

Collaborative Education for Home Ventilation and Oxygen Therapy: The Role of Nurses and Respiratory Therapists in Empowering Patients and Families

¹Mohammed AlJohani, ²Mesfer Al-Ahmari, ³Hassan Alshehri,
⁴Wadha D. Alshemmeri, ⁵Feras K.A. Melebari, ⁶Manna T. Alshammari,
⁷Shatha F. Aldhawi

Health Affairs at the Ministry of National Guard

Abstract

Background: Effective management of home ventilation and long-term oxygen therapy (LTOT) requires thorough patient and caregiver education. Nurses and respiratory therapists play critical, complementary roles in providing this education to ensure that patients can manage their therapy at home.

Objective: This study explores the collaborative role of nurses and respiratory therapists in educating patients and caregivers on home ventilation and LTOT, focusing on how this teamwork impacts patient confidence, adherence, and outcomes.

Methods: A qualitative study was conducted in a tertiary hospital, with semi-structured interviews conducted with 12 healthcare professionals, 10 patients, and 8 caregivers. Thematic analysis was used to identify key themes related to collaboration, patient confidence, and challenges in education.

Results: Three major themes emerged: (1) Collaborative patient education, (2) Improved patient and caregiver confidence in managing home care, and (3) Challenges in delivering effective education, including time constraints and variability in patient learning abilities. Collaboration between nurses and respiratory therapists was found to significantly enhance patient understanding and adherence.

Conclusion: Interdisciplinary collaboration between nurses and respiratory therapists is essential for effective patient education in home ventilation and LTOT. Addressing time constraints and providing personalized follow-up can further improve patient outcomes.

Keywords: Home ventilation, long-term oxygen therapy, patient education, interdisciplinary collaboration, nurses, respiratory therapists, chronic respiratory conditions

Introduction

Chronic respiratory diseases, such as Chronic Obstructive Pulmonary Disease (COPD), interstitial lung disease, and neuromuscular disorders, often lead to respiratory insufficiency, requiring patients to rely on long-term oxygen therapy (LTOT) or home ventilation to maintain adequate oxygenation and ventilation

(Hardinge et al., 2015). These home-based therapies have been shown to improve survival, enhance quality of life, and reduce hospital admissions for patients with chronic respiratory failure (Fujimoto, 2017). However, managing home ventilation and oxygen therapy can be complex, requiring patients and their families to learn how to operate equipment, recognize complications, and perform routine maintenance. As such, effective patient and family education is critical to ensuring adherence to treatment and preventing complications.

Nurses and respiratory therapists play crucial roles in educating patients and their families on how to manage home ventilation and oxygen therapy. Nurses typically focus on providing holistic care, addressing patient concerns, and ensuring adherence to prescribed treatments, while respiratory therapists specialize in the technical aspects of respiratory care, such as ventilator management and troubleshooting oxygen therapy equipment (Keenan et al., 2011). Together, these professionals collaborate to create comprehensive education programs that equip patients and their caregivers with the knowledge and skills needed to manage their respiratory therapies at home.

Interdisciplinary collaboration between nurses and respiratory therapists is essential for effective patient education, as both professions bring complementary expertise that enhances patient understanding and confidence in managing their conditions (Cox et al., 2009). By working together, they can ensure that patients and families receive consistent information, have their questions answered, and feel supported in their ability to manage home-based therapies. This study aims to explore how nurses and respiratory therapists collaborate in providing patient education for home ventilation and oxygen therapy and how this teamwork impacts patient outcomes, particularly in terms of adherence and complication prevention.

Literature Review

1. Home Ventilation and Long-Term Oxygen Therapy (LTOT)

Home ventilation and long-term oxygen therapy (LTOT) are vital treatments for patients with chronic respiratory conditions such as Chronic Obstructive Pulmonary Disease (COPD), interstitial lung disease, and neuromuscular disorders (Hardinge et al., 2015). LTOT, in particular, has been shown to reduce mortality in patients with severe resting hypoxemia, while home ventilation supports patients with respiratory failure by improving gas exchange, reducing work of breathing, and alleviating symptoms of breathlessness (Cano et al., 2015). However, the complexity of these treatments requires patients and caregivers to have a thorough understanding of how to operate ventilators and oxygen delivery systems, recognize complications, and maintain the equipment (Fujimoto, 2017). This makes patient and family education an essential component of home-based respiratory care.

2. The Role of Patient Education in Home-Based Respiratory Care

Effective patient education is critical to ensuring adherence to home-based therapies such as home ventilation and LTOT. Studies have demonstrated that well-informed patients are more likely to adhere to their prescribed treatments, recognize signs of complications early, and avoid preventable hospital admissions (Cox et al., 2009). Education also empowers patients and their families to take a more active role in managing their conditions, improving their confidence and reducing anxiety related to treatment. This is especially important for patients on home ventilation, where consistent adherence to therapy is key to maintaining respiratory function and preventing exacerbations (Funk et al., 2011).

3. Role of Nurses in Educating Patients on Home Ventilation and LTOT

Nurses play a crucial role in educating patients and families about home ventilation and LTOT, providing them with the knowledge they need to manage their therapy effectively. Their responsibilities typically include teaching patients how to maintain proper hygiene with respiratory devices, administering medications, managing comorbidities, and recognizing early signs of complications (Sole and Bennett, 2014). Nurses also provide emotional and psychological support to patients and caregivers, helping them adjust to the demands of home-based therapies (Evans et al., 2012).

A study by Dunne et al. (2012) found that patients who received education from nurses on oxygen therapy and ventilator care were more likely to follow prescribed protocols and maintain their equipment properly. Nurses are often the first point of contact for patients when problems arise, and they play a key role in monitoring patients' overall condition and adherence to therapy. Their holistic approach to care ensures that both the technical and emotional aspects of home-based therapies are addressed.

4. Role of Respiratory Therapists in Educating Patients on Home Ventilation and LTOT

Respiratory therapists (RTs) provide specialized education focused on the technical aspects of respiratory care, including the setup, operation, and maintenance of ventilators and oxygen delivery systems (Keenan et al., 2011). They instruct patients and caregivers on how to monitor oxygen saturation levels, adjust ventilator settings, and troubleshoot common issues such as mask leaks or equipment malfunctions. Respiratory therapists also play a critical role in educating patients about the importance of maintaining a proper seal with their non-invasive ventilation (NIV) mask to ensure effective treatment (Fujimoto, 2017).

RTs also collaborate with other healthcare professionals to develop individualized care plans based on the patient's specific needs. By providing ongoing support and follow-up, respiratory therapists help patients feel more confident in managing their home ventilation or LTOT regimen. Research has shown that patients who receive thorough training from RTs are more likely to achieve successful outcomes and maintain long-term adherence to therapy (Sole and Bennett, 2014).

5. Collaborative Care Models for Patient Education

The collaboration between nurses and respiratory therapists is essential for successful patient education on home ventilation and LTOT. Both professions bring complementary skills to the educational process, with nurses focusing on holistic patient care and respiratory therapists specializing in technical aspects of respiratory management (Cox et al., 2009). Effective interdisciplinary collaboration ensures that patients receive comprehensive education, addressing both the medical and practical aspects of home-based respiratory care.

Several studies have demonstrated that interdisciplinary education programs improve patient outcomes. According to Sole and Bennett (2014), patients who received collaborative education from both nurses and respiratory therapists were better able to manage their home ventilation and oxygen therapy, leading to fewer hospital readmissions and improved quality of life. Additionally, collaborative care models enhance communication between healthcare professionals, ensuring that any potential issues with patient care are identified and addressed early.

6. Challenges in Patient Education for Home Ventilation and LTOT

Despite the importance of patient education, there are several challenges that can hinder its effectiveness. One significant barrier is the complexity of home-based respiratory therapies, which can be overwhelming for patients and their families (Evans et al., 2012). Ensuring that patients fully understand how to operate and maintain their equipment, recognize early signs of respiratory distress, and follow safety protocols can be difficult, especially in a home environment where there is less immediate access to healthcare providers.

Another challenge is the variation in patients' learning abilities and educational backgrounds. Some patients may struggle with the technical aspects of home ventilation or LTOT, requiring additional support and follow-up. Studies have shown that ongoing education and periodic reassessment of patients' skills can help improve their ability to manage their respiratory therapy at home (Funk et al., 2011).

7. Gaps in the Literature

While much has been written about the roles of nurses and respiratory therapists in patient education, few studies have explored the specific dynamics of their collaboration in the context of home ventilation and LTOT. Research is needed to better understand how interdisciplinary education impacts patient adherence, long-term outcomes, and quality of life. Additionally, there is a need for studies that focus on developing standardized educational protocols that can be applied in various settings to ensure consistency in patient care.

Methodology

1. Study Design

This study employed a qualitative research design to explore the collaborative role of nurses and respiratory therapists in educating patients and families on home ventilation and long-term oxygen therapy (LTOT). A qualitative approach was chosen to gain an in-depth understanding of the experiences and perspectives of healthcare professionals, patients, and their families regarding the education and support provided for managing these complex therapies at home.

2. Setting

The research was conducted in a tertiary care hospital with a specialized respiratory care department. The hospital provides outpatient services to patients with chronic respiratory conditions, including those who require home ventilation and LTOT. The study focused on the outpatient pulmonary rehabilitation clinic, where nurses and respiratory therapists provide education and training for patients and their caregivers before discharge.

3. Participants

A purposive sampling method was used to recruit participants for this study. The participants included:

- 6 nurses with at least two years of experience in providing education for patients undergoing home ventilation or LTOT.
- 6 respiratory therapists with similar experience, who were actively involved in patient education for home-based respiratory therapies.
- 10 patients who were either newly discharged with home ventilation or LTOT or had been using these therapies for at least six months.

- 8 caregivers of the patients enrolled in the study, who were involved in managing the respiratory care of their family members at home.

Participants were selected based on their direct involvement in either providing or receiving education on home ventilation and LTOT. Patients and caregivers were included to provide insight into the effectiveness of the education received and the challenges they faced in managing the therapies at home.

4. Data Collection

Data were collected using semi-structured, face-to-face interviews with nurses, respiratory therapists, patients, and caregivers. The interviews were conducted in a private meeting room at the hospital to ensure confidentiality. Each interview lasted between 30 to 60 minutes. The interview guide included open-ended questions designed to explore:

- The specific roles of nurses and respiratory therapists in educating patients and caregivers on home ventilation and LTOT.
- How nurses and respiratory therapists collaborate to provide comprehensive education.
- Patients 'and caregivers 'experiences with the education they received, including what they found helpful and where they felt improvements could be made.
- Challenges faced by both healthcare professionals and patients in delivering and receiving education on home ventilation and LTOT.

All interviews were audio-recorded with participants 'consent and transcribed verbatim for analysis. Field notes were taken during the interviews to capture non-verbal cues and additional observations.

5. Data Analysis

The interview transcripts were analyzed using thematic analysis, following the method described by Braun and Clarke (2006). The steps of analysis included:

1. Familiarization with the Data: The researchers read the transcripts several times to immerse themselves in the data and gain a thorough understanding of the participants 'experiences.
2. Generating Initial Codes: The data were systematically coded by identifying key concepts and recurring patterns related to patient education, collaboration, and challenges in managing home-based respiratory therapies.
3. Searching for Themes: The initial codes were organized into broader themes, such as "collaborative education," "patient and caregiver confidence," and "barriers to effective education."
4. Reviewing Themes: The identified themes were reviewed to ensure they accurately reflected the data and addressed the research questions.
5. Defining and Naming Themes: Clear definitions were developed for each theme, and the themes were named to represent the core aspects of the collaboration between nurses and respiratory therapists in educating patients and caregivers.
6. Writing the Report: The findings were organized into a narrative report, incorporating direct quotes from participants to illustrate the themes.

6. Ethical Considerations

Ethical approval for the study was obtained from the ethics committee. All participants provided written informed consent before participating in the interviews. They were informed of their right to withdraw from the study at any time without any consequences. To ensure confidentiality, participants 'identities were

anonymized in the transcripts, and all personal information was removed from the final report. Audio recordings and transcripts were securely stored and accessible only to the research team.

7. Trustworthiness and Rigor

To ensure the trustworthiness and rigor of the study, several strategies were employed:

- Triangulation: Data were collected from multiple sources (nurses, respiratory therapists, patients, and caregivers) to provide a comprehensive understanding of the patient education process.
- Member Checking: After the initial analysis, participants were invited to review the findings and provide feedback to ensure that their experiences were accurately represented.
- Peer Debriefing: The research team engaged in regular debriefing sessions to review the coding process and discuss emerging themes, ensuring that the analysis was thorough and objective.
- Reflexivity: The researchers maintained reflexive journals throughout the study to reflect on their own potential biases and how these might influence data interpretation.

8. Limitations

While this study provides valuable insights into the collaborative role of nurses and respiratory therapists in educating patients and caregivers on home ventilation and LTOT, it is important to acknowledge its limitations. The study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the qualitative nature of the study means that the findings are based on the subjective experiences of participants, which may not fully capture all aspects of the patient education process. Future research could expand the scope of the study by including multiple hospitals and incorporating quantitative measures to assess the long-term impact of collaborative education on patient adherence and health outcomes.

Findings

Thematic analysis of the interviews revealed three main themes: Collaborative Patient Education, Patient and Caregiver Confidence in Home-Based Respiratory Care, and Challenges in Delivering Effective Education. Each theme is further divided into sub-themes, with direct quotes from participants to illustrate the findings.

1. Collaborative Patient Education

Nurses and respiratory therapists emphasized the importance of working together to ensure patients and caregivers received comprehensive education on managing home ventilation and long-term oxygen therapy (LTOT).

a) Shared Responsibility in Educating Patients and Families

Both nurses and respiratory therapists described a shared responsibility in providing education. Nurses focused on holistic care and safety measures, while respiratory therapists concentrated on the technical aspects of ventilation and oxygen therapy equipment.

- Nurse 1: "We're responsible for making sure the patient understands their overall care plan—how to manage their medication, avoid infections, and keep track of their oxygen levels. The respiratory therapists handle the more technical stuff, like troubleshooting the ventilator or explaining how to maintain the oxygen concentrator."

- Respiratory Therapist 2: "It's definitely a team effort. We handle the device setup and make sure the patient and family know how to operate the ventilator or oxygen system. The nurses are great at reinforcing what we teach and adding their own guidance about keeping the patient safe at home."

b) Regular Communication Between Nurses and Respiratory Therapists

Participants stressed the need for regular communication between nurses and respiratory therapists to ensure consistent messaging and seamless patient education.

- Nurse 3: "We constantly talk with the respiratory therapists to make sure we're on the same page. Sometimes the patient or caregiver might get confused if we don't communicate well, so it's important that we stay aligned."

- Respiratory Therapist 4: "We check in with the nurses regularly, especially when patients are about to be discharged. It's crucial that we all know what the patient needs to be comfortable managing the equipment at home."

2. Patient and Caregiver Confidence in Home-Based Respiratory Care

The collaboration between nurses and respiratory therapists positively impacted patient and caregiver confidence in managing home ventilation and oxygen therapy.

a) Improved Understanding and Confidence in Device Management

Patients and caregivers reported that the education they received improved their understanding of the equipment, leading to greater confidence in managing home ventilation and oxygen therapy.

- Patient 1: "At first, I was really nervous about using the ventilator, but after the therapist showed me how it works, and the nurse explained the safety tips, I felt much better about it. Now I'm confident I can handle it on my own."

- Caregiver 2: "They walked us through everything step by step. The respiratory therapist explained how to adjust the oxygen levels, and the nurse told us how to keep the mask clean and what signs to look out for if something goes wrong. It gave us a lot of peace of mind."

b) Increased Independence in Managing Home Care

Patients and caregivers appreciated the comprehensive education, which allowed them to manage therapy independently and avoid unnecessary hospital visits.

- Patient 3: "They made sure I knew how to troubleshoot if something went wrong, so I don't have to call the hospital for every little issue. It's a huge relief to know I can manage it on my own."

- Caregiver 4: "Thanks to the education we got, I feel capable of taking care of my husband at home. It's been a smooth transition from the hospital to home care because we knew what to expect and what to do."

3. Challenges in Delivering Effective Education

Despite the generally positive outcomes, several challenges were identified by nurses, respiratory therapists, and patients regarding the delivery of education for home-based respiratory care.

a) Time Constraints and Staffing Issues

Nurses and respiratory therapists reported that time constraints and limited staff resources sometimes hindered their ability to provide thorough education.

- Nurse 5: "There are times when we just don't have enough time to go over every little detail, especially when the unit is busy. We do our best, but sometimes we have to rush through the education."

- Respiratory Therapist 6: "I try to spend as much time as I can with the patients, but there's always a time crunch. Ideally, we would have more time to make sure they're really comfortable with the equipment before they leave the hospital."

b) Variability in Patient and Caregiver Learning Abilities

Another challenge mentioned by participants was the variability in patients' and caregivers' learning abilities, which sometimes made it difficult to ensure that all aspects of care were fully understood.

- Respiratory Therapist 7: "Some patients pick it up quickly, while others need more time or multiple sessions. We have to adapt to each patient's learning style, but it can be challenging, especially when we're pressed for time."

- Nurse 6: "We see a wide range of abilities in patients and caregivers. Some need more support than others, and it's important to follow up with them, but that can be hard to manage with all the other demands."

c) Limited Follow-Up After Discharge

Patients and caregivers mentioned that while the initial education was helpful, there was sometimes a lack of follow-up after discharge, leaving them unsure about certain aspects of home care.

- Patient 4: "They did a great job explaining everything before I went home, but once I was home, I had a few questions that came up. It would have been nice to have a follow-up call to check in."

- Caregiver 5: "We felt confident leaving the hospital, but a week later, I had a question about the oxygen concentrator, and I wasn't sure who to call. More follow-up would have been helpful."

Discussion

This study explored the collaborative efforts of nurses and respiratory therapists in educating patients and caregivers on managing home ventilation and long-term oxygen therapy (LTOT). The findings demonstrate that effective collaboration between these two healthcare professions enhances patient understanding and confidence in managing complex respiratory therapies at home. However, challenges related to time constraints, variability in patient and caregiver learning abilities, and limited follow-up after discharge were also identified. This section discusses the key findings in relation to existing literature and highlights implications for clinical practice.

1. Collaborative Patient Education

The study found that nurses and respiratory therapists play complementary roles in patient education, with nurses focusing on holistic care, safety, and emotional support, while respiratory therapists provide technical expertise on the use and maintenance of home ventilation and oxygen therapy devices. This collaborative approach was seen to improve patient outcomes, as both professions contributed their unique skills to the education process. The importance of interdisciplinary collaboration in patient education is well-documented

in the literature, with studies showing that collaborative care leads to better patient adherence to treatment and improved long-term outcomes (Cox et al., 2009; Sole and Bennett, 2014).

Effective communication between nurses and respiratory therapists was identified as a key factor in ensuring consistent messaging and patient comprehension. Previous research supports the notion that clear and regular communication among healthcare professionals is essential for delivering comprehensive and cohesive patient education (Dunne et al., 2012). By working together and maintaining open lines of communication, nurses and respiratory therapists can ensure that patients and caregivers receive clear, consistent information, which enhances their ability to manage home-based therapies effectively.

2. Impact of Collaboration on Patient and Caregiver Confidence

The study revealed that the collaborative education provided by nurses and respiratory therapists increased patient and caregiver confidence in managing home ventilation and LTOT. This finding aligns with existing research, which emphasizes that patient education improves adherence to home-based therapies, reduces anxiety, and empowers patients to take control of their care (Funk et al., 2011). Patients and caregivers reported feeling more capable of handling the technical aspects of their respiratory equipment and were better prepared to manage their condition independently at home.

This sense of confidence is particularly important for preventing hospital readmissions, as patients who are well-educated on their therapies are more likely to recognize early signs of complications and take appropriate action. Sole and Bennett (2014) found that patients who received comprehensive education from interdisciplinary teams experienced fewer complications and better overall outcomes compared to those who received fragmented or inconsistent education.

3. Challenges in Delivering Effective Education

Despite the positive impact of collaboration, several challenges were identified in delivering patient education. One of the main challenges reported by nurses and respiratory therapists was the lack of time and staffing to provide thorough education, especially in busy hospital settings. Time constraints are a common issue in healthcare and have been widely recognized as a barrier to effective patient education (Evans et al., 2012). Healthcare professionals often find themselves under pressure to deliver education quickly, which can limit the depth of information provided and hinder patient comprehension.

Another challenge highlighted in the study was the variability in patients' and caregivers' learning abilities. Some participants found it difficult to grasp the technical aspects of home ventilation and oxygen therapy, which required additional support and follow-up. This challenge underscores the need for personalized and flexible educational approaches that take into account the different learning styles and capabilities of patients and their caregivers. Studies have shown that tailored education, with opportunities for follow-up and reinforcement, leads to better retention of information and greater adherence to therapy (Cox et al., 2009).

Finally, the limited follow-up after discharge was identified as a challenge by patients and caregivers. While initial education was thorough, many participants felt that additional follow-up could have helped address questions that arose once they were managing the therapies at home. This finding aligns with research suggesting that ongoing education and follow-up are critical to ensuring long-term adherence and reducing complications in home-based therapies (Funk et al., 2011).

4. Implications for Clinical Practice

The findings of this study have important implications for clinical practice. First, healthcare organizations should prioritize interdisciplinary collaboration between nurses and respiratory therapists to ensure comprehensive patient education. Structured communication protocols and regular team meetings can help improve coordination and consistency in the education process, ensuring that patients and caregivers receive clear, accurate, and comprehensive information.

Second, there is a need to address time constraints and staffing issues that limit healthcare professionals' ability to provide in-depth education. Hospitals and clinics should explore ways to allocate more time for patient education, particularly for those managing complex therapies like home ventilation and LTOT. This could include the use of dedicated patient education specialists or the implementation of group education sessions to provide more comprehensive instruction in a time-efficient manner.

Third, personalized education programs that take into account the varying learning abilities of patients and caregivers should be developed. Healthcare professionals should assess each patient's understanding of their therapy and provide additional support as needed. Follow-up after discharge should also be a standard part of the education process, ensuring that patients and caregivers have access to ongoing support and guidance as they adjust to managing their therapies at home.

5. Limitations and Future Research

While this study provides valuable insights into the collaborative role of nurses and respiratory therapists in patient education for home ventilation and LTOT, it is important to acknowledge its limitations. The study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other settings. Additionally, the qualitative nature of the study means that the findings are based on participants' subjective experiences, which may not fully capture the full scope of education practices in other hospitals or care settings.

Future research could address these limitations by conducting studies in multiple healthcare settings and exploring the long-term impact of collaborative education on patient adherence and health outcomes. Quantitative studies could also be conducted to measure the effectiveness of different educational approaches and identify the most effective strategies for improving patient and caregiver confidence in managing home-based therapies.

Conclusion

In conclusion, this study highlights the critical role that collaboration between nurses and respiratory therapists plays in delivering effective patient education for home ventilation and long-term oxygen therapy. By working together, these healthcare professionals enhance patient and caregiver confidence, improve adherence to therapy, and prevent complications. Addressing the challenges of time constraints, variability in learning abilities, and limited follow-up can further strengthen patient education programs and improve long-term outcomes for patients receiving home-based respiratory care.

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