



Allergic Rhinitis, Atopic Dermatitis, and Asthma and its effect on school performance among Saudi adolescents

Ali Maeed Alshehri, MD MBBS* Abdulbari Ahmed Alzahrani **, Ahmed Hussain Almutlaq **, Nabeel Salman Alamri ***, Aeyd Jobran Alhashim**, Mohammad Ali Zarei**, Nada Aouda Alshahrani****

* Associate professor of Otolaryngology King Khalid University Saudi Arabia. Email:

amsalshehri@kku.edu.sa

** General Practitioner, Abha, Saudi Arabia

*** Dermatology registrar , Armed Forces Hospital in southern region

**** Medical intern, King Khalid University, Saudi Arabia

Abstract:

Background: One of the most crucial challenges in adolescence is achieving better grades and school performance because academic success determines children' future socioeconomic status and way of life. Numerous elements are known to be connected with academic performance In particular, hyperactivity/impulsivity, social behaviors, anxiety/depression, and attentional, cognitive, and socio emotional aspects were prospectively related to academic performance

Methods: In this cross-sectional study, data were collected by the purposely constructed questionnaire. A questionnaire composed of the demographic items and items related to the allergic diseases as per study objective. this panel was composed of a subject specialist, researcher, language expert. Cronbach alpha of the questionnaire was calculated. The study was conducted in the Aseer region of Saudi Arabia.

Results: Out of 250 selected students who meets the inclusion criteria of the study , 150 (60%) were males while 100 were females (40%)We have observed the significance difference between allergic students of different grades.

Conclusion: In adolescents, allergic rhinitis was favorably correlated with improved academic achievement. Asthma, in contrast, demonstrated adverse relationships with improved academic performance in these groups, while poorer sleep quality and neurocognitive deficiencies in verbal comprehension, perceptual thinking, and working memory have been linked to atopic dermatitis.

Key Words: Allergic, school , performance , asthma , dermatitis

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Introduction:

One of the most crucial challenges in adolescence is achieving better grades and school performance because academic success determines children' future socioeconomic

status and way of life. Numerous elements are known to be connected with academic performance In particular, hyperactivity/impulsivity, social behaviors, anxiety/depression, and attentional, cognitive, and

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socio emotional aspects were prospectively related to academic performance 1

Food patterns and other healthy behaviors were linked to academic success. Healthy eating and regular exercise were linked to improved scholastic performance in a variety of categories, including receptive vocabulary, standardized coefficients, and math abilities. Additionally, sleep disruptions and the ensuing weariness during the day may have a negative effect on academic performance.2

Numerous symptoms and indicators are part of allergic phenomenon. The atopic condition eczema gives rise to the allergic process, which progresses to asthma and causes allergic rhinoconjunctivitis. Eczema, a risk factor for asthma, is more likely to manifest in children and infants as a chronic inflammatory itchy skin rash. The most prevalent inflammatory illness in children is asthma, which poses a serious threat to public health.3

Atopic disorders have become significantly more common over the world in recent years, particularly in children in both developed and developing nations Children under 18 were more likely to have asthma (according to ISAAC criteria) than children aged 13–14 years or younger (7.47%), and for children aged 6-7 years, it was 7.43%, according to a systematic evaluation of 50 studies in the Middle East.4-5

Atopic disorders have become significantly more common over the world in recent years, particularly in children in both developed and developing nations [10]. Children under 18 were more likely to have asthma (according to ISAAC criteria) than children aged 13–14 years or younger (7.47%), and for children aged 6-7 years, it was 7.43%, according to a systematic evaluation of 50 studies in the Middle East.1-5

Children with these disorders may exhibit difficult behavior, do poorly in school, and have lower quality of life as a result of their symptoms. A precise assessment of these diseases' true prevalence can aid in the prevention, treatment, and adequate reduction of their prevalence. As a result, early detection

and care of these diseases in childhood lessen their sequelae.

To the contrary, some studies have found a link between asthma and periodontal disease, while other studies have found no link. In a British study, it was discovered that asthmatic kids (n = 100) had higher plaque and gingivitis than non-asthmatic kids (n = 149) between the ages of 4 and 16. [9] In India, people with asthma (n = 80) had greater mean levels of dental plaque and gingivitis than those without asthma (n = 80) (P .001). [10] Another study examined data from the third National Health and Nutrition Examination Survey (NHANES III) of teenagers aged 13 to 17 years (n = 1596) and found no significant correlation between periodontitis or gingivitis (P >.05) or asthma or the cumulative use of antiasthma medications.6-10 The main purpose of this study was to measure the association between Allergic rhinitis, atopic dermatitis, and asthma with school performance of Saudi adolescents

Methods:

In this cross-sectional study, data were collected by the purposely constructed questionnaire. A questionnaire composed of the demographic items and items related to the allergic diseases as per study objective. this panel was composed of a subject specialist, researcher, language expert. Cronbach alpha of the questionnaire was calculated. The study was conducted in the Aseer region of Saudi Arabia.

After collection of data, data were coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies, and %s were computed), to measure the significance differences t-test and chi-square test was used at 5% level of significance. Data was collected from the schools of Aseer region of Saudi Arabia. Progress f students was taken from the school examination office after their consent regarding confidentiality. Ethical approval was obtained from King Khalid University, Saudi Arabia. The study duration was from January-2021 to April-2021



Inclusion criteria:

- School going students
- Having allergic diseases

Results:

Out of 250 selected students who meets the inclusion criteria of the study , 150 (60%) were males while 100 were females (40%)

Table 1 Grade wise comparisons of allergic students

A grade	B grade	C grade	D grade	F -grade	p- value
30%	15%	15%	25%	15%	<0.0001

We have observed the significance difference between allergic students of different grades.

Table 2:Comparisons between grades and different types of allergic

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	Allergic rhinitis			Atopic Dermatitis			Asthma		
	O.R	95% C.I	P- value	O.R	95% C.I	P- value	O.R	95% C.I	P- value
Grade A students	1.25	0.8-1.45	<0.01	1.23	0.9-1.45	<0.01	1.25	0.96-1.46	<0.01
Grade B students	1.43	0.9-1.48		1.45	1.1-1.85		1.36	1.1-1.96	
Grade C students	1.65	1.1-1.96		1.68	1.12-1.78		1.47	1.2-1.56	
Grade D students	1.89	1.2-1.86		1.96	1.4-1.99		1.65	1.1-1.680	
Grade E students	1.93	1.01-1.96		1.97	1.1-1.89		1.99	1.23-1.94	

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Table 2 depicted that The prevalence of allergic rhinitis increased as school performance improved in a dose-dependent manner. We have observed significant difference between different grades with each type of allergies.

Table 3: Demographics

Variable	Class	%
Age in years	6–7 years	49.2
	13–14 years	50.8
Ever had wheezing	No	95
	Yes	5
Wheezing in the last 12 months (Current wheeze)	No	80
	Yes	20
Asthma ever	No	95
	Yes	5



Rhinitis ever	No	92
	Yes	8
Rhinitis in the last 12 months	No	89
	Yes	11
Hay fever ever	No	79
	Yes	21
Eczema ever	No	93
	Yes	7
Family history of asthma and other allergic diseases	No	82.3
	Yes	17.7
Smoker in the household	No	60
	Yes	40
Pets in the home	No	75
	Yes	25

Table 3 depicted the demographics and other items , 89% have rhinitis in the last 12 months ,82.3% have family history related to allergic diseases.

Discussion:

In the current study, there was a substantial correlation between allergic rhinitis and improved academic achievement. Asthma, on the other hand, was inversely related to improved academic achievement. There was a dose-dependent relationship between academic achievement and allergic rhinitis. In particular, the correlations' power outperformed the unadjusted models after taking into account potential confounders, such as other allergy disorders. These findings may be partially explained by the inverse relationships between asthma and allergic rhinitis and academic achievement. For instance, the positive correlation between allergic rhinitis and school performance in people with allergic rhinitis and asthma may be offset by the negative correlation between asthma and school performance, and vice versa.¹⁻⁸

When compared to people with allergic rhinitis and atopic dermatitis, asthma participants had

the largest number of school absence days, which may help to explain the unfavorable correlation between school performance and asthma. Previous research found that asthma, especially severe or poorly controlled asthma, was strongly linked to more absences from work or school. The current findings are consistent with these findings. The productivity of daytime workers may be impacted by uncontrolled nocturnal asthma symptoms. Additionally, asthma may result in sadness and other emotional problems, which would be detrimental to academic performance. In earlier studies, asthma patients were more likely to experience emotional symptoms like depression.¹⁰⁻¹²

The fact that this study is a longitudinal analysis with exposures recorded at both 9 and 12 and 15 years is one of its strengths. In addition to asthma, hay fever, eczema, and food allergies, the last two of which have received little research, we were able to collect exposure data for these conditions at the age range of 9 to 12 years. Additionally, the questionnaires and registers allowed for a variety of asthma and allergy exposure criteria, which strengthened the reliability and validity of our findings. For the 15-year-old analysis, we were able to



evaluate validated register-based asthma definitions while using ever and current reported illness criteria for children aged 9 to 12 years.¹³

In our study, there was a small but substantial negative connection between atopic dermatitis and academic achievement. The impact of atopic dermatitis on academic achievement hasn't been examined in any prior research. Poorer sleep quality and neurocognitive deficiencies in verbal comprehension, perceptual thinking, and working memory have been linked to eczema.

We are aware of a very small number of studies that have looked at the relationship between severe or uncontrolled asthma and academic performance, despite the fact that children with severe asthma are more likely to miss school and have a lower quality of life.¹⁴⁻¹⁵

Conclusion:

In adolescents, allergic rhinitis was favorably correlated with improved academic achievement. Asthma, in contrast, demonstrated adverse relationships with improved academic performance in these groups. Even after correcting for age, physical activity, sex, obesity, sleep duration, location of residence, economic status, parental education levels, stress level, smoking usage, and other allergic illnesses, there was still a dose-dependent connection between allergic rhinitis and academic performance. Increased absences from school could be a factor in the poor relationship between asthma and academic achievement. Therefore, the asthmatic adolescent should pay special attention to school life.

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