Introducing and Evaluating Intraprofessional Team-Based Care Delivery in a Dental School Clinic: A Pilot Study

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Abstract: There is growing interest in developing more efficient, patient-centered, and cost-effective models of dental care delivery using teams of professionals. The aims of this small pilot study were to assess the number of patient visits, type and number of procedures performed, and clinic revenues generated by an intraprofessional team of dental, dental hygiene, and dental therapy students and to determine the students' and patients' perceptions of this model of care. Sixteen senior students from three student cohorts (dental, dental hygiene, and dental therapy) at the University of Minnesota piloted a team-based dental delivery model from January to April 2015. The group was named the Team Care Clinic (TCC), and the team for each clinical session consisted of one dental student, three dental hygiene students, and one dental therapy student. Data were collected from the school's database to determine the number of patient visits, type and number of procedures performed, and clinic revenue generated by the TCC. Focus groups were used to assess student perceptions of the experience, and patient satisfaction surveys were administered to assess the patients' experience. The TCC students were given twice as many patients as non-TCC students, and they managed them effectively. Working as a team, the TCC student providers completed twice as many procedures per patient encounter as non-TCC students. Patients and students said their experiences in the TCC were positive, and students expressed a preference for team-based care delivery. The results of the study suggest the team-based dental care delivery model is promising. Team-based care delivery may allow providers to accomplish more during a patient appointment and increase provider satisfaction.

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Today, high-performing medical teams are widely recognized as an essential tool for constructing a more coordinated, patient-centered, and efficient health care delivery system.[1,2] Okun et al. defined team-based care as "the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively with patients to accomplish shared goals within and across settings to achieve coordinated, high-quality care."[3] A primary objective of team-based care is to use the skills of non-physician or non-dentist clinicians to increase the number of health care services provided at a given quality and cost.[4,5]

Driving forces behind team-based care delivery include a health care system that is often fragmented and costly. Health disparities and professional workforce shortages have spurred support for workforce innovation. Additionally, there is the realization that a solitary clinician, operating in isolation, and dependent on a self-contained perspective, may not provide optimal care.[6,7] On the medical side, team-based care is streamlining primary care by allowing non-physician clinicians to perform to the fullest capacity of their training. The deployment of nurse practitioners and physician assistants in the delivery of primary care services has improved access to care, addressed workforce shortages, and lowered costs without compromising the quality of care.[4,5] Studies examining whether patient health outcomes, quality of care, and costs differed among different skill mixes of health care providers have found team-based care improved the comprehensiveness, coordination, efficiency, effectiveness, and value of care.[1,2,8-12]

In Minnesota, the use of expanded function dental providers has been authorized for decades and was intended to reduce barriers to access to dental care. However, there is evidence that allied personnel are still underutilized. Post and Stoltenberg found that only 38% of Minnesota dental assistants and

hygienists with restorative functions (RF) credentials utilized their RF skills.[13] Another survey found only 12% of Minnesota dental assistants reported ever utilizing their RF skills.[14] These findings suggest traditional dental practice models are not maximizing the skillset of allied team members. Clinics staffed with different team members and provider types do not automatically result in team-based delivery of care. Implementing a team-based delivery model requires a departure from the traditional model and the intentional training of providers.

Similar to medicine, the high cost of dentistry, workforce shortages, and limited access to care for vulnerable populations are prompting many in the profession to consider new oral health care delivery models.[11] A new cadre of non-dentist providers called dental therapists has been introduced in Alaska, Minnesota, Maine, Oregon, Vermont, and Washington. A dental therapist offers a way to optimize the skill mix within a dental team, resulting in improved access and cost-effectiveness. Dental therapists have practiced in Minnesota since 2011 and can perform a full range of basic restorative procedures, freeing a dentist to take on more complex dental procedures (Table 1). Early evidence indicates dental therapists in Minnesota are expanding access to dental care in underserved areas and increasing practice productivity.[15,16]

Integrating this new dental provider into the dental team is expected to encourage the development of new ways to deliver oral health care and achieve the goals of the Triple Aim: better care experience, improved health outcomes, and reduced cost.[4,5] Without purposeful cultivation of the team, achievement of these goals is unlikely. Fundamental to the success of any model for team-based care is the skill and reliability with which team members work collaboratively.[17] While the value of interprofessional education has attracted a lot of attention, there is a lack of research on intraprofessional models of care delivery, especially in dentistry.

Interprofessional education is considered an essential step in the development of a collaborative health workforce.[17] In 2009, the Interprofessional Education Collaborative (IPEC) was formed to guide the education of an interprofessional health care workforce that delivers high-quality, team-based care. The IPEC defined four core competency domains, as updated in 2016: 1) values and ethics for interprofessional practice, 2) roles and responsibilities, 3) interprofessional communication, and 4) teams and teamwork.[18] We think the same principles can help guide the education of high-functioning intraprofessional teams within the dental profession.

The University of Minnesota is the only institution in the U.S. to educate dental (DDS), dental hygiene (DH), and dental therapy (DT) students in the same facility. The school designed an intentional plan to encourage collaborative care, in which initially all three-student groups were co-located in the school's Comprehensive Care Clinics (CCC).

Table 1. Dental therapy scope of practice in Minnesota

General Supervision

1. Oral health instruction and disease prevention education, including nutritional counseling and dietary analysis
2. Preliminary charting of the oral cavity
3. Making radiographs
4. Mechanical polishing
5. Application of topical preventive or prophylactic agents, including fluoride varnishes and pit and fissure sealants
6. Pulp vitality testing
7. Application of desensitizing medication or resin
8. Fabrication of athletic mouthguards
9. Placement of temporary restorations
10. Fabrication of soft occlusal guards
11. Tissue conditioning and soft reline
12. Atraumatic restorative therapy
13. Dressing changes
14. Tooth reimplantation
15. Administration of local anesthetic
16. Administration of nitrous oxide

Indirect Supervision

1. Emergency palliative treatment of dental pain
2. The placement and removal of space maintainers
3. Cavity preparation
4. Restoration of primary and permanent teeth
5. Placement of temporary crowns
6. Preparation and placement of performed crowns
7. Pulpotomies on primary teeth
8. Indirect and direct pulp capping on primary and permanent teeth
9. Stabilization of reimplanted teeth
10. Extractions of primary teeth
11. Suture removal
12. Brush biopsies
13. Repair of defective prosthetic devices
14. Recementing of permanent crowns
15. Dispense and administer analgesics, anti-inflammatories, and antibiotics

Source: Minnesota Rules 3100.8500 and 3100.8700; Minnesota Statutes section 150A.10.

However, co-location of students did not automatically lead to team-based care, despite implementing protocols for student team collaboration. Therefore, a new team-based care model was needed. Using the IPE core competencies as a framework, the Division of Dental Therapy, Division of Dental Hygiene, and Department of Primary Dental Care created a new team-based dental care delivery model. The aims of this small pilot study were to assess the number of patient visits, type and number of procedures performed, and clinic revenues generated by an intraprofessional team of dental, dental hygiene, and dental therapy students and to determine the students' and patients' perceptions of this model of care.

Methods

The University of Minnesota Institutional Review Board determined this study was exempt from oversight. The research design used mixed methods to assess the piloting of a new team-based care delivery model. Senior students from the three University of Minnesota student groups (DDS, DH, and DT) were selected to pilot this innovative team-based dental care delivery model, named the Team Care Clinic (TCC). The pilot study took place from January to April 2015. Faculty members selected three DH students who had completed their semester clinical competencies. DT and DDS students were contacted via email and were given the opportunity to participate in a two-week rotation in the TCC. A licensed dental assistant (LDA) was hired to support the team. Six DT and seven DDS students volunteered to rotate through the TCC in two-week blocks, while the three DH students remained constant throughout the study.

The number and type of procedures completed and data on chair utilization were obtained from the school's axiUm database. Patient experience in TCC was investigated using a 16-item close-ended survey developed by several faculty members and an outside consultant hired to conduct the student focus groups. After initial feedback, the survey was pilot tested with selected dental faculty members and senior students to determine validity, clarity, and ease of use. Patients were asked to take the survey after appointments to elicit their TCC experience.

To capture the student experience, the consultant held focus groups with participants to determine their perceptions of the team-based care delivery model. Students were invited for an in-person group interview and consented to participate. The consultant recorded and transcribed the semi-structured interview and performed a thematic analysis of the transcript using a grounded theory approach to coding the material.

Team Care Delivery Model

Traditional clinic groups in the CCC are comprised of three DH, one DT, and 12 DDS students. One LDA supports each clinic group. Five chairs in the clinic were designated for the TCC. The TCC consisted of one DDS, one DT, and three DH students. A dentist and a dental hygiene faculty member supervised these students. Each TCC session length was the same as other clinic groups (3.0 hours). Two patients were scheduled per student during each clinic session as opposed to one patient in a non-TCC group. Appointment times were consecutive 1.5-hour appointments. No production incentives were given, and grading practices remained the same across all clinic groups. The LDA supported the TCC and performed non-chairside assisting duties similar to the LDA in the other clinic groups. At the start of each TCC rotation, faculty provided an orientation to foundational team care principles, using the IPEC competencies as a framework.[18] The overarching goal of the TCC was to teach students how to function as an interdependent team, optimizing the skill mix of student providers to maximize efficiency and productivity of care delivered. As a guiding principle, faculty members allowed students to exercise autonomy and encouraged a non-hierarchical structure. They modeled the competencies that students needed to acquire.

The TCC began with a daily team huddle to develop a strategy for all patient appointments. Team members worked to ensure appointments flowed smoothly and efficiently, so each patient received as much care as possible. All team members, including the faculty, reviewed patient records and discussed patient care needs. Although previously planned treatment procedures were assigned to the appropriate provider at the time the treatment plan was completed, the DDS student leading the team delegated urgent care and changes in care to the appropriate team member with the goal of delivering care in the most productive and efficient manner. To save time, providers rotated among the five TCC chairs, while patients remained in their assigned cubicles. Appropriate patient treatment delegation to each team member allowed practitioners to work at their highest scope of practice. Additionally, in the process of the daily planning, team members learned their respective scopes of practice and developed communication and leadership skills. If a

patient failed to attend an appointment in the TCC, the student looked to complete additional treatment on patients already receiving care in that session. For example, if a DH student's patient did not appear, the DH student would provide a prophylaxis to a DT or DDS student's patient. That practice did not usually occur in the non-TCC group. In the CCC, students are booked with one patient per session, and if a patient does not appear for an appointment, the student leaves the clinic.

Team Member Roles and Requirements

The DDS students were responsible for data collection, diagnosing, treatment planning, and performance of complex treatment only within a dentist's scope of practice. The DH students were primarily responsible for prophylaxis procedures, radiographs, and non-surgical periodontal therapy. Additionally, they performed data collection and assessment, administered local anesthesia for TCC patients, and performed advanced restorative functions (Table 2). The DT students were responsible for direct placement restorative care, new patient data collection and assessment, and triaging urgent care patients. As part of their intraprofessional development, students were expected to understand their roles and the principles of teamwork dynamics and group processes; support shared decision making, leadership, and accountability for one's actions within their professional scope of practice; and communicate with colleagues in a professional, collaborative, and responsive manner.[19]

Results

The TCC student providers saw 452 patients during the study period. With only a third as many providers in each clinic session as in the non-TCC clinics, the TCC provided almost half as many patient visits as in the other clinics (Table 3). The TCC completed an average of 291 procedures per clinic chair and 3.2 procedures per patient encounter. The type of TCC dental procedures was similar to that of the non-TCC clinics (Figure 1).

The 452 TCC patients were asked to complete the post-treatment survey, and 105 patients completed it, for a 23% response rate. Even though the TCC had multiple providers involved in one patient's treatment, patient satisfaction did not suffer. The TCC performed as well and sometimes better than the CCC in patient satisfaction scores (Table 4).

Seven (44%) of the 16 TCC students (three DDS, two DH, two DT) attended a focus group session conducted by an outside consultant. Analysis revealed the students' comments fell into four themes. Table 5 provides examples of student comments for each theme.

Theme 1: teamwork. TCC students said they learned the value of teamwork and adopted a new mindset from a traditional practice model to team-based care. From the outset, students were encouraged to adopt the TCC mantra "Our Patient," underscoring the shared responsibilities each team member has towards each patient.

Theme 2: shared achievement. This team-based care approach exemplifies the idea that the whole is greater than the sum of its parts. The student providers reported feeling that they worked at higher levels with regard to scope of practice in the TCC. They attributed this increased capacity to the way the clinic was organized and how providers seamlessly collaborated to provide care. Every day, the TCC began its operations with a team huddle to develop an overall strategy for smooth management of all appointments and to ensure a better experience for each patient. The huddle ensured collaboration was centered on role clarity, in which every TCC member understood his or her role and the role of others. This approach allowed students to take ownership of the team's needs and not just their own assigned task.

Theme 3: patient-centered care. At the heart of the team-based model was the patient. Students consistently found opportunities to provide continuous care by working together. As one student noted, "Team-based care was more patient-centered because it allowed us to provide more care in one visit."

Theme 4: mutual respect and trust. When the TCC students applied team-based principles, they fostered a working environment built on mutual respect and trust. Additionally, this model of education had the potential to influence how students practice in the future. "When I look for hygienists/therapists to go into practice," said one DDS student, "I would want them to be like these guys because I feel like I can trust them if I need to ask them a question."

Discussion

The goal of the TCC was to teach students to provide collaborative, quality oral health care by maximizing the knowledge and skills of all team members. It should be noted that the concept of skill mix does not mean replacing one professional with another, but rather integrating the distinct roles and responsibilities of all team members to achieve

Table 2. Dental hygienist and dental assistant scope of practice in Minnesota

General Supervision	Indirect Supervision	Direct Supervision	Procedure
DH			1. Perform preliminary charting of the oral cavity and surrounding structures to include case histories, perform initial and periodic examinations and assessments to determine periodontal status, and formulate a dental hygiene treatment plan in coordination with a dentist's treatment plan. 2. Administer local anesthesia. 3. Administer nitrous oxide inhalation analgesia pursuant to the rule provisions. 4. Remove marginal overhangs.
DH DA			6. Obtain informed consent within scope of practice. 7. Take vital signs such as pulse rate and blood pressure as directed by a dentist. 8. Take photographs extraorally or intraorally. 9. Take radiographs. 10. Take impressions for casts and appropriate bite registration.
DH			11. Make referrals to dentists, physicians, and other practitioners in consultation with a dentist. 12. Complete prophylaxis to include scaling, root planing, polishing of restorations. 13. Dietary analysis, salivary analysis, and preparation of smears for dental health purposes. 14. Replacement, cementation, and adjustment of intact temporary restorations extraorally or intraorally.
DH DA			15. Recement intact temporary restorations; place temporary fillings (not including temporization of inlays, onlays, crowns, and bridges); and cut arch wires, remove loose bands, or remove loose brackets on orthodontic appliances.
		DH DA	16. Remove bond material from teeth with rotary instruments after removal of orthodontic appliances. 17. Place and remove matrix bands. 18. Fabricate, cement, and adjust temporary restorations extraorally or intraorally. 19. Remove temporary restorations with hand instruments only. 20. Etch appropriate enamel surfaces before bonding of orthodontic appliances by a dentist.
DH	DA		21. Remove excess cement from inlays, crowns, bridges, and orthodontic appliances with hand instruments only. 22. Apply topical medications such as, but not limited to, topical fluoride, bleaching agents, and cavity varnishes in appropriate dosages or quantities as prescribed by a dentist. 23. Etch appropriate enamel surfaces; apply and adjust pit and fissure sealants.
	DH DA		24. Perform restorative procedures limited to: placing, contouring, and adjusting amalgam restorations and glass ionomers; adapting and cementing stainless steel crowns; and placing, contouring, and adjusting Class I, II, & V supragingival composite restorations on primary and permanent teeth.
	DH DA		25. Place and remove matrix bands; fabricate, cement, and adjust temporary restorations extraorally or intraorally. 26. Remove temporary restorations with hand instruments only. 27. Etch appropriate enamel surfaces before bonding of orthodontic appliances by a dentist.
	DH DA		29. Monitor a patient during each phase of general anesthesia or moderate sedation using noninvasive instrumentation under supervision of dentist holding a valid general anesthesia or moderate sedation certificate.
DH	DA		30. Remove sutures. 30. Place and remove periodontal packs. 31. Dry root canals with paper points. 32. Place cotton pellets and temporary restorative materials into endodontic openings.
		DH DA	33. Place nonsurgical retraction material for gingival displacement.

Note: General Supervision means the dentist has prior knowledge and has given consent for the procedures being performed during which the dentist is not required to be present in the dental office or on the premises. Indirect Supervision means the dentist is in the office, authorizes the procedures, and remains in the office while the allied dental personnel are performing the procedures. Direct Supervision means the dentist is in the dental office, personally diagnoses the condition to be treated, personally authorizes the procedure, and before dismissal of the patient, evaluates the performance of the allied dental personnel.

Source: Minnesota Rules 3100.8500 and 3100.8700; Minnesota Statutes section 150A.10.

optimal care for patients. As the dental delivery system continues to transition from traditional small to larger practices, clinics may be able to achieve the Triple Aim of health care by utilizing team-based delivery models. In our study, 72% of the responding patients agreed that "More was accomplished during today's visit than I had planned," and nearly all (99%) agreed "My treatment was accomplished in a timely manner." Additionally, patients were made to feel a part of the team as students were taught to include them in the decision making process through consultation and clear communication.

Table 3. Comparison of patient outcomes by clinic group

Variable	Clinic Group A	Clinic Group B	TCC Group
Number of students per session	16	16	5
Total number of patient visits	1,082	1,035	452
Total gross revenue	$175,296	$154,791	$102,323
Total number of completed procedures	2,225	2,091	1,457
Average number of procedures completed per available chair	139.1	130.7	291.4
Procedures completed per patient visit	2.1	2.0	3.2

Note: The 16 DDS, DT, and DH students rotated through the TCC on a staggered basis, with five students (one DDS, one DT, and three DH, supported by a licensed dental assistant) in the TCC Group at any one time. The traditional clinic groups (A and B) have 12 DDS, one DT, and three DH students, supported by a licensed dental assistant.

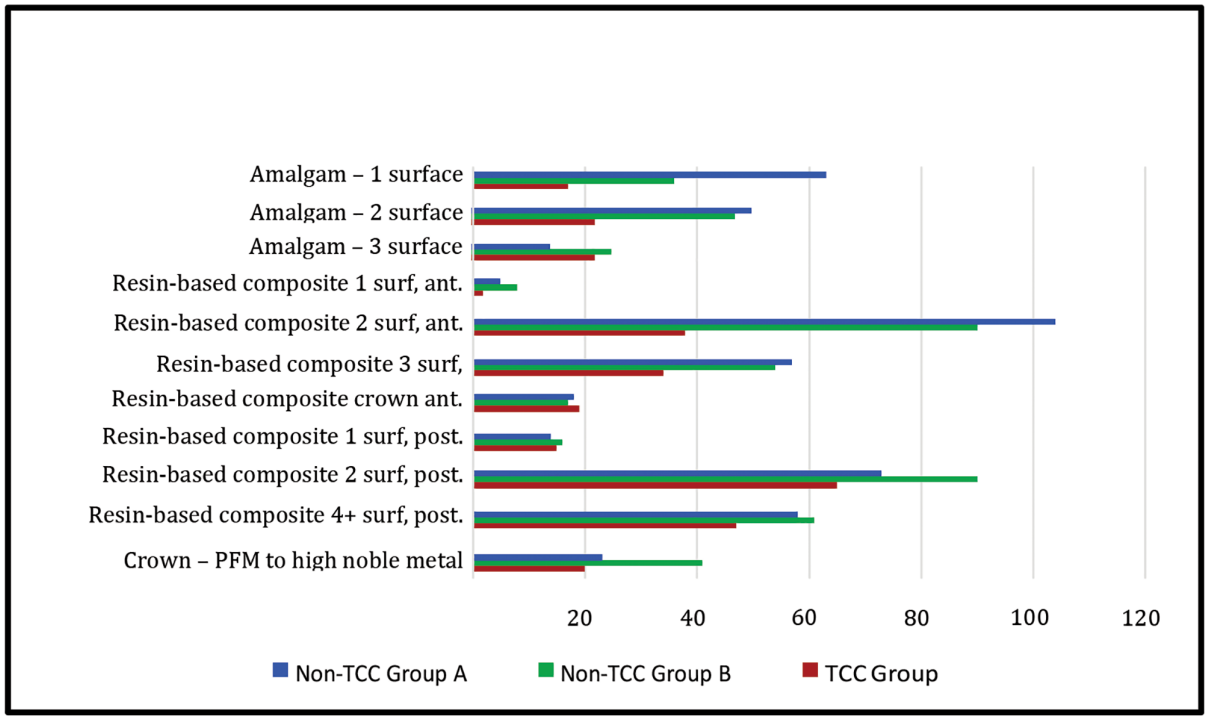

Figure 1. Total number of dental restorative procedures completed by group

Although this pilot was not designed to measure improvements in patients' health, a systematic review of oral health outcomes produced by dental teams found that "in select groups in which participants received irreversible dental treatment from teams that included midlevel providers, caries increment, caries severity, or both decreased across time."[20] That review also found "a decrease in untreated caries as compared to populations in which dentists provided all treatment."

As for reducing the cost of care, Beazoglou et al. reported that the use of "expanded function allied dental personnel had a significant and positive impact on practice productivity, specifically total net income and net income per dentist hour."[21] Beazoglou et al.'s study found that, as delegation increased, practices saw more patients and generated higher gross billings and net incomes compared to clinics that did not delegate to allied personnel. Our study supports the conclusion that team care delivery appears to

Table 4. Results of patient satisfaction surveys, January-April 2015, by percentage of respondents in each clinic model

Item	Team Care Clinic (n=105)	Comprehensive Care Clinic (n=700)
Efficiency		
All the treatment planned for today's visit was completed.	92% Yes	92% Yes
More was accomplished during today's visit than I had planned.	72% Yes	N/A
My dental treatment was accomplished in a timely manner.	91% Strongly Agree 9% Agree	85% Strongly Agree 10% Agree
Timeliness		
I was able to get an appointment in a timely manner.	91% Strongly Agree 9% Agree	90% Strongly Agree 10% Agree
I was seen for my appointment in a timely manner.	96% Strongly Agree 4% Agree	95% Strongly Agree 3% Agree
Courteousness measures		
I was greeted promptly and in a courteous manner.	95% Strongly Agree 5% Agree	92% Strongly Agree 5% Agree
My dental provider was professional and courteous.	96% Strongly Agree 4% Agree	95% Very Good 5% Good
My dental provider was sensitive to my treatment needs.	95% Strongly Agree 5% Agree	90% Strongly Agree 5% Agree
I was comfortable during the procedure(s).	93% Strongly Agree 7% Agree	94% Strongly Agree 4% Agree
Patient understanding		
My treatment was explained so I was able to understand.	95% Strongly Agree 4% Agree	96% Strongly Agree 2% Agree
All my questions were answered completely and to my satisfaction.	95% Strongly Agree 4% Agree	95% Strongly Agree 5% Agree
Satisfaction		
I am satisfied with the dental treatment I received.	95% Strongly Agree 5% Agree	95% Strongly Agree 4% Agree
I am satisfied with today's overall treatment.	94% Strongly Agree 6% Agree	94% Strongly Agree 5% Agree
I would recommend this clinic to family members.	95% Strongly Agree 5% Agree	95% Strongly Agree 5% Agree

Note: Percentages that do not total 100% had some "Neutral" responses.

be financially beneficial as the average revenue per patient visit was 50% higher in the TCC than the CCC. This result was likely because the DT students provided basic restorative treatment, freeing the DDS student to perform complex procedures that generated higher fees.

This pilot study also focused attention on the impact of the team care models on student providers. Bodenheimer and Sinsky have argued that the Triple Aim's patient-centered goals cannot be achieved if health care providers suffer burnout and thus recommended a fourth aim: improving the work-life of health care clinicians and staff.[22] Our study found the student providers were highly satisfied with the team-based care model, suggesting they may be change agents in their future practices.

With expanding scopes for dental hygienists and dental assistants and with the addition of dental therapists, dentistry is poised to embrace team-based care as medicine has. However, academic dental institutions will need to prepare the future oral health workforce for new models of care delivery. Interestingly, the themes emerging from the student focus groups were consistent with the IPEC's four core competencies,[18] suggesting, from an educational standpoint, that the TCC was able to cultivate high-functioning intraprofessional teams. Regarding IPEC domain 1 (values and ethics for interprofessional practice), TCC students placed the interest of patients at the center of their approach. While they provided collaborative care, they also developed mutual respect for each other's knowledge and expertise within their scopes of practice. The model fostered a trusting, non-hierarchal environment. Regarding domain 2 (roles and responsibilities), students reported they relied on their distinctive and complementary abilities to optimize patient care. The team huddle established roles for each treatment plan, and patient

Table 5. Examples of students' comments by theme

Theme 1: Teamwork
"We are like a little family. We know each other."
"We make sure everyone is okay."
"How productive we can actually be working as a team, and how fluid and adaptable the TCC is to new and unexpected situations."
"Team makes you more willing to throw in a prophy; things just happen when you are in a group session, and you can double book."
"All team members including the assistant help turn over the cubicle, seat patients, update records, blood pressure. You couldn't do 4 patients a day for dental students without the team being onboard."
Theme 2: Shared Achievement
"There were no specific roles. We took our roles from what we were doing that day, our procedures."
"We enjoy getting more done and being efficient with our time."
"In TCC, if you get done early then you take on more patients; in traditional clinic if you get done early you just leave."
"The sheer quantity of encounters boosted our respective skill levels and a lot of learning happened between us."
"Enjoyed, less stressed, and felt supported in TCC than in my [CCC] group."
"Team-based care is good for production; if you want to ramp up your revenue, this is a good way to do it."
Theme 3: Patient-Centered Care
"Team-based care was more patient-centered because it allowed us to provide more care in one visit." As a result, "Fewer patient visits to the clinic and more efficient use of their time."
"Usually the patient in the chair has met everyone in TCC."
"Never had patient leave unhappy."
"Patients received continuous care between providers."
"The patients liked seeing familiar faces; it really helps the patient feel comfortable."
"Patients liked to be part of the decision making process of the treatment."
"Two minds think better than one; more things get caught. We are all on the same page."
"Due to the efficiency and collaboration of the team, entire treatment plans could be completed."
"TCC was able to see many last minute or emergency patients and served them well."
Theme 4: Mutual Respect and Trust
"I don't think we [dental students] were really leading. We were all just in it."
"Working cross-professionally helped each person fully understand the scope of practice of their team and to better leverage their own scope."
"By giving me the ability to embrace situational leadership to optimize the skills of each team member, TCC has made me feel ready to graduate. Our experience in the TCC will influence how we will practice as future professionals."
"When I look for hygienists/therapists to go into practice, I would want them to be like these guys because I feel like I can trust them if I need to ask them a question."

needs drove team members to provide timely and efficient care. The flexibility of roles resulted in each student's adopting a collaborative and professional identity. Regarding domain 3 (interprofessional communication), TCC enhanced these intraprofessional students' communication skills and increased their productivity because of their ability to collaborate and delegate care. Faculty members gave students the freedom to delegate tasks and make decisions needed to maximize the volume of care delivered per patient visit and meet patient needs. The open, frequent, and honest communication improved team processes, which were key to ensuring all voices on the team were heard. Regarding domain 4 (teams and teamwork), students noted that the team approach motivated them to improve their performance. Additionally, patients reported feeling a part of the team as the student providers included them in the decision making process through consultation and clear communication.

Globally, health organizations are embracing the concept of optimizing the skills of care teams to address provider shortages and eliminate access barriers.[23] As solo dental practices are replaced by large group practices in integrated health systems, dental curricula must provide both intraprofessional and interprofessional educational experiences to prepare students for delivering care in an increasingly integrated health care system. In this transforming health care environment, benefits of the new delivery model suggest dental schools consider a shift from traditional clinic instructional to a team-based delivery model as described in this study. Because of the success of this pilot study, TCC was expanded to another group in the clinic.

Limitations of this study include sample size, length of study, low patient response rate, and limited participation in the focus group. It is also possible that volunteers in the TCC may have been intrinsically motivated to collaborate. If the CCC groups had twice as many patients and the same dental assistant-to-student ratio, the results may have been similar.

Conclusion

This article described a new intraprofessional team-based delivery model in a dental school clinic. Care processes were redesigned to reflect individual and team capacities for the safe and efficient provision of patient care. The team-based delivery model demonstrated many advantages over the non-TCC

model. The students in the TCC were able to utilize each other's skills to provide extra treatment per patient visit. The team-based delivery model has the potential to have a positive effect on clinic revenue, and it resulted in positive patient experiences as well as student provider experience. Even though our study was very small, its results urge consideration of an intraprofessional team-based model for educating students in the delivery of oral health care.

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