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Research Article

Bronchial Health and Disease Patterns in Baghdad's School-Age Population: A 2024 Study of 5-15 Year Olds Children

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ABSTRACT

Background

Bronchial conditions, particularly asthma, are a growing public health concern globally and regionally, with significant implications for childhood health and well-being. In Iraq and other Eastern Mediterranean Region (EMR) countries, the prevalence of asthma has been rising due to factors such as urbanization, environmental pollution, and genetic predisposition. Despite this, data on the epidemiology and risk factors for bronchial conditions among school-age children in Baghdad remains limited. This study aims to investigate the characteristics, prevalence, and risk factors of bronchial conditions in this population, with a focus on improving early detection and management.

Methodology

A cross-sectional prevalence study was conducted at four outpatient clinics in major hospitals in Baghdad. A total of 145 children aged 5-15 years were approached, with 100 meeting the inclusion criteria. Data were collected through structured questionnaires and medical record reviews, including demographic information, family history, environmental exposures, bronchial symptoms, and treatment practices. Descriptive statistics were used to analyze the prevalence and associated risk factors, while chi-square tests were employed to assess the relationship between variables.

Results

Most children affected by bronchial conditions were aged 5-10 years 61% and enrolled in primary school 72% . A significant proportion of children 82% had a familial history of asthma, and 70% lived in urban areas. The most common conditions were asthma 38% and bronchitis 34%, with high rates of recurrent respiratory symptoms such as coughing 76% and shortness of breath 78% over the past year. Environmental factors, including proximity to busy roads 90% and bronchiolitis as an early childhood infection 43% were prominent risk factors. Only 33% of children were diagnosed by pediatric specialists, raising concerns about access to specialized care.

Conclusions

This study highlights the significant burden of bronchial conditions, particularly asthma, among school-age children in Baghdad, with strong links to genetic predisposition and environmental exposures. The findings underscore the need for enhanced screening, early diagnosis, and targeted public health interventions in schools and communities. Addressing environmental triggers and improving access to specialized care is critical to reducing the impact of bronchial diseases on children's health and quality of life in Baghdad and across the EMR.

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1. INTRODUCTION

Bronchial health diseases, particularly asthma, represent a significant public health concern globally, with increasing prevalence in both developed and developing countries. Asthma, a chronic inflammatory condition of the airways, is one of the most common non-communicable diseases (NCDs) affecting children worldwide. It is estimated that over 262 million people suffer from asthma globally, leading to considerable morbidity and, in some cases, mortality. The condition is often underdiagnosed and undertreated, particularly in low- and middle-income countries (LMICs), contributing to a growing burden on health systems.[1-2]

In the Eastern Mediterranean Region (EMR), the prevalence of bronchial health diseases has been rising in recent decades, with asthma emerging as a leading cause of pediatric morbidity. Urbanization, environmental pollution, and rapid lifestyle changes have exacerbated the vulnerability of populations in this region. Iraq, like many other EMR countries, faces a growing challenge with childhood asthma and other bronchial conditions, where factors such as poor air quality, tobacco smoke exposure, and recurrent respiratory infections contribute to the rising incidence. Despite these trends, there is limited data on the epidemiology of bronchial conditions in school-age children in Baghdad, and this gap hinders the development of effective prevention and management strategies.[1-3]

In Iraq, particularly in urban centers like Baghdad, children between the ages of 5 and 15 are increasingly susceptible to asthma and bronchial illnesses, with environmental factors playing a critical role. The country's recent history of conflict, economic hardship, and environmental degradation has exacerbated health disparities, particularly in pediatric populations. School-age children, being highly exposed to environmental pollutants, second-hand smoke, and poor indoor air quality are at heightened risk for bronchial conditions.[3]

This study aims to address these gaps by investigating the characteristics, prevalence, and risk factors associated with bronchial conditions, including asthma and bronchitis, among school-age children in Baghdad. By evaluating the impact of these conditions on children's academic performance, quality of life, and access to care, this research seeks to propose evidence-based recommendations for school-based interventions and community health programs. Through a deeper understanding of the epidemiological patterns, it is anticipated that more targeted prevention and management strategies can be developed to alleviate the burden of bronchial diseases in this vulnerable population, in Iraq and the region.[3-4]

2. GOAL

This study aims to examine the characteristics and nature of bronchial conditions among school-age children (5-15 years) in Baghdad, Iraq, with a focus on enhancing early detection, prevention, and management strategies specifically adapted to this cohort.

3. OBJECTIVES

i. To determine the prevalence of bronchial conditions, including asthma and bronchitis, among (5-15year old) students in selected schools across Baghdad.
ii. To identify significant risk factors for bronchial conditions in this population, including environmental exposures, family history, and lifestyle behaviors.
iii. To assess the severity and recurrence of bronchial symptoms in affected children.
iv. To evaluate the influence of bronchial conditions on academic performance, school attendance, and overall quality of life.
v. To analyze current treatment modalities and management practices employed by caregivers and healthcare professionals for bronchial conditions in school-age children.
vi. To formulate recommendations for school-based interventions and community health initiatives to mitigate the burden of bronchial conditions within this age group.

4. METHODOLOGY

a. Study design :This is a cross-sectional prevalence study conducted to assess the characteristics and risk factors of bronchial conditions, particularly asthma, among school-age children (5-15 years) in Baghdad, Iraq. The study was carried out in four selected outpatient clinics affiliated with major hospitals in Baghdad, representing a cross-section of the city's pediatric population.
b. Study Population: The study targeted children aged (5-15 years) attending the outpatient clinics for respiratory complaints. A total of 145 children were initially identified and approached for inclusion in the study. However, after applying the inclusion and exclusion criteria, 100 children were eligible for participation.

c. Inclusion Criteria:
i. Children aged 5-15 years are diagnosed with or present symptoms suggestive of bronchial conditions (e.g., asthma, bronchitis).
ii. Residency in Baghdad for at least one year.
iii. Children who had no chronic respiratory conditions other than asthma or bronchitis.
iv. Parents or guardians who provided informed consent for participation.

d. Data Collection: Data were collected through structured questionnaires and medical record reviews. The questionnaire included sections on demographic information, family history, environmental exposures, and lifestyle habits. Clinical data on bronchial conditions, including symptom severity, frequency, and treatment modalities, were extracted from medical records and supplemented by physician assessments. The study also gathered data on the children's academic performance, school attendance, and overall quality of life using standardized tools to assess the impact of bronchial conditions.
e. Statistical Analysis: Descriptive statistics were used to summarize the demographic characteristics, prevalence of bronchial conditions, and associated risk factors. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means and standard deviations. The severity and frequency of bronchial symptoms were analyzed using chi-square tests and logistic regression to identify potential risk factors. Statistical significance was set at $p < 0.05$.
f. Ethical Considerations: The Ethics Committee approved the study protocol, and informed consent was obtained from parents or guardians of all participating children. The confidentiality of all participants was maintained, and data were anonymized before analysis.
This methodology enables a comprehensive evaluation of bronchial conditions among school-age children in Baghdad, to identify key risk factors and inform future interventions aimed at reducing the burden of bronchial diseases in this population.

5. RESULTS

Table I: Demographic Characteristics of child and parents

Demographic characteristics		Frequency	Percent
Child Age	< 5	11	22 %
	5 – 10	31	61 %
	> 10	8	17 %
The educational level of the child	Kindergarten	11	22 %
	Elementary school	36	72 %
	Middle school	3	6 %

Educational level (for parents)	**Elementary**	**23**	**46 %**
	Middle school	**8**	**16 %**
	Diploma	**7**	**14 %**
	Bachelor's degree	**11**	**22 %**
	Postgraduate studies	**1**	**2 %**
Employment status (of parents)	Housewife	4	8 %
	Employee	25	50 %
	Private business	9	18 %
	Unable to work	5	10 %
	Retired	7	14 %
Household income	Enough is enough	6	12 %
	Enough to some extent	28	56 %
	Not enough	16	32 %
Family history of bronchial asthma	Yes	41	82 %
	No	9	18 %
Living area	Urban	35	70 %
	Rural	15	30 %

The age was divided into three age groups as shown in (Table I) where the highest number of the sample was 31 children for the age group (5 – 10) made up 61% followed by the age group (less than 5) with 11children and 22% and then the age group (older than 10) with 8 children and 17% Figure1.

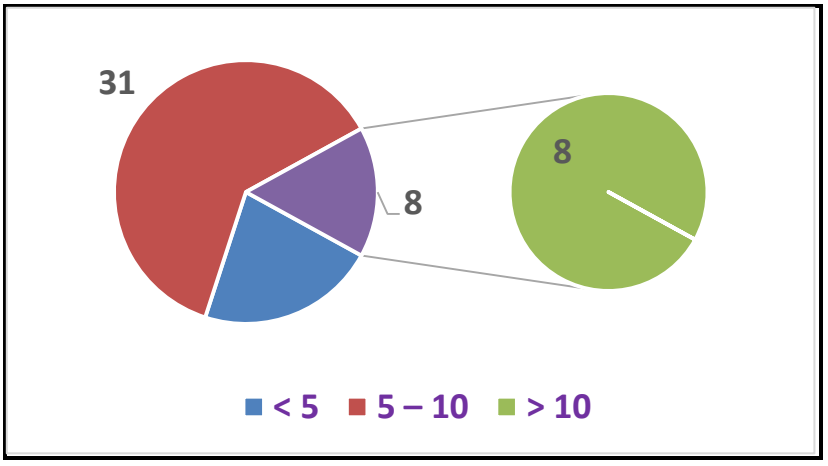

Fig.1 The age group

Source: Elaborated by the researcher based on the outputs of the Microsoft program . The marital status had three characteristics: married number 38 of the sample widow number 7 ,divorced number 5 and Figure 2.

The highest level of education for children was in primary school 36 with a high percentage 72% followed by kindergarten 11 with a percentage 22%, and finally, in the middle, there were only three students Figure 3.

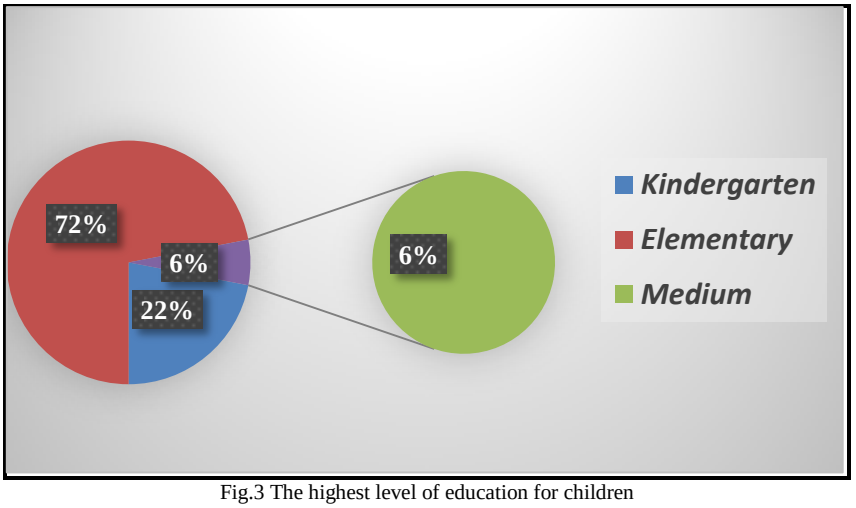

Fig.3 The highest level of education for children

Source: Elaborated by the researcher based on the outputs of the Microsoft program .

The largest number of parents employment status was for people employed in the public sector by the numbers 25 and 50 and then employed in the private sector by the numbers 9 and 18%, followed by retirees at 7 and 14%, unable to work by five people, and housewives by only four Figure 4.

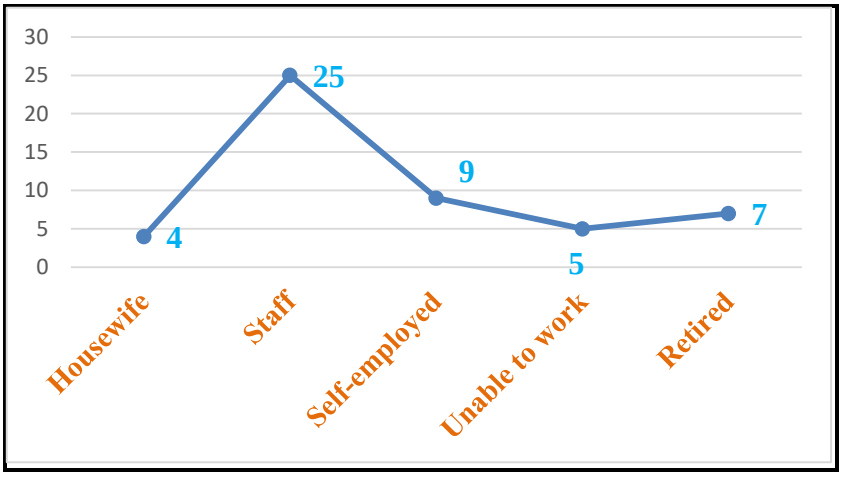

Fig.4 The largest number of parents

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

The highest family income was more or less sufficient 28 students 56% followed by insufficient income 16 students 32% and finally enough for only six families, Figure 5.

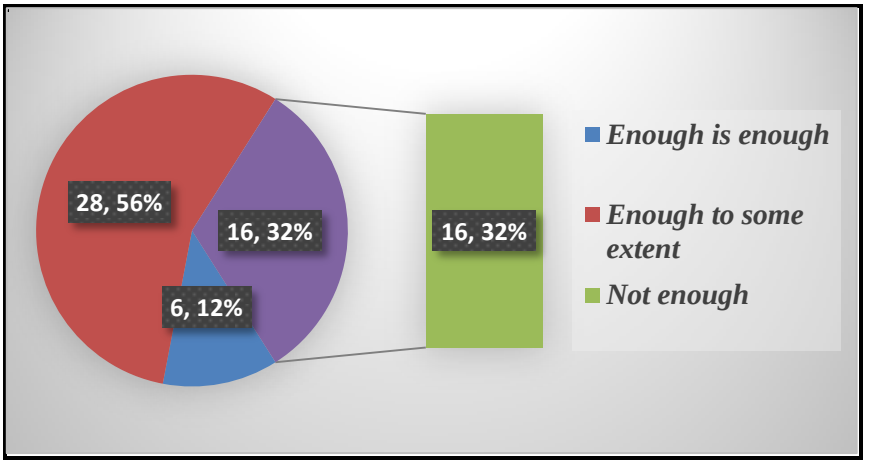

Fig.5 The highest family income was more or less sufficient

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

Figure 6 shows that 41children who had asthma for a genetic reason accounted for 82% of the selected sample, and 9 only 18% children did not have asthma for a genetic reason.

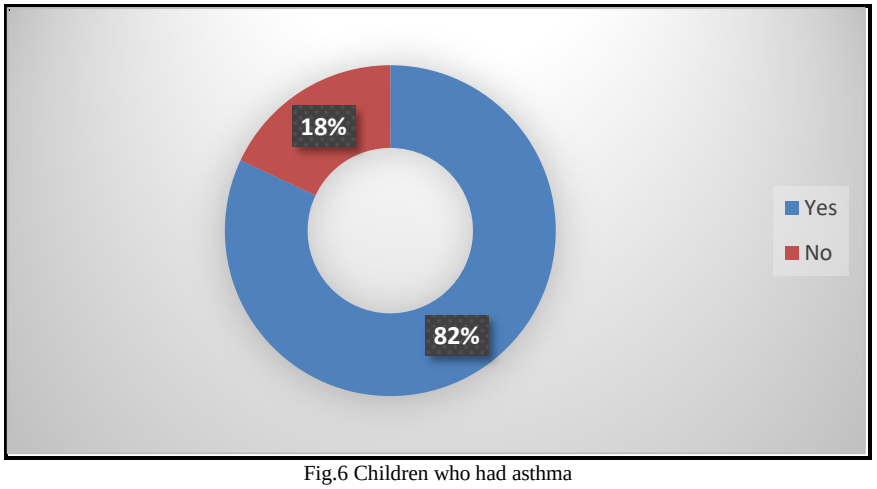

Fig.6 Children who had asthma

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

The number of children living in urban areas of the sample was 35 children 70% , while the number of children living in rural areas was 30% Figure7.

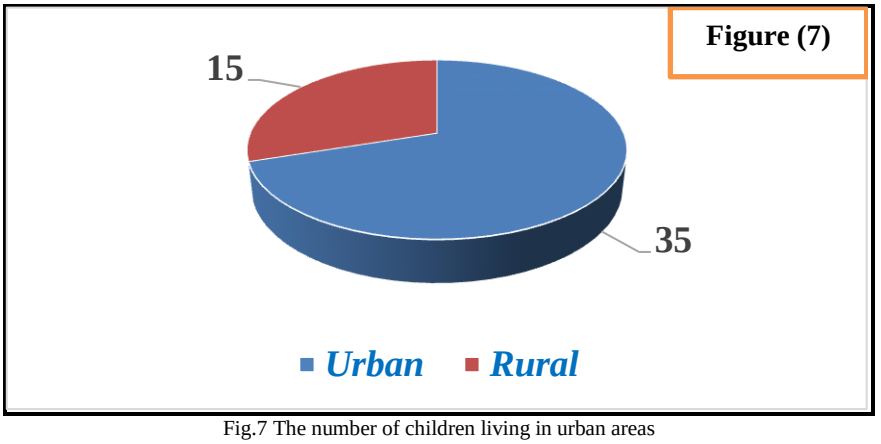

Fig.7 The number of children living in urban areas

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

The second axis: is the medical condition

Table II. The respondents ' answers

Allergic eczema	Any other respiratory disease	Inflammation of the bronchi	Allergic eye	Asthma	Mean	S.D	P. value	Sig.
6 12%	3 6%	17 34%	5 10%	19 38%	3.5	1.37	0.01	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program.

The highest percentage of children suffering from asthma 38%, bronchitis 34%, allergic eczema 12%, allergic eye 10%, and any other lung disease 6% Figure 9.

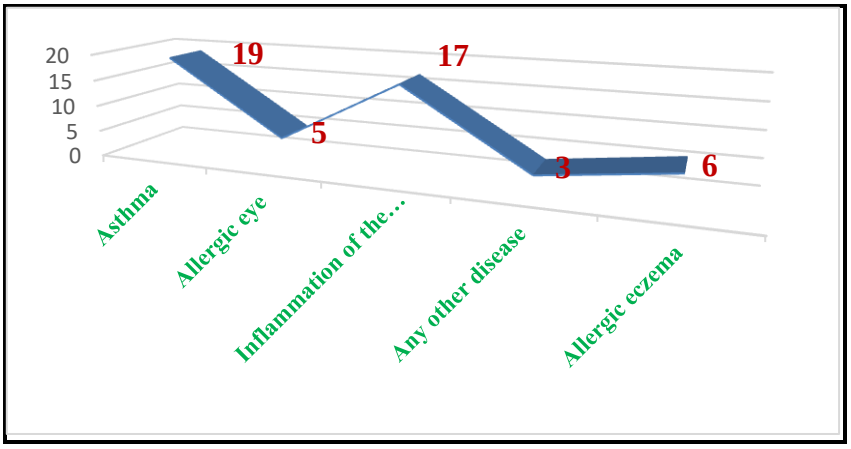

Fig.8 The highest percentage

Table III. The highest percentage

Dry cough in the night	Wheezing	Disturbed sleeping	Difficulty breathing	Mean	S.D	P. value	Sig.
10 2%	13 26%	6 12%	21 42%	2.76	1.20	0.00	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program .
Table 3 indicates that the highest percentage of the sample had difficulty breathing 42%, followed by wheezing 26%, then dry cough 20%.

Table IV. Statistics

Question	General practitioner	Pediatrician	A specialist in a specialized center	Mean	S.D	P. value	Sig.
Who diagnosed asthma	6	33	11	2.1	0.58	0.00	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program .
The number of children diagnosed by a pediatrician 33 children, who were diagnosed by a specialist 11children, and from a good general six children Figure 9.

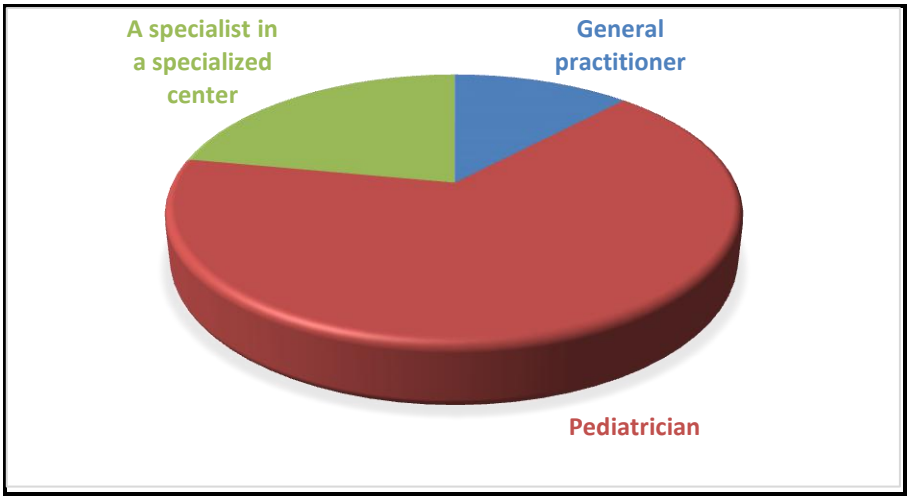

Fig.9 The number of children

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

Table V. Symptoms of Asthma Experience by the Child

Questions	Yes	No	Mean	S.D	P-value
Has your child been exposed to bouts of shortness of breath	39	11	1.2	0.47	0.000
Has your child experienced asthma symptoms in the past 12 months, i.e. intermittently or bouts of shortness of breath Symptoms may appear simultaneously with or without coughing or wheezing	37	13	1.3	0.44	0.000
Has your baby wake up in the past 12 months due to coughing, shortness of breath, or" tightness " in your chest	38	12	1.24	0.43	0.000
Does your child usually have shortness of breath, wheezing, or a severe cough	40	10	1.2	0.40	0.000
Has your child been diagnosed by a doctor with chronic bronchitis (bronchitis) or emphysema	29	21	1.42	0.49	0.000
Bronchiolitis is a major cause of asthma	43	7	1.1	0.35	0.000

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program .

Out of the total, 39 children from the sample were exposed to bouts of shortness of breath, while 11 children were not exposed to this. 37 children from the sample were exposed to asthma symptoms during the past twelve months, while 13 children were not exposed to them. 38 children from the sample were exposed to symptoms of coughing or shortness of breath during the past twelve months, while 12 children were not exposed to this. 40 children from the sample examined suffered from symptoms of severe coughing, wheezing, or shortness of breath during the past twelve months, while 10

children were not exposed to this. 45 children from the sample examined live near a busy road with traffic, while 5 children did not live in this case. The attending physician diagnosed 29 children from the examined sample with chronic bronchitis, while 21 children were diagnosed with emphysema. The cause of asthma was bronchiolitis 43 in the sample studied, while 7 children were in other cases Figure 10.

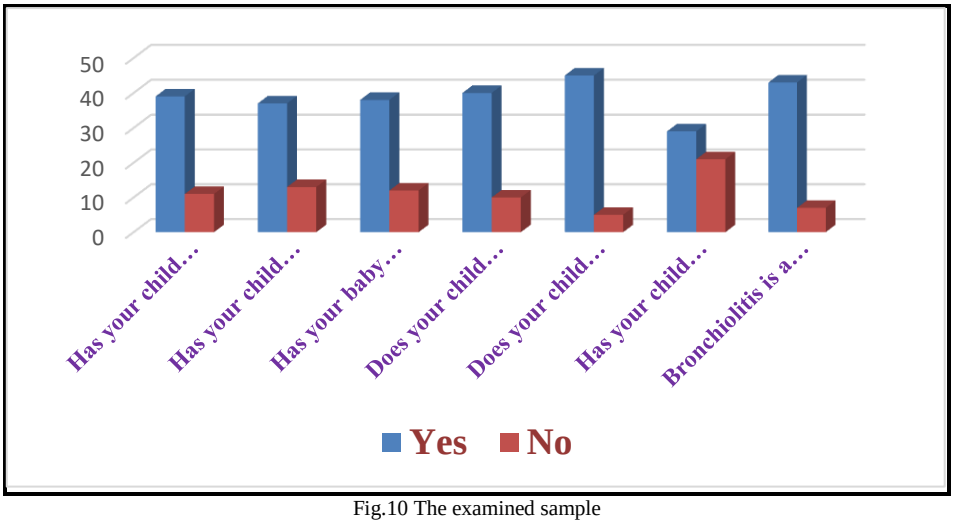

Fig.10 The examined sample

Source: Elaborated by the researcher based on the outputs of the Microsoft program.

Table VI. Statistics

Question	Watery nasal discharge	Thick yellow nasal discharge	Stuffy nose	Sneezing	Itching	Mean	S.D	P. value	Sig.
Symptoms experienced by the child	19	13	11	5	1	2.6	1.12	0.00	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program.

The percentage of watery nasal discharge for infection symptoms was the highest 38% followed by yellow nasal discharge 26%, stuffy nose 22%, sneezing 10%, itching 4% Figure 11.

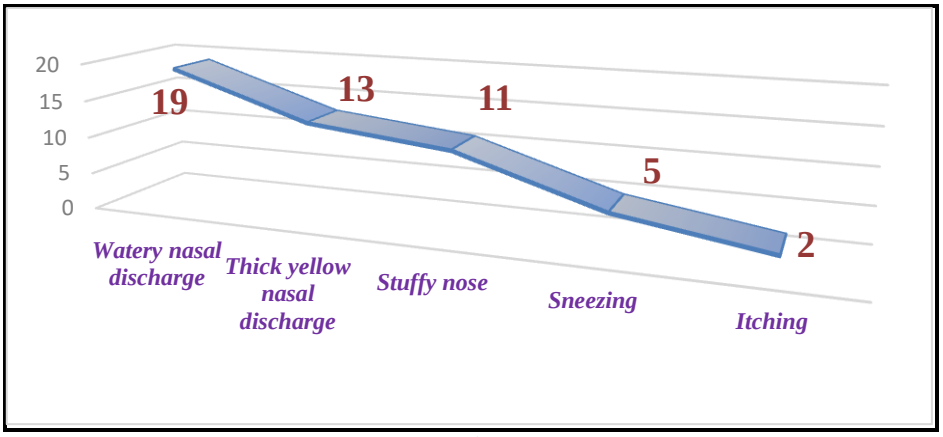

Fig.11 The percentage of watery nasal discharge

Source: Elaborated by the researcher based on the outputs of the Microsoft program

Table VII. The Association of Asthmatic Symptoms

Question	Mostly	Sometimes	Never	Mean	S.D	P. value	Sig.
How often are nasal symptoms associated with eye symptoms(itching, redness, or increased tear production Please mark one alternative?	27	20	3	1.52	0.61	0.00	S
How often are nasal symptoms associated with symptoms of the lungs (cough, shortness of breath, and/or wheezing) Please mark one alternative	31	15	4	1.42	0.53	0.00	S
Association of nasal symptoms with asthma	17	15	18	1.68	0.72	0.00	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program.

Nasal symptoms are associated with 27 children most of the time and 20 children sometimes and never associated with three children. Nasal symptoms are associated with lung symptoms in 31 children most of the time and 15 children sometimes and never associated with four children. 18 children most often and 15 children suffer from permanent unpleasant nasal symptoms, 17 children never or very rarely suffer from unpleasant nasal symptoms, and 15 children sometimes suffer from unpleasant nasal symptoms Figure 12.

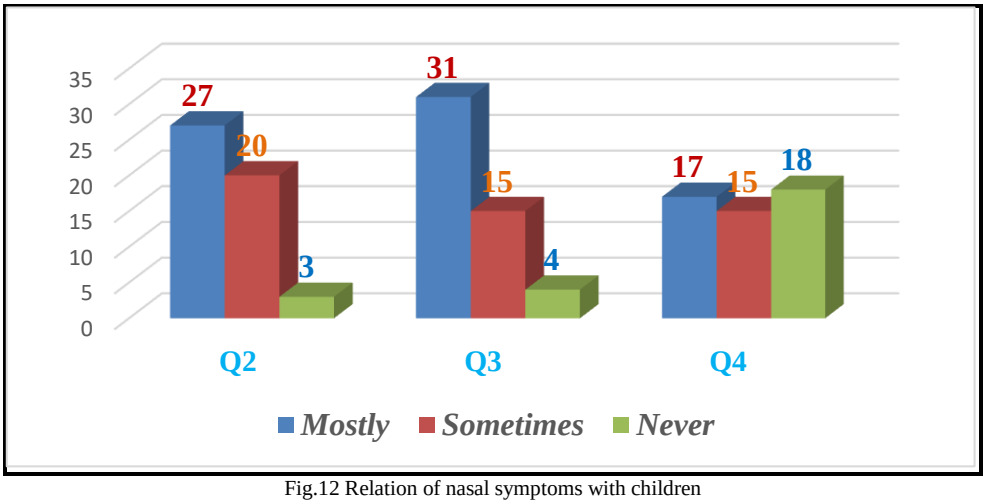

Fig.12 Relation of nasal symptoms with children

Table VIII. Factors that increase symptoms

Questions	Yes	No	Mean	S.D	P-value	Sig.
Bedroom carpet is a cause of asthma irritation	32	18	1.3	0.59	0.000	S
Passive smoking is a cause of an increase in asthma attacks	28	22	1.45	0.57	0.000	S
Sadness or fear in the increase of asthma attacks	36	14	1.31	0.47	0.000	S
The effect of dust and environmental irritants on asthma irritation	48	2	1.1	0.28	0.000	S
The influence of furry pets or birds on the irritation of an asthma attack in children	26	24	1.52	0.61	0.000	S
Does your child live near a busy road	45	5	1.1	0.30	0.000	S

with traffic						
Respiratory infection is a major cause of asthma	37	13	1.29	0.62	0.000	S
Exercising sports activity aggravates the condition of asthma or suffocation in asthmatics	11	39	2.11	0.72	0.000	S
Asthma medications cause side effects in children	12	38	2.03	0.69	0.000	S

Source: Elaborated by the researcher based on the outputs of the SPSS 27 program.

The room carpet irritates the asthma of 32 children from the sample studied, while 18 children do not. Smoking caused an increase in asthma attacks for 28 children from the sample studied, while 22 children did not get it. Sadness affects the increase in asthma attacks for 36 children in the sample studied, while 14 children do not get it. Dust affects asthma irritation in 48 children from the sample studied, while two children do not get it. Animals cause asthma irritation in 26 children from the sample studied, while 24 children do not get it. 40 children from the examined sample feel shortness of breath or cough before the attack occurs, while 10 children do not feel it. Respiratory tract infection, such as a cold, is one of the causes of asthma in 37 children in the sample studied, while 13 children did not get it. The practice of sports activity does not aggravate the condition of asthma or suffocation in asthmatics for 39 children from the sample studied, while 11 children do not. Asthma medications do not cause side effects in 38 children from the sample studied, while 12 children do not get them Figure13.

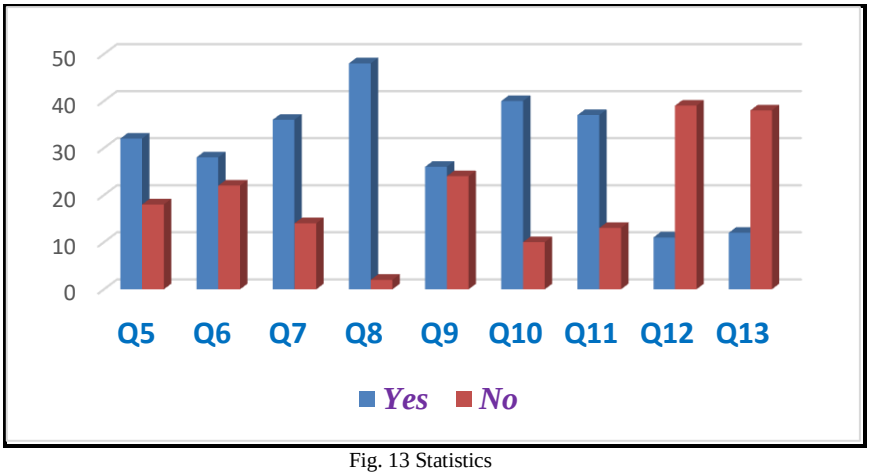

Fig. 13 Statistics

6. DISCUTION

The results of this study offer significant insights into the prevalence and characteristics of bronchial conditions, particularly asthma, among school-age children in Baghdad. The age distribution indicates that most affected children were between 5-10 years old, which aligns with global data that early childhood is a critical period for the onset of asthma and other bronchial conditions. This finding is consistent with regional studies in the Eastern Mediterranean Region (EMR), where similar age patterns of asthma prevalence have been reported. However, the lower prevalence in

children over 10 years old 17% suggests either possible underreporting or less severe symptoms in older children, which may require further investigation. [3-6]

The educational levels indicate that most of the children were in primary school 72%, which may reflect the age group of the majority but also raises concerns about the impact of asthma on school performance. The high percentage of public sector employment among parents 50% suggests that socio-economic factors, including job security and access to healthcare, might play a role in the management of bronchial conditions. However, the data also show that a significant portion of families 32% reported insufficient income, potentially limiting their ability to access quality healthcare, a common challenge in LMICs such as Iraq. [3-5]

One of the most striking findings is the genetic link to asthma, where 82% of the children had a familial history of asthma. This high percentage suggests a strong genetic predisposition within this population, which is higher than the global estimates that typically place familial asthma risk at around 50-70%. This genetic predisposition, combined with environmental factors such as urban living (70% of the sample) and proximity to busy roads 90%, aligns with other studies in urbanized settings, where pollution and traffic-related air quality have been closely linked to bronchial conditions.[1-6]

Asthma and bronchitis were the most diagnosed conditions in the sample 38% and 34% respectively, with allergic conditions like eczema and allergic eye diseases also present. These figures are in line with regional studies from the EMR, which report high co-occurrences of asthma with other allergic conditions. However, the high incidence of shortness of breath 78%, coughing 76%, and severe respiratory symptoms 80% during the past year indicates a substantial burden of poorly managed bronchial diseases, suggesting gaps in early detection and ongoing treatment strategies [4-6]. Interestingly, most children were diagnosed by pediatricians 33% rather than specialists, which raises concerns about the level of specialized care available in Baghdad. Additionally, the role of bronchiolitis as a leading cause of asthma 43% emphasizes the importance of addressing early childhood respiratory infections as a key prevention strategy.

When comparing these findings with global data, Iraq's figures align with the broader trends seen in developing nations, where environmental pollution, economic challenges, and insufficient healthcare access exacerbate the prevalence and severity of asthma. In contrast, studies in high-income countries report lower overall symptom severity, likely due to better access to healthcare and more advanced management protocols. Bronchial Asthma is a significant health problem among children and adults in Iraq and the region.[7-9]

On a national basis, and according to commitment and recommendations of the Iraqi National Council for accreditation of nursing colleges with technical support of the Accreditation Commission for Education in Nursing (ACEN) which was supported by the supervision of the Department of Certification in the MHESR based on a well-structured timely revised plan of action concluded with setting six standards ; Mission &administrative capacity, faculty and staff, students, curriculum, resources, and outcomes).[10]

Asthma is considered the major common chronic disease in children [11]. In conclusion, this study highlights the urgent need for improved asthma management and prevention strategies in Baghdad. These strategies should focus on early childhood interventions, address environmental exposures, and ensure access to specialized care. These findings underscore the importance of targeted public health initiatives, including school-based and community programs, to reduce the burden of bronchial conditions in vulnerable populations.

7. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to improve the management and prevention of bronchial conditions, particularly asthma, among school-age children in Baghdad:

a. Strengthening Early Detection and Screening Programs:

Implement routine bronchial health screening programs in schools to facilitate early identification of asthma and other bronchial conditions, especially for children with a family history of asthma and those living in high-risk urban environments.

b. Targeted Educational Campaigns:

Develop and implement educational programs to increase awareness among parents, teachers, and healthcare providers regarding the early signs and symptoms of asthma and bronchial diseases. Emphasis should be placed on the role of environmental triggers, such as pollution and tobacco smoke, and the importance of avoiding these exposures.

c. Enhanced Access to Specialized Care:

Improve access to pediatric specialists and asthma management services, particularly for children with severe or recurrent symptoms. Encouraging referrals from general pediatricians to respiratory specialists may ensure more comprehensive care and treatment.

d. Environmental and Urban Health Interventions:

Address environmental risk factors by advocating for policies that reduce exposure to air pollution, particularly in urban areas. Efforts should be made to control traffic emissions near schools and residential areas to reduce the incidence of respiratory issues.
e. School-Based Health Programs:
Establish asthma management protocols within schools, including training for school staff on how to handle asthma emergencies and the development of individualized asthma action plans for affected students. These programs should also include the availability of medications and regular health check-ups.
f. Genetic Counseling and Family Education:
Given the high prevalence of asthma linked to genetic factors, provide family counseling services to educate parents about the genetic risks and management strategies for children predisposed to asthma.
g. Community-Based Health Initiatives:
Collaborate with local healthcare providers and community leaders to develop community health programs aimed at reducing the burden of bronchial diseases. These programs should focus on promoting smoke-free environments, improving indoor air quality, and addressing socio-economic factors that may limit healthcare access.

By addressing these key areas, it is anticipated that the burden of bronchial conditions in school-age children in Baghdad can be significantly reduced, leading to improved health outcomes and quality of life for affected children.

Conflicts Of Interest
None

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None

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None

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