

The role of the pharmacist and nurse in the dental clinic: a cooperative multidisciplinary educational clinic

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Abstract

Dental patients frequently present with multiple comorbidities and complex medication regimens that can directly influence their oral health and the safety of dental procedures. As the need for holistic, patient-centered care grows, the integration of pharmacists and nurses into dental care teams offers a novel approach to improving clinical outcomes and enhancing healthcare education. This paper explores the development and implementation of a multidisciplinary, interprofessional education program that includes pharmacists and nurses within a dental clinic. A pilot program was launched at King Fahd University Hospital's Dental Clinic, where both a clinical pharmacist and a registered

nurse were integrated into the student-led dental clinic starting in early 2024. This multidisciplinary initiative was designed to enhance patient safety and interprofessional education. The collaboration later expanded to include pharmacy and nursing students through their respective clinical training rotations. Within this model, the pharmacy team delivered medication therapy management (MTM) services, conducted medication reviews, and supported the dental team in identifying potential drug interactions and treatment-related risks. Simultaneously, nursing students participated in vital sign monitoring, patient education, screening for systemic conditions, and overall coordination of care,

further contributing to a holistic, patient-centered dental care environment. including medication reconciliation, disease state and drug counseling, identification of drug-related problems and dental-medication interactions, and prescribing recommendations. This collaborative model not only improved patient safety and care but also enriched the interprofessional learning experience for pharmacy and dental students. The paper highlights the pivotal roles of pharmacists and nurses in dental clinics and advocates for wider adoption of such models in clinical education settings to support safer, more integrated care.

Keywords: Multidisciplinary collaboration, Dental-medication interactions, Clinical education, Oral-systemic health, Integrated healthcare teams.

* Introduction

In modern healthcare, the growing complexity of patient needs calls for a shift from isolated care models to collaborative, multidisciplinary approaches. Traditionally, primary care has centered around physician-patient interactions, often neglecting the significant contributions of other healthcare professionals such as dentists, pharmacists, and nurses. However, recent evidence suggests

that integrating these disciplines can lead to better clinical outcomes, more efficient care delivery, and a richer, more comprehensive healthcare experience [1].

Dental care, often siloed from other areas of medicine, is uniquely positioned to contribute to early diagnosis and the management of systemic conditions [2]. Dentists regularly encounter patients with chronic illnesses such as diabetes, cardiovascular disease, and autoimmune disorders, many of which present with oral manifestations [3]. These patients are frequently prescribed complex medication regimens that may directly influence oral health or complicate dental procedures. Despite this, most dental training programs offer limited instruction in pharmacology or therapeutics, leaving dentists underprepared to manage medication-related issues independently.

Pharmacists, as medication experts, can play a pivotal role in dental clinics by performing medication therapy management, identifying potential drug-drug and drug-disease interactions, and educating both patients and dental teams on the implications of specific medications [4]. Commonly encountered interactions—such as

NSAIDs with antihypertensives, sedatives with antidepressants, or vasoconstrictors with beta-blockers—can carry significant clinical consequences if unrecognized. Including pharmacists in the dental care team helps mitigate these risks and promotes safer, more effective patient care [4].

Similarly, nurses bring a holistic and preventive approach to patient management that complements dental care [5]. Their expertise in patient assessment, monitoring, triage, and health education allows them to identify underlying systemic conditions that may affect oral treatment plans. Nurses also provide critical support in infection control, pre-procedure screening, and patient counseling, making them integral to multidisciplinary dental teams. By bridging gaps between medical and dental care, nurses help ensure that patients receive comprehensive attention to both their oral and overall health needs.

This study aims to examine the complementary roles of dentistry, nursing, and pharmacy within the healthcare system. By exploring effective collaboration among these disciplines, the research aims to identify strategies that enhance patient-centered care, promote

seamless interdisciplinary communication, and support a more integrated and comprehensive approach to healthcare delivery.

*** Background**

Routine dental visits are uniquely positioned to serve as a critical touchpoint for the early detection, prevention, and management of both oral and systemic diseases. Dentists frequently treat patients who are taking multiple medications that may directly affect dental procedures and therapeutic decisions. The exploration of the roles of pharmacists and nurses within dental clinics highlights a critical intersection of healthcare disciplines that fosters comprehensive patient care. The literature on this topic reveals an evolving landscape where inter-professional collaboration is not merely beneficial but essential for improving patient outcomes.

El-Awaisi et al. (2018) investigate the perspectives of practicing pharmacists regarding inter-professional education (IPE) and collaborative practice in Qatar. Their findings underscore the pivotal roles that pharmacists and nurses play in enhancing treatment outcomes and patient safety through effective communication and shared responsibilities. This article

illustrates the necessity of teamwork in managing complex cases, particularly those involving medication management and chronic disease care, thereby reinforcing the argument for a multidisciplinary approach to oral health [6].

A 2015 study found that pharmacist-compiled medication histories identified omissions, duplications, or errors in nearly 90% of dental patient records [7]. Compared to other healthcare providers, pharmacists consistently generate more accurate and complete medication lists, reducing the likelihood of adverse events. In the dental clinic setting, pharmacists can also play a key role in identifying potential drug interactions and adverse effects, sharing updates on evidence-based medication guidelines, recommending over-the-counter oral health products, and supporting MTM services. Importantly, integrating pharmacists into dental teams during training provides meaningful interprofessional education (IPE) experiences, preparing students to collaborate across disciplines for better patient outcomes.

Despite the known benefits, literature reviews reveal that routine pharmacist- dentist collaboration remains limited [1,8–12]. To date,

only a small number of published studies explore this integration. Four of these studies—conducted in both free clinics and university-based dental settings—demonstrated outcomes such as fewer medication discrepancies, improved patient understanding of medications, reduced opioid prescribing, and increased success with tobacco cessation interventions[7,10–12]. Two additional studies focused on IPE models in dental school clinics, highlighting improvements in student knowledge, attitudes toward collaboration, and the ability to identify systemic health issues and drug therapy problems during dental visits [8,13]. These findings suggest that pharmacist-dentist collaboration has the potential to improve clinical care, foster mutual understanding, and strengthen pharmacotherapy knowledge within dental education.

Parallel to pharmacists, nurses also hold great potential in enhancing dental care delivery. Their training in clinical assessment, chronic disease management, and health education positions them to identify systemic health concerns that may impact oral treatment [14,15]. Nurses can monitor vital signs, screen for red flags such as poorly controlled hypertension or diabetes, and coordinate care with physicians or

other specialists. Their role extends to infection control, patient counseling, and providing support before, during, and after procedures, especially in vulnerable populations such as the elderly or medically complex patients. However, like pharmacists, nurses are often underutilized in the dental setting despite their ability to bridge gaps between medical and dental care. Their integration into dental clinics could improve both the safety and quality of care while enriching interprofessional training for students.

Given these gaps and opportunities, there is a clear need for structured and sustainable models that support collaboration among dental professionals, pharmacists, and nurses. The purpose of this paper is to describe the development of a formal interprofessional care team consisting of dentists, dental students, a pharmacist, pharmacy students, and nursing professionals within a university dental school clinic. This model aims to enhance patient-centered care, promote safe and informed medication use, and prepare future healthcare providers through hands-on, multidisciplinary educational experiences.

*** Clinic Operation**

This initiative was collaboratively established by King

Fahd University's College of Dentistry, College of Pharmacy, and College of Nursing, aiming to implement a multidisciplinary educational clinic model. The primary objectives of this interprofessional care team were to: -
1- deliver medication therapy management (MTM) and other pharmacy-related services to optimize oral health outcomes;
2- incorporate nursing services to enhance patient assessment, education, and coordination of care; and
3- create hands-on opportunities for collaborative interprofessional training among dental, pharmacy, and nursing students.

The pilot project was implemented in the university's affiliated dental hospital, which provides comprehensive and affordable dental services to a predominantly low-income and elderly population. The clinic mainly serves residents of the Eastern Province but also receives patients from other regions. A significant proportion of the patient base includes uninsured or publicly insured individuals, many of whom present with complex medical and dental needs.

As of the most recent reporting, approximately 65% of

patients are over the age of 40, and nearly 40% are older than 60, making them more susceptible to multiple chronic diseases and polypharmacy, conditions where interprofessional care can have substantial benefits. The dental clinic operates 30 hours per week and offers a full range of general and specialty dental services, including diagnostics, restorative dentistry, prosthodontics, periodontics, endodontics, oral surgery, and emergency dental care.

Clinical services are primarily delivered by fifth- and sixth-year dental students—around 90 students annually—under the supervision of licensed dental faculty. Pharmacy and nursing students participate in structured rotations, working collaboratively with dental teams to review medication histories, assess vital signs, identify medical red flags, counsel patients, and ensure safe, integrated patient care.

The main dental clinic at King Fahd University Hospital is organized as a large, open-space area with multiple private cubicles, each equipped with a dental chair, a computer workstation, and the necessary dental instruments. The clinic is staffed by a team of full-time and part-time dental faculty members, hygienists, and administrative support personnel.

Clinical training is provided to third- and fourth-year dental students, who attend regularly scheduled sessions. The facility includes approximately 80 cubicles used for patient care, with each clinical session lasting four hours. Given the comprehensive and often complex needs of patients—many of whom present with multiple comorbidities—students typically manage a single patient per session under the close supervision of faculty members who oversee treatment plans, authorize interventions, and refer patients to other dental specialties such as Oral Surgery or Periodontics. Additional dedicated units within the clinic include an Assessment Room and a separate Oral Surgery department.

In early 2024, a clinical pharmacist and a registered nurse were introduced into the dental clinic as part of a multidisciplinary care initiative. Initially, the pharmacist focused on supporting the Oral Diagnostics and Oral Surgery departments, with expanded responsibilities including the Assessment Unit by mid-2024. The integration of both fourth-year pharmacy students and nursing students followed shortly thereafter, through clinical training placements aligned with their respective academic programs. Typically, the

clinical pharmacist is physically present in the clinic four days per week and remains accessible for consultation five days a week. Two pharmacy students and two nursing students are commonly assigned on-site between September and May.

The pharmacy team—consisting of the clinical pharmacist and pharmacy students—provides services such as medication reconciliation, identification of drug-related problems, and medication therapy management (MTM). The nursing team, including a clinical nurse and nursing students, plays a key role in monitoring patient vitals, screening for chronic conditions (e.g., hypertension, diabetes), offering health education on oral hygiene and systemic disease prevention, and enhancing communication and care coordination between dental providers and patients. Together, these teams support the dental students and faculty in improving overall patient outcomes, ensuring patient safety, and fostering a collaborative clinical learning environment.

*** Dental Assessment Clinic**

At King Fahd University Hospital's dental clinic, patients begin their care journey at the Dental Assessment Clinic, which consists of

four private cubicles and accommodates approximately 20–25 patients per session. The initial evaluation, lasting about 15 minutes, focuses on determining whether the patient is medically fit to undergo dental treatment. Conditions such as poorly controlled diabetes or hypertension, active seizure disorders, significant cardiac disease, or severe psychiatric illnesses may warrant postponement of dental procedures and referral for medical management.

During this visit, the pharmacy and nursing teams collaborate closely with dental staff. The pharmacy team conducts comprehensive medication history reviews, reconciles current prescriptions, and evaluates patient adherence to therapy. Simultaneously, the nursing team assesses vital signs, screens for systemic health risks, identifies red flags such as elevated blood pressure or uncontrolled blood sugar levels, and supports health education and lifestyle counseling. Both teams assist in evaluating the patient's readiness for dental care and coordinate medical referrals when necessary. After clearance from the Assessment Clinic, patients proceed to the Oral Diagnostics unit for further evaluation and treatment planning.

*** Oral Diagnostics**

The Oral Diagnostics Department houses the largest number of treatment cubicles (approximately 20) and handles a high volume of patients per clinic session. This department is a primary site of activity for both the pharmacy and nursing teams. During the initial hour of the four-hour appointment, these teams independently access and review the patient's profile using the dental clinic's electronic health record (EHR) system. The pharmacy team verifies the completeness and accuracy of recorded health and medication histories, including details such as blood pressure measurements and glycemic indicators (HbA1c, fasting glucose levels) for patients with diabetes. Likewise, the nursing team reviews clinical observations and may perform additional screenings as needed, ensuring accurate documentation of vital signs and systemic health indicators.

If inconsistencies or missing information are found, the pharmacy and nursing teams engage with the dental students to correct and update the records. They also work collaboratively to ensure that all relevant patient details are captured for safe dental care planning.

The remaining clinic time is dedicated to entering clinical interventions in the EHR and providing patient counseling. Both teams follow structured checklists to document their contributions. For pharmacy, interventions are classified into categories such as potential drug interactions, inappropriate drug selection, incorrect dosing, medication-related patient issues, assistance with medication histories, and dental pharmacotherapy recommendations. The nursing checklist includes screenings for systemic health issues, patient education interventions, coordination of referrals, and care planning input related to chronic diseases and infection control.

When issues are identified, appropriate steps are taken—whether notifying the primary care provider, counseling the patient, or collaborating with dental staff—to resolve them. Communication with external physicians is typically done through electronic forms or phone calls. For medically complex patients (e.g., those with three or more chronic conditions and five or more concurrent medications), the pharmacy and nursing teams jointly conduct advanced reviews and offer health education interventions such as smoking cessation, lifestyle

modification advice, and chronic disease counseling. These discussions occur with the dental student present, promoting an integrated learning experience and fostering interprofessional collaboration that enhances both educational and patient care outcomes.

Integrating Pharmacists and Nurses in Dental Clinics: Enhancing Interprofessional Care in Oral Surgery

A collaborative interprofessional model was implemented in an academic dental clinic to enhance patient care, particularly in the oral surgery department. The oral surgery section comprised one cubicle dedicated to evaluations and seven procedure cubicles. Within this setting, pharmacists played a key role by participating in clinical rounds with the dental team to resolve medication-related issues prior to procedures. Additionally, they responded to consults by reviewing medication histories and counseling patients. Importantly, nurses complemented this model by supporting patient assessment, managing vital signs, and reinforcing patient education regarding pre- and post-operative care, especially when

medication administration was involved.

To establish the program, a pharmacist was appointed as a secondary faculty member in the School of Dentistry and tasked with creating a structured interprofessional education and practice site. This initiative was aligned with national efforts promoting collaborative care and accreditation standards that require interprofessional learning experiences for both pharmacy and dental students. Similarly, nursing professionals were integrated to enhance patient monitoring and to serve as a communication bridge between pharmacists, dentists, and patients.

The pharmacist identified service needs by attending meetings, shadowing clinic activities, and engaging in discussions with faculty and students. All stakeholders were informed of the pharmacy team's new role. Nurse participation was gradually incorporated to ensure continuity of care, assist in gathering patient histories, and support care coordination, especially for patients undergoing surgical procedures.

Due to limited staffing, the pharmacist focused services in key departments—Assessment, Oral Diagnostics, and Oral Surgery-to

maximize impact by targeting high-risk patients. Nurses helped streamline these efforts by assisting with patient flow, monitoring for drug side effects, and facilitating follow-up care instructions.

Between 2014 and 2018, the pharmacy team reviewed 6,596 patient charts, assisted with medication histories for 65.7% of patients, and conducted interventions in 36.9%. A total of 2,773 interventions were documented, ranging from adverse drug reactions and drug selection problems to dosing and patient-related issues. Additionally, pharmacists supported prescribing decisions in 142 cases and provided tailored counseling to address medication adherence and cost concerns. Nurses contributed to these outcomes by reinforcing education, monitoring treatment responses, and ensuring patients understood instructions—especially those with low health literacy.

Challenges to the implementation included initial resistance from some dental staff who were unfamiliar with interprofessional roles, space and technological limitations, and difficulties in accessing patients during procedures. Nurses played a critical role in mitigating these challenges by facilitating

communication and helping to coordinate patient access within the clinic's operational constraints.

Although formal clinical outcomes are still under evaluation, the collaboration has been positively received by both staff and students. Dental students began to value comprehensive medication reviews and regularly sought guidance from the pharmacy and nursing teams. Patient engagement improved when the dental team introduced the pharmacist and nurse as integral members of the care team.

Looking ahead, the team plans to expand services into periodontology due to its connection with chronic diseases like diabetes. Pharmacy consultation forms are being developed within the dental electronic health record to document interventions more systematically. In addition, advanced practice experiences (APPE) for pharmacy students now take place in the clinic, offering real-world interprofessional exposure. Nursing students or professionals involved in the clinic benefit from a similar immersive experience, helping them develop collaborative care competencies and patient advocacy skills.

*** Conclusion**

An interprofessional educational model was successfully

designed and implemented within a university-based dental clinic, demonstrating the benefits of collaborative practice among dentists, pharmacists, and nurses. The integration of pharmacy services into daily clinical operations enhanced the ability of dental professionals and students to manage medication-related concerns, contributing to safer and more comprehensive patient care. Simultaneously, the inclusion of nursing professionals added critical support in patient assessment, monitoring, and education—further improving continuity of care and communication across disciplines.

This collaborative approach not only enriched the educational experience of dental, pharmacy, and nursing students but also highlighted the potential of multidisciplinary teamwork in addressing complex patient needs. Moving forward, the team plans to broaden the scope of services, refine tracking systems for interventions, and integrate interprofessional collaboration more deeply into the health professions' curricula. Further research will explore the impact of this model on clinical outcomes and on students' competencies and attitudes toward team-based care in a dental setting.

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