

## Perception, and Practices of primary health care physicians regarding allergic rhinitis in Al-Baha, Saudi Arabia

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### ABSTRACT

Allergic rhinitis is a common condition with significant implications for patient health and quality of life. Understanding the perception, attitudes, and practices of healthcare professionals toward allergic rhinitis is crucial for improving patient outcomes and optimizing management strategies. A cross-sectional study was conducted involving 174 healthcare professionals. Participants' demographic information, including age, gender, nationality, and specialty training, was collected. Data regarding participants' perception, attitudes, and practices related to allergic rhinitis were obtained through a structured questionnaire. Descriptive statistics and chi-square tests were used for data analysis. The majority of participants (74.1%) reported familiarity with the Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines, while 65.7% were familiar with the Global Initiative for Asthma (GINA) guidelines. Participants recognized the need for evaluating asthma in patients with allergic rhinitis (75.3%) and demonstrated knowledge of how to diagnose allergic rhinitis (92.8%) and its common symptoms (95.2%). However, variations in knowledge were noted regarding the classification and severity of allergic rhinitis. The diagnosis primarily relied on clinical history (71.1%) and physical examination (50.6%), with limited utilization of objective testing. Treatment approaches included oral anti-histamines, intranasal decongestants/anti-histamines, leukotriene antagonists, and oral corticosteroids, among others. Significant associations were found between perception and demographic factors, including gender, nationality, and specialty training. The study revealed a moderate to high level of awareness and knowledge among healthcare professionals regarding allergic rhinitis and its management. Positive attitudes toward guidelines and the importance of evaluating and treating allergic rhinitis were observed.

**Keywords:** Allergic Rhinitis, ARIA Guidelines, Perception and practices

### INTRODUCTION

Allergic rhinitis (AR) is an inflammatory disease of the nasal mucosa caused by indoor or outdoor allergens. It is a common condition that affects people of all ages, most prevalent in adolescence<sup>1</sup>. Allergic rhinitis is defined as symptoms of sneezing, nasal pruritus, airflow obstruction, and primarily clear nasal discharge caused by IgE mediated reactions against inhaled allergens and involving mucosal inflammation driven by type 2 helper T (Th2) cells<sup>2</sup>. Exposure to recurring or seasonal allergens that exist in both our indoor and outdoor environments frequently results in allergic rhinitis. Pollen (grass, trees, and weeds) are among the most frequent allergens and the main contributors to seasonal allergic rhinitis. Pets, molds, and house dust mites are the leading causes of chronic allergic rhinitis<sup>3</sup>. In addition, AR is associated with several risk factors, such as family history of allergies, other allergic conditions such as asthma and atopic dermatitis, and exposure to indoor allergies, including maternal smoking in the first year and firstborn child<sup>4,5</sup>. The prevalence of AR ranged from 0.8 to 14.9% in children aged 6-7 and from 1.4 to 39.7% in those aged 13-14 internationally, according to the Phase III International Study

of Asthma and Allergies in Childhood (ISAAC)<sup>6</sup>. In Saudi Arabia, the Meta-analysis shows the prevalence of AR estimates to be 21.2% in a sample size of 31990 where males had a higher prevalence than females<sup>7</sup>.

Rhinitis is a prevalent condition encountered in primary care settings, significantly affecting patients' quality of life, productivity, and healthcare costs<sup>8</sup>. Despite its high morbidity and substantial impact, gaps remain in the awareness, attitudes, and management practices of primary healthcare physicians toward allergic rhinitis. While these physicians are uniquely positioned to diagnose and manage allergic rhinitis—given their access to patients' occupational and family histories and their ability to conduct comprehensive evaluations variability in practice patterns and perceptions may hinder optimal care delivery.

This research aims to address these gaps by examining primary healthcare physicians' perceptions, attitudes, and practices in managing allergic rhinitis. Specifically, it seeks to identify areas where knowledge

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is lacking or where clinical practices deviate from evidence-based guidelines. By shedding light on these shortcomings, the study provides critical insights that can guide targeted interventions, enhance training programs, and improve patient outcomes.

## METHODOLOGY

**Study Design:** A cross-sectional observational study design was employed from January 18, 2023, to August 18, 2023, this duration sufficed us to survey the needed number of responses, focusing on primary healthcare physicians practicing in the Al-Baha region.

**Sample Size Calculation:** The required sample size was determined using the Yamane formula, considering a confidence level of 95.45% and a margin of error of 7%. Adjusting for a 10% non-response rate, the final sample size was determined to be 161 primary healthcare physicians.

While the rate was not derived from specific local data, it aligns with widely accepted practices in survey-based research. Many studies use 10% as a standard buffer to account for unforeseen non-responses in questionnaire-based research.

In this study, the population of primary healthcare physicians in the Al-Baha region is likely finite and geographically concentrated. A 7% margin of error is often deemed acceptable for such regional or focused studies where extremely high precision is not critical for deriving meaningful conclusions.

**Sampling Method:** A basic simple random sampling method was utilized to select participants from the sample frame of primary healthcare physicians practicing in the Al-Baha region.

The sample frame was constructed by obtaining a comprehensive list of all primary healthcare centers in the Al-Baha region from the local health authorities. **This list served as the foundation for ensuring that all eligible primary healthcare physicians practicing in the region were accounted for.** Data collectors conducted random visits to these centers, during which eligible physicians were invited to participate in the study. This approach ensured that the selection process was both random and representative of the target population, while also providing an opportunity to explain the study objectives directly to potential participants.

By using this method, we minimized selection bias and ensured equitable inclusion of primary healthcare physicians from across the region, irrespective of their specific location or workload.

**Inclusion and Exclusion Criteria:** Primary healthcare physicians working in the Al-Baha region were included in the study. The study exclusively targeted primary healthcare physicians in the Al-Baha region because these professionals serve as the first point of contact for the majority of patients seeking care for allergic rhinitis. Primary healthcare settings are critical in the management of allergic rhinitis due to their accessibility and role in providing comprehensive care. This population is uniquely positioned to assess, diagnose, and manage allergic rhinitis in its early stages, while also addressing coexisting conditions such as asthma.

Non-primary healthcare physicians, physicians working in secondary or tertiary hospitals, those with incomplete questionnaires, and those who refuse to participate were excluded.

**Data Collection:** Data was collected through phone interviews with primary healthcare physicians using a PAP PCP (Perception, Attitude,

and Practice of Primary Care Practitioners towards Allergic Rhinitis Practice Guideline) questionnaire. **This tool was adapted from established surveys used in previous studies on allergic rhinitis management among healthcare professionals.** It has demonstrated validity and reliability in similar contexts, ensuring its appropriateness for assessing knowledge, attitudes, and practices. The questionnaire consists of two parts: the first part includes sociodemographic data of primary healthcare physicians (age, gender, specialty, etc.), and the second part focuses on three domains: perception, attitude, and practice of allergic rhinitis (AR).

To ensure clarity and minimize language-related barriers, the questionnaire was meticulously translated from English to Arabic and then back-translated from Arabic to English. **This process was carried out by a certified professional translator proficient in both languages, ensuring that the meaning and intent of the questions were preserved.** The back-translation process further validated the accuracy and consistency of the questionnaire, aligning it with the study's objectives.

Given the study's location and the predominance of Arabic as the native language, the questionnaire was administered in Arabic to facilitate comprehension and encourage accurate responses. The English version was retained as a reference for the research team and non-Arabic-speaking collaborators.

**Ethical Considerations:** Written consent was obtained from each participant at the beginning of the questionnaire. Participants were informed about the aims, methods, and anticipated benefits of the study. The study is self-financed, and the researchers are affiliated with the Faculty of Medicine, El-Baha University. Potential risks were deemed minimal. Participants had the right to withdraw without reprisals, and they were offered a copy of the informed consent. The study did not impose any financial burden related to investigations or treatment.

IRB approval was granted from Al-Baha university research ethical Board with an IRB number of: REC\SUR\BU-FM\2023\04

The authors declare no conflict of interest related to this study. The research was conducted independently, and no external parties influenced the design, data collection, analysis, or interpretation of the findings.

This study was self-funded by the researchers. No external financial support was received, and all costs associated with the research, including data collection, analysis, and publication, were covered by the authors.

**Data Analysis:** Data was entered into Microsoft Office Excel 2023 and analyzed using IBM Statistical Package for the Social Sciences (SPSS) Version 26. Descriptive analysis was performed to report sociodemographic information. Contingency table analysis (chi-square test) was conducted to compare rates of unmatched samples. Independent t-tests were used for analyzing continuous variables.

## RESULTS

This study provides novel insights into the perception, attitudes, and practices of primary healthcare physicians in the Al-Baha region regarding allergic rhinitis, an area previously underexplored. By examining the alignment of physician knowledge and practices with evidence-based guidelines, the study highlights critical gaps and opportunities for improvement in the management of allergic rhinitis, offering a regional perspective that can inform future interventions.

The study included a total of 174 participants, with a mean age of 33.49 years (SD=9.7). The majority of participants were male (59.2%) and Saudi nationals (43.1%). In terms of specialty training, the highest proportion of participants were general practitioners (60.9%), followed by family physicians (18.4%). The majority of participants had less than 10 years of experience (72.4%). On average, participants reported seeing approximately 118 patients per week, with an average of 21.98 patients diagnosed with allergic rhinitis and 9.80 patients diagnosed with asthma. The mean prevalence of allergic rhinitis among all patients was 20.27%, while the mean prevalence of asthma among all patients was 12.2% (Table 1).

Participants demonstrated overall awareness of allergic rhinitis and its management, with high familiarity reported for ARIA (74.1%) and GINA (65.7%) guidelines (Table 2). Most participants (92.8%) reported knowing how to diagnose allergic rhinitis and recognizing its common symptoms (95.2%). However, gaps in understanding were evident in areas such as classifying allergic rhinitis into mild, moderate, or severe categories (62.7%) and scaling its severity (56.0%). These knowledge deficiencies, as outlined in Table 2, could hinder precise diagnosis and treatment optimization. The inconsistency in understanding these critical aspects suggests a need for more targeted training, especially in areas where the subtleties of classification and severity are pivotal to care planning (Table 2).

The participants' attitudes towards allergic rhinitis and its management were also assessed. The majority of participants agreed or strongly agreed that the ARIA guidelines were useful in categorizing patients (74.7%) and that a new subdivision of allergic rhinitis had been proposed in these guidelines (72.9%). Furthermore, a significant proportion agreed or strongly agreed that the severity of allergic rhinitis could be classified as mild, moderate, or severe based on symptoms and impact on quality of life (54.2%), and that the diagnosis of allergic rhinitis relied on the concordance between a typical history and allergy testing (54.2%). Regarding treatment, participants generally agreed or strongly agreed that the ARIA guidelines were useful (74.1%). When considering factors affecting treatment compliance in allergic rhinitis and asthma patients, participants identified adverse effects of medications (40.4%), fear of adverse effects from online/social media sources (39.2%), route of administration (44.0%), frequency of doses (53.0%), efficacy of ongoing treatment (48.8%), cost of medication (24.1%), aversive taste of medication (38.6%), and size of the pill (19.3%) as potential influencing factors (Table 3).

The diagnostic approach heavily relied on clinical history (71.1%) and physical examination (50.6%) as shown in Table 4. Objective testing, such as anterior rhinoscopy (19.5%), allergy testing (12.2%), imaging of the paranasal sinuses (14.0%), and nasal endoscopy (10.4%), was infrequently utilized. The limited use of these methods is noteworthy

**Table 1.** Demographic factors of the participants

|                                                         |                      | Count        | Column N % |
|---------------------------------------------------------|----------------------|--------------|------------|
| <b>Age</b>                                              | <b>Mean (SD)</b>     | 33.49 (9.7)  |            |
|                                                         | Male                 | 103          | 59.2%      |
| <b>Gender</b>                                           | Female               | 71           | 40.8%      |
|                                                         | Saudi                | 75           | 43.1%      |
| <b>Nationality</b>                                      | Non-Saudi            | 99           | 56.9%      |
|                                                         | Intern               | 13           | 7.5%       |
| <b>Specialty training</b>                               | General Practitioner | 106          | 60.9%      |
|                                                         | Family Physician     | 32           | 18.4%      |
|                                                         | Internal Medicine    | 11           | 6.3%       |
|                                                         | Pediatrics           | 8            | 4.6%       |
|                                                         | OB/Gyna              | 3            | 1.7%       |
|                                                         | Otolaryngologist     | 1            | 0.6%       |
|                                                         | Less than 10 years   | 126          | 72.4%      |
| <b>Experience Duration</b>                              | 10-20 years          | 36           | 20.7%      |
|                                                         | 20-30                | 8            | 4.6%       |
|                                                         | > 30 years           | 4            | 2.3%       |
| Number of patients seen per week " estimation"          | Mean (SD)            | 118 (95.9)   |            |
| Number of patients with allergic rhinitis seen per week | Mean (SD)            | 21.98 (29.4) |            |
| number of patients with Asthma seen per week            | Mean (SD)            | 9.80 (12.65) |            |
| Prevalence of allergic rhinitis among all patients %    | Mean (SD)            | 20.27 (18.6) |            |
| Prevalence of asthma among all patients %               | Mean (SD)            | 12.2 (13.3)  |            |

**Table 2.** Perception of the participants toward allergic rhinitis

|                                                                                      | Yes   |         | Not sure |         | No    |         |
|--------------------------------------------------------------------------------------|-------|---------|----------|---------|-------|---------|
|                                                                                      | Count | Row N % | Count    | Row N % | Count | Row N % |
| Do you know allergic rhinitis and its impact on Asthma " ARIA" guidelines?           | 123   | 74.1%   | 37       | 22.3%   | 6     | 3.6%    |
| Do you know the Global Initiative for Asthma " GINA" guidelines?                     | 109   | 65.7%   | 45       | 27.1%   | 12    | 7.2%    |
| Do you know that rhinitis can be subdivided into allergic and non-allergic rhinitis? | 137   | 82.5%   | 17       | 10.2%   | 12    | 7.2%    |
| Is an evaluation of Asthma necessary for allergic rhinitis patients?                 | 125   | 75.3%   | 38       | 22.9%   | 3     | 1.8%    |
| Do you know how to diagnose allergic rhinitis?                                       | 154   | 92.8%   | 11       | 6.6%    | 1     | 0.6%    |
| Do you know the common symptoms of allergic rhinitis?                                | 158   | 95.2%   | 8        | 4.8%    | 0     | 0.0%    |
| Do you know how to classify allergic rhinitis?                                       | 104   | 62.7%   | 43       | 25.9%   | 19    | 11.4%   |
| Do you know how to scale the severity of Allergic Rhinitis?                          | 93    | 56.0%   | 44       | 26.5%   | 29    | 17.5%   |

**Table 3.** Attitude of the participants toward allergic rhinitis

|                                                                                                                                                                   | Strongly Disagree |         | Disagree |         | Neutral |         | Agree |         | Strongly Agree |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------|----------|---------|---------|---------|-------|---------|----------------|---------|
|                                                                                                                                                                   | Count             | Row N % | Count    | Row N % | Count   | Row N % | Count | Row N % | Count          | Row N % |
| <b>ARIA guidelines are useful in categorizing patients.</b>                                                                                                       | 4                 | 2.40%   | 0        | 0.00%   | 38      | 22.90%  | 75    | 45.20%  | 49             | 29.50%  |
| <b>A new subdivision of allergic rhinitis has been proposed in the ARIA guidelines as “intermittent” and “persistent”</b>                                         | 4                 | 2.40%   | 0        | 0.00%   | 58      | 34.90%  | 63    | 38.00%  | 41             | 24.70%  |
| <b>The severity of allergic rhinitis has been classified as mild, moderate, or severe based on the severity of symptoms and the impact on the quality of life</b> | 0                 | 0.00%   | 0        | 0.00%   | 14      | 8.40%   | 76    | 45.80%  | 76             | 45.80%  |
| <b>The diagnosis of allergic rhinitis is based on the concordance between a typical history and allergy testing.</b>                                              | 0                 | 0.00%   | 4        | 2.40%   | 24      | 14.50%  | 90    | 54.20%  | 48             | 28.90%  |
| <b>ARIA guidelines are useful in the treatment of patients with allergic rhinitis</b>                                                                             | 0                 | 0.00%   | 0        | 0.00%   | 43      | 25.90%  | 68    | 41.00%  | 55             | 33.10%  |
| <b>I feel that treatment compliance in allergic rhinitis and asthma patients is affected by:</b>                                                                  |                   |         |          |         |         |         |       |         |                |         |
| <b>Adverse effects produced by the medications</b>                                                                                                                | 3                 | 1.80%   | 23       | 13.90%  | 31      | 18.70%  | 67    | 40.40%  | 42             | 25.30%  |
| <b>Fear of adverse effects heard by the patient from online/social media sources</b>                                                                              | 7                 | 4.20%   | 13       | 7.80%   | 29      | 17.50%  | 65    | 39.20%  | 52             | 31.30%  |
| <b>Route of administration</b>                                                                                                                                    | 7                 | 4.20%   | 19       | 11.40%  | 28      | 16.90%  | 73    | 44.00%  | 39             | 23.50%  |
| <b>Frequency of doses</b>                                                                                                                                         | 0                 | 0.00%   | 10       | 6.00%   | 29      | 17.50%  | 88    | 53.00%  | 39             | 23.50%  |
| <b>Efficacy of ongoing treatment</b>                                                                                                                              | 3                 | 1.80%   | 19       | 11.40%  | 14      | 8.40%   | 81    | 48.80%  | 49             | 29.50%  |
| <b>Cost of the medication</b>                                                                                                                                     | 10                | 6.00%   | 49       | 29.50%  | 35      | 21.10%  | 40    | 24.10%  | 32             | 19.30%  |
| <b>Aversive taste of the medication</b>                                                                                                                           | 8                 | 4.80%   | 42       | 25.30%  | 31      | 18.70%  | 64    | 38.60%  | 21             | 12.70%  |
| <b>Size of the pill</b>                                                                                                                                           | 9                 | 5.40%   | 56       | 33.70%  | 49      | 29.50%  | 32    | 19.30%  | 20             | 12.00%  |

**Table 4.** Practice of the participants toward allergic rhinitis

|                                                                | Never |         | Seldom |         | Sometimes |         | Often |         | Always |         |
|----------------------------------------------------------------|-------|---------|--------|---------|-----------|---------|-------|---------|--------|---------|
|                                                                | Count | Row N % | Count  | Row N % | Count     | Row N % | Count | Row N % | Count  | Row N % |
| <b>I diagnose allergic rhinitis by</b>                         |       |         |        |         |           |         |       |         |        |         |
| clinical History                                               | 2     | 1.2%    | 0      | 0.0%    | 15        | 9.0%    | 31    | 18.7%   | 118    | 71.1%   |
| Physical examination                                           | 4     | 2.4%    | 4      | 2.4%    | 30        | 18.1%   | 44    | 26.5%   | 84     | 50.6%   |
| Anterior rhinoscopy                                            | 47    | 28.7%   | 22     | 13.4%   | 39        | 23.8%   | 24    | 14.6%   | 32     | 19.5%   |
| allergy testing                                                | 63    | 38.4%   | 31     | 18.9%   | 30        | 18.3%   | 20    | 12.2%   | 20     | 12.2%   |
| imaging of the paranasal sinuses                               | 56    | 34.1%   | 29     | 17.7%   | 26        | 15.9%   | 30    | 18.3%   | 23     | 14.0%   |
| nasal endoscopy                                                | 79    | 48.2%   | 16     | 9.8%    | 34        | 20.7%   | 18    | 11.0%   | 17     | 10.4%   |
| <b>In allergy testing I use</b>                                |       |         |        |         |           |         |       |         |        |         |
| skin prick test                                                | 78    | 47.0%   | 15     | 9.0%    | 20        | 12.0%   | 30    | 18.1%   | 23     | 13.9%   |
| skin patch test                                                | 87    | 52.4%   | 18     | 10.8%   | 22        | 13.3%   | 19    | 11.4%   | 20     | 12.0%   |
| serum total IgE                                                | 66    | 39.8%   | 18     | 10.8%   | 38        | 22.9%   | 21    | 12.7%   | 23     | 13.9%   |
| serum eosinophilia                                             | 69    | 41.6%   | 17     | 10.2%   | 33        | 19.9%   | 26    | 15.7%   | 21     | 12.7%   |
| none of the above                                              | 101   | 60.8%   | 11     | 6.6%    | 21        | 12.7%   | 6     | 3.6%    | 27     | 16.3%   |
| <b>I treat allergic rhinitis patients with</b>                 |       |         |        |         |           |         |       |         |        |         |
| 1st generation oral anti-histamines                            | 14    | 8.4%    | 8      | 4.8%    | 43        | 25.9%   | 53    | 31.9%   | 48     | 28.9%   |
| 2nd generation oral anti-histamines                            | 10    | 6.0%    | 4      | 2.4%    | 30        | 18.1%   | 75    | 45.2%   | 47     | 28.3%   |
| oral anti-histamines + decongestants                           | 12    | 7.2%    | 6      | 3.6%    | 24        | 14.5%   | 53    | 31.9%   | 71     | 42.8%   |
| intranasal decongestant \ intranasal anti-histamine            | 9     | 5.4%    | 13     | 7.8%    | 37        | 22.3%   | 53    | 31.9%   | 54     | 32.5%   |
| intranasal decongestant \ intranasal anti-histamine            | 15    | 9.0%    | 16     | 9.6%    | 50        | 30.1%   | 39    | 23.5%   | 46     | 27.7%   |
| Leukotriene antagonists                                        | 46    | 27.7%   | 37     | 22.3%   | 41        | 24.7%   | 35    | 21.1%   | 7      | 4.2%    |
| oral corticosteroids                                           | 53    | 31.9%   | 41     | 24.7%   | 44        | 26.5%   | 17    | 10.2%   | 11     | 6.6%    |
| immunotherapy                                                  | 99    | 59.6%   | 31     | 18.7%   | 17        | 10.2%   | 12    | 7.2%    | 7      | 4.2%    |
| combination of anti-histamines and Leukotriene antagonists     | 64    | 38.6%   | 32     | 19.3%   | 36        | 21.7%   | 27    | 16.3%   | 7      | 4.2%    |
| combination of antihistamines and intranasal steroids          | 22    | 13.3%   | 24     | 14.5%   | 47        | 28.3%   | 40    | 24.1%   | 33     | 19.9%   |
| combination of leukotriene antagonists and intranasal steroids | 66    | 39.8%   | 33     | 19.9%   | 27        | 16.3%   | 27    | 16.3%   | 13     | 7.8%    |

**Table 5.** The relation between perception and demographic factors

|                     |                      | Perception            |         |                     |         | P-value |
|---------------------|----------------------|-----------------------|---------|---------------------|---------|---------|
|                     |                      | Inadequate perception |         | Adequate perception |         |         |
|                     |                      | Count                 | Row N % | Count               | Row N % |         |
| Gender              | Male                 | 40                    | 40.8%   | 58                  | 59.2%   | 0.002*  |
|                     | Female               | 12                    | 17.6%   | 56                  | 82.4%   |         |
| Nationality         | Saudi                | 27                    | 40.3%   | 40                  | 59.7%   | 0.040*  |
|                     | Non-Saudi            | 25                    | 25.3%   | 74                  | 74.7%   |         |
| Specialty training  | Intern               | 5                     | 45.5%   | 6                   | 54.5%   | 0.027*  |
|                     | General Practitioner | 35                    | 33.3%   | 70                  | 66.7%   |         |
|                     | Family Physician     | 3                     | 9.7%    | 28                  | 90.3%   |         |
|                     | Internal Medicine    | 4                     | 40.0%   | 6                   | 60.0%   |         |
|                     | Pediatrics           | 4                     | 80.0%   | 1                   | 20.0%   |         |
|                     | OB/Gyna              | 1                     | 33.3%   | 2                   | 66.7%   |         |
|                     | Otolaryngologist     | 0                     | 0.0%    | 1                   | 100.0%  |         |
| Experience Duration | Less than 10 years   | 40                    | 33.9%   | 78                  | 66.1%   | 0.085   |
|                     | 10-20 years          | 8                     | 22.2%   | 28                  | 77.8%   |         |
|                     | 20-30                | 1                     | 12.5%   | 7                   | 87.5%   |         |
|                     | > 30 years           | 3                     | 75.0%   | 1                   | 25.0%   |         |

because objective tests, like skin prick tests or serum IgE levels (12.0% and 13.9%, respectively), are essential for confirming allergic rhinitis diagnoses and distinguishing it from non-allergic forms (Table 4). This reliance on subjective assessment might contribute to diagnostic inaccuracies, potentially leading to underdiagnosis or misclassification of the condition. Enhanced integration of objective testing methods, as reflected in Table 4, could improve diagnostic precision and guide evidence-based management strategies.

A wide array of treatment options was reported, including oral antihistamines, intranasal decongestants/antihistamines, leukotriene antagonists, oral corticosteroids, and immunotherapy. Among these, second-generation oral antihistamines were frequently utilized, with 73.5% of participants indicating they often or always prescribed them (Table 4). Similarly, combinations of antihistamines and intranasal steroids were reported by 44.0% of participants as a preferred approach. However, the use of immunotherapy, despite its potential for disease modification, was notably low (11.4%) as detailed in Table 4.

This underutilization of immunotherapy may indicate a lack of awareness or confidence in its benefits. Additionally, while the treatments reported align with guidelines, there was limited discussion among participants regarding treatment outcomes or rationales. The frequency of medication use often appeared to be driven by patient compliance factors, such as adverse effects (40.4%), dosing frequency (53.0%), and route of administration (44.0%), rather than efficacy data (Table 3). These findings highlight the need for more nuanced discussions on treatment selection, aiming to balance guideline adherence with patient-centered care.

Table 5 examines the relationship between perception and demographic factors. The results indicate that there were significant associations between perception and gender ( $p=0.002^*$ , in favor for female gender), nationality ( $p=0.040^*$  with favor to non-Saudis), and specialty training ( $p=0.027^*$  with favor to family medicine physicians and Otolaryngologist). Specifically, male participants, Saudi nationals, and participants with specialty training in family medicine demonstrated a higher level of adequate perception compared to their counterparts.

## DISCUSSION

Allergic rhinitis is a common condition that affects a significant proportion of the population<sup>9-12</sup>. The purpose of this research was to determine how healthcare professionals perceive, feel, and

implement the appropriate treatment for allergic rhinitis. The findings provide insights into multiple facets pertaining to the participants' comprehension of the ailment, their methodology concerning diagnosis and treatment, and the possible impact of demographic variables on their viewpoint.

With regard to participants' perceptions, the majority indicated that they have knowledge of the ARIA and GINA guidelines. The discovery is favourable, given that guidelines furnish advice grounded in empirical data for the treatment of allergic rhinitis and asthma; hence, adherence to these recommendations may enhance patient outcomes<sup>13</sup>. Nevertheless, it is critical to mention that although the majority of the participants possessed knowledge of the recommendations, there were discrepancies in their understanding of critical concepts including the classification and severity of allergic rhinitis. This implies that additional knowledge and training are required in these domains so that a systematic strategy to diagnosis and management may be established. In general, the participants held favourable sentiments of allergic rhinitis. They acknowledged the utility of the ARIA guidelines in the classification of patients and reached a consensus about the inclusion of a novel subdivision of allergic rhinitis in said guidelines. This demonstrates a readiness to embrace strategies supported by evidence and remain informed about the most recent guidelines. In addition, participants recognized the significance of allergy testing and a typical medical history concordance in the diagnosis of allergic rhinitis which is similar to the results of some previous studies<sup>14,15</sup>. This underscores the recognition that a thorough methodology, encompassing objective testing as well as clinical assessment, is necessary for precise diagnosis.

Regarding the practices of the participants, it was discovered that clinical history and physical examination constituted the majority of the diagnostic criteria for allergic rhinitis. This aligns with recognized diagnostic protocols that underscore the criticality of doing a comprehensive clinical assessment<sup>16,17</sup>. However, it is crucial to acknowledge that certain individuals failed to fully employ objective testing methods, including nasal endoscopy and allergy testing which are considering important in diagnosis process<sup>18-20</sup>. A more consistent application of these diagnostic modalities could aid in the confirmation of the diagnosis and direct the selection of the most suitable treatment.

Participants utilized an assortment of therapeutic strategies, including immunotherapy, oral corticosteroids, intranasal decongestants/antihistamines, leukotriene antagonists, and oral antihistamines.

This illustrates the wide range of alternatives accessible for the management of allergic rhinitis, enabling medical practitioners to customize treatment strategies according to the unique attributes and inclinations of each patient<sup>21,22</sup>. Despite this, it is intriguing to note that just a minority of participants reported employing immunotherapy, a potentially disease-modifying treatment. This may suggest that there is a requirement for heightened consciousness and instruction concerning the advantages and suitable application of immunotherapy in the treatment of allergic rhinitis<sup>23,24</sup>. The underuse of immunotherapy may stem from several factors, including limited awareness of its benefits, lack of confidence in administering or recommending this modality, and perceived challenges such as cost, time investment, or patient compliance. **Additionally, the need for specialized training in administering immunotherapy and concerns about adverse reactions, particularly in resource-limited primary care settings, could contribute to this reluctance.**

Upon investigating the correlation between perception and demographic variables, the findings unveiled noteworthy correlations with regard to nationality, gender, and specialized education. In comparison to their counterparts, female participants, non-Saudi nationals, and individuals with specialty training in family medicine exhibited a greater degree of sufficient perception. Based on these findings, it appears that specific demographic variables might impact the comprehension and treatment of allergic rhinitis among healthcare practitioners<sup>14,25</sup>. When Developing Educational Interventions and Strategies to Enhance Perceptions and Behaviors Regarding Allergic Rhinitis, it Is Critical to Take into Account the Aforementioned Considerations<sup>26,27</sup>.

It is critical to recognize certain limitations that underlie this research. Initially, it should be noted that the research sample was restricted to healthcare workers from a particular geographic area, thus impeding the applicability of the results to different groups. Furthermore, self-reported data, which could potentially be influenced by recall bias or social desirability bias, were utilized in the study. In order to overcome these constraints, future investigations might incorporate a more heterogeneous sample and employ unbiased metrics to assess practices and perceptions.

## CONCLUSION

**In conclusion, this research enhances our comprehension of healthcare workers' perspectives, attitudes, and behaviors about allergic rhinitis. The results underscore the significance of continuous training and education in order to guarantee a uniform methodology for diagnosis and treatment. Healthcare providers have the potential to better the management of allergic rhinitis and improve patient outcomes by addressing the identified gaps in knowledge and practices.**

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