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PNEUMONIA AMONG CHILDREN ADMITTED TO THE PEDIATRIC WARD OF SAIDU GROUP OF TEACHING HOSPITALS SWAT

Original Research

Sandeef Kumar[1], Inam Ullah[1]*
[1]Children Specialist Saidu Group of Teaching Hospital Swat, Pakistan.
Corresponding Author: Inam Ullah, Children Specialist Saidu Group of Teaching Hospital Swat, Pakistan.inampeads@gmail.com
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ABSTRACT

Background: Pneumonia is a serious respiratory infection that remains a leading cause of morbidity and mortality among children, particularly in resource-limited settings. Its prevalence varies across different geographic regions due to disparities in healthcare access, socioeconomic conditions, and environmental factors. Neonates and young children are at heightened risk due to their immature immune systems. Understanding the epidemiological burden of pneumonia in specific populations is essential for improving early diagnosis, prevention, and treatment strategies.

Objective: To determine the prevalence of pneumonia among children admitted to the pediatric ward of Saidu Group of Teaching Hospitals, Swat, and to analyze associated demographic and clinical characteristics.

Methods: This descriptive cross-sectional study was conducted from July 2023 to September 2023 at the pediatric ward of Saidu Group of Teaching Hospitals, Swat, following ethical approval. Data were retrospectively collected from hospital records. Children of both genders aged 2-60 months admitted with a confirmed diagnosis of pneumonia were included, while those with incomplete records or alternative diagnoses were excluded. The sample size of 390 was calculated using the WHO formula. Key variables such as age, gender, birth weight, maternal age, family size, duration of hospital stay, and need for oxygen supplementation or intensive care were recorded. Data were analyzed using SPSS version 20, and findings were presented in frequencies and percentages.

Results: Among 390 children examined, 78 (20.0%) were diagnosed with pneumonia. The highest prevalence was in infants aged 2-11 months (39.7%), with a male predominance (67.9%). Oxygen supplementation was required in 40 (51.0%) cases, and 28 (35.8%) were admitted to the intensive care unit. Birth weight between 2600-3900 grams was associated with 56.4% of cases, while maternal age between 21-30 years accounted for 65.4% of cases. Pneumonia was more prevalent in families with 4-6 members (50.0%), and firstborn children were more commonly affected (47.4%).

Conclusion: This study highlights a considerable burden of pneumonia among hospitalized children, particularly infants in their first year of life. Early diagnosis, improved preventive measures, and targeted interventions remain crucial in reducing pneumonia-related complications and improving pediatric health outcomes.

Keywords: Children, Epidemiology, Hospitalized, Pneumonia, Prevalence, Risk Factors, Socioeconomic Determinants.

INTRODUCTION

Pneumonia is a significant infectious disease affecting the pulmonary parenchyma and remains a major cause of morbidity and mortality among children worldwide. Globally, more than 1,400 cases of pneumonia occur per 100,000 children, equating to approximately one case per 71 children (1). Despite advancements in healthcare, pneumonia accounts for 14% of all deaths among children under five years of age, making it one of the leading infectious causes of childhood mortality. The prevalence and risk factors for pneumonia vary across different geographical regions, influenced by socio-economic conditions, healthcare accessibility, and environmental exposures. A diverse range of bacterial and viral pathogens contribute to this infection, posing a serious health challenge, particularly in resource-limited settings (2). In developing nations such as Pakistan, Sri Lanka, and Nepal, pneumonia remains the most prevalent respiratory illness among children under three years of age. In Nepal, for instance, 12.48% of all acute respiratory infection (ARI) cases are attributed to pneumonia, with a reported case fatality rate of 0.13% (3). Several risk factors have been identified as key contributors to the burden of pneumonia in low- and middle-income countries. These include malnutrition, premature birth, lack of exclusive breastfeeding, overcrowded living conditions, and exposure to indoor air pollution from biomass fuel use (4). Addressing these risk factors is critical for reducing the incidence of pneumonia and improving child health outcomes.

Understanding the local burden of pneumonia and its associated risk factors is essential for developing targeted prevention and treatment strategies. Epidemiological data on pediatric pneumonia in specific healthcare settings provide valuable insights into disease trends, guiding effective healthcare interventions and resource allocation. Given the high disease burden and preventable nature of pneumonia, this study aims to determine the prevalence of pneumonia among children admitted to the pediatric ward of Saidu Group of Teaching Hospitals, Swat. The findings will contribute to a better understanding of disease patterns and support evidence-based strategies for improving child health in resource-constrained settings (5, 6).

METHODS

The present descriptive cross-sectional study was conducted at the pediatric ward of Saidu Group of Teaching Hospitals, Swat, from July 2023 to September 2023, following approval from the hospital's ethical review board. Data were retrospectively collected from hospital records, ensuring a systematic assessment of pediatric pneumonia cases during the specified study period. Children aged between 2 to 60 months who were admitted with a confirmed diagnosis of pneumonia were included, based on the World Health Organization (WHO) case definition, which incorporates clinical signs such as tachypnea, chest in-drawing, and oxygen desaturation (5). Additionally, cases in which pneumonia was confirmed through radiological findings, including chest X-ray evidence of pulmonary infiltrates or consolidation, were also included to enhance diagnostic accuracy. Patients with incomplete records, those discharged against medical advice, and individuals with an alternative definitive diagnosis were excluded to ensure data reliability (7). The sample size was determined using the standard formula: $N = Z^2 \times p \times q / e^2$, where N represents the minimum required sample size, Z is the standard normal variate (1.96) at a 95% confidence interval, p is the assumed prevalence (50%) for maximum sample size estimation, q is 1 - p, and e denotes the margin of error (5%). Based on this calculation, a minimum sample size of 390 was required. Participants were selected using a convenience sampling technique due to the hospital-based nature of the study (8).

Patient records were reviewed using a standardized data collection checklist, designed to ensure consistency in data extraction. The checklist included key variables such as age, gender, clinical presentation, radiological findings, length of hospital stay (calculated from admission to discharge), need for oxygen supplementation, and patient outcomes. The data were recorded using Microsoft Excel 2016, and statistical analysis was performed using SPSS version 20, where categorical variables were presented as frequencies and percentages (9). Ethical considerations were strictly followed, ensuring patient confidentiality and compliance with research ethics. Institutional Review Board (IRB) approval was obtained before initiating the study, though the specific reference number was not provided in the available details. If accessible, including the IRB reference number would enhance transparency. Since the study relied on retrospective record review, informed consent from individual participants was not applicable. However, ethical clearance ensured that all data were anonymized and used solely for research purposes (10).

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RESULTS

A total of 390 children were evaluated for pneumonia, with an overall prevalence of 78 cases (20.0%). Among the affected children, 53 (67.9%) were male and 25 (32.0%) were female. The mean age of the children was 20.17 months, with the highest frequency of pneumonia observed in infants aged 2-11 months (31 cases, 39.7%), followed by 18 cases (23.0%) in the 12-23 months age group, and the lowest occurrence in children aged 48-60 months (5 cases, 6.4%). Regarding hospital stay duration, 54 (69.2%) children were discharged within seven days, 18 (23.0%) remained hospitalized for 7-10 days, while 6 (7.6%) required more than 10 days of inpatient care. Oxygen supplementation was administered to 40 (51.0%) children, and 28 (35.8%) cases required referral to the intensive care unit.

Birth weight was found to be associated with pneumonia prevalence, with 44 (56.4%) affected children having a birth weight between 2600-3900 grams. A total of 32 (41.0%) cases were reported among children with a birth weight of 1500-2500 grams, while only 2 (2.5%) cases were found in children weighing less than 1500 grams at birth. Maternal age also appeared to influence pneumonia prevalence, with 51 (65.4%) affected children born to mothers aged between 21-30 years. Household size and birth order were also examined as potential risk factors. The highest prevalence of pneumonia was found among children belonging to families with 4-6 members (39 cases, 50.0%). Additionally, firstborn children were more frequently affected, accounting for 37 cases (47.4%), compared to subsequent birth orders.

Table 1.Course of therapy in children with pneumonia admitted in the hospital n=78

Features	Frequency	Percentage
Supply of oxygen	40	51%
Referred to intensive care unit	28	35.8%

Table 2. Pneumonia effected children and their family demographic features N=78

Features	N (%)
Weight of children at birth in grams	
2600-3900	44 (56.41%)
1500-2500	32 (41.0%)
Below 1500	2 (2.5%)
Age of Mother in Years	
Below 21	12(15.38%)
21 to 30	51(65.38)
30 to 40	15(19.2%)
Above 40	0
Number of family	
Below 4	37(47.4%)
4 to 6	39(50%)
Above 6	2(2.56%)
Order of children	

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Features	**N (%)**
1	37(47.4%)
2	26(33.33%)
3	11(14.10%)
4	3(3.8%)
5	1(1.28%)
Above 6	Zero

Table 3. Age and gender wise distribution of children effected by Pneumonia n= 78

Features	**N (%)**
Age in months	
2 to 11	31(39.7%)
12 to 33	18(23.0%)
24 to 35	13(16.66%)
36 to 47	11(14.1%)
48 to 60	5(6.4%)
Gender	
Male	53(67.94%)
Female	25(32.0%)

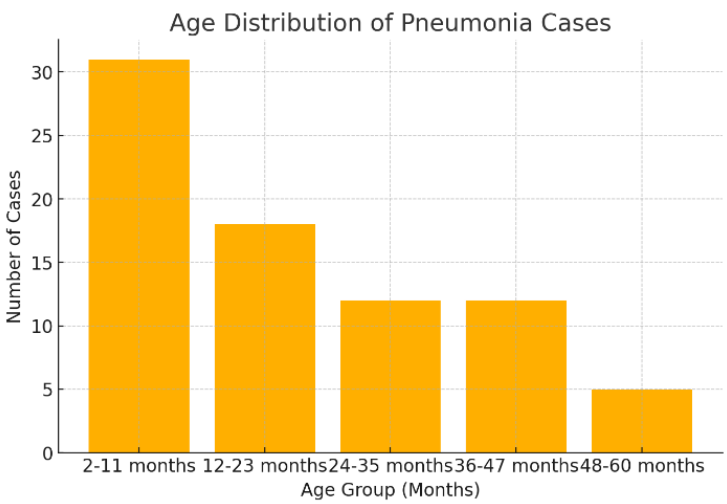


Figure 2 Age Distribution of Pneumonia Case

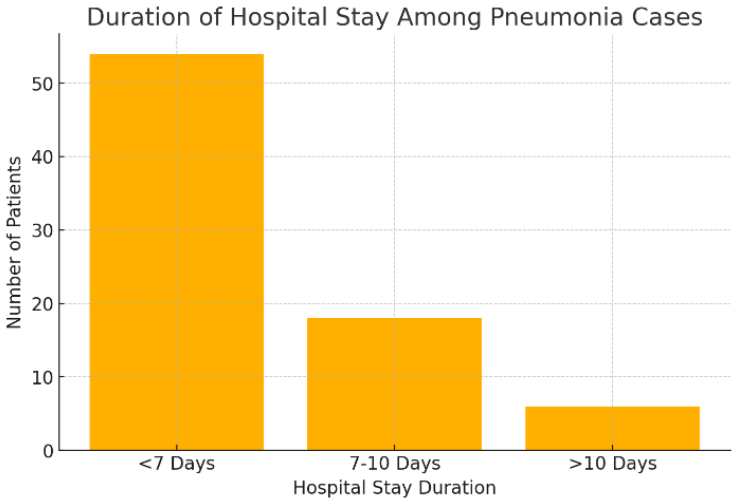
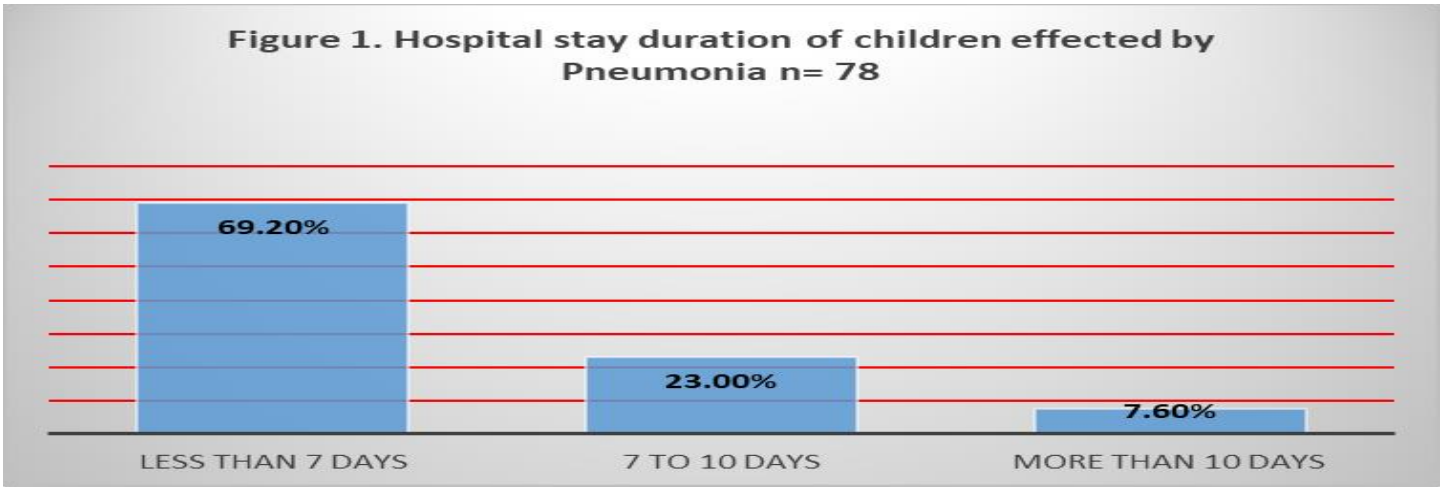


Figure 1 Duration of Hospital Stay Among Pneumonia Case



DISCUSSION

The present study aimed to determine the prevalence of pneumonia among children admitted to the pediatric ward of Saidu Group of Teaching Hospitals, Swat. Out of 390 children examined, the prevalence of pneumonia was found to be 20.0%, a rate comparable to findings reported in similar studies, where prevalence ranged around 19.0%. However, the observed prevalence contrasts with lower rates, such as 4.5%, reported in other investigations. These variations may be attributed to differences in healthcare accessibility, socioeconomic conditions, and geographic factors influencing disease burden. In contrast, studies conducted in Ethiopia have reported a higher pneumonia prevalence of 33.5%, which may reflect disparities in living conditions, malnutrition, and healthcare infrastructure across different regions (8, 11, 12). Age emerged as a crucial determinant, with the highest prevalence observed in infants aged 2-11 months, followed by children in the 12-23 months age group. These findings align with studies conducted in other regions, reinforcing the established understanding that younger children, particularly infants, are at a heightened risk due to their immature immune systems and increased susceptibility to respiratory infections (13-15). Gender-based differences were also noted, with a higher proportion of cases among males (67.9%) compared to females (32.0%), a pattern consistently observed in studies from neighboring countries (16, 17). The underlying reasons for this disparity may be multifactorial, involving biological differences in immune response and potential healthcare-seeking behavior variations between male and female children.

Family structure and household crowding were examined as contributing factors. The study revealed that pneumonia prevalence was higher among children from larger families with more than four members. This finding contrasts with studies suggesting that children in smaller families are at greater risk of pneumonia, possibly due to variations in caregiving practices, exposure to infections, and differences in living environments (18-20). In regions where extended family living arrangements are common, the increased risk associated with household crowding may be attributed to higher exposure to infectious agents and limited access to healthcare resources. Oxygen supplementation was required for 51.0% of affected children, and 35.8% required intensive care unit admission. These findings highlight the significant disease burden posed by pneumonia and the need for critical care in a substantial proportion of cases. However, studies from Ethiopia have reported even higher oxygen dependency rates, with 74.29% of pneumonia cases requiring respiratory support, indicating regional differences in disease severity and healthcare resource availability (19).

Several limitations must be acknowledged in the present study. As a single-center hospital-based study, the findings may not be generalizable to the broader population. The study lacked classification of pneumonia severity, which could have provided further insights into variations in hospital stay duration, oxygen requirement, and ICU admissions. Additionally, potential risk factors such as nutritional status, exclusive breastfeeding, and environmental exposures were not analyzed, limiting the ability to establish a comprehensive risk profile for pneumonia in this population (20). Despite these limitations, the study provides valuable epidemiological data on pneumonia in a hospital setting, emphasizing the burden of the disease in young children and highlighting key demographic and clinical patterns. Future research should incorporate a multi-center approach with a larger sample size, including severity classification and a broader range of risk factors, to enhance the understanding of pneumonia in pediatric populations. Strengthening preventive measures, such as immunization, nutritional interventions, and improved household living conditions, remains crucial in reducing the incidence and severity of childhood pneumonia.

CONCLUSION

This study highlights the significant burden of pneumonia among children admitted to the pediatric ward, emphasizing its prevalence as a major health concern. Infants, particularly those in the early months of life, were found to be the most vulnerable, underscoring the need for targeted preventive measures and early interventions. The findings reinforce the importance of strengthening healthcare strategies, including timely diagnosis, improved access to medical care, and enhanced awareness regarding risk factors. Addressing environmental and socioeconomic determinants, alongside promoting vaccination and optimal nutrition, remains crucial in reducing pneumonia-related morbidity and improving child health outcomes.

AUTHOR CONTRIBUTIONS

Author	Contribution
Sandeef Kumar	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Inam Ullah*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

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