

Assessing knowledge, attitudes, and practices towards patients with allergic rhinitis

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KEYWORDS

allergic rhinitis,
attitude,
knowledge,
patients,
practice

ABSTRACT:

Introduction: Allergic rhinitis (AR) is a prevalent hypersensitivity reaction of the upper respiratory tract to allergens in the air. Upon inhalation, these microparticles trigger a type 1 hypersensitivity reaction in persons susceptible to specific allergens, explicitly targeting the nasal mucosa.

Objectives: This study aims to assess the knowledge, attitudes, and practices towards patients with allergic rhinitis.

Methods: This study employed an observational cross-sectional design. The study focused on people diagnosed with allergic rhinitis and ranged five months between January and May 2024. The questionnaire was generated and disseminated using a Google form, and the statistical analysis was performed with SPSS 22.0. In the univariable analysis, variables with P-values less than 0.05 were added to the multiple logistic regression analysis.

Results: The current study involved a total of 114 patients, and the results showed that patients with allergic rhinitis had a poor attitude, with sufficient knowledge and excellent practices towards allergic rhinitis. The correlation analysis revealed no statistically significant association between knowledge and attitude (correlation coefficient: -0.045, $P = 0.638$). Nevertheless, there was a noteworthy negative correlation between knowledge and practice, with a correlation coefficient of -0.214 and a p-value of 0.023. Additionally, there was a substantial direct association between attitude and practice, with a correlation coefficient of 0.295 and a p-value of 0.001.

Conclusions: Patients' knowledge, attitudes, and practices scores significantly varied by age, gender, and sources of rhinitis allergic. The results demonstrated that patients with allergic rhinitis had a poor attitude, with sufficient knowledge and excellent practices towards allergic rhinitis. These findings suggested that while knowledge and attitude might not always have a clear correlation with practice, having a good attitude could enhance the implementation of effective strategies for managing allergic rhinitis. Educational interventions should be developed to enhance the knowledge, attitude, and practices of those suffering from allergic rhinitis.

1. Introduction

Allergic rhinitis (AR) is a prevalent hypersensitivity reaction of the upper respiratory tract to allergens in the air. It can occur seasonally or throughout the year (Gu et al., 2023). Upon inhalation, these microparticles trigger a type 1 hypersensitivity reaction in persons susceptible to specific allergens, explicitly targeting the nasal mucosa. Consequently, the primary treatment for allergic rhinitis (AR) is allergen management and environmental controls, which are highly recommended in the treatment guidelines (Mengi et al., 2022).

While defining the exact incidence of AR is challenging, it is widely acknowledged as one of the most prevalent diseases today (Kef & Güven, 2020; Sultész et al., 2020). Moreover, the extent of AR's presence in Indonesia has not been recognized (Fakhriani et al., 2024). However, allergic rhinitis is estimated to be the most common allergic disease among children in several big cities in Indonesia, followed by atopic dermatitis and asthma. The main allergens of allergic rhinitis in Indonesia are dust mites (Endaryanto & Nugraha, 2021; Hafshah, 2021).

Several studies have documented that the present treatment for allergic rhinitis (AR) consists of antihistamines, steroids, montelukast, and immunotherapies. However, these treatments are accompanied by undesirable adverse reactions and provide a significant risk of allergic rhinitis relapse, especially in the presence of pollen (Ding et al., 2023). Poorly controlled AR can lead to complications, such as otitis media, chronic sinusitis, and conjunctivitis (Zhou et al., 2022).

Allergies have huge socioeconomic effects on individuals affected by them. Consequently, it is imperative to possess in-depth knowledge, a positive attitude, and healthy practices to prevent the long-term progression of allergic diseases (Ali Mohamed et al., 2023; Prasad et al., 2022). Knowledge, attitudes, and practice examinations facilitate the discovery of misconceptions that can be addressed explicitly in the future to enhance the subject's performance (Andrade et al., 2020). An in-depth knowledge of allergic rhinitis (AR) can enable patients to adopt suitable practices to reduce episodes' frequency and improve their prognosis. The patients' knowledge, attitudes, and practice of AR vary among countries (Abdullah et al., 2020; Al-Rasheedi, 2023; Bhargave et al., 2022; Rajasekaran & Ghosh, 2017).

Hence, this study aims to assess the knowledge, attitudes, and practices associated with allergic rhinitis in patients with allergic rhinitis.

2. Objectives

This study aims to assess the knowledge, attitudes, and practices towards patients with allergic rhinitis.

3. Methods

This study employed an observational, cross-sectional design. It utilized a self-administered questionnaire to collect data on knowledge, attitudes, and practices related to allergic rhinitis. The study focused on people diagnosed with allergic rhinitis and ranged five months between January and May 2024.

Patients aged 18 and older who have been diagnosed with allergic rhinitis, have been admitted to the ENT department, and have given their agreement to participate in the study are considered eligible. Patients who were seriously ill and mentally incapacitated to reply to the survey were omitted.

Due to the large population for this study, researchers employed the Cochran formula to determine the required number of research samples without understanding the population size. According to the sample calculation, the study requires 96 participants. However, a sample of 114 participants was taken for this study.

The questionnaire was derived from previous research conducted by Gu et al., (2023) and Retinasekharan et al., (2021). The questionnaire was generated and disseminated using a Google form. Participants were only allowed to complete the questionnaire once for each email account to guarantee accuracy. Forty participants were chosen randomly to conduct a validity and reliability test. The questionnaire's validity was assessed using the Pearson product-moment correlation coefficient. The correlation value of ≥ 0.361 was deemed valid. All knowledge, attitude, and practice questions showed strong validity. The reliability was assessed using Cronbach's Alpha formula, and it was determined to be reliable with a coefficient of at least 0.8. All knowledge, attitude, and practice questionnaires demonstrated high reliability. The assessment of validity and reliability was conducted in January 2024.

The knowledge dimension consists of 12 questions. The scoring scale ranged from 0 to 12 points; each correct answer gained 1 point, and incorrect responses gained 0 points. The attitude dimension consisted of nine questions that utilized a five-point Likert scale. The questions regarding positive attitudes were assigned numerical values on a scale of 1 to 5. Negative scores were assigned to questions about negative attitudes (items A1 and A4). The score ranged from 9 to 45 points. The practice component comprised nine questions, employing a five-point Likert scale that ranged from 1 point for never to 5 points for always. The score ranged from 9 to 45 points. Achieving scores exceeding 70% in each component demonstrates adequate knowledge, a favorable attitude, and proactive practice (Lee & Suryohusodo, 2022).

The statistical analysis was conducted using SPSS 22.0. The means standard deviation (SD) was used to display the knowledge, attitude, and practice scores. An assessment was conducted to see if the continuous components conformed to a normal distribution. The demographic information and the distribution of knowledge, attitude, and practice qualities were displayed as percentages (n%). Pearson's test examined the relationship between knowledge, attitude, and practice. In the univariable analysis, variables with P-values less than 0.05 were added to the multiple logistic regression analysis.

The Health Research Ethics Committee, Faculty of Medicine and Health Science, Universitas Muhammadiyah Yogyakarta, approved the research. The protocol number assigned to the study is No. 280/EC-KEPK FKIK UMY/XI/2023. Before participating in the study, all individuals were required to give informed consent.

4. Results

The current study involved a total of 114 patients. The majority consisted of females, at 64.9% of the total. The majority of the participants (64%) resided in urban areas. Approximately 44.7% of the participants reported an illness duration of less than three years, 53.5% underwent allergen testing, and

77.2% reported identifying their allergens. The participants' demographic characteristics are displayed in Table I.

Table 1. Characteristics of the participants

N (%)	Knowledge		Attitude		Practice	
		Score	P	Score	P	Score
Total	114	12,26 ± 1,48		32,83±4,162		36,21±5,265
Age			0,793		0,637	0,928
≤ 25 years	65 (57%)	1,58 ± 0,808		1,58 ± 0,808		1,58 ± 0,808
26 - 35 years	38 (33,3%)	1,58 ± 0,808		1,58 ± 0,808		1,58 ± 0,808
36 – 43 years	5 (4,4%)	1,58 ± 0,808		1,58 ± 0,808		1,58 ± 0,808
> 46 years	6 (5,3%)	1,58 ± 0,808		1,58 ± 0,808		1,58 ± 0,808
Gender			0,951		0,553	0,700
Male	40 (35,1%)	1,65±0,479		1,65±0,479		1,65±0,479
Female	74 (64,9 %)	1,65±0,479		1,65±0,479		1,65±0,479
Education			0,727		0,012	0,782
High school	24 (21,1%)	2,60±0,880		2,60±0,880		2,60±0,880
Diploma degree	4 (3,5%)	2,60±0,880		2,60±0,880		2,60±0,880
Bachelor degree	80 (70,2%)	2,60±0,880		2,60±0,880		2,60±0,880
Master degree	6 (5,3%)	2,60±0,880		2,60±0,880		2,60±0,880
Type of Job			0,414		0,002	0,088
Student	58 (50,9%)	2,49±1,751		2,49±1,751		2,49±1,751
Civil servant	7 (6,1%)	2,49±1,751		2,49±1,751		2,49±1,751
Teacher/Lecturer	9 (7,9)	2,49±1,751		2,49±1,751		2,49±1,751
Housewife	26 (22,8%)	2,49±1,751		2,49±1,751		2,49±1,751
Employee/Laborer	3 (2,6%)	2,49±1,751		2,49±1,751		2,49±1,751
Self-employed	11 (9,6%)	2,49±1,751		2,49±1,751		2,49±1,751
Residence			0,229		0,957	0,590
Rural	41 (36%)	1,64±0,482		1,64±0,482		1,64±0,482
Urban	73 (64%)	1,64±0,482		1,64±0,482		1,64±0,482
Duration of disease			0,533		0,057	0,001
< 3 years	51 (44,7%)	1,85±0,854		1,85±0,854		1,85±0,854
3-5 years	29 (25,4%)	1,85±0,854		1,85±0,854		1,85±0,854
> 6 years	34 (29,8%)	1,85±0,854		1,85±0,854		1,85±0,854
Allergen test			0,797		0,009	0,005
Yes	61 (53,5%)	1,46±0,501		1,46±0,501		1,46±0,501

No	53 (46,5%)	1,46±0,501	1,46±0,501	1,46±0,501	
Know your allergens			0,358	0,247	0,282
Yes	88 (77,2%)	1,23 ±0,421	1,23 ±0,421	1,23 ±0,421	
No	26 (22,8%)	1,23 ±0,421	1,23 ±0,421	1,23 ±0,421	
Like sports			0,360	0,009	0,001
Yes	85 (74,6%)	1,25±0,437	1,25±0,437	1,25±0,437	
No	29 (25,4%)	1,25±0,437	1,25±0,437	1,25±0,437	

Source: Authors

The age variable has a mean of 1.58 and a standard deviation of 0.808. The significant values for knowledge, attitude, and practice are 0.793, 0.637, and 0.928, respectively. The gender variable has a mean of 1.65 and a standard deviation of 0.479. The knowledge variable has a significance level of 0.951, the attitude variable has a significance level of 0.553, and the practice variable has a significance level of 0.700. The education variable has a mean value of 2.60 and a standard deviation of 0.880. The significant values for knowledge, attitude, and practice are 0.727, 0.012, and 0.782, respectively. The mean value of work is 2.49, with a standard deviation of 1.751. The significant values for knowledge, attitude, and practice are 0.414, 0.002, and 0.088, respectively. The location has a mean value of 1.64 and a standard deviation of 0.482. The significance for knowledge is 0.229, while the attitude is 0.957, and the practice is 0.590. The mean duration of symptoms is 1.85, with a standard deviation of 0.854. The significant values for knowledge, attitude, and practice are 0.533, 0.057, and 0.001, respectively.

The variable of allergic rhinitis, as shown by the allergy test, has a mean value of 1.46 and a standard deviation of 0.501. The significance values for knowledge, attitude, and practice are 0.797, 0.009, and 0.005, respectively. The allergen indicator has a mean value of 1.23 and a standard deviation of 0.421. The significant values for knowledge, attitude, and practice are 0.358, 0.247, and 0.282, respectively. In addition, the mean value for the indicator of liking sports is 1.25, with a standard deviation of 0.437. The significance for knowledge is 0.360, while the attitude has a value of 0.009, and the practice has a value of 0.001.

This study utilized multiple logistic regression and correlation analysis to assess the association between patients' knowledge, attitude, and practice about allergic rhinitis (Table 2). The multiple logistic regression analysis findings indicate no significant association between the allergy test and knowledge (adjusted odds ratio [adjOR]: 0.949, $P = 0.085$). However, a significant negative association exists between the allergy test and attitude (adjOR: 0.915, $P = 0.046$) and practice (adjOR: 0.919, $P = 0.020$). The presence of knowledge regarding allergies did not demonstrate a statistically significant correlation with knowledge (adjusted odds ratio: 1.120, $p = 0.466$), attitude (adjusted odds ratio: 0.950, $p = 0.386$), or practice (adjusted odds ratio: 0.976, $p = 0.976$). Participating in sports did not have a significant correlation with knowledge (adjusted odds ratio: 1.043, $p = 0.790$) and attitude (adjusted odds ratio: 0.906, $p = 0.115$). However, it indicates a significant negative association with practice (adjusted odds ratio: 0.891, $p = 0.017$).

Table 2. Multiple logistic regression analysis

	Knowledge		Attitude		Practice	
	adjOR (95%CI)	P	adjOR (95%CI)	P	adjOR (95%CI)	P
Allergens test						
Yes	0.949 (0.725 1.243)	0,085	0.915(0.827 1.012)	0.046	0.919(0.846 0.999)	0.020
No						
Know your allergens						
Yes	1.120 (0.825 1.521)	0.466	0.950 (0.845 1.067)	0.386	0.976 (0.892 1.068)	0.976
No						
Like sports						
Yes	1.043 (0.764 1.424)	0.790	0.906(0.801 1.024)	0.115	0.891(0.810 0.979)	0.017
No						

Source: Authors

The correlation analysis revealed no statistically significant association between knowledge and attitude (correlation coefficient: -0.045, P = 0.638). Nevertheless, there was a noteworthy negative correlation between knowledge and practice, with a correlation coefficient of -0.214 and a p-value of 0.023. Additionally, there was a substantial direct association between attitude and practice, with a correlation coefficient of 0.295 and a p-value of 0.001 (Table 3).

Table 3. Correlation analysis

	Knowledge	Attitude	Practice
Knowledge	1		
Attitude	-0.045 (p=0.638)	1	
Practice	-0.214(p=0.023)	0.295 (P=0.001)	1

Source: Authors

These findings suggest that while knowledge and attitude may not always have a clear correlation with practice, having a good attitude can enhance the implementation of effective strategies for managing allergic rhinitis. This study offers valuable insights into the determinants that impact patients' knowledge, attitudes, and practices, which could serve as a basis for more efficient health interventions.

5. Discussion

The majority of patients in this study were female, and their highest level of education was a bachelor's degree. This result is consistent with earlier studies showing that females are more likely to be proactive about their (Vera Cruz et al., 2023). Fifty percent of the participants are students who live in urban areas aged 26-35 years old. Research conducted by Nurhaliza & Imanto (2023) and Huang et al. (2024) indicates that boys have a higher prevalence of allergic rhinitis compared to girls (Huang et al., 2024; Nurhaliza & Imanto, 2023). Environmental factors, immunology, hormones, and genes impact the development of the allergic process and affect problems in both males and females. The crucial gender perspective, which marks a major turning point in research and clinical practice, was enhanced

by the understanding of the roles of sex and gender (Heindl et al., 2022). The innate and adaptive immune systems on nasal mucosal surfaces may be influenced by the increased production of sex hormones during menarche, menses, pregnancy, or the use of hormonal contraceptives, according to recent mechanistic studies. These factors may also play a role in converting IgE sensitization into clinical symptoms (Leffler et al., 2018; Widuri & Hidayat, 2022).

The type of work significantly impacts knowledge and practice results, with students performing higher. This study highlights the importance of focused educational interventions for patients with varying work backgrounds. Additionally, knowledge, attitude, and practice scores were linked to the length and severity of allergic rhinitis, indicating that patients with more severe and persistent symptoms could need more specialized attention. Based on the findings, specific strategies should be created for each occupational category. Additionally, patients should be included in collaborative decision-making activities to empower their treatment choices (Serhal et al., 2020). These are similar to earlier studies emphasizing the advantages of patient education and involvement in managing chronic conditions (Gordon et al., 2023; Sigurgeirsdottir et al., 2019).

The results showed that patients with allergic rhinitis had a poor attitude, with sufficient knowledge and excellent practices towards allergic rhinitis. The results of this study are in line with the study of Ali Mohamed et al. (2023), which revealed that there was a statistically significant positive correlation between the total knowledge score and the total practice score in the studied sample towards allergic rhinitis and a previous study by Al-Rasheedi, (2023) which reported a positive correlation between knowledge and practice scores (Ali Mohamed et al., 2023; Al-Rasheedi, 2023). It can be rationalized with people's knowledge about the disease, leading to good practices and handling; increasing information and knowledge makes the person handle and practice the disease well. However, the findings of this study contrast with the earlier research conducted by Gu et al., (2023) in China. Their analysis revealed that individuals with allergic rhinitis had limited knowledge and negative attitudes but displayed positive behaviours toward managing allergic rhinitis. Furthermore, Bhargave et al., (2022) discovered significant variations among nations regarding patient and physician knowledge, attitudes, and practices related to allergic rhinitis. The level of information, attitude, and practices among patients with allergic rhinitis in Saudi Arabia is inadequate (Al-Rasheedi, 2023). India and four Southeast Asian countries had comparable findings (Abdullah et al., 2020). Variations in research findings may arise from disparities in the overall health literacy of a community, educational levels, and the healthcare infrastructure, as well as the methodologies employed to evaluate knowledge, attitudes, and practices (Gu et al., 2023).

Good knowledge of the disease and its treatment is essential for people with a chronic condition. Conversely, poor knowledge can result in incorrect adherence to prescribed medicines and other consequences (Chauke et al., 2022). The finding is attributed to the fact that several participants might come from rural regions and need higher knowledge and understanding of various diseases. According to Chen (2019) study, rural residents had less access to several health information sources than urban residents, including health care providers, professionals, magazines, and radio. Compared to urban residents, they rarely use search engines to find health-related information (Chen et al., 2019). The present research conducted by Paul et al. (2020) identified a lack of knowledge of and standard disinformation related to allergic disorders among the general population, establishing the importance of enhancing awareness (Paul et al., 2020).

Our study's participants have poor attitudes, indicating that awareness and attitudes must be raised. This highlights the importance of developing successful educational programs focusing on attitudes and information acquisition to encourage patients to adopt healthier habits. Patient behaviour tends to be responsible when they understand the importance of their actions (F. Alves, 2024). Feedback about specific behaviours and positive experiences might help to reinforce this motivation. Adherence to recommended treatment and other health services depends on the attitudes and beliefs of the patient (Al-Rasheedi, 2023). Patients with allergic rhinitis need to be socialized with knowledge due to the high but poor correlation between allergy testing and attitude and practice. However, because of the distinct relationship and direct correlation, improving knowledge should also improve attitudes and practices. Therefore, educational interventions (such as brochures, videos, podcasts, etc.) should be developed to enhance the knowledge, attitude, and practices of those suffering from allergic rhinitis (Lu et al., 2024).

Good knowledge, attitudes, and practices of patients with allergic rhinitis will improve conditions and enhance therapeutic outcomes for those suffering from allergic rhinitis. Li et al., (2023) research shows allergic rhinitis can be attributed to house dust mites. Dust mites mostly live in beds, clothing, rugs, toys, and pets. If it is impossible to prevent dust mites completely, it is possible to minimize contact with them (Wongsa et al., 2022). Hence, it is essential to encourage excellent and good knowledge, attitudes, and practices among patients to constantly create a clean-living environment, reducing allergies for people with allergic rhinitis (Pham et al., 2023). Furthermore, ensuring cleanliness in the living environment or frequently accessed areas can also contribute to positive clinical outcomes when patients seek follow-up examinations for allergic rhinitis (Kennedy, 2024; Klain et al., 2024).

Besides medical treatment, people with allergic rhinitis require self-management strategies, including avoiding allergenic triggers and growing healthy habits in their daily activities (Pham et al., 2023). Tome's research in 2023 has established that managing allergic rhinitis involves environmental control through allergen avoidance, with triggering symptoms being the initial stage of the process (Tomé & Lourenço, 2023). People can also employ waterproof mattresses to prevent house dust mites, install air purifiers, and upgrade furniture and carpets. In addition, several guidelines recommend minimizing exposure by avoiding engaging in outdoor activities. Given that most patients in this study are students, engaging in activities outside the home is unavoidable for them.

Several different factors can explain students' notably high practice results. First, students frequently have strong family support, which may promote more proactive disease management and responsiveness to novel therapies. Furthermore, their frequent use of social media may help spread and absorb health information related to treating allergy disorders more efficiently. These results also highlight how crucial it is to change attitudes and disseminate information to encourage healthy behaviours in individuals with allergic rhinitis. The substantial indirect impact of knowledge on practice emphasizes the complexity of patient behaviour and the necessity of all-encompassing interventions that address attitude and knowledge. Implementing integrated educational programs that highlight these relationships and concentrate on changing attitudes is advised. Targeted behaviour change methods like inspired interviewing, cognitive-behavioural therapy, and psychosocial support should be used to address negative attitudes (Shin et al., 2022). Positive behaviours and patient outcomes in managing allergic rhinitis can be improved by promoting patient-centered decision-making and implementing long-term follow-up and reinforcement mechanisms (Small et al., 2018).

Hence, it is essential for people who have allergic rhinitis to engage in regular exercise and adhere to a healthy lifestyle and dietary regimen; lifestyle factors significantly impact allergic rhinitis (Zhou et al., 2022). Most participants in this study were in the early stages of allergic rhinitis. They had experienced symptoms for less than three years. Applying early preventive measures may reduce the risk of recurrent allergies. Most participants in this study who do physical activity saw it as beneficial. Engaging in regular physical activity can contribute to the preservation of overall well-being and boost the body's immune system (da Silveira et al., 2021). Nevertheless, most participants were unaware that the allergens activated the allergic reaction mechanism. It can function as a stimulus for reoccurring allergies during daily activities. Hence, engaging in social interactions with patients regarding the symptoms that manifest during an allergic reaction, the appropriate methods of managing it, and the factors that provoke the onset of allergies is crucial. Healthcare organizations should implement systematic monitoring and follow-up procedures to improve patient outcomes. Frequent examinations and evaluations can assist in monitoring patient development and addressing any difficulties or concerns they might have while undergoing therapy. Healthcare providers can also emphasize treatment recommendations and inform patients about the significance of treatment adherence during these follow-up meetings. Patients must also be motivated to control their conditions and actively pursue knowledge.

6. Conclusion and future scope

The results demonstrated that patients with allergic rhinitis had a poor attitude, with sufficient knowledge and excellent practices towards allergic rhinitis. The correlation analysis revealed no statistically significant association between knowledge and attitude, negative correlation between knowledge and practice, and a substantial direct association between attitude and practice. These findings suggested that while knowledge and attitude might not always have a clear correlation with practice, having a good attitude could enhance the implementation of effective strategies for managing allergic rhinitis. Educational interventions should be developed to enhance the knowledge, attitude, and practices of those suffering from allergic rhinitis.

The present research depends on several limitations, one of which is the inclusion of patients exclusively from one hospital, resulting in a restricted geographical scope for the study. Moreover, the majority of participants in this study were female, thus introducing bias in both patient responses and research findings. Despite these limitations, the study offers insightful information about patient attitudes, knowledge, and practices related to allergic rhinitis, providing the basis for focused treatments to improve patient awareness. This limitation indicates a future research topic that could significantly advance allergic rhinitis management strategies.

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