

Prevalence of Allergic Rhinitis and Its Impact on Quality of Life among Pediatric Patients in The Tabuk Region, Saudi Arabia

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Abstract

Objectives: Allergic rhinitis (AR) is a prevalent condition among schoolchildren in various regions of Saudi Arabia, manifesting primarily through nasal symptoms. This condition significantly impacts sleep, mood, and academic performance due to exposure to allergens. AR places considerable burden on quality of life, often leading to moderate to high levels of stress. Our aim was to assess the prevalence and impact of allergic rhinitis on quality of life among children living in Tabuk

Methods: This cross-sectional observational study was conducted from September 2023 to April 2024 in Tabuk City, Saudi Arabia. Data collection was performed using a self-administered questionnaire adapted from previous studies.

Results: The study included 235 pediatric patients from Tabuk, Saudi Arabia. The prevalence of diagnosed allergic rhinitis among the participants was found to be 64.3% (n=151). Symptoms duration varied, with seasonal allergies affecting 63.4% (n=149) and perennial allergies affecting 41.7% (n=98) of the children. Notably, sleep quality was significantly compromised in 79.1% (n=186) of the cases, and emotional well-being was impacted in 78.2% (n=184). Allergic rhinitis was significantly correlated with impaired daily activities, school performance, and social interactions ($p < 0.001$). Additionally, it had a profound impact on sleep quality ($p < 0.001$), emotional well-being ($p < 0.001$), and physical activity ($p < 0.001$), indicating a broad and severe effect on the quality of life. Management strategies demonstrated significant associations, with education or counseling ($p = 0.009$) and psychological support ($p = 0.043$) showing the strongest correlation with the prevalence and management of allergic rhinitis.

Conclusions: This study demonstrates that allergic rhinitis has a significant and multifaceted impact on pediatric patients in Tabuk, Saudi Arabia, affecting daily activities, sleep, emotional well-being, and physical activities. While educational initiatives and psychological support show promise in managing the condition, further efforts are required to address environmental factors and enhance comprehensive management strategies

Keywords: Allergic Rhinitis; Prevalence; Children; Quality of Life; Saudi Arabia.

Introduction

Allergic rhinitis (AR) is the most common immunological disorder, with prevalence rates reaching up to 50% in some countries. Often underestimated, AR is a global health problem contributing to significant morbidity worldwide. In children, AR not only diminishes quality of life through its symptoms but also affects contiguous organs such as the sinuses, ears, and chest. Additionally, it can cause sleep disturbances, leading to reduced school

and work performance, family difficulties, and decreased participation in outdoor activities. Much of our understanding of pediatric AR epidemiology is derived from the International Study of Asthma and Allergies in Childhood (ISAAC) survey, first conducted in 1997 and subsequently repeated.¹

AR is an Ig E-mediated condition triggered by exposure of the nasal mucosa to allergens. A study conducted among Saudi schoolchildren reported a prevalence rate of 27.1%.² AR is a widespread medical disorder that can lead to nasal obstruction, itching, and psychological effects such as stress, depression, and anxiety. It also interferes with sleep, mood, and academic or work performance.³ In 2023, a study conducted in Al-Ahsa demonstrated that AR significantly impacts quality of life (QoL) and is associated with moderate to high levels of stress.²

Several studies have explored the prevalence, patterns, and severity of AR among children and teenagers in Saudi Arabia. Waleed Alhazmi in Qassim region reported a prevalence rate of 51.3% for AR or symptoms indicative of AR in this demographic.⁴ In 2020, a study in Madinah examined the prevalence, knowledge, and practices regarding AR, revealing a significant proportion of the population affected, particularly those from favorable family backgrounds.⁵ Additionally, a study by Noor Nabil Albaloushi, involving 807 participants, found an increasing prevalence of AR, with 76% of participants either diagnosed with AR or exhibiting symptoms consistent with the condition.⁶

The literature on the impact of allergic rhinitis on quality of life is limited. To the best of our knowledge, no studies have been conducted to evaluate this in the Tabuk region. Therefore, this study aimed to assess the prevalence and impact of allergic rhinitis among pediatric patients aged less than 14 years.

Methods

This cross-sectional observational study was conducted from September 2023 to April 2024 in Tabuk City, Saudi Arabia. The study aimed to assess the prevalence and impact of allergic rhinitis among pediatric patients aged less than 14 years.

Prior to the commencement of the study, ethical approval was obtained from the Research Ethics Committee at the University of Tabuk. The study was conducted with great adherence to the Declaration of Helsinki, informed consent was appropriately obtained, and that participants' privacy and confidentiality were maintained. An official approval letter was issued by the committee with number UT-310-155-2023, which was mandatory for initiating the data collection process.

A simple random sampling method was employed to estimate a sample size of 385 with a 95% confidence level, using the Qualtrics calculator.⁷ This method ensured that every pediatric patient in Tabuk City had an equal chance of being selected for the study. The target population consisted of pediatric patients under 14 years old residing in Tabuk City. A comprehensive list of all eligible pediatric patients was compiled to serve as the sampling frame, from which 385 participants were randomly selected using random number generation techniques. This approach minimized selection bias by providing equal probability of selection for each individual. The sample size of 385 was calculated with a 95% confidence level and a 50% assumed prevalence of allergic rhinitis, a conservative estimate given that the exact prevalence was unknown. This sample size was chosen to ensure sufficient statistical power to detect significant associations and maintain the reliability and validity of the study findings. Ultimately, 300 participants responded, resulting in a 78.1% response rate.

The inclusion criteria for this study consisted of pediatric patients and their parents residing in Tabuk who consented to participate in the electronic self-administered questionnaire. The exclusion criteria included individuals who refused to participate, those living outside of Tabuk, pediatric patients with other chronic illnesses that could confound the study results, parents or guardians unable to provide informed consent, and children who had not been diagnosed with allergic rhinitis.

Data were collected through an online structured questionnaire, derived from previous similar studies.⁸⁻¹¹ The questionnaire ensured anonymity and confidentiality of personal information for research purposes. The children were already diagnosed with allergic rhinitis by their treating physician according to the Saudi guideline. A comprehensive statistical analysis was conducted on the dataset, encompassing both descriptive and inferential methodologies: Descriptive statistics were used to summarize the demographic characteristics of the participants,

including age, gender, and other relevant features. Means, medians, standard deviations, and frequency distributions were calculated as appropriate for continuous and categorical variables.

Inferential analysis in this study included the use of the Chi-Square test and multivariate logistic regression. The Chi-Square test was applied to assess the association between categorical variables, such as the presence of allergic rhinitis and demographic characteristics like gender and age groups. This test is particularly suitable for large sample sizes, ensuring that the expected frequencies within each category are sufficiently high. Additionally, multivariate logistic regression analysis was conducted using IBM SPSS version 29.0.0 to identify predictors and assess the strength of associations between multiple independent variables and the dependent variable, the presence of allergic rhinitis. The regression model incorporated factors such as age, gender, environmental influences, family history, and other relevant variables.

The significance level was set at a p-value of <0.05, with a 95% confidence interval. Odds ratios (ORs) with corresponding confidence intervals were reported to quantify the strength of associations.

Results

The study initially included 300 participants, with 65 excluded based on the exclusion criteria, resulting in 235 pediatric patients from the Tabuk region, Saudi Arabia. Among these, 129 (54.9%) were female and 106 (45.1%) were male. The age distribution was as follows: 70 (29.8%) were under 5 years, 98 (41.7%) were between 5-10 years, and 67 (28.5%) were 11-14 years old. The majority of participants, 219 (93.2%), were Saudi nationals, with 16 (6.8%) being non-Saudi. Most of the children's parents were married (n=209, 88.9%), while 26 (11.1%) were widowed or divorced. The predominant level of education among fathers was a bachelor's degree (n=168, 71.5%), and similarly, 179 mothers (76.2%) also held bachelor's degrees. Employment was common among fathers (n=161, 68.5%) and mothers, who were either employed (n=124, 52.8%) or housewives (n=68, 28.9%). The majority of families reported a monthly income above 10,000 SAR (n=152, 64.7%) [Table1].

Table 1: Sociodemographic features of participants (n=235).

| Variables | Frequency N (%) |
|--|----------------------------|
| Gender of child | |
| Female | 129 (54.9) |
| Male | 106 (45.1) |
| Age of child | |
| <5 Years | 70 (29.8) |
| 5-10 Years | 98 (41.7) |
| 11-14 Years | 67 (28.5) |
| Nationality of child | |
| Non-Saudi | 16 (6.8) |
| Saudi | 219 (93.2) |
| Marital status of child parents | |
| Widow/Divorced | 26 (11.1) |
| Married | 209 (88.9) |
| Educational status of father | |
| Illiterate/Primary to Intermediate | 23 (9.8) |
| Secondary Education | 44 (18.7) |
| Bachelor's | 168 (71.5) |
| Educational status of mother | |
| Illiterate/Primary to Intermediate | 14 (6.0) |
| Secondary Education | 42 (17.9) |
| Bachelor's | 179 (76.2) |
| Employment status of child father | |
| Employee | 161 (68.5) |
| Health Practice | 23 (9.8) |
| Freelancer | 17 (7.2) |
| Student/Unemployed | 7 (3.0) |
| Retired | 27 (11.5) |
| Employment status of child mother | |

| | |
|-----------------------|------------|
| Employee | 124 (52.8) |
| Housewife | 68 (28.9) |
| Health Practice | 18 (7.7) |
| Freelancer | 12 (5.1) |
| Student/Retired | 13 (5.5) |
| Monthly income | |
| < 5000 SAR | 12 (5.1) |
| 5000-10000 SAR | 71 (30.2) |
| >10,000 SAR | 152 (64.7) |

(N) Frequency, (%) Percentages

Table 2 shows various features of allergic rhinitis among participants, among the 235 participants, 151 children (64.3%) had been diagnosed with allergic rhinitis, while 84 (35.7%) had not. The duration of symptoms varied: 55 children (23.4%) experienced symptoms for less than 6 months, 47 (20.0%) for 6 months to 1 year, 25 (10.6%) for 1-3 years, and 24 (10.2%) for over 3 years. The mean age at diagnosis was 56.2 months (SD = 33.7 months), with a range from 6 to 156 months. Symptom frequency varied, with 62 children (26.4%) experiencing symptoms several times a week, 45 (19.1%) less than once a week, 25 (10.6%) once a week, and 19 (8.1%) daily. Seasonal allergies were reported by 149 children (63.4%), while 98 (41.7%) had constant allergies. Allergy testing was performed on 57 children (24.3%), revealing a median of 5 allergens (SD = 2.9), with a range from 1 to 15 allergens.

Table 2: Different features of Allergic Rhinitis among Participants (n=235).

| | | N (%) |
|---|-----------------------|-------------|
| Has your child been diagnosed with allergic rhinitis? | No | 84 (35.7) |
| | Yes | 151 (64.3) |
| How long has your child suffered from symptoms of allergic rhinitis? | <6 Months | 55 (23.4) |
| | 6Months-1 Year | 47 (20.0) |
| | 1-3 Years | 25 (10.6) |
| | >3 Years | 24 (10.2) |
| What is the age (in months) at which a child is diagnosed with allergic rhinitis? | Mean (SD) | 56.2 (33.7) |
| | Range | 6-156 |
| How often does your child suffer from symptoms of allergic rhinitis? | Less than once a week | 45 (19.1) |
| | once a week | 25 (10.6) |
| | Several times a week | 62 (26.4) |
| | Daily | 19 (8.1) |
| Does your child suffer from seasonal allergies? | No | 86 (36.6) |
| | Yes | 149 (63.4) |
| Does your child suffer from constant allergies? | No | 137 (58.3) |
| | Yes | 98 (41.7) |
| Have you conducted any allergy tests on your child to determine the allergens? | No | 178 (75.7) |
| | Yes | 57 (24.3) |
| How many allergens does the child suffer from? | Median (SD) | 5 (2.9) |
| | Rang | 1-15 |

(N) Frequency, (%) Percentages

Figure 1 shows the severity of different symptoms of allergic rhinitis among participants. The severity of symptoms varied among participants. Sneezing was experienced with mild severity by 34%, moderate severity by 25.1%, and severe symptoms by 17.9%. A runny nose was reported with mild severity by 33.6%, moderate severity by 26%, and severe symptoms by 15.7%. Nose itching was experienced with mild severity by 35.3%, moderate severity by 24.7%, and severe symptoms by 14.9%. A stuffy nose affected 30.2% with mild severity, 23% with moderate severity, and 16.6% with severe symptoms. Continuous tearing in the eyes was reported with mild severity by 32.8%, moderate severity by 19.1%, and severe symptoms by 14%.

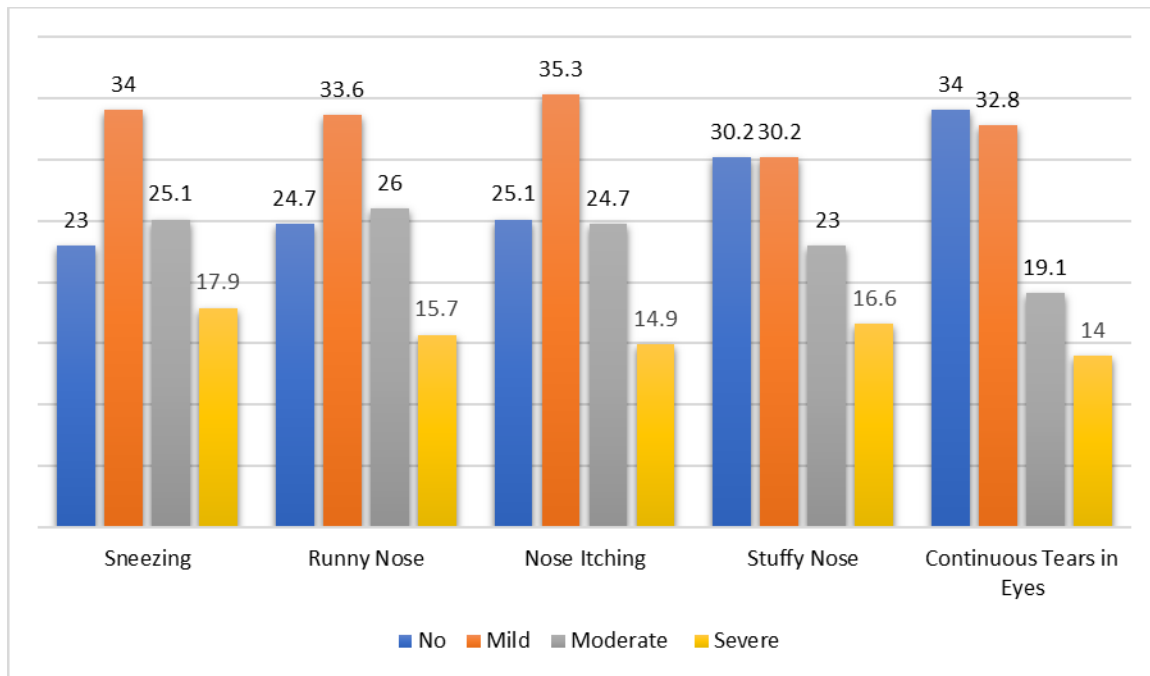


Figure 1: Degree of Severity of Symptoms of Allergic Rhinitis.

Table 3 evaluates the quality of life among the 235 participants, revealing varying degrees of impact on daily activities, school performance, and social interactions. Notably, 45 children (19.1%) were not affected, while 51 (21.7%) were greatly affected. Regarding school or activity absenteeism, 61 children (26.0%) were not affected, and 64 (27.2%) were mildly affected. Symptoms experienced at school included tiredness in 123 children (52.3%), drowsiness from nasal congestion in 49 (20.9%), learning and concentration difficulties in 42 (17.9%), and other disorders in 21 (8.9%). Sleep quality was compromised for 186 children (79.1%), with 49 (20.9%) unaffected. General mood and emotional well-being were impacted, with 68 children (28.9%) mildly affected, 74 (31.5%) moderately affected, and 42 (17.9%) greatly affected. Emotional symptoms included anger in 41 children (17.4%), frustration in 25 (10.6%), sorrow in 17 (7.2%), and isolation in 19 (8.1%). Physical activity restrictions were reported by 96 children (40.9%). General enjoyment of life was unaffected in 73 children (31.1%), mildly affected in 55 (23.4%), moderately affected in 73 (31.1%), and greatly affected in 34 (14.5%). Additionally, 101 parents (43.0%) identified environmental factors as contributors to their children's symptoms

Table 3: Assessment of Quality of Life among participants (n=235).

| | | N (%) |
|---|---------------------------------------|------------|
| How does allergic rhinitis affect your child's daily activities (such as school performance and social interactions)? | Doesn't Affected | 45 (19.1) |
| | Affects Mildly | 62 (26.4) |
| | Affects Moderately | 77 (32.8) |
| | Affects Greatly | 51 (21.7) |
| How often does your child miss school or other activities due to symptoms of allergic rhinitis? | Doesn't Affected | 61 (26.0) |
| | Affects Mildly | 64 (27.2) |
| | Affects Moderately | 57 (24.3) |
| | Affects Greatly | 53 (22.6) |
| Does your child suffer from any of the following symptoms at school? | Tired | 123 (52.3) |
| | Drowsiness due to Nasal Congestion | 49 (20.9) |
| | Difficulty Learning and Concentrating | 42 (17.9) |
| | Other Disorders | 21 (8.9) |
| How does allergic rhinitis affect your child's sleep quality? | Doesn't Affected | 49 (20.9) |
| | Affects Mildly | 60 (25.5) |
| | Affects Moderately | 79 (33.6) |
| | Affects Greatly | 47 (20.0) |
| | Doesn't Affected | 51 (21.7) |

| | | |
|--|--------------------|------------|
| How does allergic rhinitis affect your child's general mood and emotional well-being? | Affects Mildly | 68 (28.9) |
| | Affects Moderately | 74 (31.5) |
| | Affects Greatly | 42 (17.9) |
| Does your child suffer from any of the following symptoms? | Nothing | 133 (56.6) |
| | Anger | 41 (17.4) |
| | Frustration | 25 (10.6) |
| | Sorrow | 17 (7.2) |
| | Isolation | 19 (8.1) |
| Does your child suffer from restrictions in participating in physical activities due to allergic rhinitis? | Yes | 96 (40.9) |
| How does allergic rhinitis affect your child's general enjoyment of life? | Doesn't Affected | 73 (31.1) |
| | Affects Mildly | 55 (23.4) |
| | Affects Moderately | 73 (31.1) |
| | Affects Greatly | 34 (14.5) |
| Any specific environmental factors that you think are contributing to his or her allergic rhinitis symptoms? | Yes | 101 (43.0) |

(N) Frequency, (%) Percentages

Table 4 presents the knowledge and practices related to the management and prevention of allergic rhinitis among the 235 participants. Among these, 135 children (57.4%) received treatment for allergic rhinitis, while 100 (42.6%) did not. During the past week, 118 children (50.2%) received no treatment, 58 (24.7%) used nasal steroids, 50 (21.3%) took oral antihistamines, and 9 (3.8%) used non-steroidal nasal treatments. Parental knowledge about allergic rhinitis varied, with 46 parents (19.6%) being unfamiliar with the condition, 139 (59.1%) having moderate knowledge, and 50 (21.3%) being very knowledgeable. Education or counseling was provided to 112 children (47.7%), whereas 123 (52.3%) did not receive any. Psychological or emotional support was sought by 85 parents (36.2%), while 150 (63.8%) did not pursue such support. Satisfaction with available support and resources was reported as follows: 30 parents (12.8%) were not satisfied, 129 (54.9%) were neutral, and 76 (32.2%) were very satisfied. Preventive measures were known by 150 parents (63.8%).

Table 4: Knowledge about Treatment, Management and prevention of Allergic Rhinitis (n=235).

| | | N (%) |
|---|----------------------|------------|
| Has your child received any treatment for allergic rhinitis? | No | 100 (42.6) |
| | Yes | 135 (57.4) |
| What treatment did your child receive last week? | Nothing | 118 (50.2) |
| | Local Steroidal | 58 (24.7) |
| | Oral Anti-Histamines | 50 (21.3) |
| | Local non-steroidal | 9 (3.8) |
| | Very Knowledgeable | 50 (21.3) |
| How knowledgeable do you feel about allergic rhinitis and how to deal with it? | Not Familiar | 46 (19.6) |
| | Moderate | 139 (59.1) |
| | Very Knowledgeable | 50 (21.3) |
| Has your child received any education or counseling about allergic rhinitis? | No | 123 (52.3) |
| | Yes | 112 (47.7) |
| Have you sought any psychological or emotional support for your child to cope with the impact of allergic rhinitis on their quality of life? | No | 150 (63.8) |
| | Yes | 85 (36.2) |
| How satisfied are you with the support and resources available to improve your child's quality of life despite allergic rhinitis? | Not Satisfied | 30 (12.8) |
| | Neutral | 129 (54.9) |
| | Very Satisfied | 76 (32.2) |
| Do you know any preventive measures to reduce the symptoms of allergic rhinitis in your child? | Yes | 150 (63.8) |

(N) Frequency, (%) Percentages

Table 5 examines the association between allergic rhinitis and various aspects of quality of life among the 235 participants. Allergic rhinitis significantly impacted daily activities, school performance, and social interactions ($p < 0.001$), with 90.2% ($n=46$) of children greatly affected by these issues having allergic rhinitis compared to 22.2% ($n=10$) of those not affected. School absenteeism was significantly related to allergic rhinitis ($p < 0.001$), with 84.9% ($n=45$) of those greatly affected experiencing allergic rhinitis. Symptoms at school, such as tiredness (61.8%) and drowsiness (65.3%), were common among children with allergic rhinitis, although this was not statistically significant ($p = 0.819$). Sleep quality was significantly affected ($p < 0.001$), with 89.4% ($n=42$) of

those greatly affected by poor sleep quality having allergic rhinitis. Emotional well-being was also significantly impacted ($p < 0.001$), with 88.1% ($n=37$) of those greatly affected by emotional issues having allergic rhinitis. Emotional symptoms, including anger ($n=31$, 75.4%), frustration ($n=21$, 84.0%), sorrow ($n=14$, 82.4%), and isolation ($n=17$, 89.5%), were significantly more prevalent among those with allergic rhinitis ($p < 0.001$). Physical activity restrictions were more common ($n=79$, 82.3%) among those with allergic rhinitis ($p < 0.001$). Lastly, general enjoyment of life was significantly reduced ($p < 0.001$), with 91.2% ($n=31$) of those greatly affected by reduced enjoyment experiencing allergic rhinitis.

Table 5: Association between different aspects of Quality of Life and Allergic Rhinitis.

| | | Diagnosed allergic rhinitis | | Sig. Value |
|---|---------------------------------------|-----------------------------|--------------|---------------------|
| | | No N (%) | Yes N (%) | |
| How does allergic rhinitis affect your child's daily activities (such as school performance and social interactions)? | Doesn't Affected | 35 (77.8) | 10 (22.2) | <0.001 ^a |
| | Affects Mildly | 25 (40.3) | 37 (59.7) | |
| | Affects Moderately | 19 (24.7) | 58 (75.3) | |
| | Affects Greatly | 5 (9.8) | 46 (90.2) | |
| How often does your child miss school or other activities due to symptoms of allergic rhinitis? | Doesn't Affected | 42 (68.9) | 19 (31.1) | <0.001 ^a |
| | Affects Mildly | 21 (32.8) | 43 (67.2) | |
| | Affects Moderately | 13 (22.8) | 44 (77.2) | |
| | Affects Greatly | 8 (15.1) | 45 (84.9) | |
| Does your child suffer from any of the following symptoms at school? | Tired | 47 (38.2) | 76 (61.8) | 0.819 ^a |
| | Drowsiness due to Nasal Congestion | 17 (34.7) | 32 (65.3) | |
| | Difficulty Learning and Concentrating | 14 (33.3) | 28 (66.7) | |
| | Disorder | 6 (28.6) | 15 (71.4) | |
| How does allergic rhinitis affect your child's sleep quality? | Doesn't Affected | 34 (69.4) | 15 (30.6) | <0.001 ^a |
| | Affects Mildly | 22 (36.7) | 38 (63.3) | |
| | Affects Moderately | 23 (29.1) | 56 (70.9) | |
| | Affects Greatly | 5 (10.6) | 42 (89.4) | |
| How does allergic rhinitis affect your child's general mood and emotional well-being? | Doesn't affected | 36 (70.6) | 15 (29.4) | <0.001 ^a |
| | Affects Mildly | 28 (41.2) | 40 (58.8) | |
| | Affects Moderately | 15 (20.3) | 59 (79.7) | |
| | Affects Greatly | 5 (11.9) | 37 (88.1) | |
| Does your child suffer from any of the following symptoms? | Nothing | 65 (48.9) | 68 (51.1) | <0.001 ^a |
| | Anger | 10 (24.4) | 31 (75.4) | |
| | Frustration | 4 (16.0) | 21 (84.0) | |
| | Sorrow | 3 (17.6) | 14 (82.4) | |
| | Isolation | 2 (10.5) | 17 (89.5) | |
| | | | | |
| Does your child suffer from restrictions in participating in physical activities due to allergic rhinitis? | No | 67 (48.2) | 72 (51.8) | <0.001 ^a |
| | Yes | 17 (17.7) | 79 (82.3) | |
| How does allergic rhinitis affect your child's general enjoyment of life? | Doesn't affected | 43 (58.9) | 30 (41.1) | <0.001 ^a |
| | Affects Mildly | 25 (45.5) | 30 (54.5) | |
| | Affects Moderately | 13 (17.8) | 60 (82.2) | |
| | Affects Greatly | 3 (8.8) | 31 (91.2) | |

(N) Frequency, (%) Percentages, (a) Chi-Square Test

Table 6 examines the association between various management aspects and the prevalence of allergic rhinitis among the participants. Specific environmental factors did not show a significant association with allergic rhinitis prevalence, with odds of 1.506 (95% CI: 0.782–2.901) and a p-value of 0.221. Similarly, knowledge about allergic rhinitis and its management was not significantly associated with prevalence, with an Exp(B) of 1.439 (95% CI: 0.820–2.524) and a p-value of 0.204. However, children who received education or counseling had a significantly higher likelihood of having allergic rhinitis, with an Exp(B) of 2.620 (95% CI: 1.269–5.411) and a p-value of 0.009. Additionally, receiving psychological or emotional support was significantly associated with a higher prevalence of allergic rhinitis, with an Exp(B) of 2.349 (95% CI: 1.029–5.365) and a p-value of 0.043. Satisfaction with available resources did not show a significant association, with an Exp(B) of 0.967 (95% CI: 0.575–1.626) and a p-value of 0.898. Finally, knowledge about preventive measures did not significantly impact the prevalence of allergic rhinitis, with an Exp(B) of 1.303 (95% CI: 0.663–2.560) and a p-value of 0.443.

Table 6: Association between different aspects of Management and Allergic Rhinitis. prevalence

| | B | Sig. | Exp(B) | 95% CI | |
|---|----------|-------------|---------------|---------------|--------------|
| | | | | Lower | Upper |
| Specific environmental factors | .409 | .221 | 1.506 | .782 | 2.901 |
| Knowledge about Allergic Rhinitis and how to deal with it | .364 | .204 | 1.439 | .820 | 2.524 |
| Child receives education/counseling | .963 | .009 | 2.620 | 1.269 | 5.411 |
| Child receives psychological/emotional support | .854 | .043 | 2.349 | 1.029 | 5.365 |
| Satisfied with the Resources | -.034 | .898 | .967 | .575 | 1.626 |
| Knowledge about Preventive Measures | .265 | .443 | 1.303 | .663 | 2.560 |
| Constant | -1.010 | .131 | .364 | | |

Exp (B); exponential B, CI: Confidence Interval

Discussion

In this study, the prevalence of Allergic rhinitis (AR) is 64.3% which was higher than the prevalence reported among schoolchildren in Jazan region (27.1%),¹² a plausible explanation might be the different age group. A previous study conducted among children and teenagers in Qassim, reported a prevalence of 51.3% which is similar to our findings.¹³ AR significantly impacts quality of life, contributing to nasal symptoms and psychological effects such as stress and depression. According to Mou et al. (2022), AR adversely affects quality of life and work efficiency, potentially leading to mental health issues, including depression and anxiety, in a significant percentage of patients.¹⁴ Additionally, Alwesaibie et al. (2023) identified an association between AR and intermediate to high levels of stress in the studied population in Al-Ahsa.³

Our study conducted in the Tabuk area of Saudi Arabia indicates a higher prevalence of AR among children, at 64.3%. This prevalence rate aligns with research conducted in environments with substantial exposure to dust, pollen, and other allergens. Similarly, Kef et al. (2020) reported that AR prevalence varies between 10% and 58.5% across different geographical regions.¹⁵ Interestingly, our gender distribution data show a slightly higher prevalence among females (54.9%) compared to males (45.1%), which contrasts with some studies reporting a higher prevalence in males. The discrepancy in gender-related prevalence could be explained by hormonal changes during puberty, gut microbiota diversity, and lifestyle factors.¹⁶

The impact of AR on daily activities, school performance, and social interactions is significant. Our study found that 21.7% of children were greatly affected, corroborating findings from previous studies that highlighted substantial impairments in daily activities and school performance due to AR. Schuler and Montejo noted that AR, the most prevalent chronic condition among children, disrupts sleep, causes daytime sleepiness, leads to school absenteeism, reduces attention ("presenteeism"), and results in mood disturbances and lower academic performance.¹⁷ Furthermore, our study revealed that school absenteeism was notably high, with 22.6% of children frequently missing school. This finding echoes the results of Aburiziza et al. (2022), who reported higher absenteeism rates among children with AR.¹⁸

Symptoms of allergic rhinitis (AR) severity varied among the study participants, with sneezing, runny nose, and nasal itching being predominant. Akhouri et al. (2019) reported similar findings, noting common symptoms such as nasal congestion, clear rhinorrhea, sneezing, postnasal drip, and nasal pruritis.¹⁹ The prevalence of moderate to severe symptoms in our study aligns with observations from the Global Allergy and Asthma European Network, which also documented widespread severity among children.²⁰ Continuous tearing from the eyes was frequently reported, highlighting its common occurrence as a comorbidity in AR, as noted in previous studies.²¹

Sleep quality was significantly impaired among children with AR, with 79.1% experiencing disturbances. This finding is consistent with research demonstrating that AR adversely affects sleep quality, leading to daytime fatigue and impaired cognitive function. Liu et al. (2020) similarly found that AR is associated with a higher risk of daytime sleep-related dysfunctions, including difficulty waking up.²²

Emotional well-being was notably affected, with a substantial proportion of children experiencing emotions such as anger, frustration, sorrow, and social isolation. These emotional disturbances are in line with findings from

Conway et al. (2024), which linked AR to various psychological issues stemming from chronic discomfort and limitations in social interactions.²³

Our study revealed that 57.4% of children diagnosed with allergic rhinitis (AR) received medication, primarily nasal steroids and oral antihistamines. This treatment approach is consistent with recommendations outlined in the Next-generation Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines, which advocate for these medications as first-line treatments.²⁴ However, it is concerning that 50.2% of children did not receive any treatment within the past week, suggesting potential gaps in ongoing management and follow-up care.

Parental knowledge about AR varied, with 59.1% possessing moderate knowledge levels. Education and counseling significantly increased the likelihood of receiving a diagnosis, underscoring the pivotal role of parental awareness in early detection of allergic conditions. Similarly, Kostecka et al. (2022) reported higher levels of parental knowledge in families regularly visiting allergists, whereas families relying solely on regular pediatric appointments showed lower awareness levels despite their children exhibiting similar symptoms.²⁵

Psychological and emotional support emerged as crucial factors, with recipients showing a higher prevalence of diagnosed AR. This underscores the importance of a holistic approach in AR management that includes psychological support. Hennawi et al. (2016) demonstrated improved AR symptoms and enhanced quality of life through combined treatment with imipramine and levocetirizine, highlighting the benefits of addressing psychological stress in AR management.²⁶

In conclusion, our findings corroborate previous studies highlighting the high prevalence of AR and its significant impact on quality of life, which surpasses rates observed in other regions such as Brazil. The disruptions in daily activities, school performance, and sleep underscore the complex interplay of regional and environmental factors influencing AR prevalence.

Addressing these multifaceted aspects through comprehensive management strategies is crucial for optimizing outcomes and enhancing the well-being of children affected by AR. Further research should continue to explore effective interventions that encompass both medical and psychosocial dimensions of AR care.

Despite providing valuable insights into the prevalence and impact of allergic rhinitis (AR) in the Tabuk region, our study has several limitations. The cross-sectional design restricts our ability to establish causal relationships between AR and its effects on quality of life. Furthermore, reliance on self-reported data from parents introduces potential biases.

Our findings underscore the high prevalence and significant impact of AR on pediatric quality of life in Tabuk, Saudi Arabia. This highlights the necessity for targeted interventions that enhance awareness, education, and support to alleviate the burden on affected children and their families. Future research should consider longitudinal designs to better elucidate causal pathways and explore interventions aimed at mitigating the impact of AR on children's lives.

Conclusion

In conclusion, our study demonstrates a high prevalence of allergic rhinitis among pediatric patients in Tabuk, significantly impacting their quality of life, daily activities, school performance, and emotional well-being. Effective management strategies should encompass not only medical treatments but also comprehensive support services including education, counseling, and psychological assistance. Enhanced awareness and targeted interventions are crucial to reducing the burden of allergic rhinitis and enhancing the overall well-being of affected children.

Disclosure

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