal hair in the house cause asthma and asthma attacks. When the child encounters these sensitive allergens, asthma symptoms may occur.

When asthma, which ranks 3rd among the causes of hospitalisation in children under 15 years of age, is not controlled, it can lead to various problems, including physical, mental and social problems such as repeated hospitalisations, school absenteeism, decreased school performance, decreased daily life activities, and anxiety and stress due to uncertainty about when the attack will occur (8,9). These problems affect the child's daily needs such as nutrition, sleep, hygiene, and entertainment and subsequently reduce the quality of life of the child and parents, negatively affect ing their lives (10). Although asthma cannot be treated definitively, it can be controlled. Controlling the factors that cause asthma attacks is important in the management of the disease (11,12). Asthma management is based on the control of allergens, which involves many factors (13). Asthma treatment principles include drug therapy, environmental management and patient training (14).

Factors affecting the asthmatic child consist of two basic groups: internal and external factors. External factors include pollen, mould fungi, etc., while internal factors include house dust mites, and hairy animals such as dogs, cats, mice, yeasts, moulds, etc., which are mostly found in the house. Children spend most of the day at home. Therefore, domestic factors were addressed in this study. Home design plays an important role in the control of factors that trigger asthma. Factors that trigger asthma can be managed through environmental location, usage, and organization, thus reducing the number of attacks and improving the child's quality of life (8). For example, the items in the room where the asthmatic child spends most of the time should be reduced, wool carpets should not be kept at home, and mould formation should be prevented. In this way, the asthmatic child's contact with asthma-triggering factors is reduced and the number of attacks decreases.

One of the most important factors in controlling asthma is the training of patients and their parents (13). Nurses can play an important role in reducing the triggers that cause asthma attacks and the number of asthma attacks in the child by providing training and counselling to the parents of the child with asthma about home design. The main aim of the training given to the parents is to teach patients and their parents to live with asthma (15,16). Parents who

Main Points

- Asthma is frequently seen in childhood, especially between the ages of 10-14.
- The most common cause of asthma attacks in children is exposure to allergens such as house dust mites, mold, pollen, cockroaches, tobacco smoke, chemical products, some medications, and pet hair.
- Children's living space at home is critical in controlling asthma attacks. By correctly positioning and using items and arranging the environment, minimizing factors that trigger asthma, reducing the number of attacks, and thus increasing the child's quality of life can be significantly achieved.
- Nurses play an important role in reducing the factors that trigger asthma attacks and, accordingly, the number of attacks and increasing quality of life by providing training and counseling to families of children diagnosed with asthma.

receive training can manage asthma better. With training, the number of attacks, the need for medication use, and the child's school absenteeism decrease, and the quality of life of the child and parental satisfaction increase (8).

In this regard, understanding the influence of nursing training on both the awareness of home design among parents of children with asthma and the overall quality of life of these children is crucial. There appears to be a significant gap in national and international research regarding the effects of nursing training on the parents of asthmatic children, particularly in relation to home design awareness and its role in improving quality of life. Accordingly, this study seeks to examine how nursing training impacts the quality of life for children with asthma and the home design awareness of their parents. The hypotheses for this research are as follows:

H1: Nursing training provided to parents of asthmatic children increases their knowledge and implementation of home design practices.

H2: Nursing training for children with asthma and their parents positively influences the child's quality of life.

Material and Method

Study Setting and Sample

This study aimed to assess the impact of nursing training provided to children with asthma and their parents on the child's quality of life and the parents' awareness of the health-related home environment. A single-group, quasi-experimental design was employed due to the limited number of individuals seeking care at health institutions during the coronavirus disease-2019 (COVID-19) pandemic and the small population size of the region. As a result of the reduced number of healthcare visits during the pandemic, from March 2021 to July 2021, and the region's low population, the study population consisted of 42 children diagnosed with asthma along with their parents. All of them attended the pediatric outpatient clinic at a training and research hospital in eastern Turkey. The sample size was calculated using the formula determined by Salant and Dillman (17). It was calculated using the formula: "$n=n\times t^2\times p\times q/d^2\times(n-1)+t^2\times p\times q$". In this formula: t ($1-\alpha$): represents the value from the t-table for a given confidence level (typically 95%) with "infinite" degrees of freedom (for 95%, the t-table value is 1.96), n: denotes the total number of individuals in the population, n: refers to the optimum sample size to be determined, p: indicates the frequency of occurrence of the event being studied, q: refers to (1-p), the probability of the event not occurring, d: represents the expected standard deviation of the rate to be determined in the study ($p<0.05$). It was determined that there should be at least 26 asthmatic children and their parents. However, considering the possible sample losses during the study, the sample size was increased by 30%, and a total of 35 asthmatic children and their parents were included in the study.

Data Collection

The data were gathered from children and their parents who met the sample selection criteria, who had either applied to the pediatric outpatient clinic or received treatment in the inpatient service, and willingly agreed to participate in the study. The data collection process was carried out by the researcher in four stages:

Stage 1-introduction and pre-test: In this phase, an introductory interview was conducted with the children diagnosed with asthma and their parents, who were selected for participation in the study. The interview, carried out in a private setting, involved the parents filling out the "asthmatic child information form", while the children completed the "pediatric asthma quality of life questionnaire (PAQLQ)". Additionally, the parents responded to the "home design awareness scale for parents of children with asthma". These forms were completed during one-on-one, face-to-face interactions, with each interview lasting about 10 to 15 minutes. The data collected from these scales during this stage were considered baseline data (pre-test) for the study.

Stage 2-nursing teaching: After the pre-test at the first interview, the second interview was held at the hospital. In this meeting, a face-to-face nursing training was given to the child and parents on the relevant subject. Children and their families in training;

- What is asthma?
- What are the factors that cause asthma?
- What are the symptoms of asthma?
- What is an asthma attack and what should be done during an attack?
- Importance of internal factors in prevention of asthma.
- How should the home design be in asthma? Information was given.

Individuals were interactively trained with the prepared training booklet in approximately 15-20 minutes. After the training, booklet was given to the child and the family. An appointment was made to meet again 1 week after the training, and the interview ended.

Stage 3-consultancy: In the third meeting, after the face-to-face nursing teaching at the hospital, counseling was provided by telephone conversation with the parents due to the COVID-19 pandemic. In this interview, which lasted for 10-15 minutes for each parent, the effectiveness of the training was evaluated by asking questions about the nursing-related instructions (Is the house designed for the child? Are suggestions for protection from internal factors triggering asthma applied? Did the child have an

asthma attack? etc.). The phone number was shared so that parents could reach the counselor if needed. The questions were answered by going over the topics again; the missing points were completed; an appointment was made for the fourth interview one month later for the post-test; and the interview was ended.

Stage 4-post-test: In the fourth interview, the children and their families, were asked to fill in the "PAQLQ" and "home design awareness scale in children with asthma (HDASCA)" for the second time. The forms filled in at this stage were evaluated as post-tests, assessing the post-training quality of life of the asthmatic child, and the awareness of the parents.

Data Collection Tools

Asthmatic Child Information Form: The form was developed by the researchers based on existing literature (9,18,19) and contains a total of 43 questions. These include 11 questions about the socio-demographic characteristics of the family, 4 questions about the housing conditions, 14 questions regarding asthma triggers and their impact on the child, 8 questions about the clinical features of asthma, and 6 questions concerning asthma treatment and asthma triggers.

PAQLQ: The scale, originally developed by Juniper et al. (20) in 1996, evaluates the physical, emotional, and social impacts of asthma on children aged 7 to 17 years. It was translated into Turkish by Bozkurt and Yıldız (19), who also tested its validity and reliability. The scale is divided into three domains: symptoms, activity limitations, and emotional functioning. It is administered before the child's consultation with a doctor, without the parent being present. Each item on the scale is scored using a 7-point Likert scale, where "1" indicates the lowest level and "7" the highest. All items are equally weighted, with total scores ranging from 23 to 61; higher scores reflect a better quality of life. Bozkurt and Yıldız (19) reported a reliability coefficient of 0.83 for the scale. In this study, the reliability coefficient was calculated as 0.95 before the training and 0.94 after the training.

HDASCA: The scale was developed by Aldem and Geçkil (9) in Turkey in 2019 to assess the level of awareness among parents of children with asthma regarding home design. The scale includes eight subscales, with a total of 23 items: anti-allergic products, pollen control, home control, perfume control, carpet control, humidity control, bedding control, and animal control. Each item on the scale is rated on a 5-point Likert scale. The lowest possible score is 23, while the highest is 115. A higher score indicates a greater awareness of home design considerations for children with asthma. The reliability coefficients for the sub-scales range from 0.41 to 0.83, and the overall internal consistency coefficient for the entire scale is 0.86. In our study, the reliability coefficient of the scale was calculated to be 0.87 before the training and 0.92 after the training.

Statistical Analysis

The data analysis for the study was performed using SPSS 22.0 software. Descriptive statistics, including frequency, percentage, mean, standard deviation, minimum, and maximum values, were calculated. Skewness and Kurtosis tests were used to assess the normality of the data distribution, with values within the ±2.0 range considered indicative of a normal distribution (20). The paired samples t-test was used for statistical comparisons to analyze two dependent quantitative variables having a normal distribution. For variables that did not meet the normality assumption, the Mann-Whitney U test was applied to independent samples, while the Wilcoxon signed-rank test was used for dependent samples. Linear regression analysis was conducted to examine relationships between continuous variables. A p-value of less than 0.05 ($p<0.05$) was considered statistically significant. The reliability of the measurement tools was assessed using Cronbach's alpha coefficient.

Compliance with Ethical Standards

The study was conducted in accordance with the ethical standards outlined in the "1964 Helsinki Declaration" and its subsequent amendments. Ethical approval was obtained from the Atatürk University Faculty of Nursing Ethics Committee (approval number: 2020-6/17, date: 11.12.2020), and relevant institutional authorities prior to initiating the research. Participants who met the inclusion criteria and voluntarily agreed to participate were provided with comprehensive information about the study, ensuring compliance with the principle of "informed consent". The process also upheld the principle of "respect for autonomy", allowing participants to freely decide whether to participate. Additionally, strict confidentiality of all personal information was maintained in line with the principle of "confidentiality", and written informed consent was obtained from all participants.

Results

Among the children involved in the study, 60% were female, with an average age of 11.26±3.08 years. It was noted that 88.6% of the families were composed of nuclear family units. The mothers had a mean age of 38.43±5.54 years, with 34.3% holding a bachelor's degree and 37.1% being employed. The fathers' average age was 42.09±5.56 years, with 51.5% possessing a bachelor's degree and 91.4% being employed. Furthermore, 65.7% of the families reported having an income that matched their expenses, and 60% of the household members were smokers. The data also revealed that 44.1% of the children had previously received asthma training, and 65.7% of the parents had already implemented measures at home to minimize asthma triggers prior to the intervention (Table 1).

After the training intervention, both the sub-dimension and total scores of the PAQLQ showed significant improvements compared to the pre-training scores ($p<0.05$) (Table 2).

Table 1.
Demographic Information of the Participants (n=35)

Features		n	%
Gender of the child	Girl	21	60.0
	Male	14	40.0
Educational status of the mother	Elementary school	8	22.9
	Graduated from secondary school	8	22.9
	High school graduate	7	20.0
	College graduates	12	34.3
Educational status of the father	Elementary school	2	5.7
	Graduated from secondary school	3	8.6
	High school graduate	12	34.3
	College graduates	18	51.5
Mother's working status	Working	13	37.1
	Not working	22	62.9
Father's working status	Working	32	91.4
	Not working	3	8.6
Income rate	Income less than expense	3	8.6
	Income equals expense	23	65.7
	Income more than expenses	9	25.7
Family type	Nuclear family	31	88.6
	Extended family	4	11.4
Presence of a smoker in the family	Smoker	21	60.0
	Non-smoker	14	40.0
	n	**Arithmetic average**	**Standard deviation**
Child's age (year)	35	11.26	3.08
Mother's age (year)	35	38.43	5.54
Father's age (year)	35	42.09	5.56

Similarly, a comparison of the pre- and post-training scores for the HDASCA demonstrated statistically significant higher post-training scores ($p<0.05$) (Table 2).

When comparing the pre-training and post-training PAQLQ scores in relation to home precautions for asthma triggers, it was observed that children living in homes with precautions had higher scores in the "symptoms" and "emotional function" sub-scales, as well as the total score. Similarly, children from households without precautions also exhibited higher scores in the "symptoms" sub-scale and the overall total score, with a statistically significant difference between the two groups ($p<0.05$) (Table 3).

Regarding prior asthma training, it was noted that children had received general training about asthma at the time of diagnosis. A comparison of the PAQLQ scores before and after the program, taking into account prior asthma training, showed that children with previous training had higher scores in the "symptoms" and "emotional function" sub-scales, as well as in the total post-training score. Similarly, children who had not received prior training showed improvements in the same sub-scales after the training, with the difference between the groups being statistically significant ($p<0.05$) (Table 3).

A comparison of the median scores of the PAQLQ sub-dimensions and total score based on home precautions and prior training revealed that children of parents who had not taken precautions at home before the training had higher pre-training scores in "activity limitation" sub-dimension and the total score. After the training, children whose parents had received prior training achieved significantly higher scores in the "symptoms" and "activity limitation" sub-scales, with the differences being statistically significant ($p<0.05$). However, no significant differences were found in the pre-training scores for these variables ($p>0.05$) (Table 3).

A comparison of the mean HDASCA scores before and after the training based on home precautions for asthma triggers revealed that parents who had taken precautions at home had higher scores in all sub-scales after the training, including "anti-allergic products, pollen control, furniture, perfume, carpet, humidity, bedding, and animal control." Similarly, parents who had not taken precautions at home also showed increased scores in these areas after the training, with the difference being statistically significant ($p<0.05$) (Table 4).

In terms of prior asthma training, parents of children who had received it showed higher scores in all sub-scales of the HDASCA after the training, including "anti-allergic products, pollen control, furniture, perfume, carpet, humidity, bedding, and animal control." Likewise, parents of children without prior training demonstrated improved scores post-training, with the difference between the groups being statistically significant ($p<0.05$) (Table 4).

A comparison of the median scores for the HDASCA sub-dimensions and total score, considering prior asthma training and home precautions, showed that parents who had received asthma training and implemented home precautions had higher post-training scores in the "anti-

Table 2.
Comparison of the Mean Scores of the PAQLQ and HDASCA Sub-dimensions and Total Scores of Children with Asthma Before and After Education (n=35)

		Pre-training		Post-training		Test and significance
		Min-max	Mean ± SD	Min-max	Mean ± SD	
PAQLQ	**Symptoms**	21-65	44.34±10.18	25-66	48.14±8.34	t=-4.587 **p<0.001**
	Activity restriction	15-33	25.17±4.5	15-32	26.34±4.14	t=-2.561 **p=0.015**
	Emotional function	31-55	46.11±6.22	31-56	48.91±5.68	t=-4.189 **p<0.001**
	Total score	67-148	115.63±19.60	71-154	123.43±17.77	t=-5.051 **p<.001**
HDASCA	**Antiallergic product**	6-15	11.57±2.19	9-15	12.77±1.44	t=-3.018 **p=0.003**
	Pollen control	8-16	12.57±2.58	6-20	14.94±2.97	t=-3.863 **p<0.001**
	Item control	10-16	13.6±1.79	10-20	15.34±2.47	t=-6.547 **p<0.001**
	Perfume control	3-15	12.69±2.21	10-15	14.09±1.50	t=-3.459 **p<0.001**
	Carpet control	6-14	8.86±2.14	6-14	10.51±2.37	t=-4.638 **p<0.001**
	Humidity control	5-10	8.26±0.95	8-10	8.97±0.92	t=-3.390 **p<0.001**
	Linen control	5-9	7.60±1.00	6-10	8.40±0.95	t=-3.575 **p<0.001**
	Animal control	2-10	6.34±1.86	4-10	7.63±1.78	t=-4.596 **p<0.001**
	Total score	66-97	81.49±8.86	72-106	92.66±10.53	t=-8.218 **p<0.001**

t=the paired-samples t-test, Z=Wilcoxon signed-rank test, SD=standard deviation, PAQLQ=pediatric asthma quality of life questionnaire, HDASCA=home design awareness scale in children with asthma

allergic products" and "pollen control" sub-scales. These differences were statistically significant ($p<0.05$). However, no significant differences were found between the post-training scores of the two groups ($p>0.05$) (Table 4).

Linear regression analysis was conducted to examine the relationship between the total scores of the HDASCA and PAQLQ. The results indicated that the model was statistically significant ($f=7.030$; $p<0.05$). The PAQLQ total score was found to be a significant positive predictor of the HDASCA total score ($\beta=0.707$; $p<0.05$), explaining 17% of the variance (Table 5).

Discussion

In today's world, where chronic diseases are increasingly prevalent due to various factors, including health and economic conditions, this study demonstrated that the quality of life for children improved following parent training. The primary aim of the training was to enhance the child's quality of life and increase parental awareness of home environment design by providing training and counseling services from healthcare professionals, particularly nurses, to families of children diagnosed with asthma. This training empowered families to protect their children from asthma triggers. Our findings support the hypothesis that "Nursing training for parents of children with asthma has a positive impact on the child's quality of life.

Similarly, a systematic review by Walter et al. (21) on the impact of training on the quality of life in children with asthma concluded that training interventions led to significant improvements in quality of life. Horner and Brown (22) also reported that nursing interventions for asthma significantly enhanced children's quality of life. Additionally, Kocaaslan (17) found that nurse-led training improved the quality of life for children with asthma. Both our study and the existing literature highlight the positive impact of training interventions on improving the quality of life for children with asthma.

Table 3.
Comparison of the Pre- and Post-training PAQLQ Sub-dimension and Total Score Averages According to the Status of Taking Precautions at Home for the Factor and the Status of Previous Education Status of Pre-training and Post-training Groups Within and Between Groups (n=35)

PAQLQ	Variables						
	Status of taking precaution at home fort factor				Previous education status		
	Taking precautions (n=23)		Not taking precautions (n=12)	Between group U/p	Trained (n=16)	Untrainded (n=19)	Between group U/p
	Median (min-max)		Median (min-max)		Median (min-max)	Median (min-max)	
Symptoms	Pre-training	44 (21-62)	43 (36-65)	U=125.0, **p=0.651**	47 (21-62)	43 (28-65)	U=140.0, **p=0.691**
	Post-training	48 (25-66)	49 (37-65)	U=57.0, **p=0.072**	53 (25-66)	46 (35-65)	U=71.5, **p=0.049**
	Intragroup Z/p	Z=-3.137, **p=0.002**	Z=-2.326, **p=0.020**		Z=-3.085, p**=0.002**	Z=-2.514, **p=0.012**	
Activity restriction	Pre-training	26 (15-33)	27 (20-31)	U=104.5, **p=0.243**	26 (15-30)	26 (17-33)	U=151.0, **p=0.973**
	Post-training	26 (15-32)	27 (23-31)	U=74.0, **p=0.025**	27 (15-32)	26 (17-31)	U=69.0, p**=0.045**
	Intragroup Z/p	Z=-1.720, **p=0.085**	Z=-1.724, **p=0.085**		Z=-1.584, **p=0.113**	Z=-1.810, **p=0.070**	
Emotional function	Pre-training	44 (31-55)	48 (42-54)	U=94.0, **p=0.126**	43 (31-55)	47 (37-55)	U=139.5, **p=0.678**
	Post-training	49 (31-56)	49 (37-65)	U=24.0, **p=0.626**	48 (31-59)	50 (39-56)	U= 51.5, **p=0.987**
	Intragroup Z/p	Z=-3.649, **p<0.001**	Z=-1.661, **p=0.037**		Z=-2.674, **p=0.008**	Z=-2.740, **p=0.006**	
Total score	Pre-training	113 (67-148)	119 (104-146)	**U=108.5, p=0.305**	113 (67-146)	115 (84-148)	U=148.5, **p=0.908**
	Post-training	122 (71-154)	123 (112-152)	U=51.5, **p=0.021**	127 (71-154)	122 (92-152)	U=69.5, **p=0.036**
	Intragroup Z/p	Z=-3.440, **p=0.001**	Z=-1.968, **p=0.049**		Z=-1.916, **p=0.055**	Z=-3.666, **p<0.001**	

U=Mann-Whitney U test, Z=Wilcoxon signed-rank test, PAQLQ=pediatric asthma quality of life questionnaire

In our study, although some children had received asthma training beforehand, both those who had prior training and those who had not showed a reduction in symptoms, better emotional functioning, and an overall improvement in quality of life. This suggests that initial training has a positive effect, but repeated interventions further boost quality of life. These results are consistent with other studies that indicate children with asthma, who receive continuous training, experience a better quality of life than those who do not (18,24,25). These studies highlight the importance of ongoing training for asthmatic children, which is essential for effective disease management, symptom reduction, and overall quality of life improvement.

Additionally, our study found a reduction in disease symptoms, as well as improvements in emotional functioning and quality of life, in children whose parents had implemented home measures to control asthma triggers. However, there are few studies in the literature that specifically examine the impact of home measures on children's quality of life. Göv's (26) study found that home interventions did not significantly affect the child's quality of life. In our study, similar to Göv's (26) findings, home precautions had a positive impact on the quality of life for some children, while for others, it did not have the same effect. Implementing appropriate measures to reduce asthma triggers in the home environment is vital for effective asthma management, controlling symptoms, and improving the child's quality of life.

Our study also showed that after the training intervention, parents' awareness of home design increased. This supports

Table 4.
Comparison of the Pre- and Post-training HDASCA Sub-dimension and Total Score Averages According to the Status of Taking Precautions at Home for the Factor and the Status of Previous Education Status of Pre-training and Post-training Groups Within and Between Groups (n=35)

HDASCA		Variables					
		Status of taking precaution at home fort factor			Previous education status		
		Taking precautions (n=23)	Not taking precautions (n=12)	Between group U/p	Trained (n=16)	Untrainded (n=19)	Between group U/p
		Median (min-max)	Median (min-max)		Median (min-max)	Median (min-max)	
Antiallergic product	Pre-training	12 (6-15)	12 (6-14)	U=117.5, **p=0.100**	12 (6-15)	12 (6-15)	U=148.5, **p=0.894**
	Post-training	13 (9-15)	12 (12-15)	U=76.0, **p=0.038**	13 (11-15)	12 (9-15)	U=69.0, **p=0.031**
	Intragroup Z/p	Z=-3.069, **p=0.002**	Z=-0.738, **p=0.461**		Z=-2.143, **p=0.032**	Z=-2.079, **p=0.038**	
Pollen control	Pre-training	13 (8-16)	13 (6-15)	U=135.0, **p=0.916**	13 (8-16)	13 (8-16)	U=145.5, **p=0.828**
	Post-training	16 (6-19)	15 (8-20)	U=66.0, **p=0.041**	16 (6-19)	15 (13-20)	U=83.5, **p=0.032**
	Intragroup Z/p	Z=-3.354; **p=0.001**	Z=-1.903, **p=0.057**		Z=-2.341, **p=0.019**	Z=-3.200, **p=0.001**	
Item control	Pre-training	14 (10-16)	14 (12-16)	U=132.0, **p=0.832**	14 (10-16)	13 (10-16)	U=108.0, **p=0.138**
	Post-training	15 (10-20)	15 (12-20)	U=36.0, **p=0.944**	16 (10-20)	15 (11-18)	U=112.5, **p=0.183**
	Intragroup Z/p	Z=-3664, **p<0.001**	Z=-2.568, **p=0.010**		Z=-2.917, **p=0.004**	Z=-3.398, **p=0.001**	
Perfume control	Pre-training	12 (3-15)	13 (12-15)	U=91.5, **p=0.082**	12 (6-12)	12 (3-15)	U=145.5, p=**0.818**
	Post-training	15 (11-15)	15 (10-15)	U=33.5, **p=0.848**	15 (11-15)	15 (10-15)	U=151.0, **p=0.968**
	Intragroup Z/p	Z=-3.097, **p=0.002**	Z=-1.029, **p=0.303**		Z=-2.335, p=**0.020**	Z=-2.479, **p=0.013**	
Carpet control	Pre-training	9 (6-14)	8 (6-12)	U=113.0, **p=0.377**	8 (8-10)	8 (6-14)	U=126.5, **p=0.391**
	Post-training	12 (6-14)	10 (6-13)	U=106.0, **p=0.256**	12 (8-14)	10 (6-14)	U=114.5, p=**0.205**
	Intragroup Z/p	Z=-2.899, **p=0.004**	Z=-2.311, **p=0.021**		Z=-3.072, **p=0.002**	Z=-2.171, **p=0.030**	
Humidity control	Pre-training	8 (5-10)	8 (6-10)	U=96.0, **p=0.062**	8 (6-9)	8 (5-10)	U=150.0, **p=0.934**
	Post-training	9 (8-10)	9 (6-10)	U=124.5, **p=0.611**	10 (8-10)	8 (8-10)	U=86.5, **p=0.063**
	Intragroup Z/p	Z=-2.877, p=**0.004**	Z=-1.730, **p=0.084**		Z=-2.762. p=**0.006**	Z=-1.983, **p=0.047**	
Linen control	Pre-training	8 (5-9)	8 (6-9)	U=93.0, **p=0.076**	8 (6-9)	8 (5-9)	U=151.0, **p=0.970**
	Post-training	9 (7-10)	8 (6-10)	U=129.5, **p=0.742**	9 (6-10)	9 (7-10)	U=139.5, **p=0.644**
	Intragroup Z/p	Z=-2.958, **p=0.003**	Z=-0.966, **p=0.334**		Z=-1.980, p=**0.048**	Z=-2.448, **p=0.014**	

Table 4.
Comparison of the Pre- and Post-training HDASCA Sub-dimension and Total Score Averages According to the Status of Taking Precautions at Home for the Factor and the Status of Previous Education Status of Pre-training and Post-training Groups Within and Between Groups (n=35)

HDASCA		Variables					
		Status of taking precaution at home fort factor			Previous education status		
		Taking precautions (n=23)	Not taking precautions (n=12)	Between group U/p	Trained (n=16)	Untrainded (n=19)	Between group U/p
		Median (min-max)	Median (min-max)		Median (min-max)	Median (min-max)	
Animal control	Pre-training	7 (4-9)	6 (2-10)	U=129.0, **p=0.763**	7 (2-9)	7 (4-10)	U=147.0, **p=0.866**
	Post-training	8 (4-10)	8 (4-10)	U=110.0, **p=0.315**	9 (5-10)	8 (4-10)	U=175.0, **p=0.608**
	Intragroup Z/p	Z=-3.579, **p<0.001**	Z=-1.979, **p=0.048**		Z=-3.213, **p=0.001**	Z=-2.101, p=0.036	
Total score	Pre-training	77 (67-97)	82 (66-97)	U=117.5, **p=0.475**	82 (68-94)	77 (66-97)	U=136.0, **p=0.595**
	Post-training	94 (72-106)	91 (76-106)	U=63.0, **p=0.002**	100 (75-106)	90 (72-105)	U=71.5, **p=0.012**
	Intragroup Z/p	Z=-4.061, **p<0.001**	Z=-3.061, **p=0.002**		Z=-3.259, **p=0.001**	Z=-3.727, **p<0.001**	

U=Mann-Whitney U test, Z=Wilcoxon signed-rank test, HDASCA=home design awareness scale in children with asthma

Table 5.
Results of Simple Linear Regression Analysis Conducted to Determine the Effects of HDASCA and PAQLQ (n=35)

Dependent variable	Independent variable	β	Standard error	Beta	t	p	F	Model (p)	Adj. R^2	Durbin Watson	95% CI		VIF
											Lower	Upper	
Total score of PAQLQ	**Constant**	55.889	24.873		2.327	0.026*	7.030	0.012*	0.176	1.428	7.284	108.495	
	Total score of HDASCA	0.707	0.267	0.419	2.651	0.012*					0.165	1.250	1.00

PAQLQ=pediatric asthma quality of life questionnaire, HDASCA=home design awareness scale in children with asthma, CI=confidence interval

our hypothesis that, "Nursing training for asthmatic children and their parents improves the child's quality of life". Although there is a scarcity of studies specifically measuring the home design awareness of parents of children with asthma, related studies offer valuable insights. Atla et al. (27) reported that parents of asthmatic children had limited knowledge about asthma triggers in the home and the necessary precautions to mitigate them, emphasizing the importance of adequate training in this area. Similarly, Kırcan et al. (28) found that mothers' knowledge about asthma triggers and preventive measures varied depending on the duration of the child's illness. As the illness progressed, mothers' knowledge levels improved. Given that children spend a significant amount of time at home, the design of the home environment plays a crucial role in asthma management. By managing asthma triggers through home organization and strategic placement of household items, it is possible to reduce the frequency of asthma attacks and improve the child's quality of life.

Although some parents in our study had already implemented home precautions to protect against asthma triggers before the training, both groups showed an increase in awareness of home design after the training. In the study by Atla et al. (27), 52% of parents of asthmatic children were unaware of the measures needed to protect their children from asthma triggers at home. This finding aligns with our study, highlighting the importance of including home protection strategies in asthma training programs. Raising awareness and improving the knowledge of both children and parents is essential for better asthma management and protection from environmental triggers.

Study Limitations

The research is limited to patients who were examined in the pediatrics polyclinics of the relevant center and who were hospitalized in the pediatrics inpatient ward. The results of this research can be generalized to the study population.

Conclusion

The study, which aimed to evaluate the awareness of home design among parents and the quality of life of children diagnosed with asthma, found that, after nursing training was provided to parents, significant improvements were observed in the mean scores of all sub-scales and total scores on the PAQLQ and HDASCA (H1 and H2 hypotheses have been accepted). These results indicated positive changes in both the quality of life for children with asthma and in the parents' awareness of home design. The improvements were linked to factors such as the implementation of measures to control asthma triggers at home, prior asthma training, reduced limitations in daily activities, and a decrease in the frequency of symptoms in the past month.

To further enhance symptom control, prevent exposure to asthma triggers, and teach children how to manage their condition, it is crucial to provide ongoing, tailored training from the moment of diagnosis. This training should adapt to the child's and family's evolving lifestyle. Additionally, families should be informed about the necessary adjustments to home design to protect the child from asthma triggers and should receive continued support in implementing these changes.

Ethics Committee Approval: Ethical approval was obtained from the Atatürk University Faculty of Nursing Ethics Committee (approval number: 2020-6/17, date: 11.12.2020), and relevant institutional authorities prior to initiating the research.

Informed Consent: Written informed consent was obtained from all participants.

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Footnotes

Author Contributions: Concept - S.Ö., S.B.; Design - S.Ö., S.B.; Data Collection or Processing - S.Ö.; Analysis or Interpretation - S.Ö., S.B.; Literature Search - S.Ö., S.B.; Writing - S.Ö., S.B.

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