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Prevalence And Management Of Asthma In School-Aged Children

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Abstract-

Background:

Asthma is a leading chronic respiratory illness in children, significantly affecting school performance, quality of life, and healthcare burden. Early identification and consistent management are essential to reduce morbidity. However, many children remain undiagnosed or poorly managed due to lack of awareness, limited access to care, and inconsistent treatment adherence.

Objectives:

To determine the prevalence of asthma in school-aged children and assess their management practices, including medication adherence, trigger identification, and frequency of emergency care visits due to asthma exacerbations.

Study design: A prospective study.

Place and duration of study: Pediatric Department Jinnah Medical College & Teaching Hospital Peshawar from jan 2024 to july 2024

Methods:

A prospective study was conducted in the Pediatric Department Jinnah Medical College & Teaching Hospital Peshawar from jan 2024 to july 2024. A validated questionnaire based on ISAAC protocol was distributed to parents of children aged 6–12 years. Physician-confirmed diagnoses were included. Data were collected on asthma prevalence, medication use, and trigger exposure. Analysis was performed using SPSS 24.0, with significance set at $p<0.05$.

Results:

Among 100 surveyed students, 120 (12%) had physician-diagnosed asthma. The mean age of asthmatic children was 9.1 ± 1.8 years. Males comprised 65% of cases. Common triggers included dust (72%), cold weather (51%), and exercise (38%). Only 58% used controller inhalers regularly. Emergency visits were reported by 32% in the last 6 months. A significant association was found between irregular medication use and increased emergency visits ($p=0.03$). Poor knowledge about inhaler technique was observed in 41% of children.

Conclusion:
Asthma is prevalent among school-aged children, with suboptimal management and poor treatment adherence contributing to increased exacerbations. Educational initiatives for parents, school staff, and children are needed to enhance asthma awareness, improve medication compliance, and reduce preventable hospital visits. School-based asthma management plans should be promoted for early intervention and better control of symptoms, thereby improving overall health and academic outcomes.

Keywords:
Asthma, Children, Prevalence, Management

Introduction:

Asthma is a chronic inflammatory disorder of the airways characterized by episodes of wheezing, breathlessness, chest tightness, and coughing, especially at night or early morning. It is one of the most common chronic diseases in children globally and represents a major public health concern due to its impact on quality of life, school performance, and healthcare resources [1]. According to the World Health Organization (WHO), approximately 235 million people worldwide suffer from asthma, and the prevalence in children has been rising steadily, particularly in low- and middle-income countries [2]. -aged children are a particularly vulnerable group due to environmental exposures in both school and home settings, physical activity, and varying levels of parental and teacher awareness. Asthma in this age group can significantly impact physical activity, school attendance, and overall well-being. Poorly controlled asthma can lead to frequent emergency visits, hospitalization, and missed school days, thereby affecting educational outcomes and social development [3,4]. Despite the availability of international asthma management guidelines such as GINA (Global Initiative for Asthma), underdiagnosis and undertreatment remain common in many regions, particularly in resource-limited settings [5]. Several studies have shown that parents often lack proper understanding of asthma management, and children frequently do not adhere to prescribed medication regimens, especially when symptoms are intermittent or mild [6]. Environmental triggers such as allergens, air pollution, tobacco smoke, cold air, and exercise are frequently implicated in asthma exacerbations among children [7]. Schools, which are environments where children spend a significant amount of time, often lack structured asthma action plans or trained staff to manage acute episodes. This further highlights the importance of implementing asthma education programs and school-based management strategies. In Pakistan, data on asthma prevalence in school-aged children is limited and often derived from small-scale regional studies. This hampers the development of targeted public health interventions. Studies using the ISAAC (International Study of Asthma and Allergies in Childhood) protocol have demonstrated asthma prevalence rates ranging from 10% to 14% in urban Pakistani schoolchildren [8,9]. However, comprehensive assessments of both prevalence and the effectiveness of current management practices are scarce. The present study was conducted to assess the prevalence of asthma in school-aged children (6–12 years) in [Insert Location], evaluate their management practices, identify common environmental triggers, and explore associations with emergency healthcare utilization and medication adherence. The results aim to inform future school-based intervention programs and provide data for policymakers to enhance paediatric asthma care.

Methods:

The Pediatric Department Jinnah Medical College & Teaching Hospital Peshawar from jan jan 2024 to july 2024 selected public and private schools of targeting children aged 6–12 years. A sample of 100 students was selected using multistage stratified sampling. A validated, structured questionnaire based on the ISAAC protocol was distributed to parents/guardians after obtaining informed consent. Asthma diagnosis was confirmed via medical records or physician verification. The questionnaire collected demographic data, asthma history, medication use, trigger exposure, emergency visits, school absenteeism, and knowledge about inhaler use. Ethical approval was obtained from the Institutional Review Board (IRB)

Inclusion Criteria:

Children aged 6 to 12 years enrolled in participating schools whose parents provided informed consent and had complete data records including confirmed asthma diagnosis were included in the study.

Exclusion Criteria:

Children with chronic respiratory conditions other than asthma, incomplete medical records, or those whose parents did not provide consent were excluded from the study.

Data Collection:

Data were collected using self-administered, pre-tested questionnaires distributed to parents. Follow-up calls were made to clarify unclear responses. Additional verification of asthma diagnosis was conducted through school medical records and consultation with paediatricians. Confidentiality and anonymity were maintained throughout the study process.

Statistical Analysis:

Data were analyzed using SPSS version 24.0. Frequencies and percentages were calculated for categorical variables. Mean and standard deviation were reported for continuous variables. Chi-square test was used for categorical comparisons. A p-value of <0.05 was considered statistically significant to assess associations between management practices and asthma exacerbations.

Results:

Out of 100 students surveyed, 120 (12%) were confirmed to have physician-diagnosed asthma. The mean age of asthmatic children was 9.1 ± 1.8 years, with males comprising 65% (n=78) and females 35% (n=42). A history of family asthma was reported in 47% of cases. Common triggers identified were dust (72%), cold air (51%), physical activity (38%), and pet dander (19%). Only 58% of asthmatic children used inhaled corticosteroids or bronchodilators regularly. Among them, 42% adhered to daily controller medications. Emergency room visits in the past six months were reported by 32%, and school absenteeism of more than five days was noted in 28% of cases. Children with poor medication adherence had a significantly higher frequency of emergency visits (p=0.03). Moreover, 41% of children and their caregivers demonstrated poor inhaler technique knowledge. Private school students had a slightly higher prevalence of asthma (13%) compared to public school students (11%), though this was not statistically significant (p=0.08). Overall, a lack of asthma education among families and schools was evident, and only 18% of children had an asthma action plan available at school.

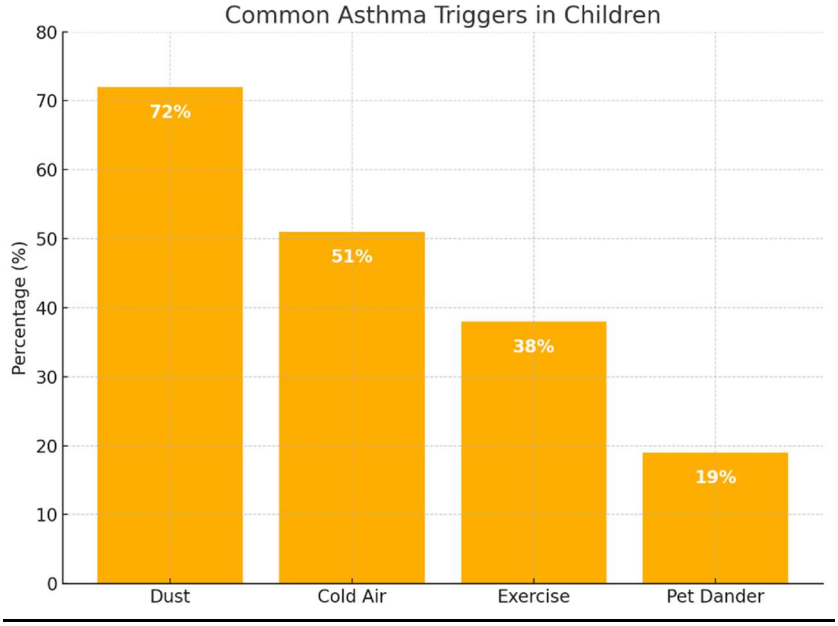

Table 1: Demographic Characteristics

Variable	Value
Total surveyed	1000
Asthmatic cases	120
Mean age (years)	9.1
Standard deviation	1.8
Male (%)	65%
Female (%)	35%

Table 2: Common Asthma Triggers

Trigger	Percentage (%)
Dust	72
Cold Air	51
Exercise	38
Pet Dander	19

Table 3: Asthma Management and Outcomes

Management/Outcome	Percentage (%)
Regular inhaler use	58
Daily controller adherence	42
Emergency visits (past 6 months)	32
School absenteeism >5 days	28
Poor inhaler technique	41

Discussion:

public health issue among school-aged children, with a prevalence of 12% in the sampled population. This result aligns closely with the reported global paediatric asthma prevalence, which ranges from 10% to 14% depending on geographic and environmental conditions [10]. A similar prevalence rate was observed in a study conducted in urban areas of Karachi, Pakistan, where asthma was reported in 11.7% of schoolchildren aged 6–12 years using the ISAAC questionnaire [11].Gender distribution in our study showed a male predominance (65%), consistent with previous study indicating that boys are more frequently affected by asthma in childhood, possibly due to smaller airway calibre and higher exposure to physical activity-induced triggers [12,13]. However, gender disparity tends to decline or reverse during adolescence due to hormonal influences [14]. Environmental triggers such as dust, cold air, and physical activity were the most commonly reported in our cohort. This corresponds with findings from a multicenter

Asian study that identified house dust mites, air pollutants, and exercise as dominant exacerbating factors in asthmatic children [15]. Moreover, the high frequency of dust as a trigger (72%) underlines the importance of environmental control interventions at home and school environments to prevent symptom aggravation. Alarmingly, the study revealed that only 58% of diagnosed children used inhalers regularly, and just 42% adhered to daily controller medication. This low adherence rate is consistent with reports from similar settings in developing countries where parental awareness, economic barriers, and fear of steroid side effects negatively influence compliance [16,17]. In a study from India, only 39% of children used inhaled corticosteroids consistently despite clear physician instructions, demonstrating a major gap in treatment literacy [18]. Emergency room visits were reported by 32% of children in our study within the previous six months, reflecting inadequate day-to-day asthma control. Prior studies have associated irregular inhaler use and poor trigger management with higher rates of emergency department utilization [19]. This suggests a need for regular follow-ups, asthma education programs, and written asthma action plans for every child diagnosed with asthma. Another critical observation was the poor knowledge regarding inhaler technique among 41% of the participants. Similar trends were found in a UAE-based study where improper inhaler usage was seen in 46% of paediatric asthma patients, which can directly compromise treatment efficacy [20]. Schools in our study rarely maintained asthma action plans, pointing toward systemic gaps in healthcare-education collaboration. Overall, these findings highlight an urgent need for school-based asthma interventions, including teacher training, awareness campaigns, and integration of asthma management protocols into public health frameworks. Strengthening community engagement and reinforcing the role of school nurses and primary care providers may improve outcomes in this vulnerable population.

Conclusion:

Asthma is prevalent among school-aged children, with suboptimal management and poor adherence to treatment contributing to frequent exacerbations. Comprehensive asthma education, improved inhaler use, and school-based action plans are essential to reduce morbidity and improve quality of life in affected children through early and sustained disease control.

Limitations:

This study was limited by its cross-sectional design, reliance on self-reported data, and absence of spirometry confirmation. The findings may not be generalizable beyond the urban school settings surveyed. Additionally, seasonal variations and environmental pollutant data were not accounted for, potentially affecting asthma prevalence and trigger analysis.

Future Recommendations:

Future studies should incorporate longitudinal follow-up, spirometry confirmation, and environmental pollutant monitoring. Interventional trials evaluating school-based asthma management programs, digital adherence tools, and caregiver training could provide deeper insights. Expanding study to rural and under-resourced areas would enhance understanding of asthma care disparities across diverse populations.

Abbreviations

1. WHO World Health Organization
2. GINA Global Initiative for Asthma
3. ISAAC International Study of Asthma and Allergies in Childhood
4. IRB Institutional Review Board
5. SPSS Statistical Package for the Social Sciences
6. ER Emergency Room
7. UAE United Arab Emirates

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Authors Contribution

Concept & Design of Study: **Karamat Ali[1], Shabnam Mahsood[2]**
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Data Analysis: **,Kashif Ahmad[4]**
Critical Review:**Kalsoom Feroz[5], Sheran Ullah[6]**
Final Approval of version:**All Mention Authors Approved the Final Version.**

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