

Atopy and allergic diseases among college students at a Saudi Public University

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ABSTRACT

Background: Despite its significant prevalence worldwide, atopy and allergic diseases continue to need more studies, with a need for published articles describing the prevalence of atopy and allergic diseases in Saudi society. The study aimed to determine the prevalence of atopic dermatitis diseases among college students at Imam Mohammad Ibn Saud Islamic University. **Methods:** The Cross-sectional study was conducted in Saudi Arabia among college students at Imam Mohammed bin Saud Islamic University in Riyadh based on self-report Asthma and Allergies questionnaires (ISSAC questionnaire, atopic dermatitis part). **Results:** Seven hundred ninety-seven (797) students from 11 colleges participated in the study. About half (47.6%) aged between 21 and 24, and 73.7% were females. More than one-third (34.8%) had atopic dermatitis during the last six months, while 30.7% of the participants reported having itchy rash in the past 12 months, and 33.8% were diagnosed with eczema in any life interval. Age is not one of the significant factors affecting the prevalence of atopic dermatitis. However, the prevalence of atopic dermatitis slightly increases with age ($P = 0.062$). Atopic dermatitis was significantly higher among female students (39.7%) than 21.0% among male students ($P = 0.000$). College level nor GPA had no significant impact on the prevalence of atopic dermatitis ($P = 0.238$ and 0.884 , respectively). **Conclusion:** Imam Mohammad Ibn Saud Islamic University students have a high prevalence of atopic dermatitis, which may indicate a higher prevalence of allergens. Females and older participants were more liable to reported atopic dermatitis.

Keywords: Allergic rhinitis, atopic dermatitis, bronchial asthma, Saudi Arabia

Introduction

All age groups are affected by this severe global public health issue with allergic disorders. In reaction to exposure to common environmental allergens such as home dust mites, grass, and cats,

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specific IgE is produced, known as atopy. Atopy is strongly linked to allergic diseases like asthma, hay fever, and eczema, but not everyone with atopy experiences clinical allergy symptoms, and not everyone with an allergic disease-compatible clinical syndrome can be identified as having atopic dermatitis after being tested for specific IgE to a variety of environmental allergens.^[1] The ongoing debate concerning the percentage of allergy illnesses caused by atopy^[2,3] underscores the need for a comprehensive understanding of the epidemiology of atopic disease and its causes, particularly for primary care physicians. To support the adoption of efficient treatment and prevention methods, doctors must comprehend the epidemiology of atopic disease and its causes.

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Epidemiological research on representative populations has shown an evident rise in atopic disorders over the past few decades, primarily due to pollinosis. Both allergen exposure, which results in the development of specific IgE antibodies, and additional realization factors are necessary for the appearance of an atopic condition.^[4,5] Asthma is undoubtedly the most dangerous allergy condition because it may be both lethal and disabling, accounting for more than 100,000 hospital admissions annually in England and Wales. One hundred thirty-seven persons under 45 died from asthma-related causes in 1995.^[6] Environmental lifestyle variables are most likely the etiological cause of the condition. Additionally, it appears likely that early illnesses, vaccines, and contact with farm animals can all work as some protection against the later onset of allergies. Studies are being conducted to see if lowering risk factors or using antiallergic medicines can change the long-term results in high-risk populations.^[7,8]

Given the significance of these findings, it is imperative to bridge the gap between theoretical knowledge and therapeutic implications, with a specific focus on the relevance to the practice of primary care physicians. A better understanding of the frequency of atopy and allergy disorders among college students at Imam Mohammad Ibn Saud Islamic University is vital, not only from a research perspective but also in the context of informing the practice of primary care providers. To investigate potential risk/protection variables related to allergy, we compared the prevalence of allergic disorders and sensitization among university students at Imam. This study aimed to ascertain the self-reported prevalence of allergy in Muslim university students, the types and frequency of symptoms, and the demographic groups impacted.

Materials and Methods

Study design

This is a quantitative study scoped to a descriptive cross-sectional study. Descriptive cross-sectional studies merely describe the prevalence of one or more health outcomes in a given group. This kind of research is the most effective for determining the prevalence and studying the relationships between numerous exposures and outcomes.^[9] This study has been conducted before on a Middle Eastern sample.^[10,11] Our sample demographic is college students at Imam Mohammad Ibn Saud Islamic University. The sampling is random, and these institutions were picked based on the number of students enrolled, academic excellence, and popularity among college students at Imam Mohammad Ibn Saud Islamic University. After obtaining the approval of the university's institutional review board (IRB) Committee, the electronic questionnaire was sent between August and November 2022 to the students' emails through the Deanship of Information Technology at the university. Follow-up emails have been sent to increase the response rate. The IRB has been obtained from the IRB committee at Imam Mohammad Ibn Saud Islamic University, project number 362/2022 dated 20-11-2022.

Application of the questionnaire

The students were asked to complete the self-rated Isaac questionnaire and a brief questionnaire comprising demographic information such as age, gender, GPA, and training level. All participants were assured of confidentiality and were asked for consent via the form.

Demographic and social/clinical characteristics questionnaire

Prevalence atopy and allergic diseases were measured on a validated Isaac questionnaire for the Arab population. The instrument has been tested on a Saudi population before.^[9,12] The Isaac questionnaire is a quick, essential, and easy-to-complete assessment, and its use as a screening tool in research contexts is widely established. The scale asks if the responder has encountered specific allergic symptoms or behavior lately.

Statistical analysis

The demographic data and Isaac scores were presented using descriptive statistics. The Student's *t*-test and one-way variance analysis were utilized for comparison. Statistical tests, such as linear or logistical regression, were used depending on the variables to help predict the prevalence of atopy and allergic diseases.

Results

Demographic

In this study, we were able to collect data from 797 students from more than 11 colleges, including 23.2% from the College of Economics and Administrative Science, 12.5% from the College of Computer and Information Science, 9.9% from the College of Media and Communications, and 9.7% from the college of medicine [Figure 1]. Moreover, 47.6% of the participants were between 21 and 24 years old, 39.3% were between 17 and 20, and 73.7% were females. Furthermore, 92.0% of the participants were single, 21.2% were at the third level, 20.7% were at the first level, and 17.6% were at the second level. Considering their GPA, 29.7% of the students reported a GPA between 4.75 and 5.00, 23.1% had a GPA of 4.49-4.75, and 22.7% had a GPA between 4.0 and 4.49 [Table 1].

According to the Isaac questionnaire, 34.8% of the participants had atopic dermatitis during the last six months, while 30.7%

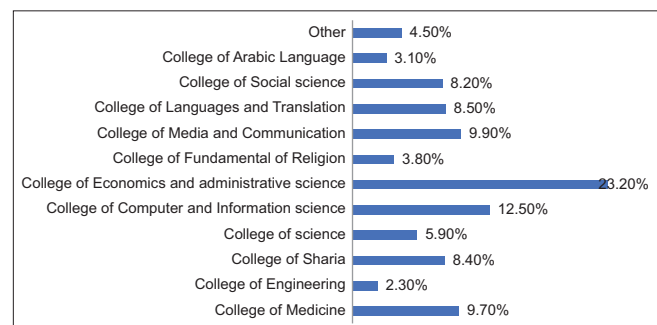


Figure 1: Distribution of the students among different

of the participants reported having itchy rash in the past 12 months, and 33.8% were diagnosed with eczema in any life interval [Figure 2]. Among patients who reported having atopic dermatitis or rash, 52.4% of them reported that this dermatitis affected the folds of the elbows, behind the knees, in front of the ankles, under the buttocks, or around the neck, ears, or eyes. Moreover, 74.1% reported that this itchy rash occurred at 5 years or older, while 16.0% were under 2. Furthermore, 71.8% of the participants reported that this rash cleared up completely at any time during the last 12 months, and 46.7% reported that this rash kept them awake at night for more than one night per week [Table 2].

The relation between incidence of atopic dermatitis and demographic factors

In addition, as shown in Table 3, age is not considered one of the significant factors affecting the prevalence of atopic dermatitis ($P = 0.062$); however, the prevalence of atopic dermatitis seems to slightly increase with the increase in age where the prevalence of atopic dermatitis among students older than 27 years was 44.9% compared with 41.1% in age group (25-27), 36.7% in age group (21-24) and 29.7% among those younger than 20 years old. Atopic dermatitis was significantly higher among female students (39.7%) than 21.0% among male students ($P = 0.000$). Moreover, the prevalence of atopic dermatitis was the lowest among single participants (33.4%) compared with 51.8% of married students ($P = 0.021$). College level nor GPA had no significant impact on the prevalence of atopic dermatitis ($P = 0.238$ and 0.884 , respectively) [Table 3].

Discussion

There needs to be sufficient data on the epidemiology of allergic disorders in Saudi Arabia; nonetheless, symptoms related to atopic dermatitis are prevalent across the country in many regions. Because the frequency of dermatitis is highly reliant on the degree to which environmental allergens are present, the epidemiology of this condition can vary substantially from one nation to another. Because of urbanization, industrialization, and other associated environmental changes, there has been an increase in the number of allergens present in the environment and an increase in the prevalence of allergic reactions in

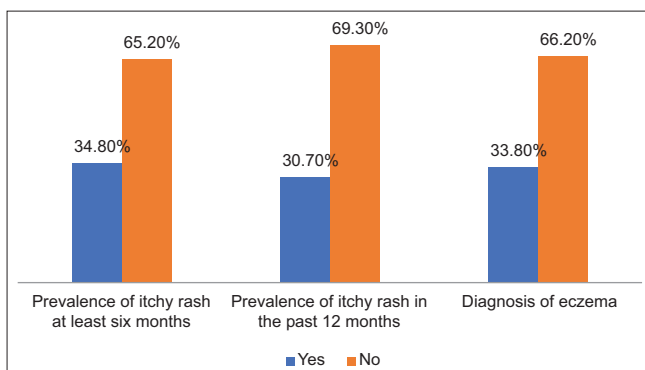


Figure 2: The prevalence of atopic dermatitis

Saudi Arabia as a country. This has led to a rise in the number of people who suffer from allergic reactions. Because primary healthcare doctors are the first gateway to health services, the University's Medical Services Center provides primary services and other consulting clinics. Primary care physicians need to understand the extent of the problem related to allergic diseases in their scope of work. This is the first report in this context

Table 1: Demographic factors of the participants (N=404)

Study Data	n (%)
Age group in years	
17-20	313 (39.7%)
21-24	379 (47.6%)
25-27	56 (7.0%)
>27	49 (6.1%)
Gender	
Male	210 (26.3%)
Female	587 (73.7%)
College level	
First-year	165 (20.7%)
Second year	140 (17.6%)
Third year	169 (21.2%)
Fourth year	123 (15.4%)
Fifth year	66 (8.3%)
Sixth year	21 (2.6%)
A seventh-year or higher	113 (14.2%)
GPA	
<3.49	64 (8.1%)
3.5-3.99	131 (16.4%)
4.-4.49	181 (22.7%)
4.49-4.75	184 (23.1%)
4.75-5.00	237 (29.7%)
Marital status	
Single	733 (92.0%)
Married	56 (7.0%)
Divorced	8 (1.0%)

Table 2: The characteristics of patients with atopic dermatitis

The characteristics of patients with atopic dermatitis	Count n (%)
Is it affecting the folds of the elbows, behind the knees, in front of the ankles, under the buttocks, or around the neck, ears, or eyes?	
No	160 (47.6)
Yes	176 (52.4%)
At which age did this itchy rash first occur	
Under two years	52 (16.0%)
2-4 years	32 (9.9%)
Age five or more	240 (28.2%)
How often, on average, have you been kept awake at night by this itchy rash?	
No	94 (8.2%)
Yes	239 (71.8%)
How often, on average, have you been kept awake at night by this itchy rash?	
<one night per week	163 (53.3%)
>One night per week	143 (46.7%)

Table 3: The relation between the incidence of atopic dermatitis and demographic factors

Factor	Incidence of atopic dermatitis		P
	No Count/ row n (%)	Yes Count/ row n (%)	
Age group in years			
17-20	220 (70.3%)	93 (29.7%)	0.062
20-24	240 (63.3%)	139 (36.7%)	
25-27	33 (58.9%)	23 (41.1%)	
>27	27 (55.1%)	22 (44.9%)	
Gender			
Male	166 (79.0%)	44 (21.0%)	0.000
Female	354 (60.3%)	233 (39.7%)	
College level			
First-year	111 (67.3%)	54 (32.7%)	0.238
Second year	94 (67.1%)	46 (32.9%)	
Third year	107 (63.3%)	62 (36.7%)	
Fourth-year	86 (69.9%)	37 (30.1%)	
Fifth year	37 (56.1%)	29 (43.9%)	
Sixth year	17 (81.0%)	4 (19.0%)	
A seventh-year or higher	68 (60.2%)	45 (39.8%)	
Marital status			
Single	488 (66.6%)	245 (33.4%)	0.021
Married	27 (48.2%)	29 (51.8%)	
Divorced	5 (62.5%)	3 (37.5%)	
GPA			
<4.49	41 (64.1%)	23 (35.9%)	0.884
3.5-3.99	87 (66.4%)	44 (33.6%)	
4.0-4.49	114 (63.0%)	67 (37.0%)	
4.49-4.75	125 (67.9%)	59 (32.1%)	
4.75-5.00	153 (64.6%)	84 (35.4%)	

among college students at Imam Mohammad Ibn Saud Islamic University.

The prevalence of atopic dermatitis among the students in this study was 34.8 percent, and the study comprised 797 college students. This is higher than what has been reported in several research, such as the study conducted by Alqahtani J among young adults in Saudi Arabia, who reported a prevalence of 13.1% for atopic dermatitis.^[12] In a previous study conducted in the United Arab Emirates, the authors reported a prevalence of atopic dermatitis and eczema of 34.9% and 14.9%,^[13] similar to our results. Moreover, another study conducted in Tehran showed a prevalence of atopic dermatitis of 35.8%.^[14] In addition, a second longitudinal study that was conducted among college students in Japan found that the prevalence of atopic dermatitis in university first-year students slightly increased from 9.1 percent in 2002 to 12.0 percent in 2010 and has remained steady until 2019, around 10-11 percent, with poorly controlled atopic dermatitis being present in 10 percent of the patients. The study was conducted over seven years.^[15] In Iran, the prevalence of itchy rashes in the past six months, itchy rashes in the past 12 months, and rashes in flexural areas were 7.5%, 8.9%, and 10.3%, respectively.^[16] In Bangkok, the prevalence of eczema among university students was 9.4%.^[17] In Saudi Arabia, previous studies showed a high sensitization rate among Saudis ranging

between 18% and 75% of different age groups,^[18-21] which may explain the high prevalence of atopic dermatitis in this study. This finding is consistent with previous studies that have reported high rates of atopic dermatitis in the Middle East.^[22] The reasons for this high prevalence are not fully understood but may be related to genetic, environmental, and lifestyle factors.^[23,24]

The gender distribution of the participants in this study revealed that the incidence of atopy was significantly higher among the female and male participants. It is possible that hormonal shifts and gender-specific differences in how each is exposed to the environment are to blame for this gender disparity in the risk of developing more chronic forms of atopic disease.^[25,26] The prevalence of allergic skin problems was found to be greater among female students (28.4 percent) compared to male students (19.6 percent) in an earlier study conducted by Aldahash B *et al.*^[27] In addition, Kalmazri R published comparable findings, demonstrating that females exhibited a higher prevalence of atrophy.^[16] However, the results of further investigations show that males have a higher propensity than females to suffer from atopy.^[12,17] Sensitization to indoor and outdoor allergens is essential for developing various atopic disorders. The distribution of allergens varies depending on environmental factors, geographic areas, local climates, and the lifestyles of individuals and across age groups. Sensitization to indoor and outdoor allergens is crucial for developing various atopic disorders.^[28] In the current study, the prevalence of atopic dermatitis increases slightly with age.

Dust was shown to be the most common allergen responsible for all sorts of allergies (allergic rhinitis, conjunctivitis, eczema, and atopic dermatitis). According to these findings, dust may significantly worsen allergy symptoms, which is consistent with what Bener *et al.*^[29] previously reported. The configuration of the home has been drastically altered due to urbanization. This has led to a significant rise in airborne pollutants and allergens. Urbanization has also increased the use of soft furniture, fitted carpeting, central cooling, and reduced indoor ventilation. These findings highlight the importance of collecting local epidemiological data on allergen sensitization to promote evidence-based practices for preventing and managing allergy disorders in various nations and areas. College students should be educated about simple ways to reduce their exposure to dust mites, such as washing their pajamas and bedding in hot water, wrapping their mattresses and pillows in dust mite covers, using washable curtains or curtains, and regularly checking their air conditioning units for contamination and pest control.^[30]

Conclusions

In conclusion, there is a significant incidence of atopic dermatitis among students attending Imam Mohammad Ibn Saud Islamic University, which may imply the presence of a higher prevalence of allergens in the environment. The likelihood of participants reporting atopic dermatitis was higher among females and older participants.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Author contributions

All authors participated in the concept, Design, analysis, interpretation of data, writing, and manuscript review. They have seen and approved the final version of the manuscript.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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