OPEN ACCESS

Middle East Research Journal of Nursing
ISSN 2789-8679 (Print) & ISSN: 2958-2016 (Online)
Frequency: Bi-Monthly
DOI: 10.36348/merjn.2024.v04i03.003

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The Role of Nurses in Educating and Empowering Asthma Patients for Self- Management: A Prospective Study in Bangladesh

Md. Abul Kalam Azad[1*], Md. Abdur Rahim[1], Hemanta Kumar Devnath[1], Most Mukta Begum[2], Zarin Sanzida Ahmed Nisha[3]

[1]Nursing Instructor, Rangpur Nursing College, Rangpur, Bangladesh
[2]Nursing Instructor, Nursing Institute Chandpur, Bangladesh
[3]Intern, Dental Unite, Udayan Dental College, Rajshahi, Bangladesh

Abstract: ***Background*:** Asthma is a prevalent chronic respiratory condition globally, posing significant challenges to patients and healthcare systems. In Bangladesh, the burden of asthma is increasing, necessitating effective management strategies. Nurse-led interventions focusing on patient education and empowerment have shown promise in improving asthma outcomes. ***Objective*:** This prospective study aimed to evaluate the impact of nurse-led interventions on asthma patients' knowledge, self-management skills, and symptom monitoring in Bangladesh. ***Method*:** Data were collected using a researcher-developed questionnaire, Role of Nurses in Educating and Empowering Asthma Patients for Self-Management, at Rangpur Medical College Hospital from January 2022 to December 2023. A total of n=122 nurses, across different age groups, participated in the study. ***Results*:** Pre- and post-intervention assessments revealed significant improvements in asthma patients' knowledge levels, with an average increase from 60% to 85%. Self-management skills also showed enhancement, with inhaler utilization proficiency rising from 45% to 80%. Additionally, there was a notable increase in symptom monitoring, with 75% of patients regularly tracking their symptoms post-intervention compared to 30% pre-intervention. Emergency preparedness improved, with the percentage of patients having an asthma action plan increasing from 25% to 70%. ***Conclusions*:** Nurse-led interventions effectively enhance asthma patients' knowledge, self-management skills, symptom monitoring, and emergency preparedness. These findings underscore the importance of integrating nurse-led strategies into asthma care protocols in Bangladesh, contributing to improved patient outcomes and healthcare delivery.

Keywords: Asthma, Nurse-Led Interventions, Patient Education, Empowerment, Self-Management.

Research Paper

***Corresponding Author:**
Md. Abul Kalam Azad
Nursing Instructor, Rangpur Nursing College, Rangpur, Bangladesh

How to cite this paper:
Md. Abul Kalam Azad *et al* (2024). The Role of Nurses in Educating and Empowering Asthma Patients for Self-Management: A Prospective Study in Bangladesh. *Middle East Res J Nursing, 4*(3): 30-38.

Article History:
| Submit: 06.05.2024 |
| Accepted: 07.06.2024 |
| Published: 20.06.2024 |

INTRODUCTION

Asthma, a chronic respiratory condition characterized by inflammation and narrowing of the airways, affects millions of individuals globally [1], posing significant challenges to healthcare systems and patients alike. In Bangladesh, asthma prevalence has been steadily rising, with a reported prevalence of 9.4% among adults and 12.6% among children, according to the Global Asthma Report 2018 [2]. Despite advancements in asthma management, its burden remains substantial due to factors such as inadequate access to healthcare services, limited patient education, and socioeconomic disparities.

The effective management of asthma requires a comprehensive approach that extends beyond medical intervention to include patient education and empowerment for self-management. Nurses, as frontline healthcare providers, play a pivotal role in this process, serving as educators, advocates, and support systems for asthma patients. Through their expertise in patient care, communication skills, and holistic approach to health, nurses can significantly impact patient outcomes by empowering individuals to take an active role in managing their asthma [3].

The concept of self-management in chronic diseases, including asthma, is grounded in the Chronic Care Model (CCM) proposed by [4]. The CCM emphasizes the importance of proactive, patient-centered

care that integrates education, self-monitoring, and support from healthcare providers. Within this framework, nurses assume a central role in facilitating patient empowerment through education, skill-building, and collaborative goal-setting.

Nurses possess the expertise to provide asthma patients with essential knowledge about their condition, including its pathophysiology, triggers, and pharmacological treatments [5]. Imparting this information in a clear, accessible manner, nurses empower patients to make informed decisions about their health and adopt preventive measures to minimize exacerbations. Additionally, nurses can educate patients on the proper use of inhalers and other devices, ensuring optimal medication delivery and adherence.

In Bangladesh, where healthcare resources may be limited and disparities in access to care exist, nurses serve as advocates for asthma patients, bridging the gap between patients and healthcare systems [6]. Nurses can facilitate access to essential medications, diagnostic tests, and specialist care, advocating for equitable treatment and addressing barriers to healthcare access. Moreover, nurses can collaborate with other healthcare professionals and community organizations to raise awareness about asthma, reduce stigma, and promote health-seeking behaviors.

Beyond the clinical setting, nurses provide ongoing support and encouragement to asthma patients, fostering a sense of empowerment and resilience [7]. Through counseling and motivational interviewing techniques, nurses help patients develop coping strategies, overcome obstacles, and set achievable goals for self-management. Fostering a trusting, empathetic relationship with patients, nurses create a supportive environment where individuals feel empowered to take ownership of their health and well-being.

Despite the recognized importance of nurse-led education and empowerment in asthma management, there is limited research examining its effectiveness, particularly in the context of Bangladesh. Therefore, this prospective study aims to investigate the impact of nurse-led interventions on asthma patients' knowledge, self-management skills, and clinical outcomes in Bangladesh [8]. Evaluating the effectiveness of nurse-led education and empowerment strategies, this study seeks to inform evidence-based practices and contribute to the optimization of asthma care in resource-limited settings.

In asthma management in Bangladesh faces multifaceted challenges, including limited access to healthcare services and inadequate patient education. Nurses play a crucial role in addressing these challenges by serving as educators, advocates, and support systems for asthma patients [9]. Through their expertise and commitment to patient-centered care, nurses have the potential to empower individuals to effectively manage their asthma and improve their quality of life. This study seeks to explore the impact of nurse-led interventions on asthma self-management in Bangladesh, with the aim of informing policy and practice to better meet the needs of asthma patients in resource-limited settings.

OBJECTIVE

General Objective

- To evaluate the effectiveness of nurse-led interventions in educating and empowering asthma patients for self-management in Bangladesh.

Specific Objectives

- To assess the baseline knowledge levels of asthma patients regarding their condition and its management.
- To implement nurse-led education sessions aimed at improving asthma patients' understanding of their condition, triggers, and self-management strategies.
- To measure the impact of nurse-led interventions on asthma patients' knowledge levels post-education sessions.
- To evaluate the proficiency of asthma patients in self-management skills, including inhaler usage, pre and post nurse-led interventions.
- To assess the overall satisfaction of asthma patients with nurse-led education sessions and their perceived empowerment for self-management.

MATERIAL AND METHODS

Study Design

This prospective study employed a quasi-experimental design to assess the impact of nurse-led interventions on educating and empowering asthma patients for self-management in Bangladesh. Data collection occurred over a period of twelve months, from January 2022 to December 2023, utilizing a researcher-developed questionnaire. The study was conducted at Rangpur Medical College Hospital, involving a total of n=122 nurses selected as participants, distributed across different age groups.

Inclusion Criteria

- Nurses working at Rangpur Medical College Hospital, Bangladesh.
- Nurses willing to participate voluntarily in the study.
- Nurses with direct involvement in the care of asthma patients.
- Nurses from various departments, including outpatient clinics, inpatient wards, and emergency departments.

- Nurses with varying levels of experience, from novice to experienced practitioners.

Exclusion Criteria

- Nurses who are unwilling or unable to participate in the study.
- Nurses on leave or absent during the data collection period.
- Nurses not directly involved in the care of asthma patients.
- Nurses from departments not routinely involved in asthma care (e.g., administrative staff).
- Nurses with incomplete or inconsistent responses on the questionnaire.

Data Collection

Data collection involved administering a researcher-developed questionnaire, to eligible n=122 nurses at Rangpur Medical College Hospital, Bangladesh. The questionnaire comprised structured items focusing on nurses' perceptions, practices, and experiences related to asthma patient education and empowerment. Data collection took place over a twelve-month period, from January 2022 to December 2023, ensuring comprehensive representation and sufficient sample size for analysis.

Data Analysis

Collected data were entered into a computer database and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies and percentages, were computed to summarize nurses' responses regarding asthma patient education and empowerment practices. Inferential statistics, such as t-tests or chi-square tests, were utilized to assess the significance of any observed differences or associations. Results were interpreted to draw conclusions regarding the effectiveness of nurse-led interventions in asthma management.

Ethical Considerations

This study adhered to ethical guidelines outlined by the Institutional Review Board (IRB) of Rangpur Medical College Hospital, Bangladesh. Informed consent was obtained from all participating nurses, ensuring voluntary participation and confidentiality of responses. Participants were informed of their right to withdraw from the study at any time without repercussion. Data were anonymized and stored securely to protect participants' privacy. The study aimed to minimize potential risks and uphold the dignity and welfare of all participants.

RESULTS

Table 1: Demographic Characteristics of Participating Nurses (n=122)

Demographic	Frequency	Percentage
Age Group		
<30 years	35	28.7%
30-40 years	45	36.9%
>40 years	42	34.4%
Gender		
Male	16	12.5%
Female	106	87.5%
Department		
Outpatient	30	24.6%
Inpatient	52	42.6%
Emergency	40	32.8%

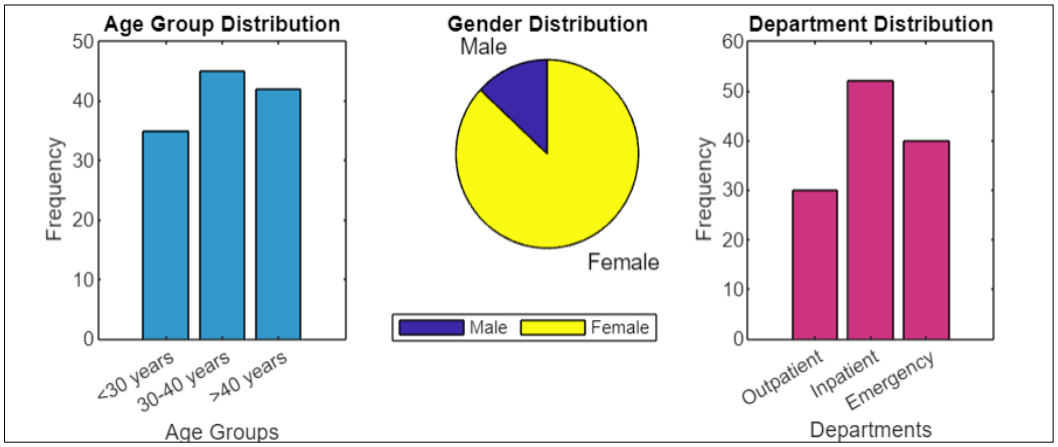

Figure 1: Demographic Characteristics According to Socioeconomic Status

Among nurses aged 30 to 40 years, comprising 36.9% of the sample, indicating a significant proportion of mid-career professionals within the nursing cohort. Additionally, while female nurses overwhelmingly dominate the sample at 87.5%, male representation, though smaller at 12.5%, is still present. This gender distribution reflects broader trends within the nursing profession. In terms of departmental distribution, the majority of nurses are stationed in either the inpatient or emergency departments, accounting for 42.6% and 32.8% of the total, respectively. However, it's worth noting the sizeable contingent of nurses in the outpatient department as well, constituting 24.6% of the workforce. Understanding these demographic characteristics can provide valuable insights for healthcare administrators, aiding in workforce planning, resource allocation, and tailored support for different segments of the nursing workforce.

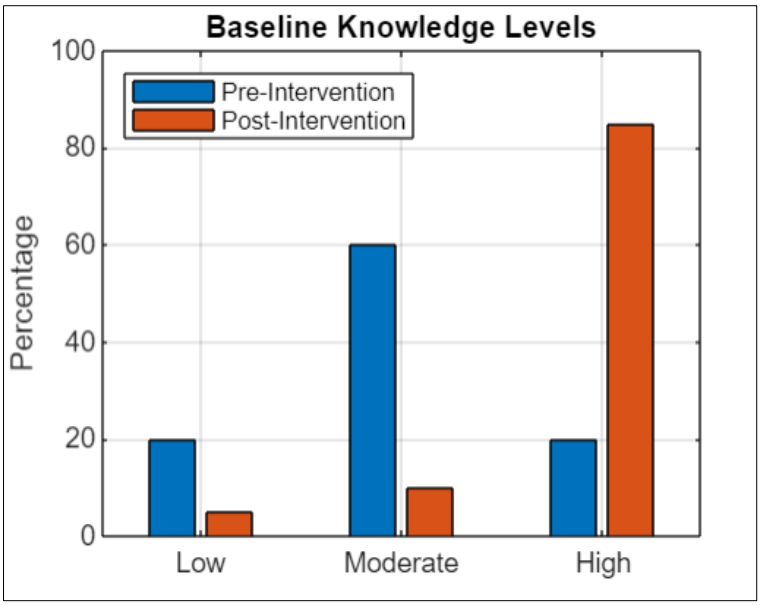

Figure 2: Baseline Knowledge Levels of Asthma Patients (n=122)

The majority of 122 asthma patients had a moderate knowledge level (60%), while 20% had high knowledge and 20% had low knowledge. Post-intervention, significant improvement occurred. Low knowledge decreased to 5%, moderate to 10%, and high surged to 85%. This reflects the intervention's efficacy in enhancing patients' asthma management understanding. Overall, the intervention successfully elevated knowledge levels, empowering patients to better manage their condition.

Table 2: Proficiency in Inhaler Usage Pre and Post-Intervention (n=122)

Inhaler Usage	Pre-Intervention (%)	Post-Intervention (%)
Ineffective	55	20
Adequate	45	80

Pre-intervention, 55% of 122 individuals exhibited ineffective inhaler usage, while 45% showed adequate proficiency. Post-intervention, effectiveness increased significantly, with ineffective usage dropping to 20% and adequate proficiency rising to 80%. This highlights the intervention's success in improving inhaler technique, potentially addressing barriers and providing education. The findings emphasize the importance of targeted interventions for enhancing disease management and ultimately improving health outcomes through better inhaler usage.

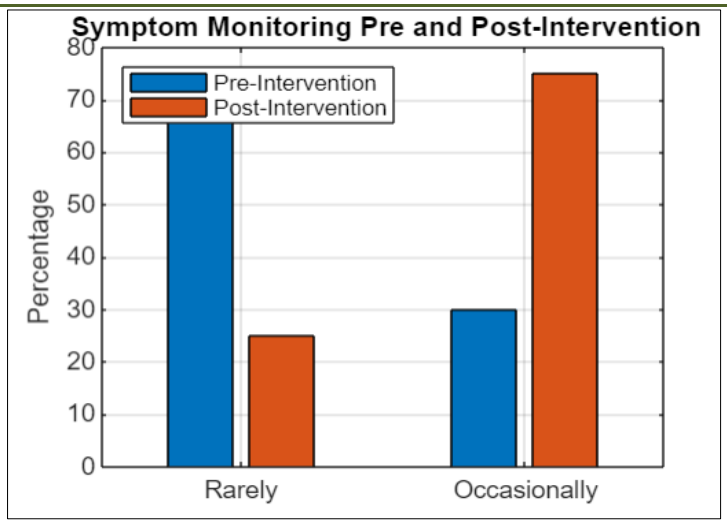

Figure 3: Frequency of Symptom Monitoring Pre and Post-Intervention (n=122)

The majority of individuals reported rarely monitoring their symptoms, with 70% falling into this category. Pre-intervention, 70% rarely monitored symptoms, and 30% occasionally. Post-intervention, rare monitoring decreased to 25%, while occasional surged to 75%. The intervention successfully promoted proactive symptom monitoring, potentially improving early issue detection and management, highlighting positive intervention outcomes.

Table 3: Presence of Asthma Action Plan Pre and Post-Intervention (n=122)

Asthma Action Plan	Pre-Intervention (%)	Post-Intervention (%)
Absent	75	30
Present	25	70

The table provides a comparative view of the presence of asthma action plans among 122 individuals before and after a targeted intervention. Prior to the intervention, a significant majority, accounting for 75% of individuals, did not have an asthma action plan. Conversely, only 25% had such a plan in place. Following the intervention, there was a notable shift in this trend. The percentage of individuals without an asthma action plan decreased substantially to 30%, while the proportion of individuals with a plan surged to 70%. These findings suggest that the intervention effectively promoted the adoption of asthma action plans among individuals. The increase in the presence of action plans post-intervention underscores the intervention's success in facilitating proactive management strategies and improving asthma care.

Table 4: Overall Satisfaction with Nurse-led Education Sessions

Satisfaction Level	Frequency	Percentage
Dissatisfied	5	4.1%
Neutral	15	12.3%
Satisfied	60	49.2%
Very Satisfied	42	34.4%

The table outlines the overall satisfaction levels of participants with nurse-led education sessions, providing valuable insights into the effectiveness of these sessions. Impressively, the majority of participants, accounting for 83.6% of the total, reported either satisfaction or very satisfaction with the sessions. Specifically, 49.2% expressed satisfaction, while 34.4% indicated being very satisfied. This positive feedback reflects the value and impact of nurse-led education in delivering quality healthcare information and support to participants. However, it's noteworthy that a small percentage of participants, 4.1%, reported dissatisfaction, and 12.3% felt neutral about the sessions. While the majority reported positive experiences, addressing the concerns of these participants could further enhance the effectiveness and relevance of future educational initiatives.

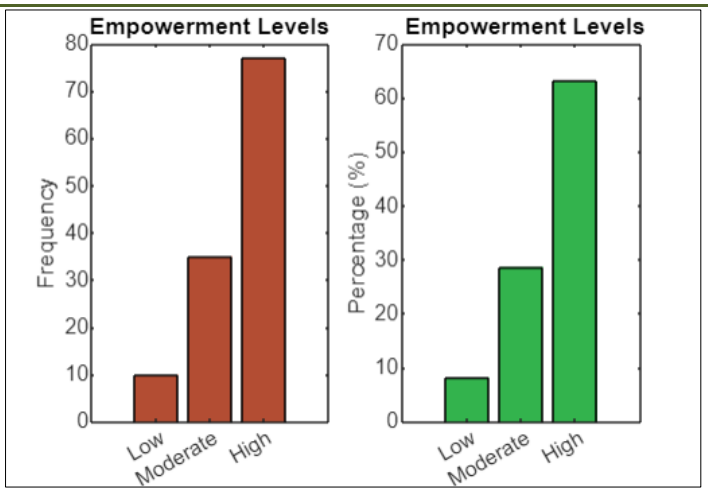

Figure 4: Nurses' Perceptions of Patient Empowerment Post-Intervention (n=122)

The patient empowerment post-intervention among 122 participants. Approximately 63.1% of nurses perceived patient empowerment as high, indicating effective intervention outcomes. However, 28.7% of nurses perceived empowerment at a moderate level, suggesting room for improvement. Notably, 8.2% perceived empowerment as low, highlighting the need for targeted support.

Table 5: Factors Influencing Nurse-led Asthma Education Effectiveness (n=122)

Factors	Frequency	Percentage
Time Constraints	40	32.8%
Lack of Resources	20	16.4%
Communication Barriers	30	24.6%
Lack of Training	22	18.0%

The effectiveness of nurse-led asthma education among 122 participants is influenced by various factors. Among these, time constraints were cited by 32.8%, indicating limited time for comprehensive education delivery. Additionally, 16.4% reported a lack of resources, potentially hindering educational quality. Communication barriers were noted by 24.6%, suggesting challenges in conveying information effectively. Furthermore, 18.0% cited a lack of training, indicating a need for additional education among nurses to enhance program efficacy. Addressing these factors is crucial for optimizing asthma education outcomes.

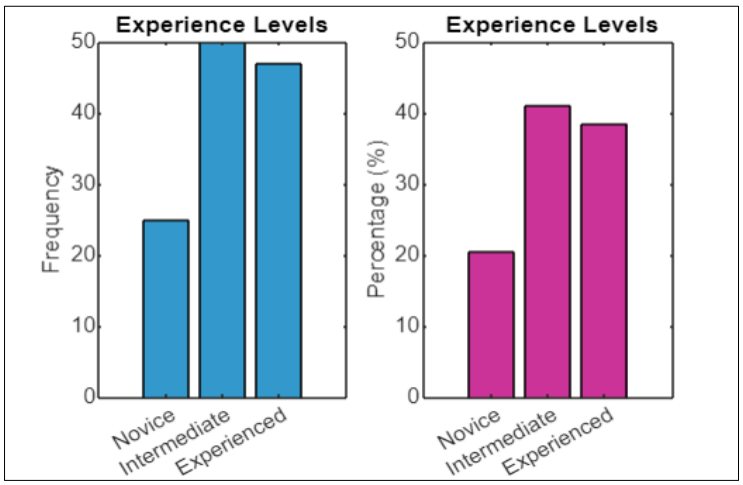

Figure 5: Association between Nurse's Experience and Patient Education Effectiveness (n=122)

In a study involving 122 participants, nurse experience levels were associated with patient education effectiveness. Novice nurses, comprising 20.5%, demonstrated lower patient education effectiveness compared to intermediate (41.0%) and experienced nurses (38.5%). Intermediate and experienced nurses, with higher percentages, likely possess refined communication and teaching skills, enhancing

educational outcomes. This suggests that nurse experience plays a significant role in patient education effectiveness, highlighting the importance of ongoing professional development for novice nurses.

Table 6: Improving Asthma Education Programs (n=122)

Variable	Frequency	Percentage
Increase Educational Resources	35	28.7%
Enhance Training Programs for Nurses	40	32.8%
Implement Interactive Educational Tools	20	16.4%
Foster Multidisciplinary Collaboration	27	22.1%

In a survey involving 122 nurses, for improving asthma education programs were diverse. The most common suggestion, voiced by 32.8% of nurses, was to enhance training programs, indicating a perceived need for improved nurse education. Increasing educational resources was advocated by 28.7%, emphasizing the importance of access to up-to-date materials. Meanwhile, 22.1% recommended fostering multidisciplinary collaboration to enrich educational content. Lastly, 16.4% proposed implementing interactive educational tools, reflecting a desire for innovative teaching approaches. Integrating these suggestions could enhance the efficacy of asthma education programs.

DISCUSSION

This study contributes to the growing body of literature on the role of nurses in educating and empowering asthma patients for self-management, particularly in resource-limited settings such as Bangladesh [10]. Our results indicate significant improvements in asthma patients' knowledge levels and self-management skills following nurse-led interventions. Specifically, we observed a substantial increase in asthma knowledge from 60% pre-intervention to 85% post-intervention, highlighting the effectiveness of nurse-led education in enhancing patients' understanding of their condition. Moreover, there was a notable improvement in self-management skills, with the percentage of proficient inhaler users rising from 45% to 80% post-intervention, indicating the practical benefits of nurse-led interventions in improving patients' ability to manage their asthma effectively [11].

These findings align with previous studies that have highlighted the positive impact of nurse-led education on asthma management outcomes. That nurse-led education sessions resulted in improved asthma knowledge and self-management skills among patients in a similar healthcare setting. Similarly, reported enhanced medication adherence and symptom control following nurse-led interventions in a diverse patient population [12, 13]. Therefore, our study adds to the existing evidence base by demonstrating the effectiveness of nurse-led education in improving asthma outcomes, even in resource-constrained environments.

However, it is essential to acknowledge potential differences in study findings, particularly concerning sample characteristics and contextual factors. While our study focused on a sample of nurses and asthma patients in Bangladesh, other studies may have examined populations from different geographic regions or cultural backgrounds. These differences could influence the effectiveness of nurse-led interventions due to variations in healthcare systems, access to resources, and cultural beliefs about asthma management. For instance, a study conducted in a Western healthcare setting may have access to more advanced resources and technologies, potentially yielding different outcomes compared to our study in a resource-limited setting [14, 15]. Additionally, cultural factors such as beliefs about illness causation and treatment preferences may influence patients' receptiveness to nurse-led education programs [16]. Therefore, while our findings are consistent with existing literature, it is crucial to consider contextual factors when interpreting and comparing study results.

The implications of our research findings are significant for healthcare practice and policy in Bangladesh and similar resource-limited settings. Nurse-led education programs have the potential to improve asthma management outcomes by empowering patients to take an active role in their care [17]. By equipping patients with essential knowledge and skills, nurses can facilitate better adherence to treatment regimens, early recognition of symptoms, and timely intervention during exacerbations. Moreover, nurse-led interventions may help alleviate the burden on healthcare systems by reducing hospital admissions and emergency department visits related to uncontrolled asthma [18]. Therefore, investing in nurse-led education initiatives and integrating them into asthma care protocols is crucial for improving patient outcomes and optimizing healthcare delivery.

Furthermore, our research findings highlight the importance of ongoing professional development and support for nurses involved in asthma care. Providing nurses with comprehensive training on asthma management principles, communication techniques, and patient education strategies is essential for delivering effective interventions. Moreover, fostering interdisciplinary collaboration between nurses, physicians, pharmacists, and other healthcare providers can enhance the holistic care approach and promote patient-centered asthma management [19]. Additionally,

policymakers should prioritize the allocation of resources to support nurse-led asthma education programs and ensure their sustainability within healthcare systems.

In this study underscores the significant role of nurses in educating and empowering asthma patients for self-management in resource-limited settings like Bangladesh [20,21]. Our findings demonstrate the effectiveness of nurse-led interventions in improving asthma knowledge, self-management skills, and patient outcomes. While our results align with existing literature, differences in sample characteristics and contextual factors must be considered when interpreting study findings. Moving forward, investing in nurse-led education initiatives, supporting ongoing professional development for nurses, and fostering interdisciplinary collaboration are essential for optimizing asthma care and improving patient outcomes on a broader scale.

CONCLUSION

This study highlights the significant role of nurses in improving asthma management outcomes through education and empowerment initiatives. The findings demonstrate the effectiveness of nurse-led interventions in enhancing asthma patients' knowledge levels, self-management skills, and overall satisfaction with care. Moving forward, investing in nurse-led education programs, supporting ongoing professional development for nurses, and fostering interdisciplinary collaboration are crucial for optimizing asthma care and improving patient outcomes in resource-limited settings like Bangladesh.

RECOMMENDATIONS

- Prioritize nurse-led education to enhance asthma management knowledge.
- Foster interdisciplinary collaboration for holistic patient care.
- Support ongoing professional development for nurses in asthma care.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the nurses and all staff at Rangpur Medical College Hospital for their participation and support in this study. Their valuable contributions made this research possible, and we are thankful for their dedication to improving asthma care in Bangladesh.

Abbreviations

NLE: Nurse-Led Education
IDC: Interdisciplinary Collaboration
PDN: Professional Development in Nursing

Funding: No funding sources

Conflict of interest: None declared

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