Original Research

Implementing Specialized Diabetes Teams in Primary Care in Southern Ontario

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A B S T R A C T

Objectives: This study explores the implementation processes of integrating specialized diabetes teams into primary care in southern Ontario, Canada.

Methods: In-depth qualitative interviews were conducted with 23 patients, 20 diabetes educators and 16 primary care physicians. In addition, group debriefing sessions were conducted and field notes were collected from diabetes educators and diabetes education program managers to further explore the day-to-day issues of implementation. Data were analyzed using an inductive content analysis approach.

Results: Analysis revealed 3 main themes: Right Place, Right Time, Right Service: the convenience and comfort of local care, timely, preventive management and delivering person-centred care; Creating Partnerships: generating intervention buy-in, formal discussion, service agreements, site orientation and team development; Operational Complexities and Strategies: access to electronic medical records and documentation, referral and scheduling procedures, and costs and resources.

Conclusions: Because situating diabetes teams in primary care currently involves using existing healthcare structures and human resources, pragmatic methods of fostering successful implementation of this model of practice are required. The utility of this model was perceived as being viable, and benefits were visible to all study participants. Strategies to facilitate implementation include outlining roles and expectations by educators and the primary care providers’ team in the beginning, investment in the intervention by all stakeholders, and clear channels of communication that allow educators to perform their roles and leverage opportunities for team collaboration in patient care. Further evaluation of implementation processes can serve to expand this model of practice, which has proven so far to be favourable to the players involved.

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Mots clés :
Soins aux diabétiques
Éducateurs en diabète
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Services aux patients
Soins de santé primaires
Enseignement sur la prise en charge autonome
Intégration des services
Soins spécialisés

RÉS U M É

Objectifs : La présente étude examine les processus de mise en œuvre de l’intégration des équipes spécialisées en diabète aux soins primaires de l’Est ontarien, au Canada.


Résultats : L’analyse révélait 3 thèmes principaux : le service approprié, au moment opportun et à l’endroit souhaité ; la commodité et le confort des soins de proximité, au moment opportun, la prise en charge préventive et la prestation de soins centrés sur la personne ; la création de partenariats : susciter l’acceptation des interventions, la discussion formelle, les ententes de service, l’orientation des sites et la consolidation de l’équipe ; les difficultés et les stratégies opérationnelles : l’accès aux dossiers médicaux électroniques et à la documentation, les procédures d’agencement et de planification, ainsi que les coûts et les ressources.

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Conclusions: Puisque la situation des équipes en diabète aux soins primaires comporte actuellement l’utilisation des structures de soins de santé et des ressources humaines existantes, des méthodes pragmatiques pour favoriser la réussite de la mise en œuvre de ce modèle de pratique sont requises. L’utilité de ce modèle était perçue comme étant viable, et les avantages étaient visibles pour tous les participants de l’étude. Les stratégies pour faciliter la mise en œuvre sont les suivantes: la définition initiale des rôles et des attentes des éducateurs et de l’équipe de prestataires de soins primaires, l’engagement de toutes les parties aux interventions et des voies de communication claires qui permettent aux éducateurs d’assumer leurs rôles et d’exploiter les possibilités de collaboration entre les équipes de soins aux patients. Une évaluation plus approfondie des processus de mise en œuvre peut servir à étendre ce modèle de pratique, qui, jusqu’à présent, s’est avéré favorable pour les parties concernées.

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Introduction

In Ontario and across Canada, diabetes education programs (DEPs) have started to develop collaborative partnerships with their local primary care physicians by delivering specialized diabetes services at primary care sites. This collaborative service model between primary and specialty care affords primary care providers (PCPs) and their patients living with diabetes access to certified diabetes educators who offer self-management training and support that are aligned with clinical practice guidelines (1) and the Chronic Care Model (2). Furthermore, it was established primarily to address the many challenges involved in access to and uptake of diabetes self-management education services. Diabetes education services are underused; uptake occurs by only 25% to 30% of Canadians living with diabetes (3,4). Most Canadians with diabetes receive care solely from their PCPs (5), who face challenges in providing optimal diabetes care and self-management support to patients (6–12). Furthermore, less than half of Ontarians and Canadians meet the recommended clinical targets for diabetes management (6,13). These findings demonstrate a need for more effective delivery of diabetes care, education and support.

Clinical practice guidelines are now recommending that diabetes care management be provided by an interprofessional team with specific training in diabetes, or supported by diabetes specialists, in primary care (1). These recommendations are based on current meta-analyses, which demonstrate that various aspects of disease management and quality-improvement strategies that include promotion of self-management, patient education and provision of team care, improve glucose control (14,15) and cardiovascular risk factors (15). Despite the reported benefits of integrating diabetes specialists, such as certified diabetes nurses and dietitians into primary care, translation of this evidence into practice is scarce in the literature; this contributes to the knowledge-to-action gap (16), limiting evidence-informed practices and decisions as well as replications. Implementation research can provide insight that enhances the design, planning and further development of new interventions (17,18). Our research objective was to provide pragmatic information to assist in the translation and transferability of integrating specialized diabetes teams, specifically nurse and dietitian diabetes educators, into primary care. This article’s objective is to explore how several primary care sites introduced and implemented this integration.

Methods

The intervention

The specialized diabetes teams were composed of a nurse and a dietitian-certified diabetes educator who provided primarily patient self-management education, coaching, timely treatment adjustment (access to remote glycemic regimen optimization and monitoring via telephone and e-mail), and system navigation support to patients. They also provided primary care physicians with recommendations for medication optimization and decision support for diabetes management. Educators were on site either weekly or monthly, depending on the patient case load. Patients were referred to the educator teams by their primary care physicians. The intervention was targeted primarily to reach patients with type 2 diabetes who had been newly diagnosed, had experienced poor glycemic control, had complications resulting from diabetes or needed insulin initiation. Because patient referrals varied across sites on the basis of physicians’ discretion and the site partnership agreement with the DEP, some educator teams also saw patients with insulin glucose intolerance and type 1 diabetes, but the majority of patients seen had type 2 diabetes. Patients who typically require intense and specialized treatment, such as some patients with type 1 diabetes or gestational diabetes and those on multiple daily insulin regimens, were referred to DEPs.

The educator teams saw patients (for approximately a half hour each, with a nurse and a dietitian or together, depending on space availability) to assess patients’ level of diabetes self-care, diabetes knowledge and lifestyle habits. The educator team provided individualized patient education and developed treatment priorities and action care plans in consultation with the patients; these plans were shared with the PCPs, who reinforced them during subsequent visits. Case conferences were conducted when major changes to the patients’ treatment plans (e.g. insulin initiation, prescription for supplies, dose titration) were considered; thus, the PCPs and educators collaboratively managed patient care. However, some sites did not have PCPs and the diabetes teams concurrently on site. All patients were also encouraged to attend their local DEPs for additional support services (e.g. education classes, workshops, cooking demonstrations, grocery store tours). Half-hour follow-up visits with the educator teams were scheduled over a 1-year period for all patients, during which action plans and patients’ goals and needs were reviewed, discussed and, potentially, revised. After the first year, more follow-up visits occurred on the basis of patients’ needs and the educators’ clinical judgements, such as when patients’ glycated hemoglobin (A1C) levels were outside the target range, when patients required insulin initiations or insulin adjustments, or when patients requested additional visits.

Study locations

Diabetes teams were sent to 11 primary care sites in a region of Ontario, Canada, operating between November 2009 and August 2014. Of the 11 primary care sites, 8 were family health teams, 2 were family group practices and 1 was a solo physician practice.

Data collection and participants

Three types of data were collected from the diabetes educators concerning their experiences in implementing the intervention: 1) 18 in-depth, semistructured, face-to-face interviews with 8 nurses and 10 dietitians (including a clinical team lead); 2) 10 quarterly group debriefing sessions with educator teams and program managers and 3) 23 monthly reflective journal entries from diabetes educators across all sites. In-depth interviews were also
conducted with 16 PCPs (50% of those participating) by phone or face-to-face and with 23 patients by phone. All interviews were conducted 1 year after the intervention began at each primary care site. Interview times ranged from 45 minutes to 1.5 hours. Patients’ ages, levels of education, genders, ethnicities and care provider’s ages and number of years practising were collected (Table 1). Purposeful sampling was used to interview physicians and patients from all the participating sites. Patients were purposefully sampled to represent a range of number of visits that included at least 1 to 10 visits. For each participant, group interviews were performed until saturation was achieved (i.e. no new themes were being generated) (19).

Interview guides were developed for each group of participants (Table 2) and were informed by existing conceptual models of implementation (20,21), which focused on contextual factors related to intervention development needs (norms and attitudes, structures and processes, and resources); the processes of implementation (adoptive intervention, variations in implementation) and intervention outcomes (patient care and health outcomes). Interview guides were reviewed by the research team and piloted with 2 persons from each participant group to assess clarity, comprehensiveness and ease of completion.

Educator teams were asked to attend quarterly debriefing sessions to discuss their experiences and any implementation issues that arose and were also asked to maintain field notes. A monthly e-mail reminded educators to submit field notes entries that they wanted to share. Journal data were transmitted via a confidential online form (Opino), sending a Word document, or during an audiorecorded meeting with the research coordinator.

The study protocol, consent forms and interview guides were approved by the institutional ethic boards at Ryerson University and participating hospitals and facilities. After the study was described to participants, written informed consent was obtained. All interviews and debriefing sessions were audiotaped and transcribed verbatim. The study participants are identified in this article according to their professions and/or roles (e.g. diabetes educator [DE], primary care physician/provider [PCP], patient [Pt], DEP Manager [M], clinical team lead at the DEP [CTL]).

Data analysis

An inductive qualitative approach is recommended to describe both planned and unanticipated impacts arising from program implementation (24–26). Data were analyzed using content analysis (22,23). This analytic approach involved 3 researchers’ reading the field notes journals and the transcripts of the debriefing sessions and interviews line by line to identify codes. The team then met and developed by consensus an initial list of codes. The codes were then grouped under categories (subthemes) that were then collapsed into 3 broader themes. This was an iterative process whereby the team members would review transcripts and the emerging coding schema separately and then would meet to refine the coding schema until consensus was reached and all researchers agreed on themes and subthemes. To ensure methodologic rigor and the trustworthiness of the data analysis, the research team developed an audit trail that included the triangulation of responses from the in-person interviews, field notes and debriefing sessions. NVivo software, version 11 (QSR International, Burlington, Massachusetts, USA) was used to facilitate coding across all the data sets.

Table 1
Demographics for patients, primary care providers and educator interviewees

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient (n=23)</th>
<th>Primary care provider (n=16)</th>
<th>Certified diabetes educator (n=18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30–39</td>
<td>0</td>
<td>7 (43.8%)</td>
<td>4 (22.2%)</td>
</tr>
<tr>
<td>40–49</td>
<td>6 (26.1%)</td>
<td>3 (18.8%)</td>
<td>5 (27.8%)</td>
</tr>
<tr>
<td>50–59</td>
<td>6 (26.1%)</td>
<td>2 (12.5%)</td>
<td>8 (44.4%)</td>
</tr>
<tr>
<td>60+</td>
<td>11 (47.8%)</td>
<td>4 (25.0%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15 (65.2%)</td>
<td>7 (43.8%)</td>
<td>18 (100%)</td>
</tr>
<tr>
<td>Male</td>
<td>8 (34.8%)</td>
<td>9 (56.3%)</td>
<td>0</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>5 (21.7%)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>High school/GED</td>
<td>6 (26.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational/technical school</td>
<td>2 (8.6%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>5 (21.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated college</td>
<td>5 (21.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated university</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of years living with diabetes</td>
<td>10 years:8.9</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Number of years practising</td>
<td>N/A</td>
<td>18.1±12.6</td>
<td>12.75±6.2</td>
</tr>
</tbody>
</table>

N/A, not applicable.

Results

The themes that emerged from our analysis (Table 3) included Right Time, Right Place, Right Service; Creating Partnerships and Operational Complexities. Exemplar quotations that best embody the reported themes are found in Table 4.

Right time, right place, right service

PCPs described how the presence of educator teams at their sites contributed to the development of a “medical home” by centralizing timely access to specialized patient-centred care services at convenient and familiar locations and by facilitating interprofessional collaboration and knowledge transfer.

Right time: Timely and preventive management. Patients and PCPs agreed on the importance of prompt availability of and access to the specialized diabetes care provided by the educators, clearly a benefit, given that the average wait time for the DEPs can be several months. The educators provided immediate management support to patients, such as recommending adjustments of medications or dosages, booking required ophthalmologic appointments, and referring to endocrinologists or the DEPs for further specialized services, including education classes, insulin initiations and emergency foot care.

Healthcare providers believed this model of care produced greater adherence to self-care recommendations because patients received consistent messaging from both educators and PCPs. For instance, many PCPs found it difficult to encourage patients to start insulin because they lacked the time and expertise necessary to help patients...
PCPs recognized that educators’ specialization in insulin starts is a great value-added support for their sites. Likewise, patients reported feeling comfortable and confident in using insulin after their interactions with the educators.

**Right place: Convenience and comfort of local care.** Having diabetes teams on site in a familiar location was convenient and comfortable for patients. Patients had established relationships with their PCPs and, in some cases, with the administrative assistants, which led to their sense of ease, as indicated by a patient who called it “my own place” (Pt 20). Patients who had previously attended local DEPs preferred to receive care at the sites of their PCPs, where they saw both dietitian and nurse educators during each clinic visit, whereas at the DEPs, this was not always the case. Centralizing the educators in primary care enhanced communication and follow through with recommendations such as medication adjustments. Patients also had the option to see all 3 providers during the same visit. A referral to the DEP meant new travel logistics; the challenges of navigating the hospital parking system was often noted. Such stresses were heightened for patients who were older, living with mental illness, living in poverty or who had multiple health issues, especially because in most cases the DEP was farther from the patients’ residence than their PCP office. In addition, some diabetes educators noted that their patients prefer the anonymity of their PCP sites as opposed to going to the DEP, where all patients have diabetes.

**Right service: Delivering person-centred care.** Patient participants agreed that the educator teams offered and delivered care that was patient centred. Patients reported shifts in their attitudes, behaviours and observances of their treatment plans after meeting the educators; they expressed appreciation for the educators’ time and support, which improved their understanding of their diabetes and their confidence in their treatment plans and abilities to self-manage. Patients found the educators to be very accessible by phone or e-mail for insulin adjustments or further questions, and they felt at ease when talking to them regarding their diabetes and appreciated their nonjudgemental, supportive approach. Patients described the educators as going “above and beyond” in delivering patient-centred care, for instance, by informing patients of subsidies from specific diabetes-management programs, filling out paperwork and getting doctors to sign documentation. They said educators tailored care to their circumstances and needs. Furthermore, the presence of the educator teams on site allowed the PCPs and educators to engage in more real-time interactions, which allowed the health professional teams to discuss the patients’ stories
and the details of the patients' lives that were not easily conveyed through medical charts or helped them to "understand why something may or may not have been done or added or changed, right on the spot." This was particularly important for patients with health comorbidities or mental health issues.

### Creating partnerships

#### Generating intervention buy-in

To generate interest in the mobile diabetes teams, DEP managers asked pharmaceutical representatives to promote the intervention among general practitioners by distributing a 1-page pictorial guide describing the DEP services available for patients, including the diabetes teams' services. The DEP managers also regularly attended physicians' continuing education events to network and promote the intervention.

Early adoption of the intervention was associated with PCPs' acceptance of quality improvement and multidisciplinary care concepts that were encouraged at professional-development venues. PCPs explained that resistance to the intervention was related to their colleagues' belief that the PCPs should be responsible for all aspects of patient care and to a misunderstanding of other health professionals' scopes of practice. Conversely, educators at the hospital-based family health team sites did not have to promote their services actively; they were initiated at the hospital level as a value-added program to the family health teams and were formally integrated to provide prompt and timely specialized care.

The educators found that having even 1 PCP championing the mobile diabetes education teams' could spark interest and referrals from other PCPs at the site, fostering a culture of support for the intervention that trickled down to the staff around them.

#### Formal discussion, service agreements and site orientation

Factors that facilitated more successful implementations included establishing service agreements and allowing for on-site orientations to introduce the educator teams to the PCPs (i.e. meet the designated contact persons, such as office managers or nurse practitioners; learn the office layout; find out where they would meet patients and which spaces were available for their resources). These introductory procedures also enabled the teams to ascertain the unique needs of the PCP site for the delivery of diabetes care, encouraged the formation of relationships among health professionals, and informed PCPs of the range of services offered by the educator teams and DEP services available for their patients. These formal activities provided opportunities for exchanges of critical information relating to the implementation and operation of the diabetes teams, particularly in terms of scope of practice and roles and responsibilities with regard to patient care. Face-to-face meetings between the PCP teams and educators reduced the likelihood of future conflicts. Lack of clarity regarding roles, responsibilities and needs from the onset led to problems in scheduling, in electronic medical record (EMR) access, in under-referral of patients to the educators, in referral of patients who did not have diabetes and in space availability for the diabetes teams to operate.

#### Team attributes

Educators acknowledged administrators as being critical to the success of the intervention because they were involved with booking appointments for the educators, providing educators access to patient information, instructing educators in how to use the EMRs, organizing space for the educators to operate and designating areas for their resources. Primarily in situations where EMR access was not available to educators, the administrative staff ensured...
Table 4
Major themes and exemplary quotations from informants

<table>
<thead>
<tr>
<th>Facilitators to implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention benefits</strong></td>
</tr>
<tr>
<td>Right time:</td>
</tr>
<tr>
<td>PCP 1-1: I think it's a great opportunity for prompt, timely management of newly diagnosed diabetics and problem diabetics. And it's also an opportunity for learning from very highly skilled professionals (mobile teams). So, you know, it works certainly to our advantage from both camps.</td>
</tr>
<tr>
<td>Pt 3: If you've just learned you have diabetes, you've got to get on stream immediately. People that have had it for a number of years, I guess, they probably know a little bit more about it. But, there's new things coming out all the time and new programs. So yeah, I would definitely say that everyone that has it [diabetes] does it [visit with diabetes team] on a consistent basis, whether it's once a year or twice a year. It doesn't hurt. And, like, for half an hour of your time, it's well worth it.</td>
</tr>
<tr>
<td>DE 6: [DE 2] also has that specialty of being a foot-care nurse, so there's been a couple of situations where some people who were in great need of emergency foot care and she had to get them in to see a dermatologist as soon as possible. She [DE 2] was very concerned, and she wanted to see them in the foot clinic.</td>
</tr>
<tr>
<td>PCP Pilot #1: Insulin initiation was something that I really didn't do myself. It was usually done through the diabetes management centre. So having people onsite [diabetes team] doing the initiation . . . the timing of it was improved. And my comfort level and knowledge in terms of initiating insulin, it's grown with having them there.</td>
</tr>
<tr>
<td>Right place:</td>
</tr>
<tr>
<td>PCP 1-2: The advantage [of the diabetes teams] is that it allows us [PCP site] to further create our medical home here, which is where we try to provide all the services we can for our patients in the environment that they're familiar with. And so I think it's better for patients, but I think it's also better for providers because we get to interact more directly with the team. And that opportunity for knowledge transfer is there.</td>
</tr>
<tr>
<td>PCP 1-2: It's reassuring for the patients that these people [diabetes team] are part of our team and that we're working together, and that these ideas about, “You need insulin” or “You need a new drug” or whatever, are not coming out of anywhere. They know that they're [mobile diabetes education teams] in direct contact with me, much more so than when you send them off to another hospital or another specialist, or so on.</td>
</tr>
<tr>
<td>Pt 13: It's quite a good team in terms of getting consistent information. . . . Concerning me and the diabetes, they have also worked together with me. It's always a combination of DE 23, the doctor. . . . DE 23 will pass information on to the doctor, or she will email the doctor. And then my doctor will, if it's something I need to come back for, they will either call me or leave a message. So, it's kind of . . . it flows really well. There is a lot of interaction between all three.</td>
</tr>
<tr>
<td>DE 6: They probably have a good relationship with their doctor, and they feel because they're [diabetes team] in their doctor's office, this is just part of their care. . . . I think that they are getting personal attention, it's in a place of their choice, which hopefully would make them more agreeable to continue on and to sort of follow through on recommendations. So they feel that attachment, I think, to the family physicians, so perhaps [there] is a little bit more accountability.</td>
</tr>
<tr>
<td>PCP 4-1: I think as people in healthcare, we need to respect the fact that we need to try to keep their lives as normal as possible, and not impinge on their time by making them go to multiple appointments at different times. You know, that makes them like a full-time patient.</td>
</tr>
<tr>
<td>Pt 16: I'd say it's, like, very convenient, [you get] 3 in 1 . . . because you see the doctor, and after that you see the nurse, and after the nurse you see the diettian, 3 in 1, like what else do you want? They tell you about how to do it, and how much to eat, and, you know. . . . Yes, it's very convenient and it's very helpful for any patient.</td>
</tr>
<tr>
<td>Right service:</td>
</tr>
<tr>
<td>PT 4: [DE] has helped me out quite a bit with the insulin, and she takes her time, she doesn't rush me out of the office. She explains things to me that I'm confused on, like with the insulin. I call her every couple of days and let her know my levels, my sugar levels, and then she decides to either boost it up or put it down a bit.</td>
</tr>
<tr>
<td>Pt 1: But they make you feel at ease though, you know? It's the way they speak to you that makes you understand more. But if somebody said, “Look, you gotta do it and that all's there is to it.” But you want to know why, right?</td>
</tr>
<tr>
<td>Pt 4: She knows my situation. She really understands. She goes out of her way to do this (i.e. informing patients of diabetes subsidies and filling out paperwork).</td>
</tr>
<tr>
<td>DE 6: Just because of the way that DE 4 and DE 7 are . . . you know, they're not judgemental. Like, so many people are ashamed because . . . maybe they're not looking after themselves properly or they don't know how to look after themselves. Whereas DE 4 and DE 7, they don't . . . teach you like you're inferior to them. They're like, “Okay, well this is what you need to do.”</td>
</tr>
<tr>
<td>Pt 15: I find they [DEs] look into what you have to say, and we go through a whole process. And I do find that they do a lot of tailoring, so it's not “Okay, this is all you can have, and here, you got to follow it” . . . and, you know, the whole explanations and everything that they do just makes you feel a lot better about yourself and the choices that you can make.</td>
</tr>
</tbody>
</table>

Creating partnerships

Generating intervention buy-in by PCPs:

M: What have we done is we have engaged with a lot of our different pharmaceutical companies. Each company has their own GP [general practitioner] reps that go out into the community. They [GP reps] are really our legs and eyes and our ears. We developed a basic, little 1-page pictorial guide of what we can do for them [PCP sites], and one of them is the mobile diabetes teams. They [pharmaceutical representatives] kind of do the cold call for us . . . . We go out to [physician continuing education events] and work the room a little bit. Often, part of what we would talk about at those events is that we can offer them in a mobile diabetes team. It would be 5 to 10 minutes of us talking, and then people would give me their cards if they are interested in hearing more about it. |

PCP 4-1: 4. So, multidisciplinary care was certainly the way to go, you know, utilizing your allied health to their full scope of practice—all of this sort of stuff. So we were very interested in trying to change up whatever we could change up . . . . Yeah, I'm generally, of the group here, going to be more accepting of using allied health. Like a lot of my partners are still sort of hung up on, “No, no, no. The family doctor's got to do that.” Like, they're afraid to trust the nurse practitioner or the pharmacist, or—you know what I mean? |

CTL: And usually, there's one champion physician in the practice. . . . Like there's always one who goes, “This is great, I just have to sell my other colleagues on this idea.” You just need 1 champion, and then these guys [referring to the DEs] go in and prove their worth, and [other PCPs] will follow as soon as they see what you do . . . . But you probably get most of your referrals initially from that one, I'm guessing, until it really picks up.

Formal discussion, service agreements and on-site orientation:

M: We want a partnership, we want face time with you [PCP], we want to work together to see patients while you're around or available so that we are able to make those timely adjustments and recommendations . . . . But it was a good thing when we talked to physicians on the phone and gave them the lowdown, then we send them the service agreement, so they really understood what it was. . . . The physicians [who] get that [service contract] ahead of time, and it very clearly outlines that they're [diabetes team] willing to be available for consultation, that here's our scope, here's what we'll be doing, here's what we won't be doing . . . . so there shouldn't be a lot of surprises going in. The physicians and the staff should know what to expect before the staff shows up. |

CTL: I mean, primary care is kind of fee for service, so the fact that they believe in the additional benefits of allied and things like that for chronic conditions, means that you just want to make sure that you're providing that value-added. . . . You can ask them, right? And I think that's one thing that maybe taking the time to get to know them, to make sure they know who you are, to get to know their secretaries, to get to know their nurses, to introduce yourself, to just give a two-second blurb to—whether it's the secretary or the nurse, or the physician themselves—about where you're from and what you're here to do, and what you can help them with, to [say], “Feel free to come to me with such and such” is huge. I think people forget to ask, you know, “What is it that you are looking for me?” When I'm here to do diabetes services with your patients, what are some of your burning issues? What are your gaps? What do you see as the biggest barriers or difficulties for your patients?” Ask them that. And find out what it is that they believe would bring value to their practice. Because then you can set about to provide that. So I wouldn't make any assumptions around what you're there to do, I would go and ask them and clarify.
communication between educators and PCPs. Thus, the absence of an invested support team at the PCP site was problematic for the educators and hindered their ability to deliver care. In fact, the intervention was terminated at some sites due to the absence of supportive organizational practices and only resumed once these issues were resolved.

Educator teams required experienced educators. In a primary care environment, educators needed to be adaptable and flexible and able to be team players. Primary care and DEP sites were quite different from each other, and the educators needed to develop strategies to adapt, as reflected in their comments on the need to “roll with it,” “improvise,” “be persistent,” and “go with the flow” and not get “upset about the fact that you might be asked to move offices 3 times in 1 day.” Furthermore, compatibility between the 2 educators were reported as important by educators because they had to rely on each other’s expertise and support in a new environment to deliver patient care effectively. The ideal educator was described as being “knowledgeable” and being a “veteran of diabetes” with “at least 2 to 3 years’ experience.” Previous experience in working with a variety of physicians and an understanding of the complexities of diabetes was considered important. Physicians described the ideal educators as being assertive, confident in their abilities and scope of practice, and able to advocate for patients’ needs in an interprofessional environment.

Table 4 (continued)

<table>
<thead>
<tr>
<th>Barriers to implementation</th>
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<tbody>
<tr>
<td><strong>Operational complexities</strong></td>
</tr>
<tr>
<td>EMR access and documentation:</td>
</tr>
<tr>
<td>DE 4: If the office support is there and the schedule is worked out, then everybody’s happy. And also, not being in the way—you have your own space and you don’t have to put your stuff on top of somebody else’s. The little things. But then, you know, they’re looking forward to you going there, rather than, “Oh no, they’re here again and we don’t have any room to put them.”</td>
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* The type of informant is indicated at the start of the quote.

ctl, clinical team leader; de, diabetes educator; pcp, primary care physician; pt, patient; emr, electronic medical records.

**Operational complexities**

**EMR access and documentation.** Given the lack of integration of EMRs across healthcare organizations in Ontario, educators had varying access to the EMRs at each site, from complete access to none, including access via a staff member’s login, which would not guarantee confidential charting, or via their own secure login, paid for, in some cases, by the PCP’s site. At the 5 hospital-based family health...
team sites, the educators were full-time staff members of the hospital with complete access to the EMRs, allowing the educators to receive referrals from PCPs, prepare for patients' appointments effectively, update patient information with ease, and communicate with other health professionals immediately via the EMR communication tool. Both PCPs and educators agreed that an accessible EMR system aided implementation and enhanced patient care delivery by ensuring that health providers delivered consistent care based on the patients' medical histories.

When educators had no access to the EMRs, they relied heavily on administrative staff members to print patient information which, at times, was incomplete or not up-to-date, and that impeded the educators from delivering optimal patient care. In certain cases, educators felt they imposed on staff by “asking too many questions and asking too much of them.” Inaccessibility to the EMRs prohibited educators from providing the detailed charting notes that PCPs wanted.

Referrals, scheduling, and cancellations and no-shows. At most sites, the educators saw predominantly patients who had been newly diagnosed or needed insulin initiations; at some sites, the educators also saw patients who were not meeting clinical targets, had multiple comorbidities or faced multifaceted barriers to healthcare. Given the greater number of patient referrals to educator teams at the hospital-based family health sites, these educators were very busy and were on site once a week. However, this was not the norm at many of the DEP partnership sites, where the educators’ services were underutilized due to the lack of patient referrals. Educators felt that the PCPs that were on site on the same day as themselves were most likely to refer. Lack of PCP referrals and unorganized booking procedures were noted as barriers by educators. Some PCPs did not feel these services were necessary for their well-controlled patients and did not inform all patients of these services.

Suggestions by educators to improve the use of their services included promotion directly to patients using mail, e-mail and promotional posters on site; allowing patient to book diabetes specialty services without PCP referrals; and screening patients’ charts to determine suitable candidates for the intervention. All these strategies were used effectively at the 5 hospital-based family health team sites.

Effective scheduling and follow up with patients for rebooking required a great deal of energy, as described by a PCP who suggested that appointment booking would be better managed by educators than by the overtaxed administrative assistants. At some sites, the DEP administrative team booked appointments; at others, the regular administrative staff handled bookings; and a minority of educator teams scheduled patients themselves. At the onset, many sites encountered conflicts due to inaccurate scheduling, timing and length of appointments, overbooking, and inappropriate referrals; however, these issues were usually resolved over time, and participants agreed that scheduling guidelines should be established early in the process.

No-show and cancellation rates, which were reported more often for follow ups than for initial appointments, caused educators much uncertainty about their workloads. They adapted by combining the nurse and dietitian appointments, thereby reducing repetition in terms of patient-information collection and self-management education. Certain sites adopted this method for all patient appointments as a way to see more patients during the half-day per month when office space was available. In many cases, PCPs and educators attributed patient no-shows or cancellations to the complexities of socioeconomic, addiction and mental health issues. Educators suggested that when regular administrative staff booked patients, reminders by phone or by appointment cards may decrease no-shows and cancellations.

Costs and resources

Because space is scarce in most primary care practices, and cost is a factor for some PCPs, some sites hosted the educator team only on days when PCPs were absent or only 1 day or 1 half day per month. At times, there was insufficient space for educators’ resources and some instances of scheduling conflicts that led to room shortages for educators to meet with patients. Educators coped by mailing patients specific materials at later dates from the DEP and, at 2 sites, offered their services in the evenings and on weekends.

Discussion

The implementation of new models of practice or healthcare interventions requires attention to real-world issues that affect service uptake and delivery based on local contexts, such as operational barriers, patient diversity, time constraints, financial limitations or supports, and the organizational culture and structure (27). In addition to identifying the benefits, study participants described the many facilitators and barriers that affected the implementation and sustainability of this proposed primary care model for diabetes care.

The right place, right time and right service

According to the diffusion of innovation theory, it is critical that an intervention offer prospective participants a relative advantage to motivate its adoption (28–31). Interviews with stakeholders (PCPs, diabetes educators and patients) attest to the benefits observed when specialized diabetes services are integrated within primary care. A key finding of our study is that patients prefer to receive specialized diabetes care at their primary care sites because of the convenience, comfort and familiarity. Individuals living with diabetes face numerous barriers to accessing DEP services, including long waiting times, lack of time to attend appointments at other locations, and parking, travel and logistic issues (6,32,33). The integration of primary and specialty care services is also favoured by some PCPs as a way to develop the “patient medical home,” a concept advocated by both the Canadian and the American College of Family Physicians, which refers to a “family practice defined by its patients as the place they feel most comfortable—most at home—to present and discuss their personal and family health and medical concerns” (34). PCPs are the gatekeepers to specialized health services, and patients experience successful outcomes when their primary caregivers coordinate their care (35,36). Inclusion of a diabetes team at the primary site allows the PCP-patient relationship to include diabetes educators and, in some cases, the local DEP, which may enhance patient care. The patients interviewed felt more comfortable with the consistent messaging from the entire healthcare team.

Most of the PCPs interviewed recognized the benefits of on-site diabetes specialists. They appreciated the educators’ diabetes expertise, the opportunity to learn from them, and the support they provide in making timely recommendations for appropriate treatments, referrals to other specialists and changes in therapy, including insulin management. This model of care provides opportunities for real-time communication among health providers by allowing health providers to act quickly when necessary as well as providing occasions for informal discussions of patients’ issues (e.g. “hallway meetings”) that are not easily conveyed in writing. These intricacies are part of the patients’ stories and, when known collectively by the team, facilitate better patient-centred care (37). Furthermore, the diabetes educator are able to spend more time with patients and can discuss their issues and develop relationships over time. Overall, participants agreed that the quality of patient care is enhanced by this interprofessional teamwork.
Creating partnerships

Understanding the who, what and how during an intervention’s installation phase is essential to facilitating successful implementations (38). All care providers in this intervention should understand each other’s roles and responsibilities, needs, and understand the scope of services offered which are best defined by the use of a service agreement and orientation that clearly outlines these elements. Diffusion of innovation theory stresses the importance of the compatibility of an intervention with the existing structures, needs and values of the prospective intervention adopters. Service agreements, formal discussions and orientation sessions allow the educator teams, the PCPs and the site teams to discover areas of incompatibility that can lead to problems, and such discussions enable the care providers to develop processes that will overcome these issues.

In this study, the success of the intervention was dependent primarily on the cooperation of the primary care site teams (PCPs and administrative staff). Some staff were reluctant to accept the extra administrative workload created by the integration of the educator teams. For instance, at some sites educators were expected to schedule their own patients, decreasing their time available to see patients. Intervention buy-in is a top-down phenomenon, and when educators had the PCPs’ support this, in turn, can stimulate support for the administrative tasks necessary for the intervention to function smoothly. Leadership from PCPs is required in delegating tasks to support the intervention, for successful implementation (39).

Our findings also confirm the importance of matching the educator and the primary care environment. Because the PCP setting may not always be accommodating, flexibility and amiability are essential skills required by educators who may need to adapt to room relocation or not having the same resources as they have at the DEP. Educators also require considerable experience with patients with diabetes and confidence in working independently.

Relationship building is central to the development of a cohesive professional team, but that requires time, and most of the educators were on site only once a month. Time was an important facilitator; over the duration of the intervention, many issues were resolved simply through increased opportunities for communication and the demonstrated benefits of having educators on site. Intergroup contact theory asserts that contact among members of differing groups can enable discovery of similarities that can dismantle perceived barriers to relationship building and can generate positive changes in stereotypical attitudes (40). Health professionals may be apprehensive of each other’s skills, roles and responsibilities until they have had the opportunity to observe and get to know each other; regular formal and informal meetings increase interaction and help to build trust and confidence. Effective team development is facilitated by participants’ abilities to value and believe in each other’s roles and responsibilities (40).

Operational complexities

Certain sites faced issues of cost, limited space and inadequate staffing to sustain the additional workload necessary to support educators. For instance, the use of EMRs has been shown to improve patient outcomes (41), suggesting that educators’ access to EMRs is vital. However, depending on the EMR system, there may be an additional cost associated with adding users (i.e. educators), which is a deterrent in providing access to educators. When educators lacked access to the EMR, the administrative staff was required to provide educators with patients’ histories, increasing their workload and often providing incomplete or outdated information to educators. This ultimately compromises patient care and undermines the goals of the intervention. Conversely, when educators had access to the EMRs, they could view patients’ histories and the health care team’s management notes, add their own recommendations and communicate with other health team members via instant EMR chat. At some sites it became clear that permitting educators access the EMRs unburdened the administrative staff and facilitated better patient care because educators had up-to-date patient information and provided detailed chart notes for the PCPs after each appointment.

Lack of space is a common issue in primary care settings, and providing a room for educators adds cost, so some educators were on site only when a room was available (usually when a PCP was not on site) and for an afternoon up to 1 day a month. If this model of care is going to be adopted, this issue must be resolved among the key stakeholders or with the local government.

With the exception of a few sites, the educators believed that they were underutilized. Underutilization is common in the implementation of novel primary care interventions (42). We found that early adopters of the intervention made the majority of the patient referrals to the educator teams; over time, however, as other PCPs observed the benefits of the service, they made more referrals. At some sites, PCPs did not refer the service, primarily because of their unfamiliarity with the educators and their roles and skills. Educators able to promote the intervention directly to patients had more self-referred patients.

Interactive problem solving among the educators, DEP management teams, PCPs and their administrative staff is required for the development of sustainable solutions. Although the benefits of the intervention are clear, an investment by PCPs and their staff is necessary to accommodate and support the implementation initially and to embed new processes to sustain the integration of these services. A summary of key pragmatic recommendations to assist in the implementation of an integrated diabetes teams within a primary care setting, based on our findings, is provided in Table 5.

Study limitations and strengths

Limitations included a lack of data from other primary care staff, such as administrative assistants or on-site nursing staff at some sites, who may also have played integral roles in implementation. Also, the study was conducted in 1 southern region in Ontario, Canada, and may not have been representative of issues in rural or remote regions of Canada. Also, we did not collect data on years of practice as certified diabetes educator and years of practice in primary care. However, the study was conducted across sites that differed in organizational structure. Its other strengths included the use of semistructured interview guides that ensured consistency and reliability in the data collection without limiting the conversational flow or discovery of new themes. Data saturation was reached for all participant groups, indicating that the number of interviews per participant group was sufficient to explore fully each relevant theme. Very few studies devote the time and resources necessary for an implementation-focused process evaluation; our findings are pragmatic and sufficiently detailed to guide future implementation of this model of care. Last, the study evaluation was somewhat large in scope, encompassing multiple key participants’ perspectives across 3 diabetes education programs and 11 primary care sites.

Conclusions

This study explored the processes and experiences of implementing diabetes educator teams in 11 primary care sites. We explored the reported benefits of the implementation of this model and suggested strategies to overcome hurdles, based on interviews with healthcare providers and patients. Effective
implementation of an intervention in primary care requires an understanding of its merits, proper introductory procedures and genuine invested support. The ability of a new teams to work together to solve problems and develop strategies to offset challenges that may arise during implementation is critical for the success of the intervention.

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Author contributions

EG conceived and designed the project, coordinated the acquisition of the data, the analysis and the interpretation of the data, was involved in drafting and revising the manuscript for intellectual content, and reviewed the final version; SE contributed to the design of the project, the acquisition of the data and the analysis and interpretation of the data, was involved in drafting and revising the manuscript for intellectual content, and reviewed the final version; AM contributed substantially to the acquisition of data and the analysis and interpretation of data, was involved in drafting and revising the manuscript for intellectual content, and reviewed the final version; LD contributed substantially to the acquisition of data, the analysis and interpretation of data, was involved in drafting and revising the manuscript for intellectual content, and reviewed the final version.

References


Table 5

Table 5 Implementation recommendations

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Buy-in by PCPs</td>
<td>A marketing plan designed to generate buy-in from physicians, nurses and administrators. For example, the intervention team or other key contact (pharmaceutical representatives) promote the intervention via a 1-page pictorial guide; intervention team promoting the intervention at physician continuing education events</td>
</tr>
<tr>
<td>Buy-in from patients</td>
<td>Promoting services directly to patients via mail, e-mail and promotional posters on site as well as screening charts to determine suitable candidates</td>
</tr>
<tr>
<td>Invested interest</td>
<td>Invested interest of key intervention players (e.g. physicians, nurses and administrators) to accommodate and support the educator team on site to ensure successful implementation</td>
</tr>
<tr>
<td>Formal service agreement</td>
<td>The establishment of a service agreement outlining the intervention scope of practice, roles and responsibilities with regard to patient care, with special attention paid to the process of communication between the PCPs and the diabetes team</td>
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<tr>
<td>Space</td>
<td>A designated space/room for educators to meet with patients</td>
</tr>
<tr>
<td>Site orientation</td>
<td>An on-site orientation to meet with physician and office staff to assess the unique needs of each site and describe future roles and responsibilities and procedural operations</td>
</tr>
<tr>
<td>Team attributes</td>
<td>Key educator characteristics that feature individuals who are flexible, knowledgeable, assertive team players</td>
</tr>
<tr>
<td>EMR access</td>
<td>Access to EMRs so that educators can provide the best quality care to patients</td>
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EMRs, electronic medical records; PCP, primary care physician.