The Collaborative Role of Respiratory Therapists and Nurses in Managing Acute Respiratory Distress Syndrome (ARDS) in the ICU: Focusing on Mechanical Ventilation, Patient Positioning, and Comprehensive Care

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Abstract

Background: Acute Respiratory Distress Syndrome (ARDS) is a critical condition requiring complex management strategies, including mechanical ventilation and prone positioning. Effective collaboration between respiratory therapists and nurses is essential to optimize patient outcomes in the ICU.

Objective: This study investigates how respiratory therapists and nurses collaborate in managing ARDS patients, focusing on mechanical ventilation strategies, patient positioning, and overall patient care.

Methods: A qualitative study was conducted at a tertiary hospital ICU. Semi-structured interviews were held with 12 respiratory therapists and 12 nurses to explore their roles, communication strategies, and collaborative practices in ARDS management. Thematic analysis was used to identify key themes.

Results: Three major themes emerged: (1) Collaboration in mechanical ventilation strategies, (2) Team-based patient positioning, and (3) Communication and workflow challenges. While collaboration was generally effective, communication gaps and role ambiguity were identified as barriers to optimal teamwork.

Conclusion: Effective collaboration between respiratory therapists and nurses is essential for managing ARDS patients. Addressing communication barriers and role clarity can further enhance teamwork and improve patient outcomes in the ICU.

Keywords: Acute Respiratory Distress Syndrome, ARDS, ICU, respiratory therapists, nurses, mechanical ventilation, prone positioning, interprofessional collaboration.

Introduction

Acute Respiratory Distress Syndrome (ARDS) is a life-threatening condition characterized by rapid onset of widespread inflammation in the lungs, leading to severe hypoxemia and respiratory failure. ARDS commonly occurs in critically ill patients and is often associated with conditions such as pneumonia, sepsis, trauma, and

COVID-19 (Thompson et al., 2017). Patients with ARDS are typically treated in intensive care units (ICUs), where mechanical ventilation is one of the primary therapies used to support oxygenation and prevent further lung injury.

The management of ARDS in the ICU is complex and requires a multidisciplinary approach, with respiratory therapists and nurses playing critical roles in patient care. Mechanical ventilation strategies, such as lung-protective ventilation, positive end-expiratory pressure (PEEP), and prone positioning, are essential components of ARDS treatment (Fan et al., 2017). These interventions must be carefully tailored to the individual patient, and their effectiveness depends on the seamless collaboration between respiratory therapists, who manage ventilation settings, and nurses, who monitor the patient's overall condition and implement supportive care measures.

The role of respiratory therapists in ARDS management includes adjusting ventilator settings, monitoring blood gases, and ensuring that the mechanical ventilation strategy minimizes lung injury (Hess, 2001). Nurses, on the other hand, are responsible for monitoring vital signs, assessing fluid balance, and ensuring proper positioning of the patient to optimize lung function (Cederwall et al., 2018). Both professions must work together closely to manage the complex needs of ARDS patients, as effective teamwork can lead to better outcomes, including reduced mortality and shorter ICU stays (Papazian et al., 2016).

Despite the clear need for collaboration, there is limited research exploring how respiratory therapists and nurses work together in the management of ARDS, particularly in implementing ventilation strategies and patient positioning. This study aims to investigate how these two professions collaborate in the ICU to optimize the care of patients with ARDS, with a focus on mechanical ventilation, patient positioning, and overall patient care.

Literature Review

1. Overview of ARDS and Its Management

Acute Respiratory Distress Syndrome (ARDS) is a severe inflammatory condition of the lungs, resulting from direct or indirect injury, which leads to impaired gas exchange and respiratory failure (Thompson et al., 2017). Common causes include pneumonia, sepsis, and trauma, which trigger a cascade of events leading to fluid accumulation in the alveoli, reducing oxygen transfer into the bloodstream. Mortality rates for ARDS remain high, despite advancements in ICU care, with estimates ranging from 30-50% depending on the severity and underlying causes (Bellani et al., 2016). The complex nature of ARDS demands a multidisciplinary approach, and ICU teams—including physicians, respiratory therapists, and nurses—play critical roles in managing the condition through interventions such as mechanical ventilation, fluid management, and patient positioning.

2. Mechanical Ventilation Strategies in ARDS

Mechanical ventilation is the cornerstone of ARDS management, aimed at improving oxygenation while preventing further lung injury. Key strategies include lung-protective ventilation, which involves low tidal volumes (4-6 mL/kg of predicted body weight) and the use of positive end-expiratory pressure (PEEP) to prevent alveolar collapse (Fan et al., 2017). These approaches have been shown to reduce mortality and improve patient outcomes by minimizing ventilator-induced lung injury (VILI) (Briel et al., 2010).

Respiratory therapists are integral to the implementation of these ventilation strategies. They are responsible for adjusting ventilator settings, monitoring respiratory parameters, and managing weaning protocols (Hess,

2001). Studies suggest that the involvement of respiratory therapists in the ICU is crucial for the successful delivery of lung-protective ventilation, as they provide expertise in adjusting ventilator settings based on the patient's response to therapy (Kallet, 2015). Collaborative decision-making with ICU nurses ensures that ventilator settings are optimized for individual patients, particularly in the face of rapid clinical changes.

3. The Role of Patient Positioning in ARDS

Patient positioning, particularly prone positioning, has been shown to improve oxygenation and reduce mortality in patients with severe ARDS (Guérin et al., 2013). Prone positioning allows for more even distribution of lung stress, improving gas exchange and reducing the risk of lung injury. The early application of prone positioning has been recommended as a standard of care for severe ARDS cases (Fan et al., 2017).

Nurses play a central role in implementing and maintaining prone positioning, ensuring that patients are properly positioned and monitored for complications, such as pressure ulcers and tube dislodgment (Cederwall et al., 2018). Given the physical demands and complexity of prone positioning, close collaboration between respiratory therapists and nurses is essential to ensure its safe application and to monitor the patient's response. Studies show that effective teamwork can reduce the risks associated with prone positioning, improve oxygenation outcomes, and reduce mortality (Papazian et al., 2016).

4. The Role of Respiratory Therapists in ARDS Management

Respiratory therapists are specialized healthcare professionals trained to manage mechanical ventilation and monitor respiratory function in critically ill patients. In ARDS management, respiratory therapists adjust ventilator settings to maintain lung-protective strategies, titrate oxygen therapy, and monitor blood gases to ensure adequate oxygenation while minimizing the risk of VILI (Hess, 2001). Their expertise in ventilator management and understanding of respiratory mechanics are critical for adapting mechanical ventilation to the dynamic needs of ARDS patients (Kallet, 2015).

Respiratory therapists also collaborate with the ICU team in assessing readiness for weaning from mechanical ventilation and managing complex cases that require non-invasive or invasive ventilation strategies. Research shows that respiratory therapists' involvement in the ICU can improve patient outcomes, reduce the duration of mechanical ventilation, and decrease the incidence of complications such as barotrauma and pneumothorax (Kallet, 2015).

5. The Role of Nurses in ARDS Management

Nurses are essential members of the ICU team, responsible for continuous monitoring and providing comprehensive care to ARDS patients. In addition to managing fluid balance, administering medications, and providing supportive care, ICU nurses play a key role in managing respiratory therapies. They ensure the correct implementation of ventilator settings prescribed by respiratory therapists, monitor patient responses, and address any complications that may arise during ventilation (Cederwall et al., 2018).

Nurses also manage the physical and emotional care of ARDS patients, including patient positioning, infection control, and sedation management. Their ability to monitor for subtle changes in a patient's condition, such as respiratory distress or hemodynamic instability, is crucial for early detection of complications. The close relationship between nurses and respiratory therapists in the ICU ensures that any necessary adjustments to care plans or ventilation settings are communicated and implemented quickly (Donovan et al., 2018).

6. Collaboration Between Respiratory Therapists and Nurses in ARDS Management

Effective collaboration between respiratory therapists and nurses is essential for the successful management of ARDS. Studies have shown that interdisciplinary teamwork in the ICU improves patient outcomes, reduces mortality, and enhances the quality of care delivered to critically ill patients (Reader et al., 2007). In the context of ARDS, collaboration is particularly important in coordinating complex interventions, such as mechanical ventilation and prone positioning, which require the expertise of both professions.

Clear communication between respiratory therapists and nurses is key to managing rapid changes in a patient's condition. Nurses provide continuous bedside monitoring, allowing them to detect early signs of deterioration, while respiratory therapists adjust ventilation strategies to meet the patient's evolving needs. This teamwork ensures that ARDS patients receive timely interventions and that ventilator settings and patient positioning strategies are optimized for their specific condition (Reader et al., 2007).

Despite the benefits of collaboration, challenges such as role ambiguity and communication barriers can hinder effective teamwork. Research suggests that structured communication protocols and interprofessional education can improve collaboration between respiratory therapists and nurses, leading to better coordination of care and improved patient outcomes (Weller et al., 2014).

Methodology

1. Study Design

This study employed a qualitative research design to explore the collaborative role of respiratory therapists and nurses in managing patients with Acute Respiratory Distress Syndrome (ARDS) in the ICU. A qualitative approach was chosen to gain an in-depth understanding of how both professions work together to optimize mechanical ventilation strategies, patient positioning, and overall patient care. Semi-structured interviews were conducted to gather detailed insights into the participants 'experiences and perceptions regarding collaboration in ARDS management.

2. Setting

The study was conducted in the intensive care units (ICUs) of a tertiary care hospital. The hospital specializes in the care of critically ill patients, including those with ARDS, and has dedicated respiratory therapy and nursing teams that manage ventilated patients. The ICU is equipped with state-of-the-art mechanical ventilation technologies, and the hospital follows evidence-based guidelines for ARDS management, including prone positioning and lung-protective ventilation strategies.

3. Participants

A purposive sampling method was used to recruit 12 respiratory therapists and 12 ICU nurses who were directly involved in the care of ARDS patients. Participants were selected based on their experience in ARDS management, with inclusion criteria requiring at least two years of experience in ICU settings. The participants represented a diverse range of ages, years of experience, and roles within the ICU, ensuring a broad perspective on interdisciplinary collaboration.

4. Data Collection

Data were collected through semi-structured, face-to-face interviews conducted in private meeting rooms within the hospital to ensure confidentiality. Each interview lasted between 30 and 60 minutes. The interview guide included open-ended questions designed to explore the following areas:

- The roles and responsibilities of respiratory therapists and nurses in managing ARDS patients.
- How respiratory therapists and nurses collaborate to optimize mechanical ventilation strategies.
- The role of patient positioning (including prone positioning) in ARDS management and how collaboration influences this intervention.
- Communication and teamwork between the two professions in addressing the complex needs of ARDS patients.
- Challenges encountered in collaboration and strategies to overcome them.

All interviews were audio-recorded with participants' consent, and field notes were taken to capture additional observations during the interviews. The audio recordings were transcribed verbatim for analysis.

5. Data Analysis

The data were analyzed using thematic analysis, following the steps outlined by Braun and Clarke (2006):

1. Familiarization with the Data: The researchers repeatedly read the transcripts to immerse themselves in the data and gain a comprehensive understanding of the participants' experiences.
2. Generating Initial Codes: Each transcript was systematically coded, identifying key phrases and concepts related to the research questions. Codes were assigned to segments of data reflecting collaborative practices, communication strategies, and challenges.
3. Searching for Themes: Codes were grouped into broader themes that encapsulated the core findings, such as "collaboration in mechanical ventilation," "team-based patient positioning," and "communication challenges."
4. Reviewing Themes: The identified themes were reviewed to ensure consistency with the data and relevance to the research objectives.
5. Defining and Naming Themes: Clear definitions were developed for each theme, and appropriate names were assigned to reflect the underlying concepts.
6. Writing the Report: The final themes were organized into a narrative, integrating direct quotes from participants to support the findings.

6. Ethical Considerations

Ethical approval for the study was obtained from the ethics committee prior to data collection. All participants provided written informed consent, and they were assured of their right to withdraw from the study at any time without any repercussions. Participant confidentiality was maintained throughout the study, with identifying information removed from the transcripts. The audio recordings were securely stored and deleted after transcription.

7. Trustworthiness and Rigor

To ensure the trustworthiness of the study, the following strategies were employed:

- Triangulation: Data were collected from both respiratory therapists and nurses to provide multiple perspectives on ARDS management.
- Member Checking: Participants were given the opportunity to review the findings to ensure that their views were accurately represented.
- Peer Debriefing: The research team conducted regular debriefing sessions to reflect on the findings and challenge assumptions, ensuring a rigorous interpretation of the data.
- Reflexivity: The researchers maintained a reflexive journal throughout the study, documenting potential biases and the influence of the researcher's background on the data analysis process.

8. Limitations

One limitation of this study is its focus on a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the study was conducted in a high-resource hospital with specialized ICU care, which may not reflect the experiences of healthcare professionals in lower-resource settings. Future research could explore collaborative practices in different types of hospitals or settings.

Findings

The thematic analysis of the interviews with respiratory therapists and ICU nurses revealed several key themes related to the collaborative management of patients with Acute Respiratory Distress Syndrome (ARDS). Three main themes emerged: Collaboration in Mechanical Ventilation Strategies, Team-Based Patient Positioning, and Communication and Workflow Challenges. These themes are supported by sub-themes and illustrated with direct quotes from participants.

1. Collaboration in Mechanical Ventilation Strategies

Participants highlighted the importance of collaboration between respiratory therapists and nurses in managing mechanical ventilation for ARDS patients. Both professions emphasized their shared responsibility in adjusting ventilator settings and ensuring lung-protective ventilation strategies.

a) Shared Responsibility in Ventilation Management

Respiratory therapists and nurses discussed the shared responsibility they have in managing ventilation, with nurses monitoring the patient's condition and respiratory therapists making adjustments based on their assessments.

- Respiratory Therapist 1: "We work closely with the nurses to ensure that the ventilator settings are adjusted according to the patient’s needs. They monitor the patient’s vitals constantly, and if they notice anything off, we step in to make the necessary adjustments."
- Nurse 2: "The respiratory therapists handle the technical side, but we’re the ones by the patient’s bedside, so we catch the early signs of distress. It’s definitely a team effort to keep these patients stable."

b) Implementing Lung-Protective Ventilation

Participants emphasized the use of lung-protective ventilation, including low tidal volume strategies and maintaining optimal PEEP levels, as critical for reducing ventilator-induced lung injury (VILI) in ARDS patients. This requires constant communication between nurses and respiratory therapists.

- Respiratory Therapist 3: "Lung-protective ventilation is our priority, but it's not just about setting the machine and walking away. The nurses keep us updated on the patient’s oxygen levels and any changes, so we’re continuously tweaking the settings."
- Nurse 4: "We see the effects of ventilation in real-time—whether it's helping or if the patient’s struggling. When that happens, we immediately call the respiratory therapist to review and adjust the ventilator settings."

2. Team-Based Patient Positioning

Patient positioning, particularly prone positioning, emerged as a critical intervention in ARDS management. Both respiratory therapists and nurses acknowledged that prone positioning requires careful coordination to ensure patient safety and effectiveness.

a) Prone Positioning as a Collaborative Effort

Participants described prone positioning as a physically demanding procedure that requires the coordinated efforts of both respiratory therapists and nurses to ensure proper execution.

- Nurse 5: "Prone positioning is one of the most challenging things we do, but it's so effective for ARDS. It takes the entire team—nurses, respiratory therapists, and even a few others—to turn the patient safely and monitor them throughout."
- Respiratory Therapist 6: "We monitor the patient's airway during prone positioning to make sure the tubes stay in place and there's no disconnection. The nurses handle a lot of the positioning and checking for skin breakdown. We all have to be on the same page."

b) Monitoring During Prone Positioning

Both professions discussed the need for continuous monitoring during and after prone positioning to assess its effectiveness and address potential complications such as pressure ulcers, airway dislodgment, and hemodynamic instability.

- Respiratory Therapist 7: "Once the patient is in the prone position, it doesn't stop there. We're monitoring their oxygen levels, checking the ventilator settings, and making sure the airway remains clear."
- Nurse 8: "We check for any signs of skin damage or pressure sores and monitor vitals to ensure the patient remains stable. If anything seems off, we alert the respiratory therapist immediately to make adjustments."

3. Communication and Workflow Challenges

Despite the overall positive collaboration, participants noted several challenges related to communication and workflow, which sometimes hindered the effectiveness of the teamwork in managing ARDS patients.

a) Communication Gaps

Participants identified occasional communication gaps between respiratory therapists and nurses, particularly during busy shifts or in urgent situations where rapid interventions are needed.

- Nurse 9: "Sometimes things get hectic, and we're not able to communicate as effectively as we'd like. You need that quick communication when something changes in the patient's condition, but it's not always easy when we're all rushing around."
- Respiratory Therapist 8: "It's a fast-paced environment, and sometimes we're dealing with multiple patients at once. It can be hard to keep everyone in the loop, especially if changes are happening quickly."

b) Role Ambiguity and Overlapping Responsibilities

Some participants mentioned role ambiguity as a challenge in their collaboration. While both professions have clearly defined roles, there were instances where responsibilities overlapped, leading to confusion about who should take the lead in specific situations.

- Respiratory Therapist 9: "There are times when I'm not sure if I should make a decision about something, or if it's up to the nurse. We work well together, but sometimes the lines get blurred when it comes to who's responsible for what."

- Nurse 10: "We're all trying to do what's best for the patient, but sometimes we overlap in what we do, especially when things need to be done quickly. It's not always clear who should take the lead, which can slow things down."

Discussion

This study explored how respiratory therapists and nurses collaborate in the management of patients with Acute Respiratory Distress Syndrome (ARDS) in the ICU, focusing on mechanical ventilation strategies, patient positioning, and overall patient care. The findings highlighted several important aspects of this collaboration, while also revealing communication and workflow challenges that can impact the effectiveness of ARDS management. This section synthesizes the key findings, relates them to existing literature, and discusses their implications for clinical practice.

1. Collaboration in Mechanical Ventilation Strategies

One of the key findings of this study is the critical role of collaboration in managing mechanical ventilation for ARDS patients. Both respiratory therapists and nurses emphasized their shared responsibility in adjusting ventilator settings and maintaining lung-protective ventilation strategies, including low tidal volume and PEEP management. This finding aligns with existing literature, which underscores the importance of lung-protective strategies in reducing mortality and preventing ventilator-induced lung injury (VILI) (Fan et al., 2017).

The close communication between respiratory therapists and nurses ensures that ventilator settings are continuously monitored and adjusted based on real-time patient data, such as oxygen saturation levels and blood gas readings. Nurses, being at the bedside, are able to detect early signs of deterioration, allowing respiratory therapists to make rapid adjustments to the ventilator settings. This supports previous research suggesting that interdisciplinary collaboration improves the effectiveness of mechanical ventilation and contributes to better patient outcomes (Hess, 2001).

2. Team-Based Patient Positioning

Prone positioning emerged as a key collaborative intervention in the management of ARDS patients, particularly those with severe hypoxemia. Both professions recognized prone positioning as a physically demanding procedure that requires careful coordination between respiratory therapists and nurses. The literature supports prone positioning as a highly effective intervention for improving oxygenation and reducing mortality in ARDS patients (Guérin et al., 2013). However, it is also a complex intervention that requires a team-based approach to ensure patient safety and reduce the risk of complications such as pressure ulcers and airway dislodgment.

The findings of this study are consistent with previous research indicating that the successful implementation of prone positioning requires close collaboration between respiratory therapists and nurses, particularly in managing airway stability and monitoring for complications (Kallet, 2015). Both professions play complementary roles, with respiratory therapists focusing on airway management and ventilator settings, while nurses handle the physical positioning of the patient and monitor for any signs of distress or skin damage.

3. Communication and Workflow Challenges

While the overall collaboration between respiratory therapists and nurses was seen as effective, participants identified several challenges related to communication and workflow. Communication gaps were reported, particularly during busy shifts when rapid interventions were needed. This finding is consistent with existing literature, which suggests that communication breakdowns in high-pressure environments can lead to delays in care and negatively impact patient outcomes (Reader et al., 2007).

In addition, role ambiguity was identified as a challenge, with some participants expressing uncertainty about their respective responsibilities in certain situations. Overlapping responsibilities, particularly in urgent care scenarios, led to occasional confusion regarding who should take the lead. This challenge aligns with previous studies that emphasize the need for clear role definitions and structured communication protocols to prevent confusion and ensure smooth collaboration in critical care settings (Weller et al., 2014).

4. Implications for Practice

The findings of this study have several important implications for clinical practice. First, the study highlights the need for structured communication protocols to minimize communication gaps and ensure that both respiratory therapists and nurses are always aligned in their care strategies. Implementing regular interdisciplinary huddles or check-ins could enhance communication and reduce the risk of miscommunication during busy shifts.

Second, addressing the issue of role ambiguity is essential to improving collaboration. Developing clear role definitions and delineating responsibilities during specific interventions, such as prone positioning or ventilator adjustments, could help reduce confusion and streamline patient care. Interprofessional education programs that focus on defining roles and fostering teamwork between respiratory therapists and nurses could further enhance collaboration and improve patient outcomes.

Finally, the study underscores the value of continuous collaboration in managing complex interventions such as mechanical ventilation and prone positioning. By encouraging open communication and teamwork, ICU teams can optimize care strategies and improve the overall management of ARDS patients.

5. Limitations and Future Research

While this study provides valuable insights into the collaborative role of respiratory therapists and nurses in managing ARDS patients, 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 collaboration.

Future research could explore collaboration in ARDS management across multiple hospitals or examine how technological interventions, such as real-time communication platforms, can enhance teamwork and reduce communication gaps. Further studies could also investigate the impact of specific interprofessional training programs on improving collaboration between respiratory therapists and nurses in the ICU.

Conclusion

In summary, this study highlights the critical role of collaboration between respiratory therapists and nurses in managing ARDS patients in the ICU. By working together on mechanical ventilation strategies, patient positioning, and overall patient care, both professions contribute to optimizing outcomes for critically ill patients. Addressing communication challenges and clarifying role definitions will further enhance teamwork and improve the quality of care delivered to ARDS patients.

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