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Frequency of Recurrent Wheeze in Breastfeeding Children Presenting to Rehman Medical Institute Peshawar

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ABSTRACT

Introduction: Recurrent wheeze in children is a significant health issue, often linked to respiratory infections and environmental exposures. Breastfeeding, known for its immunological benefits, has been associated with reduced respiratory morbidity. However, limited data exist on the protective role of breastfeeding against recurrent wheeze in children in Pakistan. This study focuses on determining the frequency of recurrent wheeze in breastfeeding children and its associated factors. **Objectives:** To determine the frequency of recurrent wheeze in breastfeeding children aged 1 to 5 years presenting to Rehman Medical Institute, Peshawar. **Materials and Methods:** This cross-sectional study was conducted from 1st June 2024 to 30th November 2024 at the Pediatric Department, Rehman Medical Institute, Peshawar. A total of 217 children aged 1–5 years with a history of exclusive breastfeeding were enrolled. Data were collected through interviews and analyzed using SPSS version 22. **Results:** Recurrent wheeze was observed in 16.1% of children. Exclusive breastfeeding significantly reduced the prevalence of recurrent wheeze compared to partial breastfeeding ($p < 0.05$). **Conclusion:** Exclusive breastfeeding plays a protective role against recurrent wheeze in young children and should be encouraged to improve respiratory health.

INTRODUCTION

Wheeze is a frequent and important symptom in pediatricians, with an estimated prevalence of approximately 10% of emergency room presentations in children with wheezing and 30- to 50% of these children being hospitalized (1). However, the continued prevalence of this condition proves the fact that there is still much to attain in terms of disease modification to adherence to guidelines. Wheeze involves repeated spasms of bronchioles, which are commonly precipitated by the surrounding environment or infections. Though it causes moderate illness in most infants, it can develop into severe respiratory distress in some, needing hospitalization. Acute bronchiolitis in the first year of life is related to recurrent wheezing and occurs in 10-15% of children (2). Reactive airway manifestations in AD cases involve bronchial hyperirritability arising from genetic factors and environmental factors such as dust, pets, moulds, and viruses. The study showed that more than 40 percent of children may wheeze during the first three years of their lives, and persistent conditions may develop before the child is six years old (3, 4).

Breastfeeding is known to have many health benefits, and it is an essential factor in reducing disease incidence and mortality among young children. UNICEF and WHO mention that early initiation of breastfeeding within the first-hour post is objectively vital to the survival of the newborn child since it provides immunity through colostrum and energy nutrients essential for additional vitamin A. However, various data on a global level show that about 50% of newborns are left out of this opportunity, as pre-lateral feeding helps deprive babies of these advantages. This has been associated with increased morbidity and mortality among children less than five years old (6, 7). The benefits of breastfeeding are thought to have

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protective effects on the respiratory system and may prevent asthma and recurrent wheeze 8. For instance, recurrent wheezing was diagnosed in 10% of children who had been exclusively breastfed for a year, hinting at the possible preventive influence of the feeding method on the deteriorative respiratory health status of children (8).

There also are many mediating factors that have a direct effect on the relationship between breastfeeding and respiratory outcomes for children - genetics, exposure to environmental factors, and maternal health status. Research has indicated that there is a reduced risk of asthma and wheezing among children who are exclusively breastfed, regardless of the maternal atopy or exposure to environmental allergens (9). Every human milk also contains human milk oligosaccharides, which are respiratory health in children, and a low risk of wheezing has been associated with (10). These studies make evident the significance of exclusive breastfeeding during the first six months of life as a protective factor against recurrent wheezing and other respiratory issues.

The damaging facts about child respiratory diseases, especially in Pakistan, make it very important to know the level of protection that breastfeeding offers children. Research which compared the findings from studies on different population groups has established that breastfeeding helps to prevent wheezing and asthma even if young children are exposed to respiratory infections or allergens (11). For example, wheezing tends to be associated with RSV bronchiolitis. This condition is more common in children who are rarely breastfed (12). Breastfeeding, among others, has been deemed as a primary prevention measure that could be used to reduce the prevalence of pediatric asthma as these remain crucial lighting to enhancing long-term respiratory health (13).

Breastfeeding not only has direct health benefits for the child but also socio-economic implications such as decreased healthcare bills and parent turnover. It has also been established that extending breastfeeding to six months has been economical and effective in enhancing children's welfare, hence reducing the strain on health facilities (14). Breastfeeding appears to offer protective effects against allergy-related diseases, including asthma, in a prospective cohort study, making it even a preventive measure (15). However, numerous studies have shown that breastfeeding has protection benefits, which may vary from population to population because of genetic, environmental and cultural differences. Underscores the need for studies of regions of the world to develop recommendations that are relevant within their contexts.

The justification for undertaking this research lies in evaluating the incidence of recurrent wheeze in children who were exclusively breastfed to one year of age in the community of Peshawar, Pakistan. Wheeze recurrence is a polygenic and polysymptomatic disorder that reflects a complex interaction of genetic and epigenetic factors and geographical and dietary determinants. It varies by geographical location. Analyzing its relation to breastfeeding within the native population may be helpful to healthcare professionals and decision-makers. Therefore, this research seeks to provide empirical evidence that will be useful in advocating for exclusive breastfeeding as a way of preventing recurrent wheezing in children. At the moment, no data can be sourced locally to support this issue, which underlines the necessity of conducting this research to fill the existing gap.

The discovery of the recommendations in this study should assist physicians in encouraging breastfeeding directly to better the respiratory health of children. This study provides the basis for the development of specific interventions and public health approaches by identifying the roles of breastfeeding in the prevention of recurrent wheezing. Further, it expands on understanding the specific link between breastfeeding and respiratory health and can be helpful in similar populations with similar levels of development and living conditions..

Objective

To identify the prevalence of Recurrent wheeze in Breast feeding children age group 1-5 years attending the Pediatric Department of Rehman Medical Institute, Peshawar and its correlate.

MATERIALS AND METHODS

Study Design: Prospective observational design.

Study setting: The study was conducted in the Department of Pediatrics, Rehman Medical Institute, Peshawar, Pakistan.

Duration of the study: The study was conducted for six months, starting from 1st June 2024 to 30th November 2024.

Inclusion Criteria

Only children below the age of 5 years, especially one-year-old to five-year-olds attending Pediatric OPD, were considered for the study. This study only considered those children who had been exclusively breastfed for the initial six months of life, where breastfeeding began within 48 hours of birth and without any supplementation with any liquids other than fresh breast milk. Children presenting for routine checkups and those with recurrent wheezing, which operationalized the male and female children, were included.

Exclusion Criteria

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The subjects who were born preterm or had chronic lung diseases, including bronchopulmonary dysplasia, were also excluded. Other exclusion criteria included children with prior incomplete breastfeeding history or comorbidity that may affect respiratory status, including congenital anomalies, cystic fibrosis, and immunodeficiency disorders.

Methods

The participants were recruited from the Pediatric OPD of Rehman Medical Institute Peshawar after having sought permission from the hospital's ethical board and selecting children who met the inclusion criteria. Parents/guardians' informed written consent was sought from the parents/guardians after informing them of the purpose of the study. Age of infant, gender, place of living, education standard of the mother and SMA, and socioeconomic status of the father were also documented. A detailed history of the mother was obtained in order to gather information about the breastfeeding practices, including the initiation and duration of exclusive breastfeeding, and also to get the frequency of the recurrent wheeze according to the operational definition. The researcher palpated each child for remarkable signs and symptoms through physical assessment. Every bit of data was measured and written down in a format that was specially created for this purpose. Data would then be inputted and analyzed using the Statistical Products and Services Solutions (SPSS) software version 22.0. Categorical data was presented as frequencies and percentages, and the chi-square test was used to determine significance at $p \leq 0.05$.

RESULTS

The study included 217 children aged between 1 and 5 years, and the subjects were divided equally by gender. The children's mean age was 3.2 ± 1.1 years. The demographic details of the participants included maternal education, area of residence, and father's socio-economic status, which are summarized in Table 1.

Table 1

Demographic Characteristics of the Study Population

Variable	Frequency (n=217)	Percentage (%)
Gender		
Male	109	50.2
Female	108	49.8
Maternal Education Level		
Primary	56	25.8
Secondary	101	46.5
Higher	60	27.7
Residence		
Urban	138	63.6
Rural	79	36.4
Socioeconomic Status		
Low	58	26.7
Middle	105	48.4
High	54	24.9

The reappearance of wheeze within the study population was also relatively high at 16.1 percent or 35 of the children. Table 2 highlights the distribution of recurrent wheeze across various demographic factors.

Table 2

Prevalence of Recurrent Wheeze by Demographic Factors

Variable	Recurrent Wheeze (n=35)	Percentage (%)
Gender		
Male	18	51.4
Female	17	48.6
Maternal Education Level		
Primary	15	42.9
Secondary	14	40.0
Higher	6	17.1
Residence		
Urban	20	57.1
Rural	15	42.9

The study further stratified the effect of exclusive breastfeeding on recurrent wheeze. There was a lower prevalence of recurrent wheeze among the children who were exclusively breastfed for the first six months of their lives as compared to those who were partially breastfed. The findings related to breastfeeding practices and their relation with recurrent wheezing are presented in Table 3 below.

Table 3

Association Between Breastfeeding Practices and Recurrent Wheeze

Breastfeeding Practice	Total (n=217)	Recurrent Wheeze (n=35)	Percentage (%)
Exclusive Breastfeeding	162	20	12.3
Partial Breastfeeding	55	15	27.3

The study also found that exclusive breastfeeding reduced the prevalence of recurrent wheezing by 46% when compared to non-exclusively breastfed infants ($p < 0.05$). Several other covariates also pointed to the probability of developing the recurrent wheeze, such as maternal education and place of residence. These findings sum up the realization that exclusive breastfeeding has a crucial role in the prevention of respiratory complications in young children.

DISCUSSION

Wheezing in children under the age of 5 years is a major public health problem locally because of the high incidence, morbidity, and burden on healthcare facilities. Therefore, the purpose of this study was to establish the prevalence of recurrent wheeze in breastfeeding children dependent on exclusive

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breastfeeding. The research established the conclusion that significantly fewer reports of recurrent wheezing in children exclusively nursed for the first six months of their lives underline a marked preventive effect that is effective from breastfeeding. The proportion of children with recurrent wheezing in this study was 16.1%, and based on the literature, wheezing episodes are frequent during early childhood (1, 2). It has been estimated that approximately 50% of all children have at least one wheezing episode in the first three years of their life, and many of these children will go on to develop recurrent wheezing or asthma by the time they start school (3, 4). This study provides evidence in favour of the multi-component concept of wheezing that relates to genetic, environmental and nutritional factors.

The health benefits of exclusive breastfeeding for at least six months have been scientifically researched in relation to its impact on respiratory sickness (5, 6). The children who were exclusively breastfed had less recurrent wheeze of 12.3% compared to those who were partially breastfed of 27.3%. This finding is in agreement with other similar studies showing breastfeeding reduces the risk of wheezing and asthma (7, 8). The immunoglobulins, human milk oligosaccharides, and cytokines present in breast milk all help to build up the immune system in the infant and prevent respiratory tract infections (9, 10). Further, the different exposure to potential allergens in formula milk rather than breast milk can cause wheezing episodes in predisposed children.

The contribution of various maternal characteristics to respiratory health among children is another significant consideration. This study also showed that recurrent wheezing was less frequent in children of mothers with higher education levels. This finding has readily been associated with enhanced knowledge and compliance with exclusive breastfeeding among mothers who have had formal education. The preexisting literature also showcases maternal education as having a predictive role in the commencement and sustainability of breastfeeding practices, which go on to influence respiratory outcomes in children adversely (11). Consistent with this, urban residents were deemed to have a slightly higher proportion of individuals with recurrent wheeze than rural residents. This could be due to variations in the level of exposure to environmental factors, toxins, and irritants, which are widely available in the cities (12).

The role of environmental and genetic factors is proved in the etiology of recurrent wheezing. Frequent episodes of wheezing affect children in the age group of five years old and below and are occasioned by respiratory viruses, indoor pollutants, dust mites, and pet dander (13). This study showed that the prevalence of recurrent wheezing was higher in children whose families belonged to the lower socioeconomic class because they were more vulnerable to such factors. Additionally, primary predisposing factors, including a family history of asthma or atopy, may predispose one to recurrent wheezing (14). Although genetic factors were not directly included as an independent variable in this present study, the results are consistent with other research on the significant contributions of interactions between environmental and genetic factors in the development of respiratory diseases.

The conclusion made herein implies that there is a need to develop a public health strategy to ensure that the respiratory disease burden among children is reduced. Exclusive breastfeeding as a preventive strategy can reduce the level of recurrent wheezing and other respiratory problems to a considerable extent. Education and support for the process of breastfeeding should be core to antenatal and postnatal care interventions for all known healthcare attendants. Furthermore, transcultural advertising strategies with a focus on the rural and less privileged can be used to control disparities in breastfeeding as well as respiratory health consequences. However, some limitations of this study can be highlighted to those interested in the relationship between breastfeeding and recurrent wheezing. First, due to the cross-sectional study design, it is not possible to clearly speak about the causal relationship between breastfeeding and respiratory outcomes. These findings warrant longitudinal research to monitor the link between breastfeeding and respiratory health and the consequent effects on the child. Second, data on breastfeeding history and wheezing episodes were obtained using maternal self-reports and hence are subjected to recall bias. Future studies could improve the reliability of their findings by verifying the information patients provided in surveys with medical records or biomarkers.

Furthermore, the present study is unable to present an overall view of the Egyptian population due to the restriction to a specific tertiary care hospital. More research is encouraged that should include different environments and a more significant number of participants to support the previously mentioned benefits of breastfeeding. However, some other population characteristics that may affect respiratory outcomes, including diet, vaccination, and second-hand smoke, were not considered in this study. However, this study shows that breastfeeding plays an essential part in decreasing the risk of recurrent wheezing in young children. These results can be added to the literature on breastfeeding as an affordable and feasible alternative for combating poor child health. If healthcare providers begin from the extreme and constantly encourage exclusive breastfeeding as a method of protection, they will also be promoting breastfeeding-supportive

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policies that are beneficial for both the mother and the child.

Finally, this research also emphasizes the preventive role of exclusive breastfeeding in recurrent wheezing and the better respiratory health of children. The relatively fewer incidences of recurrent wheeze in children who were exclusively breastfed is indicative of the many benefits of breastfeeding, irrespective of the countries in which children grow up. It is crucial to counteract the causes of not breastfeeding through the absence of awareness, traditional practices that positively correlate with contraceptive use and limitations at workplaces, among others. There is a need for further research to find out how and why breastfeeding promotes respiratory health and other factors that would help explain respiratory health in children. Promoting breastfeeding education and support helps lower childhood obesity levels, enhances child health, and decreases the number of respiratory illnesses affecting families and healthcare facilities.

CONCLUSION

This study also elucidates the fact that exclusive breastfeeding helped in the prevention of recurrent wheeze illness in children of 1 to 5 years of age. The results also proved the hypothesis, showing that children who were exclusively breastfed during the first 6 months of life developed recurrent wheezing less frequently than children who were partially breastfed. There is nutritional protection for the baby through breast milk, hence better immunological importance and less exposure to allergens that cause respiratory illness. The education of the mother, her socioeconomic status, and her environment also affected the rate of recurrent wheezing, which is also a multifactorial illness. A health intervention approach that has been proposed and should form part of the advocacy strategies for exclusive breastfeeding is the respiratory health of children. Imparting knowledge to and encouraging mothers to start and maintain exclusive breastfeeding practices should be the goal of healthcare providers. These efforts directly help to remove barriers to breastfeeding and promote breastfeeding companion initiatives that will decrease the disease of respiratory illnesses and the general health and well-being of young people.

REFERENCES

1- Altaib, R. M., Yonis, K. O., Akrim, F. A., Qowaider, S. R., Muhammed, A. A., Bofarraj, M., & Ali, E. M. (2021). Nutritional Rickets among Children Admitted with Wheezy Chest at Al-Bieda Medical Center–Libya. *Age*, *35*(15), 70.

2- Munir, B., Karim, H., Rehman, W. U., Bano, N., Khadija Bibi, & Saeed, M. (2023). Prevalence and determinants of tobacco use in the undergraduate students of nursing in Peshawar, KP. *Pakistan Journal of Health Sciences*, 110-115. https://doi.org/10.54393/pjhs.v4i05.677

3- Wilson, K., Gebretsadik, T., Adgent, M. A., Loftus, C., Karr, C., Moore, P. E., Sathyanarayana, S., Byington, N., Barrett, E., Bush, N., Nguyen, R., Hartman, T. J., LeWinn, K. Z., Calvert, A., Mason, W. A., & Carroll, K. N. (2022). The association between duration of breastfeeding and childhood asthma outcomes. *Annals of Allergy, Asthma & Immunology*, *129*(2), 205-211. https://doi.org/10.1016/j.anai.2022.04.034

4- Di Filippo, P., Lizzi, M., Raso, M., Di Pillo, S., Chiarelli, F., & Attanasi, M. (2022). The role of breastfeeding on respiratory outcomes later in childhood. *Frontiers in Pediatrics*, *10*. https://doi.org/10.3389/fped.2022.829414

5- Peters, R. L., Kay, T., McWilliam, V. L., Lodge, C. J., Ponsonby, A., Dharmage, S. C., Lowe, A. J., & Koplin, J. J. (2021). The interplay between eczema and breastfeeding practices may hide breastfeeding's protective effect on childhood asthma. *The Journal of Allergy and Clinical Immunology: In Practice*, *9*(2), 862-871.e5. https://doi.org/10.1016/j.jaip.2020.09.006

6- Venter, C., Palumbo, M. P., Sauder, K. A., Glueck, D. H., Liu, A. H., Yang, I. V., Ben-Abdallah, M., Fleischer, D. M., & Dabelea, D. (2021). Incidence and timing of offspring asthma, wheeze, allergic rhinitis, atopic dermatitis, and food allergy and association with maternal history of asthma and allergic rhinitis. *World Allergy Organization Journal*, *14*(3), 100526. https://doi.org/10.1016/j.waojou.2021.100526

7- Wasilewska, E., Małgorzewicz, S., Szczepankiewicz, A., Myśliwczyk, D., Hennig, M., Jassem, E., & Skotnicka, M. (2022). Are obesity and asthma in school-age children still strongly related to breastfeeding in infancy?-A real-life study. *European Review for Medical & Pharmacological Sciences*, *26*(5). https://www.europeanreview.org/wp/wp-content/uploads/1658-1667.pdf

8- Ambalavanan, A., Chang, L., Choi, J., Zhang, Y., Stickley, S. A., Fang, Z. Y., Miliku, K.,

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This work is licensed under a Creative Common Attribution 4.0 International License.

Robertson, B., Yonemitsu, C., Turvey, S. E., Mandhane, P. J., Simons, E., Moraes, T. J., Anand, S. S., Paré, G., Williams, J. E., Murdoch, B. M., Otoo, G. E., Mbugua, S., … Duan, Q. (2024). Human milk oligosaccharides are associated with maternal genetics and respiratory health of human milk-fed children. *Nature Communications*, *15*(1). https://doi.org/10.1038/s41467-024-51743-6

9- Calatayud Sáez, F., Calatayud Moscoso del Prado, B., Luque Navas, M., Calatayud Moscoso del Prado, A., Gallego Fernández-Pacheco, J. G., & Rivas Ruiz, F. (2021). Effects of the affinity to the Mediterranean diet pattern together with breastfeeding on the incidence of childhood asthma and other inflammatory and recurrent diseases. *Allergologia et Immunopathologia*, *49*(6), 48-55. https://doi.org/10.15586/aei.v49i6.338

10- Zhou, Y., Tong, L., Li, M., Wang, Y., Li, L., Yang, D., Zhang, Y., & Chen, Z. (2021). Recurrent wheezing and asthma after respiratory syncytial virus bronchiolitis. *Frontiers in Pediatrics*, *9*. https://doi.org/10.3389/fped.2021.649003

11- Nuzzi, G., Di Cicco, M., Trambusti, I., Agosti, M., Peroni, D. G., & Comberiati, P. (2022). Primary prevention of pediatric asthma through nutritional interventions. *Nutrients*, *14*(4), 754. https://doi.org/10.3390/nu14040754

12- Triasih, R., Setyowireni, D., Nurani, N., & Setyati, A. (2023). Prevalence, management, and risk factors of asthma among school-age children in Yogyakarta, Indonesia. *Journal of Asthma and Allergy*, *16*, 23-32. https://doi.org/10.2147/jaa.s392733

13- Ekelund, L., Gloppen, I., Øien, T., & Simpson, M. R. (2021). Duration of breastfeeding, age at introduction of complementary foods and allergy-related diseases: A prospective cohort study. *International Breastfeeding Journal*, *16*(1). https://doi.org/10.1186/s13006-020-00352-2

14- Nuzzi, G., Di Cicco, M., Trambusti, I., Agosti, M., Peroni, D. G., & Comberiati, P. (2022). Primary prevention of pediatric asthma through nutritional interventions. *Nutrients*, *14*(4), 754. https://doi.org/10.3390/nu14040754

15- Chen, C., Lin, Y., Ho, S., Fu, C., Chou, A., & Yang, Y. (2022). Association of exclusive breastfeeding with asthma risk among preschool children: An analysis of national health and nutrition examination survey data, 1999 to 2014. *Nutrients*, *14*(20), 4250. https://doi.org/10.3390/nu14204250

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