

PREVALENCE OF ASTHMA, ALLERGIC RHINITIS, AND ECZEMA IN SCHOOL CHILDREN IN A TROPICAL REGION, IN SOUTHWESTERN IRAN

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ABSTRACT

Objective: Allergic diseases (ADs) are a serious global public health problem affecting all age groups. Hundreds of millions suffer from ADs worldwide. We aimed to determine the prevalence of asthma, allergic rhinitis (AR), and eczema symptoms in school children aged 6-14 years in a tropical region in Southwestern Iran.






Material and Method: In 2020, we conducted a cross-sectional study using the Persian version of the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire among two age groups (school children aged 6-7 and 13-14 years). The schools were randomly selected from Dezful City, Iran.

Results: Valid responses were obtained from 2908 participants. The prevalence of diagnosed asthma, AR,

and eczema was 3.1% and 6.3%, 3.9% and 7.6%, and 4.5% and 7.1% among the 6-7 and 13-14 age groups, respectively. Also, the prevalence rates of diagnosed asthma, AR, and eczema in school children aged 6-14 years were 4.6%, 5.5%, and 5.8%, respectively. Regarding sex and age groups, the prevalence rates of AD symptoms were significantly higher in boys than in girls and in the 13-14 age group than in the 6-7 age group ($p < 0.05$).

Conclusion: The prevalence of asthma, AR, and eczema was moderate in school children of Dezful City. Our study described the distribution of AD in school children in this region of Iran.

Keywords: Allergic disease, asthma, allergic rhinitis, eczema, prevalence, children.

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GÜNEYBATI İRAN'DA TROPİKAL BİR BÖLGEDEKİ OKUL ÇOCUKLARINDA ASTIM, ALERJİK RİNİT VE EGZAMA PREVALANSI

ÖZET

Amaç: Alerjik hastalıklar (AH) tüm yaş gruplarını etkileyen ciddi bir küresel halk sağlığı sorunudur. Dünya çapında yüz milyonlarca kişi AH'den muzdariptir. Bu çalışmada Güneybatı İran'da tropikal bir bölgede 6-14 yaş arası okul çocuklarında astım, alerjik rinit (AR) ve egzama semptomlarının prevalansını belirlemeyi amaçladık.

Materyal ve Metot: 2020'de, iki yaş grubu (6-7 ve 13-14 yaş arası okul çocukları) arasında Uluslararası Astım ve Çocuklukta Alerji Çalışması (ISAAC) anketinin Farsça versiyonunu kullanarak kesitsel bir çalışma gerçekleştirdik. Okullar İran'ın Dezful şehrinde rastgele seçilmiştir.

Bulgular: 2908 katılımcıdan geçerli yanıtlar alındı. Tanılı astım, AR ve egzama prevalansı 6-7 ve 13-14 yaş gruplarında sırasıyla %3,1 ve %6,3, %3,9 ve %7,6 ve %4,5 ve %7,1 idi. Ayrıca 6-14 yaş arası okul çocuklarında teşhis edilen astım, AR ve egzama prevalans oranları sırasıyla %4,6, %5,5 ve %5,8 idi. Cinsiyet ve yaş gruplarına göre, AH semptomlarının yaygınlık oranları erkeklerde kızlardan, 13-14 yaş grubunda 6-7 yaş grubundan anlamlı olarak daha yüksekti ($p < 0,05$).

Sonuç: Dezful City'deki okul çocuklarında astım, AR ve egzama prevalansı orta düzeydeydi. Çalışmamızla, İran'ın bu bölgesindeki okul çocuklarında AH'nin yaygınlığı tanımlanmıştır.

Anahtar kelimeler: Alerjik hastalık, astım, alerjik rinit, egzama, prevalans, çocuklar.

INTRODUCTION

Allergic diseases (ADs) are a global public health problem affecting all age groups. The prevalence of ADs has increased worldwide over the last three decades, especially in children. The World Health Organization has reported that hundreds of millions worldwide suffer from ADs, which cause notable healthcare burden.^{1,2}

The increased prevalence of ADs has been reported in different areas, which could be due to changes in environmental pollution. This increase should be considered a public health issue worldwide. ADs have harmful effects not only on the life quality of patients but also on their socioeconomic status. If not controlled, these disorders can constitute a challenge for public health organizations and healthcare providers.³⁻⁵

Although the cause of ADs is still unknown, factors such as environmental pollution seem to be significant determinants of the increased prevalence of these diseases. The exact prevalence of ADs varies in different countries, and even in different regions of the same country.^{6,7} These variations appear to reflect the highly heterogeneous nature of ADs and the differences in ethnicity and environmental risk factors.⁸

The worldwide prevalence of ADs is an essential issue from the viewpoint of healthcare delivery and due to the need to determine health-associated factors globally. Therefore, the epidemiological study of ADs

based on a universally accepted standardized method seems to be effective and useful. Accordingly, in 1992, the International Study of Asthma and Allergies in Childhood (ISAAC) was designed to estimate the geographical distribution of ADs among school children. ISAAC used a questionnaire to unify the diagnosis, which was agreed upon and implemented in 1991. It is still widely used with modifications. One of the strengths of the ISAAC questionnaire was that it used disease symptoms based on standardized methods to allow for comparisons between different countries and even data obtained at different times.⁹

Considering the growing trend of urbanization during recent years and the importance of the accessibility to updated statistics in healthcare planning for subsequent therapeutic approaches, this study was implemented to evaluate the prevalence of ADs in school children in Dezful City, Iran.

In Iran, several epidemiological studies have been conducted to determine the prevalence of ADs in children.¹⁰⁻¹⁴ These studies reported the prevalence of ADs from 2.7% to 35.4% in different cities of the country. Due to climatic conditions, environmental pollution, and dust air pollution (dust) in Southwestern Iran, and since few studies have been conducted on ADs in this area, we decided to perform the first phase of the ISAAC study on school children in this region of the country. Therefore, this study aimed to determine the prevalence of asthma, allergic rhinitis (AR), and eczema in children aged 6-7 and 13-14 years in Dezful City, Southwestern Iran.

MATERIAL AND METHOD

Location and Population

This cross-sectional study was conducted in Dezful City from September 2019 to February 2020 on children aged 6-7 and 13-14 years. Dezful is the second capital of the Khuzestan Province, with a population of 843,971 people. The city is in Southwestern Iran, with a warm and semi-dry climate.¹⁵

The Ethics Committee of Ahvaz Jundishapur University of Medical Sciences approved the ethical considerations of the present study ethical code: IR.AJUMS.REC.1397.536).

Subjects and Sampling

The study population was students aged 6-7 and 13-14 years from all primary and secondary schools in Dezful City. In line with the ISAAC committee recommendations, we recruited 3000 school children (1500 in each age group).⁹ The sampling frame of the survey was a list of all primary and secondary schools provided by the Dezful Ministry of Education, indicating the region, number of schools, and number of children in primary and secondary schools. A total of 28 schools in Dezful City, 14 for the 6-7 age group and 14 for the 13-14 age group, were chosen randomly. A total of 3300 questionnaires were distributed among the participants (1700 questionnaires to children aged 6-7 years and 1600 questionnaires to children aged 13-14 years). The sample size for the 6-7 age group was larger by 10% to allow for the expected lower response rate of the parents in this group. The inclusion criteria were school children aged 6-7 to 13-14 years and giving personal consent for participation in the study.

The Persian version of the ISAAC standardized written questionnaire (translated by the National Research Institute of Tuberculosis and Lung Disease, Tehran, Iran) was used to identify asthma, AR, and eczema symptoms. The instrument had already been translated according to ISAAC recommendations, and it was used in the Iranian branch of the ISAAC study in Tehran and Rasht and published by the ISAAC Steering Committee report.^{16,17} The researcher gave instructions before the questionnaires were completed. The questionnaires were completed by the parents of the 6-7-year-old children and self-completed by the 13-14-year-old children. The ISAAC questionnaire includes questions on wheezing frequency, past and current wheezing episodes, sleep disturbance, speech limitation during attacks, and exercise-induced wheezing. Other questions were about the presence and severity of AR and eczema.

After obtaining consent from the school authorities, the 6-7-year-old school children were asked to take the questionnaires home with a letter of explanation. The letters explained the purpose of the study and directions for the attached questionnaire. The questionnaire was completed by the parents of the children and returned to the school. The 13-14-year-old school children completed the questionnaires in the classroom under the supervision of professionally trained interviewers according to phase one of the ISAAC methodology.

Statistical Analysis

Data were collected according to the ISAAC protocol and analyzed using SPSS version 18.0 (Chicago, IL, USA). Prevalence rates were calculated by dividing the number of positive responses to each item by the number of completed questionnaires. Comparisons between sex and age group were performed using the Chi-square test. A *p*-value of < 0.05 was considered statistically significant.

RESULTS

Of the 3300 questionnaires distributed among the school children, 392 were incomplete, yielding a response rate of 88.12% (2908/3300). The questionnaires for 1488 children aged 6-7 years were completed by their parents at home, and 1420 children aged 13-14 years filled the questionnaires themselves. There were 1484 (51.2%) boys and 1424 (48.8%) girls. In the 6-7 age group, 756 (50.8%) were boys, and 732 (49.2%) were girls, and in the 13-14 age group, 728 (51.3%) were boys, and 692 (48.7%) were girls. There was no sex difference between the groups (*p*>0.05).

Of the 2908 school children, 466 had allergic disorders (16%), with 135 (4.6%) having asthma, 161 (5.5%) having AR, and 170 (5.8%) having eczema. Tables 1 and 2 show the prevalence rates of reported symptoms and diagnoses of asthma, AR, and eczema by gender and age group. The prevalence rates were significantly higher in boys than in girls and in the 13-14 age group than in the 6-7 age group (*p*<0.001).

Prevalence of Asthma Symptoms

The prevalence of allergic disorders is shown in Table 1. According to the ISAAC questionnaire, the prevalence of wheezing ever, wheezing last 12-month, and diagnosed asthma in school children aged 6-14 years was 10.6%, 7.4%, and 4.6%, respectively, with a significantly higher prevalence of these symptoms in boys (13.8%, 9.8%, and 6.9%, respectively) than in girls (7.2%, 4.4%, and 2.3%, respectively) and in the 13-14 age group (12.5%, 8.2%, and 6.3%, respectively)

Table 1. The prevalence rate of symptoms and diagnoses of asthma, allergic rhinitis, and atopic eczema among school children by gender and age groups

Symptoms	Total Sample (n=2908)	Gender			Age Group		
		Male	Female	p-value	6-7 year	13-14 year	p-value
		n (%)	n (%)		n (%)	n (%)	
Bronchial asthma							
Wheezing ever	308 (10.6)	205 (13.8)	103 (7.2)	0.001	127 (8.6)	181 (12.8)	0.001
Wheezing last 12 months	208 (7.2)	145 (9.8)	63 (4.4)	0.001	89 (6.0)	119 (8.4)	0.006
Severe wheezing last 12 months	37 (1.3)	25 (1.7)	12 (0.8)	0.043	13 (0.9)	24 (1.7)	0.036
Asthma ever	135 (4.6)	102 (6.9)	33 (2.3)	0.001	46 (3.1)	89 (6.3)	0.001
Exercise-induced wheezing last 12 months	183 (6.3)	126 (8.5)	57 (4.0)	0.001	38 (2.6)	145 (10.2)	0.001
Nocturnal cough last 12 months	267 (9.2)	169 (11.4)	98 (6.9)	0.001	103 (6.9)	164 (11.6)	0.001
Rhinitis							
Allergic rhinitis ever	410 (14.1)	247(16.6)	163(11.4)	0.001	121 (8.2)	289 (20.4)	0.001
Current rhinitis	310 (10.7)	190 (12.8)	120 (8.4)	0.001	109 (7.3)	201 (14.2)	0.001
Current rhinoconjunctivitis	147 (5.1)	93 (6.3)	54 (3.8)	0.002	58 (3.9)	89 (6.3)	0.002
Hay fever ever	161 (5.5)	110 (7.4)	51 (3.6)	0.001	58 (3.9)	103 (7.6)	0.001
Eczema							
Itchy rash ever	137 (4.7)	86 (5.8)	51 (3.6)	0.005	45 (3.0)	95 (6.5)	0.001
Itchy rash last 12 months	101 (3.5)	62 (4.2)	39 (2.7)	0.034	33 (2.2)	68 (4.8)	0.001
Itchy flexural areas	72 (2.5)	47 (3.2)	25 (1.8)	0.014	26 (1.8)	46 (3.2)	0.007
Eczema ever	169 (5.8)	100 (6.8)	69 (4.8)	0.024	67 (4.5)	102 (7.2)	0.001

than in the 6-7 age group (8.6%, 6.0%, and 3.1%, respectively). The prevalence of exercise wheeze was 6.3% in the last 12 months, which was significantly higher in boys (8.5%) than in girls (4.0%). Data analysis showed that 38 (2.6%) of the 6-7-year-old children (3.7% of boys and 1.4% of girls) experienced wheezing in the last 12 months. According to the parents' reports, 268 (9.2%) of the school children had suffered from dry night cough in the previous 12 months, with a significant difference between boys and girls (11.4% versus 7.0%, respectively). Wheezing after exercise and dry night cough were more frequently reported by boys and children aged 13 to 14 years ($p < 0.05$).

Prevalence of Allergic Rhinitis Symptoms

The prevalence of rhinitis ever, current rhinitis symptoms, and hay fever was 14.1%, 10.7%, and 5.5%, respectively, with a significantly higher rate among boys than in girls (16.6%, 12.8%, and 7.4% vs. 11.4%, 8.4%, and 3.6%, respectively). The prevalence of rhinitis ever, current rhinitis symptoms, and hay fever was significantly higher among the 13-14 age group than in the 6-7 age group (20.5%, 14.3%, and 7.6% vs. 8.2%, 7.3%, and 3.9%, respectively). In 147 children (5.1%), rhinitis symptoms were combined with conjunctivitis symptoms (Table 1). In both age groups, the prevalence rate of these symptoms was significantly higher in boys than in girls.

Prevalence of Eczema Symptoms

The prevalence of itchy rash ever, itchy rash last 12-month symptoms, and eczema was 4.7%, 3.5%, and 5.5%, respectively, with a significantly higher rate among boys than in girls (5.8%, 4.2%, and 6.8% vs. 3.6%, 2.7%, and 4.8%, respectively). The prevalence of itchy rash ever, itchy rash last 12-month symptoms, and eczema was significantly higher among the 13-14 age group than in the 6-7 age group (6.5%, 4.8%, and 7.1% vs. 3.0%, 2.2%, and 4.5%, respectively). In the 13-14 age group, the prevalence of itchy rash ever, itchy rash last 12 months, and eczema was significantly higher in boys than in girls. However, these symptoms did not show any gender differences in the 6-7 age group. Accordingly, the prevalence of eczema symptoms was similar between boys and girls aged 6-7 years.

Combination of Symptoms of Allergic Diseases

Combined asthma and AR symptoms were found in 51 (1.8%) children, asthma and eczema symptoms in 30 (1.0%) children, AR and eczema symptoms in 48 (1.7%) children, and asthma, AR, and eczema symptoms in 18 (0.6%) children.

DISCUSSION

This study provided the first data on the prevalence of ADs among school children in Dezful City, Southwestern Iran. According to the results of this

Table 2. The prevalence rate of symptoms and diagnoses of asthma, allergic rhinitis, and eczema among school children by age group

Symptoms	6-7-year age group (n=1488)			13-14-year age group (n=1420)		
	Male	Female	p-value	Male	Female	p-value
	n (%)	n (%)		n (%)	n (%)	
Bronchial asthma						0.001
Wheezing ever	85 (11.3)	42 (5.8)	<0.001	120 (16.5)	61 (8.8)	<0.001
Wheezing last 12 months	61 (8.1)	28 (3.8)	0.001	84 (11.6)	35 (5.1)	<0.001
Severe wheezing last 12 months	10 (1.3)	3 (0.4)	0.051	15 (2.1)	9 (1.3)	0.183
Asthma ever	34 (4.5)	12 (1.6)	0.001	68 (9.4)	21 (3.0)	<0.001
Exercise-induced wheezing last 12 months	28 (3.7)	10 (1.4)	0.003	98 (13.5)	47 (6.8)	<0.001
Nocturnal cough last 12 months	69 (9.2)	34 (4.7)	0.001	100 (13.8)	64 (9.3)	0.005
Rhinitis						
Allergic rhinitis ever	85 (11.3)	36 (4.9)	<0.001	162 (22.3)	127 (18.4)	0.039
Current rhinitis	74 (9.8)	35 (4.8)	<0.001	116 (16.0)	85 (12.3)	0.029
Current rhinoconjunctivitis	40 (5.3)	18 (2.5)	0.003	53 (7.3)	36 (5.2)	0.066
Hay fever ever	41 (5.4)	17 (2.3)	<0.001	69 (9.5)	34 (4.9)	<0.001
Eczema						
Itchy rash ever	26 (3.4)	19 (2.6)	0.213	60 (8.3)	32 (4.6)	0.004
Itchy rash last 12 months	17 (2.3)	16 (2.2)	0.538	45 (6.2)	23 (3.3)	0.008
Itchy flexural areas	13 (1.7)	13 (1.8)	0.545	34 (4.7)	12 (1.7)	<0.001
Eczema ever	37 (4.9)	30 (4.1)	0.270	63 (8.7)	39 (5.7)	0.018

study, the prevalence of asthma, AR, and eczema was 4.6%, 5.5%, and 5.8%, respectively. As expected, this is lower than the prevalence of these conditions in the city of Ahvaz, another city in the Khuzestan Province with a warm and humid climate (8.4%, 12.3%, and 5.7%, respectively).¹⁷ The results from an ISAAC study conducted in the city of Bushehr in 2014 showed that the prevalence of asthma, AR, and eczema was 6.7%, 12.1%, and 11.8% in students aged 6-7 years and 7.6%, 19%, and 30% in students aged 13-14 years, respectively. The increase in the rate of AD in these two studies may be due to the current dusty, air pollution, and higher humidity in Ahvaz and Bushehr.¹⁴

Asthma

The results of our study indicated that the prevalence of asthma was low among school children (4.6% overall; 3.1% in 6-7-year-old students, and 6.3% in 13-14-year-old students) compared to the same population in other parts of Iran (13.4%) and the Middle East countries (7.53%), according to the Global Initiative for Asthma.^{11,18} In an ISAAC study conducted in the city of Ahvaz, the prevalence of asthma was reported

at 8.4% overall, being 6.8% and 9.8% in students aged 6-7 and 13-14 years, respectively. The prevalence of asthma in the city of Dezful, compared to Ahvaz, was lower, probably due to the causes mentioned above.

The prevalence of asthma in school children from other Iranian cities has been reported from 2.7% in Kerman to 35.4% in Tehran, with an overall rate of 13.14% using the ISAAC protocol.¹¹ Compared with the reports from neighboring countries, including Iraq (17.15%), Kuwait (25.9%), Saudi Arabia (17.61%), and Bahrain (10.8%), the prevalence of asthma was significantly lower in the city of Dezful.¹⁹ Reasons for the lower prevalence of asthma among Dezfulian school children may be related to environmental and climatic conditions and genetic factors. A study showed that the prevalence of asthma was lower in hot and dry climates than in higher humidity regions.²⁰

The present study showed that the prevalence of ever- and current-wheeze as the main symptoms of asthma among school children was 10.6% and 7.2%, respectively. These values are lower than those reported in a study conducted in Ahvaz in 2010 (14.1% and 8.8%, respectively).¹⁷ The prevalence of the two major asthma symptoms from other Iranian cities ranges from 3.7% in Tabriz to 23.2% in Rasht for ever-wheeze and 2.9% in Tabriz to 19.7% in Rasht for current-wheeze.^{21,22} For the two other common symptoms studied, i.e., night cough and exercise-induced wheeze, this study also showed lower rates than an earlier report in Ahvaz city (6.3% versus 16.4% and 9.2% versus 18.1%, respectively). The prevalence of ever-wheeze, current-wheeze, and physician-confirmed asthma was significantly higher in boys than in girls, which is similar to the study conducted by the ISAAC steering committee in which boys showed a significantly higher prevalence of asthma and related symptoms than girls.¹⁸

Allergic Rhinitis

In this study, the prevalence of AR in school children was reported at 5.5% (3.9% in 6-7-year-old and 6.3% in 13-14-year-old). A meta-analysis study in Iran showed that the prevalence of AR in school children aged 6-7 and 13-14 years was 11.9% and 21.2%, respectively.²³ Therefore, the prevalence of AR in Dezful City is lower than the mean estimated national prevalence of the disease. Since Iran is a large country with different geographic areas, different prevalence ratios attained in different cities can be explained by the type of climate, air pollution, and genetic factors. Also, the frequency of AR in Dezful City is approximately at a lower level than in other parts of the world. The worldwide prevalence of AR in 155 centers, according to the Phase III International Study of the ISAAC

written questionnaire, varied between 0.8% and 14.9% in 6-7-year-old children and 1.4% and 39.7% in 13-14-year-old children worldwide.²⁴ The lower rate of AR in our study may be due to the lower humidity and air pollution in Dezful City compared to other regions in Iran, such as Ahvaz, Bushehr, and Gorgan.^{13,17,25}

Although, some studies reported no gender preponderance for AR.^{13,17} The finding of our study, in agreement with findings of other studies, indicated the higher prevalence of AR in boys.²⁶⁻²⁸ In a study performed by Momen *et al.* (2018) in Isfahan (Central Iran), it was declared that the prevalence of AR was higher in females than in males, which is in contrast to our study results.²⁹ Sahebi (2010), in a similar study in Tabriz (North Western Iran), showed that the prevalence of AR symptoms was higher in males than in females.³⁰

It has been established that the sensitization rates, total IgE levels, were higher in boys than in girls.³¹ The differential expression of ADs between males and females may be contributed by hormonal changes, which led to different immune response activity and differences in susceptibility to AR.

Overall, alteration in the prevalence of AR between two genders has been statistically significant in some research and non-significant in others, but the issue is open to discussion.

Eczema

The current study's findings showed that the prevalence of eczema in school children was 5.8% (4.5% in 6-7-year-old children and 7.1% in 13-14-year-old children). Based on a meta-analysis study in Iran, the prevalence of eczema in school children aged 6-7 and 13-14 years was 5.99% and 6.52%, respectively.³² The lowest and highest prevalence rates of eczema in Iran were reported in Shiraz (1.62%) and Zanjan (11.8%), respectively.³³ Therefore, the overall prevalence of eczema among school children in Dezful was within the average range compared to other cities in Iran. Considering the global reported mean prevalence rate of eczema as 7.6% (range: 0.1 to 19.9), the prevalence of eczema among school children was partly low in this study as compared to other parts of the world.¹³ A previous study conducted in Ahvaz City using similar methods showed that the prevalence of eczema was 5.7% among Ahvazian school children, which consisted of the finding of our study.¹⁷ However, it was low compared to studies conducted in Bushehr and Gorgan, with a prevalence of 15% and 19%, respectively.^{13,25} Significant variations were previously observed in the prevalence of eczema symptoms between regions and the country.^{13,32} Iran is a vast country with a wide variety

of climates. Thus, it is not unreasonable to expect a great variety in the prevalence of eczema in its different regions. Environmental factors such as climate, diet, and genetic background can be potential explanations for the observed variations.

In general, the prevalence of asthma, AR, and eczema symptoms was higher in boys than in girls. The exception was for eczema in the 6-7 age group, which did not show any significant difference between the two sexes (Table 2). Studies about the prevalence of ADs in school children worldwide can be compared.^{2,7} The difference between the two sexes regarding the chance of having such an allergic disease was reported to be statistically significant in some studies, and insignificant in some others.^{26,30,34}

Like most studies conducted in other countries, the prevalence rates of all evaluated symptoms of asthma, AR, and eczema were significantly higher in school children aged 13-14 years compared to 6-7-year-old children.^{13,17,23,29,35}

It was interesting to see a significant association between the rates of asthma, AR, and eczema. Our study showed that 0.6% of the school children had all three disorders simultaneously. Asthma with AR was at 1.8%, and asthma with eczema was at 1.0%. Similar to our study, studies conducted in China and Qatar also reported the co-existence of asthma, AR, and eczema.^{35,36}

This study had some limitations. It was a cross-sectional questionnaire study and lacked objective laboratory measures. Also, the prevalence of ADs was estimated on symptoms reported by school children or their parents, which could be influenced by data conclusion.

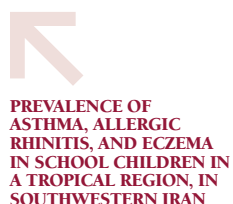
CONCLUSION

In conclusion, the prevalence of asthma, AR, and eczema was moderate in school children from Dezful City, Southwestern Iran. Moreover, the prevalence of asthma and other ADs was higher in boys than in girls and in children aged 13-14 years than in 6-7-year-old children. Our study provides primary data on the prevalence of ADs in school children, which can be followed up in the future to describe trends in the region.

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*The authors declare that there are no conflicts of interest.



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