

Evaluation of Asthma Knowledge Level of Patients Over 11 Years of Age with Asthma Diagnosis

On Bir Yaş Üzeri Astım Tanılı Hastaların Astım Bilgi Düzeyinin Değerlendirilmesi

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Cite this article as: Kangallı Boyacıoğlu Ö, Atay Ö, Atakul G, Al S, Asilsoy S, Uzuner N. Evaluation of asthma knowledge level of patients over 11 years of age with asthma diagnosis. J Curr Pediatr. 08 January 2025 DOI:10.4274/jcp.2024.46034 [Epub Ahead of Print].



Abstract

Introduction: Asthma is the most common respiratory disorder in children. Knowledge about asthma helps in achieving asthma control. Self-management of the disease includes adherence to medication, avoidance of trigger factors, and appropriate response to symptoms. Education about asthma is essential to improve the health and reduce the negative impact on daily life.

Materials and Methods: In this study, 62 patients aged 14.04 ± 2.25 years, who had been followed up for at least 6 months at Dokuz Eylül University Pediatric Allergy and Immunology outpatient clinic, were included. A modified Asthma Self-Management Knowledge Questionnaire with 25 true or false questions was administered.

Results: The results of the study included the mean asthma control score of the patients to be 20.08 ± 4.50 . Minimum and maximum score patients achieved on the questionnaire were 9 and 23 points, respectively. The effect of general asthma knowledge, asthma medication knowledge, and environmental factors knowledge on asthma control were found to be statistically significant. On the other hand, asthma exacerbation knowledge was not statistically significant. The findings of this study reveal that knowledge of environmental factors is the most influential factor on asthma control, whereas, the second most effective variable was the asthma medication knowledge.

Conclusion: Hence, asthma education programs must be tailored specifically to this age group, so that they can self-manage properly, avoid exposure to triggering factors appropriately, and hopefully live symptom free.

Öz

Giriş: Astım çocuklarda en sık görülen solunum yolu hastalığıdır. Astım hakkında bilgi sahibi olmak astım kontrolünün sağlanmasına yardımcı olur. Hastalığın öz yönetimi, ilaçlara uyumu, tetikleyici faktörlerden kaçınmayı ve semptomlara uygun yanıtı içerir. Astım hakkında eğitim, sağlığı iyileştirmek ve günlük yaşam üzerindeki olumsuz etkiyi azaltmak için esastır.

Gereç ve Yöntem: Çalışmamıza Dokuz Eylül Üniversitesi Çocuk Alerji ve İmmünoloji polikliniğinde en az 6 ay takip edilen, yaşları $14,04 \pm 2,25$ yıl olan 62 hasta dahil edildi. 25 doğru-yanlış sorudan oluşan Astım Öz Yönetim Bilgi Anketi uygulandı.

Keywords

Atopy, dose rescue medications, exacerbations, environmental triggers

Anahtar kelimeler

Atopi, kurtarıcı ilaçlar, alevlenme, çevresel tetikleyiciler

Received/Geliş Tarihi : 02.10.2024

Accepted/Kabul Tarihi : 31.12.2024

Epub : 08.01.2025

Published Date/

Yayınlanma Tarihi :

DOI:10.4274/jcp.2024.46034

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Bulgular: Çalışmanın sonuçlarına göre hastaların astım kontrol puanı ortalaması $20,08 \pm 4,50$ olarak bulundu. Hastaların ankette aldıkları minimum ve maksimum puan sırasıyla 9 ve 23 oldu. Genel astım bilgisi, astım ilacı bilgisi ve çevresel faktörler bilgisinin astım kontrolü üzerindeki etkisi istatistiksel olarak anlamlı bulundu. Öte yandan, astım alevlenmesi bilgisi istatistiksel olarak anlamlı değildi.

Sonuç: Bu çalışmanın bulguları, çevresel faktörler bilgisinin astım kontrolünde en etkili faktör olduğunu, ikinci en etkili değişkenin ise astım ilacı bilgisi olduğunu ortaya koymaktadır. Bu nedenle, astım eğitim programları bu yaş grubuna özel olarak uyarlanmalıdır, böylece kendilerini düzgün bir şekilde yönetebilirler, tetikleyici faktörlere uygun şekilde maruz kalmaktan kaçınabilirler ve semptomsuz yaşayabilirler

Introduction

Asthma is the most common chronic disease among children and adolescents worldwide (1). Education is one of the cornerstones in achieving asthma control and is recommended in national and international guidelines (2). Self-management includes adherence to medication, avoidance of triggers, and appropriate response to symptoms, all of which are crucial for the well-being and asthma control of patients with chronic diseases (3). Lack of information about the disease among asthmatic patients and their family members may lead to inadequate treatment and disease control, frequent hospital admissions, high morbidity, and falling behind in school (4,5,6).

The primary aim of this study is to evaluate the asthma knowledge levels of children and adolescents over the age of 11 who have been diagnosed with asthma and to determine the impact of this knowledge on asthma control. As asthma is the most common chronic respiratory disease during childhood and adolescence, it is critical for patients and their families to have sufficient knowledge about the disease for its effective management.

In this study, patients' knowledge levels regarding general asthma information, asthma medications, environmental triggers, and asthma exacerbations were examined, and the contributions of this knowledge to asthma control were analyzed. The results of the study indicate that knowledge of environmental factors and medication use plays a significant role in improving asthma control. Based on these findings, it is aimed to tailor asthma education programs specifically for this age group and to enhance patients' self-management skills.

Materials and Methods

Patients with asthma who had been followed up for at least 6 months at Dokuz Eylül University Pediatric Allergy and Immunology outpatient clinic

were included in the study. Asthma diagnosis was made according to the Global Strategy for Asthma Management and Prevention report by the Global Initiative for Asthma. Patients' age, sex, time of asthma onset, presence of atopy, presence of atopy in the family, exposure to smoking, asthma control test score, and comorbid allergic diseases were documented. A 25-question questionnaire was administered to the patients. Although the Turkish validation of the Asthma Self-Management Knowledge Questionnaire has been performed for adults, it was modified and administered by three independent pediatric allergists in a language that children over 11 years of age could understand. The questionnaire includes 25 items with "true" or "false" responses about general asthma knowledge, asthma medications, asthma exacerbations, and environmental triggers. One point was given for each correct answer, and the total score indicated the patient's knowledge of asthma (7).

The asthma control test consists of five items: It evaluates (1) the effect of asthma on daily functioning, (2) the frequency of shortness of breath, (3) nighttime/early awakenings due to asthma symptoms, (4) the use of rescue medication, and (5) the overall self-assessment of asthma control. All items refer to the past 4 weeks and are scaled from 1 to 5. The total score indicates asthma control with values of 25, 20–24, and <19 translating to excellent, good, and poor asthma control, respectively (8). An informed consent form was obtained from the patients and their families. For patients with atopy, a positive skin prick test of ≥ 3 mm was considered significant. The approval for this study was obtained from the Dokuz Eylül University Non-Interventional Research Ethics Committee (date: 27.04.2022, approval number: 2022/16-08).

Statistical Analysis

Descriptive statistics, including mean \pm standard deviation (SD), were used to summarize continuous variables such as age, asthma knowledge, medication

knowledge, environmental factors knowledge, and exacerbation knowledge. For categorical variables (e.g., sex distribution, smoking exposure, and family history of atopy), frequencies and percentages were calculated.

To evaluate the relationships between level of asthma control and independent variables (general asthma knowledge, medication use knowledge, environmental factors knowledge, and asthma exacerbation knowledge), regression analysis was performed. Regression coefficients, standard errors, and p-values were reported to assess statistical significance. A p-value of <0.05 was considered statistically significant.

Results

The study included 62 patients, 37 of whom were male. The mean age of the patients was 14.04 ± 2.25 years. The time of asthma onset was 5.70 ± 3.27 years. Of the patients, 72.6% had no exposure to smoking, and 69.4% had a family history of atopy (Table 1). Sensitization to at least one allergen on a skin prick test was found in 87.1% of the patients. The main complaints at admission were cough and dyspnea 98.4%, accompanied by nasal congestion in 29% of the cases. Among the patients, 83.9% were using metered-dose inhalers, 30.6% were on montelukast, and 9.7% were on nasal corticosteroids. Additionally, 62.9% of the patients had atopic dermatitis and allergic rhinitis (Table 2). The mean asthma control score of the patients was 20.08 ± 4.50 . The questionnaire scores ranged from a minimum of 9 to a maximum of 23, with a mean score of 16.56 ± 2.75 . Only 6.5% of the patients responded correctly to all questions related to general asthma knowledge, asthma medication, environmental triggers, and asthma exacerbations (Table 3). Except for the score variable related to asthma exacerbation, other score types positively affected asthma control, increasing the control level. While the effect of general asthma knowledge ($p<0.05$), asthma medication knowledge ($p<0.01$), and environmental factors knowledge ($p<0.01$) on asthma control was statistically significant, asthma exacerbation knowledge was not significant (Table 4). A 1% increase in general asthma knowledge increased asthma control by approximately 0.39%. A 1% increase in asthma medication knowledge increased asthma control by approximately 0.72%. Lastly, a 1% increase in environmental factors

knowledge increased asthma control by about 0.77%. The findings show that knowledge of environmental factors is the most influential factor on asthma control, followed by asthma medication knowledge (Figure 1).

Discussion

Although adequate asthma control can be achieved for most patients, the disease is often sub-optimally controlled. The reasons for this are multifactorial, including the patient's age, age of onset or severity of asthma, patient beliefs and coping strategies leading to decreased adherence to treatment, disease mechanisms, and lack of patient knowledge about management (9). Improving knowledge about asthma among individuals with the disease is an important component of self-management (10). Self-efficacy plays a key role in the prevention of asthma, improvement in asthma conditions, and sustainability of asthma control in children and adolescents (11). Previous data suggest that adolescents and young adults, in particular, are often unable to manage their asthma properly (12,13). To effectively personalize asthma education, it is necessary to identify gaps in asthma knowledge and self-management skills. An information questionnaire completed by the patient can be a useful tool to identify these gaps. Asthma self-management during adolescence becomes challenging due to poor treatment adherence. Recent studies have observed that digital applications and phone reminders improve treatment compliance in this age group alongside individual education (14).

Table 1. General characteristics of patients

Mean age	14.04 \pm 2.25
Sex	Female 40.3% (n = 62)
Mean age at asthma onset	5.70 \pm 3.27
No cigarette exposure	72.6%
Family history of atopy	69.4%
Those with concomitant allergic diseases	62.9%

Table 2. Medications used by patients for at least 6 months

Metered dose inhaler	83.9%
Nebul	4.8%
Montelukast	30.6%
Nasal corticosteroid	9.7%

Table 3. Survey results

		General asthma knowledge	Medication use knowledge	Environmental factors knowledge	Asthma exacerbations knowledge
n	Valid	62	62	62	62
	Missing	0	0	0	0
Mean		5.0645	5.1290	4.4677	1.9194
Std. Deviation		1,23966	1,40822	88183	1.07579
Range		6.00	5.00	5.00	4.00
Minimum		1.00	3.00	1.00	00
Maximum		7.00	8.00	6.00	4.00
Sum		314.00	318.00	277.00	11900

Table 4. Relationship between survey results and ECT

Independent Variables:	Coef.	Std. Err.	p-value
General asthma knowledge	0.39	0.16	0.018
Medication_use_knowledge	0.72	0.19	0.000
Environmental_factors_knowledge	0.77	0.20	0.000
Asthma_exacerbations_knowledge	0.02	0.13	0.855

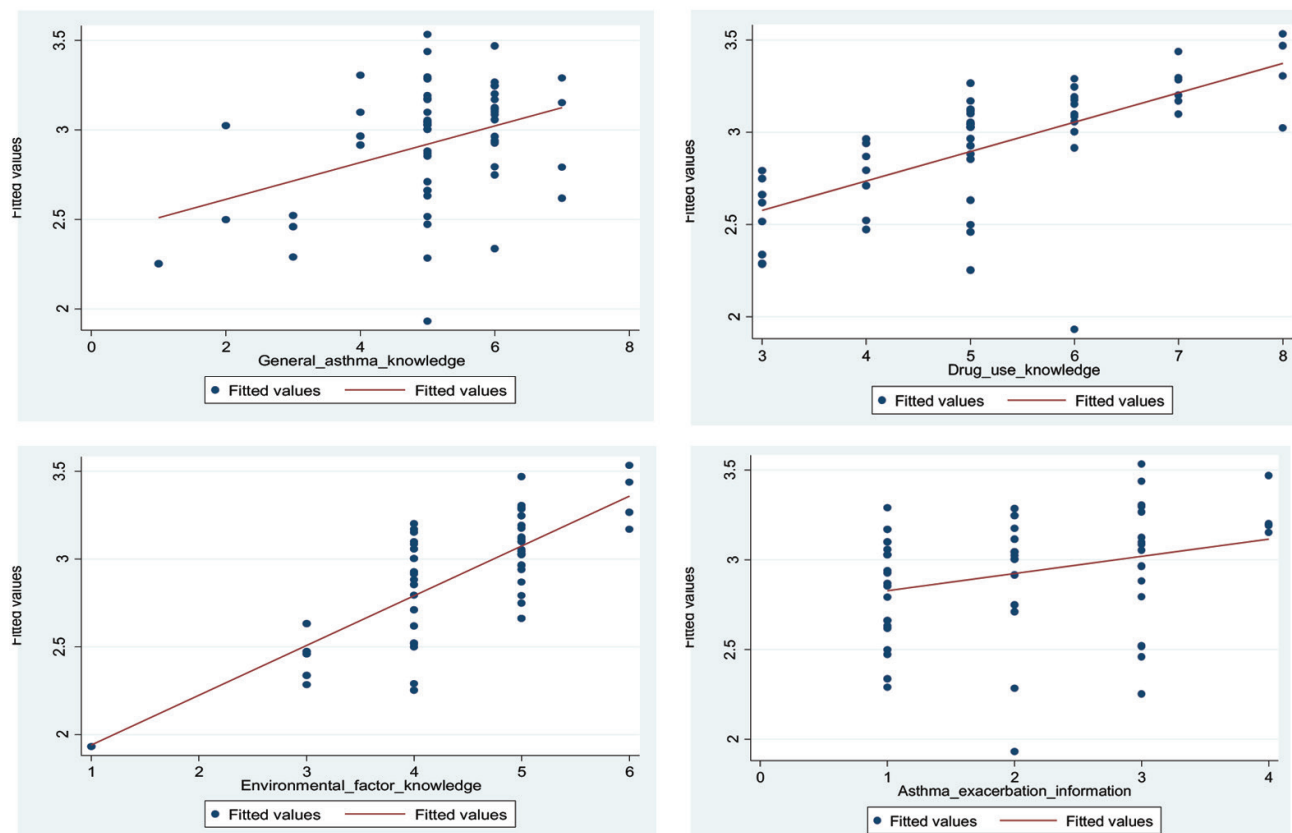


Figure 1. Relation of asthma control with various factors

In this study, patients were asked about their knowledge of asthma, medication use, environmental triggering factors, and asthma exacerbations. General knowledge of asthma, medication use, and environmental triggers was associated with asthma control, whereas knowledge of exacerbations was not. This may be because patients who are well-informed about their disease, take their medication regularly and correctly, and avoid triggers are less likely to experience exacerbations. Hence, their knowledge about exacerbations may be limited. Recent studies have shown that educational programs play a significant role in achieving asthma control. Children who received training on recognizing environmental triggers and proper use of inhaler devices showed a significant reduction in hospital admissions and symptom frequency (15).

Emphasizing the factors that most affect asthma control, as found in this survey, is crucial. It is widely accepted that asthma knowledge is necessary for effective self-management (16). However, managing asthma involves many complex tasks, requiring a vast amount of information (17). For example, patients need to understand the basic pathophysiology to comprehend why triggers can vary and why maintenance medications are necessary even in the absence of symptoms. They also need to learn to monitor lung function, recognize exacerbations early, dose rescue medications, and determine when emergency care is needed. Measuring knowledge in all these areas can be challenging. However, asthma attacks are likely to be less frequent if patients are educated about asthma, how to use medication, and how to avoid triggering factors during every clinical visit. Raising family awareness about recognizing asthma symptoms and taking early action has been shown to significantly reduce the frequency of asthma attacks (18).

A study conducted in Turkey found a 40% decrease in emergency department visits among children whose families participated in educational programs. A study conducted in Turkey revealed that indoor cigarette smoke and house dust mites are the most significant environmental risk factors affecting asthma control in children. Therefore, educating families on reducing exposure to environmental triggers is of utmost importance (19).

Study Limitations

Sample size: The study included only 62 patients, which limits the generalizability of the findings to the larger population of children and adolescents with asthma.

Cross-Sectional Design: As a cross-sectional study, it provides a snapshot of the relationship between asthma knowledge and control at a single point in time, without capturing longitudinal changes or causal relationships.

Self-Reported Data: The reliance on self-reported answers may introduce recall bias, particularly regarding adherence to medication and avoidance of triggers.

Unmeasured Confounding Factors: Other factors influencing asthma control, such as socioeconomic status, psychological factors, or detailed environmental exposures, were not included in the analysis.

Limited Scope of Education: The study emphasizes knowledge about asthma medications and environmental triggers but does not thoroughly explore other components of asthma education, such as the psychological impact or family support.

Generalizability to Other Age Groups: The findings are specific to children over 11 years old and may not apply to younger children or adults with asthma.

Conclusion

Education is essential to improve the health of young people with asthma and reduce the negative impact of the disease on their daily lives. The developmental tasks of adolescence require asthma education programs tailored specifically to this age group.

Ethics

Ethics Committee Approval: The approval for this study was obtained from the Dokuz Eylül University Non-Interventional Research Ethics Committee (date: 27.04.2022, approval number: 2022/16-08).

Footnotes

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The author declared that this study received no financial support.

References

1. The global asthma report 2014. Global Asthma Network, Auckland. New Zealand 2014.
2. Global Initiative for Asthma – GINA. A pocket guide for health professionals updated. Available from: <http://ginasthma.org/>
3. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA*. 2002;288:2469-75.
4. Neffen H, Fritscher C, Schacht FC, Levy G, Chiarella P, Soriano JB, et al. Asthma control in Latin America: the Asthma Insights and Reality in Latin America (AIRLA) survey. *Rev Panam Salud Publica*. 2005;17:191-7.
5. Bruzzese JM, Bonner S, Vincent EJ, Sheares BJ, Mellins RB, Levison MJ, et al. Asthma education: the adolescent experience. *Patient Educ Couns*. 2004;55:396-406.
6. Bruzzese JM, Evans D, Kattan M. School-based asthma programs. *J Allergy Clin Immunol*. 2009;124:195-200.
7. Baygül A, Öztürk AB, Özyiğit LP, Keskin H, Karakaya G, Kalyoncu F, et al. The reliability and validation of the turkish version of the asthma self-management knowledge questionnaire. *Turk Thorac J*. 2017;18:125-30.
8. Jia CE, Zhang HP, Lv Y, Liang R, Jiang YQ, Powell H, et al. The asthma control test and asthma control questionnaire for assessing asthma control: systematic review and meta-analysis. *J Allergy Clin Immunol*. 2013;131:695-703.
9. Soriano JB, Rabe KF, Vermeire PA. Predictors of poor asthma control in European adults. *J Asthma*. 2003;40:803-13.
10. McDonald VM, Gibson PG. Asthma self-management education. *Chron Respir Dis*. 2006;3:29-37.
11. Schlösser M, Havermans G. A self-efficacy scale for children and adolescents with asthma: construction and validation. *J Asthma*. 1992;29:99-108.
12. Rand CS, Wright RJ, Cabana MD, Foggs MB, Halterman JS, Olson L, et al. Mediators of asthma outcomes. *J Allergy Clin Immunol*. 2012;129:136-41.
13. Rhee H, Belyea MJ, Halterman JS. Adolescents' perception of asthma symptoms and health care utilization. *J Pediatr Health Care*. 2011;25:105-13.
14. Kaya E, Ergin H. Managing asthma in adolescence: challenges and solutions. *Turk Klin Pediatr*. 2023;32:45-52.
15. Güler N, Çetinkaya F. The importance of education in childhood asthma management. *Turk Arch Pediatr*. 2023;58:112-20.
16. van der Palen J, Klein JJ, Seydel ER. Are high generalised and asthma-specific self-efficacy predictive of adequate self-management behaviour among adult asthma patients? *Patient Educ Couns*. 1997;32:35-41.
17. Shegog R, Bartholomew LK, Parcel GS, Sockrider MM, Mâsse L, Abramson SL. Impact of a computer-assisted education program on factors related to asthma self-management behavior. *J Am Med Inform Assoc*. 2001;8:49-61.
18. Öztürk S, Çoban H. The impact of family awareness programs in preventing asthma attacks. *J Pediatr Health Dis*. 2022;15:172-9.
19. Demir A, Yılmaz B. The effects of environmental triggers on childhood asthma. *J Chest Dis*. 2022;30:256-64.