




Epidemiological Study of Asthma Prevalence and Management among Primary School Students in Al-Hilla City, Iraq

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ABSTRACT

Background: Asthma is a prevalent chronic respiratory disease that significantly impacts children's health, school attendance, and academic performance. This study investigates the prevalence, risk factors, and management of asthma among primary school students in Al-Hilla City, Iraq.

Methods: A cross-sectional study was carried out on 300 students from five non randomly selected primary schools in Al-Hilla city, during the academic year 2024-2025. The questionnaire was developed by the researcher. Data were analyzed by SPSS, version 25, software. A P-value of ≤ 0.05 was considered statistically significant.

Results: The findings revealed an overall asthma prevalence of 12%, with higher rates in urban areas (15%) compared to suburban areas (9%). Key risk factors included environmental pollution (55%), dust storms (47%), indoor pollutants (37%), a family history of asthma (40%), and low socioeconomic status (50%). Asthma significantly affected students' health, leading to frequent absenteeism (65%), reduced physical activity (58%), and lower academic performance (45%). Asthma management practices in schools were found to be inadequate, with inconsistent medication use (40%) and limited access to peak flow meters (15%).

Conclusion & Recommendation: The study concluded that asthma is a common health problem among students, affecting 12% of the participants, with a significantly higher incidence in urban areas compared to suburban areas. Environmental, social, and economic factors—particularly pollution, dust storms, indoor pollutants, family history, and low income—play a significant role in increasing the risk of asthma. The study highlights the need for improved asthma management protocols in schools, better environmental policies to reduce pollution, and enhanced education for both students and school staff on asthma care.

Keywords: Asthma, Prevalence, Management, Students

1. Introduction

Asthma is a chronic respiratory disease characterized coughing, wheezing, chest tightness, and dyspnea. The severity and frequency of asthma symptoms varies, and they are associated with underlying inflammation, bronchial hyper responsiveness, and airflow obstruction [1]. Asthma is defined by the

history of respiratory symptoms including wheezing, shortness of breath, chest tightness, and coughing that change in strength and duration over time, together with variable expiratory airflow restriction. Diagnosis of asthma required the presence of many respiratory symptoms, their worsening at night, and their exacerbation by a viral illness, exercise, allergens, changing weather, or smoking [3].

Both sexes can get asthma at any age, although it is most common in adolescence and early infancy. At the moment, a lot of research is focused on elucidating the unidentified underlying causes of asthma. Evidence suggests a combination of lifestyle, environmental, and genetic variables supports the risk of developing asthma. Since there is no known cure for this illness, community-level management and prevention measures are being successfully implemented to stop the condition's onset and manage future escalation of asthma symptoms [4].

In addition to genetic susceptibility, environmental factors that might irritate airways include exposure to dust mites, cockroaches, pollen, carpets, active and passive tobacco smoking, and air pollution [11]. adolescents who have asthma are susceptible to severe morbidity and disability that could compromise their overall health and well-being [6]. Asthma severity variation can result in varying degrees of handicap in teenagers' social and physical activities, school attendance, and emotional components. Additionally, teenagers who experience the least amount of physical activity due to their asthma may be more susceptible to asthma episodes [9].

Over the past few decades, the incidence of asthma has increased globally, reaching as high as 14.1% in children [1]. Regardless of financial level, 235 million individuals worldwide suffer from asthma across all nations. The quality of life for both the affected individual and their family is significantly impacted by undiagnosed and untreated asthma [2]. In the Middle East, asthma affects 7.57% of children between the ages of 13 and 14 and is more common in younger males [10]. Due to differences in race, ethnicity, sex, socioeconomic status, lifestyle, and environmental factors, the incidence of asthma ranges from 1 to 20% or even more in various nations and even within the same country.

Urban locations and industrialized nations are two of the disease's risk factors [3]. Asthma killed 455 000 people and afflicted an estimated 262 million people in 2019 [5]. Achieving asthma control is the main objective of asthma care, according to current clinical practice standards. Because asthma affects not only those who have the condition but also those who care for them, affecting their everyday activities, children and adolescents with asthma demand special attention when it comes to their quality of life [7]. Because asthma is a chronic condition, there is a direct correlation between the severity of the condition and quality of life (QoL), as well as between asthma treatment and QoL in these people. Because asthma is a common chronic illness, it is crucial to look at the quality of life of those who suffer from it. QoL is impacted by asthma, and poor asthma management is linked to worse QoL ratings. It is crucial to consider quality of life when managing asthma [8]. In the central Iraqi city of Al-Hilla, asthma is becoming more common among primary school pupils. The purpose of this study is to look at the prevalence, risk factors, and treatment of asthma among Al-Hilla students, with an emphasis on how the condition affects academic performance, school attendance, and overall health.

2. Study Objective

The objectives of this study are:

- To determine the prevalence of asthma among primary school students in Al-Hilla City.
- To identify the environmental, genetic, and socioeconomic risk factors contributing to asthma.
- To assess the impact of asthma on health, school attendance, and academic performance.

3. Methods

3.1. Design of the Study:

A cross-sectional descriptive study design was used.

3.2. Setting of the Study:

The study was carried out in Al-Hilla City, involving five primary schools.

3.3. Duration of study:

The study was carried out from the 1st of October 2024 to the 30 of December 2024.

3.4. The Sample of the Study:

3.4.1. The sampling method:

Five primary school schools have been selected nonrandomly Sampling Technique.

3.4.2. The study instrument:

Through appropriate use of the pertinent literature that was accessible, the researcher adjusted the study instrument (questionnaire). The European Community Respiratory Health Survey (ECRHs) served as the model for the clinical history section of asthma (Janson *et al*, 2001). The Sydney Asthma Quality of Life Questionnaire (AQLQ-S) and the Juniper Asthma Quality of Life Questionnaire (AQLQ-J) were the sources of the items pertaining to the QoL areas, (Juniper *et al*, 1992; Marks *et al*, 1992). The questionnaire consisted of three parts. The first one was about sociodemographic characteristics, the second part consisted of two domains: exposure to risk factors and clinical history; and the third part was the asthma quality of life domain.

4. Result

Table 1. Distribution of studied sample according to socio-demographic characteristics. n=300

Variables	No.
Age (years)	
6-7	150 (50%)
8-9	85(29%)
10-12	65(21%)
Gender	
Male	150(50)
Female	150(50%)
Residency	
Urban	260(87%)
Sub-urban	40(13%)

Father's educational level.	
Illiterate	40(13%)
Read & write, primary	54(18%)
Intermediate	62(21%)
Secondary	30(10%)
College and above	114(38%)
Mother's educational level.	
Illiterate	53(18%)
Read & write, and primary	68(23%)
Intermediate	43(14%)
Secondary	66(22%)
College and above	70(23%)
Father's occupation	
Illiterate	40(13%)
Unskilled manual worker	54(18%)
Skilled manual worker	62(21%)
Non-manual worker	30(10%)
High rank occupations	114(38%)
Mother's occupation	
Housewife	120(40%)
Unskilled manual worker	30(10%)
Skilled manual worker	55(18%)
Non-manual worker	35(12%)
High rank occupations	60(20%)
Income	
Not sufficient or marginally sufficient	167(56%)
Sufficient	113(37%)
Exceeds daily needs	20(7%)
Do you sleep alone in a private room?	
No	189(63%)
Yes	111(37%)
Is there any person smoking inside the house?	
No	178(59%)
Yes	122(41%)
Total	300

The data suggests a sample where many families are urban-based, with relatively high educational levels among both fathers and mothers, and a significant portion of fathers in high-rank occupations. However, economic stability appears to be a challenge, with more than half of the families reporting

insufficient or marginally sufficient income. A considerable portion of children do not sleep in private rooms, indicating crowded living conditions, and exposure to smoking is common in some households. These variables could have significant implications for children's health, education, and well-being, and they may reflect broader socio-economic trends in the population. The findings suggest a need for policy or community interventions to address issues like income disparity, living conditions, and health risks (such as secondhand smoke exposure).

Table 2. Distribution of study sample according to socio-economic status (SES)

It is evident in Table 2. that 60.0% of the samples studied were of medium SES, 33.0% were of low SES and 7.0 % were of high SES.

Table 3. Distribution of study sample according to socio-economic status (SES).

SES	No.	(%)
Low	100	(33.0)
Medium	180	(60.0)
High	20	(7.0)
Total	300	(100.0)

Table 4. Prevalence of Asthma among Primary School Students in Al-Hilla City.

Category	Percentage (%)	Number of Students (out of 300)
Overall Prevalence of Asthma	12%	36
Urban Areas Prevalence	15%	22
Suburban Areas Prevalence	9%	14
Gender Distribution (Boys)	58%	21
Gender Distribution (Girls)	42%	15
Age Group (8-10 years)	45%	16

Table 5. Risk Factors Contributing to Asthma.

Risk Factor	Percentage (%)	Number of Students (out of 36)
Air Pollution	55%	20
Dust	47%	17
Indoor Pollutants (Secondhand Smoke, Household Dust)	37%	13
Family History of Asthma	40%	14
Low Socioeconomic Status	50%	18

Table 6. Impact of Asthma on Health and Well-being

Impact Category	Percentage (%)	Number of Students (out of 36)
Frequent Absenteeism (6-8 days/year)	65%	23
Reduced Physical Activity	58%	21
Fatigue and Decreased Energy	52%	19
Academic Performance (Poor Grades)	45%	16
Psychosocial Impact (Anxiety, Low Self-confidence)	41%	15

Table 7. Asthma Management Practices in Schools

Management Practice	Percentage (%)	Number of Students (out of 36)
Inhaler Use	85%	31
Inconsistent Medication Use	40%	14
Access to Peak Flow Meter	15%	5
Designated Healthcare Professionals in School	60%	22
Asthma Care Plan in School	55%	20
Parental-Teacher Collaboration	40%	14

5. Discussion

The results of this study indicate a notable prevalence of asthma among primary school students in Al-Hilla City, with environmental pollution being a primary contributor. The higher prevalence in urban areas can be attributed to air pollution, dusts, and traffic emissions, which are significant asthma triggers. The study also highlights the role of genetic factors, as a family history of asthma was reported in 40% of cases.

The impact of asthma on students' health is substantial, with frequent absenteeism, reduced physical activity, and poor academic performance being commonly reported. These findings are consistent with global research, which has shown that asthma significantly affects children's daily activities, including school attendance and academic achievement.

Asthma management practices in schools, however, appear to be inadequate. While most students have access to inhalers, inconsistent medication use and limited asthma care protocols in schools suggest a need for better asthma management training for school staff and parents. The lack of peak flow meters and the absence of structured asthma care plans in many schools highlight gaps in the health services provided to students with asthma.

6. Conclusion

The study concluded that asthma is a common health problem among students, affecting 12% of the participants, with a significantly higher incidence in urban areas compared to suburban areas. Environmental, social, and economic factors—particularly pollution, dust storms, indoor pollutants, family history, and low income—play a significant role in increasing the risk of asthma. Asthma has significant negative impacts on students' health, as evidenced by frequent school absences, decreased physical activity, and lower academic achievement. Furthermore, asthma management in schools is inadequate, characterized by inconsistent medication use and limited availability of basic monitoring tools. These findings highlight the urgent need for targeted public health interventions, improved school-based asthma management programs, and increased community awareness to reduce the burden of asthma among students. By addressing the gaps in asthma care and focusing on preventive measures, the health and well-being of children with asthma disease.

7. Recommendations

Based on the findings of this study, the following recommendations are made:

1. Relevant authorities in the community should work to reduce air pollution, especially in areas near schools and residential neighborhoods. Initiatives such as increasing green spaces, improving waste management, and enhancing the cleanliness of public transportation can help minimize the triggers of asthma.
2. Schools should implement asthma education programs for both students and teachers to raise awareness of asthma management, triggers, and emergency procedures.
3. Asthma care plans in schools should adopt comprehensive asthma care plans for all affected students, ensuring that medication and emergency protocols are clearly outlined.
4. Community support for healthcare providers and local government should work together to offer more accessible asthma care for low-income families, including free or subsidized asthma medications, regular health check-ups, and home visits to educate families on asthma management.

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