



## RESEARCH ARTICLE

# Awareness & knowledge of Allergic Conjunctivitis among a group of university students in Sultanate of Oman

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## ABSTRACT

**Background:** The increasing prevalence of Allergic Conjunctivitis presents a significant challenge to public health, as, amongst other issues, it impedes the quality of life. In order to mitigate the consequences, it is essential to enhance understanding and knowledge of the identification of Allergic Conjunctivitis and its management strategies.

**Aim:** The aim of this research is to assess the level of Awareness and knowledge of Allergic Conjunctivitis amongst University of Buraimi students in the Sultanate of Oman.

**Methodology:** This is a cross-sectional study in which an online google questionnaire form was distributed to university students through a URL link. The link was distributed via social media networks and emails targeting University of Buraimi students from multiple disciplines. This was to ensure a wide range of response to represent a wider population trend. The poll included questions about typical demographics, awareness, symptoms, causes management and prevention of the disease. The questionnaire was carefully adapted modified revalidated and approved to ensure that respondents would answer the questions whilst they are focused.

The study adopted quantitative research over qualitative research. This approach allowed the drawing of statistically significant conclusions. There is also an emphasis on objectivity and the ability to generalise findings to a broader population, as required by this research.

**Results:** A total of 350 participants answered the questionnaire. Demographically, females were 68.57%, males were at 31.43%, and participants age ranged between 17 and 34 with a mean of 21.94(±1.90) years old.

Most participants i.e., 55.14% have fair awareness about Allergic Conjunctivitis. There was a statistically significant relationship between awareness level and a student's discipline. The results showed that students from the College of Health Sciences have better awareness compared to non-Health Science related disciplines. (*P value = 0.0*)

**Conclusion:** Based on the results of the current study, it can be deduced that the level of familiarity with Allergic Conjunctivitis among college students in Oman was moderate, which could partially explain the increasing incidence of this condition amongst the population. Health science students demonstrated greater awareness compared to the non-health sciences group. Therefore, it is recommended that awareness posters, flyers, and sessions be implemented in university halls to increase Allergic Conjunctivitis awareness.

**Keywords:** Awareness, Conjunctiva, Allergic Conjunctivitis, University of Buraimi.

## 1. Introduction

Allergic Conjunctivitis ('AC') or ocular allergy encompasses a range of conditions characterized by an abnormal immune response of the conjunctiva to typically innocuous antigens<sup>1,2</sup>. The occurrence of AC has been on the rise side globally over the past few decades<sup>3,4</sup>. The prevalence of AC, estimated to be 15-20% globally, may not be enough to justify country- and region-specific policy interventions. This is due to the lack of information on key contributing factors, such as age, environmental characteristics, genetics, and childhood exposure<sup>5,6</sup>.

The signs and symptoms associated with AC are typically mild and can involve a range of discomforts, including dryness, itchiness, redness, and the presence of tears. These symptoms do not discriminate based on age and can affect individuals of all ages<sup>7,8</sup>. For example, because of the industrial revolution and the rise in air pollution levels over the last few decades, AC estimation has significantly increased. This is more prevalent in developing countries, where more severe forms of ocular allergy can be found<sup>9,10</sup>. Genetic factors and exposure to exact allergens are additional factors that may contribute to AC<sup>11</sup>.

Allergic Conjunctivitis covers various types of allergic and inflammatory conditions affecting the conjunctiva and eyelids, such as, vernal and atopic keratoconjunctivitis, seasonal perennial allergic conjunctivitis, and contact blepharoconjunctivitis<sup>12</sup>. To minimise allergen exposure, individuals with AC can take several precautionary measures, including wearing wrap-around glasses, avoiding specific items like pillows and carpets, and applying cool compresses.

Additionally, using lubricating eye drops can be beneficial in reducing the concentration of inflammatory agents and washing away allergens, which can alleviate itching and prevent symptoms from exacerbating<sup>13</sup>. Improving understanding of allergy symptoms is crucial, not only for accurately identifying the condition, but also for effectively managing it.

Consequently, education plays a vital role in preventing and controlling allergic diseases<sup>14</sup>, hence, improved awareness of AC can lead to more effective treatment and a reduction in the occurrence of the condition<sup>15</sup>.

It is crucial to emphasize and consistently conduct research in AC, as this will aid in achieving valid outcomes in the prevention and management of this prevalent and long-lasting condition in the 21<sup>st</sup> century<sup>16</sup>. A study conducted in 2015 showed 2.83% prevalence of AC in an industrial area<sup>17</sup>.

Public health measures are advised to raise awareness among students about the prevention and management of ocular allergy, along with the potential complications associated with this condition<sup>18</sup>.

As far as our knowledge extends, no studies have been undertaken to investigate the level of awareness of AC in Oman. Therefore, this study is performed to assess the level of awareness of AC among University of Buraimi students, Sultanate of Oman.

## 2. Methods

### 2.1 ETHICS

This study was a cross-sectional, self-administered questionnaire conducted amongst University of Buraimi students in the Sultanate of Oman. The survey was conducted between July and December 2023 and was made available for a total 5 months.

The sample size was determined using a calculator that accounted for the finite population correction to assess the mean<sup>19</sup>. The necessary minimum sample size was 341. To create a 95% confidence interval with a margin of error of 5%, the study sample screened was greater than the estimated sample size, providing a higher level of confidence. The University of Buraimi Research and Ethics Committee granted ethical approval for this survey (AY23-24COHS-99) on 19 March 2023. Prior to the online survey questions, a statement of consent was presented and only participants who agreed to it were permitted to proceed and be included in the study.

## 2-2 RESEARCH TOOLS

The questionnaire employed in this research was modified with permission from the study by Bazuhair et al.<sup>8,25</sup> A 15-question form was created to identify certain common aims of awareness, including questions about typical demographics, awareness, symptoms, causes management and prevention of the disease.

The questions were phrased using positive language to ensure objectivity and impartiality. Sub-headings were used to focus on one idea at a time. This was important to avoid overcrowding of information and ensure that statements were being used, rather than “agree-disagree” response options. The questionnaire was also drafted to ask the more important questions earlier in the form, to increase the likelihood that respondents would answer these whilst they were focused.

After reviewing and finalising the questionnaire, there were validation tests conducted to ensure the reliability. The Research Committee at the College of Health Sciences at the University of Buraimi undertook pilot testing of the questionnaire. This process assisted with the construction of questions, their order and the refining of the questionnaire before distribution.

Overall, the methodology adopted with respect to the questionnaire was appropriate because they were quality-checked and piloted by experts in the field. This was to support sensitivity of the questionnaire and to ensure it was fit for purpose.

The survey was disseminated via a URL link on social media and sent by email. Subsequently, the collected responses were analyzed, revealing that 0-49% denotes poor awareness, 50-74% signifies fair awareness, and more than 75% indicates good awareness.

## 2.3 DATA COLLECTION

The survey was built in an online ‘Google Form’ format. The sample size calculated was 323, the questionnaire was distributed to all students in University of Buraimi through their university emails and social media in the period of one month.

Participants were questioned on their understanding of AC epidemiology, its connection to visual loss, the source of AC discomfort, prevention methods, symptoms, the nature of AC, the eye structures involved, triggers, medications, various forms of AC, any risk factors, and the sources of their information. Correct answers to 13 questions were awarded a score of 1, and for the questions regarding recognizing signs and symptoms of AC, a score of 1 was given for each of the eight correct answers.

## 2-4 DATA ANALYSIS

The data was analyzed using the SPSS software, version 25<sup>26</sup>. The qualitative data was transformed into numerical values and expressed as percentages, while the Analysis of Variance (‘ANOVA’) test was conducted to assess the relationship between variables. The quantitative data was represented by the mean and standard deviation (mean  $\pm$  SD), with statistical significance set at  $P < 0.05$ .

# 3- Results

## 3-1 SAMPLES CHARACTERISTICS

A total of 350 students from the four faculties of University of Buraimi responded to this survey. These faculties were the College of Business, College of Health Sciences, College of Law and College of Engineering. Most of the participants were female (68.57%). The participants age ranged between 17 and 34 with a mean of 21.94 ( $\pm 1.90$ ) years old.

The College of Health Sciences represented 33.43% of participants, followed by Business students at 28.57%, Law students at 23.71%, and Engineering students 14.3%. The data characteristics of the participants are summarised in Table 1 below.

Table 1: demographic data of participants (n=350)

Demographic of responders		
	No. of Participants	Percentage (%)
Male	110	31.43
Female	240	68.57
<b>Colleges</b>		
Business	100	28.57
Health Sciences	117	33.43
Law	83	23.71
Engineering	50	14.3

The participants responses to the questionnaire were categorised to three sections. These were the Awareness about allergic conjunctivitis, symptoms and causes and prevention.

### 3.2.1 Awareness about allergic conjunctivitis

The participants were asked a set of questions regarding their AC awareness. Most participants showed that they were able to define AC as eye inflammation caused by a non-harmful foreign substance (37.71%), followed by 31.41% of participants' who thought that AC can be defined as pain and discomfort in the eye. The other

responses reported that AC occurs due to rubbing in the eye (27.14%), and a small group of participants did not know about AC (3.71%). Most participants were aware that AC does not cause blindness (51.43%), while 27.14% of students believed that AC may cause a person to lose their sight and 21.43% reported that they did not know. A high percentage of the participants reported that itching was the primary source of discomfort (62%). More than 44% said the AC cannot be transmitted from one individual to another. A summary of responses is shown in Table 2 below.

Table 2 – Awareness and Effects of AC

Question	Response Options	Total	%
Awareness toward AC	An eye inflammation caused by a non-harmful foreign substance	132	37.71
	AC happens due to rubbing in the eye	95	27.14
	AC is a pain and discomfort in the eye	110	31.41
	Participants don't know about AC	13	3.71
Could ocular allergic lead to visual loss	Yes	153	43.71
	No	180	51.43
	I don't know	17	4.85
AC experiences itching as the primary source of discomfort	True	217	62.00
	False	88	25.14
	I don't know	45	12.86
AC transmitted from person to person	True	125	35.72
	False	156	44.57
	I don't know	69	19.71
Eye structures involved in AC include	Conjunctiva, cornea, and eyelids	84	24.00
	Conjunctiva	116	33.14
	Conjunctiva and cornea	68	19.43
	Cornea	17	4.86
	I don't know	65	18.57

### 3.2.2 Symptoms and Causes

In the Symptoms and Causes sections, each question was evaluated, with correct answers receiving one point as detailed in the methods section above. The average score was 22.26% ( $\pm$  5.66), ranging from a minimum of 10 points to a

maximum of 31 points. Additionally, percentages were determined for each participant's score, revealing that 41.43 % of the respondents possessed a fair level of knowledge (10% to 31%) regarding AC, as shown in table 3 below.

Table 3 – Symptoms and Causes

Substance that most cause ocular allergies	Smoke	81	23.14
	Dust	109	31.14
	Household detergents or perfume	63	18
	Seasonal	97	27.71
Common symptoms of ocular allergies	Itching	80	22.86
	Blurred vision	36	10.29
	Photophobia	52	14.86
	Headache	37	10.86
	All above	145	41.43

### 3.2.3 Prevention

In the Prevention sections, each question was evaluated. The average score was 20% ( $\pm$  3.54). Additionally, percentages were determined for each participant's score, revealing that 41.71% of participants answered that the best way of prevention was to avoid the source of causes.

Other responses included 22% were in favor of using allergic medications and 10.29% reported to avoid those who suffer from AC. Hence 19.14% preferred to seek clinician advice and 6.86% claimed they did not know how to prevent AC, as shown in Table 4 below.

Table 4 – Prevention

What is the best way to prevent AC?	Avoid the source of causes	146	41.71
	Apply anti- allergic medications	77	22.00
	Stay away from an infected person	36	10.29
	Visit eye clinics	67	19.14
	I don't know	24	6.86

### 3.3 AWARENESS LEVEL AMONG UNIVERSITY STUDENTS

Figure 1 illustrates the awareness levels among university students. The diagram categorizes students into different levels of awareness, providing a visual representation of how awareness is distributed across the student population. The x-axis might represent various categories or levels of awareness (e.g., poor, fair, high), while the y-axis could denote the number or percentage of

students in each category. The distribution depicted in the figure can help identify whether most students fall into a particular awareness level or if there is a more even spread across different levels. This visual aid complements the statistical analysis by providing an intuitive grasp of the data, highlighting key trends or disparities in students' awareness levels within the university setting.

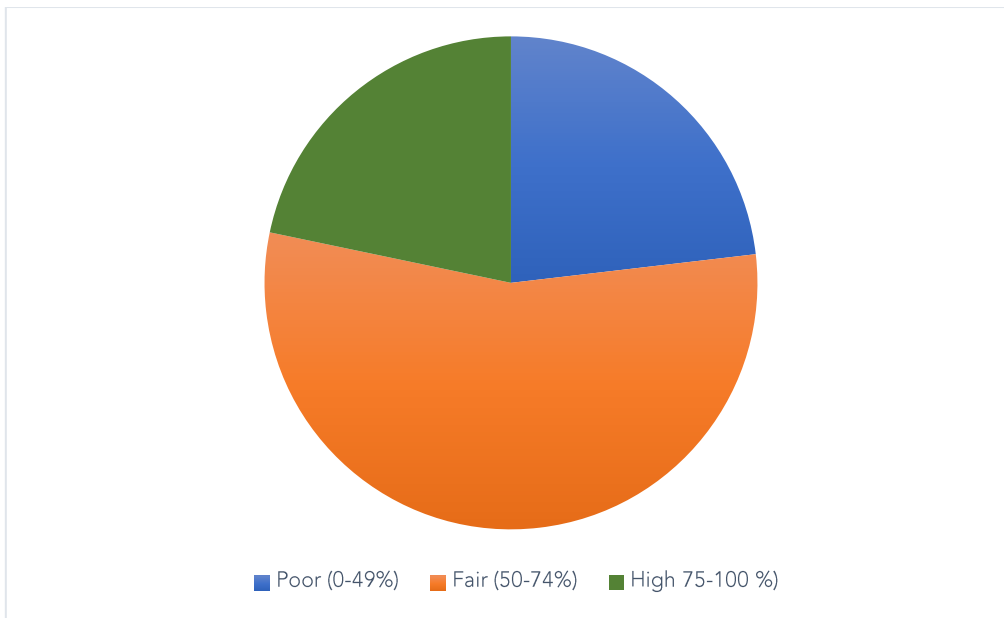


Figure 1. Awareness Level among University students

3-4 FACTORS AFFECTING THE AWARENESS LEVEL OF THE STUDENTS.

In table 5. One-way ANOVA variance was used to examine the mean scores across various groups based on demographic variables, with a significance level of  $P < 0.05$ . The table presents the results of an analysis of variance (ANOVA) examining the factors affecting the awareness level of students across three variables: age, gender, and college. The analysis for age shows that there is no significant difference in awareness levels based on age, as indicated by an F value of 0.830 and a P value of 0.708, which is far above the conventional significance threshold of 0.05. Similarly, gender does not significantly influence

awareness levels, with an F value of 1.316 and a P value of 0.142, also above the 0.05 threshold. In contrast, the variable "college" shows a highly significant effect on students' awareness levels, with a very high F value of 50.979 and a P value of 0.000, indicating that the college a student attends plays a crucial role in their awareness level. The low mean square within groups for college further supports the consistency of this effect across the sample.

Table 5. Factors affecting the awareness level of the students.

		Sum of Squares	Degree of freedom	Mean Square	F value	P value
Age	Between Groups	78.310	26	3.012	.830	.708
	Within Groups	1172.547	323	3.630		
	Total	1250.857	349			
Gender	Between Groups	7.227	26	.278	1.316	.142
	Within Groups	68.202	323	.211		
	Total	75.429	349			
Collage	Between Groups	1.188	1	1.188	50.979	.000
	Within Groups	8.112	348	.023		
	Total	9.300	349			



## 4- Discussion

University students are well-positioned to serve as catalysts for change in their communities, as their understanding of AC can not only improve their quality of life but also influence broader community health policies and outcomes<sup>17</sup>.

The evaluation of these responses revealed that the average score for knowledge about prevention was 20% ( $\pm$  3.54). This suggests that while a significant number of participants are aware of practical preventive measures, there is still a considerable portion of the population with limited knowledge on this topic. The data underscores the importance of targeted educational initiatives to enhance understanding and implementation of effective prevention strategies for AC.

The main objective of the present study was to gather information and to raise the level of awareness about AC among students at the University of Buraimi. Despite the distressing symptoms and potential complications associated with AC, it has not been given sufficient public health attention and is not considered a top-listed eye disease<sup>16</sup>. Despite this, it is important to note that awareness and knowledge can help alleviate dealing with AC.

Participants in this study were drawn from various colleges across the university, encompassing both health and non-health sciences disciplines, with the aim of investigating the hypothesis that students in health science colleges would possess greater awareness and knowledge<sup>20</sup>. Likewise, a separate study revealed that patients typically have low awareness of several urgent eye conditions, including retinal detachment, acute angle-closure glaucoma, giant cell arteritis, and central retinal artery occlusion<sup>21</sup>.

This study showed that students defined AC as an eye inflammation caused by a non-harmful foreign substance (37.71%). The results of this study were lower than studies conducted in Saudi Arabia, which found that in a comparable sample size, 51.2% of the participants had a positive outcome<sup>8,22</sup>. The majority of participants were aware that AC does not cause vision loss (51.43 %),

The current study revealed that the students had a fair level of knowledge about AC, which was slightly higher than the study conducted by Kyei et al. and their estimation in Ghana<sup>18</sup>.

The current study's findings showed that most of participants (62%) reported that itching was the main cause of discomfort, which is lower than the estimated rate in Ghana of 85.9%, and Aseer and Jeddah, Saudi Arabia<sup>8,18,20</sup>. AC is often characterized by itching, and diagnosing it in the absence of this symptom can be challenging<sup>23,24</sup>. This study revealed that over forty-four percent of respondents claimed that the AC cannot be transmitted from person to person, which is lower than the percentage of students at a university in Ghana at 62% but consistent with the percentage of the population in Jeddah, Saudi Arabia at 47.4%<sup>8</sup>. The finding of the current survey showed that 41.71% of the participants thought the AC could be prevented by voiding the source of the trigger lower. This was lower than Kyei et al. in Ghana in 2016 which was 55.9%<sup>18</sup>.

The level of understanding of participants regarding AC was also assessed. Most participants have a fair amount of information about AC at 55.14 %, whereas 76 of participants (21.71%) were highly aware of this condition which is comparable with students at Ghana universities at 55.9%<sup>18</sup>. The finding showed that the average score of awareness was 21.74% ( $\pm$  5.65) higher than Jeddah in Saudi Arabia 15.6% ( $\pm$ 6.1)<sup>18</sup>.

Furthermore, the present study was able to identify the most significant factors contributing to a good level of knowledge and showed no significant correlation between the level of awareness, age and gender<sup>27</sup>. However, there was a significant positive correlation between awareness level and college programs. Students studying health science program showed higher levels of awareness, compared with other colleges. This trend was consistent with the Saudi Arabia study<sup>18,25</sup>.

## 5- Conclusion

Based on the current study's findings, it is reasonable to infer that the degree of familiarity

with AC among college students in Oman was fair, which may partially account for the growing prevalence of this condition in the Sultanate. Health sciences students demonstrated greater awareness compared to the non-health sciences group. Therefore, it is recommended that awareness posters, flyers, workshops and community engagement sessions to arranged to upsurge AC awareness. Likewise, to determine a national estimate for the level of knowledge about AC across universities in the Sultanate of Oman, it is recommended that similar studies be conducted at other universities in the country.

### **Conflict of Interest:**

None

### **Funding Statement:**

None.

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