Research

Integrating Dental Hygienists into Medical Care Teams: Practitioner and patient perspectives

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Abstract

Purpose: The Colorado Medical Dental Integration (MDI) project explored ways to leverage medical visits with the goal of expanding access to dental services through the integration of dental hygienists (DH) into medical practices. The purpose of this study was to explore the perceptions of DH and patient participants in the MDI project.

Methods: A concurrent, mixed-methods approach was used. Qualitative key informant interviews were conducted with MDI DHs. A quantitative survey was administered to patient-participants who had received MDI care 18-24 months into the practices' participation in the project. Interviews explored DH's perceptions of working as an integrated DH, factors impacting MDI implementation, the level-of-Integration into the medical team, and how ways to access to dental services were expanded through the MDI. Interviews were recorded, transcribed, and analyzed for recurring themes using an iterative process. A patient-participant survey, available in English and Spanish, assessed perceptions regarding MDI care. Descriptive statistics were used to analyze the data.

Results: A total of 17 dental hygienists, across 15 MDI practices, agreed to participate. Generally, participants endorsed working in MDI practices and identified factors that were facilitators and barriers to MDI care. A total of 390 patients were surveyed for a response rate of 33%; one half (52%) had attended > 1 MDI visit. Most (95%) were extremely satisfied with MDI care and very few barriers to MDI care were reported.

Conclusions: Integrating dental hygienists into medical practices was generally endorsed by both the DHs and patient-participants. Dental hygienists reported various challenges to the MDI approach, however most were surmountable.

Keywords: access to care, dental hygienists, interprofessional collaboration, collaborative practice, health promotion

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Introduction

Despite improvements in oral health prevention and treatment, many individuals lack adequate access to oral health services and consequently experience oral health disparities.[1] Integrating preventive oral health services into primary care has expanded over the past decades, yet, has faced challenges.[2-4] In a recent scoping review of medical-dental integration, various models of integration were described; however, none described the integration of dental hygienists into primary care medical teams.[5] More commonly, the term medical-dental integration has been used to describe the delivery of preventive oral health services by medical providers/teams (e.g. caries risk assessment, oral health examination, fluoride varnish application and a coordinated

dental referral) at medical visits.[2, 6, 7] Patients have direct access to dental hygienists in 42 states.[8] Most literature describing dental hygienists working in non-traditional settings includes examples of employment in school settings and/or public health environments.[9,10] There are emerging descriptions of the dental therapists' experience,[11-13] but there is a paucity of literature describing or evaluating models that integrate dental hygienists into medical teams in primary care practices.

Colorado has been testing models of integrating dental hygienists into medical teams with the goal of expanding access to dental services for populations who have limited access to dental care due to insurance status, living in dental professional shortage areas and other barriers. Over the past

decade, the Delta Dental of Colorado Foundation (DDCOF) has supported medical-dental integration, beginning with the co-location of direct-access dental hygienists into medical practices (2007-2011).[14] In 2014 DDCOF expanded their original approach to a new model which integrated dental hygienists directly into medical care teams, allowing for the full scope of dental hygiene services to be delivered within the medical practices. Using a level-of-integration scale of one to six, where a level five or six includes having a common workspace, support staff members, electronic health record, workflows and treatment goals,[15] dental hygienists were integrated at a level of five or six with coordinated referrals to co-located dentists (when available) or outside community dentists. The purpose of this study was to explore dental hygienists' perceptions of working as a member of an integrated medical team and patients' perceptions regarding medical-dental integration (MDI) care. Factors impacting implementation of MDI, the level-of-integration of dental into medical teams, and how MDI expanded access to dental services were also examined.

Methods

This study was approved by the Colorado Multiple Institutional Review Board, Protocol 15-0263. A concurrent, mixed-methods approach was used; qualitative interviews were conducted with the MDI dental hygienist participants and a quantitative survey was administered to patient-participants who had received MDI care. Participants in each approach were independent, therefore both approaches were considered primary and analyzed independently. Results were integrated in the interpretation phase.

Key Informant Interviews

A semi-structured interview guide to explore dental hygienists' perceptions related to MDI was developed by the study team (Table I). A qualitative research expert piloted the interview guide and refined it to improve its validity and fit for the setting. All dental hygienists from the healthcare organizations participating in the MDI (n=15) project were invited to complete a semi-structured telephone interview during a two-month period in 2018. At that point in time, organizations were 18-24 months into MDI implementation. Each MDI dental hygienist received up to four email-invitations over a 2-month period. Two investigators conducted all interviews with only the interviewer and interviewee present. Interviews lasted approximately 30-60 minutes. Summary notes were made following each interview and reviewed by the study team during analysis. All interviews were audio-recorded and securely sent for verbatim transcription by an independent professional transcription service. No compensation was provided for participation.

Content analysis was used to identify themes and subthemes within and across all interviews.[16] A hybrid of both deductive and inductive approaches from data collection throughout the analysis was applied.[17] Themes and subthemes were formulated using team-based analysis. Trained qualitative data analysts iteratively read transcripts, individually coded three transcripts to develop and refine both the codebook and coding approach and met to discuss emergent themes. One analyst was a content expert and provided subject matter context to the evaluation. The team compared the individually coded text, discussed code definitions, and edited codes to accurately describe these data. All remaining transcripts were then coded using these agreed upon definitions.

Open and axial coding of transcripts were used to form the basis of analysis: open coding included labeling concepts and defining and developing categories based on the interview data and axial coding was used to confirm and explore relations between transcripts by applying a priori concepts to the data.[18] The analyst team met regularly to check biases and understand emergent themes and intercoder reliability was confirmed. A software program (ATLAS.ti 7.0; Scientific Software Development GmbH, Berlin, Germany) was used to complete coding and analysis.

Patient Satisfaction Survey

The parents of children and adult patients seen by the integrated dental hygienists in the MDI project (2016 and 2018) were asked to complete a paper survey (English/Spanish). The MDI clinical teams were instructed to ask all patients seen by the dental hygienist within the specific time frame of the study, to complete the survey and place it in an anonymous collection box/area. Surveys were written in English/Spanish and did not include participant identifiers. Six practices were excluded from the survey collection process: one practice exclusively served refugee patients (language/translation barriers), two school-based practices (parents did not attend visits), two practices had transitioned to a co-located model, and one practice had a dental hygienist on leave.

The survey was developed using questions from a previous study on co-location care satisfaction[14] and measured participants' perceptions regarding MDI care. The 20-item survey was piloted in a convenience sample of participants and then refined prior to administration. Four-point Likert scales were used to measure perceptions: satisfaction (extremely to not-at-all satisfied), barriers (big problem to not a problem) and attitudes (strongly agree to strongly disagree). Descriptive statistics were calculated to describe baseline socio-

Table I. Key informant interview questions	
Objectives	
Describe dental hygienists' perceptions regarding working in MDI practice.	Tell me what you think about working in a medical practice/office without a dentist?
	Probe: what are some of the benefits of this arrangement? What are some of the challenges?
	If you were hiring a new dental hygienist to work on the project, what experience and characteristics would be important to look for?
	Would you recommend this kind of dental hygiene position to your friend? Why, why not?
	What additional knowledge or skills does a dental hygienist need for medical-dental integration work?
	How do you feel about the scope-of-practice you are providing?
	What are some of the things you considered when deciding whether to participate in the project?
Identify factors impacting implementation of medical-dental integration.	What has worked well in the implementation of the MDI project at your practice? What hasn't worked well?
	What were the biggest challenges you have encountered while working on this project?
	Describe the characteristics of your practice that made it easier to implement the MDI project? More difficult?
	Describe the characteristics of your organization that made it easier to implement this project? More difficult?
	Has your practice been able to devote enough time to work on medical-dental integration? If no, why not?
Assess level-of-Integration of dental hygienist into medical team.	How do you feel about your role in the practice? Are you "part of the team?"
	What do others at the practice think about the project? Probe: providers, staff, dentist(s) you're working with, patients?
	What does your practice/team do to solve problems? How are those approaches working?
	Describe the communication between you and your practice's staff. How about the communication between you and the referral dentist/dental office staff?
	Tell me about your practice's workflow and how you see patients. How is this workflow working? How could it be improved?
	What is the billing process for your services? What is your role in it? Whom do you work with for billing? How could it be improved?
Evaluate how medical-dental integration expands access to dental services.	Do you think this project meets the dental needs of your patients? If not, why not? If so, how so?
	What things need to change to better meet your patients' dental needs?
	What are some of the barriers patients in your practice face when trying to access dental care? How has this project addressed any of those barriers?
	Do you think that this project has addressed any of those barriers? If so, how? If not, why not?

demographics of the study population, and baseline and follow-up variables. Data are presented as means and ranges for continuous data and percent of whole for categorical data.

Results

The 15 participating MDI health care organizations included federally qualified health centers (n=6), nonprofit practices (n=5), school-based health centers (n=2), and private for-profit practices (n=2). A total of 17 dental hygienists employed as part of the MDI project agreed to participate, only one declined. Dental hygienists practicing in the MDI settings provided a variety of services including caries risk assessments, fluoride varnish applications, sealants, dental radiographs, scaling and root-planing. Characteristics of the MDI health care organizations are shown in Table II.

Qualitative Findings

Interview themes

Three major themes emerged as factors impacting successful medical-dental integration. Individual-level impacts included dental hygiene skills and personal characteristics. Practice-level impacts related to leadership support, workflow support (billing and front office/medical assistant (MA) support), scheduling DH visits, patient volume, and the a lack of onsite dentist. The system-level impacts included areas such as insurance policy limitations and insufficient reimbursements. Overall, the participant perceptions did not differ based on the type of health care organization in which they were employed.

Dental hygiene skills and personal characteristics

Certain dental hygiene skill sets and characteristics emerged as important for MDI success. Integration into the

Table II. Medical Dental Integration (MDI) organization characteristics, 2016

Practice	Type	Setting	Size[1]	Level of integration[2] (1- 6)	DH interviews (n=17)
1	Nonprofit	Urban	Small	5	1
2	FQHC	Urban	Medium	6	1
3	FQHC	Urban	Large	6	1
4	FQHC	Urban	Medium	5	2
5	FQHC	Rural	Small	5	1
6	Nonprofit	Urban	Small	5	2
7	FQHC	Urban	Large	5	1
8	Nonprofit	Urban	Small	5	1
9	Nonprofit	Urban	Small	5	1
10	Nonprofit	Urban	Small	4	2
11	Private/For-profit	Urban	Small	3	1
12	FQHC[3]	Rural	Medium	5	0
13	Private/For-profit	Rural	Small	4	1
14	FQHC (SBHC)[4]	Urban	Large	6	1
15	FQHC (SBHC)[4]	Rural	Small	5	1

1 Small: < 10,000; Medium: 10,000-50,000; Large > 50,000 unduplicated visits (2018 UDS data).

2 Level-of-Integration: see criteria

3 FQHC: Federally Qualified Health Center

4 SBHC: School Based Health Center

medical system was universally new to the participants and they possessed a range of professional skills and personalities. When asked what characteristics were necessary for this kind of work, participants replied that it was important for dental hygienists to be adaptable, problem-solvers, good negotiators, and able to work independently yet also build professional and clinical relationships. Participants also emphasized that willingness to "learn-by-doing" was required for success. One dental hygienist summarized:

> "It's a hard position…I am a one-person dental office, less the dentist, because I literally do everything, except for the scheduling. You have to be someone who is willing to be very thorough, be willing to switch up doing something at the drop-of-a-hat, be able to 'multitask on steroids."

Participants also expressed the importance of a being willing to work with challenging patient populations. Many of the MDI practices cared for vulnerable populations which required the dental hygienist to be compassionate and willing

to meet the individual needs of the patient population.

> "…you definitely want someone here who has compassion for the demographic of people that we work with—a lot of homeless men. And I specifically work with foster care kids. I see a lot of child abuse and neglect."

Leadership support

The individual health care organization's support of the integration of the dental hygienist into the medical teams was essential. At medical practices where integration was successful participants described a supportive practice-site leader; within the practices with failed integration, participants described a lack of clinic leaders' support for the dental hygienist and/or the MDI concept. Successful practice leaders provided enabling/enforcing support such as clerical staff to schedule dental hygiene patients, billing staff to bill for the dental hygiene services provided, and medical assistants to screen patients who were eligible for integrated care and/ or to complete warm hand-offs to dental hygienists for same-day services. One participant from a successfully integrated

practice shared how initial challenges were solved through the practice leadership.

> "It took almost 3 months to get her [a receptionist] trained and willing to just change the schedule… everyone is so resistant to doing additional work…the only way to get that done was to have leadership tell them they have to do it."

Participants reported that when a practice lacked leader support for dental hygiene appointment scheduling and billing, it appeared to impair the MDI process. One participant from a practice struggling with the MDI process stated that she had to do her own scheduling.

> "The dental program was not a priority for anyone… the lady who was in charge of scheduling…she really didn't care much about it and her staff, which is the front desk, they didn't care either."

Anecdotally, this particular practice's chief operating officer ended their MDI project work citing that the dental hygienist did not see enough patients.

Workflow support

Another practice-level theme that influenced the dental hygienists' integration was the delegation of work to other team members to support dental hygiene workflows. When work was delegated to other team members and the leadership was able to motivate staff to support integrated dental hygiene care, the MDI practice was more likely-to-succeed. For instance, when leaders delegated dental screening tasks to medical assistants and motivated them to complete these added tasks, practices were more successful with completing integrated dental hygiene visits. Also, at successful practices, medical assistants also helped check in DH patients and monitor patient flow. A participant from one successful MDI site described a strong working relationship between dental and medical staff.

> "We all work really well together. I can go straight to the MAs and MD and just tell them what we need and…if they see where there is a patient that needs [dental hygiene] care right away, they can come straight to us, and we are able to see that patient immediately."

Furthermore, this practice developed a check-in process that included each medical assistant routinely mentioning to their patients that dental hygiene services were available and "…if the patients are willing to be seen, we are able to see them. That isn't a problem for us." This was in contrast to what was experienced at practices with less-successful integration. For example, one participant from a practice that struggled with integration stated,

> "it has been extremely hard to get the medical assistants onboard to let the patient know that there is a hygienist in the office, and they can have their dental hygiene services here. In my opinion, I seem to be put as the low man on the totem pole."

However, a participant from a practice that had successfully integrated the dental hygienist into their setting shared,

> "The longer I was there, and the more people got accustomed to me, the more I felt a part of the team."

Also, a significant barrier to dental hygiene integration was the expectation that it was incumbent upon the dental hygienist (at some sites, sole responsibility) to fit the dental practice needs, billing, and identification of new patients, into the established medical practices' processes, patients, and practice billing structure and procedures. Yet, some practices had leaders who supported a culture that promoted the medical staff and providers working with the dental hygienist and made incremental changes in their culture to increase staff awareness and held them accountable for their role in making MDI successful (a "continuous improvement culture"). The ability of the medical practice to implement practice change incrementally appeared to be associated with successful integration. One participant shared,

> "We have weekly clinic meetings and we have biweekly staff meetings and bring up issues that we have, as well as the supervisors also discuss what issues that we're having that aren't working…[and] need to be dealt with."

Dental hygiene appointments

Participants reported a range of experiences with scheduling patients across the practices. The act of scheduling new and returning dental hygiene care visits was a key factor in how the participants perceived successful/unsuccessful integration. The MDI practice benefited when the administrative staff scheduled the dental hygiene patients. One example was a MDI within a school-based health center practice, co-located where children spent their days in the classroom. In such settings, the dental hygienists could more easily see patients,

> "…[I have] a list of kiddos I can pull from class… being able to schedule and do that from the get-go was a huge thing that played a huge role in it for families [to access dental care at her site"].

Workflow support in regard to scheduling dental hygiene care visits was mentioned by other participants as important factors to MDI success.

Low patient volume

Participants working in small practices with low patient volume faced particular challenges including the frequency

of low-patient visit days impacting the opportunities for MDI visits, combined with a high no-show rate. One DH shared,

> "Well, it was slow. It was real slow; a typical day, three patients, probably if lucky enough, 4 to 5….and there would be days that I had nobody…and there were a lot of patients who would not show up."

Lack of an onsite dentist

Another practice-level challenge was not having an onsite-dentist for restorative dental services. A few of the participants expressed that they believed it was a unique and exciting opportunity to practice independently from dentists, however, most participants described difficulties associated with not having an onsite dentist. This created a barrier for patients to access restorative dental care and was particularly concerning to the participants. Low-income and patients with emergent needs were noted to be particularly vulnerable. One participant stated,

> "…sending children to off-site clinics is kind of a barrier to care because it's hard for families to get to the clinic where the dentist is."

Challenges for patients to receive dental care from a dentist also included a lack of capacity on referral dentists' schedules to absorb the dental hygienists' patients. One participant noted that,

> "…there are not enough dentists providing the actual dental care, even with a 'backdoor' clinical relationship between the dental hygienist and dental practice."

Finally, participants described challenges with practicing solo and not having a dentist, "…just to run things by" to help make a clinical determination or, for instance, to approve their use of anesthesia or nitric oxide with a periodontal patient.

Insurance eigibility

Though it was mentioned less frequently, the need to verify the patients' insurance status was described as a barrier for several MDI practices. In Colorado, medical and dental insurance portals are separate. Additionally, medical claims are traditionally paid by diagnosis and dental claims are paid by procedure (with frequency limitations). Since few of the front office administrators had started this program with in-house knowledge or experience with handling dental insurance, MDI practices had to invest time into teaching the staff how to check and confirm dental insurance eligibility and coverages for patients, or else the dental hygienists in each MDI practice were required to complete these activities.

Dental insurance reimbursement

Some participants described frustration with providing services that were eventually not reimbursed. A variety of reasons were cited for denying dental claims including dental insurance benefit changes, lack of expertise in accurately submitting the insurance claims, providing services prior to coverage, and changes in coverage. Some participants stated that keeping up with benefit changes took time away from providing direct care and was a frustrating aspect of the MDI project. One participant expressed, "I wish that Medicaid would settle down. They just change the rules all of the time."

Quantitative Results

Patient and parent surveys

A total of 1,196 patient-participants were provided integrated dental hygiene care during the months surveyed in the participating MDI practices. One-third of the participants (n=390) completed the paper survey. Respondent demographics are shown in Table III. In general, the respondents favored the MDI care they received. A majority reported being satisfied with the care (100% extremely/very), more likely to recommend the MDI practice with a dental hygienist to friend/family than one without (95% strongly agree) and were likely to return to the dental hygienist in the future (95% strongly agree). Most reported that they were more likely to take self/child to a dental hygienist located within the medical office than outside (75% strongly agree). More than three-quarters (78%) agreed that MDI care was more convenient than traditional care. Patient and parent perspectives regarding MDI care are shown in Table IV.

Regarding barriers to utilizing dental hygiene care in a MDI setting, a little more than one half of the respondents (52%) reported that it was problematic that the dental hygienist was not able to fill cavities. General barriers to receiving MDI care are shown in Table V.

Discussion

In this mixed-methods investigation into the perceptions of dental hygienists and patients/parents participating in medical dental integration programs, both the dental hygienists and patient/parents endorsed the benefits of integrated dental hygiene services. Dental hygienist participants reported various, but not unsurmountable, barriers to providing integrated care. Dental hygienists working in this non-traditional MDI model were enthusiastic about providing care to an underserved population, however they identified challenges and reported that working in this non-traditional setting required unique skills. These skills have been similarly described in an investigation of extended-function dental hygienists by Delinger et al.[9] Dental hygienists working in an extended function capacity needed to be entrepreneurs

Table III. Patient/parent demographics

Practice setting*	All	1	2	3	4	5	6	7	8	9
Surveys completed	390	12	16	19	18	104	100	19	28	74
Reported number of dental hygiene visits during the survey month**	1196	55	314	144	260	133	120	53	28	89
Response Rate	33%	22%	5%	13%	7%	78%	83%	36%	100%	83%
Characteristic	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n(%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Age (years)										
0 - 12	155 (40)	2 (17)	–	3 (16)	14 (78)	14 (13)	74 (74)	6 (32)	7 (25)	35 (47)
13 -18	67 (17)	0 (0)	–	10 (53)	3 (17)	2 (2)	18 (18)	6 (32)	10 (36)	18 (24)
Greater than 18	87 (22)	9 (75)	4 (25)	3 (6)	0 (0	42 (40)	0 (0	0 (0	10 (36)	19 (26)
(no response n=81)										
Hispanic or Latino/Latina (no response n= 35)	188 (48)	6 (50)	4 (25)	9 (47)	4 (22)	49 (47)	54 (54)	5 (26)	18 (64)	39 (53)
Dental insurance plan										
Medicaid	240 (62)	8 (67)	7 (44)	6 (32)	13 (72)	44 (42)	73 (73)	10 (53)	13 (46)	69 (93)
State Child Health Insurance	23 (6)	0 (0)	0 (0)	1 (5)	0 (0)	1 (1)	10 (10)	4 (21)	0 (0)	3 (4)
Private	13 (3)	0 (0)	0 (0)	0 (0)	2 (11)	8 (8)	3 (3)	0 (0)	0 (0)	0 (0)
None	56 (14)	2 (17)	4 (25)	10 (53)	1 (6)	38 (37)	8 (8)	4 (21)	1 (4)	0 (0)
Don't know/ Missing	58 (15)	2 (16)	5 (31)	2 (10)	2 (11)	13 (12)	7 (7)	1 (5)	14 (50)	1 (1)
(no response n=27)										
One or more visits with a dental hygienist?	201 (52)	2 (17)	4 (25)	9 (47)	6 (33)	65 (62)	70 (70)	8 (42)	13 (46)	27 (36)

* Six of the 15 MDI practices did not participate in the data collection process

** Participants were surveyed during the 18th month of the MDI program

with good communication skills, demonstrate the ability to network, problem solve, think critically, and possess strong administrative skills.[9] Patient and parent satisfaction levels were similar to perceptions previously reported by recipients of dental hygiene services co-located with medical providers.[14]

Medical-dental integration studies reported in the literature have primarily focused on preventive oral health services delivered by medical providers/teams such as caries risk assessments, oral health examinations, fluoride varnish applications and coordinated dental referrals.[2,6,7] Barriers reported by medical teams relating to the provision of these services in the medical office setting have been almost exclusively at the provider- or practice-levels.[3,4] Additional barriers have included lack of training,[3] and lack of sufficient time to plan for change or the logistics of providing these services.[3,4]

In comparison, this study employed a unique model of oral health promotion in the medical setting and provides new results to the literature. The embedded dental hygienists in this MDI project provided full-scope dental hygiene care within the medical practice. While some of the reported practice-level barriers were similar regardless of the approach, such as lack of efficient workflow/logistics, it is noteworthy that lack of time did not emerge as a theme in this study. Rather, a low patient volume was mentioned by some participants. This may be due to the finding that medical providers providing oral health services commonly focus on young children and already incorporate oral care into the existing medical care visit,[2,6,7] whereas the embedded dental hygienists in MDI practices provided care to a broader spectrum of patients and the appointments were separate from medical visits.

Table IV. Patient/parent perspectives regarding Medical Dental Integration

MDI practice setting	All	1	2	3	4	5	6	7	8	9
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
How satisfied are you with the dental care received from the dental hygienist in this medical office? (extremely/very) (no response, n=13)	371 (95)	12(100)	16(100)	17 (89)	7(94)	104 (100)	95(95)	17(89)	28 (100)	74(100)
It is more convenient to get dental care from a dental hygienist located in the medical practice than a traditional dental office. (strongly agree) (no response, n=4)	304 (78)	10 (83)	14 (88)	11 (58)	13 (72)	80 (77)	87 (87)	19 (100)	11 (39)	62 (84)
I am more likely to take myself/my child to a dental hygienist located in medical office than a traditional dental office. (strongly agree) (no response=7)	291 (75)	9 (75)	11 (69)	17 (74)	8 (44)	75 (72)	89 (89)	16 (84)	12 (43)	58 (78)
I am more likely to take myself/my child to medical office that has a dental hygienist than medical office without a dental hygienist. (strongly agree) (no response=12)	274 (70)	7 (58)	10 (63)	12 (63)	12 (67)	72 (69)	82 (82)	16 (84)	11 (39)	55 (74)
Getting dental care at same time as medical care makes sense. (strongly agree) (no response=13)	329 (84)	10 (83)	13 (81)	13 (68)	16 (89)	87 (84)	90 (90)	17 (89)	16 (57)	68 (92)
Do you plan on bringing yourself/your child to the dental hygienist in this office in the future? (strongly agree) (no response=5)	357 (92)	12 (100)	16 (100)	18 (95)	12 (67)	98 (94)	97 (97)	16 (84)	21 (75)	67 (91)
Would you recommend this medical office to a friend or family member because a dental hygienist works here? (yes/no) (no response=6)	372 (95)	12 (100)	15 (94)	19 (100)	16 (89)	101 (97)	96 (96)	16 (84)	24 (86)	73 (99)

Table V. Reported patient/parent barriers to using integrated dental hygiene care in a medical setting

		All n (%)	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)	6 n (%)	7 n (%)	8 n (%)	9 n (%)
The dental hygienist is not in this medical office at convenient times. (no response = 29)	Not a problem,	249 (64)	8 (67)	7 (44)	7 (37)	10 (56)	86 (83)	54 (54)	11 (58)	16 (57)	50 (68)
	Somewhat of a problem	47 (12)	1 (1)	0 (0)	8 (42)	0 (0)	9 (9)	17 (17)	4 (21)	2 (7)	6 (8)
	A big problem	19 (5)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	11 (11)	2 (11)	1 (4)	4 (5)
	Don't know	44 (11)	3 (25)	3 (19)	2 (11)	2 (22)	6 (6)	11 (11)	1 (1)	8 (29)	8 (11)
Takes too much time to see both the medical provider and the dental hygienist on the same day. (no response = 24)	Not a problem,	284 (73)	11 (92)	7 (44)	10 (53)	15 (83)	75 (72)	74 (74)	13 (68)	7 (25)	63 (85)
	Somewhat of a problem	30 (8)	0 (0)	1 (1)	5 (26)	0 (0)	9 (9)	6 (6)	1 (19)	5 (18)	3 (4)
	A big problem	12 (3)	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	7 (7)	3 (19)	0 (0)	1 (1)
	Don't know	40 (10)	1 (8)	2 (13)	1 (1)	0 (0)	18 (17)	7 (7)	0 (0)	7 (25)	4 (5)
I am/my child is afraid to see the dental hygienist. (no response = 26)	Not a problem,	308 (79)	12 (100)	8 (50)	12 (63)	13 (72)	85 (82)	76 (76)	18 (95)	25 (89)	59 (80)
	Somewhat of a problem	36 (9)	0 (0)	1 (1)	5 (26)	1 (1)	11 (11)	12 (12)	0 (0)	1 (4)	5 (7)
	A big problem	3 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (4)
	Don't know	16 (4)	0 (0)	1 (1)	0 (0)	1 (1)	3 (3)	6 (6)	0 (0)	1 (4)	4 (5)
Cost to see the dental hygienist is too high. (no response = 26)	Not a problem,	272 (70)	10 (83)	5 (31)	17 (90)	10 (56)	69 (66)	77 (77)	12 (63)	16 (57)	56 (76)
	Somewhat of a problem	26 (7)	1 (1)	0 (0)	0 (0)	3 (17)	10 (10)	6 (6)	0 (0)	4 (14)	3 (4)
	A big problem	12 (3)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	6 (32)	1 (1)	3 (4)
	Don't know	51 (13)	1 (1)	3 (25)	0 (0)	2 (1)	18 (17)	11 (11)	0 (0)	7 (25)	9 (12)
Too busy to take myself/my child to dental hygienist. (no response = 33)	Not a problem	303 (78)	9 (75)	7 (44)	14 (74)	11 (61)	83 (80)	88 (88)	18 (95)	19 (68)	54 (73)
	Somewhat of a problem	43 (11)	2 (2)	0 (0)	3 (16)	3 (17)	13 (13)	3 (3)	0 (0)	7 (25)	12 (16)
	A big problem	4 (1)	0 (0)	0 (0)	0 (0)	0 (0)	2 (2)	0 (0)	0 (0)	0 (0)	2 (3)
	Don't know	6 (2)	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	1 (1)	2 (3)
Dental hygienist doesn't take my/my child's dental insurance. (no response = 36)	Not a problem,	276 (71)	10 (84)	5 (31)	17 (90)	12 (67)	73 (70)	75 (75)	12 (63)	15 (54)	57 (77)
	Somewhat of a problem	12 (3)	1 (1)	0 (0)	0 (0)	1 (1)	2 (20)	3 (3)	1 (5)	0 (0)	4 (5)
	A big problem	19 (5)	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)	8 (8)	3 (16)	1 (0)	5 (7)
	Don't know	43 (11)	0 (0)	2 (2)	0 (0)	0 (0)	18 (17)	6 (6)	0 (0)	12 (43)	5 (7)
Dental hygienist does not fill cavities. (no response = 27)	Not a problem,	180 (46)	6 (50)	4 (25)	1 (5)	12 (67)	50 (48)	52 (52)	5 (26)	11 (39)	39 (53)
	Somewhat of a problem	56 (14)	1 (1)	0 (0)	13 (68)	0 (0)	16 (15)	6 (6)	6 (32)	2 (7)	12 (16)
	A big problem	28 (7)	0 (0)	0 (0)	1 (1)	0 (0)	8 (8)	12 (13)	2 (11)	2 (7)	3 (4)
	Don't know	74 (20)	5 (49)	3 (2)	1 (1)	3 (17)	23 (22)	22 (22)	4 (21)	12 (43)	14 (19)

Dental hygienist participants in this study also commonly mentioned the healthcare organizations' lack of experience with providing dental services such as unfamiliarity with dental insurance and lack of leadership support, issues that were less commonly reported in investigations of medical providers providing preventive dental services themselves. Regardless of the approach, barriers to providing preventive oral health services in the medical office exist but are surmountable. Evidence supports the efficacy of oral health promotion by medical providers on reducing dental disease,[6,7] however, more investigation is needed to explore the impact of integrating dental hygienists into medical care teams on oral health outcomes.

System-level challenges, including insurance payment policy restrictions, have been cited in the literature when describing the barriers to providing dental hygiene services outside of traditional dental practice settings.[9,19] Dental hygienists interviewed in this study shared that insurance barriers included not being able to bill under a medical providers' license (which led to limited reimbursement) as well as providing dental hygiene care within the constraints of dental-insurance-recall-frequencies. These arbitrary con-straints limited the type of care provided and the frequency of the dental hygiene care visits despite the risk for oral diseases. In a survey of expanded-access dental hygienists in Oregon, barriers to working outside of traditional dental practices included challenges with insurance reimbursement and difficulty obtaining a collaborative agreement/cooperating facility.[19] An investigation of direct-access dental hygiene care in Kansas reported similar barriers in addition to dental hygienists not being able to directly bill for services rendered.[9] Participants interviewed in this study also mentioned reim-bursement concerns including the lack of dental insurance in addition to challenges in keeping appraised of dental-benefit updates.

Study participants rarely mentioned challenges with establishing a collaborative agreement with a dentist. More commonly, dental hygienists in this study noted challenges in finding dentists to refer patients with untreated dental decay. This barrier has also been cited in previous work investigating barriers to medical providers providing preventive dental services.[4] While integrating dental hygiene care into medical settings expanded access to dental services, system-level barriers persisted including disparities in dental insurance coverage and differences in how medical and dental claims are reimbursed. Comprehensive healthcare insurance, which includes both medical and dental coverage, has the potential to reduce these barriers.

Findings from this study are similar to those describing behavioral health integration in medicine. Specifically, factors cited to be important to behavioral health integration include having an empowered leadership team, integrated care processes, and workflows.[20] In a qualitative study of integrated behavioral health specialists, similar facilitators and barriers were identified, including the importance of leadership support for building new models, the benefits of any prior experience with integration, and the importance of support from others doing similar work.[21-23] Developing efficient workflows was also cited by the dental hygienist participants interviewed in this study and have been noted as critical to the successful of behavioral health integration.

This study adds to the literature describing stakeholders' perceptions with integrating dental hygienists into medical care teams. Strengths include reporting comprehensive perceptions of dental hygienists working in a variety of MDI healthcare systems. Limitations of this study include a lack of generalizability. Although 42 states allow direct-access to dental hygienists, practice acts vary state-by-state so the level of independent care provided in Colorado may not apply to all direct-access states. While patients/parents were intentionally surveyed 18 months into their practices' participation in MDI, patients' experiences varied as each practices' approach to the MDI model were customized based on the practice size and population. The participating dental hygienists reported the number of patients seen during the month that the survey was collected, and the authors cannot confirm that all patients received a survey. Additionally, while the survey had been used previously in a similar study,[14] the instrument was not validated. Also, reporting bias may have impacted the responses as well as missing data.

Conclusions

Results from this study support that this innovative approach of integrating dental hygienists into medical practice settings provided patients with a favorable alternative access to oral health care services. Challenges to this medical-dental integration approach included dental insurance limitations, challenges with integrating the dental hygiene care workflows, limitations on the dental hygienists' ability to restore decay, and a lack of available dentists to provide restorative care to vulnerable populations. However, many of these challenges were surmountable. Building a dental hygiene workforce ready to deliver integrated care is warranted for the future.

Disclosure

Project (CO MDI). The content is solely the responsibility of the authors and does not represent the official views of the DDCOF.

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