FEATURE ARTICLE

Older People With Type 2 Diabetes–Individualising Management With a Specialised Community Team (OPTIMISE): Perspectives of Participants on Care

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Despite the high prevalence of diabetes in older people, there is limited information on optimal methods to support their diabetes management, including how to incorporate technology. This article reports on the results of semi-structured interviews with 41 adult participants with type 2 diabetes (mean age 74 ± 7 years) on their perspectives of a new model of care (the Older People With Type 2 Diabetes–Individualising Management With a Specialised Community Team [OPTIMISE] program) for older people with type 2 diabetes. The OPTIMISE program involved telemedicine consultations, home visits by a credentialed diabetes educator, and intermittent flash glucose monitoring. Human connection and relationships were key to the positive perspectives expressed by participants in this program that used technology to enhance the care of older people in their homes.

In 2017–2018, diabetes affected 4.9% of the Australian adult population (1) and diabetes rates had nearly tripled in the previous two decades, from 1.5% in 1989 to 4.4% in 2014–2015 (2,3). Diabetes is more prevalent in older people, with the rate among 65- to 74-year-olds (16%) being three times higher than that of 45- to 54-year-olds (5%) and almost double the rate of those 55–64 years of age (9%) (4). A recent review of a large database comprising an Australian cohort of adults aged ≥45 years with a mean age of 63.0 years (n = 152,169) found a diabetes prevalence of 10.8% (5).

Managing diabetes involves addressing multiple aspects of self-care and is demanding for people living with the condition (6). A holistic approach to diabetes care is recommended, including lifestyle management (including diet, weight management, smoking cessation, and physical activity), attention to primary and secondary prevention (including glycemia, blood pressure, and lipid management and complications screening), and access to specialist services as required (7,8). International guidelines on managing diabetes in older people recommend that glycemic targets should be individualized based on patients' duration of disease, functional status, and overall life expectancy (9,10). Furthermore, the benefits of glucose management must be balanced against the risks of hypoglycemia, falls, and polypharmacy, considering factors that can affect the ability of older people to self-manage, such as cognitive and sensory impairment and education deficits (9,11). Achieving the "right" degree of glycemic management is often difficult in older individuals, many of whom have long-standing diabetes with underlying pancreatic failure (12) and multiple comorbidities (13). Therefore, supporting older people with diabetes in managing their health is especially important. There is significant room for improvement in both diabetes self-management support and the delivery of diabetes services to older people (14).

The provision of professional diabetes guidance, medical treatment, and technological devices tailored to individual needs can support people with diabetes in self-managing their condition (6). Diabetes self-management programs can improve A1C, diabetes knowledge, and self-care practices in people with type 2 diabetes (15). Unfortunately, few studies include strategies that support participants in managing the impact of medical conditions on

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their everyday lives (16). Older people have particular barriers around self-management of their diabetes. Lack of knowledge and understanding and challenges with implementing self-management tasks are key barriers (17,18). Extra time and strategies aimed at specifically addressing issues that are relevant to older people with diabetes are warranted (17–19).

Person-centered care provided by an interprofessional team is the approach recommended in guidelines to support people with diabetes in achieving their optimal management goals. Originally proposed by the Institutes of Medicine in 2001 (20), person-centered care means individuals' values and preferences are identified and are used to guide all aspects of their health care. Additionally, individuals are supported in their efforts to achieve realistic health and life goals (21–23). Person-centered care delivery includes a collaborative effort to support self-management; engagement of individuals in care decisions; effective prevention, early diagnosis, and intervention; and provision of emotional, psychological, and practical support (24). Interprofessional practice involves team collaboration and communication to provide person-centered care (25,26).

Technology can facilitate self-management, thereby helping to improve health and person-centered outcomes through improved communication, access to health data, education, and timely feedback (27). Telemedicine, defined by the American Telemedicine Association, is the use of medical information exchanged from one site to another via electronic communications (28). There are many different types of telemedicine, including teleeducation, teleconsultation, telemonitoring, telecasemanagement and telementoring (29). The range of communication media used in telemedicine have included telephones, the Internet, mobile phones, and videoconferencing platforms, and the most common administrators of telemedicine interventions have included nurses, primary care physicians, endocrinologists, and diabetes educators (29). A systematic review of telemedicine to support diabetes management showed that, in all but one study (which showed no difference to usual care), telemedicine successfully improved A1C levels (30). Telemedicine for self-management of chronic conditions, including diabetes, can also successfully improve self-care skills, self-monitoring behaviors, and clinical outcomes with high-level satisfaction reported by participants (31). However, research has shown that enabling the uptake of technology by older people may require additional support (18).

We developed and implemented the OPTIMISE (Older People With Type 2 diabetes—Individualising Management With a Specialised Community Team), a person-centered team approach to diabetes management for older people with type 2 diabetes involving two forms of telemedicine: *1*) videoconferences involving a hospital-based endocrinologist and a credentialed diabetes educator with the participant in the participant's home, and *2*) the use of flash glucose monitoring (FGM) technology to support diabetes management planning and evaluation. This article reports on the perspectives of participants in the study to assess the safety and feasibility of the OPTIMISE program.

Research Design and Methods

The writing of this articles was guided by the Consolidated Criteria for Reporting Qualitative Studies (32).

Intervention

The intervention is summarized in Figure 1 and has been described more fully elsewhere (33). It followed the approach articulated in the technology-enabled self-management (TES) feedback loop (27). The TES loop includes four key elements (communication, patient-generated health data, education, and feedback) to support uptake of diabetes self-management and thereby improve health and person-centered outcomes.

Our intervention consisted of a full assessment by a credentialed diabetes educator in each participant's home and the use of FGM (34) for a 2-week period at the start of the program. The FGM system (FreeStyle Libre, Abbott Diabetes Care) involves a sensor applied to the arm that captures interstitial glucose levels and can be scanned intermittently by the user (34).

Next, a joint telemedicine appointment was held with the participant and the diabetes educator (in the participant's home) and the endocrinologist (in the hospital, via a Web-based videoconferencing platform). Assessment findings were discussed, and a management plan was developed. The management plan was underpinned by a goal-setting theory, through which the process of goal-setting facilitates behavior change by guiding a person's effort and attention (35). Feedback strategies were incorporated into the goal-setting practices to enhance goal attainment (36). This approach has been shown to improve glycemic management (37) and is recommended to be used with older people with diabetes (19). Education was individually tailored to meet the needs of the participant (38–40). The management plan, involving

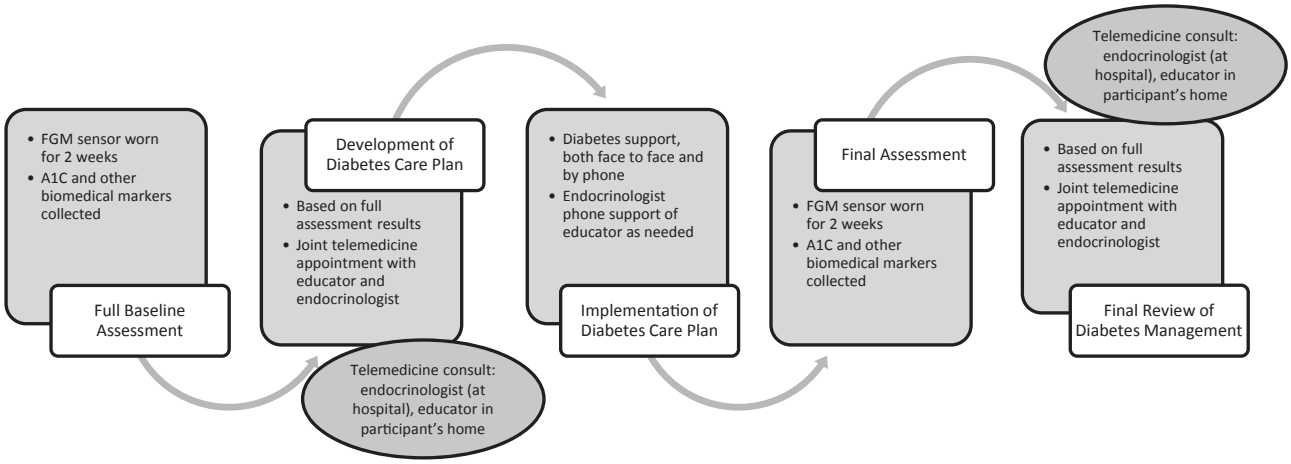

FIGURE 1 OPTIMISE study flowchart.

personalized treatment targets and lifestyle and pharmacotherapy recommendations, was summarized and communicated to the participant's general practitioner via a letter.

The diabetes educator worked with participants, assisting them in meeting goals through the provision of tailored education, practical guidance, and psychological support. A repeat assessment by the diabetes educator was undertaken at 16 weeks, followed by a second 2-week period of FGM use and then a follow-up teleconsultation with the endocrinologist to ascertain progress and assess the impact of the management plan. All participants were interviewed after the intervention.

This intervention was piloted to evaluate feasibility and safety, with quantitative findings to be reported elsewhere. Here, we report on the qualitative findings.

Research Design

An inductive qualitative study design was used, through which researchers drew meaning from the data (41).

Setting

The study was undertaken in the endocrinology department of a tertiary teaching hospital and a home care and nursing organization providing care to people in Northeast Melbourne, Australia. Clinical visits were conducted in participants' homes.

Sample

People who were ≥65 years of age, had a diagnosis of type 2 diabetes, were English-speaking, and lived in the nursing organization's catchment area for home visits (Northeast Melbourne, Australia) were eligible to participate.

Ethics approval for this study was provided by the Human Research Ethics Committees of the participating organizations, Austin Health and Bolton Clarke.

Recruitment

Participants living with diabetes were recruited from the community, existing home nursing clients, the local tertiary hospital, other clinicians in the region, and self-referrals. All participants recruited into the trial between March 2017 and November 2018 were invited to participate in the qualitative component, comprising an interview conducted at the end of the study by the research team (33). All interview environments were private, and all interviews were conducted in participants' homes. Two participant interviews included the presence of family members at the participant's request.

Research Team

The research team consisted of nine researchers (five female), with research experience varying from limited but with diabetes education experience (P.S.) and policy experience (T.A.), to early career (L.T.) and mid-career (R.O. and S.L.N.), to highly established (E.I.E., L.C., J.Z., and R.A.). Three team members currently work within an aged and health care service organization (R.O., T.A., and P.S.), with another having previously worked for this organization (L.T.). Two team members work as clinicians, one in a hospital (S.L.N.) and one in primary care with a university position (R.A.). Two hold joint hospital and university positions (E.I.E. and J.Z.), and one works within a university

environment only (L.C.). The health care backgrounds of the research team were also diverse, with clinical training in the fields of podiatry (R.O.), nursing and diabetes education (T.A.), physiotherapy (L.T.), general practice (R.A.), and endocrinology (S.L.N., E.I.E., and J.Z.).

Data Collection

Semi-structured interviews were conducted in the homes of participants at a mutually convenient time at the end of the intervention. Table 1 shows the questions/prompts that were used as guides rather than followed verbatim for these interviews. The interviews were conducted by an experienced doctorate-prepared female qualitative researcher (R.O.) and two early-career researchers (L.T. and Georgia Major) who had no relationship with the interviewees. Participants were advised that the interviews were to seek information on their experiences with all aspects of the program. The interviews were audiotaped and independently transcribed verbatim. Authors (R.O. and L.T.) checked the transcript for accuracy against the recording.

Sociodemographic data were collected, including age, country of birth, living situation, and postal code. Index of Relative Socio-Economic Disadvantage (IRSD) deciles for Victoria provided by the Australian Bureau of Statistics were used as a proxy for participants' socioeconomic status, through linkage with residential postal codes (42). An indication of high disadvantage is provided by a low decile, whereas a high decile indicates an area of low disadvantage. Additionally, a Charlson Comorbidity Index (CCI) (43) was calculated for participants to predict their 12-month risk of mortality based on their diagnoses and was used as a proxy for participants' overall burden of disease (44). The higher the index was, the more complex the health issues were.

Data Analysis

A theoretical thematic analysis was conducted within a constructionist framework, guided by the process described by Braun and Clarke (45). Three researchers read all the transcripts separately (R.O., T.A., and L.T.) and then met and collectively organized the data into domains, and then categorized the meaning units within each domain (46). The analysis sought to interpret the underlying ideas conveyed by participants at the latent level, beyond simplistic interpretation of only words (45). This process involved a constant comparison of the meaning of each unit to others and to the emerging categories, until all the data were sorted, with NVivo software used to organize participant quotes into the themes (47). Differences in categorization, where evident, were resolved by consensus. Sociodemographic data are presented descriptively.

Trustworthiness of the Data and Analysis

The trustworthiness of the data and analysis was ensured through attention to credibility, transferability, and confirmability (48). Rapport and trust were established between the researchers and participants, ensuring credibility. Researchers reported conflicting and contradictory comments, and transferability was supported through the provision of a rich description of the data, through which researchers could draw inferences to their own experiences (48). Reflexivity was practiced by researchers in their continual and deep examination of their own beliefs and assumptions while considering participants' transcripts (49), maintaining open dialogue and discussion about interpretations of the transcripts among the research team. We ensured confirmability through an audit trail of audio-recordings, verbatim transcriptions, and the data analysis file. Transcripts were not returned to participants for review. The sample size was sufficient to develop a richly textured understanding of concepts from participants' data (50).

Results

Sample

Of the 47 participants approached by the diabetes educator about participating in the study, 45 chose to participate, and 41 completed the interview component. One participant withdrew from the study before beginning the program, one declined to be interviewed, one could not fit in her interview before a scheduled surgery, and one died before completing the interview. Table 2 summarizes the sociodemographic and health data, including diabetes-related details, of the participants.

During the 20-week study period, all participants received at least two video-conferencing calls with the diabetes educator in their home and the endocrinologist in the hospital and attended an additional two data collection visits (for baseline and post-intervention data). Additional contact was provided face-to-face and by telephone as clinically required; activity data were not collected. Interviews were, on average, 25 minutes in length (median 24 minutes, range 13–44 minutes). Table 3 provides glycemic information at baseline and at 20 weeks' follow-up.

TABLE 1 Question Guide for Interviews With Study Participants

A broad open leading question was asked, and prompts were then followed if topics were not covered by participants in their response.
Broad introductory question: Please tell me about what happened with the diabetes team in this project.

Prompts to draw out areas of focus for the study:

- Can you please share with me your initial thoughts and expectations about receiving care from the OPTIMISE team (the diabetes educator and specialist)?
- Can you please share with me what your goals were for managing diabetes at the beginning of the study? What did you want to achieve?
- Can you please share with me about your experience of being seen by the diabetes educator in your home?
- How did you find the initial testing and questionnaires?
- Can you please tell me about your experience in talking to the diabetes specialist over the computer?
  - Was it easy to hear and understand the doctor?
  - What did you think of having both the doctor and the educator together? Can you tell me a little bit about this?
  - Is there anything else about talking with the specialist over the computer that you noticed?
  - What are your thoughts about seeing a specialist over the computer like this in the future?
- What do you think worked well about this program? What were the positives?
- What challenges did you face in being part of this program?
- What do you think could have been improved?
- What have you and the educator and specialist decided about your ongoing diabetes care?
  - How does this compare with your past management of your diabetes?
  - How satisfied were you with your treatment during the study?
  - Are you going to continue to follow the plan set up by the specialist?
  - How confident do you feel to keep managing your diabetes now?
  - Why do/don't you feel confident now? What else do you think may help you?
- Did you seek any other help? From where?
- Would you recommend this program to your friends or family members? Why/why not?
- Is there anything else you would like to talk about with regard to being in this program?

Qualitative Analysis

The interview data demonstrated that the person-centered and individualized technology-supported approach suited participants. The participants praised key aspects of the person-centered model, which embedded technology to support self-management of diabetes and was delivered in their environment, with some participants having a preference for face-to-face contact, particularly when discussing serious health concerns. The approach allowed time for health care providers to establish rapport, listen and understand individuals' needs, and develop a goal-oriented approach that fit with the way participants wanted to live their lives. Continuity of care and a team approach allowed a professional relationship to develop, so that participants felt the diabetes team cared about them and understood their situation and their individual needs. Participants felt valued.

The researchers drew three main themes from the data: *1*) Person-Centered Attributes, *2*) Interprofessional Team, and *3*) The Role of Technology. Each theme had subthemes providing a more detailed understanding of participants' perspectives and experiences of the intervention (Figure 2). Although insufficient to form separate themes, comments from participants also identified organizational supports as important to implementing this approach, and participants stated that the multifaceted nature of the program worked well. The major themes and their subthemes are discussed in more detail below.

Theme 1: Person-Centered Attributes

Participants consistently commended the way the health care providers interacted with them and with each other. There was strong recognition of the positive attributes of the team members regarding the way they treated participants (e.g., taking the time to find out about them and to work through any issues). Subthemes included dignity and respect; building rapport and being caring; not judgmental and easy to understand; and knowledgeable and professional.

Dignity and Respect

Overwhelmingly, participants described the health care providers as treating them with dignity and respect, reflected through the health care providers' pleasant manner and courteousness.

> *"Courtesy is very important, and [the diabetes educator] has it, and [the endocrinologist] has it. It was a pleasure." (P36)*

Building Rapport and Being Caring

Diabetes management requires understanding the people with the condition, their complex

TABLE 2 Demographic and Health Data of Interviewed Participants ($N = 41$)

Characteristic	Value
Age, years	74.1 ± 7.2 (65–92)
Female gender	16 (39)
Country of birth	
Australia	15 (41)
Italy	3 (7)
Greece	2 (5)
New Zealand	2 (5)
Croatia	1 (2)
Malta	1 (2)
Missing	17 (41)
Living alone	13 (32)
Missing data	4 (10)
IRSD	
Most disadvantaged (1–2 deciles)	5 (12)
Second most disadvantaged (3–4 deciles)	7 (17)
Middle (5–6 deciles)	6 (15)
Second least disadvantaged (7–8 deciles)	7 (17)
Least disadvantaged (9–10 deciles)	16 (39)
Duration of diabetes, years	15.7 ± 8.8 (0–34)
History of diabetes education	33 (80)
CCI	5.56 ± 2.00 (3–10)
A1C, %	7.43 ± 1.2 (5.3–11.4)
A1C, mmol/mol	57.76 ± 13.68 (34–101)
Taking injectable therapy at baseline	14 (34)
After assessment	
Required injectable therapy	18 (44)
Required change in medication dose	18 (44)
Required cessation in medication	15 (37)
Required referral to health care providers	5 (12)

Data are mean ± SD (range) or *n* (%).

psychosocial context, and their life priorities. Part of the model was to provide dedicated time for team members to develop rapport with participants and to understand their lives. By doing this, participants could connect with the health care providers, so they became comfortable sharing their experiences and then developing care goals that were important for them. This process led participants to feel cared for and to want to take part in the program.

> *"When he started on me about what was going on about it and all these things he had to do and everything like that, I thought it was really nice because I thought it was somebody . . . caring about me, and I thought, 'I'm going to do this course.'" (P08)*

Not Judgmental and Easy to Understand

Diabetes management involves many lifestyle changes, and optimal management cannot be followed all of the time. Participants conveyed that this sentiment was understood by the diabetes team. Participants felt that they could share when they were unable to follow recommendations made by the team without feeling that they would be judged. Furthermore, the information was conveyed in a way that was easy to understand, so they didn't "feel stupid."

> *"I thought he was very good because I confessed to him my sins, and he said, 'Look, we don't expect people to be perfect. Just try.'" (P05)*

> *"Both [diabetes educator] and [endocrinologist] . . . don't used technical language . . . . Everything they say to you is just instantly absorbed." (P34)*

Knowledgeable and Professional

Although it was important for the health care providers to have the time and attributes to develop rapport, it was also important for them to be knowledgeable so that participants could have their issues addressed appropriately and in a professional way.

> *"He explained everything very well, and I didn't really have to ask many questions because he, you know, he told me exactly what was going to happen and what would happen, and so on. So that was good." (P31)*

Theme 2: Interprofessional Team

Participants were very positive about the collaborative approach used by the team, with active communication styles and everyone treated as equals. Subthemes included health care providers worked well together; person felt included as part of the team; reducing confusion and conflicting advice; and feeling of safety from the team approach.

Health Care Providers Worked Well Together

The endocrinologist and diabetes educator worked together, collaboratively problem-solving to come up with answers to any issues raised by participants. Team members' skills and expertise were complementary, and when the diabetes educator needed support, the endocrinologist made time to provide it.

> *"Well, if [the diabetes educator] would come up with an idea, he spoke to [the endocrinologist], and they agreed, you know, on how much insulin to take at*

TABLE 3 Glycemic Measures Using FGM at Baseline ($N = 41$) and 20 Weeks' Follow-Up ($N = 41$)

Glycemic Measure	Baseline	Follow-Up
Mean sensor glucose, mmol/L	8.5 (7.6–10.3)	8.7 (7.6–10.1)
A1C, mmol/mol	56.0 (48.0–63.0)	57.0 (50.0–61.0)*
A1C, %	7.3 (6.5–7.9)	7.4 (6.8–7.7)*
Time in range (4–10 mmol/L or 70–180 mg/dL), %	67.0 (46.5–83.5)	69.0 (51.0–82.0)
Time in hypoglycemia (<4 mmol/L or <70 mg/dL), %	0.0 (0.0–2.5)	0.0 (0.0–4.8)
Time in hyperglycemia (>10 mmol/L or >180 mg/dL), %	29.0 (13.5–52.5)	26.0 (14.0–48.0)

Data are mean (interquartile range). *$N = 40$; one participant did not obtain follow-up results for A1C.

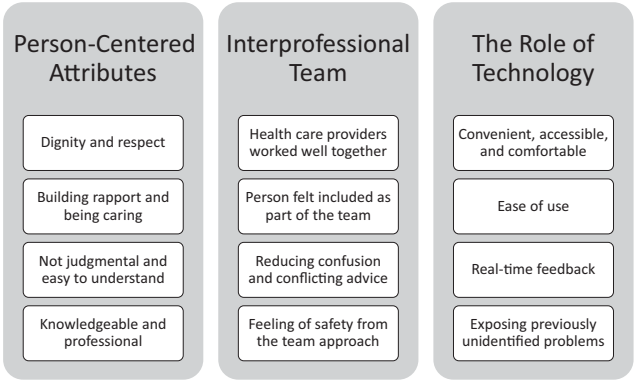

FIGURE 2 Themes and subthemes drawn from participant interviews.

night and so much in the morning, and they'd come up with an answer between the two of them . . . No, they were good together." (P14)

There was a clear positive relationship between the two health care providers, ensuring that participants felt confident in their support.

"I thought it was very good that they both got on so well together. They obviously had a very close working relationship with regard to being across all of the data and having a lot of experience with diabetes. That inspired confidence, and they had respect for each other and esteem for each. I thought that made one feel very comfortable." (P36)

Person Felt Included as Part of the Team

Participants were very positive about the interprofessional approach, through which there was active communication and everyone, including the participants, was treated as equals. This approach enabled all participants to feel that they could speak up and contribute to the discussions, so that all options could be explored when goal-setting. Participants felt that they were active members of the team.

"But when you have the specialist and the diabetes educator actually talking the same way, it was great. When they talked to themselves, I was next to [the diabetes educator] still, and they still knew I was there and [were] including me, as well as talking to themselves." (P17)

Reducing Confusion and Conflicting Advice

Participants reported that, in the past, different health care providers sometimes gave conflicting advice, often leading to confusion. Participants were relieved that, in the OPTIMISE program, team members discussed concerns and provided supportive, consistent advice.

"About time. Because sometimes you get one person [saying] one thing. Forget the diabetes educator at the moment. But when you see a specialist, they'll say one thing, and your doctor says another thing. It can be confusing. Well, it is confusing." (P17)

Feeling of Safety from the Team Approach

The collaborative approach of having professionals from the two health care disciplines as part of the team while keeping participants' general practitioner involved and informed increased participants' feelings of safety. They felt reassured that the team was supporting them and would help them when needed.

"I know that if [the diabetes educator]—even though [the diabetes educator] answered all my questions, and he knew everything—I'm sure that, if there was something not going right, he had the specialist there

as backup . . . . I'm very confident we would always find a solution with whatever I had." (P44)

Theme 3: The Role of Technology

The video-conferencing technology was a useful tool that supplemented the health care providers' support. Participants found the video-conferencing component to be convenient and easy, increasing accessibility to specialist care for those who found physically attending appointments to be difficult. Any issues with sound or other technical aspects of these conferences were considered minor when weighed against the positives and were little mentioned. This was also the case with the FGM technology, when some participants had sensors not capturing data and/or falling off. Participants appeared to overlook these issues. Subthemes included convenient, accessible, and comfortable; ease of use; real-time feedback; and exposing previously unidentified problems.

Convenient, Accessible, and Comfortable

All participants conveyed the convenience of using telemedicine compared with outpatient clinic visits, particularly in relation to reducing the need to find transportation and parking and to deal with waiting times. Difficulty accessing face-to-face appointments was a disincentive to attend visits.

"I have a problem getting out. Unless I'm assisted by somebody, I can't do it. It's as simple as that. By having them come to the home, it's really good." (P37)

Furthermore, the long waits in busy outpatient clinics, surrounded by ill people, were another disincentive to attending appointments. Being in their own home—the place they were most comfortable—was another factor that made the use of telemedicine a positive experience.

"There was no worry that I had to go anywhere, and it was all presented to me in my own place, where I feel more comfortable than ever." (P19)

Ease of Use

The program focused on ease of use, understanding that familiarity with technology by older community members varied. The diabetes educator came to participants' homes and linked to the video-conferencing, negating the need for participants to need to know how to access the support online or even have their own equipment or pay for Internet access. Participants acknowledged that this approach was very easy. However, they raised concern about whether they would need to access the video-conferencing themselves.

"Great, it was great as long as [the diabetes educator] was using the computer. I wouldn't know how to get onto a computer. But yeah, that was good." (P16)

The FGM was perceived positively by all, by virtue of removing the need for capillary glucose testing. Monitoring their glucose levels was much easier for participants using the FGM system.

"Well, I didn't have to prick my finger for one thing, and it wasn't painful or anything. It just sat there. I liked the idea of just waving the thing underneath it. Yeah, very good." (P32)

Being able to simply swipe the reader over the sensor was extremely convenient; it could be done anywhere, at any time. Participants were all very accepting of and genuinely impressed by how simple, easy, and painless their FGM experience was.

"Taking your diabetic reading, it was so easy. I didn't have to do any pinpricks, nothing like that, so all I had to do was just scan, and it shows a reading. It is so much easier. It was noninvasive. It was very good." (P39)

The only issue was the potential stigma should others see the sensor.

"I was a bit embarrassed sometimes, if you wear a short sleeve, people might say, 'What's that?'" (P22)

The video-conferencing was perceived positively by many participants, with being able to see and talk to the endocrinologist mentioned as being very important. Participants were pleased with the ability to see someone through the computer, and many felt it was similar to a face-to-face clinic appointment.

"I just thought it like a normal conversation with I ask her questions, and she tells me things or whatever she told me the problem was. Just like a normal [visit seeing a person]. I didn't look at it as [though] she's on a computer . . . because I see her face." (P42)

Having personal contact with the diabetes educator in their home made the video-conferencing more palatable. The in-person contact was not only important for troubleshooting technical issues, but also reassuring to participants.

"Well, I think you can sense people. You can get the vibes from each other, whereas from the computer, it's just looking at a screen, and it doesn't mean anything, and even though they might be able to explain things over the computer, you don't get that contact feeling, you know what I mean? The personal contact, that is." (P31)

Some participants did prefer face-to-face in-person appointments rather than using video-conferencing. They felt that the connection with their health care provider was only possible by being in the same room with them. Others felt that in-person contact would be important for serious consultations, for example, if they were feeling very unwell or needed to have surgery, which would require having confidence in the person. These situations would require physically meeting with the health care provider.

"I'm going to see a neurologist next week because I've got a very bad back, as you can see, and I've had two big operations, and I wouldn't just want to see him on a computer. I'd just want to be there, and I could see what I thought of him." (P06)

"I mean like if I'm seriously crook with diabetes and I've got to go and see them I probably would rather go and see her in her office. I wouldn't want to sort of do it over the computer." (P24)

Others suggested that it was not their first preference, but if they had difficulty accessing the specialist, they would be satisfied using video-conferencing.

"[Face to face] would be my first choice, but [video-conferencing] would certainly be a very acceptable second choice if . . . you live miles from anywhere or your particular specialist is miles from you." (P43)

Real-Time Feedback

The FGM system made it much easier for participants to monitor their glycemic levels, and they could understand the readings and act on them immediately. This was liberating for some. For others, it actively encouraged them to monitor their glycemic levels more or to easily check should they feel unwell. Participants found that FGM gave them more power; the information allowed them to see what was happening and to assess and decide whether it was necessary for them to intervene. Importantly, they could review the impact of their interventions in real time.

"Well [the FGM sensors] are the best thing that you've ever had. They really are because that can tell you—you can just go beep and have a look and see the reading and say, 'Jesus, that's high' or 'That's low,' and you've got it straight away. So, you can control that straight off, which is good." (P14)

"But it's awakened me . . . to the fact that you get more knowledgeable doing the test and seeing the test. The test after the meals and before meals, to see what my sugar levels are . . . . When I had grapes, I'd do the test, and it would be reading 10. I'd think, 'Oh, gee, I better keep off the grapes.' Whereas before, that wouldn't have registered with me. So, taking the readings on a daily basis was teaching me that things like grapes I should steer clear of." (P15)

Exposing Previously Unidentified Problems

That the FGM could collect the variation in glycemic levels over 24 hours was recognized as important to participants in that it provided practical information on diabetes management outcomes.

"Well, it's more reliable because I wouldn't have had a clue that it [blood glucose levels] dropped to below two in the middle of the night . . . . Nobody would've known that if it hadn't of been for that monitor." (P03)

Additional Factors of Importance

Organizational Supports

Although not sufficient to include as a separate theme, it was clear that organizational supports were important to enable the delivery of the program. In particular, participants recognized that time is a finite resource for health care providers. Participants appreciated that there was allocation of sufficient time for them to get the care they needed.

"When [the diabetes educator] comes, I can talk about it to him, and he can talk about it to me. But you see that computer, they've got so long and they have to check what day and what time, because they are very busy at the hospital, so they only have so much to tell you. But with [the diabetes educator], I can talk more, and he can tell me more if I want to know something. I can ask him more." (P12)

The scheduling of joint appointments with the diabetes educator, the endocrinologist, and the person with diabetes was important and was acknowledged as being harder when they all have to be there physically at the same time.

"But it was great to have [the endocrinologist] and three-way. It was great because we could all intermingle with what we were talking about. It was better than running into the hospital and out of the hospital to hear one thing. And [the diabetes educator] might not have been able to make it when I could make it. So, it was really good that [the diabetes educator] was there [and the endocrinologist] was there." (P17)

Multifaceted Program Worked Well

Overall, participants thought that the elements of the program worked well together and considered it in a positive light.

"Yeah, it was all pretty good. Very informative. It's when it all comes together, then you start to understand what it's all about." (P11)

"I have much more of a regime about it. I think it's a consequence of that that I feel so much better." (P36)

"I'm 1,000 times happier than what I was before." (P22)

Positive health outcomes also led participants to convey a positive opinion about the intervention.

"What I think that has improved is, I know we're talking about diabetes, but again, I tell you that this cholesterol has come down a lot, and I'm very happy through this." (P19)

"My tablets are reduced by more than 50 percent." (P11)

Discussion

Participants positively perceived the OPTIMISE program as a whole. This project highlighted participants' perceptions that the diabetes health care providers (i.e., diabetes educator and endocrinologist) had several crucial person-centered attributes and worked well as an interprofessional team and that the program's success required tailored organizational supports. These supports allowed participants the time, access, and scheduling structure to develop the therapeutic relationship necessary to support their diabetes self-care. Video-conferencing was viewed as a useful tool that allowed participants to access trusted and supportive specialist care in a convenient manner. Having the diabetes educator present with participants during video-conferencing also enabled the diabetes educator to act as a "boundary spanner" between participants and the diabetes specialist. Participants also positively perceived the FGM technology, as it made the monitoring of their diabetes management outcomes easier. Both technologies assisted the health care providers' support of participants.

Participants also positively viewed the person-centered model, which embedded technology to support diabetes self-management. They reported feeling respected and cared for as part of a team and that they had the ability to self-manage. Establishing a human connection with the diabetes team was important to participants and fundamental to their engagement in developing and implementing their diabetes management plans. Human connection involves building trust and rapport and is essential for sharing of information (51). Older people in particular need the support of human connection to actively participate in their health care (52). Self-management programs for people with type 2 diabetes that have a primary focus of partnering with participants in the self-care process are effective in improving A1C, diabetes knowledge, and self-care practices (15).

Person-centered care has been articulated as a multicomponent concept, in which a person's needs are placed at the heart of the system, the person is supported to make informed decisions, the relationship between the practitioner and the person is a key focus, there is a partnership approach, and that person's experiences are valued (53). All of these components combine to promote a process of empowerment (53) through which care delivery supports individuals in successfully achieving self-management of their chronic condition(s), aided in this effort by appropriate technologies (54).

Participants in this study were very positive about both the FGM and video-conferencing technologies. The FGM use enabled a timely and understandable feedback mechanism that, first, increased their awareness of the need for diabetes management improvement and, second, allowed them to see the direct effect of self-management changes on their glucose levels (55,56). This process was a revelation for some. For others, they could see that their glycemic levels were poor at night, despite their A1C being at a near-optimal level. As in other qualitative studies, all participants saw value in this technology, and any technical issues when using this technology were overlooked or downplayed in comparison with the perceived positives (57).

Video-conferencing was very convenient for participants, removing obstacles such as the inconvenience of

traveling to the hospital, parking, walking to the clinic, and waiting for an appointment to start, which has also been reported in other studies (58). The participants considered that video-conferencing still facilitated human contact by allowing them to see the specialist, albeit remotely, and this helped establish positive engagement, as did the positive attributes of the diabetes health care professionals. Some participants preferred the video interaction over in-person visits, as the physical separation from the specialist made them feel less threatened and more at ease to freely discuss their nonideal behaviors; however, others preferred in-person contact. A number of participants said that they would strongly prefer an in-person appointment if they felt seriously unwell. All appreciated having the diabetes educator on hand to set up the Internet connection and support them in person through the appointment. Such connection with community members has also been an issue in other studies (59).

Based on these findings, we propose that it is the relationship between the participant and the health care providers that shapes the experiences of older participants and forms the basis for whether they perceive a program positively. Having all team members on an equal footing in the interactions, with the additional foundation of health care providers having person-centered attributes so that the interactions were respectful, considerate, and courteous, as well as the health care providers being knowledgeable and providing useful information all contributed to a positive experience for the older people participating in the program. Providing technologies that were convenient, accessible, and easy to use in addition to the interaction and support provided by the health care providers also aided participants in better managing their diabetes. Operational supports such as allocating the time to interact and scheduling joint appointments also enabled improved self-care. Figure 3 depicts the relationship among these different components.

There were some limitations to this study. This project involved older individuals from one region of a metropolitan city and cannot be generalized to the broader population or to people in other geographical locations. Furthermore, this study included very few participants with culturally and linguistically diverse backgrounds, and more work is needed to identify what such diverse individuals may require to better support their diabetes management. Finally, the study included one endocrinologist and one diabetes educator delivering the program to all participants. Results may differ when the program is delivered by other health care providers.

Conclusion

This program's person-centered model, which embedded technology to support diabetes self-management, was viewed positively by older people with type 2

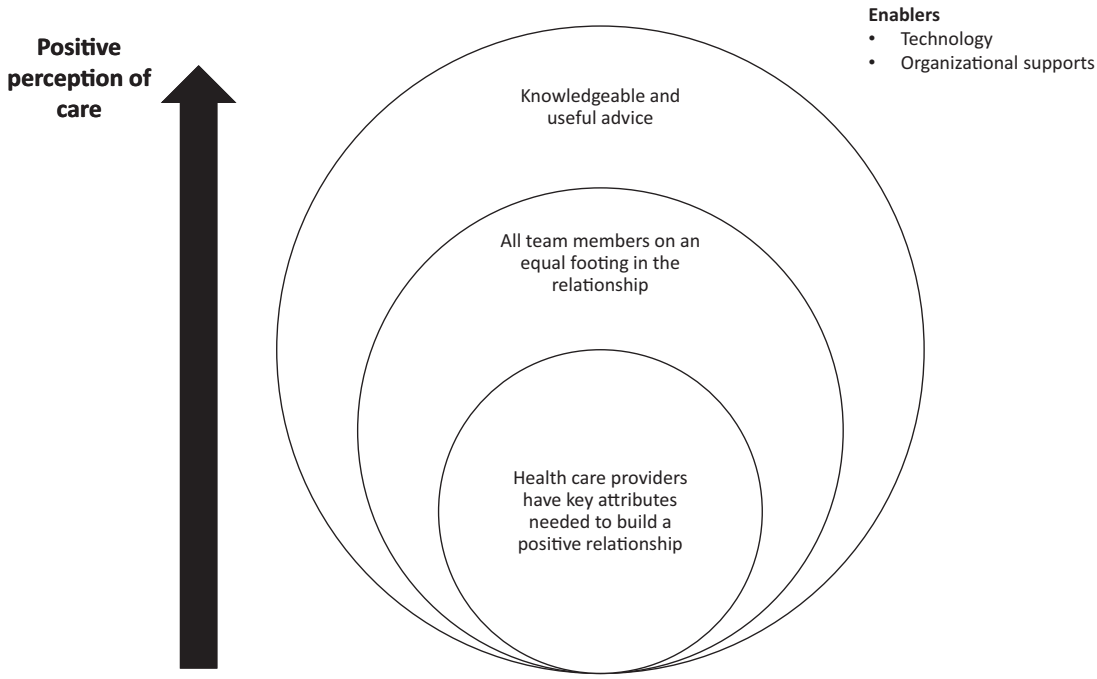

FIGURE 3 Positive perceptions of care by older people with diabetes comes from health care providers having attributes necessary to build a positive relationship and from being treated as equals in this relationship. Technology and organizational supports are additional enablers of positive perceptions of care.

diabetes. The person-centered attributes of the diabetes care providers who were working as an interprofessional team, along with tailored organizational supports and technologies, were essential to ensure that participants had a positive experience. Participants emphasized that the human connection they developed with the team was key. Furthermore, the technologies incorporated into the program helped to increase their awareness of the impact of the disease and track the effect of behavioral and lifestyle changes on glycemic levels. Thus, the OPTIMISE program was shown to be safe and effective and well accepted by participants. Future work should evaluate which outcomes are important to older people when receiving professional diabetes management support. It will also be important to study this program in a larger cohort to determine its feasibility and cost-effectiveness on a larger scale.

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DUALITY OF INTEREST

No potential conflicts of interest relevant to this article were reported.

AUTHOR CONTRIBUTIONS

R.O. and E.I.E. led the development of the protocol. R.O. provided expertise in qualitative trial design. T.A., S.L.N., P.S., and J.Z. provided significant input into project design with respect to clinical knowledge, screening of participants, care delivery. and clinical management. R.A. and P.S. contributed to project design clinical assessment aspects. L.T. coordinated administrative tasks, report writing, and study implementation. R.O., T.A., and L.T. undertook analysis. All authors contributed to refinement of the study protocol and approved the final manuscript. R.O. is the guarantor of this work and, as such, had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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