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Journal of Interprofessional Education & Practice 15 (2019) 119–126

Contents lists available at ScienceDirect

Journal of Interprofessional Education & Practice

journal homepage: www.elsevier.com/locate/jiep

The benefits of interprofessional learning and teamwork in primary care ambulatory training settings

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ARTICLE INFO

Keywords:
Interprofessional teamwork
Health professions education
Interprofessional education
Interprofessional learning
Qualitative research

ABSTRACT

Background: New skills for assembling, working effectively in, and leading teams are needed to prepare the next generation of health professionals who work in outpatient settings.
Purpose: To report on a qualitative analysis conducted with 27 residency primary care training programs that included multiple health professional learners.
Methods: Twenty-seven focus groups were conducted with family medicine, general internal medicine and general pediatrics faculty, clinic staff, and diverse groups of learners to identify benefits of learning together in ambulatory primary care practices. Independent and consensus open and axial coding techniques applied to focus group field notes with consensus meetings identified emergent themes.
Discussion: Four themes were beneficial: Development of Personal Relationships, Improved Education, Improved Patient Care and Improved Job Satisfaction. Enablers to realizing benefits involved leadership support, co-location of learners and having adequate space for team huddles, which allowed health professionals to collaborate and learn together. Barriers to achieving benefits included top-down leadership approaches, poor communication, and lack of knowledge of roles and professions. Inadequate staffing, space constraints, scheduling challenges and clinic productivity pressures made interprofessional learning difficult.
Conclusions: Clinic culture, structures and operations both enable or create barriers to interprofessional learning.

1. Introduction

Though still evolving in response to healthcare reforms, the Patient Centered Medical Home (PCMH) holds promise as a transformative model for delivering primary care toward improving the quality of care and health outcomes among the U.S. population while containing costs as stated in the "Triple Aim".[1,2] A key attribute of PCMH is the provision of comprehensive care, which requires a team of care providers.[3] New skills, especially those associated with assembling, working effectively in, and leading teams,[4–8] are needed to enhance the preparation of the next generation of health professionals who primarily work in outpatient settings. Physicians, nurses, behavioral health providers, pharmacists, care managers, and other health care professionals must coordinate their efforts to provide effective patient care, yet most of these professionals have never trained *together* in outpatient settings.

Prior research indicates that the three primary care disciplines in medicine (family medicine, general internal medicine and general pediatrics) are typically in different places in their development of clinical and educational transformation toward team-based care.[9] Additionally, faculty in all healthcare professions need to break down traditional siloes toward creating a culture where interprofessional teamwork is part of the fabric of everyday patient care.[8] Competent clinical systems are necessary to produce skilled clinicians,[10–12] as it is clear that the clinical learning environment in which one trains affects future performance. Centering transformation in academic primary care practices creates an explicit link between clinical and educational redesign and exposes primary care medical residents and other trainees to new care models and core competencies for interprofessional teamwork.[13]

Several important gaps exist in the current literature on interprofessional education (IPE). These include that the majority of papers on IPE in the health professions report on what occurs in classroom settings,[14] with outcomes at the lowest level of the Kirkpatrick model (change in attitude and perceptions of other professions).[15] Focusing on interprofessional learning in actual clinical practice allows for higher levels of learning, such as changes in behavior and improved performance at both the level of the individual and the team. Another

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https://doi.org/10.1016/j.xjep.2019.03.011
Received 27 November 2018; Received in revised form 11 March 2019; Accepted 25 March 2019

weakness in published studies is that most report on team-based care activities based in inpatient rather than outpatient settings.[16–20]

A program, guided by the Interprofessional Learning Continuum Model,[21] was designed to equip interprofessional teams of primary care faculty with the skills to transform traditional primary care training environments into high functioning PCMHs with active interprofessional learning occurring in ambulatory settings at its center. Interprofessional learning is defined as "learning arising from interactions between members (or students) of two or more professions, which may be a product of interprofessional education or happen spontaneously in the workplace or in education settings and therefore be serendipitous in nature".[22] The ultimate goal was to catalyze transformation in primary care training and foster continued collaboration among primary care health professionals. Based on a guiding model, learners in this study spanned undergraduate and graduate education (medical residents and other health professional graduate trainees, such as nurse practitioner, physician assistant and PharmD students and residents) as well as continuing professional development of those in practice. The project, known as PACER (Professionals Advancing Clinical and Educational Redesign), involved site visits where 27 focus groups were conducted with faculty, clinic staff, and a diverse group of learners to identify the benefits of practicing and learning together in primary care outpatient settings. Findings from this study are reported here to address existing gaps in the IPE literature.

2. Methods

2.1. The PACER project and ethical considerations

PACER is a three-year quasi-experimental mixed methods study funded by the American Board of Family Medicine Foundation, the American Board of Internal Medicine, the American Board of Pediatrics Foundation, the Josiah Macy Jr. Foundation, and the Accreditation Council for Graduate Medical Education (ACGME) running from September 2015 through August 2018. Oregon Health & Science University's Institutional Review Board reviewed and approved all PACER activities (IRB #11932). A competitive process was used to select nine PACER sites with their respective primary care physician residency continuity practices (n = 27), which represented diverse academic institutions and health systems. Each site recruited an interprofessional team that included faculty from family medicine, general internal medicine, general pediatrics, and other health professions such as nursing, pharmacy and behavioral health.

The interventional components of PACER included two in-person training sessions that lasted one and a half day each and were conducted 18 months apart, and longitudinal transformational assistance from an interprofessional coach assigned to each of the nine teams. The evaluative components relevant to this paper involved in-person focus groups that occurred during site visits and that were held with primary care physician faculty, primary care medical residents, medical students, and faculty and learners from behavioral health, pharmacy, nursing, and physician assistant programs. The focus groups occurred between August 9th, 2016 and January 20th, 2017, approximately 4–9 months after the first in-person training session. The focus group questions that served as the primary stimulus for the qualitative analyses conducted are shown in Fig. 1.

2.2. Data collection

A total of 27 focus groups were conducted with 1 focus group for each primary care residency continuity practice (family medicine, internal medicine, and pediatrics) per institution. To mitigate possible power differentials in the group, residency program directors, associate directors and department chairs were excluded from participation in focus group sessions. A formally trained mixed-methods researcher facilitated all 27 focus groups, and through facilitation and learner specific probes, the inclusion of learners' perspectives was balanced relative to faculty perspectives. Three trained observers collected field notes during the sessions.

Field notes rather than audio recordings were cost effective and maintained the institutional review board (IRB) minimal risk study status. After each focus group, a member of the PACER evaluation team combined the observers' notes into a single set of composite notes. The resulting 27 composite documents were analyzed including a tally of the participants' profession and role in the practice. Data from the focus groups is the only data source used for this report.

2.3. Data analysis

The master composite documents were imported into Atlas.ti (Version 7.0, Atlas.ti Scientific Software Development GmbH, Berlin, Germany) for coding. Using a grounded theory analytic approach[23] the analytic team worked to answer the question: "What is the added value of health professional interprofessional learning in ambulatory practice settings?" Team members first individually open-coded[24] relevant passages and phrases in composite field notes and then compared codes during nine consensus meetings held between February and May of 2017. The consensus open codes were applied to the master composite documents.

This process was repeated over several consensus meetings until coding was complete. As consensus meetings progressed, open codes were combined, eliminated, or refined through a process of constant comparative analyses.[24] Code saturation was achieved when no new codes were applied to the data; this occurred at Meeting 5 and saturated open codes were applied to the remaining composite notes during Meetings 6 and 7. Between Meetings 7 and 8, the study team shared coding progress with the broader PACER evaluation team for feedback. The analysis team brought this feedback to Meeting 8 for axial coding.[25] During Meeting 9, the analysis team determined definitions for the selective codes[24] in the form of themes and sub-themes for each code category. The evaluation team selected exemplar statements that were representative and explanatory of each code across focus groups. Exemplar statements from the composite field notes analysis are used to illustrate these themes.

3. Results

Each focus group included between four and seventeen participants and involved physician, nursing, pharmacy, and psychologist faculty members; physician and pharmacy residents; nurses, clinic supervisors, residency program coordinators, medical assistants, and front office staff; as well as trainees from nursing, pharmacy, social work, behavioral health, and physician assistant programs (Table 1). Open codes were grouped under three broad categories: 1) the *benefits* of interprofessional learning, 2) factors that *enable* those benefits to occur, and 3) *barriers* that prevent those benefits from occurring.

3.1. Benefits of interprofessional learning

A total of four themes with 13 supporting sub-themes emerged as *Benefits* of interprofessional learning. Each is described in detail below with exemplars derived from field notes included in italics. The broad themes identified as benefits of interprofessional learning are: Development of Personal Relationships, Improved Education, Improved Patient Care, and Improved Job Satisfaction.

3.1.1. Development of personal relationships

Interprofessional learning helped participants develop personal relationships with other health professionals leading to genuine friendships that complimented professional relationships and workflows. Informal interactions fueled by these personal relationships helped "lighten the load" of the day and at times had added benefits outside of

1. What changes are you currently trying to implement in your continuity clinic and residency program?
2. When you're making changes to how you work with residents in clinic or during training, what makes it easier? What makes it harder?
3. When you do make changes, are they sustainable?
4. What are you learning about interprofessional collaboration?
    a. Has PACER helped facilitate this?
    b. What are the best parts of interprofessional education and collaboration?
    c. What are the challenges?
5. How do you interact with the other disciplines in primary care?

    If yes, how has this helped you understand how you can work together?

Fig. 1. PACER focus group interview schedule/questions included for these analyses.

the clinic.

Residents indicate they are friends with attendings and staff and that relationships are open and comfortable. Residents don't feel they are crossing any boundaries when they ask for help [Site 8, Family Medicine].

Residents indicate they like working with nurses, and nurses and staff enjoy working with residents. These residents also like their informal interactions (e.g. conversations in the lunch room). Nurses and staff like getting to know the residents so that they can assign patients to them based on their personalities. Nurses also help residents with outside life stuff too – where to shop for food, etc., since residents often moved here recently [Site 4, Internal Medicine].

3.1.2. Improved education

Interprofessional learning provided participants with improved knowledge of others' roles and responsibilities. Working in a diverse professional environment helped professionals reach a new understanding of the training, values, and roles of other professionals on the health care team, thus improving individual and overall workplace educational environment.

One resident indicated that 'just talking to pharm on a daily basis teaches me things every day.' [Site 7, Internal Medicine]

One participant indicated that the pharmacist has an open-door policy and also hangs out in the preceptor room so residents, faculty, and staff have the opportunity to learn from her. Pharmacist is part of the BH rotation and meets with residents weekly to discuss use of psychotropic drugs. RN has used the pharmacist to help design a program for f/u of patients on anticoagulants. MHA intern has been working with pharmacist to better understand what kinds of visits can be billed by the pharmacist to add revenue to the clinic. The pharmacist works shoulder-to-shoulder with physicians in all settings [Site 6, Family Medicine].

A pharmacy student voiced that learning from multiple disciplines improves her education because she processes many points of view. Everyone in clinic is more comfortable when they are all on the same page about the kinds of knowledge that each other can bring to the table [Site 6, Pediatrics].

An additional educational benefit of interprofessional learning involved participants being better able to determine the kind of practice they wanted to work in when their training is complete. This occurred when participants saw interprofessional learning modeled in practice and felt better prepared to participate in similar future work environments.

A resident indicated that he knows there is a good chance he will be the most prepared wherever he goes next, and he considers it his responsibility to help advance his future clinic settings [Site 1, Family Medicine].

When prompted, a resident commented that he will definitely look for this model of team-based care at his next employment [Site 4, Internal Medicine].

3.1.3. Improved patient care

Participants realized that interprofessional teamwork had tangible benefits on the quality of care they could deliver to their patients. Related to this was the benefit of 'overlapping' care. By understanding where one profession's skill set ends and another's begins, participants were able to provide more immediate and continuous care for their patients. Having diverse skill sets that were immediately available in clinic often enabled quicker and more streamlined care to patients.

When prompted about what they've learned about working together, a resident said that it's "mutual learning." "At the end of the day, coming together as a group of providers benefits the patient." The patients are very appreciative that a diversity of services is available. They can get the answers and care that they need are easily available [Site 8, Family Medicine].

One participant stated that having pharmacy students around helps residents take care of more patients' needs. Pharmacy students always make themselves known and are always helpful. Internal medicine residents 'curbside consult' with the pharmacist regularly. They have been able to mobilize services for complex patients at times, e.g. helping a patient who was about to lose his home oxygen. When probed, these residents cannot imagine working in clinic without a pharmacist available to them, especially to help with medication reconciliation and contraindications [Site 7, Internal Medicine].

3.1.4. Improved job satisfaction

Participating in an interprofessional learning environment and working closely with other professionals increased the sense of

Table 1
Program and participant characteristics.

Site ID	Geographic Location	Primary Care Discipline	FG Participant roles	Clinic Sponsorship
Site 1	Midwest	FM	Appointment coordinator Clinical assistant supervisor Nurse manager PharmD resident PGY3 Chief resident (2) MD faculty (2)	University health system
		IM	Pharmacist Nurse MD faculty (4) Clinical assistant Patient coordinator Physician assistant	University health system
		Peds	Nurse (2) MD faculty (2) Resident (2) Clinical assistant (2)	University health system
Site 2	West	FM	PGY3 resident PGY2 resident 2nd year PharmD resident MD faculty (2) Medical assistant Social work intern Front desk staff Psychology intern	University health system
		IM	Front desk staff Nurse manager Medical assistant PGY2 resident PGY1 resident (2) MD faculty (2)	University health system
		Peds	PGY2 resident PGY3 resident MD faculty (2) Medical assistant Nurse Clerical supervisor 3rd year medical student	Safety net health system
Site 3	South	FM	Nurse Medical assistant Office manager Office coordinator Care manager Head nurse PGY1 resident	University health system
		IM	MD faculty PGY2 resident (2) Hypertension educator Faculty nurse Nurse manager Nursing student	University health system
		Peds	Social worker Clinic manager Clinical supervisor Office coordinator MD faculty Nurse Primary care coordinator PGY2 resident (2)	Children's Hospital
Site 4	Midwest	FM	Medical assistant PharmD student PharmD faculty MD faculty Front desk staff PhD psychologist Psychology Trainee PGY3 resident (2)	Federally Qualified Health Center system
		IM	MD faculty Behavioral health counselor Medical assistant (2) Nurse (2) PGY2 resident PharmD resident	Federally Qualified Health Center system
		Peds	MD faculty Nurse PGY2 resident Medical assistant supervisor PharmD faculty	Military
Site 5	West	FM	4th year medical student PGY5 FM/Psych resident PharmD Pharmacy student PGY3 resident MD faculty	University health system
		IM	MD faculty (3) 3rd year medical student Physician assistant student PGY3 resident Nurse Behavioral health counselor Physician assistant (2) Pharmacist	Federally Qualified Health Center system
		Peds	PGY3 resident PGY2 resident PGY1 resident MD Faculty Front desk staff (2)	Community health center network
Site 6	South	FM	Nurse navigator PGY3 resident PGY1 resident Masters of Health Admin intern MD faculty	Health system-University partnership
		IM	MD faculty Pharmacy resident Nurse (2) Behavioral health intern PGY1 resident PGY2 resident	Health system-University partnership
		Peds	MD faculty (2) Pharmacy resident Pharmacist Nurse Social worker (2) PGY2 resident PGY3 resident (2)	Health system-University partnership
Site 7	Midwest	FM	PGY2 resident PGY3 resident Behavioral health staff (2) Medical assistant MD faculty (3) Nurse practitioner Pharmacist	Federally Qualified Health Center system
		IM	Nurse PGY4 resident	University health system

(continued on next page)

Table 1 (*continued*)

Site ID	Geographic Location	Primary Care Discipline	FG Participant roles	Clinic Sponsorship
			PGY1 resident PharmD student PharmD faculty MD Faculty	
		Peds	PGY2 resident (2) MD faculty (2) PharmD student PharmD faculty Nursing director Front desk staff Registration supervisor	University health system
Site 8	West	FM	Nurse LCSW PGY2 resident Psychiatry resident (2) MD faculty (2)	Community hospital, university affiliated
		IM	Nurse PGY2 residents (2) MD Faculty (2) Pharmacy intern Pharmacist	Community hospital, university affiliated
		Peds	Medical assistants (2) Nurse practitioner LCSW Care manager Medical student Chief resident PGY1 resident (3) PGY2 resident (3) MD faculty (4)	Community hospital, university affiliated
Site 9	Mid-Atlantic	FM	MD Faculty PGY2 resident PGY3 resident (3) Social worker Pharmacist Office manager Nurse manager	Urban health system, university affiliated
		IM	PGY2 resident PGY3 resident Medical assistant Practice coordinator MD faculty (3) PharmD Faculty Nurse practitioner	Urban health system, university affiliated
		Peds	Nurse MD faculty (2) Front desk staff PGY3 resident PGY2 resident (2)	Urban health system, university affiliated

"teamness," which simultaneously improved job satisfaction. From focus group data, "teamness" was defined as having open and constant communication across the team regardless of hierarchy and trusting that everyone is willing to help each other to achieve the shared goal of improved teaching, learning, clinic flow and patient care.

> *Family medicine participants indicated that having folks from different professions enriches the clinic. A social work intern conveyed that being able to come to the table with other professions and physicians makes things feel a lot better. The playing field is leveled when he gets to be at the same meetings with everyone else [Site 2, Family Medicine].*

Positive workplace environments, as a result of interprofessional learning, also led to improved job satisfaction among participants. Positive attitudes by interprofessional team members and a climate of positive communication also contributed to an improved sense of job satisfaction and helped participants re-focus on their collegiality and mission-centeredness.

> *A behavioral health counselor, who came from a mental health outpatient setting, was very surprised by what she learned about integrated behavioral health care. In this clinic, she has the luxury of talking to residents about patients and collaborating with nurses and the other health professionals. She said that it was shocking at first to collaborate with all of these providers in community mental health – but after this experience, she cannot imagine going back to a mental health specialty clinic. It has been a completely new and amazing experience to actually see changes in patients – and seeing the patient from different vantage points. She interacts with pharmacy often – there is better information flow back and forth because of learning together [Site 4, Internal Medicine].*

> *Members of the family medicine continuity clinic and residency program indicate they have open dialogue and look at new initiatives from multiple perspectives and decide thoughtfully using available data. One participant indicated that that this residency program has 'effectively assembled people who have a desire to make things work better and learn from the process' [Site 3, Family Medicine].*

> *One participant indicated that nurses back up the medical assistants and providers, and everyone helps each other because 'all staff here are intimately committed to the same goal and mission, so we help each other make changes possible' [Site 2, Pediatrics].*

A final aspect of job satisfaction as a result of interprofessional learning was that it gave participants a greater sense of ownership in their work. This ownership sometimes put them into positions of leadership, and they felt that this helped better prepare them for their day-to-day work as well as for their future practice.

> *Residents revealed they feel more like part of the team, and also like they are leading the team at times. One resident indicates he takes incredible pride in the leadership opportunities he is offered. He has 700 patients on his panel. He knows that this experience sets him up to be more experienced than folks from other residencies with smaller patient panels (e.g. workload, managing patients, working their way through a PCMH). He understands everyone's role on the team and how to best utilize them and other resources. He knows what others can take responsibility for, and that frees him up, which he appreciates [Site 1, Family Medicine].*

3.2. Enablers to realizing the benefits of interprofessional learning

Several enablers that helped participants realize benefits of interprofessional learning were identified.

3.2.1. Clinic culture enablers

Clinics with faculty, learners and staff who embraced a culture of change (defined as an alteration of the way practices/residency programs are willing to identify and overcome barriers to transformation) created an environment beneficial to the positive aspects of interprofessional learning. Similarly, participants who described a culture of learning (defined as a belief that everyone learns from each other) at their clinics were better positioned to realize the benefits of interprofessional learning.

> *Participants expressed feeling good about having leadership recognize that change is needed and give them the flexibility they need in order to make those changes [Site 1, Internal Medicine].*

> *Participants have found that making changes is easier because they have a culture of change, and they have people who accept changes. There are so many people involved, and for residents it feels like there is so much to handle, particularly with having to do their QI projects. When medical assistants are on board with them, it makes it much easier … Communication is the biggest piece – rather than one person taking the initiative and making change, it is a group effort [Site 4, Family*

Medicine].

One participant indicated that residents are still 'moldable clay.' Staff are excited to be part of a learning environment and they have a culture of learning in this clinic [Site 3, Family Medicine].

A participant commented that everyone is willing to learn from each other and teach each other [Site 3, Pediatrics].

3.2.2. Operational enablers

The benefits of interprofessional learning were realized by features that were "baked in" to the day-to-day operations of the clinics. Participants often indicated the physical space and layout of the clinic were essential in creating an environment for the health professions to collaborate and learn together. Co-location, or having multiple types of providers simultaneously working in the same place, was identified as important to having interprofessional learning experiences and in caring for patients as a team.

Getting physicians out of offices into team rooms at one clinic was difficult. Nurses used to be in their own room and were skeptical about the noise and chaos of having one large team room. They adapted one day at a time, and now they love it. They can ask questions of anybody [Site 1, Family Medicine].

One physician faculty emphasized that they can see the difference in quality of care provided because of integrated Psych. Being able to just go down the hall to ask a question is a huge asset. Residents have learned a lot from this. Even if a resident cannot get psychiatry to see a patient for 2 weeks, they know how to start the assessment process and know generally what patient needs are since they have been trained by Psych. Residents have seen how the process works and have learned to deal with the basics themselves [Site 8, Family Medicine].

Several internal medicine participants voiced that they find it enormously helpful having pharmacy co-located with them on the floor rather than having to call to speak to someone they don't know. They also find it helpful having integrated behavioral health staff in their clinics, so that they understand the internal medicine practice and flow – it makes their jobs easier. For example, they can get a social worker in the room with a patient exhibiting suicidal thoughts or behaviors. The physician doesn't have to dedicate three hours to deal with this one issue [Site 1, Internal Medicine].

Further, the existence of clinic-level interprofessional learning activities that encouraged teams to participate, educate, and learn together helped establish a working and learning environment in which all points of view are heard and appreciated.

They have a Collaborative Care Team, which consists of a social worker, registered nurse, front office staff, finance staff, physician resident, and faculty. Anyone can bring a problem to this group and get help with fixing the problem. They change things that need to be worked on and the residents are all involved in QI projects to improve an aspect of care delivery [Site 9, Family Medicine].

3.3. Barriers to realizing the benefits of interprofessional learning

Several aspects of clinic culture and organizational factors pose barriers to realizing the benefits of interprofessional learning.

3.3.1. Clinic culture barriers

Top-down leadership often created a culture that made interprofessional learning difficult. Participants noted that the way they are organized in clinic is mandated by leadership, and if it isn't set up in a way that promotes teamwork and collaboration, interprofessional learning is challenging. Similarly, different staff groups were sometimes given different information from above, making it difficult for interprofessional learners to be on the same page.

Medical assistants and office staff indicate that they sometimes get overwhelmed by all of the new things they are trying. There is a sense that there is a more top-down approach lately. Staff don't feel like they have a say with slowing down on changes … There are certain things that they don't have a choice about – top-down mandates. But there are things they talk about in their staff meetings – they talk about the top 3 things they'd like to change. Office staff feel like there is always some sort of pushback or hesitancy to change [Site 2, Pediatrics].

Providers and office staff in an internal medicine clinic indicate they have never been organized into smaller teams within the clinic. Participants have heard that they will soon be organized in teams but there is variable information about moving to a team-based model. The information any individual gets depends on which meeting they attend. It seems like there is not a clear plan. They anticipate it will be phased in. A problem identified is that they have not had staff who are in the trenches involved in the planning [Site 5, Internal Medicine].

Further, a clinical culture that exhibited poor communication made realizing the benefits of interprofessional learning difficult.

One chief resident expressed surprise at learning just this week that there is a social worker in this clinic, which he did not know existed previously. This may be more due to a communication issue such that the residents are not aware of clinic resources. It's difficult to get everyone on the same page in this clinic – all the providers are part-time and come and go [Site 5, Family Medicine].

Internal medicine participants indicated that communication is initially a barrier for providers and office staff in the clinic because they are fairly siloed in their professions. Learning about interprofessional communication is essential. However, a PharmD embedded in the internal medicine clinic mentioned that he advocates for himself to let everyone know what he does and that he is available [Site 4, Internal Medicine].

Another barrier to interprofessional learning in practice is having a lack of knowledge of and about other professions. Without this knowledge, it was difficult for participants to realize the benefits of interprofessional learning. Additionally, when professional siloes were engrained into the culture of a clinic, integration and interprofessional learning became difficult.

Leadership in one pediatric clinic is trying to have clinical assistants, residents, and staff all working together. One resident said they have lots of good people and resources, but they struggle understanding everyone's roles. This is especially true for residents because of their limited time in the clinic (1 afternoon per week) [Site 1, Pediatrics].

Staff and providers currently work almost entirely in siloes. The only times they work interprofessionally are when they get a referral or an order to do so [Site 1, Pediatrics].

Teams are at the discipline or process level, e.g. behavioral health team, referral team, nursing team (do triage mostly), and case management teams. The teams are not fully integrated in their work [Site 5, Internal Medicine].

3.3.2. Operational barriers

One significant barrier to realizing the benefits of interprofessional learning was a lack of appropriate physical space, including structures for team meetings, briefings and huddles, to support collaboration between different professions and learners.

One participant indicated that sometimes there are too many learners – too many residents and too many providers involved in sub-specialty clinics like palliative care. There is just not enough physical space for all the learners and providers [Site 8, Family Medicine].

One participant indicated that the physical dynamics of space play a role.

Having to change floors to get a question answered from another discipline is not going to happen when your schedule is already stretched very thin. It's just hard to fit in [Site 1, Pediatrics].

One participant voiced that the one thing that stops disciplines from working together is that there are no incentives to do so; even more, there are disincentives. There's not enough time to collaborate in that manner. Having multiple sites also prevents collaboration, as there would be too much travel. The issue of physical separation is compounded by the fact that there is no remote conferencing capability. People actually have to come together physically, and it would be a big challenge [Site 4, Internal Medicine].

Additional operational barriers to realizing the benefits of interprofessional learning in practice are the lack of adequate staff in clinic to support co-learners and the pressure to be clinically productive.

Residents try to work with staff on problem solving but there are limits to what they can get done on solving problems because of staffing shortages [Site 8, Internal Medicine].

Nurse participants indicated that they have had nursing students in the past – they find that there isn't as much interest in primary care from nursing students because their training is so hospital focused. They loved having them here though. The nurse manager asked about bringing in nursing students, but her boss thought they are just too busy to take on new learners. They are hopeful that with better staffing in the clinic, they could add more trainees. The clinic leadership has the ability to take medical assistant externs, but they have been so busy, they have had to decline this. But with new initiatives they may be able to open that back up [Site 2, Internal Medicine].

One participant indicated that there is no down time and they are very productivity-driven, so there is not time to visit other clinics [Site 4, Pediatrics].

The impression from a faculty psychologist is that the residents are more annoyed when they have medical students training with them, as opposed to working with the other health professions tr.ainees, because medical students slow them down and the other health professions make them more efficient [Site 4, Family Medicine].

Finally, when different professions were not able to spend meaningful time with one another due to scheduling challenges, realizing the benefits to interprofessional learning was a challenge.

Since the residents are only in clinic on intermittent blocks, sometimes policies and procedures change during the interval and they have to re-learn the process each time. It can be difficult for the social worker to know how best to communicate with residents when they are only in clinic for blocks [Site 6, Pediatrics].

4. Discussion

This study represents in-depth findings from 27 residency practices where interprofessional learning among multiple health professionals takes place in the three primary care disciplines: family medicine, general internal medicine, and general pediatrics. The vast majority of papers currently in the literature on IPE have focused on inpatient settings,[16–20] leaving limited literature on IPE in outpatient settings. This study helps to fill this gap in the literature. Only four articles were found that focused on interprofessional learning in ambulatory settings. The first two involved student-led clinics as a model for how interprofessional learning can be delivered through service learning experiences.[26,27] While undoubtedly a valuable clinical learning experience, student-run free clinics represent a small subset of ambulatory primary care training settings. The third paper, a survey study of physicians, nurses, psychologists and social workers in both in- and outpatient pediatric settings,[28] found that most competencies important for interprofessional learning were acquired on the job and that a substantial lack of formal interprofessional education, especially for physicians and psychologists, exists.

This study findings revealed that faculty, clinic staff, and learners from the diverse professions (including medicine, nursing, pharmacy, behavioral health) all valued learning from and with each other, and that interprofessional learning often occurred in real time, such as in the use of “curbside consults.” This is an invaluable model for interprofessional learning in real world primary care settings where actual patient care is delivered by faculty and learners working shoulder to shoulder. Developing relationships, understanding each other's roles, level, and types of knowledge, and communicating effectively were all perceived as beneficial and were felt to improve both patient care and job satisfaction. These findings are consistent with and substantiate other studies on interprofessional teamwork and practice conducted in inpatient or university-based settings[29–31]

Clinic culture, which involved factors like leadership style, could either foster or serve as a barrier to interprofessional learning. Operational factors, such as clinic layout and physical space, could also either foster or inhibit interprofessional learning. These findings are similar to a study of IPE in ambulatory settings, which involved a workforce survey completed with staff at 12 primary care clinics that were also transforming to a PCMH practice.[32] Multivariable analyses in this study by Stout et al., revealed that having effective leadership was the main factor associated with practice teamwork perceptions. This study also found that practices that have successfully transformed to PCMHs and have high levels of team-based care also had higher job satisfaction and higher perceptions of effective practice teamwork, which aligns with these findings. As pointed out by Allan and colleagues,[33] an interprofessional learning culture takes time to develop in daily practice, and requires shared values, goals, and clear communication. Further, these researchers found that recognizing responsibility for individual learning in addition to learning as a team, all participants involved in developing a learning culture need to recognize structural controls can influence and constrain cultural developments which are likely beyond their immediate control.

This study, however, as with[32]; suggests there is much to be learned about implementing change in busy primary care practices. Leadership development and changing culture are both areas that are ripe for further study, including when in health professions training leadership is most effectively addressed. Adaptive leadership may be a more effective style in practices with ongoing interprofessional learning that are truly integrated.[34] Changing culture may be even more complex than leadership development. One study was found that proposes using simulation exercises to both develop nurse leaders and change institutional culture toward interprofessional teamwork.[35] Though simulation can be effective as a learning strategy, this should not replace deliberate, flexible, real world education that is tailored to patient needs and achieved by the expertise represented in team members. This type of knowledge sharing is invaluable toward developing a community of learning. The professional and personal benefits of communities of practice in the workplace are well documented.[16]

The strengths of this study include the diversity of perspectives represented in the focus group participants with both faculty and learners in medicine, pharmacy, nursing, and behavioral health. This study also includes a breadth of primary care residency practices and 9 different health systems, including university-based, community-based with different payment structures, representing heterogeneity in participants; and, lastly, the PACER sites varied in size and geographic region. Conducting in depth focus groups allowed us to hear the voices of and observe reactions and interactions among faculty, staff, and learners, which is not achievable using quantitative study designs, and which is another strength. Weaknesses of the study included a lack of specific focus on whether the benefits of interprofessional learning were different in each of the primary care disciplines, though no differences emerged on their own as part of this study. This could be because the

three disciplines continue to be relatively siloed in their work with patients. It is also true that PACER occurred at a time when practices were transforming to PCMH, and it may be that changes would have occurred even without PACER, though this program served as a catalyst that accelerated planned changes.

In conclusion, interprofessional learning in primary care residency practices has several benefits including the development of personal relationships, improved education, improved patient care, and improved job satisfaction. Recognition of the features of clinic culture and operations that serve as enablers or barriers to interprofessional learning are important in creating an environment for the health professions to collaborate and learn together.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

Acknowledgements

This study was funded by the American Board of Family Medicine Foundation, the American Board of Internal Medicine Foundation, the American Board of Pediatrics Foundation, the Josiah Macy Jr. Foundation (grant ID: B15-06), and the Accreditation Council for Graduate Medical Education.

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