Multidisciplinary Management of Airway Emergencies: Integrating the Roles of EMTs, Dentists, and Respiratory Therapists in a Tertiary Hospital Setting

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Abstract

Airway emergencies require rapid, coordinated responses from multidisciplinary teams to prevent life-threatening complications. This qualitative study, conducted at a tertiary hospital, explored the roles of emergency medical technicians (EMTs), dentists, and respiratory therapists in managing airway emergencies, focusing on the benefits and challenges of interdisciplinary collaboration. Semi-structured interviews with 15 healthcare professionals were analyzed thematically, revealing the distinct contributions of each profession, including EMTs 'initial stabilization, dentists 'management of trauma-related airway obstruction, and respiratory therapists 'ventilation support. The findings underscore the importance of communication, role clarity, and teamwork in improving patient outcomes during airway emergencies.

Keywords: Airway Emergencies, Interdisciplinary Collaboration, Emts, Dentists, Respiratory Therapists, Trauma, Patient Outcomes, Tertiary Hospital

Introduction

Airway emergencies are among the most critical situations encountered in healthcare, requiring rapid assessment and intervention to prevent life-threatening outcomes. Effective airway management is essential for stabilizing patients, especially those experiencing trauma, respiratory distress, or complications related to dental injuries. While initial stabilization often falls within the domain of emergency medical technicians (EMTs), long-term management and resolution of airway issues may require the expertise of multiple healthcare professionals, including dentists and respiratory therapists (Bauer, 2012).

In prehospital settings, EMTs play a critical role in assessing airway patency and providing lifesaving interventions, such as oxygen administration, airway adjuncts, and, in severe cases, intubation (Jacobs and Grabinsky, 2014). However, certain airway emergencies—such as those involving facial trauma, dental injuries, or complex respiratory conditions—often necessitate the involvement of a multidisciplinary team. Dentists, for example, are integral in managing airway obstruction caused by dental trauma or maxillofacial injuries, which can significantly compromise breathing (Prasad et al., 2012). Similarly, respiratory therapists contribute specialized knowledge in managing ventilation and ensuring that the airway remains clear and functional through advanced respiratory techniques (Henlin et al., 2014).

The need for collaboration among these professions becomes even more apparent in the context of a tertiary hospital, where complex emergencies are often managed. A coordinated, multidisciplinary approach ensures that airway emergencies are addressed holistically, with each professional bringing their unique expertise to the table. Research has shown that interdisciplinary collaboration in emergency care leads to improved patient outcomes, particularly in critical cases where time and precision are of the essence (Hansen et al., 1999).

This paper aims to explore the roles of EMTs, dentists, and respiratory therapists in the management of airway emergencies, with a focus on how multidisciplinary collaboration enhances patient care in a tertiary hospital setting. By examining the contributions of each profession, this study seeks to identify key strategies for optimizing teamwork and improving patient outcomes during airway emergencies.

Literature Review

Airway Management in Emergency Settings

Airway management is one of the most critical aspects of emergency care, as failure to secure a patent airway can lead to hypoxia, brain injury, or death (Bauer, (2012). In emergency situations, such as trauma or respiratory distress, prompt and effective airway intervention is crucial. Emergency Medical Technicians (EMTs) are often the first healthcare providers on the scene, and their ability to assess and manage airway emergencies can significantly impact patient outcomes. Prehospital airway management strategies employed by EMTs include basic techniques like head-tilt chin lift, the use of airway adjuncts, and, when necessary, more advanced interventions such as endotracheal intubation or cricothyrotomy (Jacobs and Grabinsky, 2014).

The complexity of airway emergencies increases when patients present with facial trauma or dental injuries, which can obstruct the airway and complicate standard interventions. For these cases, EMTs must act quickly to prevent airway compromise, often with limited tools and in uncontrolled environments. Jacobs and Grabinsky (2014) argue that although EMTs receive training in airway management, certain scenarios, especially those involving trauma, require additional expertise from other medical professionals to ensure optimal outcomes.

The Role of Dentists in Airway Management

Dentists, particularly those with training in maxillofacial trauma, play a crucial role in managing airway emergencies involving facial and dental injuries. Dental trauma, such as fractured teeth, dislocated jaws, or facial fractures, can obstruct the airway and complicate emergency interventions (Prasad et al., 2012). In many cases, dental professionals are called upon in emergency departments to address these injuries and work alongside other specialists to ensure that the airway remains patent.

Prasad et al. (2012) highlights that dental trauma can present unique challenges, such as bleeding, swelling, or fractured teeth, all of which can obstruct the airway. Dentists 'expertise in managing these complications is invaluable in both the acute phase and longer-term recovery. They can assist in repositioning dislocated structures, performing emergency extractions, or stabilizing facial injuries, allowing respiratory therapists and EMTs to focus on respiratory stabilization. The integration of dental care into emergency response teams has been shown to improve outcomes in cases where trauma directly impacts the oral cavity or facial structures (Prasad et al., 2012).

The Role of Respiratory Therapists in Airway Management

Respiratory therapists (RTs) are essential in managing the respiratory aspects of airway emergencies, particularly in hospital settings. RTs are trained to provide advanced respiratory support, including non-invasive ventilation, mechanical ventilation, and advanced airway interventions like intubation (Henlin et al., 2014). Their expertise is critical in maintaining oxygenation and ventilation, especially when patients have sustained injuries that compromise their ability to breathe.

In cases of airway obstruction caused by trauma, infections, or dental injuries, RTs work closely with EMTs and dentists to ensure the airway remains clear and functional. Henlin et al. (2014) emphasize the importance of RTs in managing airway emergencies within tertiary hospitals, where complex cases often require coordinated, multidisciplinary efforts. Their role in assessing and monitoring the patient's respiratory status throughout the emergency is essential to prevent hypoxia and other complications.

Challenges in Airway Management

Despite the critical roles of EMTs, dentists, and respiratory therapists in managing airway emergencies, several challenges remain. One of the primary issues is the need for seamless communication and collaboration between these professionals during time-sensitive emergencies. Bauer(2012) found that communication breakdowns or delays in involving specialists like dentists or RTs can lead to poorer patient outcomes. This is particularly true in cases involving facial trauma or respiratory compromise, where timely interventions from multiple professionals are required.

Another challenge is the variation in training and protocols among different healthcare professionals involved in airway management. EMTs, for example, may have limited training in handling complex dental trauma, while dentists may not always be equipped to manage respiratory emergencies. Bridging these gaps requires an integrated approach, with clear protocols for collaboration in place to guide emergency teams in managing airway issues effectively (Hansen et al., 1999).

The Importance of Multidisciplinary Collaboration in Airway Emergencies

Multidisciplinary collaboration is increasingly recognized as a key factor in improving outcomes during airway emergencies. When EMTs, dentists, and respiratory therapists work together, each contributing their specialized knowledge, patients benefit from a more comprehensive approach to care (Hansen et al., 1999). In particular, the integration of dental expertise into emergency response teams is crucial when managing airway compromise related to facial or dental trauma.

Hansen et al. (1999) demonstrated that interdisciplinary collaboration improves patient outcomes by ensuring that no aspect of the airway emergency is overlooked. For example, while an EMT may focus on stabilizing the patient, a dentist can quickly address structural issues caused by dental trauma, and a respiratory therapist can ensure ventilation is maintained throughout the process. The success of this approach relies on the ability of these professionals to communicate effectively and to work cohesively under pressure.

Henlin et al. (2014) further support the importance of a team-based approach, noting that airway emergencies often involve multiple systems and require input from different specialties. By establishing clear protocols for collaboration and fostering an environment where interdisciplinary teamwork is encouraged, healthcare institutions can enhance their response to airway emergencies, leading to better patient outcomes.

Methodology

This study was conducted at a tertiary hospital and aimed to explore the roles of Emergency Medical Technicians (EMTs), dentists, and respiratory therapists in managing airway emergencies, with a focus on multidisciplinary collaboration. A qualitative approach was employed to gain in-depth insights from healthcare professionals involved in airway management during emergency situations.

Study Design

A qualitative, descriptive study design was chosen to understand how EMTs, dentists, and respiratory therapists collaborate during airway emergencies. Semi-structured interviews were conducted with healthcare professionals to explore their experiences, challenges, and perceptions of interdisciplinary teamwork in managing these emergencies.

Participants and Sampling

Participants: The study included 15 healthcare professionals from the emergency department and related units within the hospital. Participants were selected using purposive sampling, ensuring representation from all three key professions:

- 5 EMTs working in the prehospital and emergency department settings,
- 5 dentists with experience in managing patients with facial trauma or dental injuries in emergency situations, and
- 5 respiratory therapists involved in providing airway management and respiratory support during emergencies.

Inclusion criteria required that participants had at least two years of experience in managing airway emergencies in a hospital or prehospital setting. All participants were actively working in the hospital's emergency department or in units frequently involved in airway emergency cases.

Data Collection

Semi-Structured Interviews: Data were collected through in-depth, semi-structured interviews conducted over a two-month period. Each interview lasted between 30 and 60 minutes and was conducted in a private room within the hospital. An interview guide was developed to explore the professionals' roles, the nature of collaboration between different teams, and the challenges they faced during airway management. Sample questions included:

- "Can you describe a recent case where you were involved in managing an airway emergency?"
- "How do you collaborate with other healthcare professionals, such as dentists and respiratory therapists, during these cases?"
- "What challenges do you encounter when working in a multidisciplinary team during airway emergencies?"

All interviews were audio-recorded with the participants' consent and transcribed verbatim for analysis.

Data Analysis

Thematic analysis was used to analyze the interview transcripts. The analysis followed Braun and Clarke's (2006) six-phase framework, which includes:

1. Familiarization with the Data: The researchers read through the interview transcripts multiple times to gain an overall understanding of the participants 'experiences.

2. Generating Initial Codes: Two researchers independently coded the data to identify key themes related to interdisciplinary collaboration, individual roles in airway emergencies, and common challenges.
3. Searching for Themes: Codes were organized into broader themes, such as "communication in emergencies," "role-specific challenges," and "benefits of teamwork."
4. Reviewing Themes: The researchers refined and reviewed the themes to ensure they were supported by the data and accurately reflected the participants' experiences.
5. Defining and Naming Themes: The final themes were named and defined to clearly represent the findings, with supporting quotes extracted from the transcripts.
6. Writing Up: The results were written up, with a narrative that explains the themes and incorporates direct quotes from participants to illustrate the findings.

Ethical Considerations

Ethical approval for the study was obtained from the ethics committee. All participants were informed of the study's purpose and their rights, including the confidentiality of their responses and the voluntary nature of their participation. Written informed consent was obtained from all participants before the interviews. To ensure confidentiality, all identifying information was removed from the transcripts, and participants were assigned pseudonyms.

Trustworthiness of the Study

To ensure the trustworthiness of the findings, the following strategies were employed:
- Credibility: Member checking was conducted by sharing the initial findings with a subset of participants to verify that the themes accurately represented their experiences.
- Dependability: An audit trail was maintained throughout the research process, documenting decisions made during data collection and analysis to ensure transparency.
- Transferability: Rich descriptions of the study context and participants 'experiences were provided to allow readers to determine whether the findings could be applied to other settings.
- Confirmability: Reflexivity was practiced by the researchers to acknowledge and minimize any potential biases, ensuring that the data and findings were grounded in participants' accounts rather than researcher interpretations.

Study Limitations

While the study provides valuable insights into the roles and collaboration of EMTs, dentists, and respiratory therapists in airway emergencies, there are several limitations. First, the study's sample size was relatively small and limited to professionals from one tertiary hospital, which may limit the generalizability of the findings to other settings. Additionally, the study relied on self-reported data, which may be subject to recall bias or participant subjectivity. Future research could address these limitations by incorporating real-time observational data and expanding the study to multiple hospital sites.

Findings

The thematic analysis of the interviews revealed three key themes: (1) Role-Specific Contributions to Airway Management, (2) Challenges in Multidisciplinary Collaboration, and (3) Benefits of Team-Based Care in Airway Emergencies. Each theme is further divided into sub-themes that reflect the participants ' experiences and insights.

Theme 1: Role-Specific Contributions to Airway Management

Participants highlighted the distinct roles that EMTs, dentists, and respiratory therapists play during airway emergencies. Each profession brought its expertise to the management of complex cases, particularly those involving trauma or respiratory distress.

Sub-theme 1.1: Emergency Medical Technicians (EMTs) and Initial Stabilization

EMTs emphasized their role in the rapid assessment and stabilization of patients with airway compromise in prehospital settings. They described how they are often the first to assess the severity of the airway issue and initiate interventions to maintain or secure the airway.

- "Our job is to get there fast, assess the airway, and do whatever is necessary to stabilize the patient. We use basic airway adjuncts like oropharyngeal airways, and if needed, we proceed to more advanced techniques like intubation." (EMT 4)
- "We have to act quickly. In many cases, we're dealing with trauma where the airway is compromised due to swelling or bleeding, so securing the airway is the top priority." (EMT 2)

Sub-theme 1.2: Dentists and Management of Trauma-Related Airway Obstruction

Dentists discussed their involvement in managing airway obstruction caused by dental or maxillofacial trauma. They explained that their specialized skills are often called upon to address structural issues that could impede breathing, such as broken teeth, dislocated jaws, or facial fractures.

- "In cases of facial trauma, particularly when teeth or jaws are involved, the airway can be obstructed by fractured bones or dislocated teeth. My role is to realign the structures or, if necessary, extract damaged teeth to clear the airway." (Dentist 3)
- "We often work with the team to manage trauma cases where the airway is compromised due to maxillofacial injuries. It's not just about fixing the teeth; it's about ensuring the airway is clear." (Dentist 1)

Sub-theme 1.3: Respiratory Therapists and Ventilation Support

Respiratory therapists described their critical role in managing the airway once it has been secured, particularly through advanced interventions such as mechanical ventilation. They highlighted their responsibility for maintaining proper oxygenation and ventilation, particularly in complex or prolonged emergencies.

- "Once the airway is secured, we take over by managing the ventilation and ensuring the patient is getting the oxygen they need. In cases where intubation is required, we're responsible for making sure the tube stays in place and monitoring the patient's breathing." (Respiratory Therapist 2)
- "Our role is to maintain the airway's patency once it's been established, often through non-invasive ventilation or intubation. We also monitor the patient's respiratory status to prevent any further complications." (Respiratory Therapist 5)

Theme 2: Challenges in Multidisciplinary Collaboration

While the participants acknowledged the importance of collaboration during airway emergencies, they also identified several challenges that can arise during multidisciplinary teamwork.

Sub-theme 2.1: Communication Barriers

A common challenge mentioned by participants was communication breakdowns, particularly in high-pressure situations. EMTs, dentists, and respiratory therapists all described instances where unclear communication hindered effective collaboration during critical moments.

- "In the heat of the moment, communication can be tricky. Sometimes we're trying to secure the airway while others are assessing different parts of the trauma, and it's easy to lose track of who's doing what." (EMT 1)
- "There are times when the communication isn't as clear as it should be, especially when we're managing trauma cases. You have different teams working on the same patient, and if everyone's not on the same page, it can create confusion." (Dentist 4)

Sub-theme 2.2: Role Confusion and Overlap

Another challenge identified was role confusion, where professionals were unsure of the boundaries of their responsibilities during emergencies. This sometimes led to delays in care or duplicated efforts.

- "There are situations where roles can overlap, especially when it comes to managing the airway. We might be handling ventilation, but then someone else is adjusting the tube, which can cause complications if it's not coordinated." (Respiratory Therapist 3)
- "There are cases where we're not sure if we should proceed with a specific intervention or wait for the respiratory therapist or dentist to step in. Clearer guidelines would help us understand when to take the lead." (EMT 3)

Theme 3: Benefits of Team-Based Care in Airway Emergencies

Despite the challenges, participants overwhelmingly agreed that a team-based approach to airway emergencies improves patient outcomes. They noted that the combined expertise of EMTs, dentists, and respiratory therapists allows for comprehensive and effective airway management.

Sub-theme 3.1: Complementary Skills and Expertise

Participants emphasized how each profession brings unique skills to the table, allowing for a more holistic approach to airway management. The collaboration between EMTs, dentists, and respiratory therapists was seen as essential in managing complex airway emergencies.

- "Each of us brings something different. EMTs stabilize the patient, but once the patient is in the hospital, we rely on dentists for trauma-related issues and respiratory therapists to manage ventilation. It's a team effort, and it works well when we all contribute our expertise." (EMT 5)
- "Working with EMTs and respiratory therapists means we can address airway emergencies from all angles. It's not just about fixing the airway—it's about making sure the patient is stable and can breathe properly." (Dentist 2)

Sub-theme 3.2: Improved Patient Outcomes Through Collaboration

Participants highlighted that the outcomes of airway emergencies were notably better when interdisciplinary collaboration was smooth and well-coordinated. They pointed to cases where the combined efforts of EMTs, dentists, and respiratory therapists led to successful airway management, reducing complications and improving recovery.

- "When we work together seamlessly, the patient outcomes are much better. We've had cases where rapid collaboration between the teams prevented serious complications." (Respiratory Therapist 4)
- "I've seen firsthand how a well-coordinated team can save lives. The collaboration between EMTs, dentists, and respiratory therapists makes a huge difference in managing complex airway cases." (EMT 2)

Discussion

The findings from this study provide valuable insights into the roles of Emergency Medical Technicians (EMTs), dentists, and respiratory therapists in managing airway emergencies in a tertiary hospital setting.

The data reveal the distinct contributions of each profession, the challenges they face in interdisciplinary collaboration, and the overall benefits of a team-based approach to airway management. This discussion reflects on these findings in the context of existing literature and explores implications for clinical practice and patient outcomes.

Role-Specific Contributions to Airway Management

The study confirms the critical roles that EMTs, dentists, and respiratory therapists play in addressing airway emergencies, each contributing unique expertise. EMTs are often the first responders, tasked with the rapid assessment and stabilization of the airway in prehospital settings. Their ability to quickly intervene using basic and advanced airway management techniques aligns with existing research that highlights the importance of early intervention in improving patient outcomes (Jacobs and Grabinsky, 2014). In this study, EMTs consistently emphasized their responsibility for initiating life-saving airway procedures under time constraints, which is critical in preventing hypoxia and further complications.

The role of dentists in airway management, particularly in cases involving dental trauma and maxillofacial injuries, was also highlighted. Dentists provide essential expertise in clearing airway obstructions caused by broken teeth, dislocated jaws, and facial fractures, which can obstruct breathing. Prasad et al. (2012) underscores the need for dental involvement in emergencies where trauma compromises the airway, and the findings from this study support that assertion. Dentists working in collaboration with EMTs and respiratory therapists help address structural issues that could otherwise impede patient recovery.

Respiratory therapists, as expected, played a pivotal role in maintaining the airway once it was secured, particularly by managing ventilation and oxygenation. Their specialized skills in operating mechanical ventilators and providing ongoing respiratory support are essential for preventing respiratory failure during airway emergencies (Henlin et al., 2014). The respiratory therapists in this study emphasized their role in ensuring that patients remained stable throughout the emergency and beyond, reinforcing their critical role in the airway management team.

Challenges in Multidisciplinary Collaboration

Despite the recognized benefits of interdisciplinary collaboration, participants identified several challenges in working as a team during airway emergencies. Communication barriers were frequently mentioned, especially in fast-paced, high-pressure environments where clear, concise communication is vital. These findings are consistent with Bauer,(2012), who found that communication breakdowns in emergency settings can lead to delays or errors in patient care. In this study, participants noted that, in some cases, unclear roles or overlapping responsibilities between EMTs, dentists, and respiratory therapists led to confusion, potentially delaying critical interventions.

Role confusion was another challenge highlighted by participants. The overlapping responsibilities between healthcare professionals, particularly in managing complex airway emergencies, sometimes resulted in uncertainty about who should take the lead in certain situations. This is consistent with the findings of Hansen et al. (1999), who emphasized the need for clearer guidelines and protocols to delineate roles in interdisciplinary teams. In airway emergencies, where every second counts, a lack of clarity around roles can lead to duplication of efforts or missed interventions, which may negatively impact patient outcomes.

Benefits of Team-Based Care in Airway Emergencies

Despite these challenges, the participants overwhelmingly agreed that interdisciplinary collaboration led to better patient outcomes. The integration of EMTs, dentists, and respiratory therapists allowed for a more comprehensive approach to managing airway emergencies, with each profession contributing its specialized knowledge. This finding supports previous research by Hansen et al. (1999), who highlighted the benefits of multidisciplinary teamwork in improving outcomes in critical care settings.

The complementary skills of these professionals are crucial in complex cases, such as those involving trauma-related airway obstructions, where the expertise of a dentist may be needed alongside the respiratory support provided by an EMT and a respiratory therapist. Participants in this study frequently cited cases where effective teamwork led to the successful resolution of airway emergencies, preventing complications and facilitating recovery. These findings suggest that fostering collaboration between these healthcare professionals can significantly enhance the quality of care delivered in emergency settings.

Implications for Practice

The findings from this study have several important implications for clinical practice. First, they highlight the need for clearer communication protocols during airway emergencies. Establishing formalized communication strategies, such as briefings before emergency interventions and debriefings afterward, could help address the communication barriers identified by participants. This would ensure that each team member understands their role and responsibilities, reducing confusion and improving the efficiency of care.

Second, role clarity is essential in managing airway emergencies effectively. Healthcare institutions should consider developing specific guidelines that outline the responsibilities of EMTs, dentists, and respiratory therapists during airway management. These guidelines should be tailored to reflect the specific expertise of each profession while encouraging collaboration and teamwork.

Finally, the study underscores the value of interdisciplinary training and simulations. By engaging in regular team-based simulations of airway emergencies, healthcare professionals can improve their teamwork, communication, and role clarity, leading to more seamless and effective interventions during actual emergencies. Interdisciplinary training programs should be incorporated into ongoing professional development for EMTs, dentists, and respiratory therapists to enhance their ability to work together in high-pressure situations.

Study Limitations

While this study provides valuable insights into the roles of EMTs, dentists, and respiratory therapists in managing airway emergencies, there are several limitations. First, the sample size was relatively small and limited to a single tertiary hospital, which may limit the generalizability of the findings. Future research could benefit from including a larger and more diverse sample across multiple healthcare settings. Additionally, the study relied on self-reported data from participants, which may introduce recall bias or subjectivity in describing their experiences. Observational studies during real-time airway emergencies could provide more objective insights into the dynamics of interdisciplinary collaboration.

Conclusion

This study highlights the critical roles that EMTs, dentists, and respiratory therapists play in managing airway emergencies and underscores the importance of interdisciplinary collaboration in ensuring optimal patient outcomes. While communication and role clarity challenges exist, the benefits of a team-based

approach far outweigh these obstacles. The findings suggest that fostering collaboration, improving communication, and providing clear guidelines for roles and responsibilities can enhance the management of airway emergencies in a tertiary hospital setting. By working together effectively, EMTs, dentists, and respiratory therapists can ensure that patients receive comprehensive, timely, and high-quality care during airway emergencies.

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