

CORRELATION BETWEEN NURSE-LED DISCHARGE EDUCATION AND 30-DAY READMISSION RATES IN CHILDREN WITH ASTHMA

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Abstract

Background: Asthma is one of the most common chronic conditions affecting children and a leading cause of pediatric hospital readmissions worldwide. Inadequate caregiver education at discharge is a significant contributor to poor asthma management and early readmissions. Nurse-led discharge education has emerged as a promising strategy to improve patient outcomes by enhancing caregiver knowledge and preparedness.

Aim: This study aimed to assess the correlation between nurse-led discharge education and 30-day hospital readmission rates in children with asthma at Lady Reading Hospital, Peshawar.

Methods: A descriptive correlational study design was used, involving 270 children aged 2–12 years who were admitted with asthma and later discharged from the pediatric ward. The sample size was calculated using OpenEpi with a 95% confidence level and 5% margin of error. Participants were selected through non-probability convenience sampling. Data were collected through hospital records and structured caregiver interviews during follow-up within 30 days post-discharge. The data were analyzed using SPSS version 27, applying descriptive statistics and Chi-square tests to determine associations.

Results: Among the 270 participants, 178 (65.9%) received nurse-led discharge education, and 92 (34.1%) did not. The overall 30-day readmission rate was 22.6%. Children who received discharge education had a significantly lower readmission rate (12.9%) compared to those who did not (41.3%). The association was statistically significant ($\chi^2 = 28.47$, $p < 0.001$).

Conclusion: Nurse-led discharge education is significantly associated with reduced 30-day readmission rates in children with asthma. Structured education should be integrated into routine discharge planning to enhance pediatric asthma outcomes.

INTRODUCTION

Asthma is a chronic inflammatory disease of the airways, which can occur in people of any age group, most often in children (Agache et al., 2021). Discharge education can be defined as an organized procedure of imparting patients and caregivers with crucial information concerning disease control, medication, aftercare, and lifestyle change prior to discharge out of the hospital (Martin et al., 2022). Nurse-led discharged education is characterized by the role of the nurses who have the main responsibility of providing this education (Trivedi et al., 2023). Readmission rate is a quality measure based on the percentage of patients readmitted to a hospital within a certain period such as 30 days. In pediatric cases, asthma readmission is often associated with failure to maintain symptoms, improper use of medication, or lack of knowledge of treatment (Jukić et al., 2023).

Asthma represents one of the prevalent chronic diseases in children. The World Health Organization (WHO) estimates 262 million persons worldwide have asthma, where children make up a large percentage of these numbers. Asthma ranks third among the leading causes of hospitalization in children below 15 years in the United States (Sharma et al., 2025). About one out of 6 children who have asthma is readmitted within 30 days of discharge. The same occurrences in the low- and middle-income world, extending to countries such as Pakistan, however, have lower rates of awareness regarding caregivers and subsequent follow-up and thus high re-admission rates. These dismal figures point toward the importance of better discharge procedures and education to facilitate asthma management at home (Merhej & Zein, 2023).

The discharge education is instrumental in making families equipped with the necessary knowledge and competencies to manage asthma in conditions outside the hospital. Nurse-led teaching is especially worthwhile because nurses are constantly in contact with both the parent and the child, so they can personalize instructions to meet the needs of the child and the family. Such education may comprise education on prescribed medications, inhaler technique, warning signs, triggers, and follow-up visits. On its effective delivery, it increases the confidence of the caregivers and it can remarkably

minimize preventable readmissions (Patel et al., 2022).

The benefits of structured discharge education on hospital readmission rate are highlighted in a series of studies. In another example, studies did reveal that with the knowledge given to the caregivers on how to administer medications, as well as manage acute symptoms, children had less chances of getting back to the hospital with deteriorating conditions (Jroundi & Tse, 2021). On the other hand flawed or hurried procedures concerned with discharge tend to confuse and ill equip families leading to lack of control of diseases and frequent readmission. Nurse-led education in this scenario is an active measure to reduce the barrier between the hospital healthcare and domestic management (Lin et al., 2024).

Asthmatic children are especially susceptible to changes caused by the environment, irregular medication, and unmonitored routine. These causes are the leading factors towards acute exacerbations causing emergency visits and hospital readmission (Becker et al., 2021). By addressing the discharge the nurses could discover possible knowledge gaps in the caregiver or lack of care resources access. When they fill these gaps prior to discharge, they will be able to facilitate clear care trajectories and provide families with everything needed to manage mild-to-moderate symptoms at home. These preventative measures are essential in enhancing health outcomes and lowering the health care system load (Hunt-O'Connor et al., 2021).

Although promising, nurse-led discharge education does not exist in every healthcare organization. Factors like understaffing, time limitations, absence of standardized regulations and patient education training barricade the efficiency of the advancement of discharge preparing. In resource-limited settings, these challenges are even more pronounced. The measurement of outcome performance-based on nurse-led discharge education-can be a powerful steward of solid evidence to guide policy and achieve broad adoption of structured education activities (Omonaiye et al., 2024).

Since pediatric asthma imposes a significant burden and since nurses can play a central role in educating their patients, the relationship between asymmetric nurse-led discharge education and 30-day readmission

is an important objective to find. By knowing this relationship, healthcare providers can create focused interventions that would prevent readmission and improve the quality of life of children with asthma. In addition, their evidence-based practices could improve the nursing profession, streamline the use of resources and augment health care delivery systems.

Methodology

This research was done in Lady Reading Hospital of Peshawar (LRH) which is a major tertiary care health facility serving a wide variety of children. The correlation between nurse-led discharge education and the 30-days readmission rate was studied using a descriptive correlational study design in children who were diagnosed with asthma. The research looked into comparing the effect of structured education offered by nurses during the discharge period in avoiding readmissions within 30 days of discharge.

The target group was the children between 2-12 years of age that were critical due to asthma as the major admitting diagnosis and released time out of the pediatric division. Sample size was estimated in the OpenEpi sample size calculator, with a confidence level of 95 percent, margin of error of 5 percent, and the assumed readmission prevalence rate according to the past data of the given institution. This calculation yielded a required sample of 270 participants. A convenient non-probability sampling strategy was used to select participants who should satisfy inclusion criteria.

Inclusion criteria included discharged children with a diagnosis of asthma whose caregivers had consented to their study participation, whose education was actually provided by registered nursing staff members. The study excluded children with chronic illnesses like congenital heart disease or cystic fibrosis, as well as children discharged against medical advice. The collection of the data was performed using the hospital records and structured interviews with the

caregivers during the follow-up visits or calls within 30 days after discharge.

Data Collection Procedure

An adopted and validated tool was used for data collection, it included demographic data, discharge education session documentation, and readmission status within 30 days. Discharge-education content and delivery: The content and delivery of discharge education were graded against a checklist that contained education about medications, trigger avoidance, follow-up, and planning an emergency response.

The study was approved ethically by the Institutional Review Board (IRB) of Lady Reading Hospital. The caregivers of all the participating children were given informed consent. Confidentiality and anonymity of data were highly observed in the study.

Data Analysis Procedure

These data were entered and analyzed in SPSS version 27. Participant characteristics were summarized by descriptive statistics provided through frequencies, percentages, means, and standard deviations. This relationship between nurse-led discharge education and 30-day readmission rates was analyzed by the Chi-square analysis. The p-Value of <0.05 was assumed to be significant.

Results and Analysis

Demographic Characteristics of Participants

The majority of the children in the study were between 2–5 years of age (40%), followed by 6–9 years (36.3%) and 10–12 years (23.7%). Male participants comprised a larger proportion (60%) compared to females (40%). Most of the children resided in urban areas (61.9%), while 38.1% were from rural settings. This distribution reflects a diverse demographic representation of the pediatric asthma population at LRH (Table 1).

Table 1: Demographic Characteristics of Participants (n = 270)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
2–5	108	40.0
6–9	98	36.3
10–12	64	23.7
Gender		

Male	162	60.0
Female	108	40.0
Residence		
Urban	167	61.9
Rural	103	38.1

Nurse-Led Discharge Education Delivery

A majority of the participants (65.9%) received nurse-led discharge education at the time of hospital discharge. In contrast, 34.1% did not receive any

structured education from nursing staff. This indicates a higher prevalence of nurse involvement in discharge planning for children with asthma (Figure 1).

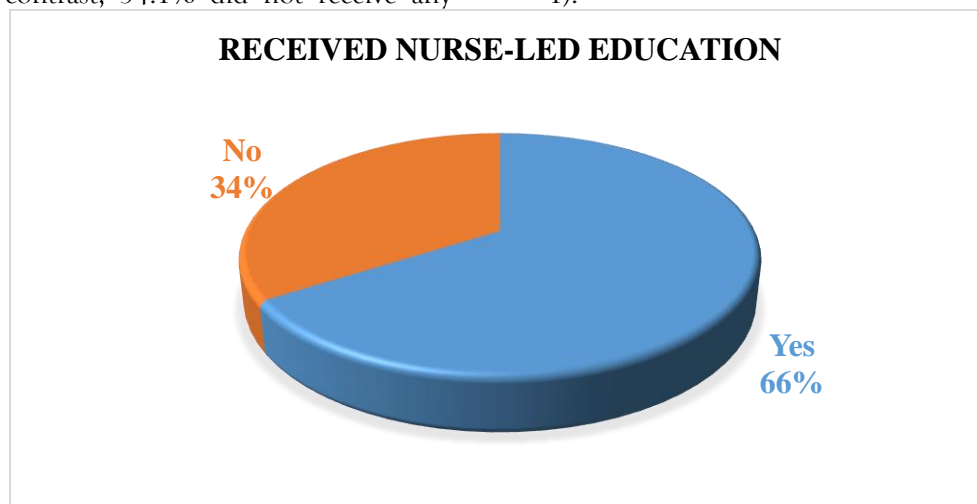


Figure 1: Nurse-Led Discharge Education Delivery

Among the participants, 22.6% of children were readmitted to the hospital within 30 days of discharge. In contrast, 77.4% did not experience any

readmission during the same period. This suggests that a significant proportion of children successfully managed their condition post-discharge (Figure 2)

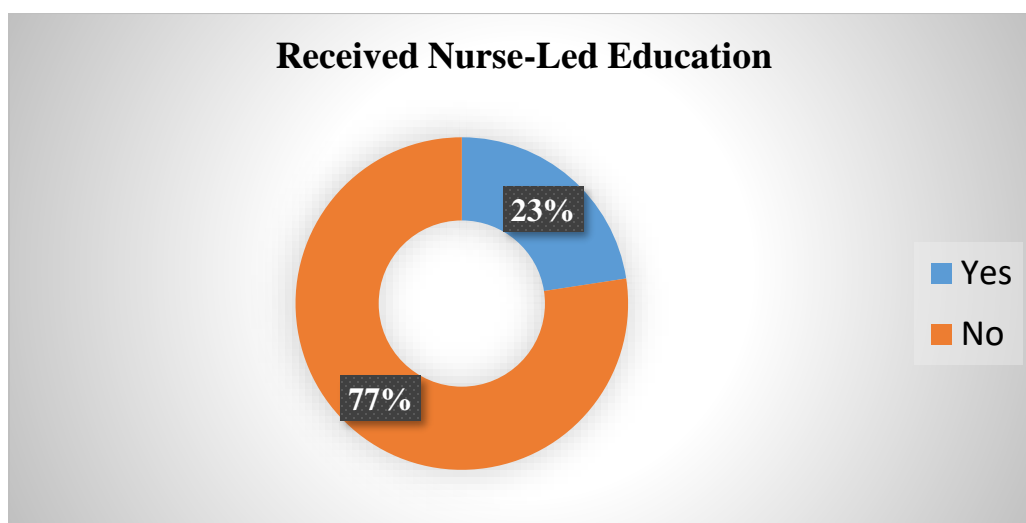


Figure 2: 30-Day Readmission Status

Cross-Tabulation Between Discharge Education and 30-Day Readmission

The cross-tabulation shows that among the 178 children who received nurse-led discharge education, only 23 (12.9%) were readmitted within 30 days,

while 155 (87.1%) were not. In contrast, of the 92 children who did not receive such education, 38 (41.3%) were readmitted, and 54 (58.7%) were not. This indicates a strong negative association between nurse-led discharge education and 30-day readmission rates (Table 2).

Table 2: Cross-Tabulation Between Discharge Education and 30-Day Readmission

Nurse-Led Education	Readmitted (n)	Not Readmitted (n)	Total (n)
Yes	23	155	178
No	38	54	92
Total	61	209	270

Chi-Square Test Result

The Chi-square test revealed a statistically significant association between nurse-led discharge education and 30-day readmission rates ($\chi^2 = 28.47$, $p < 0.001$). This indicates that children who received nurse-led

education were significantly less likely to be readmitted within 30 days compared to those who did not receive such education. The p-value being less than 0.05 confirms the strength and reliability of this association (Table 3).

Table 3: Chi-Square Test Result

Variable	χ^2 (Chi-square)	p-value	Interpretation
Nurse-led discharge education × Readmission	28.47	<0.001	Significant association ($p < 0.05$)

Discussion

This research study aimed to explore the relationship between discharge education faced by nurses and the readmission rate of children within 30 days of being discharged in Lady Reading Hospital, Peshawar. The results indicated a negative relationship of hospital readmissions within 30 days and nurse-led discharge education, which is statistically significant. The readmission rate was significantly lower among those who had received a disciplined teaching by the nurses than in those who had not. It indicates that point of discharge care by nurses can be critical to enhancing post discharge care in pediatric asthmatics.

They were in line with the results of Omonaiye et al. (2024) that discharge education programs with nurse-led reduced readmission and better asthma management in children. In the same vein, a randomized controlled study by Abraham et al. (2022), revealed that fewer emergency visits and all-time readmission occurred when children were given a comprehensive discharge plan during which nurse-led counseling took place. These papers reinforce the present research by confirming the efficiency of

individualized education to facilitate drug compliance and alarm symptom progression in caregivers.

Conversely, there have been studies that indicated that discharge education had little or no effects on readmission after discharge especially where the education was not individualized or reinforced after discharge. An example of this has been reported in a study conducted by Parry et al. which noted that initially hospital-based education was promising; however, over time, it lost its impact unless further reinforcement was provided at home or a follow-up was done (Akinso, 2024) Such disagreement with the findings of the current study can be attributed to a variation in educational materials, mode of delivery, and the support systems of the healthcare system.

The focus of the present research on a nurse-led educational background is especially significant in the realms of South Asian health facilities, as healthcare providers can be nurses, who take the role of a leading voice in the educational process and patient advocates (Wong et al., 2021). Nurses/care providers in such roles can develop a good rapport with the caregivers in turn resulting in a good understanding and trust that is vital to the management of asthma at home.

The availability of nurses and that they could make complex medical instructions easy might have greatly contributed to this reduction in readmissions that was witnessed (Michael et al., 2025).

Cultural and systemic factors that can contribute to the efficiency of discharge education are also to be taken into consideration. Personalized nurse-education can potentially fill knowledge gaps and give caregivers the necessary skills in the Pakistani context, where health literacy levels are exceptionally low. This agrees with the conclusions of Faessler et al. (2023) who claimed that health literacy-sensitive discharge instructions show vast superiority in enhancement of patient comprehension and patient outcomes in vulnerable groups.

The current research supports also the concept that the problem of hospital readmissions does not solely lie in clinical failures but frequently hints at poor communication and support of the transition between the hospital and home Lei et al., (2023). Discharge planning by nurses may be used as a preventive measure as they will be able to educate families before they leave the hospital, provide them with asthma management equipment and ensure that families feel confident in managing Michael et al. (2025) also confirm this when they reported that in a structured discharge planning with nurses, care continuity greatly improved and readmission rates decreased among the different chronic conditions.

To conclude, the research has demonstrated substantive evidence that discharge education led by nurses is related to improved 30-day readmission rates among pediatric asthma patients. The results correlate with the global literature on the relevance of patient-centered education, and when given by nurses. Although future research is advisors in the direction of longitudinal, multi-center studies, the role of nurses in discharge planning is revealed to be extremely important, and the structured educational protocols should be integrated into pediatric asthma care to promote positive long-term outcomes.

Conclusion and recommendations

This study findings illustrated a strong positive correlation between 30-day readmissions in the range of likelihood rates of children with asthma and the occurrence of the nurse-led discharge education. The children who had a structured education as provided

by the nursing staff at the time of discharge had much reduced cases of readmission as opposed to those that did not. This explains why nurses are crucial when it comes to discharge planning and patient education especially in enhancing continuous care and post-discharge care. The findings again note that it is possible to mitigate the toll of inessential readmissions by individualizing instructions to caregivers and providing straightforward information on how to manage asthma, take medication, and answer to emergencies to help pediatric patients lead a better life.

Based on the study's findings, several recommendations are proposed. First, they should establish a standard set of nurse-led discharge education in hospitals to treat patients with pediatric asthma in order to guarantee thoroughness and consistency of the provided information. Second, they should develop training programs that will improve the level of nurses communications and provide the teaching skills of nurses especially in the field of health literacy and engagement of caregivers. Third, visual aids, written materials and demonstration tactics ought to be applauded during a discharge education to strengthen the education. Fourth, the outpatient visit or follow-up call would be organized to answer any questions or barriers that caregivers can face once they leave the hospital. Finally, the given findings should be confirmed at other healthcare facilities to encourage long-term studies investigating the impact of discharge education on asthma management and the overall results of pediatric healthcare delivery. The adoption of these strategies would contribute to the decreased number of avoidable readmissions and better control of asthma in children.

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