

Allergic Rhinitis among the Inhabitants of Santasi-Apire in the Ashanti Region, Ghana

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ABSTRACT

Allergic rhinitis often co-occurs with common illnesses, such as rhinosinusitis, asthma, and otitis media with effusion, which significantly contributes to the severity of these conditions and negatively impacts the individuals' quality of life. Additionally, the pathogenesis of most upper and lower respiratory illnesses is affected by the presence of allergic rhinitis, according to the World Allergy Organization (WAO). The study aimed to assess the knowledge, prevention, and management of Allergic Rhinitis among inhabitants of Santasi-Apire in the Ashanti Region, Ghana. The study was a descriptive cross-sectional study with a quantitative technique. The target population was inhabitants aged 15 years and above. A sample size of 100 was selected for the study using a stratified sampling method. Ethical clearance was sought from Kumasi Metropolitan and the health directorate Committee for data collection using both open and closed types of questionnaires which were structured according to the objectives of the study. Data collected were collated, compiled, and analyzed using Statistical Package for Social Science Software (SPSS) version 20.0 and results were presented in the form of tables and charts according to their frequencies and percentages. The study discloses that most Allergic Rhinitis cases are triggered by dust, of which rhinorrhea the most is evidenced as the sign and symptom. Inhabitants of the Santasi-Apire community know that allergic rhinitis is a life-threatening condition. However, sprinkling water, avoidance of dusty areas, smoking, and triggers of allergic rhinitis are the preventive measures used by Santasi-Apire inhabitants.

Keywords

Allergic rhinitis
Inhabitants
Knowledge
Prevention
Santasi-Apire

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Introduction

Allergic rhinitis (AR) is a condition of the nasal mucosa primarily defined by a complicated IgE-mediated inflammatory response to recurrent exposure to an external protein that induces hypersensitivity [1]. It is often linked to comorbidities such as asthma, rhinosinusitis, and otitis media with effusion, which exacerbate disease severity and significantly impair patients' quality of life. Globally, the rise in AR cases has been attributed to factors such as urbanization, pollution, and climate change, which increase exposure to allergens [2]. Reh and Poetker [3] stated that AR is the most prevalent atopic condition. Consequently, it has emerged as a significant public health issue due to its escalating occurrence globally. Kim et al. [1] observed that AR coexists with prevalent conditions such as rhinosinusitis, asthma, and otitis media with effusion, greatly exacerbating the severity of these ailments and impacting patients' quality of life. Furthermore, the pathophysiology of the majority of upper and lower respiratory diseases is influenced by the existence of AR [4]. Despite being classified as a benign chronic condition of the upper airway, its impact on quality of life indicates that it can inflict functional damage beyond that of heart disease and asthma [5]. The uncontrolled short- and long-term effects may encompass sleep deprivation, learning deficits, diminished cognitive function, poor quality of life, sinusitis, otitis media, nasal polyposis, turbinate hypertrophy, respiratory infections, and orthodontic malocclusions [6].

Meltzer et al. [7] found in their study that the complete etiology of this atopic condition remains unclear. They proposed numerous variables contributing to allergy sensitization, including lifestyle changes, increased exposure to allergens, pollution, irritants (such as smoke and gas), and stress. While AR may not be deemed life-threatening, its impact on quality of life, particularly sleep disturbances caused by nasal flare-ups, can significantly diminish productivity. Currently, it is believed that AR affects up to 40% of the global population, with a larger frequency observed in industrialized nations like Ghana. This underscores the necessity to investigate the trend in our context to identify enduring solutions.

Untreated AR can severely impact an individual's quality of life. AR has been consistently devalued and overlooked over the years, despite its prevalence, chronic nature, and the significant burden it imposes on individuals and society. Individuals with Allergic

Rhinitis have received little care, as it is perceived as a trivial health issue [8]. Individuals globally, from many origins, have Allergic Rhinitis [9]. The condition adversely affects the patient's life and, as an upper airway disease, if inadequately managed, may predispose the patient to rhinosinusitis, otitis media, nasal polyps, allergic conjunctivitis, and hearing loss.

Researchers from the Bugando Medical Centre in Tanzania have observed that Allergic Rhinitis and its associated comorbidities are prevalent issues, exhibiting a rising tendency over the previous three years. However, it fails to garner the attention it warrants from patients, families, and healthcare professionals, particularly in underdeveloped nations [10]. The prevalence and potential etiological variables of AR remain inadequately characterized in most developing nations. Research has also been conducted on patients' perceptions of their condition, attitudes, lifestyles associated with AR, and their satisfaction with therapy [11]. Also, the inhabitants of Santasi-Apire have mounted pressure through demonstrations on the current government due to the sudden increase in respiratory tract infections among them in recent times. They believe this could be a result of the dusty road in the area hence the government has to fix it as soon as possible. Therefore, knowing the trend, its triggers, and complications in this setting will go a long way in informing governmental decisions on policies such as imminent road constructions in dust-prone areas such as the setting for this research. The study aimed to assess the knowledge, prevention, and management of Allergic Rhinitis among inhabitants of Santasi-Apire in the Ashanti Region, Ghana.

Material and Methods

A. Research Design

A cross-sectional survey design was utilized for the quantitative study. Using this method, which is not experimental, the researcher can look for connections between the dependent and the independent factors, or exposure. The design is convenient in nature as it allows the researcher to spend less time and also less cost to conduct the study and gives a quick outlook about the outcome and the characteristics associated with it [12]. The cross-sectional design was adopted because it is easy to use and it makes data gathering and analysis faster and easier.

B. Research Setting

Santasi-Apire was the setting for this study. Santasi-Apire is a small community within the Kumasi metropolis in the Ashanti Region of Ghana. Kumasi metropolis is located in the transitional forest zone and it's about 270km north of the national capital. It is located between latitude 6.35°–6.40° and longitude 1.30°–1.35°, with an elevation ranging between 250 and 300 meters above sea level. The land area of the metropolis is about 254sq/km and approximately 10 kilometers in radius. This community was chosen among the 13 communities in the metropolis for this study because its members have been complaining of respiratory tract infections due to bad road networks within the community and its environs.

C. Target Population

The complete set of individuals (subjects), objects, or events having common observable characteristics in which the researcher is interested in the study population. This is the main concern of the study which must be clearly defined and identified. The target population of this research was the inhabitants of the community who are 15 years and above since approximately 80% of AR symptoms develop before the age of 20 years [13]. The estimated population of the community is 2,825 and this was used as the population for the study.

D. Sample Size and Sampling Procedures

The stratified random sampling technique was employed for this study. This method involves dividing the population into distinct subgroups (strata) based on relevant characteristics, such as age, and then randomly selecting participants from each stratum. This approach ensures that all segments of the population are adequately represented, enhancing the validity and generalizability of the findings. A sample size of 100 respondents was selected from the target population of 2,825, determined using Slovin's formula. This sample size was chosen to balance the need for representativeness with constraints related to time and funding. By adopting stratified random sampling, the study ensures a more accurate representation of the community's knowledge, prevention, and management practices regarding AR.

E. Instrument for Data Collection

Data for this study was collected by using a questionnaire. The questionnaire was developed by the objectives set for the study. The first section focused on the demographic information of the respondents. The second section examined the knowledge of AR within the study setting. The third section assessed the management of the condition. The last section covered preventive measures for developing the condition. This instrument was more appropriate because it was not rigid; hence, the sequence of questions allows for data to be collected in one place and analyzed simultaneously [14].

F. Validity and Reliability

The questionnaire was constructed in a way that captures all the objectives of the study. Data gathered were also scrutinized to ensure that no wrong data was used for the analysis. Before data gathering, a pre-test of the designed study questionnaire was administered at the Market Centre of the Kenyasi community using ten (10) respondents who had similar characteristics to respondents from the study setting. This exercise was done to help check the reliability of the questionnaire to determine its appropriateness including the length, wording, and sensitivity of some of the questions. The researchers and their supervisor also read over the data gathered several times to ensure that the information received from the respondents was correct information that was entered for the data analysis.

G. Data Collection Procedure and Ethical Consideration

Closed and open questions in the questionnaire in the English language were used to collect the data. The two researchers (BSc ENT Nurses) were engaged in the data collection without any research assistant. An introductory and ethical clearance letter from the ENT Nursing School, Kumasi was sent through the Kumasi Metropolis Health Directorate. Permission was also obtained from the households through the leaders of the community. Ethical principles in research involve issues of honesty, privacy, confidentiality, and respect for the rights of individuals and this is the sole responsibility of the researcher especially in research involving human beings as participants [15]. The respondents in this research were assured and accorded confidentiality of the information they provided as required by ethics. The autonomy of respondents was also maintained and made to understand the purpose of the study and their right to withdraw from the study at any point without consequences if they felt the need to do so. They were also made to understand that participation in the study is voluntary and no respondent would be coerced to participate in the study. Data collected were explained to the selected participants to get verbal informed consent from them. Those who agreed to take part in the study and made themselves available, the questionnaires were administered to them on the incidence of AR. Some of the questionnaires were administered by reading to respondents and allowing them to indicate their choice of answers in the questionnaire especially in respondents who would be having difficulty understanding the questionnaire. Those respondents who required enough time to respond to the questionnaire at the appropriate time were also given ample time to do so. The data collection process lasts for two weeks.

H. Data Processing and Analysis

The data was collected compiled and analyzed using Statistical Package for Social Science Software (SPSS) version 20.0 and results were presented in the form of tables and charts according to their frequencies and percentages. This software was adopted because it was easier to use and it made analysis of data faster. The analysis was based on the specific objectives that were set for the study. This was done in both descriptive and figurative approaches to identify answers to the objectives for which this study will be carried out. This was important because, the presentation of research findings in frequency distribution tables, pie charts, and bar charts allow for a better and easier understanding of the results of the study.

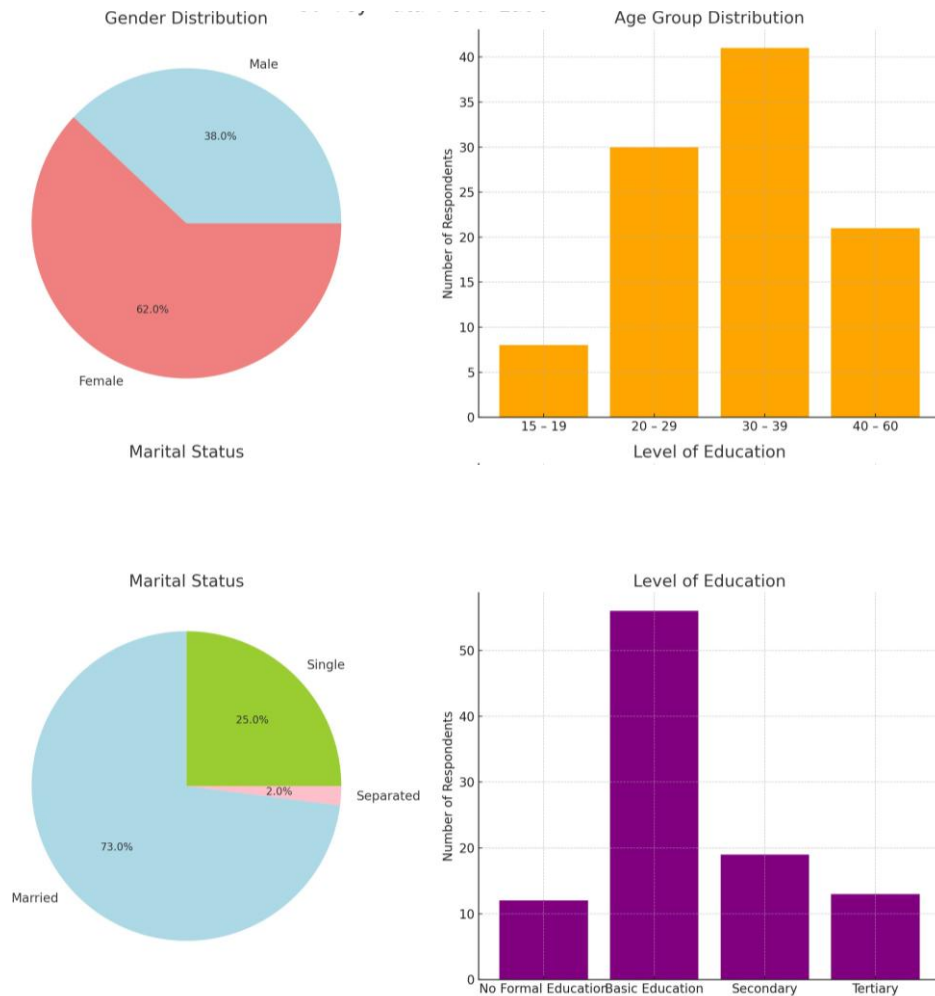
Results

A. Demographic Characteristics of Respondents

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, 8 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%) of the participants had basic education, 19(19%) of the participants 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 as Roman Catholic, 21(21%) of the participants worshipped at Pentecost, 43(43%) of the participants worshipped at Christian churches, meanwhile, 12(12%) of the participants were Muslims (Fig. 1).



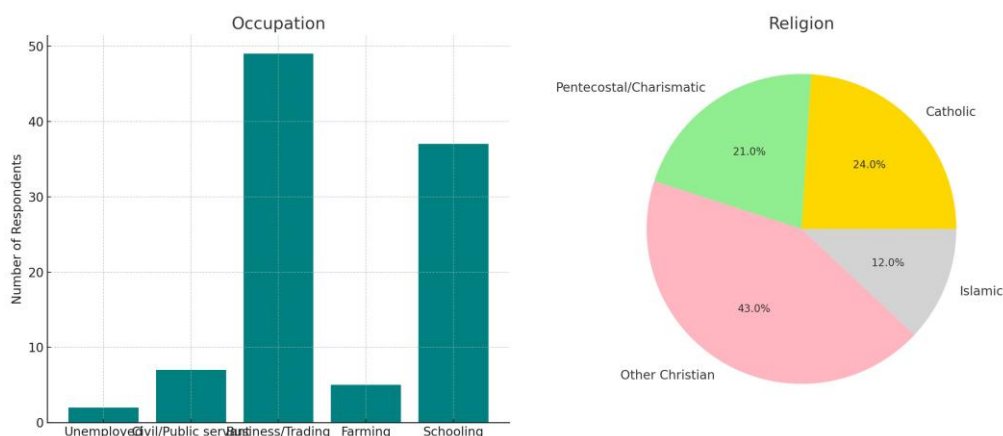


Fig. 1. Demographic Characteristics of Respondents (n = 100)

B. Knowledge of Allergic Rhinitis

This section covered the knowledge of AR among inhabitants of Santasi-Apire of the Ashanti region. Fig. 2 shows how often participants experience AR in a year. Among the inhabitants, 35% indicated that once a year, 43% said twice a year, 17% said three times a year and 5% indicated four times a year.

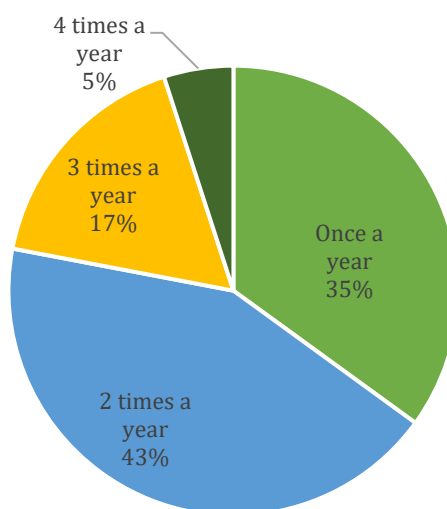


Fig. 2. How Often Do Participants Experience Allergic Rhinitis in a Year?

The pie chart Fig. 3 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 AR is running nose, 20% of the participants disclosed that AR is also called catarrh, while 9% had no idea about AR.

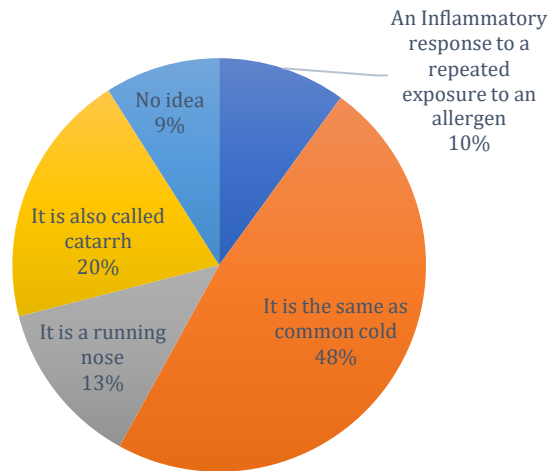


Fig. 3. What is Allergic Rhinitis?

Table 1 demonstrates the knowledge of some of the triggers of AR and 70(70%) of the inhabitants revealed that dust is a trigger, Hay 3(3%) is a trigger, perfume 22(22%) is a cause, pollen 5(5%) is a trigger, certain drug 2(2%) is a trigger and certain food 3(3%) is a trigger of AR.

Table 1. Knowledge of Some of the Triggers of Allergic Rhinitis

Some of the Triggers of Allergic Rhinitis	Yes Count	Percentage
Dust	70	70.0%
Hay	3	3.0%
Perfume	22	22.0%
Pollen	5	5.0%
Certain Drugs	2	2.0%
Certain food	3	3.0%
Total	105	105.0%

The results from Table 2 revealed that about 75(75%) of the respondents said that Rhinorrhea is mostly the sign and symptom of AR, with the rest reported as fever 70(70%), sneezing 63(63%), coughing 45(45%), itchy nose 57(57%), and headache 68(68%). A meager percentage of the respondents representing 20% said Catarrh is one of the signs and symptoms of AR.

The diagram in Fig. 4 assessed the level of agreement of AR whether it is life-threatening sometimes. Out of the 100 cases, 60% of the inhabitants of Santasi-Apire reported that they strongly agree, while 40% of them agreed that AR is sometimes life-threatening.

Table 2. Knowledge of Some of the Signs and Symptoms of Allergic Rhinitis

Some of the Signs and Symptoms of Allergic Rhinitis	Yes Count	Percentage
Fever	70	70%
Sneezing	63	63%
Catarrh	20	20%
Rhinorrhea	75	75%
Coughing	45	45%
Itchy nose	57	57%
Headache	68	68%
Total	398	398%

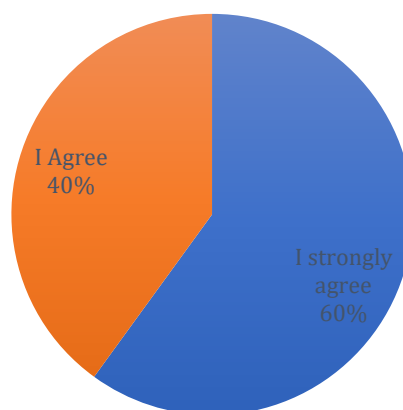
**Fig. 4.** Do you agree that Allergic Rhinitis can be Life Threatening Sometimes?

Table 3 presents knowledge about some of the life-threatening conditions of AR. Of the 100 participants sampled, 35(35%) reported that Intense Bronchospasm is a life-threatening condition of AR, 45(45%) said Laryngeal Edema is a life-threatening condition of AR, 40(40%) reported that Cyanosis is a life-threatening condition of AR. Also, Hypotension 47(47%), Anaphylactic shock 12(12%), and death 25(25%) were some of the life-threatening conditions of AR.

Table 3. Knowledge of Some of the Life-Threatening Conditions of Allergic Rhinitis

Some of the Life-Threatening Conditions of Allergic Rhinitis	Yes Count	Percentage
Intense Bronchospasm	35	35%
Laryngeal Edema	45	45%
Cyanosis	40	40%
Hypotension	47	47%
Anaphylactic shock	12	12%
Death	25	25%
Total	204	204%

C. Management of Allergic Rhinitis

This section examined the management of AR among the inhabitants of Santasi-Apire. Four questions were used to explore the management of AR. The first question sought to find out how respondents manage AR. From Fig. 5, 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 AR at all.

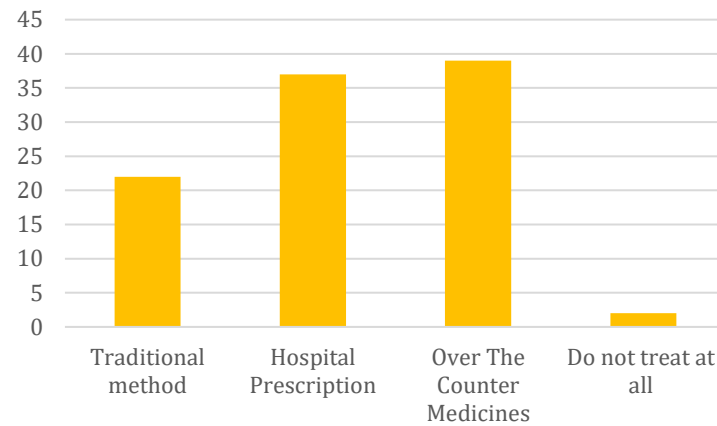


Fig. 5. How do you Manage Allergic Rhinitis?

From Fig. 6, it can be observed that out of the 100 respondents, 11% use antibiotics in managing AR, 47% of the majority use Antihistamines in managing AR, while, 42% use nasal decongestants in the management of AR.

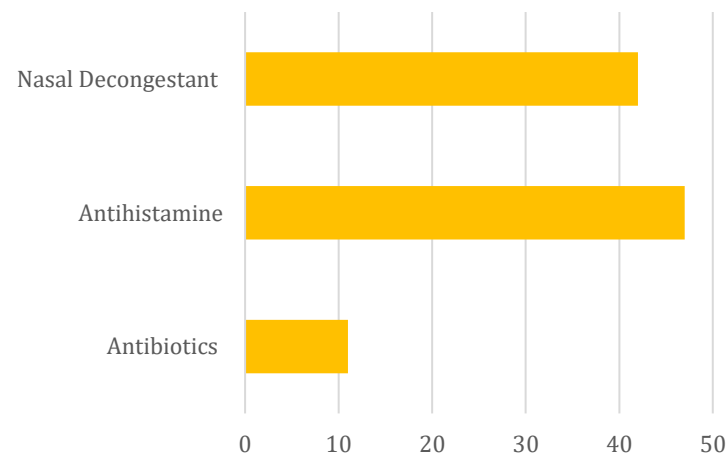


Fig. 6. Which Category of Drug Do You Usually Use in Managing Allergic Rhinitis?

Results from the bar graph below disclosed that 78% of Santasi-Apire inhabitants strongly agreed that avoiding triggers of AR is the best management option, while, 22% of the participants agreed that avoiding triggers of AR is the best management option (Fig. 7).

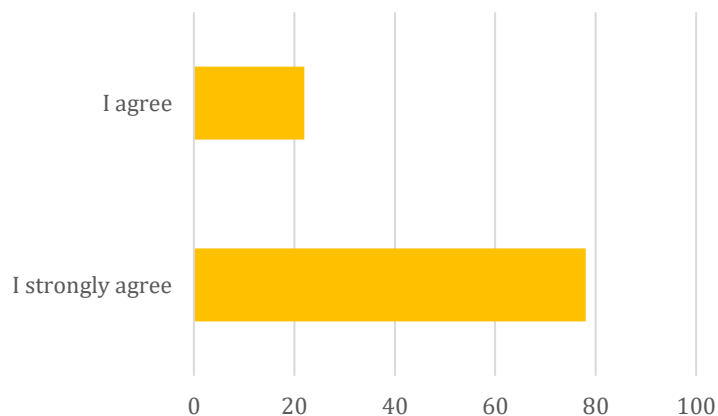


Fig. 7. Do you Agree that Avoiding the Triggers of Allergic Rhinitis is the Best Management Option?

Fig. 8 shows whether there is a clinic within the inhabitants' environment that manages only ENT conditions. Of the 100 respondents sampled, 58% said no clinic, while 42% said there is a clinic that manages only ENT conditions.

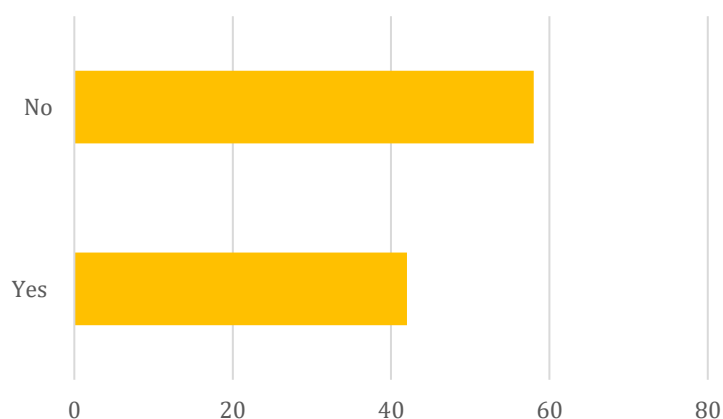


Fig. 8. Is there any Clinic Within your Environs that Manages Only ENT Conditions?

D. Preventive Measures of Allergic Rhinitis

This section demonstrated the preventive measures for AR among the inhabitants of Santasi-Apire. From the pie chart in Fig. 9, 95% of the Santasi-Apire inhabitants were exposed to a dusty environment, while only 5% of the Santasi-Apire inhabitants were not exposed to a dusty environment.

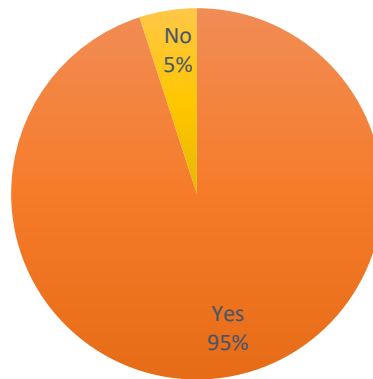


Fig. 9. Are You Exposed to a Dusty Environment?

Table 4 presents how Santasi-Apire inhabitants deal with the dusty nature of your area. Of the 100 participants sampled for the study, 52(52%) of them usually sprinkled water on the part of the road closer to them to reduce the dust particles, and 43(43%) of them used nose masks anytime they were going out. Meanwhile, 5(5%) of the inhabitants in Santasi-Apire do not sprinkle water and wear masks.

Table 4. Inhabitants Dealing with the Dusty Nature in their Area

Dealing with the Dusty Nature	Frequency	Percentage
We usually sprinkle water on the part of the road closer to us to reduce the dust particles	52	52.0
I use a nose mask anytime am go out due to the dusty nature of the road	43	43.0
None of the above	5	5.0
Total	100	100

Table 5 shows other ways Santasi-Apire inhabitants can prevent AR in their various localities. It was observed that 20(20%) of the participants used steam inhalation as a preventive measure for AR, 15(15%) did not bother using any other preventive measure, meanwhile, 65(65%) of the participants avoided it as much as possible dusty areas and smokes.

Table 5. Other ways Santasi-Apire inhabitants can prevent Allergic Rhinitis

Other ways you can prevent Allergic Rhinitis	Frequency	Percentage
We do steam inhalation	20	20.0
Nothing	15	15.0
Avoid as much as possible dusty areas and smokes	65	65.0
Total	100	100

Table 6 demonstrates the extent of Santasi-Apire inhabitants' agreement about whether exposure to the triggers of AR can exacerbate asthma conditions. Out of the 100 participants sampled, 20(20%) strongly agreed that exposure to the triggers of AR can exacerbate asthma conditions, 15(15%) agreed, while, 65(65%) of the participants disagreed that exposure to the triggers of AR can exacerbate asthma conditions.

Table 6. Exposure to the Triggers of Allergic Rhinitis

Exposure to triggers can Exacerbate Asthma	Frequency	Percentage
I strongly agree	20	20.0
I agree	15	15.0
Disagree	65	65.0
Total	100	100

Discussion

Presented in this section are the major findings of the study. It highlights the most salient discoveries revealed by the research. The findings are appraised in line with the specific objectives of the study. Additionally, this section relates the findings to the literature review.

A. Knowledge of allergic rhinitis among inhabitants

The study evaluated the knowledge of AR among inhabitants aged 15 years and above in Santasi-Apire, located in the Ashanti region. The findings revealed that most (48%) of the inhabitants believed AR was the same as a common cold. However, a study conducted to investigate AR and its influence on the 2016 revision of asthma guidelines did not agree with this finding, indicating that the current study was inconsistent. According to Brožek et al. [16], AR is defined as a disorder that causes nasal symptoms. This condition results from inflammation of the nasal mucosa, which is mediated by IgE and triggered by allergen exposure.

Additionally, the study found that the primary trigger of AR in the Santasi-Apire community was dust, reported by 70% of respondents, while other triggers such as hay (3%), perfume (22%), pollen (5%), certain drugs (2%), and certain foods (3%) were less common. This finding aligns with the research by Wang et al. [17], which supported the current study by identifying dust as a major trigger and exacerbating factor for pollen-sensitized AR.

Moreover, although the participants knew that fever, sneezing, catarrh, coughing, itchy nose, and headache were some of the signs and symptoms of AR, the majority of the inhabitants disclosed that rhinorrhea 75(75%) was the sign and symptom of AR mostly seen at Santasi-Apire community. A study conducted by Wheatley & Togias [13] was in line with the present

study. In their research, it was identified that rhinorrhea was one of the signs and symptoms of AR.

Furthermore, findings from the study showed that 60% of the participants strongly agreed that AR is a life-threatening condition sometimes. Justiz et al. [18] in their study agreed with the current study. In their study, it was asserted that people with AR suffer debilitating allergic symptoms that can lead to severe disability and life-threatening conditions. In addition, the study indicated that one of the most life-threatening conditions in the community was hypotension 47(47%). A study done by Valenta et al. [19] affirmed the recent study when it was revealed that in severe cases of AR, people are additionally diagnosed with hypotension.

B. Management of allergic rhinitis among the inhabitants

The results from the study revealed that over-the-counter medicines were mostly used to manage AR among 39 (39%) of the Santasi-Apire inhabitants, although 2% of the inhabitants did not manage AR at all. This finding did not correspond with the results of a study by Bjermer et al. [20], which disclosed that hospital-prescribed medications such as cetirizine, loratadine, desloratadine, fexofenadine, rupatadine, and bilastine are commonly used to manage AR. Additionally, 47 (47%) of the participants primarily used antihistamines to manage AR. This aligns with the findings of Bjermer et al. [20], who reported that newer generations of antihistamines were preferred for the management of AR.

Regarding the avoidance of triggers as the best management option for AR, 78 (78%) of the Santasi-Apire inhabitants strongly agreed. These findings were supported by a study conducted in Ghana, which revealed that allergen avoidance is the most effective way to manage allergic conditions, as they are induced by specific allergens [21].

C. Preventive measures of allergic rhinitis among the inhabitants

The findings from the study conducted in the Santasi-Apire community reveal interesting insights into the preventive measures adopted by inhabitants to manage AR, particularly in response to the dusty environment. The most reported measure, sprinkling water on roads to reduce dust particles (52% of participants), highlights a practical, community-level approach to mitigating environmental triggers of AR. This method aligns with the understanding that reducing airborne dust can significantly decrease allergen exposure, a key factor in managing AR [22]. However, this finding contrasts with the study by Krzych-Fałta et al. [23], which identified anti-dust-mite spray as the primary preventive measure in their Polish cohort. This discrepancy may reflect differences in environmental conditions, cultural practices, or access to healthcare resources between the two regions. While the Santasi-Apire community relies on low-cost, accessible solutions like water sprinkling, the Polish study emphasizes the use of

specialized products, possibly due to better healthcare coordination and availability of such interventions.

Another key finding from the Santasi-Apire study is that 65% of participants avoided dusty areas and smoke, demonstrating a proactive approach to minimizing exposure to allergens. This aligns with global recommendations for AR management, which emphasize environmental control as a cornerstone of prevention [24]. However, the study also revealed that 15% of participants did nothing to prevent AR, which may reflect a lack of awareness, resources, or perceived severity of the condition. This finding is contradicted by Alreshidi et al. [25], who reported that 77.8% of their participants did not avoid house dust and smoke, suggesting even poorer adherence to preventive measures. The difference in findings could be attributed to variations in study populations, cultural attitudes toward health, or the effectiveness of public health education campaigns in the respective regions.

Conclusion

Allergic rhinitis is a debilitating condition with significant effects on an individual's life if left untreated. However, it has been undervalued and neglected over the years, leading to a rise in respiratory tract infections among the inhabitants of Santasi-Apire in recent times. The inhabitants of Santasi-Apire are aware that dust is a major trigger for AR and recognize rhinorrhea as a common symptom of the condition. Over-the-counter medications, such as antihistamines, are commonly used to manage the condition in the community. Additionally, Santasi-Apire inhabitants employ preventive measures, including sprinkling water on dusty roads, avoiding dusty areas, and refraining from smoking and other triggers of AR.

It is therefore, recommended that the District Health Administration and the local Council of Santasi-Apire, in collaboration with the Department of Feeder Roads in the Ashanti Region (Adiebeba), should ensure that the roads in Santasi-Apire are frequently watered. This will help reduce the amount of dust particles that enter inhabitants' homes, foods, and properties. The District Health Directorate, in collaboration with ENT nurses at HopeXchange Medical Centre (Santasi-Apire), should organize sensitization programs for the inhabitants and surrounding communities. These programs should focus on the signs and symptoms of AR and guide proper management to prevent a further increase in cases.

The management of the ENT department at HopeXchange Medical Centre should ensure that ENT nurses, in collaboration with health educators, periodically educate the inhabitants of Santasi-Apire and nearby communities on more effective ways to prevent AR. This education should be provided during visits to the ENT clinics. Further research can focus on the health-seeking behavior of Santasi-Apire inhabitants with AR.

Conflict of Interest

The authors declare that there is no conflict of interest.

References

- [1] J. K. Kim, S. H. Cho, S. S. Kim, and J. Kim, "Allergic rhinitis and its comorbidities: Impacts on quality of life," *Allergy and Asthma Proceedings*, vol. 34, no. 2, pp. 145-152, 2013.
- [2] R. Pawankar *et al.*, "The global burden of allergic diseases: A call for action," *World Allergy Organisation Journal*, vol. 6, no. 1, p. 1-5, 2013.
- [3] D. D. Reh and D. M. Poetker, "Allergic rhinitis as a public health problem," *American Journal of Rhinology and Allergy*, vol. 28, no. 6, pp. 494-501, 2014.
- [4] J. Maspero, B. W. Lee, C. H. Katelaris, P. C. Potter, C. Cingi, A. Lopatin, ... and R. D. Walters, "Quality of life and control of allergic rhinitis in patients from regions beyond western Europe and the United States," *Clinical & Experimental Allergy*, vol. 42, no. 12, pp. 1684-1696, 2012.
- [5] J. Kim and H. S. Park, "The impact of allergic rhinitis on quality of life: An overview," *Journal of Korean Medical Science*, vol. 29, no. 12, pp. 1596-1602, 2014.
- [6] Z. Zhu, Z. Zhang, and Y. Wang, "Complications and long-term consequences of allergic rhinitis," *Allergy, Asthma & Clinical Immunology*, vol. 7, no. 2, pp. 98-104, 2011.
- [7] E. O. Meltzer, M. S. Blaiss, and M. J. Derebery, "Burden of allergic rhinitis: Findings from the pediatric allergies in America survey," *Annals of Allergy, Asthma & Immunology*, vol. 108, no. 6, pp. 373-381, 2012.
- [8] T. Ozdoganoglu, M. Songu, and H. M. Inancli, "Burden of allergic rhinitis: Quality of life and comorbidities," *World Allergy Organization Journal*, vol. 5, no. 3, pp. 93-103, 2012.
- [9] D. Price, C. Bond, and J. Bouchard, "Global burden and management of allergic rhinitis," *World Allergy Organization Journal*, vol. 8, no. 1, p. 1-10, 2015.
- [10] D. Mir, J. Kundi, and N. Kilonzo, "Allergic rhinitis prevalence and comorbidities: Bugando Medical Centre records," *East African Medical Journal*, vol. 91, no. 8, pp. 299-305, 2014.
- [11] M. Amizadeh, H. Safizadeh, and S. Farrokhi, "Patient perception, attitude, and lifestyle in allergic rhinitis and patient satisfaction with treatment," *Iranian Journal of Otorhinolaryngology*, vol. 25, no. 71, pp. 211-218, 2013.
- [12] L. A. Goodman and W. H. Kruskal, *Cross-sectional study design and data analysis in social research*, 2nd ed., Chicago: University of Chicago Press, 2013.
- [13] L. M. Wheatley and A. Togias, "Clinical practice. Allergic rhinitis," *New England Journal of Medicine*, 2015.
- [14] J. Mason, *Designing questionnaires for social research*, 4th ed., Oxford: Oxford University Press, 2016.
- [15] L. K. Trevino, M. Brown, and L. P. Hartman, "Ethical principles in research: Ensuring privacy, confidentiality, and respect for participants," *Journal of Applied Social Psychology*, vol. 44, no. 5, pp. 673-690, 2014.
- [16] J. L. Brożek *et al.*, "Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines – 2016 revision," *Journal of Allergy and Clinical Immunology*, vol. 140, no. 4, pp. 950-958, 2017.
- [17] X. Wang, R. Chen, and Z. Yin, "Dust as a trigger for pollen-sensitized allergic rhinitis: A clinical study," *Asian Pacific Journal of Allergy and Immunology*, vol. 38, no. 1, pp. 19-24, 2020.
- [18] J. Justiz, K. Logan, and A. Kaplan, "The burden of allergic rhinitis and its impact on quality of life," *Allergy & Rhinology*, vol. 9, 2018.
- [19] R. Valenta, I. Mittermann, and S. Vrtala, "Severe cases of allergic rhinitis: Symptoms and comorbid conditions," *Journal of Allergy and Clinical Immunology*, vol. 141, no. 4, pp. 1302-1311, 2018.
- [20] L. Bjermer, M. Westman, M. Holmstrom, and M. C. Wickman, "The complex pathophysiology of allergic rhinitis: scientific rationale for the development of an alternative treatment option," 2019.
- [21] S. Opoku-Buabeng, "Managing allergic conditions in Ghana: The effectiveness of allergen avoidance," *Ghana Medical Journal*, vol. 49, no. 3, pp. 183-188, 2015.
- [22] J. Bousquet *et al.*, "Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen)," *Allergy*, vol. 63, Suppl 86, pp. 8-160, 2008.
- [23] E. Krzych-Fałta, D. Jenerowicz, and J. Nowak, "Preventing perennial allergic rhinitis: Strategies in coordinated healthcare in Poland," *International Journal of Environmental Research and Public Health*, vol. 19, no. 6, p. 3345, 2022.

- [24] D. V. Wallace *et al.*, "The diagnosis and management of rhinitis: An updated practice parameter," *Journal of Allergy and Clinical Immunology*, vol. 122, no. 2, pp. S1-S84, 2008.
- [25] F. Alreshidi, M. Aldossari, and M. Alqahtani, "Knowledge, attitude, and practice regarding preventive measures of allergic rhinitis among primary health care attendees in Al-Jouf, Saudi Arabia," *Journal of Family Medicine and Primary Care*, vol. 6, no. 3, pp. 568-572, 2017.

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