

A cross-sectional study on prevalence of Lower Respiratory Tract Infections (LRTIs) among children

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Abstract

Lower Respiratory Tract Infections (LRTIs) remain a major public health concern and are among the leading causes of morbidity and mortality among children worldwide, particularly in developing countries. LRTIs include conditions such as pneumonia, bronchitis, bronchiolitis, and wheezing-associated lower respiratory infections, which significantly affect the respiratory health and quality of life of children. This community-based cross-sectional study was conducted in Eraviperoor Grama Panchayat, Thiruvalla, Kerala, with the primary objective of assessing the prevalence of LRTIs among children and identifying associated sociodemographic and environmental risk factors.

A total of 200 children below 18 years of age were enrolled in the study using a structured questionnaire administered to caregivers. Among the participants, 134 children (67%) had a history of LRTI. Pneumonia was identified as the most common type of LRTI affecting 75 children (56%), followed by bronchitis (22%), bronchiolitis (15%), and wheezing-associated lower respiratory infection (7%). The highest prevalence was observed among children aged 3–6 years. Several risk factors were associated with recurrent LRTIs, including premature birth, low birth weight, passive smoking exposure, overcrowding, pet exposure, and poor influenza vaccination coverage.

The study also assessed caregiver awareness regarding LRTIs and provided educational counselling to improve knowledge related to symptoms, causes, preventive measures, and treatment-seeking behavior. Following counselling, improvement in awareness regarding hand hygiene, vaccination, and early identification of symptoms was observed among caregivers.

The findings highlight the substantial burden of LRTIs among children and emphasize the importance of early prevention strategies, caregiver education, vaccination awareness, and reduction of environmental risk factors to minimize disease burden and improve respiratory health outcomes in children.

Keywords: Lower Respiratory Tract Infection; LRTI; Children; Prevalence; Risk Factors; Pneumonia; Bronchiolitis; Passive Smoking; Caregiver Awareness

1. Introduction

Lower Respiratory Tract Infection (LRTI) refers to infections affecting the airways and lung tissues below the larynx, including bronchitis, bronchiolitis, and pneumonia.⁽¹⁻³⁾ LRTIs are among the most common infectious diseases affecting children and continue to be a significant cause of morbidity and mortality worldwide, especially in low- and middle-

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income countries.⁽⁴⁻⁶⁾ Children are particularly vulnerable because of their immature immune systems, poor nutritional status, and increased exposure to environmental pollutants and infectious agents.⁽⁷⁾

LRTIs are commonly caused by viral, bacterial, or fungal pathogens. Respiratory syncytial virus (RSV), influenza virus, *Streptococcus pneumoniae*, and *Haemophilus influenzae* are among the major pathogens responsible for lower respiratory infections in children. These infections are mainly transmitted through respiratory droplets, contaminated surfaces, and close contact with infected individuals.^(2,8)

Common symptoms of LRTIs include persistent cough, fever, wheezing, chest discomfort, breathlessness, fatigue, and sputum production. Severe infections may result in respiratory distress, hypoxia, hospitalization, and long-term respiratory complications if not diagnosed and treated promptly.^(2,8)

Several sociodemographic, environmental, and medical factors contribute to the occurrence and recurrence of LRTIs among children. Premature birth, low birth weight, malnutrition, passive smoking, overcrowding, poor hygiene, lack of breastfeeding, inadequate vaccination coverage, and exposure to indoor air pollution are recognized risk factors associated with increased susceptibility to respiratory infections.⁽⁷⁾

Caregivers play an important role in the prevention and early management of LRTIs. Their awareness regarding symptoms, preventive measures, vaccination, and healthcare-seeking behaviour can significantly influence child health outcomes. Delayed recognition and inadequate home management may lead to severe complications and repeated hospitalizations.^(4,7)

Understanding the prevalence and associated risk factors of LRTIs is essential for planning effective preventive interventions and public health strategies. Therefore, this study was conducted to evaluate the prevalence of LRTIs among children in Eraviperoor Grama Panchayat, Thiruvalla, Kerala, and to assess the knowledge and awareness of caregivers regarding LRTIs.^(5,7)

Objectives

To conduct a cross-sectional study on the prevalence of Lower Respiratory Tract Infections (LRTIs) among children.

2. Materials and methodology

A community-based cross-sectional study was conducted among children residing in Eraviperoor Grama Panchayat, Thiruvalla, Kerala, over a period of six months from December 2024 to May 2025. The study was approved by the Institutional Review Board of Nazareth College of Pharmacy.

A total of 200 children below 18 years of age were included in the study. Data were collected through caregiver interviews using a structured and pre-validated questionnaire. Children above 18 years of age and caregivers unwilling to participate were excluded from the study.

The questionnaire included demographic details, clinical history, frequency of respiratory infections, environmental exposures, vaccination status, hygiene practices, and caregiver awareness regarding LRTIs. An educational awareness session regarding causes, symptoms, risk factors, prevention, and treatment-seeking behaviour related to LRTIs was also conducted for caregivers.

The collected data were entered into Microsoft Excel and analyzed using descriptive statistical methods. Results were expressed as frequencies and percentages and presented in tables and figures.

3. Results

3.1. Distribution of Prevalence of LRTI

Among 200 children included in the study, 134 children (67%) had a history of Lower Respiratory Tract Infection, while 66 children (33%) did not report LRTI.

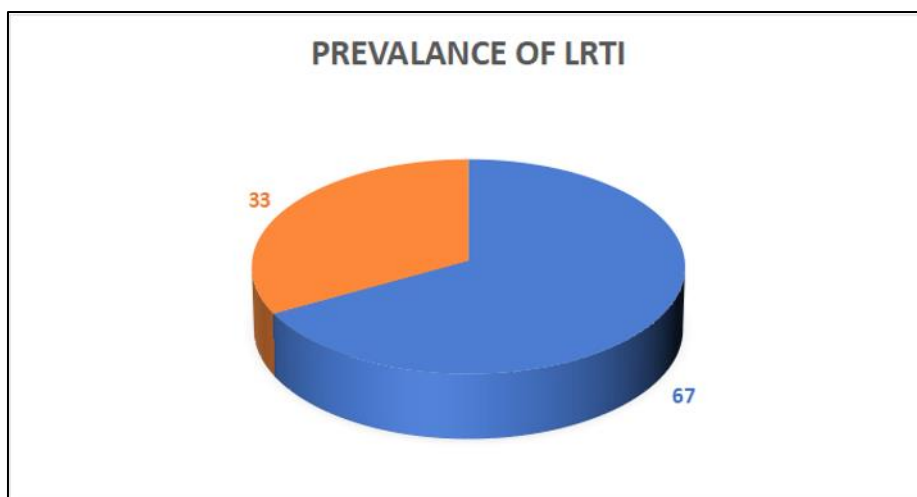


Figure 1 Distribution of prevalence of LRTI

3.2. Distribution of Age Group

The highest prevalence of LRTI was observed among children aged 3–6 years (35.82%), followed by children aged 6–12 years (26.12%). Toddlers aged 1–3 years accounted for 18.66% of cases.

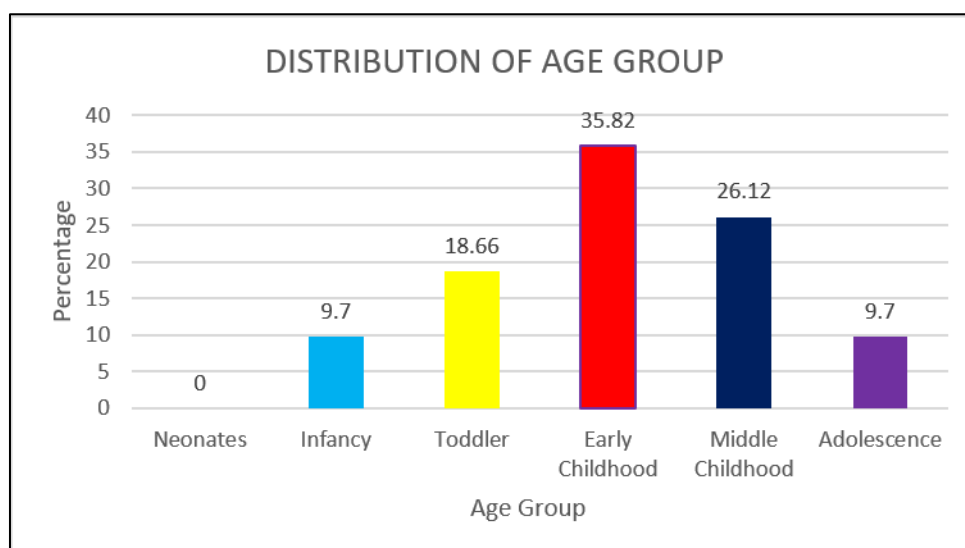


Figure 2 Distribution of age group

3.3. Distribution of Gender

Among the 134 children affected with LRTI, 74 (55%) were females and 60 (45%) were males.

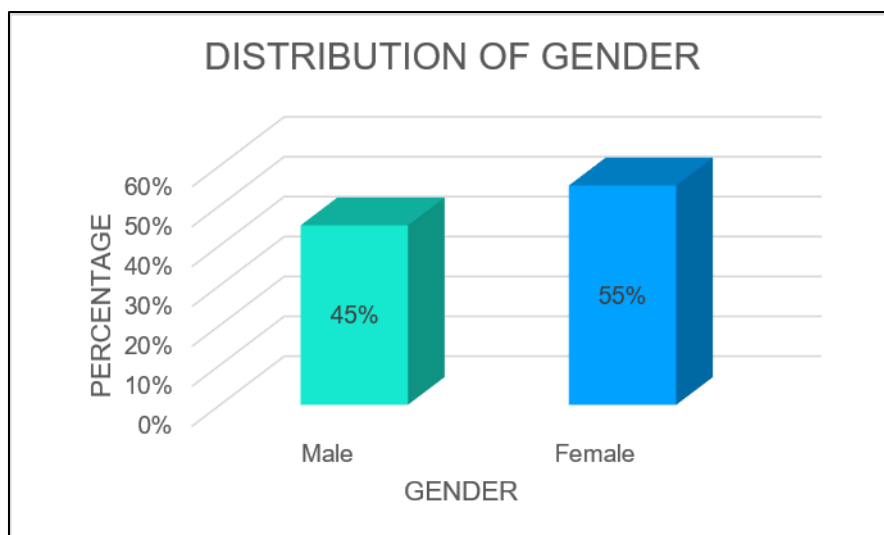


Figure 3 Distribution of gender

3.4. Distribution of Types of LRTIs

Pneumonia was the most common type of LRTI observed among children, accounting for 56% of cases, followed by bronchitis (22%), bronchiolitis (15%), and wheezing-associated lower respiratory infection (7%).

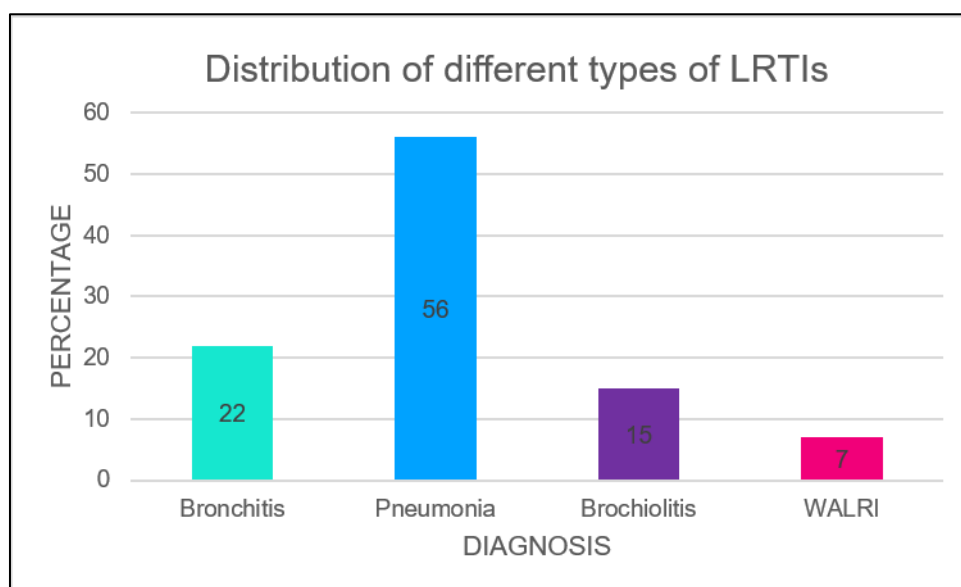


Figure 4 Distribution of types of LRTIs

3.5. Episodes of LRTI in the Past Year

Among the affected children, 49.25% experienced LRTI episodes 2–3 times during the previous year, while 20.9% had 4–5 episodes and 9.7% had more than five episodes.

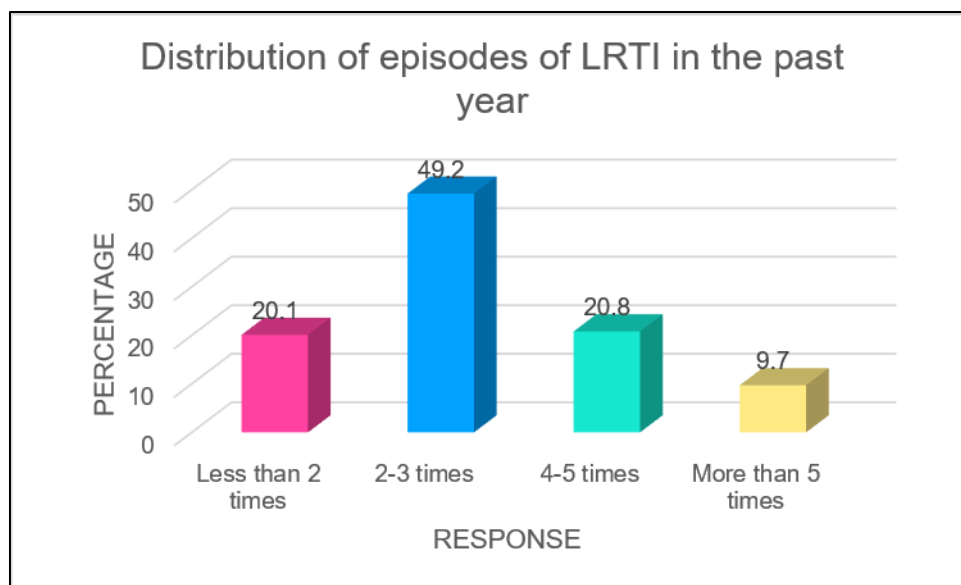


Figure 5 Episodes of LRTI in the past year

4. Discussion

The present study evaluated the prevalence of Lower Respiratory Tract Infections among children in Eraviperoor Grama Panchayat, Thiruvalla, Kerala, and identified associated risk factors and caregiver awareness regarding LRTIs.

The prevalence of LRTIs among children in the present study was found to be 67%, indicating a substantial burden of respiratory infections among the paediatric population. Similar findings were reported in previous studies conducted in developing countries where respiratory infections remain one of the leading causes of hospitalization and morbidity among children^(5,7)

Pneumonia was identified as the most common form of LRTI, followed by bronchitis and bronchiolitis. Recurrent episodes of infection were frequently observed among children exposed to environmental and socioeconomic risk factors such as passive smoking, overcrowding, and poor ventilation.⁽⁷⁾

The study also demonstrated an association between premature birth, low birth weight, and recurrent respiratory infections. These findings are consistent with previous literature reporting increased respiratory vulnerability among preterm and low-birth-weight children.⁽⁷⁾

Caregiver awareness regarding LRTI symptoms and preventive strategies was initially inadequate. However, educational counselling improved caregiver understanding regarding hand hygiene, vaccination, and early healthcare-seeking behaviour. This highlights the importance of community-based awareness programmes in reducing the burden of LRTIs among children.⁽⁴⁾

The low uptake of annual influenza vaccination identified in the study emphasizes the need for improved immunization awareness and accessibility. Public health interventions targeting vaccination coverage, environmental risk reduction, and caregiver education can significantly reduce the incidence and complications of LRTIs.^(4,6)

Abbreviations

- LRTI – Lower Respiratory Tract Infection
- RSV – Respiratory Syncytial Virus
- ALRI – Acute Lower Respiratory Infection

5. Conclusion

The present study demonstrated a high prevalence of Lower Respiratory Tract Infections among children in Eraviperoor Grama Panchayat, Thiruvalla, Kerala. Pneumonia was identified as the most common LRTI, and recurrent

infections were associated with several modifiable risk factors including passive smoking, overcrowding, premature birth, low birth weight, and poor vaccination status.

The study also identified inadequate caregiver awareness regarding LRTI symptoms, causes, and preventive measures. Educational counselling significantly improved caregiver knowledge and preventive practices.

These findings emphasize the importance of strengthening public health measures aimed at improving vaccination coverage, reducing environmental exposure, promoting hygiene practices, and enhancing caregiver awareness to reduce the burden of LRTIs among children.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of informed consent

The authors certify that they have obtained consent from the participants in this study and their details will be concealed with due effort.

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