RESEARCH PAPER

Correlation of Physical Activity and Respiratory Symptoms in School Going Children with Bronchial Asthma in Kolhapur Urban

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ABSTRACT

Background: Asthma is one of the most common chronic respiratory conditions affecting children and continued to pose a significant health challenge, especially in urban areas. Factors such as increasing pollution, sedentary lifestyle, and changing environmental conditions had contributed to a noticeable rise in respiratory complaints among school-aged children. Physical activity played an important role in maintaining respiratory health; however, its relationship with asthma symptoms in children remained an area requiring further exploration, particularly in growing urban regions like Kolhapur.

Objectives: To assess the relationship between levels of physical activity and the occurrence of respiratory symptoms among school-going children diagnosed with bronchial asthma in Kolhapur urban.

Methodology: This study adopted an observational design and included children aged 7 to 18 years from selected urban schools in Karvir Taluka. Participants were selected using a multistage stratified random sampling technique. Information regarding respiratory symptoms, physical activity, and demographic details was collected using a structured and pre-validated questionnaire. Peak Expiratory Flow Rate (PEFR) was measured using a standardized peak flow meter. The collected data were analyzed using statistical methods, including descriptive analysis and tests of association to determine correlations between variables. Ethical approval and informed consent were obtained prior to conducting the study.

Results: A total of 158 school-going children participated in the study, with equal representation of males and females. The mean age of participants was 13.32 ± 1.03 years, and the mean BMI was 19.05 ± 1.26. Most participants were classified under the moderate symptom category (68%), while 32% were categorized as severe. A higher proportion of children with low physical activity levels was observed in both moderate and severe groups; however, this association was not statistically significant ($p = 0.182$). Similarly, no significant association was found between PEFR categories and symptom severity ($p = 0.251$), although reduced PEFR was more common in the severe group.

Correlation analysis showed a significant negative relationship between ISAAC scores and both physical activity ($r = -0.320$) and PEFR ($r = -0.539$), indicating that higher activity levels and better lung function were associated with lower symptom severity ($p < 0.001$).z

Conclusion: The findings of this study highlighted the importance of maintaining adequate physical activity in children with asthma. Encouraging active lifestyles, along with addressing environmental factors, helps in reducing symptom severity and improving overall respiratory well-being in this population.

Keywords: Asthma, physical activity, respiratory symptoms, school children, urban health, PEFR, Kolhapur

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INTRODUCTION

In India, recent studies have highlighted a rising trend in childhood asthma, especially in rapidly developing urban and semi-urban regions. Factors such as environmental pollution, overcrowding, and limited awareness contribute significantly to this increase. Karvir Taluka, an urban region undergoing rapid industrial and infrastructural expansion, presents a relevant setting to study these patterns. The growing presence of small-scale industries, increased vehicular density, and changing living conditions may be contributing to a higher burden of respiratory illnesses among children in this area [14–15]. Asthma is a long-term inflammatory condition of the airways that continues to affect a large proportion of the paediatric population worldwide. It is characterized by airway hyperresponsiveness, intermittent airflow obstruction, and symptoms such as wheezing, breathlessness, chest tightness, and coughing. These symptoms often vary in intensity and may worsen with exposure to specific triggers. Over the past few decades, the burden of asthma has steadily increased, making it a major concern for public health systems globally, especially in developing countries [1–3].

Asthma symptoms most commonly first develop in early childhood. Children of pre-school age often wheeze with viral infection, but only about half of them go on to have characteristic asthma at school age. Children who have frequent or persistent wheeze are more likely to have evidence of airway inflammation and remodeling, impaired lung function, and persistently troublesome symptoms into adulthood. The underlying mechanisms of

asthma are still not well understood. About half of people with asthma have underlying allergic and the other half non-
allergic mechanisms and this latter type is more common in low- and middle-income countries (LMICs). It is unclear whether asthma is a single disease, or if it is in fact a grouping of different conditions which all result in the same clinical effect. Despite this, most people with asthma symptoms improve with asthma medicines, and the use of the term
asthma as a clinical diagnosis is still useful in most patients because it opens the door to appropriate management to reduce disease

A noticeable rise in asthma cases has been reported in urban settings, where environmental and lifestyle-related factors play a crucial role. Compared to rural populations, children living in urban areas are exposed to higher levels of air pollution, including particulate matter, vehicular emissions, and industrial pollutants, all of which are known to aggravate airway inflammation [4–5]. Additionally, indoor pollutants such as dust, smoke, and allergens further contribute to the frequency and severity of respiratory symptoms.

The distribution of asthma varies significantly across different regions, influenced by socioeconomic, environmental, and genetic factors. Urban regions consistently report higher prevalence rates, which has led researchers to conduct region-specific studies to better understand local determinants and patterns of the disease [6–7]. Although advancements in medical management have improved symptom control and quality of life, asthma remains a chronic condition without a definitive cure. Therefore, early identification of modifiable risk factors is essential for effective prevention and long-term management [8].

Rapid urbanization has introduced multiple challenges that directly or indirectly influence respiratory health. Increased industrial activity, traffic congestion, and construction work have led to declining air quality in many cities. At the same time, lifestyle changes such as reduced outdoor activity, increased screen time, and unhealthy dietary habits have contributed to decreased physical fitness among children. These factors not only increase the risk of developing asthma but may also worsen existing symptoms [9–11].

Physical activity, which is essential for overall growth and respiratory efficiency, has shown a complex relationship with asthma. While regular physical activity can improve lung function and exercise tolerance, children with poorly controlled asthma may avoid physical exertion due to fear of symptom exacerbation. This avoidance can lead to a cycle of inactivity, reduced fitness, and worsening respiratory health. Understanding this relationship is particularly important in school-going children, as they represent a group where early interventions can have long-term benefits [12–13].

Children are particularly vulnerable to these environmental and lifestyle influences due to their
developing lungs and higher respiratory rates compared to adults. Moreover, school environments expose them to both indoor and outdoor pollutants, making them a critical group for epidemiological assessment. Identifying the association between physical activity levels and respiratory symptoms in this population can provide valuable insights for designing targeted interventions [16–17].

Considering these factors, the present study aims to explore the correlation between physical activity and respiratory symptoms among school-going children with bronchial asthma in urban Kolhapur. The findings may help in developing preventive strategies, promoting healthy lifestyle practices, and guiding school-based health programs to reduce the burden of asthma in this population [18–19].

In a subject whose lungs have not been affected by any pathological condition (see below), the factors which determine PEF are as follows:

1. The dimensions of the large intra- and extra thoracic airways. The length and calibre of intrathoracic airways increase with lung volume during growth; within an individual, the calibre is a function of transbronchial pressure and, hence, of the volume and the elastic properties of the lung, and of the compliance of the air-ways. Both thoracic airway diameter and compliance are influenced by flexion and extension of the neck [7].
2. The force generated by the expiratory muscles, primarily abdominal. This is dependent on the force-length relationship and, hence, varies with the level of lung
inflation.
3. The speed with which maximal alveolar pressure is reached, which depends on the force- velocity properties of the expiratory muscles [8].
4. The "volume history" of the lung, i.e. how the lung was stretched prior to the PEF manoeuvre; stress relaxation of viscoelastic lung elements is time-dependent,
so that peak expiratory flow immediately after stretching the lungs is higher than after a pause at total lung capacity

METHODOLOGY -

An Observational Study conducted using Multistage stratified random sampling at Selected urban schools in Karvir Taluka, Maharashtra on children aged 7 to 18 years enrolled in government and private urban schools. Stage 1: Stratified selection of schools from different urban zones (e.g., residential, commercial, industrial). Stage 2: Random selection of students from each school. Sample size is 158.

Inclusion criteria- Children aged 7–18 years, studying in urban schools of Karvir Taluka, Permanent residents (≥1 year) of the urban area, Parental/guardian written consent obtained, Physically and mentally able to participate.

Exclusion criteria- Children aged 7–18 years, Diagnosed with other chronic respiratory illnesses, Studying in urban schools of Karvir Taluka, Suffering from cardiac, neurological, or congenital conditions, Permanent residents (≥1 year) of the urban area, Absent on data collection day, Parental/guardian written

consent obtained, Consent not given or withdrawn, Physically and mentally able to participate, Recently migrated (residing <1 year in the area)

Materials-

Pre-validated ISAAC Questionnaire (adapted for local context) Consent and assent forms

Demographic data collection sheet Peak flow meter (Mini Wright type) Digital weighing scale

Measuring tape

Stationery kit (clipboard, pens, folders)

PROCEDURE

Before initiating the study, ethical permission was obtained from the ethical committee and official permission was obtained from the principals and administrative heads of the selected urban schools in Karvir Taluka. The purpose and significance of the study were clearly explained to the authorities to ensure their cooperation during data collection. Dates and timings for data collection were planned in consultation with school staff to avoid disruption of academic activities. Suitable time slots such as free periods or non-academic hours were selected for conducting the study. Students aged between 7 and 18 years who satisfied the inclusion criteria were identified from the selected schools. Care was taken to ensure that the participants represented different classes and backgrounds within the urban setting. Consent forms were provided to the students to be taken home and signed by their parents or guardians. Adequate time was given for submission of the signed forms before proceeding with data collection.

On the day of data collection, the purpose of the study was explained to the children in simple and age-appropriate language. Their willingness to participate was confirmed, and assent was obtained prior to inclusion in the study. Participants were given clear instructions regarding the procedure. They were encouraged to respond honestly and were reassured that their responses would be kept confidential and used only for academic purposes. The pre-validated ISAAC questionnaire, adapted to the local language, was distributed among the participants. The questionnaire was explained wherever necessary, and trained investigators were present throughout to guide students and clarify any doubts. Special attention was given to younger participants to ensure proper understanding of the questions. Investigators provided assistance without influencing the responses, maintaining the authenticity of the data collected.**Recording of Demographic Details:**

Basic information such as age, gender, and relevant background details was recorded using a structured data collection sheet to support further analysis.

Measurement of PEFR:

Peak Expiratory Flow Rate (PEFR) was measured on-site using a standardized peak flow meter. Each participant was first demonstrated the correct technique, including proper posture and effort. Participants were then asked to perform the test three times, and the highest value obtained was recorded as the final reading.

Ensuring Standardization:

All measurements were carried out using the same equipment and following uniform procedures to maintain consistency and reliability across all participants.

Data Checking and Completeness:

Immediately after data collection, all questionnaires and recording sheets were reviewed to identify any missing or unclear entries. Necessary corrections were made on the spot to ensure completeness of the data.

Data Handling and Storage:

The collected data was carefully organized and stored in a secure manner. Each participant was assigned a unique identification code to maintain anonymity and avoid disclosure of personal informationRESULTS

	Minimum	Maximum	Mean	Std. Deviation
AGE	9.00	16.00	13.32	1.03
BMI	15.50	25.60	19.05	1.26

Table 1: statistics for age and body mass index (BMI) of the study participants.

The table shows that the age of participants ranged from 9 to 16 years, with a mean of 13.32 ± 1.03, indicating a fairly uniform distribution within the adolescent age group.

BMI values ranged from 15.50 to 25.60, with a mean of 19.05 ± 1.26, suggesting that most participants had BMI within a normal range with minimal variation.

The relatively low standard deviation for both variables indicates consistency within the sample, which helps in reducing the influence of age and BMI as confounding factors. This supports the reliability of further analysis related to respiratory symptoms and physical activity.

GENDER	Frequency	Percentage
Female	79	50%
Male	79	50%
Total	**158**	**100%**

Table 2: Gender wise Distribution of Study Participants

Out of the total 158 participants, 79 were female and 79 were male, each accounting for 50% of the sample. This shows that both genders are equally represented in the study. Having an equal number of male and female participants helps in avoiding gender-related imbalance and makes the findings more dependable when comparing outcomes across groups.

Pie chart 1: Figure: Showing Gender Distribution of Study Participants

The pie chart illustrates that the study population is equally divided between male and female participants, with each group contributing 50% of the total sample.

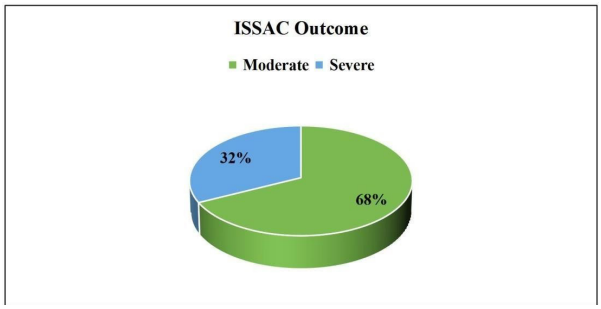
This equal representation ensures that neither gender is over- or under-represented, which helps in making the observations more balanced. It also allows for fair comparison of findings across both groups, thereby improving the overall strength and credibility of the study results.

ISSAC	Frequency	Percentage
Moderate	107	68%
Severe	51	32%
Total	**158**	**100%**

Table 3: Distribution of Participants Based on ISAAC Severity Classification

The table shows that the majority of participants, 107 (68%), fall under the moderate category, while 51 (32%) are classified as severe.

This indicates that most children experience moderate levels of symptoms, with a smaller proportion having more severe involvement. The distribution highlights the presence of a considerable burden of symptoms in the study group and suggests the need for early identification and appropriate management to prevent progression to more severe conditions.



Pie Chart 2: Showing Distribution of ISAAC Outcome Among Participants The chart shows that a larger proportion of participants fall in the moderate category (68%), while a smaller group (32%) are classified as severe.

This pattern indicates that most children experience symptoms at a moderate level, though a notable portion still presents with more serious involvement. The presence of a considerable number of severe cases highlights the importance of timely screening and appropriate management to reduce symptom progression and improve respiratory health.

PAQ-C	ISSAC		Total	p-value
	Moderate	Severe		
w physical activity	62	37	**99**	0.182
	57.90%	72.50%	**62.70%**	
rate physical activity	44	14	**58**	
	41.10%	27.50%	**36.70%**	
low physical activity	1	0	**1**	
	0.90%	0.00%	**0.60%**	
Total	**107**	**51**	**158**	
	100.00%	**100.00%**	**100.00%**	

Table 4: Association Between Physical Activity Level (PAQ-C) and ISAAC Severity Classification

The table shows that a higher proportion of participants with low physical activity fall in both moderate (57.9%) and severe (72.5%) categories compared to those with moderate physical activity. Participants with moderate activity levels appear to have relatively fewer severe cases. Very low physical activity was observed in only a minimal number of participants.

However, the p-value (0.182) indicates that this association is not statistically significant. This suggests that although a trend is visible, the relationship between physical activity level and severity of symptoms cannot be considered conclusive in this study.

PEFR	ISSAC		Total	pvalue
	Moderate	Severe		
Better	9	5	**14**	0.251
	8.40%	9.80%	**8.90%**	
Moderate	90	38	**128**	
	84.10%	74.50%	**81.00%**	
Reduced	8	8	**16**	
	7.50%	15.70%	**10.10%**	
Total	**107**	**51**	**158**	
	100.00%	**100.00%**	**100.00%**	

Table 5: Association Between PEFR Levels and ISAAC Severity Classification

The table shows that most participants fall within the moderate PEFR category (81%), while smaller proportions are seen in the better (8.9%) and reduced (10.1%) categories. Among those with reduced PEFR, a relatively higher percentage is observed in the severe group compared to the moderate group.

However, the p-value (0.251) indicates that the association between PEFR levels and severity of symptoms is not statistically significant. This suggests that although some variation is present, PEFR levels were not significantly related to symptom severity in this study population.

Correlation Between		Correlation Coefficient	p-value
ISSAC	PAQ-C	-0.320	<0.001*
ISSAC	PEFR	-0.539	<0.001*

Table 6: Correlation of ISAAC Scores with Physical Activity (PAQ-C) and PEFR

The table shows a negative correlation between ISAAC scores and both physical activity (r = - 0.320) and PEFR (r = -0.539). This indicates that as physical activity levels and PEFR values increase, the severity of respiratory symptoms tends to decrease.Both correlations are statistically significant ($p < 0.001$), suggesting that these

relationships are unlikely to be due to chance. The stronger negative correlation with PEFR indicates a more pronounced association with symptom severity compared to physical activity.

Overall, these findings highlight the importance of better lung function and adequate physical activity in reducing the severity of asthma-related symptoms.

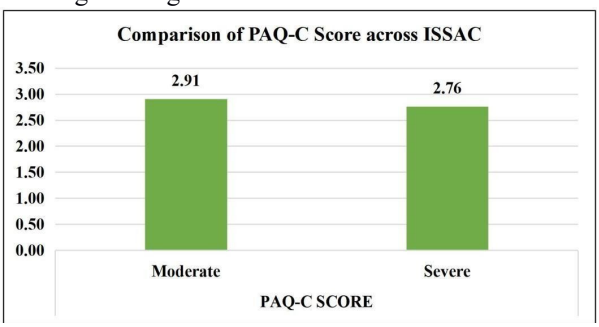
	ISSAC	Mean	Std. Deviation	p-value
PAQ-C SCORE	Moderate	2.91	0.32	0.009*
	Severe	2.76	0.36	
PEFR SCORE (LITRE/MINUTE)	Moderate	229.37	16.61	<0.001*
	Severe	215.69	18.58	

Table 7: Comparison of PAQ-C and PEFR Scores Between Moderate and Severe ISAAC Groups

The table compares mean PAQ-C and PEFR values between participants with moderate and severe symptom categories. The mean PAQ-C score is slightly higher in the moderate group (2.91 ± 0.32) than in the severe group (2.76 ± 0.36), indicating relatively better physical activity levels among those with less severe symptoms.

Similarly, the mean PEFR value is higher in the moderate group (229.37 ± 16.61) compared to the severe group (215.69 ± 18.58), suggesting better lung function in participants with lower symptom severity.

The difference in PAQ-C scores is statistically significant ($p = 0.009$), while the difference in PEFR values is highly significant ($p < 0.001$). These findings suggest that both physical activity and lung function are lower in individuals with more severe symptoms, with PEFR showing a stronger association.



Graph 1: Bar Graph Showing Comparison of PAQ-C Scores Between Moderate and Severe ISAAC Groups

The graph shows that the mean PAQ-C score is higher in the moderate group (2.91) compared to the severe group (2.76). This indicates that participants with less severe symptoms tend to have slightly better physical activity levels.

The observed difference suggests a relationship between physical activity and symptom severity, where reduced activity may be associated with more severe respiratory symptoms. This finding supports the importance of maintaining adequate physical activity in children with asthma.

Graph 2: Bar Graph Showing Comparison of PEFR Values Between Moderate and Severe ISAAC Groups

The graph shows that the mean PEFR value is higher in the moderate group (229.37 L/min) compared to the severe group (215.69 L/min). This indicates that participants with less severe symptoms tend to have better lung function.

The difference suggests that reduced PEFR is associated with greater symptom severity. This highlights the role of lung function in the clinical status of children with asthma and emphasizes the importance of regular monitoring.

DISCUSSION

The present study was conducted to examine the correlation between physical activity levels and respiratory symptoms among school-going children diagnosed with bronchial asthma in urban Kolhapur. Asthma continues to be one of the most prevalent chronic respiratory disorders affecting children worldwide, and its burden is particularly rising in urban settings due to increasing pollution, lifestyle changes, and environmental exposures. The findings of this study provide valuable insight into the complex interaction between physical activity, lung function, and symptom severity in children. By analyzing demographic characteristics, symptom classification, physical activity levels, and Peak Expiratory Flow Rate (PEFR), the study highlights important trends that contribute to understanding asthma management in the pediatric population.

The demographic distribution of participants in this study showed a relatively uniform age group with a mean age of 13.32 ± 1.03 years. This narrow age range ensures that developmental differences in lung function and physical capacity do not significantly influence the outcomes. Additionally, the equal representation of male and female participants (50% each) strengthens the reliability of the study findings by eliminating gender bias. This balanced sampling allows for a more accurate comparison of variables and ensures that the observed associations are not skewed due to demographic imbalance. Such methodological strength enhances the internal validity of the study and supports the generalization of findings within similar urban populations.

The distribution of respiratory symptom severity, as assessed using the ISAAC classification, revealed that a majority of participants (68%) were categorized under the moderate symptom group, while 32% were classified as severe. This indicates that although a large proportion of children experience manageable symptoms, a significant number continue to suffer from severe respiratory impairment. This finding is consistent with previous studies that highlight the growing burden of asthma in urban areas. The presence of a considerable proportion of severe cases suggests that asthma control may not be optimal in many children, possibly due to factors such as delayed diagnosis, inadequate treatment adherence, environmental exposure, or lack of awareness. It also emphasizes the need for early

intervention strategies and improved healthcare accessibility to prevent disease progression.

The relationship between physical activity and respiratory symptoms is one of the central aspects of this study. Physical activity, measured using the PAQ-C questionnaire, showed that children with moderate asthma symptoms had slightly higher activity levels compared to those in the severe category. This observation suggests that reduced physical activity may be associated with increased symptom severity. One plausible explanation for this finding is that children with severe asthma tend to avoid physical exertion due to fear of triggering symptoms such as breathlessness or wheezing. This avoidance behavior can lead to reduced physical fitness, decreased muscle strength, and lower exercise tolerance, which may
further exacerbate respiratory symptoms. Over time, this creates a negative cycle where inactivity contributes to worsening asthma, and worsening asthma further reduces activity levels.

However, despite the observed trend, the association between physical activity levels and symptom severity was not statistically significant in categorical analysis ($p = 0.182$). This indicates that while there is a visible relationship, it may not be strong enough to establish a definitive causal link within this sample. Several factors may have contributed to this lack of statistical significance. Firstly, physical activity was assessed using a self-reported questionnaire, which may be subject to recall bias or overestimation. Secondly, asthma symptoms are influenced by multiple variables such as medication use, environmental exposure, and genetic predisposition, which were not fully controlled in this study. Lastly, the cross-sectional design of the study limits the ability to establish causality, as it captures data at a single point in time rather than observing changes over a period.

In contrast to physical activity, lung function as measured by PEFR demonstrated a more consistent and significant relationship with symptom severity. The results showed that participants in the moderate symptom group had higher mean PEFR values (229.37 L/min) compared to those in the severe group (215.69 L/min), and this difference was statistically significant ($p < 0.001$). This finding aligns with the physiological understanding of asthma, where airway inflammation and narrowing lead to reduced airflow and lower PEFR values. PEFR serves as an objective measure of airway obstruction and provides a direct indication of respiratory function. The significant association observed in this study highlights the importance of regular lung function monitoring in children with asthma, as it can help in early detection of worsening symptoms and guide appropriate treatment interventions.

Further supporting these findings, correlation analysis revealed a significant negative relationship between ISAAC scores and both physical activity ($r = -0.320$) and PEFR ($r = -0.539$). This indicates that as physical activity levels and lung function improve, the severity of respiratory symptoms decreases. The stronger correlation observed with PEFR suggests that lung function has a more direct and measurable impact on symptom severity compared to physical activity. This is expected, as PEFR reflects the physiological status of the airways, whereas physical activity is influenced by behavioral and environmental factors. These results emphasize that while promoting physical activity is important, maintaining optimal lung function through proper medical management remains a critical component of asthma care.

The findings of this study are consistent with previous research conducted in similar settings. Studies have shown that children living in urban areas are exposed to higher levels of air pollution, including particulate matter, nitrogen dioxide, and industrial emissions, which contribute to airway inflammation and increased asthma prevalence. Environmental factors such as construction dust, vehicular pollution, and indoor allergens play a significant role in triggering and worsening asthma symptoms. In rapidly developing urban regions like Kolhapur, these factors are particularly relevant due to ongoing industrialization and infrastructure expansion. The interaction between environmental exposure and lifestyle factors further complicates asthma management, making it essential to adopt a comprehensive approach that addresses both aspects.

Another important aspect highlighted by this study is the role of behavioral and psychological factors in influencing physical activity levels among children with asthma. Fear of symptom exacerbation, lack of awareness about safe exercise practices, and parental restrictions may discourage children from participating in physical activities. This highlights the need for proper education and guidance for both children and caregivers. Healthcare professionals should encourage safe and supervised physical activity, emphasizing that regular exercise can improve lung capacity, enhance cardiovascular fitness, and reduce symptom severity when performed appropriately. Structured exercise programs, including breathing exercises and aerobic activities, can be beneficial in improving overall respiratory health.

The role of school environments in shaping physical activity patterns is also significant. Schools provide an ideal platform for promoting physical activity and implementing health education programs. Availability of playgrounds, supportive policies, and trained staff can encourage children to participate in regular exercise. Conversely, lack of facilities or
restrictive attitudes toward physical activity may contribute to sedentary behaviorIntegrating asthma-friendly physical education programs in schools can help children remain active while managing their condition effectively. Regular health check-ups, monitoring of symptoms, and awareness programs can further support asthma management in school settings.

Seasonal variations and climatic conditions are additional factors that may influence respiratory symptoms and physical activity levels. Changes in temperature, humidity, and pollen levels can trigger asthma symptoms

and affect outdoor activity patterns. In urban areas, seasonal fluctuations in pollution levels may further aggravate respiratory conditions. These factors act as confounding variables and should be considered while interpreting the relationship between physical activity and asthma symptoms. Future studies should incorporate seasonal analysis to provide a more comprehensive understanding of these effects. The findings of this study also have important clinical implications. The significant association between PEFR and symptom severity highlights the need for routine lung function monitoring in children with asthma. PEFR measurement is a simple, cost-effective, and non-invasive tool that can be easily used in clinical and community settings. Regular monitoring can help in early identification of airway obstruction, assessment of disease progression, and evaluation of treatment effectiveness. Additionally, the observed relationship between physical activity and symptom severity underscores the importance of promoting active lifestyles in children with asthma. Healthcare providers should develop individualized exercise plans and educate patients about safe physical activity practices.

Despite its strengths, the study has certain limitations that must be considered. The cross-sectional design limits the ability to establish causal relationships between variables. The use of self-reported questionnaires for assessing physical activity may introduce bias. The study was conducted in a specific urban region, which may limit the generalizability of findings to other populations. Additionally, environmental exposure and medication use were not extensively analyzed, which could have influenced the results. Future research should address these limitations by using longitudinal designs, objective measures of physical activity, and comprehensive assessment of environmental factors.

In conclusion, the present study provides valuable insights into the relationship between physical activity, lung function, and respiratory symptoms in school-going children with bronchial asthma. While physical activity shows a modest association with symptom severity, lung function demonstrates a stronger and more direct relationship. The findings emphasize the importance of encouraging regular physical activity, monitoring lung function, and addressing environmental factors to improve asthma management. A multidisciplinary approach involving healthcare professionals, schools, parents, and policymakers is essential Tasso reduce the burden of asthma and enhance the quality of life of affected children.

CONCLUSION

The present study concluded that bronchial asthma remains a significant health concern among school-going children in Kolhapur, urban with a considerable proportion experiencing moderate to severe respiratory symptoms. Although the association between physical activity levels and symptom severity was not statistically significant in categorical analysis, a clear trend was observed indicating lower physical activity among children with more severe symptoms. Importantly, correlation analysis revealed a significant negative relationship between physical activity and respiratory symptoms, suggesting that increased physical activity is associated with reduced symptom severity.

Furthermore, lung function, demonstrated a strong and significant negative correlation with symptom severity, indicating that better airway function is linked to improved clinical outcomes. These findings highlight that while physical activity may have an indirect or modest effect, lung function plays a more direct role in determining respiratory status in children with asthma.

Overall, the study emphasizes the importance of encouraging safe and regular physical activity along with routine monitoring of lung function for effective asthma management. Integrating these strategies into school-based health programs and increasing awareness among parents, teachers, and children can help reduce symptom burden and improve the quality of life of children with asthma.

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