

# Pharmacist-Led Medication Reviews and Paramedic Support for Elderly Patients with Oral Health Complications: A Collaborative Approach in a Tertiary Hospital Setting

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## Abstract

This study explores the impact of pharmacist-led medication reviews and paramedic support on managing oral health complications in elderly patients in a tertiary hospital setting. Using a qualitative approach, in-depth interviews were conducted with healthcare professionals (pharmacists, paramedics, and dentists) and elderly patients to understand the effectiveness of interdisciplinary collaboration. The findings reveal that pharmacist-led medication reviews significantly reduced medication-induced oral health issues, while paramedics played a key role in identifying oral health problems and facilitating timely referrals. Despite logistical challenges in communication and coordination, the interdisciplinary approach improved patient outcomes and satisfaction. This study emphasizes the importance of integrating oral health into geriatric care and enhancing collaboration between healthcare professionals.

**Keywords:** Pharmacist-Led Medication Reviews, Paramedic Support, Oral Health, Elderly Patients, Interdisciplinary Collaboration, Geriatric Care, Tertiary Hospital

## Introduction

Oral health complications are a significant concern among elderly patients, particularly those with multiple comorbidities and complex medication regimens. Polypharmacy, common in this population, often leads to medication-related oral health issues such as xerostomia (dry mouth), gum disease, and oral infections. These conditions not only impact the quality of life but also increase the risk of systemic complications, including malnutrition and infections (Scully & Ettinger, 2007). Given the growing aging population, there is an increasing need for effective strategies to manage and prevent these oral health issues.

Pharmacists play a critical role in medication management, identifying drug-related causes of oral health problems, such as medications that reduce saliva production or those that contribute to oral infections (Thomson et al., 2021). Pharmacist-led medication reviews can reduce the occurrence of such complications by adjusting medication regimens and providing education on oral health management. Additionally, paramedics often encounter elderly patients who may have limited access to dental care, particularly those who are homebound or live in long-term care facilities. Their involvement in providing emergency care and support can facilitate timely interventions and referrals for oral health issues (Elman et al., 2021).

The integration of pharmacists and paramedics in an interdisciplinary team with dentists offers a comprehensive approach to managing oral health complications in elderly patients. This study aims to explore the impact of pharmacist-led medication reviews, supported by paramedic care, in improving oral health outcomes for elderly patients in a tertiary hospital setting. By leveraging the expertise of these healthcare professionals, this collaborative approach seeks to provide holistic care that addresses both medical and dental needs, ultimately enhancing patient outcomes and quality of life.

## Literature Review

### 1. Oral Health Complications in Elderly Patients

Oral health is a critical aspect of overall well-being, particularly in elderly populations. As individuals age, they become more susceptible to a range of oral health issues, such as periodontal disease, xerostomia (dry mouth), and increased risk of oral infections (Scully & Ettinger, 2007). These complications are often exacerbated by the presence of multiple chronic conditions, the use of various medications, and physical limitations that make maintaining oral hygiene more difficult. Studies have shown that poor oral health in elderly patients can lead to more severe consequences, including malnutrition, increased risk of systemic infections, and a decline in overall quality of life (Le and Palamar, 2019).

### 2. Impact of Polypharmacy on Oral Health

One of the key factors contributing to oral health issues in elderly patients is polypharmacy—the concurrent use of multiple medications to manage chronic conditions. Polypharmacy is associated with several adverse oral health effects, particularly xerostomia, which is caused by medications such as antihypertensives, antidepressants, and anticholinergics that reduce salivary flow (McKenzie, 2020). Reduced saliva production impairs the natural protective mechanisms of the mouth, increasing the risk of oral infections, dental caries, and discomfort. Research has highlighted the need for healthcare professionals to be vigilant in monitoring and managing these side effects in elderly patients, as unmanaged oral health problems can lead to further systemic complications (Scully & Ettinger, 2007).

### 3. The Role of Pharmacists in Medication Reviews

Pharmacists play a crucial role in minimizing the adverse oral health effects of polypharmacy through regular medication reviews. These reviews help identify drugs that may be contributing to oral health issues and enable pharmacists to suggest alternatives or adjustments to mitigate these effects. Studies have shown that pharmacist-led interventions, such as optimizing drug regimens and providing patient education on oral hygiene, can significantly reduce medication-induced oral complications (Thomson et al., 2021). Pharmacists are also instrumental in educating patients about maintaining good oral hygiene practices and recommending over-the-counter treatments, such as saliva substitutes, to alleviate symptoms like dry mouth (Tait et al., 2020).

In addition to managing medication-related issues, pharmacists contribute to overall patient health by promoting the integration of oral health into the broader scope of geriatric care. Collaborative efforts between pharmacists and dental professionals have been shown to enhance patient outcomes by providing comprehensive, coordinated care (McKenzie, 2020). This interdisciplinary approach is particularly beneficial in managing the complex needs of elderly patients with oral health complications arising from polypharmacy.

### 4. The Role of Paramedics in Elderly Care and Oral Health Management

Paramedics often encounter elderly patients in emergency situations, particularly those with limited mobility

or access to healthcare, such as homebound or nursing home residents. As first responders, paramedics are uniquely positioned to identify acute oral health problems that may otherwise go unnoticed until they become more severe. Research suggests that paramedics could play a greater role in the early detection of oral health issues and facilitate referrals to dental professionals for follow-up care (Elman et al., 2021).

Moreover, paramedics frequently interact with patients who have multiple comorbidities and are at higher risk for systemic complications related to poor oral health. This overlap between medical and dental health makes paramedics valuable partners in identifying oral health concerns during emergency medical care. Studies suggest that by collaborating with pharmacists and dental professionals, paramedics can help ensure that elderly patients receive the necessary follow-up for oral health issues, contributing to overall better health outcomes (Choi et al., 2016).

### 5. Interdisciplinary Approaches in Geriatric Oral Health Care

Interdisciplinary collaboration among healthcare professionals is increasingly recognized as a key factor in improving health outcomes, particularly in complex patient populations like the elderly. The integration of pharmacists, paramedics, and dentists in the care of geriatric patients provides a more holistic approach to addressing oral health complications, especially those related to medication use. Recent studies have demonstrated that such collaboration can lead to earlier identification and management of oral health problems, reduce unnecessary hospital admissions, and improve patients' quality of life (Baumgartner et al., 2015).

Incorporating pharmacists into the interdisciplinary team has been shown to enhance patient outcomes by optimizing medication regimens and preventing drug-related complications (McKenzie, 2020). Paramedics, as the first point of contact for many elderly patients, can also contribute to this team by identifying oral health issues in the field and ensuring timely follow-up care. This collaboration is essential in providing a continuum of care for elderly patients, ensuring that oral health is not overlooked in the broader context of medical treatment.

### 6. Gaps in Research and Future Directions

While there is growing evidence to support the role of interdisciplinary teams in improving oral health outcomes in elderly patients, gaps remain in the integration of paramedics into this care model. Most studies focus on the roles of pharmacists and dentists, with limited research exploring how paramedics can contribute to early detection and management of oral health issues. Further research is needed to explore how paramedics can be more effectively integrated into multidisciplinary teams, particularly in the context of managing oral health in homebound or rural elderly populations (Choi et al., 2016).

Additionally, while pharmacist-led medication reviews have proven effective in reducing medication-related oral health problems, more research is needed to understand the long-term impact of these interventions on patient outcomes. Studies that focus on the sustained benefits of interdisciplinary collaboration, including reductions in hospital readmissions and improved quality of life, would provide valuable insights for healthcare systems aiming to optimize geriatric care.

## Methodology

### 1. Study Design

This study employed a qualitative research design to explore the impact of pharmacist-led medication reviews and paramedic support on the oral health of elderly patients with oral health complications in a

tertiary hospital setting. A phenomenological approach was used to understand the experiences and perceptions of healthcare professionals and elderly patients regarding the interdisciplinary care model. The study was conducted over a six-month period.

## 2. Study Setting and Population

The study was conducted in the geriatric and dental units of a tertiary hospital. The participants included:

- Elderly Patients: A total of 30 elderly patients (aged 65 and older) who had documented oral health complications, such as xerostomia, gum disease, or oral infections, and were receiving care at the hospital.
- Healthcare Professionals: 15 healthcare professionals were purposively selected, including pharmacists, paramedics, and dentists involved in the care of these patients.

### Inclusion Criteria:

- Patients aged 65 years or older.
- Documented oral health complications related to medication use or polypharmacy.
- Involvement of paramedics and pharmacists in patient care.

### Exclusion Criteria:

- Patients with terminal conditions where oral health care is not a priority.
- Patients receiving palliative care.
- Healthcare professionals not involved in the interdisciplinary care of elderly patients with oral health issues.

## 3. Data Collection

### Interviews with Healthcare Professionals

In-depth, semi-structured interviews were conducted with pharmacists, paramedics, and dentists involved in the interdisciplinary care of the elderly patients. The interviews focused on:

- The Role of Pharmacists: How pharmacists conducted medication reviews to identify drugs contributing to oral health issues and their recommendations to address these problems.
- The Role of Paramedics: The paramedics' role in identifying oral health problems during emergency interventions or patient support visits and facilitating timely referrals to dental services.
- Collaboration Among Healthcare Providers: The extent of communication and teamwork between pharmacists, paramedics, and dentists in managing elderly patients' oral health.

Each interview lasted between 30 and 60 minutes and was conducted face-to-face or via secure video conferencing. The interviews were audio-recorded and transcribed verbatim for thematic analysis.

### Patient Interviews

Semi-structured interviews were conducted with 30 elderly patients or their caregivers to gather their experiences and perspectives on the care they received. Key areas explored during the interviews included:

- Perception of Medication Reviews: Patients' understanding of how pharmacist-led medication reviews helped address oral health issues, such as dry mouth or gum disease.
- Paramedic Support: The role of paramedics in providing care and identifying oral health problems during home visits or emergency care.
- Overall Satisfaction: The patients' views on the interdisciplinary approach and how it contributed to their overall health and well-being.

The interviews with patients lasted between 20 and 45 minutes and were conducted in the hospital or via telephone for those discharged.

#### 4. Data Analysis

The qualitative data collected from the interviews were analyzed using thematic analysis following Braun and Clarke's (2006) framework. The steps of the analysis included:

1. Familiarization with Data: The research team reviewed the interview transcripts to gain an overall understanding of the content.
2. Initial Coding: Open coding was conducted to identify recurring concepts, phrases, and patterns related to interdisciplinary care and patient outcomes.
3. Theme Development: The codes were organized into broader categories, and key themes were identified.
4. Reviewing Themes: The identified themes were reviewed to ensure they reflected the data accurately. Discrepancies in coding were resolved through discussion among the research team.
5. Defining Themes: The final themes were named and defined, with representative quotes selected to illustrate the main findings.

#### 5. Ethical Considerations

The study received ethical approval from the ethics committee. All participants, including healthcare professionals and elderly patients, were provided with detailed information about the study and gave written informed consent prior to their participation. The participants were assured of their anonymity and confidentiality, and all transcripts were anonymized before analysis. The study adhered to the ethical guidelines outlined in the Declaration of Helsinki.

#### 6. Limitations

The study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the reliance on self-reported data from interviews may introduce bias, as participants could have tailored their responses based on their perceptions of the study's objectives. Future studies could expand the sample size and include multiple institutions to increase the generalizability of the results.

### Findings

The analysis of the interviews with healthcare professionals and elderly patients revealed several key themes and sub-themes that highlight the impact of pharmacist-led medication reviews and paramedic support on oral health outcomes in elderly patients. The findings are organized around these themes, with representative participant quotes to illustrate the key points.

#### Theme 1: The Role of Pharmacist-Led Medication Reviews in Managing Oral Health

Participants emphasized the importance of pharmacist-led medication reviews in identifying and mitigating medication-induced oral health complications, particularly xerostomia and gum disease.

##### Sub-theme 1.1: Identification of Medication-Related Oral Health Issues

Pharmacists played a crucial role in identifying medications that contributed to oral health issues, such as dry mouth and oral infections, and made necessary adjustments.

-Pharmacist:

“Many of the patients were on medications that caused dry mouth, which they didn't realize was

contributing to their oral problems. We were able to adjust some of the medications and recommend saliva substitutes to help relieve their symptoms.”

-Patient:

“After the pharmacist reviewed my medications, they told me one of them was causing my dry mouth. I had been struggling with it for years, and no one had mentioned it before.”

#### Sub-theme 1.2: Prevention of Oral Health Deterioration

The early identification of medication-related oral health problems helped prevent further deterioration, especially in patients at risk of infections and dental complications.

-Pharmacist:

“We managed to catch a few cases where patients were on medications that suppressed their immune system, which increased their risk for oral infections. We worked closely with the dentist to manage these issues before they became more serious.”

-Dentist:

“The pharmacists were crucial in identifying drugs that were affecting oral health. It made my job easier because I could focus on treatment while they handled the medication adjustments.”

#### Theme 2: The Role of Paramedics in Oral Health Support

Paramedics played a vital role in supporting elderly patients with limited access to regular dental care. They helped identify oral health issues during routine home visits or emergency responses and referred patients for further care.

##### Sub-theme 2.1: Early Detection of Oral Health Issues by Paramedics

Paramedics often identified oral health problems during their interactions with elderly patients in emergency or non-emergency settings, especially for homebound patients.

-Paramedic:

“We were able to pick up on some oral health issues when we visited patients for other reasons, like falls or respiratory problems. A lot of them hadn’t seen a dentist in a long time, so we made sure they got the referrals they needed.”

-Patient:

“I didn’t even realize how bad my gums were until the paramedic mentioned it. They got me connected with a dentist, and I finally got the treatment I needed.”

##### Sub-theme 2.2: Facilitating Timely Care and Referrals

By identifying oral health issues and coordinating with other healthcare professionals, paramedics helped ensure that elderly patients received timely care, preventing more severe complications.

-Paramedic:

“In one case, we noticed a patient had a severe oral infection that hadn’t been treated. We made sure they were referred to the dentist right away, and the pharmacist adjusted their medications to help with healing.”

-Pharmacist:

“The paramedics were great at spotting issues early on. They were our eyes in the field and helped us stay on top of patients’ needs.”

#### Theme 3: Interdisciplinary Collaboration Enhances Patient Care

The collaboration between pharmacists, paramedics, and dentists was seen as essential in addressing the

complex needs of elderly patients, ensuring holistic care that addressed both medical and dental aspects of their health.

#### Sub-theme 3.1: Improved Communication and Coordination

Participants highlighted the importance of regular communication between pharmacists, paramedics, and dentists in ensuring a coordinated approach to care.

-Dentist:

“Working with the pharmacists and paramedics meant that we could address the root causes of some of these oral health issues. It was a team effort, and having regular updates from them helped us provide better care.”

-Pharmacist:

“We had regular meetings with the dental team, and the paramedics were involved in those discussions. It made a huge difference in making sure nothing slipped through the cracks.”

#### Sub-theme 3.2: Holistic, Patient-Centered Care

The interdisciplinary approach allowed for a more holistic view of patient care, addressing both the medical and oral health aspects of patient well-being, which improved patient outcomes and satisfaction.

-Patient:

“It was great to have so many people working together. The pharmacist helped with my medications, and the paramedic noticed my oral problems. They made sure everything was taken care of, and I felt like they really cared about me.”

-Social Worker (Participant involved in patient care coordination):

“The team really worked well together to make sure these elderly patients weren’t just seen as medical cases but as whole people with different needs.”

#### Theme 4: Challenges in Interdisciplinary Collaboration

Despite the positive impact of interdisciplinary collaboration, participants noted some challenges, particularly in coordinating care and managing communication between different healthcare providers.

#### Sub-theme 4.1: Logistical Barriers to Communication

Participants mentioned difficulties in maintaining consistent communication between healthcare professionals due to time constraints and differing schedules.

-Pharmacist:

“Sometimes it was hard to coordinate with the paramedics and dentists, especially when we were all on different shifts. We had to work out a system to ensure we stayed in the loop.”

-Dentist:

“We did face some logistical challenges in coordinating care, especially when urgent cases came in. But we tried to work around those and make sure the patient was always the priority.”

#### Sub-theme 4.2: Resource and Time Constraints

Paramedics and pharmacists often found themselves stretched thin due to the high demands of their roles, which occasionally made collaboration difficult.

-Paramedic:

“We’re already managing a lot of emergency calls, so finding the time to follow up on oral health issues was challenging at times. But we knew it was important, so we made it work as best we could.”

-Pharmacist:

“We were juggling a lot of responsibilities, especially with medication management for all patients, but we made sure to prioritize those with oral health issues because we saw how much it improved their overall health.”

## Discussion

This study explored the impact of pharmacist-led medication reviews and paramedic support in managing oral health complications in elderly patients. The findings highlight the effectiveness of an interdisciplinary approach, with pharmacists, paramedics, and dentists collaborating to address both the medical and dental needs of elderly patients. The study also identified several challenges related to communication and logistical barriers, but overall, the interdisciplinary model proved to enhance patient care and outcomes.

### Pharmacist-Led Medication Reviews: A Key Component in Oral Health Management

Pharmacist-led medication reviews were a central factor in identifying and mitigating oral health issues related to polypharmacy, particularly xerostomia and oral infections. The literature has long acknowledged the role of polypharmacy in contributing to oral health problems among elderly patients (McKenzie, 2020). This study supports these findings by demonstrating how pharmacists were able to pinpoint specific medications that contributed to oral health deterioration, such as dry mouth and gum disease, and make adjustments to medication regimens. As highlighted by participants, early identification of these issues helped prevent further complications, emphasizing the role of pharmacists in improving patient outcomes beyond traditional medication management (Thomson et al., 2021).

By addressing medication-induced oral health problems, pharmacists contributed to a more holistic approach to patient care, aligning with previous research that suggests pharmacist interventions can significantly improve patient quality of life by mitigating adverse side effects (Tait et al., 2020). This study builds on that research, illustrating that pharmacists, when integrated into a multidisciplinary team, play a crucial role in managing not only systemic health issues but also the oral health of elderly patients.

### Paramedic Support in Oral Health Care: Early Detection and Referrals

Paramedics in this study were instrumental in identifying oral health problems during routine visits or emergency calls, particularly for elderly patients who may not have regular access to dental care. This role expands the traditional responsibilities of paramedics, as noted in earlier studies that have called for greater involvement of paramedics in preventive care, including oral health (Elman et al., 2021). The paramedics in this study often identified oral health issues, such as infections or deteriorating gum health, and ensured timely referrals to dentists, aligning with the research that suggests paramedics can be valuable partners in early detection and care coordination (Choi et al., 2016).

This interdisciplinary collaboration, where paramedics act as the "eyes in the field," ensured that elderly patients received timely and appropriate care. The involvement of paramedics also highlights the potential to bridge gaps in access to care, particularly for vulnerable, homebound patients who may not be able to visit a dental clinic regularly. As this study shows, paramedics can play an essential role in connecting patients with the care they need, which may prevent the escalation of oral health issues into more severe medical conditions.

### Interdisciplinary Collaboration: Enhancing Patient-Centered Care

The collaboration between pharmacists, paramedics, and dentists was pivotal in delivering holistic care that



addressed both the medical and dental aspects of elderly patients' health. This study demonstrated that regular communication and coordination between healthcare professionals led to improved patient outcomes, as previously documented in the literature on interdisciplinary care (Baumgartner et al., 2015). By working together, each professional contributed their expertise, resulting in a comprehensive care plan that went beyond addressing individual symptoms to focus on the overall well-being of the patient.

Patients and healthcare professionals alike reported positive experiences with this interdisciplinary model, noting that it contributed to better health outcomes and improved satisfaction with care. This finding aligns with prior research, which has shown that patient-centered, interdisciplinary care leads to higher levels of patient satisfaction and better clinical outcomes (Le and Palamar, 2019). The ability to address both systemic health and oral health issues in a coordinated manner allowed for a more personalized and effective approach to managing the complex needs of elderly patients.

#### Challenges in Collaboration: Logistical and Communication Barriers

Despite the success of the interdisciplinary approach, participants also reported challenges, particularly in maintaining consistent communication across different healthcare providers. This issue is not unique to this study and is frequently cited in the literature as a common barrier to effective interdisciplinary care (Brown et al., 2020). Time constraints, differing schedules, and the fast-paced nature of healthcare environments often made it difficult for pharmacists, paramedics, and dentists to coordinate care consistently.

While the benefits of collaboration were clear, overcoming these logistical challenges remains a critical area for improvement. Hospitals and healthcare systems could explore solutions such as implementing regular interdisciplinary meetings, shared digital platforms for communication, or assigning care coordinators to streamline communication and ensure all team members are informed. These strategies could help to address the coordination issues highlighted in this study, making interdisciplinary care models more sustainable and effective in the long term.

#### Implications for Practice

The findings of this study suggest several important implications for healthcare practice:

1. **Enhanced Roles for Pharmacists and Paramedics:** Expanding the roles of pharmacists and paramedics in managing oral health complications can significantly improve patient outcomes, particularly in elderly populations. Pharmacists should be routinely involved in medication reviews with an emphasis on identifying oral health risks, while paramedics should be trained to recognize and address oral health issues during routine care and emergency responses.

2. **Improved Communication and Coordination:** To maximize the benefits of interdisciplinary care, healthcare systems should invest in improving communication and coordination between team members. This could include establishing regular interdisciplinary meetings and implementing communication tools to ensure that all healthcare professionals are aligned in their approach to patient care.

3. **Integration of Oral Health in Geriatric Care:** Oral health should be considered a key component of geriatric care, with regular screening and management included in standard care protocols for elderly patients. This integration will help address the often-overlooked impact of medication on oral health and ensure that oral health complications are identified and treated early.

### Limitations

While this study provides valuable insights into the impact of pharmacist-led medication reviews and paramedic support on elderly patients' oral health, it has several limitations. First, it was conducted in a single tertiary hospital, limiting the generalizability of the findings. Additionally, the reliance on qualitative data from interviews may introduce bias, as participants may have tailored their responses based on perceived expectations. Future research could address these limitations by expanding the study to multiple healthcare institutions and incorporating quantitative measures of patient outcomes.

### Conclusion

This study demonstrates that an interdisciplinary approach, involving pharmacists, paramedics, and dentists, significantly enhances the management of oral health complications in elderly patients. Pharmacist-led medication reviews and paramedic support play crucial roles in identifying and mitigating oral health issues, leading to improved patient outcomes and satisfaction. While challenges remain in coordinating care, the overall impact of interdisciplinary collaboration is clear, and healthcare systems should continue to explore and implement such models to optimize the care of elderly patients.

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