



PREVALENCE OF RESPIRATORY DISEASES IN CHILDREN: SEASONAL IMPACTS AND PREVENTION STRATEGIES

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SUMMARY:

Introduction:The prevalence of respiratory diseases among pediatric populations is a substantial public health concern, shaped by inherent biological susceptibilities and environmental determinants. Temporal variations exert a critical influence on the occurrence and intensity of these diseases.**Material and methods:**In this study, an analysis of recent literature on respiratory diseases in children was carried out, focusing on seasonal factors, environmental impacts and prevention strategies, such as vaccination, hygiene and control of indoor air pollution.**Results and discussion:**Respiratory diseases such as influenza, bronchiolitis and asthma have been shown to be more prevalent during periods of low temperatures and high humidity. During cold months, increased viral transmission has been linked to increased indoor exposure. On the other hand, in tropical countries, rainy periods have increased risks due to factors related to humidity and mold exposure. Vaccines, hygiene practices and improvements in indoor ventilation have shown a significant reduction in severe cases. Seasonality has a direct impact on the dynamics of respiratory diseases. It is essential that measures such as awareness campaigns, vaccination and reduction of indoor air pollution are adopted and disseminated. On the other hand, the implementation of these strategies is limited by socioeconomic barriers.**Conclusion:**Seasonal impacts and the adoption of preventive measures are essential in order to reduce the prevalence of respiratory diseases in children, allowing an improvement in their quality of life.

Keywords:Respiratory diseases. Seasonal fluctuations. Preventive measures. Vaccination initiatives. Indoor air pollution.

ABSTRACT:

Introduction:The prevalence of respiratory diseases among pediatric populations constitutes a substantial public health concern, shaped by inherent biological susceptibilities and environmental determinants. Temporal variations critically influence the occurrence and

severity of these diseases. **Material and Methods:** In this study, recent literature on respiratory diseases in children was analyzed, focusing on seasonal factors, environmental impacts, and prevention strategies such as vaccination, hygiene, and indoor air pollution control. **Results and discussion:** Respiratory diseases, such as Influenza, Bronchiolitis, and Asthma, demonstrated higher incidence during periods of low temperatures and high humidity. In colder months, increased viral transmission was associated with prolonged stays in enclosed spaces. Conversely, in tropical climates, rainy periods heighten risks due to factors related to humidity and mold exposure. Vaccination, hygiene practices, and improved ventilation in indoor environments showed significant reductions in severe cases. Seasonality has a direct impact on the dynamics of respiratory diseases. It is essential to adopt and promote measures such as awareness campaigns, vaccination, and reductions in indoor air pollution. However, the implementation of these strategies is limited by socioeconomic barriers. **Conclusion:** Seasonal impacts and the adoption of preventive measures are fundamental to reducing the prevalence of respiratory in children, allowing for an improvement in diseases in their quality of life. **Keywords:** Respiratory diseases. Seasonal fluctuations. Preventive measures. Vaccination initiatives. Indoor air pollution.

1. INTRODUCTION

The prevalence of respiratory diseases in pediatric populations is a relevant public health issue, largely affected by children's inherent biological vulnerabilities and also by environmental factors. According to Zar and Ferkol (2014), environmental exposures, such as tobacco smoke, indoor air pollution, and poor nutrition, are common risk factors for acute and chronic respiratory diseases in pediatric populations. Respiratory conditions, such as influenza, bronchiolitis, and asthma, directly affect children's quality of life and can have serious outcomes, frequent hospitalizations, and, in extreme cases, lead to mortality. The fact that children have an immune system that is still developing and is associated with exposure to adverse environmental factors makes them especially more susceptible to these diseases. According to Van Meel et al. (2022), respiratory infections in early life are related to a higher risk of reduced lung function and asthma in the school-age group, as demonstrated in a meta-analysis with 150,000 European children.

According to Neumann and Kawaoka (2022, p. 1), seasonality in virology consists of variations in the prevalence of viruses at regular intervals over a period of one year, with evidence of influenza virus outbreaks occurring throughout the winter and low activity during the summer. In addition, rainy periods of the year also have a significant impact, since high humidity favors the proliferation of fungi and mold, increasing the risks to children's respiratory health. Seasonal factors demonstrate the need for specific approaches adapted to the climatic realities of each location.

Furthermore, environmental issues also play a key role in worsening respiratory conditions in children. According to Vanker, Gie and Zar (2017, p. 661), exposure to environmental tobacco smoke is associated with upper and lower respiratory tract infections in childhood, wheezing or asthma, and reduced lung function early in life. In addition, frequent exposure of individuals to indoor air pollutants, such as those mentioned above, and inadequate ventilation systems, have been shown to have a significant impact on children's respiratory health. Children living in environments with high indoor or outdoor air pollution are at greater risk of developing respiratory diseases, such as asthma and chronic bronchitis. These conditions often result in a lack of disease control, leading to frequent hospitalizations and an increase in the use of medications. Current scientific literature also indicates that exposure to tobacco smoke in the home environment is one of the main risk factors associated with the development of serious respiratory diseases during childhood, negatively impacting lung function and healthy airway growth.

Therefore, the objective of the present study is to analyze the environmental and seasonal factors that influence the prevalence of respiratory diseases in children, as well as to discuss effective prevention strategies to reduce the impacts of these conditions in pediatric populations.

2. MATERIAL AND METHOD

This study is characterized as a literature review, with the objective of analyzing the prevalence of respiratory diseases in children, focusing on seasonal and environmental impacts, in addition to prevention strategies. The selection of articles was based on

specific inclusion and exclusion criteria, in order to guarantee the relevance and quality of the information.

Inclusion criteria were studies published in peer-reviewed scientific journals that address the prevalence of respiratory diseases in children and seasonal and environmental factors associated with these conditions. Articles that discussed the relationship between exposure to tobacco smoke, indoor air pollution, and respiratory infections, as well as the impacts of seasonality, were also considered. Only studies that presented samples of pediatric children, preferably with more than 500 participants, were included. In addition, priority was given to studies that provided data on the incidence of respiratory diseases in different climates and geographic regions, with a focus on the prevention and control of these conditions.

Studies that focused exclusively on adults or non-pediatric populations were excluded. Articles that did not address the relationship between environmental and seasonal factors with respiratory diseases in children were also discarded. In addition, studies with samples smaller than 100 participants and articles without peer review were discarded, as they were considered inappropriate for inclusion. Furthermore, studies that dealt only with non-infectious or chronic respiratory diseases, such as cystic fibrosis, without reference to seasonal or environmental factors were not included.

This methodology allowed the selection of relevant and pertinent studies, which provided a solid basis for the discussion on the prevalence of respiratory diseases in children and effective preventive strategies to mitigate them.

3. RESULTS AND DISCUSSION

Examination of the studies reviewed revealed a distinct correlation between seasonal and environmental determinants and the prevalence of respiratory diseases in pediatric populations. During the winter, there was a notable escalation in the incidence of respiratory disorders, including influenza, bronchiolitis, and asthma exacerbations, as documented by Zar and Ferkol (2014). This escalation was associated with prolonged confinement indoors, which facilitates the transmission of respiratory viruses. In tropical climates, Neumann and Kawaoka (2022) emphasized that rainy seasons raise humidity levels, thus creating an environment that promotes the proliferation of fungi and molds, which exacerbates the risks to

pediatric respiratory health. These findings highlight the need for strategies adapted to specific climate contexts.

Environmental determinants, such as exposure to tobacco smoke and indoor air pollution, have been identified as significant exacerbators of respiratory conditions. Vanker, Gie, and Zar (2017) found that environmental tobacco smoke is directly correlated with upper and lower respiratory tract infections, wheezing, and early onset of lung dysfunction. Children exposed to these environmental factors, especially in low-income settings, are more likely to develop chronic diseases such as asthma, attributable to poor air quality and inadequate access to healthy environments. These observations highlight the critical importance of preventive strategies aimed at mitigating household pollution and banning smoking in areas frequented by children.

Furthermore, existing literature has indicated that respiratory infections occurring in early life have long-lasting implications for lung health. Van Meel et al. (2022) conducted a meta-analysis covering over 150,000 European children, concluding that early infections are associated with an increased risk of asthma and decreased lung function during school age. These findings emphasize the urgency of early interventions, such as promoting vaccination against influenza and pneumococcal infections, to alleviate the severity and recurrence of these respiratory conditions. The effectiveness of vaccination has been demonstrated not only in preventing severe cases but also in decreasing the incidence of hospitalizations related to pediatric respiratory diseases.

The influence of seasonality on respiratory diseases further underscores the need for seasonal and region-specific strategies to manage these conditions. In temperate climates, for example, targeted interventions such as mask use during viral outbreaks and awareness campaigns during the winter months can substantially reduce pathogen transmission. In tropical regions, it is imperative to prioritize indoor humidity management and measures to inhibit the growth of fungi and molds. Implementing hygiene practices such as regular hand washing and adequate ventilation of indoor spaces has also been widely recognized as an effective strategy to prevent the spread of respiratory pathogens.

Ultimately, the results indicate the need for cohesive public policies that comprehensively address the diversity of determinants that influence health.

respiratory diseases in children. Educating parents and caregivers is essential for early identification of symptoms and subsequent seeking of medical intervention. In addition, initiatives aimed at reducing social and environmental disparities are crucial to alleviate the prevalence of these health conditions. In conclusion, implementing preventive measures based on empirical evidence, together with localized management and education initiatives, is vital to alleviate the impact of respiratory diseases in the pediatric population, improve their quality of life and reduce the pressure on health systems.

FINAL CONSIDERATIONS

Respiratory diseases among pediatric populations constitute a significant public health problem, particularly attributed to the interplay of intrinsic biological susceptibilities and detrimental environmental influences. This research highlights the critical need to understand the seasonal and environmental determinants that affect the incidence of these diseases, along with the imperative of effective preventive measures aimed at mitigating risks to children's respiratory well-being. Empirical evidence has elucidated that early respiratory infections, seasonal climatic variations, and environmental exposures such as tobacco smoke and air pollution are directly implicated in the escalation of morbidity and mortality in pediatric demographics. According to Woensel, Alderen, and Kimpen (2003), viral lower respiratory tract infections are a major cause of morbidity and mortality during childhood, especially in low-income regions. Furthermore, according to Sonogo et al. (2015), children under the age of five in low- and middle-income countries face a higher risk of mortality due to acute lower respiratory infections, associated with factors such as malnutrition, low vaccination coverage and difficulty in accessing adequate health services.

The analysis conducted indicates that implementing vaccination programs, advocating hygiene practices, and regulating indoor air quality are essential strategies to alleviate the incidence and severity of respiratory diseases among children. Furthermore, it is crucial to adapt these interventions to local contexts, taking into account the distinct characteristics of temperate and tropical climates, where seasonal and environmental variables manifest different but equally detrimental effects. Increasing awareness among parents and caregivers about the associated risks, together with the adoption of

preventive measures, was identified as a fundamental factor in reducing the impact of these respiratory conditions.

However, the successful implementation of these strategies continues to face socioeconomic obstacles that need to be addressed through inclusive public policy initiatives and investments in the health sector. Disparities in access to healthy environments, health services and awareness campaigns reinforce the urgency of cohesive government action that prioritizes child health.

In conclusion, this study enhances the understanding of the multifaceted nature of respiratory diseases in children, emphasizing the need for effective preventive strategies and contextually appropriate management. Through the integration of evidence-based practices, educational initiatives, and socio-environmental interventions, it is possible to decrease the burden of these diseases and promote a better quality of life for children worldwide. Therefore, children's respiratory health should be recognized as a primary concern to ensure the well-being and holistic development of future generations.

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