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Understanding the experience of clinicians and non-clinical staff in Integrated Virtual Care, a hybrid primary care program in rural Ontario, Canada: a qualitative study

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Abstract

Background Current physician shortages are exacerbated in rural areas, worsening access to primary care. In Renfrew County, Ontario, the Integrated Virtual Care (IVC) program addresses this by attaching patients to a family physician working predominantly off-site, supported by an interprofessional healthcare team at a local clinic. Patients receive a hybrid of in-person and virtual care, based on their individual clinical needs and preferences. Limited evidence exists regarding the experiences of clinicians and non-clinical staff working in hybrid teams, with some members working off-site. This study explored the experiences of family physicians, interprofessional health providers (IHP), and non-clinical staff (clerical staff, managers, and leaders) working in a hybrid primary care program.

Methods We conducted a qualitative descriptive study using one-on-one semi-structured interviews with clinicians (physicians and interprofessional team) and non-clinical staff working in the IVC program. Interview questions addressed satisfaction, team communication, collaboration, technology use, and rapport with patients. Transcripts were analyzed thematically using an inductive approach. Themes and quotes were then charted by participant type: physician, interprofessional health provider (IHP), and non-clinical staff.

Results Sixteen participants (10 clinicians and six non-clinical staff) were interviewed. Five themes were generated, describing their experiences within the IVC program: support for IVC and meeting community needs, importance and role of interprofessional and non-clinical teams, IVC as a developing model: early program experiences, ongoing logistical challenges, and varied views on strengths and benefits. After charting themes by participant type, we identified a number of diverging views among the three groups, with perceived program benefits being more pronounced for physicians.

Conclusions Understanding the experiences of clinicians and non-clinical staff, which emphasized community ties, roles of clinical and non-clinical teams, and supportive leadership environments, can inform improvements to programs that combine interprofessional primary care teams and virtual technologies to enhance access to primary care in rural areas.

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Background

It is estimated that over 6.5 million Canadians do not have a regular family physician or nurse practitioner (NP) [1], affecting access to preventive care [2], and leading to increased illness risk, disability, and mortality [2]. Attachment to a family physician or NP, also referred to as rostering, enrollment, or patient registration, is defined as, "the confirmed and documented affiliation between a patient and a regular primary care provider (family physician or NP), in which the provider is responsible for providing longitudinal and continuous care to the patient via any delivery channel (in person, remotely, or both), enabled by provider access to patient health information" [3]. Unattachment can lead to care fragmentation and greater reliance on hospitals and emergency departments [4].

The problem of low attachment to primary care is worse in rural areas [2], where insufficient family physician supply has been longstanding. Only 7% of physicians practice in rural communities, despite nearly one-fifth of Canadians residing there [5]. To address low attachment, expanding the physician workforce and emphasis on interprofessional primary care teams can enhance primary care capacity [6]. Interprofessional primary care brings together a mix of health providers, including family physicians and NPs, registered nurses, registered practical nurses (RPNs), social workers, pharmacists, dietitians, physiotherapists, and/or other health professionals [7–9]. This comprehensive approach is considered critical to providing quality care, and represents a gold standard internationally [10]. Interprofessional primary care also improves access for those with chronic conditions, reduces emergency department use, and can alleviate pressure on physicians by distributing responsibilities across a diverse healthcare team [6, 11, 12]. Interestingly, despite having fewer physicians, rural areas often have better access to primary care teams compared to urban settings [13].

Virtual care, defined as remote interactions between patients and members of the circle of care through communication technologies [14], can be an effective strategy to improve access to physicians and interprofessional primary care in rural areas [15]. Evidence suggests that integration of virtual technologies into primary care enhances flexibility for both patients [16], and providers [17]. However, the successful delivery of virtual primary care depends on strong local teams and clinic support [18].

Integrated Virtual Care (IVC) is an innovative hybrid primary care model that combines in-person and virtual care options from an interprofessional primary care team, to provide formal attachment to previously unattached patients. Each patient is enrolled to a family physician who works predominantly off-site, supported by a local interprofessional primary care team [19]. The patient's family physician delivers and coordinates care, predominantly by virtual means, with in-person assessment and care available as needed by a local family health team, including physicians, NPs, community paramedics, and other interprofessional health providers (IHPs). While a previous study demonstrated high patient satisfaction with IVC [20], the experiences of clinicians and non-clinical staff within this model remain unexplored.

A recent study on virtual team collaboration highlighted challenges in care coordination due to the lack of shared physical space, less frequent in-person contact, and reliance on virtual communication [21]. However, evidence suggests that primary care teams using virtual or hybrid models can effectively address complex care needs through virtual collaboration on care planning [15]. Interprofessional primary care in virtual or hybrid models plays a crucial role in meeting community needs in rural areas, yet little research has explored the experiences of those working in teams where some members (in the case of IVC, the family physician), work off-site. This study aimed to describe the experiences of physicians, IHPs, and non-clinical staff working within a hybrid primary care program. For the purposes of this work, we consider clinicians to include physicians and IHPs; however, we separate physicians from other IHPs, as the physicians work predominantly off-site in the IVC program. We define non-clinical staff as those with administrative roles including reception, decision support, and leadership.

Methods

Study design and setting

We conducted a qualitative descriptive study, as this approach provides straightforward descriptions of experiences and perceptions [22], and is well-suited for informing practice change [23, 24]. We used one-on-one semi-structured interviews to describe the experiences of physicians, IHPs, and non-clinical staff working within a hybrid primary care program in rural Ontario. Findings are reported in concordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) [25].

Spanning 7,645 square kilometres and home to 106,365 residents [26], Renfrew County is the largest county in Ontario (Canada's most populous province), and is predominantly rural. Within this county lies the town of Petawawa, population 14,382 [26], where the Petawawa Centennial Family Health Centre (PCFHC) operates

as an interprofessional primary care team, known in Ontario as a Family Health Team (FHT). The PCFHC, which serves over 2,000 local patients (excluding IVC patients), is staffed by physicians, NPs, social workers, a pharmacist, a registered dietitian, a midwife and nurses, as well as administrators responsible for leadership, referral support, reception, and quality improvement. At the time of this work, the IVC program included three family physicians working off-site and served approximately 1,500 patients of all ages who resided within the local area.

Participant recruitment

Participants were purposively sampled and included physicians working in the IVC model, IHPs who had encounters with IVC patients, and non-clinical staff, including the executive director, office manager, and quality improvement support staff. An invitation and study details were emailed to potential participants, and for those who agreed to participate, reception staff scheduled the interview in their calendars. We invited all who met the criteria but were limited by the small size of the program. Of the 17 eligible physicians, clinicians and staff, 16 agreed to participate, while one was on leave. No participants withdrew.

Data generation

A semi-structured interview guide was created, informed by concepts relevant to provider experience, identified from the literature and existing evaluations [27], including the Health System Performance Network's provider experience survey tool [28]. We also included questions related to the use of technology (including telephone, video conferencing, and electronic medical records (EMR)) as these were relevant elements in the provider experience as well [20]. The interview guide included the following domains: interest in IVC, overall experience, working with the interprofessional team, challenges and benefits of working in IVC, virtual tools, professional autonomy, rapport and continuity with patients. We used a brief questionnaire at the beginning of each interview to collect demographic information, including age, gender, and self-described ethnicity, participants' years of experience and number of days per week working in the IVC program. Both the interview guide and questionnaire were reviewed and refined by the study team after the first three interviews. Interviews were audio and video recorded and transcribed verbatim. The interview questionnaire and guide are provided in Appendix A.

We used information power as a framework to determine sample size, which suggests that the more relevant information a sample holds, the fewer participants are needed [29]. This study is descriptive, focusing on a rich, contextual understanding of the program through dialogue with experienced researchers familiar with the setting. Rather than aiming to develop or extend theory, we centered our analysis on capturing diverse participant perspectives, including those from varied training backgrounds.

Interview process

Once participants expressed interest in the study, an interview was scheduled, lasting between 30 and 60 min. Participants virtually joined interviews from their offices at the PCFHC or from their homes. Interviews were conducted by two authors (KP and SC) via the video conferencing software Zoom. Interviewers were introduced as researchers with knowledge of the program and the administrative team.

Reflexivity

Most interviews were completed by SC, a female postdoctoral researcher with expertise in health services research and clinical experience as an occupational therapist. Three interviews were completed by KP, a final-year medical student at the time. Both interviewers had experience in qualitative research, with SC having completed coursework in qualitative research methods. Both KP and SC were familiar with the PCFHC and the IVC program, and SC had prior familiarity with some IVC administrators who were interviewed. Neither interviewer had existing relationships with the other participants. A master's-trained researcher (AS) with similar knowledge of the PCFHC setting and program supported the analysis.

Analysis

We used thematic analysis [30] to inform our analytic approach, starting with an independent review of transcripts followed by the inductive development of an initial set of codes. Two coders (KP and SC) met three times to compare and refine codes to create a final codebook. After all transcripts were coded, themes were generated by collating codes and discussing them with a third coder (AS). Final themes were reviewed by the entire study team and then charted by participant category – physicians, IHPs, and non-clinical staff – to explore differences in how participants experienced their roles in IVC [31]. This latter approach was informed by framework analysis. NVivo (version 14) software [32] was used for data management and analysis. Themes are described using detailed descriptions and supporting quotes.

Ethics

This study was approved by the Hospital Montfort Research Ethics Board (File number 22-23-09-025). The informed consent form was shared prior to the interview,

and verbal consent was confirmed before the recording began.

Results

The study included 16 participants: family physicians ($N=3$), IHPs ($N=7$), and non-clinical staff ($N=6$). Most participants were female ($N=14$) and had over one year of IVC experience ($N=11$) (Table 1). Most participants reported having contributed to the program since its inception (14 months before the start of data collection). Physicians reported working between one and two and a half days per week, IHPs worked between zero and five days per week (one IHP provided occasional coverage of IVC), and non-clinical staff worked one to five days per week at the PCFHC. IVC physicians indicated residing between one and five hours from the clinic, while staff working on site resided within Renfrew County.

We generated five themes which describe the experiences of clinicians and non-clinical staff working in IVC. Overall, the themes highlight both positive and challenging aspects of working in IVC. Themes were considered from the different perspectives of physicians, IHPs, and non-clinical staff. Notably, diverging viewpoints from the physicians and IHPs and non-clinical staff emerged. The themes included: (1) Support for IVC and meeting community needs, (2) Importance and role of interprofessional and non-clinical teams, (3) IVC as a developing model: Early program experiences, (4) Ongoing logistical challenges, (5) IVC varied views on strengths and benefits. Themes are described using participant quotes, including any diverging perspectives organized by role – IHP, non-clinical staff, and physician – and summarized in a separate table by participant type (Table 2).

Table 1 Characteristics of included participants ($N=16$)

Characteristic	Category	*N* (%)
Job/Role	Family Physician	3 (18.8)
	IHP*	7 (43.8)
	Non-clinical**	6 (37.5)
Gender	Female	14 (87.5)
	Male	2 (12.5)
Age	18–30	2 (12.5)
	31–40	5 (31.3)
	41–50	4 (25.0)
	51+	5 (31.3)
Experience with IVC	0–6 months	2 (12.5)
	6–12 months	3 (18.8)
	1 year +	11 (68.8)

*IHPs included: Registered practical nurses (RPNs), nurse practitioners (NPs), pharmacists, midwives, dietitians

**Non-clinical staff included: Executive Director, receptionists and quality improvement and data support specialist

Theme 1: Support for IVC and meeting community needs

When discussing their experiences and asking participants what they liked about working in IVC, many described the local context of the community where the clinic is located. They characterized the physician shortage as an important problem affecting the local residents, highlighted the role of IVC in meeting those needs, and discussed their contributions to the community as positive and impactful. Helping to meet the primary care needs of underserved individuals in Renfrew County was an important part of participants' experience.

IHPs described the challenges many local residents face in accessing primary care, emphasizing the high rate of unattachment and the long-standing difficulty of recruiting physicians to a rural area. For instance, one participant noted that residents were anxious about the state of primary care access, with several existing physicians approaching retirement: "There is such like, almost this like rippling level of worry across our county because we know quite a few of our docs are soon to retire" (Participant 15, IHP).

Another IHP who was familiar with the area described how IVC provided care to individuals who otherwise lacked access and described the program as innovative:

> *So, this format gets people the care anyway, in an innovative way. It made people happy, and people are being heard, being taken care of, sometimes we just want that. So, I think that's why I like this, that people could really access care. (Participant 1, IHP)*

Non-clinical staff, who worked at the clinic in person and were familiar with the region and difficulties with primary care access, characterized the depth of the challenge, and the excitement of contributing to a solution through the IVC:

> *We were already in a physician crisis in primary care, so we had chatted about it, and I thought it was brilliant because you can only do so many things to recruit, and then once those failed, what else can you do? (Participant 9, non-clinical staff)*

> *[Leadership] had approached me that this is something that they were considering, and we looked at it... Was that something I was interested in? Of course I was. Not just because it's innovative, but because I thought it was important. (Participant 9, non-clinical staff)*

Non-clinical staff working in IVC also described the primary care shortage from a personal perspective. They shared a desire to be more involved in supporting their

Table 2 Description of themes by type of participant

Theme	Physicians	Interprofessional Health Providers (IHPs)*	Non-clinical staff**
Theme 1: Support for IVC and meeting community needs	IVC provided physicians with an opportunity to serve an underserved community, which many found more meaningful than practicing in urban settings. Some physicians also shared prior personal or professional ties to the community.	IHPs felt that IVC met a critical need in their own communities and acknowledged the need for it. They emphasized rising unattachment and physician retirements as drivers of community anxiety.	Non-clinical staff shared that IVC supports the local community and addresses a recognized need. They expressed a strong commitment to contributing to its success. They described IVC as an innovative solution in the face of failed physician recruitment efforts.
Theme 2: Importance and role of interprofessional and non-clinical teams	Physicians emphasized the pivotal role of both clinical and non-clinical staff in supporting patient care. They particularly highlighted the value of in-person support provided by on-site team members.	IHPs described their on-site roles in supporting IVC patients in the context of off-site (virtual) physicians and shared how this model has reshaped their clinical responsibilities. They noted adapting their scope, sometimes acting as go-betweens or conducting assessments when other team members were unavailable.	Non-clinical staff were widely recognized by others as essential to system navigation and care coordination. They also described their own roles in scheduling, communication, and administrative support across the team.
Theme 3: IVC as a developing model: Early program challenges	Physicians described challenges related to onboarding and becoming familiar with the practice and the available services across the county. They also described adapting to a new system and technologies (e.g., new EMR).	IHPs described the challenge and time required to create new processes and adapt to new ways of working. They also described taking on expanded responsibilities, such as facilitating communication or conducting assessments when other providers were unavailable.	Non-clinical staff described the time and effort required to create new processes and adapt to evolving workflows, including managing increased administrative demands, supporting communication across a hybrid team, and helping patients navigate the new care model.
Theme 4: Ongoing logistical challenges	Physicians identified communication with reception staff as a key part of the program's success and expressed gratitude for their collaboration. However, they expressed uncertainty about the program's future, which affected their ability and desire to take on more patients.	IHPs reported growing logistical strain due to increased patient volume, noting that while more physicians are being added to the program, IHP staffing has not expanded accordingly due to regional shortages. They viewed these pressures as manageable but persistent.	Non-clinical staff admitted that there was an increased workload. In addition, when reflecting on team dynamics, non-clinical staff – primarily receptionists – noted that communication with off-site IVC physicians was sometimes difficult, often involving more back and forth, and feeling less personal. Those in managerial and coordination roles noted that decisions about continued program funding were made externally to the family health centre.
Theme 5: IVC varied views on strengths and benefits	Physicians valued the flexibility of working mostly off-site and the ability to provide comprehensive care without full-time rostering burdens.	IHPs emphasized strong leadership support and appreciated having a channel to raise concerns. While direct communication with off-site physicians was limited, they valued the opportunity to collaborate when needed and recognized that the model encouraged new ways of working together.	Non-clinical staff credited responsive leadership as fundamental for staff morale and program stability.

*IHPs included: Registered practical nurses (RPNs), nurse practitioners (NPs), pharmacists, midwives, dietitians

**Non-clinical staff included: Executive Director, receptionists and quality improvement and data support specialist

community, reflected on the meaningful role they played in doing so:

> *I just thought it was something great to be a part of that would involve me more in the community and help, you know, connect with the people that need family doctors. Whether it be, you know, through email or mailing the paperwork just cause there's such a need. (Participant 11, non-clinical staff)*

Physicians, who work predominantly off-site and could be located anywhere in the province, described a desire to help address the needs of an underserved area, noting that their work felt more impactful in a rural setting compared to larger cities, where those needing care have access to walk-in clinics:

> *I feel like I can do so much, and, you know, you'd be surprised in [large city], if [patients] can't see you, they can go to the walk-in clinic next door... But it's not the case in rural settings, and that's what makes it... Having this rewarding job that I can actually provide care to people who actually need care, and they can't access it properly. (Participant 6, physician)*

Physicians also described having prior connections to the region through residency or other clinical training experiences; these experiences influenced their commitment to supporting this underserved community: "I did my training in the Petawawa area, so when I heard about this program, I was excited to help out because I have

that attachment to that area of my training" (Participant 3, physician). Another provider shared:

> *And then I heard about this program… and I thought that was interesting because I enjoyed virtual care. I also did quite a bit of training in [location removed], which is close to Petawawa, as a medical student and a resident. So, I always loved working there, and I loved the people, so I always had a goal of giving back to them in some way. (Participant 4, physician)*

Theme 2: Importance and role of interprofessional and non-clinical teams

Participants discussed the importance and roles of the interprofessional team in IVC. Despite differing viewpoints on the roles of IHPs and non-clinical staff, reflections on team contributions were largely positive and emphasized the important role of IHPs and non-clinical staff.

Physicians emphasized the essential contributions of NPs and other IHPs, describing the benefit of a "helping hand" in managing referrals, as well as the crucial importance of having a team member who can perform in-person assessment when needed: "So how it works with IVC is we do work with nurse practitioner on site. So, if anyone requires like, preventive care, requires a physical exam in our clinic, they can see the nurse practitioner" (Participant 6, physician).

Physicians also described relying on administrative staff, particularly for navigating the local healthcare system, and expressed gratitude for the team's support in assisting patients:

> *I think having a team part of IVC is very critical. If I did it alone, it would be in shambles; being able to have someone there, part of the team, to also see patients, if I need that extra helping hand managing, you know, their referrals, and helping me manage their medications is very useful… And without those sorts of supports, I wouldn't really be able to handle that. (Participant 3, physician)*

Physicians also discussed the support they received from leadership and other non-clinical members of the team:

> *I've also been working with some senior administrators… and having that support is a huge benefit because sometimes I don't know how to navigate the system, and they've been great at helping me deal with that, and supporting me in that sense. (Participant 3, physician)*

IHPs and non-clinical staff also noted the importance of in-person support from IHPs, clarifying that the entire interprofessional team is available for in-person appointments and is sometimes more available than physicians: "So, I'm kind of an extension of each of the docs… so if we have a patient that needs in person assessment, that's where I get involved" (Participant 1, IHP). Another added:

> *Yes, I have heard often people say, you know, it would be nice to have [physicians] in person. But once I explain we have the whole team involved, including me, I'm very accessible compared to some of the providers. So that comforts them. (Participant 5, IHP)*

The perspective of IHPs also included a view that their roles as health providers shifted and were adapted to help meet the needs of patients in this model. Some IHPs described how their roles shifted when working with IVC patients compared to their typical care, requiring them to take on additional responsibilities and adapt their scope of practice. One IHP described how they support patients in communicating with their physicians to facilitate the patient getting the care they need:

> *Yeah, so and maybe it's more system navigation information might be a better way to put that… "These are the symptoms I have; how do I convey this to my physician?" And sometimes it's a little bit of coaching. I'm in a unique position because I'm not their provider, but I can facilitate some dialogue between them and their provider. So, I see myself as a little bit of a "go-between" sometimes. (Participant 5, IHP)*

Another IHP shared that they occasionally "fill in the gaps" by conducting a physical examination when the NP is particularly busy:

> *RPNs don't do as in depth of a physical exam as like, a nurse practitioner or a physician would do, so they still need to see their IVC nurse practitioner, but because there is sometimes a delay in them being able to see the nurse practitioner, we can kind of fill in the gaps a little bit, do a physical exam if anything concerning comes up, we can say, "hey, this [person] needs to be seen sooner." (Participant 12, IHP).*

Theme 3: IVC as a developing model: early program experiences

This study began about one year after the launch of the IVC program; many of the experiences participants

shared reflected the challenges of developing and adapting to a new, innovative program.

Several participants highlighted how collaboration was essential in addressing challenges during the program's early stages. The small team involved in its creation and planning worked closely to resolve issues as they arose. They described feeling supported by IVC leadership to discuss and resolve issues, which facilitated team bonding and collaboration:

> *You know, this has been one of the great things we've been able to do in this program. If something is clunky, or inefficient, or doesn't seem productive, or whatever term you want to say, we've been able to discuss it, make some changes. (Participant 5, IHP)*

Even for those not involved in core program planning, IHPs described a process of improving their workflows, with support from members: "So I started… using the template for documentation… and then the other thing is I got the reception staff booking the patients in, to get me like two rooms… So, it was a lot better" (Participant 1, IHP).

Both IHPs and non-clinical staff described challenges in initiating the program and its logistics, including the increased workload associated with enrolling new patients. This included tasks such as conducting initial meet-and-greet appointments, explaining the IVC model to new patients, establishing referral processes for in-person care, becoming familiar with digital technologies and the EMR, and distributing tasks and responsibilities among providers to ensure efficient workflow:

> *Now, we have spent some time chatting over the year in regard to how the physicians work with the IHPs, and vice versa, so those are some of the things, that we've had to, to work out…even in regard to who do you message, why do you book an appointment on someone's behalf? …You know how all those pieces work. (Participant 9, admin)*

Physician participants worked predominantly off-site and were not part of the initial IVC planning phases. Early program experiences for this group centered around the experience of initiating a primary care practice within IVC and within the rural county and familiarizing with new processes:

> *I found that everyone is incredibly kind and supportive. Especially like [reception staff], they've been incredible. They answer their emails within minutes, they helped me with anything, because I was, you know, I was new. It was a new model for me and obviously, a new clinic. I completely knew the geographical area, but I didn't know really the resources that much, so they helped me a lot. And so that's been really good. (Participant 4, physician)*

Physicians also described the learning curve associated with using a new EMR, familiarizing themselves with that as part of their role: "One other challenge for me has been just getting to know the new EMR. I had never worked with it before" (Participant 4, physician).

Despite the varying experiences of IHPs, non-clinical staff, and physicians, there was a sense across all groups that the challenges had been largely resolved:

> *I think it was growing pains for us. I think we have it running [now]. Like enrollment is down to a fine process now, I think it's very efficient and it works well. But there were some definite grown pains. (Participant 5, IHP)*

Theme 4: Ongoing logistical challenges

Participants acknowledged several ongoing logistical challenges associated with working in IVC. Unlike the challenges of developing IVC, this theme describes ongoing issues that persisted after the initial phase of the program.

One challenge described by many IHPs and non-clinical participants was an increase in workload, as more patients joined the clinic, and staffing levels did not always catch up right away. IHPs framed this increase in workload as positive, as evidence that IVC was providing care to more people in the community:

> *Overall, it's added to my workload, which is great. … it's a good sign, right? It means that people have embraced it and are using the family health team services, well in my mind. Maybe that's an overstatement … (Participant 5, IHP)*

Non-clinical staff also noted an increase in their workloads, attributing this to a general increase in number of patients calling, booking appointments, and additional doctors:

> *It's busy, because adding all of those people has meant that we have more messages coming through to do [administrative] stuff in terms of like booking follow ups and faxing things and asking patients for more information on things and then of course, yeah, we do have more phone calls coming in… So definitely has made it busier on the phones. (Participant 13, non-clinical staff)*

Similar to IHPs, non-clinical participants emphasized that the extra busyness was positive, as it meant more people were getting the care they needed: "So, I do think, like the IVC program is positive, and the fact that… It allows a lot of patients to have doctors. But in an aspect of working, I do find the workload has increased quite a bit" (Participant 14, non-clinical staff). Another provider said: "It's been busy, and you can quote that. [laughing] … I mean, it's always great to work in something that's innovative and new and the providers are so happy and were so excited, and willing to try something new" (Participant 9, non-clinical staff).

Non-clinical staff also shared concerns about uncertainty about IVC's future, emphasizing that sustained funding was not guaranteed: "There are some things, that we don't have control over, like what the Ministry decides, what Ontario decides, what [health planning organizations] are doing" (Participant 9, admin).

Physicians also shared uncertainties related to IVC's future, which complicated long-term planning. This lack of stability deterred some from making a full-time commitment. One physician described that the funding uncertainty made them less willing to increase their hours within IVC:

> *Right now we're just limited to, like, I guess, half [full-time equivalent] …. So, I'm willing to more take it from part-time to full-time. … I'm hesitant to take on more than what I have because I just don't have a clear like, where is this this is going? (Participant 6, physician)*

Theme 5: Varied views on IVC strengths and benefits

While many strengths and benefits of working in IVC were identified and described, they varied considerably by provider type and role.

IHPs and non-clinical staff emphasized the strong support from IVC leadership, describing being able to bring concerns forward:

> *When I felt like I wasn't having the rewards, I discussed it with [management], and they brought it forward. I talked with [one of the doctors] a couple times because we had a patient that was hard and had a question. [The doctor] called me. (Participant 1, IHP)*

As the only participants working predominantly off-site, physicians shared differing perspectives with respect to IVC strengths and benefits that did not apply to IHPs and non-clinical staff. Physicians described the benefit of having a flexible work schedule, allowing them to work in IVC while also pursuing other roles:

> *You know, I went into family medicine to provide continuity of care to my patients, and a kind of comprehensive healthcare. And, I have to admit, I now don't see myself working as a full-time family physician. I personally don't think I could take on that responsibility because it's a lot of work … but I still have the skills and I enjoy this work, and this is a way for me to still do what I actually went to training for… Have that continuity but don't have to roster 2000 patients, which is just too much for me. (Participant 4, physician)*

The flexibility also extended to geographic location, with physicians sharing that working predominantly off-site had advantages in deciding when to travel to the clinic: "Driving in the winter, especially that distance and on those roads is quite dangerous. I want to avoid that for now" (Participant 3, physician).

Discussion

This qualitative study on clinician and non-clinical staff experiences points to the essential support that IHPs and non-clinical staff provide to family physicians in the success of a hybrid primary care program. Some themes reflected varied perspectives across groups of providers, while others were shared. Some perspectives were specific to certain roles within the program, for example, non-clinical staff experiences on managing practice changes during the first year of IVC, while physicians described different challenges during the first year. The emphasis on collaboration in a hybrid setting aligns with findings from previous studies [15, 21].

For physicians, maintaining a patient roster and providing continuous care enhanced their experience of working in IVC, suggesting important implications for future physician recruitment and program expansion. As this hybrid of in-person and virtual care is increasingly recognized as a viable means of delivering comprehensive primary care, it aligns with a recent definition of attachment, which encompasses care provided through any channel (in-person, remotely, or both) [3].

The desire to contribute to an underserved community and for physicians to "give back" to a region where they have a connection has been identified in another study, which identified a passion for serving underserved populations as a key value influencing primary care preferences in rural areas [33]. Our study identified a similar phenomenon, even within a hybrid program where physicians were not on site and in the community as other providers were. Maintaining a strong connection to the local context and values may influence the experiences of clinicians and non-clinical staff and could play a crucial role in recruitment efforts.

IVC now provides comprehensive primary care for over 7000 patients and has a physician team of 19. The program has also expanded to two new primary care clinic sites within the county, contributing significantly to improved attachment in this underserved region. This IVC expansion utilised existing funding for physician salaries within IPCTs that had been unable to recruit physicians to physically relocate and work on-site but where the IPCT did have IHP and non-clinical staff available to support the program locally. In this way, IVC is unique in that it modifies an existing model of primary care attachment to provide longitudinal, comprehensive primary care. From a policy perspective, IVC is an innovative approach to address the challenge of recruiting physicians, particularly in more rural communities. These findings, and future evaluation findings may be relevant when considering alternative physician compensation and employment models. In addition, considering the health human resource supply of IHPs, particularly NPs, is an important consideration for future potential expansion.

Findings from this study demonstrate the occasionally diverging views of clinician and non-clinical staff working in this program, capturing some experiences which were specific to the first year of IVC's operation. This is relevant to policymakers, as they grapple with current health system challenges related to capacity, access, and health human resources in rural areas. Our findings emphasize the importance of IHPs in delivering a hybrid in-person and virtual care program like IVC; ensuring adequate IHP capacity is essential for supporting IVC physicians in delivering high-quality care [7]. In a recent case example by Ashcroft and colleagues, clarification of interprofessional team roles was linked to building capacity. Additionally, strong organizational supports from responsive management and locally knowledgeable leaders are key assets in interprofessional primary care [34].

Limitations

This study offers a comprehensive perspective on clinical and non-clinical staff experiences with IVC, as nearly all employees participated in interviews. However, certain limitations must be acknowledged. First, the sample of participants was diverse, including professionals from various disciplines working both on- and off-site. While this diversity enriches the findings, it may limit the strength of the information generated, particularly for smaller participant groups. Nonetheless, despite the moderate sample size, there was consensus across coders that thematic saturation was reached, demonstrating sufficient information power to capture the breadth and depth of relevant experiences [29]. Additionally, a time delay between data collection and analysis (due to one researcher being on leave) meant that the program has evolved in the interim. Some challenges have since been addressed, such as the hiring of additional non-clinical staff to reduce workload.

Future directions

As IVC scales by enrolling more patients, recruiting more physicians, and expanding to additional clinic sites, this study can provide a foundation for future study and evaluation. Specifically, given the unique, predominantly off-site role of physicians in IVC, there will be a need to understand the perspectives of physicians opting to join this practice model. This will be relevant for longer-term sustainability of IVC, to provide continuous care to patients currently enrolled in the program. Additionally, as many jurisdictions continue to implement integrated models of healthcare delivery [35], further work is warranted to explore how hybrid primary care programs can be incorporated and contribute to integrated care systems by aligning strategy and vision, and by connecting primary care to other sectors of the healthcare system. This latter point is particularly relevant given the importance of attachment to primary care in integrated care systems.

Conclusions

This study describes the experiences and challenges of clinicians and non-clinical staff working within a hybrid primary care program, emphasizing the crucial role of collaboration, the contribution of IHPs and non-clinical staff in caring for an underserved community, and their role in supporting physicians. These findings can inform program improvements and highlight considerations for similar programs, particularly in rural Ontario. Additionally, this work can support the scale and spread of IVC in other regions facing challenging primary care access and low attachment.

Abbreviations

IVC	Integrated Virtual Care
FHT	Family Health Team
PCFHC	Petawawa Centennial Family Health Centre
NP	Nurse Practitioner
RPN	Registered Practical Nurse
PCP	Primary Care Provider
IHP	Interprofessional health providers

Supplementary Information

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Supplementary Material 1

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Author contributions
SC, KP, and JF contributed to the conception and design of this study. SC and KP contributed to the acquisition of data, while SC, KP, and AS contributed to analysis of data. SC, KP, and AS wrote the first draft of this work with input from JF. All authors contributed to interpretation of the data, revision of the final draft of the manuscript. All authors approved the submitted version of this study.

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Data availability
The complete datasets generated and analysed during the current study are available from the corresponding author on reasonable request, subject to approval from the Hôpital Montfort Research Ethics Board.

Declarations

Ethics approval and consent to participate
This study was approved by the Hôpital Montfort Research Ethics Board (file number 22-23-09-025) in accordance with the Declaration of Helsinki. Informed consent was obtained prior to each interview.

Consent for publication
Not applicable.

Competing interests
Jonathan Fitzsimon is the medical lead of the Integrated Virtual Care program. No other competing interests are declared.

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