

# The Effectiveness of Multidisciplinary Rounds in Improving Patient Outcomes in Intensive Care Units: A Mixed-Methods Study

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## Abstract

**Background:** Multidisciplinary rounds (MDRs) are essential in intensive care units (ICUs) to enhance collaboration and improve patient outcomes. This study evaluates the impact of MDRs on ICU mortality rates, length of stay (LOS), readmission rates, and staff satisfaction in a tertiary hospital.

**Methods:** A mixed-methods study was conducted over six months in a 20-bed ICU. Quantitative data on patient outcomes (n=150) were analyzed pre- and post-MDR implementation, while qualitative insights were gathered from 25 healthcare providers through interviews and focus groups.

**Results:** ICU mortality rates decreased from 18.7% to 12% (p=0.048), LOS reduced from 8.3 to 6.7 days (p<0.001), and 30-day readmission rates dropped from 14.7% to 9.3% (p=0.036). Staff satisfaction significantly improved in communication, collaboration, and confidence (p<0.001). Qualitative themes revealed enhanced communication, improved patient outcomes, and challenges in scheduling and time management.

**Conclusion:** MDRs significantly improve ICU patient outcomes and staff collaboration. Addressing implementation barriers can further optimize their effectiveness in critical care settings.

**Keywords:** Multidisciplinary Rounds, Intensive Care Unit, Patient Outcomes, Staff Satisfaction, Collaboration, Critical Care

## Introduction

Multidisciplinary rounds (MDRs) are a critical component of patient management in intensive care units (ICUs), involving collaboration among various healthcare professionals to optimize care delivery and improve patient outcomes. By integrating perspectives from physicians, nurses, pharmacists, respiratory therapists, and other specialists, MDRs facilitate comprehensive discussions and coordinated care planning, which are essential in the complex ICU environment (O'Leary et al., 2010).

Evidence highlights the positive impact of MDRs on clinical outcomes. Studies have demonstrated that MDRs can significantly reduce ICU mortality rates, hospital length of stay, and readmissions. A systematic review by Kim et al. (2010) reported that structured MDRs were associated with improved

communication among team members, leading to enhanced decision-making and better alignment of treatment goals. Similarly, a study by Lane et al. (2013) found that MDRs were instrumental in reducing medication errors and optimizing therapy for critically ill patients.

The composition and structure of MDRs greatly influence their effectiveness. Research by Kim et al. (2010) emphasized that the inclusion of pharmacists in MDRs led to improved medication management and patient outcomes, particularly in reducing adverse drug events. Additionally, the frequency and leadership of MDRs are pivotal. For instance, daily MDRs led by intensivists have been associated with significant reductions in mortality compared to less frequent rounds or those led by non-intensivists (Kim et al., 2010).

However, despite these benefits, implementing MDRs is not without challenges. Coordinating schedules among diverse professionals, maintaining consistent participation, and fostering effective communication can be barriers to successful MDRs (O'Leary et al., 2010). Addressing these challenges through structured approaches and standardized protocols is essential to maximize their potential.

This study aims to evaluate the effectiveness of multidisciplinary rounds in improving patient outcomes in ICUs, focusing on specific metrics such as mortality, length of stay, and staff satisfaction.

## **Literature Review**

Multidisciplinary rounds (MDRs) have garnered significant attention in critical care research due to their potential to improve patient outcomes and enhance healthcare team collaboration. This section reviews existing literature on the structure, benefits, challenges, and outcomes associated with MDRs in intensive care units (ICUs).

### *The Role and Structure of Multidisciplinary Rounds*

MDRs are structured meetings where healthcare professionals, including physicians, nurses, pharmacists, respiratory therapists, and other specialists, convene to discuss and coordinate patient care. The frequency, composition, and leadership of MDRs vary, but their effectiveness largely depends on the presence of diverse expertise and regular scheduling. According to Kim et al. (2010), MDRs that include pharmacists have demonstrated significant improvements in medication management, particularly in reducing adverse drug events. Similarly, Lane et al. (2013) highlighted that MDRs led by intensivists were more effective in reducing ICU mortality and improving communication within the team.

### *Impact on Patient Outcomes*

Several studies have highlighted the positive impact of MDRs on patient outcomes. Kim et al. (2010) conducted a systematic review that showed MDRs significantly reduced ICU mortality, hospital length of stay, and readmissions. The study emphasized that structured communication during MDRs allowed for better alignment of treatment goals and reduced discrepancies in care plans. Additionally, research by Lane et al. (2013) demonstrated that MDRs reduced the incidence of medical errors, particularly those related to medication prescribing and administration.

### *Enhanced Communication and Teamwork*

MDRs foster collaboration and improve communication among healthcare professionals. Effective communication is essential in ICU settings, where rapid decision-making and coordinated efforts are critical. O’Leary et al. (2010) observed that MDRs enhanced teamwork, reducing miscommunication and promoting a shared understanding of patient care objectives. This collaborative approach not only benefits patients but also improves job satisfaction among healthcare providers, as team members feel more engaged and valued.

### *Challenges in Implementing MDRs*

Despite their benefits, MDRs face several challenges in implementation. Scheduling conflicts among healthcare providers, lack of consistent participation, and varying levels of engagement can hinder the effectiveness of MDRs (O’Leary et al., 2010). Additionally, some studies have reported that time constraints and limited resources in ICUs can make it difficult to conduct regular and comprehensive rounds (Kim et al., 2010). Addressing these barriers requires the development of standardized protocols and training programs to ensure active participation and efficient use of time.

### *Future Directions and Opportunities*

While the existing literature supports the effectiveness of MDRs in improving patient outcomes, there is a need for further research to optimize their structure and implementation. For instance, studies could explore the impact of digital tools, such as electronic health records (EHRs), in enhancing communication during MDRs. Additionally, examining patient and family perspectives on MDRs could provide valuable insights into their role in promoting patient-centered care.

The literature consistently demonstrates that MDRs are a valuable intervention in ICUs, contributing to improved patient outcomes, enhanced communication, and better team collaboration. However, challenges in implementation highlight the need for standardized practices and further research to maximize their potential. This study builds on existing evidence to evaluate the effectiveness of MDRs in improving ICU patient outcomes, focusing on mortality rates, length of stay, and staff satisfaction.

## **Methodology**

### *Study Design*

This study utilized a mixed-methods design, combining quantitative and qualitative approaches to evaluate the effectiveness of multidisciplinary rounds (MDRs) in improving patient outcomes in intensive care units (ICUs) of a tertiary hospital. The study was conducted over a six-month period.

### *Study Setting*

The study was conducted in the ICU of a tertiary hospital, a 500-bed tertiary care facility with a 20-bed ICU. The ICU serves patients with a wide range of critical conditions, including medical, surgical, and

trauma cases. The multidisciplinary team in the ICU consisted of intensivists, nurses, pharmacists, respiratory therapists, dietitians, and case managers.

## *Participants*

The study included two groups of participants:

1. **Healthcare Providers:** All healthcare professionals participating in MDRs during the study period were included. This group consisted of intensivists (n=5), ICU nurses (n=30), pharmacists (n=3), respiratory therapists (n=4), and dietitians (n=2).
2. **Patients:** Adult ICU patients admitted during the study period were included. Exclusion criteria were patients with a length of stay less than 48 hours or those discharged against medical advice. A total of 150 patients met the inclusion criteria.

## *Intervention*

MDRs were conducted daily during the study period. Each session was led by an intensivist and followed a standardized protocol:

- **Pre-Round Preparation:** Each team member reviewed patient charts and relevant data before the rounds.
- **Round Structure:** For each patient, the team discussed medical history, current condition, treatment goals, and plans. Pharmacists provided recommendations on medication management, and respiratory therapists contributed to ventilator settings and oxygen therapy adjustments. Dietitians addressed nutritional needs, and nurses shared bedside observations.
- **Documentation:** Key decisions and plans were documented in the electronic health record (EHR).

## *Data Collection*

Quantitative Data:

1. **Patient Outcomes:**
  - ICU mortality rate
  - Length of stay (LOS) in the ICU
  - Readmission rates within 30 days of discharge
2. **Staff Outcomes:**
  - Staff satisfaction with MDRs, measured using a validated survey tool with a 5-point Likert scale.

Qualitative Data:

Focus group discussions and semi-structured interviews were conducted with healthcare providers to explore their perceptions of the effectiveness and challenges of MDRs. Interviews were audio-recorded, transcribed, and anonymized for analysis.

## Data Analysis

### Quantitative Data:

- Descriptive statistics were used to summarize patient demographics and clinical outcomes.
- Comparative analyses (e.g., t-tests, chi-square tests) were conducted to assess differences in patient outcomes before and after implementing the standardized MDR protocol.
- A multiple regression analysis was performed to evaluate the association between MDR participation and patient outcomes.

### Qualitative Data:

- Thematic analysis was conducted on the interview and focus group transcripts.
- Data were coded independently by two researchers, and themes were identified through iterative discussions.

## Ethical Considerations

Ethical approval for the study was obtained from the ethics committee. Informed consent was obtained from all healthcare providers who participated in focus groups and interviews. For patient data, de-identification was ensured to maintain confidentiality.

## Limitations

Potential limitations of this study include the single-center design, which may limit generalizability, and the reliance on self-reported data for staff satisfaction, which may introduce bias.

This methodology provides a comprehensive approach to assessing the impact of MDRs on ICU patient outcomes and staff perceptions, contributing valuable insights to the field of critical care.

## Findings

### Quantitative Findings

The quantitative findings are based on the analysis of 150 ICU patients and the responses of 44 healthcare providers. The outcomes assessed included ICU mortality rates, length of stay (LOS), readmission rates, and staff satisfaction.

**Table 1: Patient Outcomes Before and After Implementation of MDRs**

Outcome	Before MDRs (n=75)	After MDRs (n=75)	p-value
ICU Mortality Rate (%)	18.7%	12.0%	0.048*
Mean Length of Stay (days)	8.3 ± 2.5	6.7 ± 2.1	<0.001**
30-Day Readmission Rate (%)	14.7%	9.3%	0.036*

\*Significant at  $p < 0.05$ , \*\*Significant at  $p < 0.01$ .

**Key Findings:**

- ICU mortality rates decreased significantly after implementing MDRs ( $p = 0.048$ ).
- Average LOS in the ICU reduced by 1.6 days ( $p < 0.001$ ).
- The 30-day readmission rate decreased from 14.7% to 9.3% ( $p = 0.036$ ).

**Table 2: Staff Satisfaction with MDRs**

Domain	Mean Score (Pre-MDR)	Mean Score (Post-MDR)	p-value
Communication Effectiveness	3.4 ± 0.7	4.5 ± 0.6	<0.001**
Collaboration Among Team Members	3.6 ± 0.8	4.7 ± 0.5	<0.001**
Confidence in Care Plans	3.3 ± 0.9	4.4 ± 0.6	<0.001**

**Key Findings:**

- Significant improvements were observed in all domains of staff satisfaction, particularly in communication effectiveness and collaboration.

*Qualitative Findings*

Thematic analysis revealed three main themes with corresponding subthemes based on interviews and focus groups with 25 healthcare providers (5 physicians, 10 nurses, 5 respiratory therapists, 3 pharmacists, and 2 dietitians).

1. **Enhanced Communication:** Participants appreciated the structured format of MDRs, which facilitated clear and consistent communication across disciplines.
  - Subtheme 1: Structured information sharing promoted cohesive decision-making.
  - Subtheme 2: Collaboration among team members improved, especially with the inclusion of pharmacists and dietitians.
2. **Improved Patient Outcomes:** Participants observed tangible benefits in patient management due to timely interventions.
  - Subtheme 1: Reduced medical errors were frequently mentioned, particularly in medication management.
  - Subtheme 2: Care plans were more dynamic and adaptive to changing patient needs.
3. **Challenges in Implementation:** Despite the benefits, logistical issues were significant barriers to optimal MDR implementation.
  - Subtheme 1: Scheduling conflicts among healthcare professionals limited participation.
  - Subtheme 2: Time constraints during rounds occasionally interfered with other clinical responsibilities.

**Discussion**

This study evaluated the effectiveness of multidisciplinary rounds (MDRs) in improving patient outcomes and staff satisfaction in a tertiary hospital ICU setting. The findings demonstrate significant benefits of MDRs in reducing ICU mortality rates, length of stay (LOS), and 30-day readmission rates,

alongside enhanced staff satisfaction in communication, collaboration, and confidence in care planning. These results align with existing literature and provide critical insights into the role of MDRs in critical care.

### *Interpretation of Quantitative Findings*

The reduction in ICU mortality rates and LOS observed in this study is consistent with findings from previous research (Kim et al., 2010; Lane et al., 2013). The collaborative nature of MDRs likely contributed to these improvements by ensuring timely interventions and minimizing medical errors. For instance, the inclusion of pharmacists in rounds, as highlighted in both the quantitative and qualitative findings, facilitated optimized medication management, reducing the likelihood of adverse drug events—a critical factor in ICU mortality.

The significant reduction in LOS ( $p < 0.001$ ) may also reflect the ability of MDRs to streamline care plans and adapt them dynamically to patients' changing conditions. By integrating expertise from multiple disciplines, care decisions were more comprehensive and proactive. This finding is crucial as reduced LOS not only benefits patients by minimizing exposure to hospital-related complications but also reduces healthcare costs and ICU resource strain.

The improvement in staff satisfaction, particularly in communication and collaboration, underscores the value of structured MDRs in fostering a supportive team environment. These outcomes resonate with the findings of O'Leary et al. (2010), who reported enhanced teamwork and reduced communication barriers among ICU staff participating in MDRs.

### *Insights from Qualitative Findings*

The qualitative analysis highlighted key themes that explain the mechanisms behind the observed improvements. Enhanced communication and interdisciplinary collaboration were central to the success of MDRs. Participants noted that the structured format of rounds ensured all voices were heard, which reduced ambiguity in decision-making and increased confidence in care plans. These findings align with the concept of "collective intelligence" in healthcare, where diverse perspectives contribute to better outcomes (Kim et al., 2010).

Improved patient outcomes, such as reduced medical errors and timely adjustments to care plans, further support the effectiveness of MDRs. The proactive involvement of specialists, such as respiratory therapists in ventilator management and dietitians in nutritional planning, highlights the critical role of diverse expertise in optimizing patient care.

However, challenges in implementing MDRs were also evident. Scheduling conflicts and time constraints were frequently cited barriers, echoing concerns raised in previous studies (Kim et al., 2010). These logistical issues emphasize the need for hospital leadership to allocate resources and develop flexible scheduling to ensure consistent participation without overburdening staff.

## *Comparison with Literature*

The findings of this study are consistent with existing research on MDRs, reinforcing their effectiveness in improving patient and staff outcomes. However, the study also contributes new insights by highlighting specific areas of improvement, such as the role of pharmacists in reducing medication errors and the tangible benefits of daily rounds led by intensivists.

Notably, this study observed slightly lower reductions in ICU mortality and LOS compared to meta-analyses reported in the literature (Kim et al., 2010; Lane et al., 2013). This discrepancy may be attributed to the single-center design and variability in the composition and leadership of MDRs.

## *Strengths and Limitations*

### **Strengths:**

- The mixed-methods design provided a comprehensive evaluation of MDRs, capturing both quantitative outcomes and qualitative perspectives.
- The study was conducted in a real-world ICU setting, enhancing the generalizability of findings to similar healthcare environments.

### **Limitations:**

- The single-center design may limit the generalizability of the findings to other settings.
- Challenges in consistently involving all disciplines in MDRs may have influenced the outcomes.
- Self-reported measures of staff satisfaction may introduce bias, as participants might overstate benefits due to social desirability.

## *Implications for Practice*

The findings underscore the need for hospitals to prioritize MDR implementation as a standard practice in ICUs. To maximize effectiveness, hospital administrators should:

- Develop standardized MDR protocols to ensure consistent participation and clear role delineation.
- Address logistical challenges by implementing flexible scheduling and allocating sufficient time for rounds.
- Invest in training programs to enhance communication skills and interdisciplinary collaboration among healthcare providers.

## *Future Research*

Future studies should explore:

- The long-term impact of MDRs on patient outcomes beyond the ICU, such as overall hospital readmissions and recovery trajectories.





- The integration of digital tools, such as electronic health records (EHRs) and telemedicine, to enhance MDR efficiency and communication.
- Comparative studies across multiple hospitals to assess variability in MDR effectiveness and identify best practices.

## Conclusion

This study reinforces the critical role of MDRs in improving patient outcomes and fostering collaboration in ICU settings. By addressing the challenges identified, healthcare systems can further optimize MDRs to ensure high-quality, patient-centered care. The findings provide a foundation for future research and serve as a call to action for hospital leadership to embrace and enhance multidisciplinary collaboration in critical care.

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