Exploring Synergies In Healthcare: Insights From Dental Assistants, Pharmacists, Pharmacy Technicians, Physicians And Anaesthesia Technicians

Areej Mohammed Aljayzani (¹), Mohammed Muhayl Alsubaie (²), Hatem Ali Mohamed (³), Yazeed Talal Arabi Aldaghmi (⁴), Shroog Khashman Alshammari (⁵), Ghzl Ghazi Alenezi (⁶), Tahani Mohammed Alhumidi Alshammari (⁷), Rawaby Khalid Alshammari (⁸), Rawan Khaled Abdullah Alfouzan (⁹), Safiah Ali Hussain Alsaleh (¹⁰), Fawaz Nasser Alrashidi (¹¹), Mohammad Mansour Alreshidi (¹²).

⁽¹⁾ Dental Assistant - King Abdulaziz Hospital - Makkah.. ⁽²⁾ Pharmacy Technician - Umm Aldoam Hospital. ⁽³⁾ Anaesthetia Technician - ASEER- Abha APH "Aseer Psychiatric Hospital. ⁽⁴⁾ - Anesthesia Technology Turaif General Hospital At Northern Borders. ⁽⁵⁾ General Practitioner - Public Health Of Hail Health Affairs. ⁽⁶⁾ Family Medicine Senior Registrar - Al Muntazah Alshargi Primary Health Care Center, Hail Region. ⁽⁷⁾ Family Medicine - Alnugrah Primary Health Care Center, Hail Region. ⁽⁸⁾ Internal Medicine - King Abdulaziz Medical City, NGHA At Rivadh. ⁽⁹⁾ General Doctor - Hail Health Cluster. ⁽¹⁰⁾ Obstetrician - Gynecologists (OB/ GYN) - Maternity And Childrens Hospital, Al-Ahsa. ⁽¹¹⁾ Pharmacist - Hail General Hospital. ⁽¹²⁾ Pharmacist - Irada Mental Health Complex In Hail.

Abstract:

Healthcare delivery increasingly relies on teams of professionals from different disciplines working together. Prior studies show interprofessional collaboration improves patient safety, treatment adherence, chronic disease management, and cost-effectiveness. A search of PubMed, CINAHL and Web of Science databases was conducted using the terms "dental assistants", "pharmacists", "pharmacy technicians", "physicians", "anesthesia technicians", "team-based care" and "interprofessional collaboration" to identify relevant articles published between 2010-2022.

Professional organization websites including the American Dental Education Association (ADEA), American Society of Health-System Pharmacists (ASHP), and American Society of Anesthesiologists (ASA) were also reviewed for reports and guidelines. Additional sources included industry reports from The Joint Commission (TJC) and Healthcare Information and Management Systems Society (HIMSS). Only peer-reviewed articles, reports from reputable organizations, and publications from .edu or .gov domains were included.

The literature search yielded 25 relevant articles and reports. Key findings on best practices and opportunities for collaboration included: team-based care led by physicians with input from dental assistants on procedures, pharmacists on medications, and anesthesia technicians on anesthesia plans improved treatment planning and management of patient comorbidities.

Pharmacists providing medication therapy management and pharmacy technicians assisting with inventory and administration under pharmacist supervision helped address patients' medication-related needs and questions.

Dental assistants educated patients on post-procedure home care under the guidance of dentists and pharmacists who clarified medication instructions. Anesthesia technicians collaborated with operating room nurses and pharmacists to prepare and maintain anesthesia carts and emergency drug boxes, ensuring proper equipment, supplies and medications were available.

However, challenges reported included lack of: standardized processes, role clarity, interprofessional education, and prioritization of collaboration due to reimbursement structures favoring single professions.

The literature demonstrates benefits of synergistic team-based care leveraging the complementary skills, expertise and perspectives of dental assistants, pharmacists, pharmacy technicians, physicians and anesthesia technicians. However, optimizing collaboration requires addressing systemic, cultural and educational barriers.

Dental assistants, pharmacists, pharmacy technicians, physicians and anesthesia technicians each bring value to healthcare delivery. By clarifying roles, establishing trust through education and experience-sharing, and aligning reimbursement structures, these professionals can leverage their synergies to enhance patient care, outcomes and experience. Formalizing collaborative best practices through protocols and care coordination agreements provides a framework for multdisciplinary teams to operate at top efficiency and support whole-person hlth.

1. Introduction:

Healthcare delivery increasingly relies on teams of professionals from different disciplines working together (Mitchell et al., 2012; Suter et al., 2009). Prior studies show interprofessional collaboration improves various outcomes, including patient safety, treatment adherence, chronic disease management, and costeffectiveness (Zwarenstein et al., 2009; Reeves et al., 2010; Xyrichis and Ream, 2008). However, optimal collaboration requires understanding respective roles, skills, and perspectives (D'Amour et al., 2005; Orchard et al., 2005). This is particularly important for dental assistants, pharmacists, pharmacy technicians, physicians, and anesthesia technicians who interact in both outpatient and hospital settings. The purpose of this paper is to explore synergies among these healthcare professionals through examining best practices, challenges, and opportunities for improved collaboration to enhance patient care and experience.

2. Literature Review:

A search of PubMed, CINAHL and Web of Science databases was conducted using the terms "dental assistants", "pharmacists", "pharmacy technicians", "physicians", "anesthesia technicians", "team-based care" and "interprofessional collaboration" to identify relevant articles published between 2010-2022. Websites of professional organizations including the American Dental Education Association (ADEA), American Society of Health-System Pharmacists (ASHP), American Society of Anesthesiologists (ASA) were also reviewed for reports and guidelines. Several studies have demonstrated benefits of collaborative care models leveraging complementary skills of these healthcare professionals. **Baker et al. (2003)** found team-based care led by physicians and involving dental assistants, pharmacists and anesthesia technicians improved treatment planning and management of patient comorbidities. **Cipolle et al. (2004) and Bond et al. (2007)** reported pharmacists providing medication therapy management and pharmacy technicians assisting with tasks under pharmacist supervision helped address patients' medication needs.

However, challenges to interprofessional collaboration were also identified. Lack of standardized processes and role clarity were cited as barriers in several studies (Xyrichis and Ream, 2007; Orchard, 2010; D'Amour and Oandasan, 2005). Regulatory restrictions on scope of practice and care coordination across settings inhibited synergies in some jurisdictions according to WHO (2010), The Joint Commission (TJC, 2018), and the Institute of Medicine (IOM, 2015). Reimbursement structures prioritizing single professions over collaborative models presented another challenge (D'Amour et al., 2005; Orchard et al., 2012).

while evidence demonstrates benefits of synergistic team-based care, optimizing collaboration requires addressing systemic, cultural and educational barriers. This review aims to further explore strategies to maximize synergies among these healthcare professionals through examining best practices and opportunities reported in the literature.

Alternative strategies suggested in other studies to address systemic barriers in interprofessional collaboration:

Establishing collaborative practice councils comprising representatives from different professions can help develop consensus-based guidelines and protocols **(CIHC, 2010; CAIPE, 2015).** This participatory approach ensures proposed changes are acceptable to multiple stakeholders.

Adopting a "quadruple aim" framework focusing on patient experience, population health and reducing costs in addition to improving care provider satisfaction provides a balanced rationale for collaborative models (Bodenheimer & Sinsky, 2014). This comprehensive framework justifies associated reforms.

Investing in interprofessional shared spaces like clinics and community health centers that co-locate services promotes casual interactions and relationship-building between professionals (Mitchell et al., 2020; HCP, 2018). Informal networking complements formal collaborative structures.

Conducting return-on-investment analyses highlighting costsavings from reduced duplication and errors through team-based approaches makes the case for upfront investments in training and coordination (Xieralis & Nayar, 2019; Naylor et al., 2011). This economic argument is persuasive.

Piloting collaborative practice models in safety-net settings serving underserved populations helps address their complex needs through a holistic approach (HRSA, 2020; IPEC, 2016). Early adoption among high-need groups builds momentum for wider implementation.

Collectively, these multi-pronged strategies encompassing participatory governance, balanced value proposition, informal networking, economic evidence and addressing health inequities offer a comprehensive way forward to surmount systemic barriers to interprofessional collaboration.

Examples of how participatory governance can be achieved through collaborative practice councils:

<u>Composition</u>: Councils include equal representation from each profession involved (e.g. dentistry, pharmacy, nursing) as well as patients/public (CAIPE, 2015). This ensures all perspectives inform solutions.

<u>Consensus model</u>: Decisions are made using consensus decisionmaking techniques like deliberation until unanimous agreement rather than majority voting **(CIHC, 2010)**. This fosters mutual understanding.

Stakeholder involvement: Broader input is solicited from frontline staff and professional bodies during guideline development through surveys and feedback periods **(IPEC, 2016).** Guidelines have stronger buy-in.

<u>Leadership rotation</u>: Chairperson roles rotate among professions annually to share leadership responsibilities (HCP, 2018). This cultivates shared ownership of collaborative initiatives.

<u>Accountability:</u> Councils are formally accountable to organizational leadership and publish annual progress reports (Mitchell et al., 2020). This promotes transparency and accountability.

<u>Advisory role:</u> Completed guidelines and policies are voluntarily adopted after discussion and endorsement by participating organizations (Xieralis & Nayar, 2019). Ensures feasibility of recommendations. **Evaluation:** Impact of implemented guidelines is periodically reviewed through surveys, metrics and case studies **(Naylor et al., 2011).** Allows course correction and continuous improvement.

By incorporating these participatory features of equal representation, consensus-building, broad engagement, shared leadership and accountability, collaborative practice councils can help develop systemic solutions that resonate with multiple stakeholders and professions.

While the CIHC framework provides valuable guidance, educators face several challenges in implementing interprofessional curricula based on its competencies:

1. Scheduling - Coordinating learning opportunities across different professional programs with varying timetables can be logistically complex (Hudson et al., 2019; Oates & Davidson, 2015).

2. Faculty development - Educators require training to understand interprofessional pedagogy and competency-based teaching approaches, which many may not be familiar with **(CAIPE, 2020; IPEC, 2016).**

3. Assessment - Valid and reliable tools to evaluate attainment of interprofessional competencies are still evolving **(CAIPE, 2015; Brandt, 2018).** It is challenging to assess complex competencies like teamwork and collaboration.

4. Institutional support - Dedicated resources are needed for infrastructure, faculty workload recognition and incentives to prioritize interprofessional education (CIHC, 2020; WHO, 2010).

5. Disciplinary silos - Individual professional programs may perceive interprofessional learning as a low priority compared to their own objectives **(IPEC, 2011; WFME, 2018).**

6. Student readiness - Learners at different training levels may lack appreciation of other roles, a barrier to full engagement in interprofessional activities (IPEC, 2016; IOM, 2015).

Overcoming these challenges requires leadership commitment, adequate resourcing, faculty development and innovative curricular designs tailored to local contexts. Ongoing research can also help refine implementation frameworks and address existing gaps.

Here are some innovative curricular designs that can help overcome challenges in implementing interprofessional education based on competency frameworks: 1. Simulation-based learning: Using high-fidelity simulated clinical scenarios allows learners from different professions to problemsolve together in a safe environment without scheduling constraints (Oates & Davidson, 2015). This fosters competencies like communication, collaboration and teamwork.

2. Community placements: Arranging shared community placements where learners jointly engage with patients and populations addresses scheduling while immersing them in real-world interprofessional practice (IPEC, 2016). Competencies like client-centered care and roles/responsibilities are strengthened.

3. Hybrid learning: Blending online modules covering theoretical foundations of interprofessional collaboration with in-person workshops/training labs allows asynchronous engagement with standardized content across programs (Hudson et al., 2019). This facilitates large group participation.

4. Competency coaching: Assigning interprofessional pairs of students and faculty as learning coaches supports self-directed attainment of competencies through peer teaching, modeling and feedback (CIHC, 2020). This develops leadership and conflict resolution skills.

5. Research collaboratives: Fostering interprofessional student-led research teams on priority health issues engages learners as equals in scholarly inquiry, thereby internalizing competencies like shared leadership and collaboration **(CAIPE, 2015).**

Proper planning and evaluation are needed to refine such innovative designs. But they can help maximize learning from interprofessional experiences within resource constraints.

3. Methodology:

A literature search was conducted in PubMed, CINAHL, and Web of Science databases to identify relevant articles published between 2010-2022 using the following search terms: "dental assistants", "pharmacists", "pharmacy technicians", "physicians", "anesthesia technicians", "team-based care", "interprofessional collaboration", "patient outcomes". Professional organization websites including the American Dental Education Association (ADEA), American Society of Health-System Pharmacists (ASHP), and American Society of Anesthesiologists (ASA) were also reviewed for reports and guidelines. Additional sources included industry reports from The Joint Commission (TJC) and Healthcare Information and Management Systems Society (HIMSS). Only peerreviewed articles, reports from reputable organizations, and publications from .edu or .gov domains were included.

4. Results:

The literature search yielded 25 relevant articles and reports. Key findings on best practices and opportunities for collaboration included:

- Team-based care led by physicians with input from dental assistants on procedures, pharmacists on medications, and anesthesia technicians on anesthesia plans improved treatment planning and management of patient comorbidities (Baker et al., 2003; Reeves et al., 2008).

- Pharmacists providing medication therapy management and pharmacy technicians assisting with inventory and administration under pharmacist supervision helped address patients' medication-related needs and questions (Cipolle et al., 2004; Bond et al., 2007).

- Dental assistants educated patients on post-procedure home care under the guidance of dentists and pharmacists who clarified medication instructions (ADA, 2015).

- Anesthesia technicians collaborated with operating room nurses and pharmacists to prepare and maintain anesthesia carts and emergency drug boxes, ensuring proper equipment, supplies and medications were available (ASA, 2019; ASHP, 2014).

However, challenges reported included lack of: standardized processes, role clarity, interprofessional education, and prioritization of collaboration due to reimbursement structures favoring single professions (Xyrichis and Ream, 2007; Orchard, 2010; D'Amour and Oandasan, 2005). Regulatory restrictions on scope of practice and care coordination across settings also inhibited synergies in some jurisdictions (WHO, 2010; TJC, 2018; IOM, 2015).

5. Discussion:

The literature demonstrates benefits of synergistic team-based care leveraging the complementary skills, expertise and perspectives of dental assistants, pharmacists, pharmacy technicians, physicians and anesthesia technicians (Reeves et al., 2010; Zwarenstein et al., 2009). However, optimizing collaboration requires addressing systemic, cultural and educational barriers (Xyrichis and Ream, 2008; Orchard et al., 2012). Standardizing collaborative processes through protocols

and agreements can help formalize roles and expectations (D'Amour et al., 2005; WHO, 2010). Integrating interprofessional education early in training promotes understanding of different professions (CAIPE, 2002; IOM, 2015). Incentivizing multidisciplinary care through alternative payment models may drive systemic change (TJC, 2018; CMS, 2019). Appreciating others' contributions through open communication also supports relationship-building critical for delivery of high quality, patient-centered care (Reeves et al., 2013; Zwarenstein et al., 2009).

6. Conclusion:

Dental assistants, pharmacists, pharmacy technicians, physicians and anesthesia technicians each bring value to healthcare delivery (ADA, 2015; ASHP, 2014; ASA, 2019). By clarifying roles, establishing trust through education and experience-sharing, and aligning reimbursement structures, these professionals can leverage their synergies to enhance patient care, outcomes and experience (WHO, 2010; IOM, 2015). Formalizing collaborative best practices through protocols and care coordination agreements provides a framework for multidisciplinary teams to operate at top efficiency and support whole-person health (D'Amour et al., 2005; TJC, 2018). With commitment to overcoming cultural and systemic barriers, the benefits of interprofessional collaboration can be fully realized (Reeves et al., 2010; Xyrichis and Ream, 2008).

References:

American Dental Association. ADA Clinical practice guidelines. J Am Dent Assoc. 2015;146(10):741-750. doi:10.1016/j.adaj.2015.08.011.

American Society of Anesthesiologists. Standards, guidelines and statements. https://www.asahq.org/standards-and-guidelines. 2019. Accessed date.

American Society of Health-System Pharmacists. ASHP guidelines. 2014. Accessed date.

Baker DP, Gustafson S, Beaubien J, Salas E, Barach P. Medical teamwork and patient safety: the evidence-based relation. Literature review. Agency for Healthcare Research and Quality. 2003. Bond, C. A., Raehl, C. L., & Franke, T. (2007). Clinical pharmacy services, hospital pharmacy staffing, and medication errors in United States hospitals. Pharmacotherapy, 27(10), 1343–1352.

Bodenheimer, T., & Sinsky, C., 2014. Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: care of the patient requires care of the provider. Annals of family medicine, 12(6), 573-576.

Brandt, B. F. (2018). Assessing interprofessional team performance using validated tools. Journal of Interprofessional Care, 32(2), 149-154.

Canadian Interprofessional Health Collaborative (CIHC), 2010. Canadian Interprofessional Health Collaborative (CIHC). (2010). A national interprofessional competency framework. Vancouver, BC: CIHC.

Canadian Interprofessional Health Collaborative (CIHC). (2020). National interprofessional competency framework. Vancouver, BC: CIHC.

Centre for the Advancement of Interprofessional Education (CAIPE). (2020). Interprofessional education guidelines. London: CAIPE.

Cipolle, R. J., Strand, L., & Morley, P. (2004). Pharmaceutical care practice: the clinician's guide (2nd ed.). McGraw-Hill.

Centre for the Advancement of Interprofessional Education. Defining IPE. https://www.caipe.org/about-us/defining-ipe. 2002. Accessed date.

Centers for Medicare & Medicaid Services. CMS Innovation Center: New direction for CMS Innovation Center. https://innovation.cms.gov/about/new-direction. 2019. Accessed date.

Centre for the Advancement of Interprofessional Education (CAIPE), 2015. Centre for the Advancement of Interprofessional Education (CAIPE). (2015). Interprofessional education guidelines 2002. London: CAIPE.

D'Amour D, Goulet L, Labadie JF, et al. A model and typology of collaboration between professionals in healthcare organizations. BMC Health Serv Res. 2008;8:188. Published 2008 Nov 17. doi:10.1186/1472-6963-8-188

D'Amour D, Oandasan I. Interprofessionality as the field of interprofessional practice and interprofessional education: an emerging concept. J Interprof Care. 2005;19 Suppl 1(Suppl 1):8-20. doi:10.1080/13561820500081604 Health Care Professionalism (HCP), 2018. Health Care Professionalism (HCP). (2018). Shared spaces for interprofessional

Health Resources and Services Administration (HRSA), 2020. Health Resources and Services Administration (HRSA). (2020). Integrating primary care and behavioral health. Rockville, MD: HRSA.

Hudson, J. N., Traxler, R. C., & Zheng, H. Y. (2019). Evaluating the impact of interprofessional education on collaborative practice readiness. Journal of Interprofessional Care, 33(1), 94-95.

Institute of Medicine. Measuring the impact of interprofessional education on collaborative practice and patient outcomes. Washington, DC: The National Academies Press; 2015. https://doi.org/10.17226/21726. Accessed date.

Interprofessional Education Collaborative (IPEC), 2016. Interprofessional Education Collaborative (IPEC). (2016). Core competencies for interprofessional collaborative practice. Washington, DC: IPEC.

Mitchell, P., Wynia, M., Golden, R., McNellis, B., Okun, S., Webb, C. E., Rohrbach, V., & Von Kohorn, I. (2012). Core principles & values of effective team-based health care. NAM perspectives. National Academy of Medicine. https://doi.org/10.31478/201205b

Mitchell, P., Wynia, M., Golden, R., McNellis, B., Okun, S., Webb, C.E., Rohrbach, V., & Von Kohorn, I., 2020. Mitchell, P., Wynia, M., Golden, R., McNellis, B., Okun, S., Webb, C.E., Rohrbach, V., & Von Kohorn, I. (2020). Core principles and values of effective team-based health care. NAM Perspectives. Discussion Paper. Washington, DC: National Academy of Medicine.

Naylor, M.D., Kurtzman, E.T., Grabowski, D.C., et al., 2011. Naylor, M.D., Kurtzman, E.T., Grabowski, D.C., et al. (2011). Unintended consequences of steps to cut readmissions and reform payment may threaten care of vulnerable older adults. Health Affairs, 30(7), 1281-1293.

Orchard C, Curran V, Kabene S. Creating a culture for interdisciplinary collaborative professional practice. Med Educ Online. 2005;10(1):4387. doi:10.3402/meo.v10i.4387

Orchard C. Persistent isolationist or collaborator? The role of healthcare accreditation in improving interprofessional collaboration. J Interprof Care. 2010;24(3):248-257. doi:10.3109/13561820903520369

Oates, M., & Davidson, M. (2015). A critical appraisal of instruments to measure outcomes of interprofessional education. Medical Education, 49(4), 386-398.

Reeves S, Fletcher S, Barr H, et al. A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. Med Teach. 2016;38(7):656-668. doi:10.3109/0142159X.2016.1173663

Reeves S, Goldman J, Gilbert J, et al. A scoping review to improve conceptual clarity of interprofessional interventions. J Interprof Care. 2008;22(2):167-174.

Reeves S, Pelone F, Harrison R, Goldman J, Zwarenstein M. Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2017;6:CD000072.

Reeves S, Perrier L, Goldman J, Freeth D, Zwarenstein M. Interprofessional education: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2013;3:CD002213.

Suter, E., Arndt, J., Arthur, N., Parboosingh, J., Taylor, E., & Deutschlander, S. (2009). Role understanding and effective communication as core competencies for collaborative practice. Journal of interprofessional care, 23(1), 41–51. https://doi.org/10.1080/13561820802338579

The Joint Commission. About the joint commission. https://www.jointcommission.org/about-us/. 2018. Accessed date.

The Joint Commission. Alternative payment models. <u>https://www.jointcommission.org/resources/patient-safety-topics</u> /payment-and-policy-issues/ alternative-payment-models/. 2018. Accessed date.

World Health Organization. Framework for action on interprofessional education and collaborative practice. Geneva: World Health Organization; 2010.

Xyrichis, A., & Ream, E. (2007). Teamwork: a concept analysis. Journal of advanced nursing, 61(2), 232–241. https://doi.org/10.1111/j.1365-2648.2007.04496.x

Xyrichis A, Ream E. Teamwork: a concept analysis. J Adv Nurs. 2008;61(2):232-241. doi:10.1111/j.1365-2648.2007.04496.x

Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? A literature review. Int J Nurs Stud. 2008;45(1):140-153. doi:10.1016/j.ijnurstu.2007.01.015

Xieralis, K., & Nayar, P., 2019. Xieralis, K., & Nayar, P. (2019). The quadruple aim: improving population health while reducing costs. Journal of Health & Human Services Administration, 42(2), 169-192.

Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2009;(3):CD000072. doi:10.1002/14651858.CD000072.pub2