Original Article

Allergic Rhinitis in Ghana: Knowledge, Prevention, and Management Among Community Residents

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ABSTRACT

Background: Allergic rhinitis is a common comorbidity associated with respiratory illnesses, including asthma, sinusitis, and otitis media with effusion, and significantly impacts patients' quality of life. This study aimed to assess the knowledge, preventive practices, and management of allergic rhinitis among residents of Santasi-Apire in the Ashanti Region, Ghana.

Methods: A descriptive cross-sectional study was conducted using a quantitative approach. The target population consisted of individuals aged 15 years and above residing in Santasi-Apire. A total of 100 participants were recruited through convenience sampling. The inclusion criteria included permanent residents aged 15 years or older; individuals with cognitive impairments or those who declined consent were excluded. Data were collected using a structured questionnaire based on the study objectives, which covered variables such as knowledge, preventive measures, and management practices related to allergic rhinitis. Ethical approval was obtained from the Kumasi Metropolitan Health Directorate. Data were analyzed using SPSS version 20.0, with results presented as frequencies and percentages.

Results: A total of 48% of respondents misidentified allergic rhinitis as a common cold. Dust was identified as the most prevalent trigger (70%), followed by perfume (22%), pollen (5%), hay (3%), certain foods (3%), and specific drugs (2%). About 65% of participants reported avoiding dusty environments and smoke, while 15% did not engage in any preventive behavior. Sprinkling water on roads to reduce dust was the most commonly practiced preventive measure (52%). In terms of management, 47% used antihistamines, and 39% relied on over-the-counter medications. A minority (2%) reported no form of management.

Conclusion: The study indicates that dust is the primary trigger of allergic rhinitis among Santasi-Apire residents, who predominantly experience rhinorrhea as a symptom. While community members recognize allergic rhinitis as a serious condition, their efforts to prevent and manage it largely rely on environmental control and self-medication. Strengthening public health education on evidence-based management and clinical evaluation is recommended.

Keywords: Rhinitis, Allergic; Respiratory Tract Diseases; Self Medication; Dust; Ghana.

Implications for Practice:

- Public health education on allergic rhinitis should address common misconceptions and promote evidence-based prevention and management strategies to improve patient outcomes.
- Community-based interventions targeting environmental triggers, such as dust control measures, can

Implications for Practice:

reduce the incidence and severity of allergic rhinitis.

- Training primary healthcare providers to recognize and manage allergic rhinitis effectively can prevent complications and improve quality of life.
- Incorporating allergic rhinitis screening into routine community health outreach may facilitate early detection and reduce long-term healthcare burdens.
- Policy advocacy for infrastructure improvements, such as paving dusty roads, may serve as a preventive public health measure in high-risk communities.

Introduction

Allergic rhinitis (AR) is a chronic inflammatory condition of the nasal mucosa triggered by immunoglobulin E (IgE)-mediated responses to environmental allergens, such as pollen, dust mites, or mold (Bousquet et al., 2020; Siddiqui et al., 2022). Globally, AR is one of the most common atopic conditions and continues to rise in prevalence, representing a significant public health concern (Czech et al., 2023). The World Allergy Organization (WAO) notes that AR not only compromises upper airway function but also contributes to the pathogenesis of several lower respiratory tract diseases such as asthma, rhinosinusitis, and otitis media with effusion, thereby worsening their clinical severity and impacting patients' quality of life (Ponda et al., 2023; Y. Zhang et al., 2021).

Although AR is often regarded as a non-life-threatening condition, its chronicity and complications are substantial. Uncontrolled AR is associated with sleep disturbance, impaired cognitive performance, decreased work and school productivity, and increased susceptibility to secondary complications such as sinusitis, otitis media, nasal polyposis, and even orthodontic malocclusion (Schuler Iv & Montejo, 2021; Y. Zhang et al., 2022). Despite these implications, AR is frequently underestimated by both patients and healthcare providers, especially in low- and middle-income countries (LMICs), where limited attention is given to its diagnosis, management, and impact (Mazur et al., 2023; Nappi et al., 2022)

Multiple factors have been proposed to explain the increasing trend of AR worldwide, including urbanization, environmental pollution, changes in lifestyle, stress, and prolonged exposure to allergens and irritants (Bayar Muluk & Cingi, 2023; Moitra et al., 2023). While the global burden is well-documented, the exact etiology and prevalence of AR remain underexplored in many developing countries, particularly in sub-Saharan Africa, where healthcare infrastructure and environmental control measures may be limited.

In Ghana, anecdotal and clinical reports indicate a rising trend in respiratory tract infections, particularly in peri-urban areas such as Santasi-Apire in the Ashanti Region. The community has voiced concerns about worsening respiratory symptoms allegedly linked to prolonged exposure to unpaved, dusty roads. This growing unrest highlights a potential environmental determinant of AR that has received minimal empirical attention. Despite similar findings being reported in other parts of the world, a critical research gap remains in characterizing the epidemiology, community perceptions, and self-management strategies of AR in local Ghanaian contexts.

This study is grounded in the biopsychosocial framework, which recognizes the interplay among biological susceptibility (e.g., genetic and immune responses), environmental exposure (e.g., dust and allergens), and behavioral components (e.g., preventive practices and treatment-seeking behavior) in shaping

health outcomes. In alignment with this framework, the study explores how exposure to environmental irritants affects both awareness and coping strategies for allergic rhinitis, thereby linking individual knowledge and actions to broader environmental and policy issues (Glenn et al., 2022; Ozoh et al., 2023).

This study aimed to assess the knowledge, preventive practices, and management of allergic rhinitis among inhabitants of Santasi-Apire, Ashanti Region, Ghana. The study aims to generate context-specific evidence that can inform public health interventions and environmental policy, particularly in relation to urban planning and dust control strategies.

Methods

Study Design

This study employed a descriptive cross-sectional survey design using a quantitative approach. The cross-sectional method allowed the researchers to identify associations between dependent and independent variables without manipulating them. It was considered suitable due to its cost-effectiveness, shorter data collection period, and efficiency in providing a snapshot of the population's characteristics and the prevalence of allergic rhinitis.

Participants

The study was conducted in Santasi-Apire, a peri-urban community located within the Kumasi Metropolis in the Ashanti Region of Ghana. The area was purposively selected due to increasing complaints from residents regarding respiratory symptoms they associate with the dusty, poor road conditions. Kumasi is situated approximately 270 kilometers north of the capital city, Accra, within the transitional forest zone, and has an elevation ranging from 250 to 300 meters above sea level. Santasi-Apire is one of 13 communities in the metropolis and was considered ideal for this research due to its demographic characteristics and environmental risk factors.

The target population consisted of residents aged 15 years and above. This criterion was chosen based on evidence indicating that up to 80% of allergic rhinitis symptoms manifest before the age of 20. The estimated population of Santasi-Apire is 2,825 individuals. A total sample size of 100 participants was selected using a convenience sampling strategy. Participants were chosen based on their availability and willingness to participate, making this approach suitable for exploratory community-based studies, especially when time and resources are limited. The inclusion criteria were residents aged 15 years or older who had lived in the community for at least six months. Individuals unable to provide informed consent or with known cognitive impairments that would interfere with questionnaire completion were excluded.

Instruments

The primary data collection instrument was a structured questionnaire developed by the researchers to achieve the study's objectives. The questionnaire included both open-ended and closed-ended questions and was divided into four main sections: demographic data, knowledge of allergic rhinitis, preventive practices, and management strategies. To ensure the reliability and appropriateness of the instrument, a pre-test was conducted with ten individuals in Kenyasi Market Centre who shared similar demographic characteristics with the target population. The research supervisor reviewed the questionnaire's content for face and content validity. The pre-test helped refine the questionnaire in terms of language, clarity, and cultural sensitivity. Although the researchers developed the instrument, no

formal psychometric validation was undertaken. Permission for adaptation was not required as the tool was not adopted from a previous study.

Data Collection

Data collection took place over two weeks and was carried out solely by the two principal researchers, both of whom are qualified ENT nurses. Questionnaires were administered face-to-face, and when necessary, researchers read the questions aloud to participants and assisted them in recording their responses, particularly for those with low literacy. Ample time was given for participants who needed it.

Data Analysis

Collected data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic and outcome variables. Results were presented using tables and charts to provide a clear overview of trends and patterns within the study population. The analysis focused on answering the research objectives concerning the knowledge, preventive practices, and management of allergic rhinitis among residents of Santasi-Apire.

Ethical Considerations

Ethical clearance for this study was obtained from the ENT Nursing School in Kumasi, in collaboration with the Kumasi Metropolitan Health Directorate. A formal letter of introduction was provided to local authorities in Santasi-Apire, and verbal informed consent was obtained from all participants. Participation was voluntary, and respondents were assured of the confidentiality and anonymity of their responses. Participants were informed of their right to withdraw from the study at any time without any repercussions.

Results

The demographic characteristics of both the infant and the caregiver, which were considered in this study, included gender, age, marital status, level of education, occupation, and religion. As presented in Table 1, 38 (38%) of the respondents were males, and 62 (62%) were females. Again, eight respondents representing 8% aged between 15 – 19 years, 30 respondents representing 30% aged between 20 – 29 years, 41 respondents representing 41% were in the age range of 30 -39 years, while, 21 respondents representing 21% were in the age range of 40 to 60 years. Out of the 100 participants sampled, 25(25%) were single, 73(73%) were married and 2(2%) were separated.

Moreover, 12 (12%) of the participants did not have formal education, 56 (56%) had basic education, 19 (19%) had secondary education, and 13 (13%) had tertiary education. Of the 100 participants, 2(2%) were unemployed, 7(7%) were Civil/Public servants, 49(49%) were businessmen and women and traders, 5(5%) were farmers, and 37(37%) were students. However, 24 (24%) of the participants worshipped at Roman Catholic churches, 21 (21%) worshipped at Pentecostal churches, 43 (43%) worshipped at Christian churches, and 12 (12%) were Muslims **(Table 1).**

Table 1. Demographic Characteristics of Respondents (n = 100)

Characteristics	Response	Frequency	Percentage (%)
Gender			
	Male	38	38.0
	Female	62	62.0
Age Group (in years)			
	15 – 19	8	8.0
	20 – 29	30	30.0
	30 – 39	41	41.0
	40 – 60	21	21.0
Marital Status			
	Single	25	25.0
	Married	73	73.0
	Separated	2	2.0
Level of education			
	No Formal Education	12	12.0
	Basic Education	56	56.0
	Secondary	19	19.0
	Tertiary	13	13.0
Occupation			
	Unemployed	2	2.0
	Civil/Public servant	7	7.0
	Business/Trading	49	49.0
	Farming	5	5.0
	Schooling	37	37.0
Religion			
	Catholic	24	24.0
	Pentecostal/Charismatic	21	21.0
	Other Christian	43	43.0
	Islamic	12	12.0

This section covered the knowledge of allergic rhinitis among inhabitants of Santasi-Apire of the Ashanti region. **Figure 1** illustrates the frequency of allergic rhinitis episodes per year. Among the inhabitants, 35% indicated that they did it once a year, 43% said twice a year, 17% said three times a year, and 5% indicated four times a year.

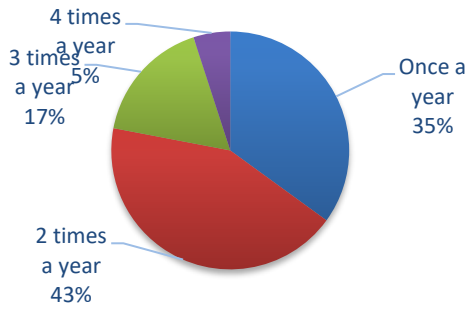

Figure 1. How Often Do Participants Experience Allergic Rhinitis in a Year?

The pie chart **Figure 2** indicated that 10% of the inhabitants said Allergic Rhinitis is an inflammatory response to repeated exposure to an allergen, 48% of the inhabitants said Allergic Rhinitis is the same as a common cold, 13% said Allergic Rhinitis is running nose, 20% of the participants disclosed that Allergic Rhinitis is also called catarrh. In comparison, 9% had no idea about allergic rhinitis.

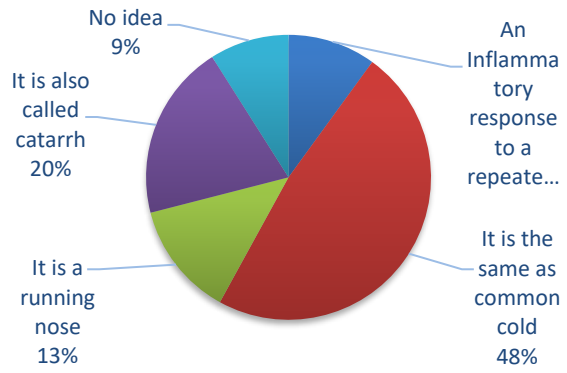

Figure 2. What is Allergic Rhinitis?

Table 2 presents data on the respondents' knowledge of allergic rhinitis triggers: a majority, 70 (70%), identified dust as a key trigger. Additionally, 22 (22%) cited perfume, 5 (5%) reported pollen, 3 (3%) mentioned hay, 3 (3%) identified certain foods, and 2 (2%) pointed to specific drugs as potential triggers. Regarding the signs and symptoms of allergic rhinitis, 75% (75) of participants recognised rhinorrhea as the most common symptom. Other reported symptoms included fever (70%), sneezing (63%), headache (68%), itchy nose (57%), and coughing (45%). Only 20 (20%) of respondents identified catarrh as a symptom.

The study also assessed knowledge of life-threatening conditions associated with allergic rhinitis. Of the 100 participants, 35 (35%) reported intense bronchospasm, 45 (45%) cited laryngeal oedema, and 40 (40%) identified cyanosis as potential complications. Furthermore, 47 (47%) mentioned hypotension, 25 (25%) mentioned death, and 12 (12%) identified anaphylactic shock as a possible severe outcome of allergic rhinitis.

Table 2 outlines how inhabitants of Santasi-Apire manage the dusty conditions in their area. Among the respondents, 52 (52%) reported sprinkling water on nearby roads to suppress dust, and 43 (43%) used nose masks when going outdoors. However, 5 (5%) did not engage in any of these protective behaviors.

Regarding other preventive measures, 20 (20%) of respondents reported using steam inhalation, 65 (65%) stated that they actively avoided dusty environments and smoke, while 15 (15%) indicated that they did not adopt any additional preventive strategies.

Finally, the study explored participants' perceptions of whether exposure to triggers of allergic rhinitis could exacerbate asthma conditions. Among the respondents, 20 (20%) strongly agreed with this assertion, 15 (15%) agreed, and 65 (65%) disagreed.

Table 2. Knowledge of Triggers, Symptoms, Life-Threatening Conditions, and Preventive Measures of Allergic Rhinitis (n = 100)

Variable	Response	Frequency	Percentage (%)
Some of the Triggers of Allergic Rhinitis	Dust	70	70
	Hay	3	3
	Perfume	22	22
	Pollen	5	5
	Certain Drugs	2	2
	Certain Food	3	3
Some of the Signs and Symptoms of Allergic Rhinitis	Fever	70	70
	Sneezing	63	63
	Catarrh	20	20
	Rhinorrhea	75	75
	Coughing	45	45
	Itchy nose	57	57
	Headache	68	68
Some of the Life-Threatening Conditions of AR	Intense Bronchospasm	35	35
	Laryngeal Edema	45	45
	Cyanosis	40	40
	Hypotension	47	47
	Anaphylactic shock	12	12
	Death	25	25
Dealing with the Dusty Nature in their Area	Sprinkle water on the part of the road closer to us	52	52

Variable	Response	Frequency	Percentage (%)
	Use a nose mask anytime you go out due to the dusty nature of the road	43	43
	None of the above	5	5
Other Ways You Can Prevent Allergic Rhinitis	We do steam inhalation	20	20
	Nothing	15	15
	Avoid as much as possible dusty areas and smoke	65	65
Exposure to the Triggers Can Exacerbate Asthma	I strongly agree	20	20
	I agree	15	15
	Disagree	65	65

The diagram in **Figure 3** assessed the level of agreement that allergic rhinitis is sometimes life-threatening. Out of the 100 cases, 60% of the inhabitants of Santasi-Apire reported that they strongly agree, while 40% of them considered allergic rhinitis to be sometimes life-threatening.

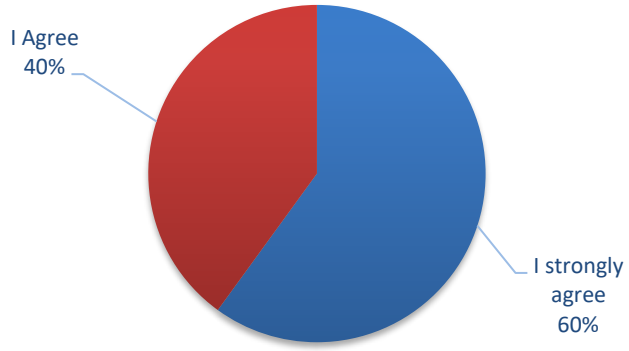

Figure 3. Do you agree that Allergic Rhinitis can be Life Threatening Sometimes?

This section examined the management of allergic rhinitis among the inhabitants of Santasi-Apire. Four questions were used to explore the management of allergic rhinitis. The first question aimed to determine how respondents manage allergic rhinitis. From **Figure 4,** 22(22%) of the respondents answered that they use the traditional method, 37(37%) of the respondents use hospital prescription, 39(39%) of the respondents used over-the-counter medicines, meanwhile, 2(2%) of the respondents do not manage allergic rhinitis at all.

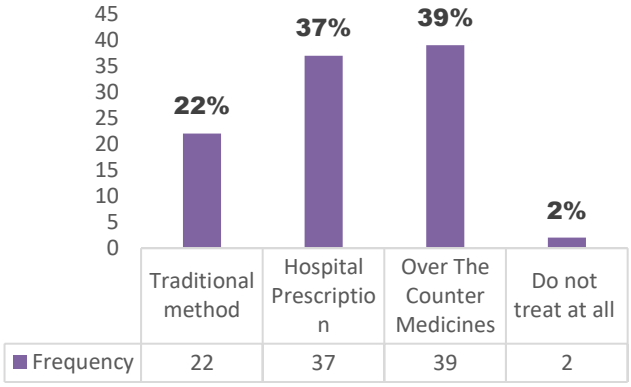

Figure 4. How do you Manage Allergic Rhinitis?

From **Figure 5,** it can be observed that out of the 100 respondents, 11% use antibiotics in managing allergic rhinitis, 47% use Antihistamines in managing allergic rhinitis, while 42% use nasal decongestants in the management of allergic rhinitis.

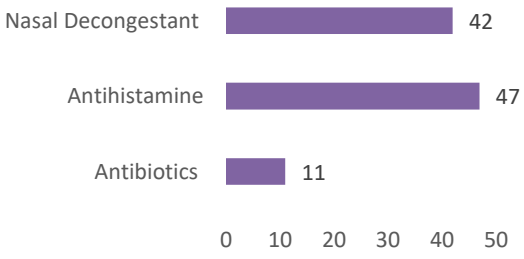

Figure 5. Which Category of Drug do you Usually Use in Managing Allergic Rhinitis?

Results from the bar graph below indicate that 78% of Santasi-Apire inhabitants strongly agreed that avoiding triggers of allergic rhinitis is the most effective management option. In comparison, 22% of the participants agreed that avoiding triggers of allergic rhinitis is the best management option (**Figure 6**).

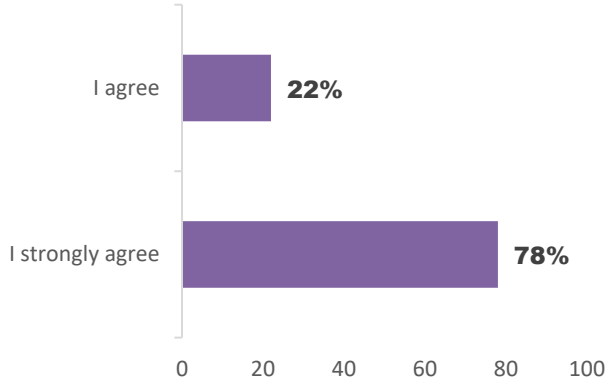

Figure 6. Do you agree that avoiding the Triggers of Allergic Rhinitis is the Best Management Option?

Figure 7 illustrates whether there is a clinic within the inhabitants' environment that specializes in managing only ENT conditions. Of the 100 respondents sampled, 58% reported no clinic, while 42% indicated that there is a clinic that manages only ENT conditions.

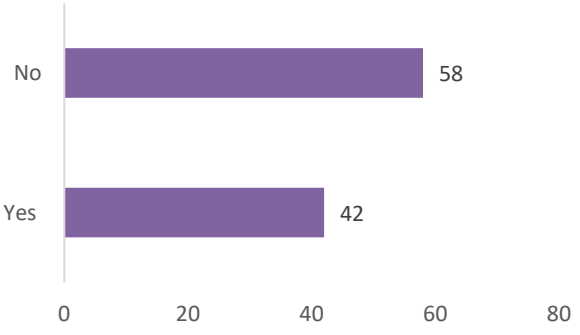

Figure 7. Is there a clinic within your Environs that Manages Only ENT Conditions?

This section demonstrated the preventive measures for allergic rhinitis among the inhabitants of Santasi-Apire. From the pie chart in **Figure 8**, 95% of the Santasi-Apire inhabitants were exposed to a dusty environment. In comparison, only 5% of the Santasi-Apire inhabitants were not exposed to a duty environment.

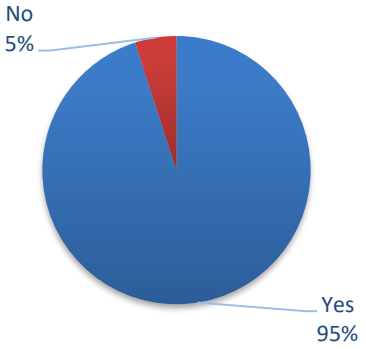

Figure 8. *Are You Exposed to a Dusty Environment?*

Discussion

This section presents the major findings of the study, contextualized within the framework of existing literature and theories. The discussion is structured around the core themes of knowledge, management, and preventive measures of allergic rhinitis among residents of the Santasi-Apire community. The findings provide valuable insights into the community's understanding and response to allergic rhinitis, highlighting areas of both alignment and divergence with previous research.

The study explored the knowledge of allergic rhinitis among community members aged 15 years and above. A significant proportion of the participants held the misconception that allergic rhinitis is the same as the common cold, indicating a gap in public awareness. This is inconsistent with the medical definition by Brożek et al., who described allergic rhinitis as an IgE-mediated inflammation of the nasal mucosa caused by allergen exposure (Hua et al., 2022; X. Zhang et al., 2023). The misinterpretation among participants may stem from the overlapping symptoms between allergic rhinitis and upper

respiratory infections. Consistent with other studies, dust was identified as the predominant trigger for allergic rhinitis in the study area. Established dust as a major environmental factor exacerbating allergic responses (Liu et al., 2023; Sharma et al., 2024).

Furthermore, while the community demonstrated general knowledge of symptoms such as sneezing, coughing, and headaches, rhinorrhea emerged as the most recognised symptom, a finding supported by Wheatley et al., who emphasized rhinorrhea as a key manifestation of the disease. Interestingly, a substantial number of participants perceived allergic rhinitis as a potentially life-threatening condition. This perception is supported by Justiz et al., who reported that individuals with allergic rhinitis may experience debilitating symptoms that, if not managed properly, could lead to complications. Reports of hypotension as a perceived severe consequence reflect broader concerns about comorbidities, although such associations require further clinical validation, as noted by Valenta et al.

The study found that most participants primarily relied on over-the-counter medications and antihistamines to manage their allergic rhinitis. This reflects a preference for accessible and immediate relief options, although it diverges from recommendations that emphasize prescription-based treatments such as cetirizine or loratadine (Bernstein et al., 2024; Gupta & Anari, 2022). Nonetheless, the use of antihistamines aligns with broader clinical trends noted in recent literature, which favour second-generation antihistamines due to their efficacy and reduced side effects. Avoidance of known allergens was widely practised among participants, with many opting to minimise their exposure to dust and smoke. Allergen avoidance is a cornerstone in allergic rhinitis management. This proactive approach suggests a growing awareness of environmental control strategies within the community.

Preventive efforts among the community included practical strategies such as sprinkling water on dusty roads and avoiding polluted areas. These grassroots measures underscore the community's adaptive behaviors in the absence of formal health interventions. However, such practices differ from those in developed contexts (He et al., 2022; Rosenthal et al., 2024). Identified anti-dust-mite sprays as the preferred preventive tool. Furthermore, not all community members engaged in preventive behaviours, highlighting gaps in public health education. While some literature, such as the study by Alreshidi et al., reported poor adherence to preventive practices in other settings, the current study found a more favorable pattern of behavior, suggesting the influence of local environmental conditions and possibly targeted health messaging within the community.

This study contributes new insights into the lived experiences, perceptions, and behavioral responses to allergic rhinitis within a peri-urban Ghanaian community. It underscores the persistence of misconceptions about the condition and the community's reliance on self-management strategies. While confirming certain established patterns—such as dust as a primary trigger and the use of antihistamines—it also reveals local adaptations and interpretations that may challenge standardized clinical frameworks. These findings highlight the importance of context-specific health education and suggest a need for improved diagnostic awareness.

The study's findings must be interpreted within the limitations of its design. The use of convenience sampling and a relatively small sample size limits the generalizability of the results. In addition, the lack of psychometric validation for the data collection instrument may affect the

reliability of the responses. The reliance on self-reported data is also subject to recall bias and social desirability bias.

The findings suggest several implications for practice and research. Health education campaigns tailored to distinguish allergic rhinitis from common colds could enhance community knowledge and encourage timely medical consultations. Local health authorities should consider integrating environmental interventions, such as dust control measures, into urban planning. Future research should employ larger, randomized samples and validated instruments to enhance generalizability. Furthermore, public health strategies should include training for community health workers on the identification and management of allergic rhinitis, ensuring early intervention and reducing disease burden.

Relevance to Clinical Practice

The findings of this study have important implications for clinical practice by enhancing the diagnosis, treatment, and overall care of patients with allergic rhinitis, particularly in resource-limited settings. By uncovering common misconceptions—such as confusing allergic rhinitis with the common cold—the study highlights the need for improved diagnostic awareness and patient education, which can lead to more accurate clinical assessments and better health outcomes. The reliance on over-the-counter medications underscores the need for healthcare providers to offer clearer guidance on treatment options, encouraging safer and more effective use of antihistamines and other therapies. Clinicians can incorporate locally practiced environmental control strategies, such as dust avoidance, into patient counseling and care plans, thereby improving adherence and prevention. These insights also support updates to clinical protocols by emphasizing early identification and community-based interventions, contributing to a more efficient workflow and enhancing patient safety. Furthermore, the findings can inform healthcare policies and professional training programs, reinforcing the importance of culturally relevant education for both patients and healthcare workers to strengthen the management of allergic rhinitis across diverse clinical settings.

Conclusion

This study addressed the research objectives and hypotheses, revealing key findings about the knowledge, management, and preventive measures of allergic rhinitis among residents of the Santasi-Apire community. The results support the initial assumptions that there are significant gaps in understanding and variations in the management of allergic rhinitis, while also highlighting the community's adaptive strategies in the absence of structured healthcare interventions. These findings provide a better understanding of how allergic rhinitis is perceived and handled in peri-urban settings, shedding light on the socio-environmental factors that influence patient behavior and outcomes. It is recommended that targeted health education programs be implemented to correct misconceptions, promote accurate diagnosis, and encourage appropriate treatment-seeking behavior. Furthermore, integrating environmental management strategies into public health planning and training community health workers in allergic rhinitis care could improve early intervention, reduce symptom burden, and enhance overall health outcomes in similar contexts.

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CrediT Authorship Contributions Statement
Cecilia Opoku Agyemang: Conceptualization, Methodology, Supervision, Writing – Original Draft.
Olivia Nyarko Mensah: Data Collection, Validation, Writing – Review & Editing.
Albert Opoku: Data Collection, Formal Analysis, Visualization.
Linda Agyenim Boateng: Data Curation, Writing – Review & Editing.
Kwakye Shadrack: Project Administration, Resources.
Oscar Agyemang Opoku: Supervision, Final Review, Approval of Manuscript.

Conflicts Of Interest
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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