Original Research

Tailoring Diabetes Education to Meet the Needs of Adults With Type 2 Diabetes and Mental Illness: Client and Health-Care Provider Perspectives From an Exploratory Pilot Study

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Key Messages

- The experience of mental illness symptoms and the socioeconomic implications that often co-occur can create challenges for effective diabetes self-management.
- Tailored diabetes education care requires client-driven education session content and flexibility in the support and education provided.
- Empowering clients by teaching sustainable behaviour changes is an important component of diabetes education.

ABSTRACT

Objectives: People with mental illness are more likely to experience poorer outcomes with type 2 diabetes than the general population. Diabetes management can be improved when lifestyle-intervention content is tailored to the learning needs of individuals or groups. The purpose of this pilot study was to explore the perspectives of clients and providers involved with mental health care with regard to how diabetes education can effectively address the challenges that may be faced when people with mental illness engage in diabetes self-care behaviours.
Methods: Focus groups included 17 people with mental illness and type 2 diabetes and 21 mental health clinicians. Data were transcribed verbatim, assessed for quality and saturation and coded to identify relationships and meanings among identified themes.
Results: Participants described strategies concerning how to consider symptoms of mental illness and address the psychosocial challenges that people with mental illness may be more likely to experience. Teaching strategies identified by clinicians and clients that were perceived to be effective included allowing clients to guide education session content, and being flexible when providing support, identifying education topics to discuss and teaching about diabetes. Participants also emphasized the importance of empowering clients by helping them to see how sustainable behaviour changes can be achieved. Differences between the perspectives of the clients receiving mental health care and the clinicians were often related to neglecting to begin with client-driven needs assessments.
Conclusions: Our study offers diabetes educators a strategy for applying Diabetes Canada's self-management education guidelines to the needs of people with mental illness by using suggestions from clients and clinicians.

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R É S U M É

Mots clés :
enseignement sur la prise en charge
   autonome du diabète
maladie mentale
autosoins
solutions
soins adaptés

Objectifs : Les personnes atteintes d'une maladie mentale sont plus susceptibles que la population générale de connaître de moins bons résultats si elles sont atteintes de diabète de type 2. Il est possible d'avoir une meilleure prise en charge du diabète lorsque le contenu de l'intervention sur le mode de vie est adapté aux besoins d'apprentissage des individus ou des groupes. L'objectif de la présente étude pilote était d'examiner les points de vue des clients et des prestataires impliqués dans les soins de santé mentale en ce qui concerne la façon dont l'enseignement sur le diabète peut aborder efficacement les difficultés à relever lorsque les personnes atteintes d'une maladie mentale adoptent des comportements d'autosoins liés au diabète.
Méthodes : Les groupes de discussion comptaient 17 personnes atteintes d'une maladie mentale et du diabète de type 2, et 21 cliniciens en santé mentale. Les données étaient transcrites textuellement, faisaient l'objet d'une évaluation de la qualité et de la saturation, et étaient codées pour cerner les liens et les significations parmi les thèmes retenus.
Résultats : Les participants décrivaient les stratégies sur la façon d'envisager les symptômes de santé mentale et d'aborder les difficultés psychosociales que les personnes atteintes d'une maladie mentale sont plus susceptibles de connaître. Les stratégies d'enseignement perçues comme efficaces que les cliniciens et les clients avaient déterminées étaient de permettre aux clients de suggérer le contenu des séances d'enseignement, de faire preuve de souplesse lors qu'ils offrent du soutien, de déterminer les sujets d'enseignement à traiter et d'offrir un enseignement sur le diabète. Les participants soulignaient également l'importance de rendre les clients autonomes en les aidant à découvrir comment atteindre des changements de comportements durables. Les différences entre les points de vue des clients et des cliniciens en soins de santé mentale étaient souvent liées à l'omission de faire des évaluations initiales des besoins axés sur les clients.
Conclusions : Notre étude fournit aux éducateurs en diabète une stratégie d'application des lignes directrices en matière d'enseignement sur les autosoins de Diabète Canada aux besoins des personnes atteintes d'une maladie mentale en tenant compte des suggestions des clients et des cliniciens.

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Introduction

People with mental illnesses, such as schizophrenia and major mood disorders, are 2 to 3 times more likely to be diagnosed with type 2 diabetes compared to the general population. Once diagnosed with diabetes, people with mental illness tend to have poor blood sugar control, which results in increased diabetes-related complications (1–3). These poorer outcomes contribute to early mortality in people with mental illnesses (4,5).

Higher rates of adverse diabetes outcomes may, in part, be explained by the limited diabetes-management knowledge that has been observed in people with mental illness (1,6,7). This knowledge gap may be related to reduced access to diabetes and lifestyle counseling (1,8). People with mental illness also tend to have lower health literacy levels compared to the general population, which can impede the acquisition and understanding of diabetes education (9–13).

Furthermore, people with mental illness may be more likely to experience challenges that can reduce access to and engagement in diabetes self-management education. For instance, symptoms of mental illness or poorer states of physical health resulting from comorbidities and potential medication side effects can create barriers to self-care (13–19). Psychosocial challenges related to unemployment and low income may make it difficult to adhere to diet and lifestyle guidelines (13,14,16,17,20–22). In addition, people with mental illness often have inadequate positive social supports that would reinforce diet and lifestyle changes for diabetes self-management (13,22–26).

Diabetes Canada's self-management education clinical practice guidelines recommend teaching according to literacy and numeracy levels, incorporating participation and collaboration and using cognitive-behavioural education interventions, such as problem solving and goal setting (27). These practice guidelines suggest that diabetes education programs should be tailored to address challenges that may be experienced by people with mental illness. There is literature that indicates that this approach may improve the acquisition and application of diabetes self-care

knowledge and, in turn, improve outcomes related to diabetes (28,29). However, the guidelines offer limited directions to operationalize these activities. Furthermore, the authors have no knowledge of research to date that explores how diabetes education can be tailored to meet the needs of people with mental illness. The objective of this exploratory pilot study was to gain insight from health-care providers and clients about how diabetes education programs can address the challenges experienced by people with mental illness. Our findings also highlight areas where the perception of diabetes education needs differ between health-care clients and providers. Thus, the results of this study can inform the design of tailored diabetes self-management education programs for people with mental illness.

Methods

This research study has been reviewed and approved by the Centre for Addiction and Mental Health Research Ethics Board.

Focus group participants

Two sets of focus groups were held. One set was composed of clients who use mental health services. The other set was composed of frontline service providers who work with clients who have mental illness.

Mental health care client inclusion criteria were that they lived independently in the community and that they self-reported as 1) receiving a provider-given diagnosis of a mental illness, defined as major mood disorders, including major depression or bipolar disorder or psychotic disorders, including schizophrenia and schizo-affective disorder, and 2) having been told by a primary health-care provider that they have either prediabetes, diabetes or "borderline diabetes" or "borderline high sugars" or "slightly high blood sugar."

Exclusion criteria for the client focus groups included residing outside of the geographic region. This criterion was based on the rationale that accessibility needs can be related to geographic

Table 1
Participants' diagnoses

Mental illness	Participants (%)
Schizophrenia	6
Depressive disorder	53
Bipolar disorder	17
Severe anxiety	6
Bipolar + schizoaffective disorder	6
Bipolar + PTSD	6
Major mood disorder + PTSD + panic attack disorder	6

PTSD, post-traumatic stress disorder.

location (30). Mental health-care clients were also excluded if they reported that they "never managed their own diabetes" (i.e. they never took medications independently, prepared meals, managed their levels of activity or checked blood sugar levels).

The study's participants were recruited through a combination of volunteer and snowball sampling methods. Initially, advertisements were placed at community health agencies and hospitals, community meal locations and libraries. Two focus groups were conducted with participants who responded from community meal locations and libraries. Snowball sampling was used to recruit adequate participants for a third focus group, whereby clients who gave consent to be contacted for the purpose of snowball sampling were asked to recommend prospective participants (31).

A total of 17 participants were recruited, and 3 focus groups with 3 to 8 participants were held. Focus groups took place at a convenient and central location that was easily accessed by public transportation. A snack and a $20 honorarium were provided.

All participants self-reported having type 2 diabetes and 1 or more mental illnesses (Table 1). In the sample, 6% of participants reported having schizophrenia, 53% had major depression/severe depressive disorder, 17% had bipolar disorder, 6% had severe anxiety, and 18% of participants reported multiple mental illness diagnoses.

Health-care providers who self-identified as providing service and support to people with both type 2 diabetes and mental illness were eligible to participate. Voluntary sampling was used, where advertisements were sent through e-mails as part of news bulletins within various health-care organizations throughout London-Middlesex, Ontario. A total of 21 mental health-care providers comprised 4 focus groups with 3 to 8 participants.

Health-care provider participants who supported people with type 2 diabetes were from a variety of professions (Table 2). The provider sample consisted of 5% nurse practitioners, 38% social workers, 14% registered nurses, 5% registered dietitians, 14% registered nurse- or registered dietitian-certified diabetes educators and 24% community workers. Of these participants, 95% reported working in community health-care organizations, and 5% of these participants worked in home care. All of these participants provided health care within the Middlesex-London geographic region in Ontario, Canada; 95% of participants were employed in London, Ontario, and 5% in Newbury, Ontario.

Prior to participant recruitment and data collection, the researchers consulted with clinical experts who worked at community health agencies within the locality and who had experience working with people who have diabetes and mental illness. This expert group was composed of 3 medical social workers, 2 mental health nurses and 1 client services director. They were asked for their insights regarding 1) the relevance of the data-collection questions and 2) input/suggestions/concerns regarding the proposed research project. The feedback was used to revise the focus-group questions and the wording of advertisement posters.

Data collection

Focus group discussions were transcribed verbatim and reviewed concurrently with data collection to assess quality and saturation. Saturation was determined when no recurring themes and concepts were identified in the data. Saturation was reached after 3 client focus groups and 4 health-care provider focus groups were held.

The interviewer asked a series of semistructured questions with prompts to stimulate meaningful conversation. Mental health-care clients were asked 1) How do you get information on diabetes education? 2) How important is managing your diabetes to you? 3) What types of diabetes education programs have you attended in the past, and how would you describe your experience? 4) What would help you to attend an appointment or a group for diabetes education? 5) What would your ideal diabetes education group look like? 6) What would help you better manage your diabetes?

Mental health-care providers were asked 1) What do you know about the diabetes education services available? 2) What do you feel are the unique challenges clients with mental illness and diabetes face when accessing education for diabetes management? 3) What types of programs and resources do you feel would be helpful to improve diabetes self-care for clients who also have mental illness? 4) What types of modifications could be made to existing diabetes education programs that might help to meet the challenges and needs of clients with mental illness and diabetes?

The diabetes management challenges experienced by mental health-care clients identified from client focus groups have been published elsewhere (13). This manuscript focuses on the solutions mental health-care clients and providers suggested to tailor diabetes education care for people with mental illness.

Data analysis

Axial coding was used to analyze the transcript data. The process involved identifying and combining connections among open code categories (31,32). Transcripts were also reviewed to determine whether there were examples that contradicted identified themes. The authors developed open codes independently and met to discuss and come to a consensus on open codes throughout the data analysis process. Prior to consensus, the proportion agreement of each identified code was calculated (33). Global themes were then identified through group discussion based on the codes.

Trustworthiness of data

To ensure credibility, the study was designed using the qualitative methodology recommended for successful health research (30,31), with a methodologic description that allows the study to be repeated for dependability (34). Credibility was further achieved through triangulation in the data-collection process, whereby diabetes and mental health-care clients and providers shared perspectives on how to address diabetes-education needs. Furthermore, the thematic analysis involved a process in which 4 coders with different professional perspectives independently analyzed the data and reached a consensus through the frequent questioning of identified themes in order to ensure that they emerged solely from the data and were not created by personal perspectives. This method aims to increase both credibility and confirmability of data.

Table 2
Mental health-care provider participants' professions

Job description	Participants (%)
Nurse practitioner (NP)	5
Social worker (SW)	38
Registered nurse (RN)	14
Registered dietitian (RD)	5
Certified diabetes educator (RN/RD)	14
Community worker	24

To further avoid personal bias during the interpretation of findings in qualitative research (25), confirmability was also addressed by journaling throughout the data collection and analysis processes in order to increase awareness of personal perspectives that could potentially bias results (30,31). Finally, to explore transferability, research findings were then compared with qualitative data from similar populations (34).

Results

We identified 42 open codes; the proportion agreement ranged between 25% and 100% (Supplementary Table 1), for an average agreement of 75%. This is within the recommended range of 70% to 94% required to signify an acceptable level of reliability within the coding process (33).

Three major themes emerged from the thematic analysis of the focus group data from clients and mental health-care providers. First, the role of the clients should be to help guide the diabetes education in terms of content and pedagogy. Second, clinicians should be flexible in how education is provided. Finally, an important goal of the education should be to empower clients by demonstrating how diabetes can be self-managed in accordance with their lifestyles.

Theme 1: Let the clients guide the diabetes education

The themes that emerged suggested that providing clients with the opportunity to express their needs can be an effective way to tailor diabetes care.

Variation in client needs. Focus group discussions highlighted the ways in which diabetes education needs differ among mental health-care clients (Supplementary Table 1A). Clients talked about the various ways they need to be supported by diabetes education programs. These included having appointments during which clients are held accountable and motivated to engage in regular diabetes self-care. In contrast, some clients believed that motivation to engage in diabetes management should come from within the individual, and some clients shared how self-reliance was important.

Clients also talked about offering diabetes education at varying levels of complexity. A few participants noted their low literacy levels. Some described not understanding information provided during appointments, whereas others wanted more detailed information about how to manage diabetes.

Clients additionally shared thoughts about having differing needs from diabetes education groups. Rather than acquiring diabetes education, some looked to the group for a sense of community and belonging. This need was also observed by clinicians, recognizing that being part of a group could be a powerful source of support. However, other clients spoke about attending diabetes groups to learn about diabetes, and they preferred group discussions that adhered to planned content. To mitigate the various expectations by the groups, health-care providers suggested referring clients to various groups according to their needs. This means that at least 2 types of groups with differing objectives should be available.

Incorporate individual client needs into diabetes education. Participants in both sets of focus groups suggested that listening to individual clients' needs would help to tailor diabetes education effectively for people with mental illness. Some health-care providers described using clients' priorities and concerns to guide education so that the information provided is relevant to the clients. Clients similarly described valuing appointments in which their needs were addressed.

Mental health-care providers also recommended establishing client-centered goals as an approach to help achieve health-promoting behaviour changes.

Theme 2: Clinicians' role is to be flexible

A second major theme that emerged from both sets of focus group discussions was the need for flexibility in the way diabetes educators support clients, identify topics to discuss at education sessions and teach about diabetes (Supplementary Table 1B).

Consider health beyond diabetes. Participants talked about the need to address both mental and physical health when providing individualized diabetes education care.

Primarily, health-care providers discussed the importance of considering the severity of mental illness symptoms being experienced; many believed that a stable mental health status would enable better learning and retention of diabetes self-care information.

However, opinions about how to address mental health symptoms differed. Some clinicians recommended an interdisciplinary approach by specialized health-care providers, whereas other clients and clinicians felt that each provider should have the skills and knowledge required to consider both mental and physical health.

Consider readiness to change. Mental health-care clients also discussed how becoming aware that health behaviours could prevent adverse diabetes outcomes would provide motivation to engage in self-care. For example, 1 participant recounted checking blood sugar levels to prevent kidney disease. Others explained that diet and lifestyle changes were made to prevent having the same adverse outcomes observed in others.

Engage in flexible teaching methods. Participants in each focus group recommended that diabetes educators accommodate heterogeneous literacy levels through flexible teaching methods.

Primarily, clinician participants advised modifying the complexity of education materials and communication. One health-care provider pointed out that some clients with mental illness are high functioning, and there is a difference between literacy and effective communication. For clients with lower literacy levels, clinicians recommended adjusting the literacy level of handouts provided.

Many health-care providers and clients talked about using visual aids instead of text-based teaching materials. For instance, a client recounted how food models taught balanced meals and recommended portion sizes. Another advised showing pictures to increase understanding. A health-care provider suggested that showing food products can help clients learn to make better choices.

For clients with lower literacy levels, both mental health-care providers and clients recommended that didactic teaching methods be avoided. Instead, 1 recommendation was to use a conversational approach to teaching. Some mental health-care clients found conversations more helpful than handouts. Health-care providers acknowledged that conversations could incorporate active participation and bring forth clients' individual needs and concerns.

Both mental health-care clients and clinicians suggested defining diabetes self-management terms and explaining mechanisms during appointments. For example, discussions about blood sugars should include definitions of tests and normal ranges. Another client described wanting to know how psychiatric medications relate to metabolism.

Participants in both sets of focus groups suggested simplifying information by explaining concepts through the use of opposing principles. For instance, a client explained her strategy of avoiding pop to prevent a stroke. Another proposed that food items should be categorized as good or bad for blood sugars. Other health-care

providers used a similar approach to explain better dietary intake choices at places frequented when eating away from home.

Providing action-based strategies was another approach recommended by clients to simplify diabetes information. For example, 1 client suggested providing advice about how to lower blood sugars. Another wanted to know how to identify the presence of diabetes complications.

Some clinicians talked about repeating information to help clients attain diabetes education concepts because they believed that mental illness symptoms and addictions could result in difficulty in retaining information. In contrast, clients wanted to learn new information at appointments and recounted being unengaged when diabetes education sessions were repetitive. Others described how acquiring knowledge would motivate attendance at diabetes education appointments.

Theme 3: Empower clients to self-manage

Focus group discussions also highlighted the need to empower mental health-care clients by helping them see how to make sustainable behavior changes that can improve blood sugar management (Supplementary Table 1C).

Transfer knowledge into action. One approach was to tailor diabetes education so clients could make lifestyle changes. One client thought this was integral for her diabetes management because she felt her biggest challenge was beyond the general diabetes management recommendations.

Many mental health-care providers advised personalizing recommendations through considering challenges related to the social determinants of health that clients may experience. Others described more specific examples of how the information provided should align with clients' access to resources. One reasoned that where food is obtained and how it is prepared should be considered. Another recommended helping clients to see how they can manage their diabetes when limited resources are available.

Clinicians also recommended problem solving with clients to create strategies that address specific self-care challenges. Suggestions included addressing challenges that could indirectly help with diabetes management or creating action plans such as treating low blood sugar levels.

Other providers talked about tailoring recommendations according to the clients' everyday lives, such as considering eating habits, food customs and home dynamics.

Help clients build self-care skills. In both sets of focus groups, participants suggested that demonstrating how to engage in self-care behaviours could empower clients by building the practical skills required to apply diabetes management guidelines, such as informal sessions that include cooking, meal planning, budgeting and how to engage in physical activity. One client shared how providing hands-on learning for insulin administration would be helpful.

Learning how to find a sense of balance when adhering to diabetes recommendations was also suggested by both mental health-care clients and providers. One client described the value of treating oneself in moderation to avoid over-restriction that could impede mental health stability. Similarly, clinicians described helping clients avoid all-or-nothing thinking by promoting efforts toward behaviour change rather than focusing on the consistency of engaging in positive behaviours.

Enable motivation from peers. Creating opportunities for clients to become motivated by having the social support of peers was also seen as a way to empower diabetes self-management behaviour changes. Some participants talked about how the presence of peers can promote collaboration and learning together. For example, clinicians suggested that diabetes-management strategies and coping mechanisms provided by peers can be easier to identify with. Similarly, a client described how hearing different perspectives about diabetes management can be helpful. Another viewed information that comes from one's lived experience as being more credible.

Discussion

The purpose of this pilot study was to explore how diabetes education programs can address challenges that may be experienced by people with mental illness in order to build diabetes self-management skills and improve self-care behaviours. Our study sought the perspectives of both mental health-care clients and providers, because the literature suggests that clinicians identify and prioritize clients' needs differently from clients themselves (33). Furthermore, mental health-care providers are not always able to assess their clients' needs effectively, yet may overestimate their ability to do so (35–37). Such discrepancies may result in the absence of services required to meet some needs that people with mental illness may have (38).

Our study results showed that there is alignment between mental health-care clients' and clinicians' perspectives on how diabetes education programs can tailor care to address the challenges commonly experienced by people with mental illness (Table 3). However, there are also differences. An important difference was seen between the amount of information described as appropriate to provide to clients with mental illness and how much information was perceived to be retained. Considering that some clients described underestimation of their ability to learn and retain information suggests that not all clients receive diabetes management education at levels appropriate to meet their needs. This mismatch between teaching and learners' needs often occurs as a result of neglecting to begin with a client-driven needs assessment.

Of additional note, some strategies focused on addressing symptoms of mental illness; however, the majority addressed psychosocial challenges that people with mental illness may be more likely to experience (13,21). People with mental illness are more likely to have lower literacy levels compared to the general population because symptoms of mental illness may disrupt education attainment (9,11). People with mental illness are also more likely to experience unemployment, which creates financial challenges related to living in low-income situations (21,39). Furthermore, people with mental illness are more likely to have reduced social-support networks and low levels of perceived available support (22,23,25). The presence of such challenges can result in the need to adapt education to a number of dimensions, including diet and lifestyle habits, while creating opportunities for clients to become empowered regarding their self-management. Taken together, although many of the diabetes education suggestions are applicable to all individuals with diabetes, the physiologic and psychosocial processes associated with mental illnesses can magnify the extent to which challenges are experienced.

Additionally, the major themes that emerged corroborate research investigating how people with mental illness need to be supported to make lifestyle changes. There is also alignment with Diabetes Canada's self-management education clinical practice guidelines, which recommend teaching according to literacy and numeracy levels, incorporating participation and collaboration and using cognitive-behavioural education interventions, such as problem solving and goal setting with clients (27). Through collaborative dialogue, clinician participants in our study focused on particular strategies when asked about tailoring diabetes education. However, none of the clinician participants referred to the importance of using health-behaviour changes. This suggests that there may be a need for increased understanding about the role of

Table 3

Summary of strategies diabetes education programs can implement to tailor diabetes education care in people with mental illness and type 2 diabetes

Strategy		Suggestions for implementation
Let clients' needs guide diabetes education	Identify the clients' needs	• Discuss literacy level • Discuss needs for peer support or group learning • Discuss how clients prefer to be supported by educators
	Discuss how to provide support	• Explain the purpose of diabetes education • Establish how program content can be tailored according to clients' self-care challenges, perceived needs and personal goals
Be flexible to teach to where the client is	Consider mental and physical health	• Discuss the experience of mental health symptoms and potential impact on diabetes self-care • Address mental health as appropriate
	Assess readiness to change	• Explain how diet and lifestyle changes can improve health outcomes for clients in the precontemplation stage
	Modify teaching methods according to literacy and cognition	• Check client understanding of concepts discussed • Have conversations about diabetes education topics instead of teaching a lesson • Define terms and explain mechanisms • Simplify information by using opposing principles (i.e. use if-then statements) • Provide action-based strategies • Use visual aids • If repetition appears warranted, elevate concepts to a more challenging level • Limit introduction of new concepts to a few at each session
Empower clients to self-manage	Transfer knowledge into action by helping clients to see how they can apply guidelines	• Individualize information by addressing and problem solving around individual challenges • Tailor recommendations to clients' everyday life (i.e. help plan routines for regular eating and physical activity)
	Build hands-on skills	• Provide food purchasing and budgeting skills • Assist with meal planning • Demonstrate healthful eating by using food models or by cooking together • Help find a sense of balance by preventing all-or-nothing thinking and teaching about moderation
	Supportive peer environments	• Provide opportunities for clients to learn from and motivate each other • Create positive group dynamics by combining participants who have the same intentions for group attendance

health-behaviour change theory within the clinical community. Thus, it might be helpful if trainings were offered that demonstrate how to incorporate change theory to develop effective ways of addressing the needs of people with mental illness (40). In addition, our findings suggest that there are multidimensional approaches to tailoring diabetes education to the needs of people with mental illness, in accordance with the clinical practice guidelines. Flexibility in teaching is not sufficient to create effective collaboration. It is also necessary to have clients reflect on their teaching needs and identify their goals and how they learn best.

Let the clients guide diabetes education according to their needs

Listening to clients' needs can create the therapeutic relationship required to enable client-guided diabetes education care. For instance, our findings suggest that clients may benefit from a discussion about the type of support needed to increase motivation to make lifestyle changes. In alignment with this finding, some research proposes that internal motivation to care for oneself and improve future health outcomes is gained with increased insight about diabetes and believing that behaviours can adequately improve health despite experiencing self-care challenges (13,41). Other research indicates that the presence of health-care providers can facilitate the motivation required for successful lifestyle changes. For instance, Yarborough and colleagues (42) found that maintaining lifestyle changes required active engagement in a healthy lifestyle intervention where accountability was created through group attendance, submitting food and exercise logs and participating in weight monitoring. Relationships in which health-care providers provide positive reinforcement or motivational communication to clients have also been found to enable behaviour changes that lead to successful outcomes (43,44).

Additionally, providing education topics according to clients' needs and priorities can be a successful strategy to enable client-guided diabetes education. McKibbin and colleagues (7) similarly suggested that the rationale behind health-promoting behaviour changes be tailored according to what the clients find relevant, rewarding and motivational. Roberts and Bailey (45) also found that

communicating lifestyle content was important for creating incentives to participate and increasing attendance.

Flexible clinicians are able to teach to where the client is

Our findings suggest that diabetes educators should recognize mental and physical health needs when tailoring care because experiencing symptoms of mental illness can impede daily self-care behaviours (41,42).

Recognizing clients' readiness to make behaviour changes is another component of providing flexible diabetes education (40). Mental health-care clients in our study talked about having increased motivation to make health behaviour changes after being made aware of associated health benefits. Similar research suggests that providing healthful eating and physical activity knowledge can encourage lifestyle changes in mental health-care clients with diabetes (7,42,44—46). El-Mallakh (41) also found enhanced insight and motivation to engage in healthy behaviours when mental health-care clients were aware that adverse diabetes outcomes observed in family members could be prevented.

Finally, successfully tailoring diabetes education involves flexible teaching methods so that information is presented in a way that can be understood by clients with varying learning capacities. McKibbin and colleagues (7) similarly suggest modifying health-promotion teaching strategies between a spectrum of simple and concrete to sophisticated, based on the clients' emotional and cognitive functional levels. Simplified teaching strategies will likely be necessary because people with mental illness tend to have learning challenges associated with reduced health literacy (9—11). Furthermore, both psychotic disorders and type 2 diabetes are diseases that reduce cognitive function such that processing speed and problem-solving abilities may be limited (11,47).

For clients requiring simplified teaching modifications, the literature suggests participatory learning. For example, Yarborough and colleagues (42) suggested that low-cost cooking demonstrations could foster meal-preparation skills and increase the palatability of healthful foods. Interactive teaching strategies, such as group outings, discussions using flip charts, quizzes and small

group tasks, were also used to engage people with mental illness in education about lifestyle interventions (45). Our findings also proposed learning through conversation so as to provide opportunities to participate by asking questions after processing and understanding information provided.

If didactic teaching methods are used, research suggests limiting new information presented in each session and that information be summarized using written handouts with visual supports (44,46,48). Health-care providers in Hultsjo and Hjelm's study (44) also described perceiving the need for repetition. However, considering that the mental health-care clients in our study preferred the acquisition of new knowledge, an acceptable approach may be to repeat information in a way that elevates concepts to a more challenging level if educators find that reviewing previous information is warranted (46).

Empower clients to manage their diabetes

Our research advises that diabetes education programs should empower mental health-care clients to build the diabetes self-management skills required to engage in self-care.

Primarily, the literature corroborates our finding that clients can be empowered through providing information about how to apply health recommendations because this enables knowledge to be transferred into action (6,17,42,44). Wardig and colleagues (17) recommended demonstrating the portion sizes required for adequate energy consumption. Providing strategies for developing routines that achieve healthful eating and activity were also suggested (17,44,46). Building food-purchasing and preparation skills was further recommended, such as how to purchase more healthful foods on limited incomes (42,44) and how to adopt more healthful cooking methods and preparation of meals (42).

Individualizing information to work around barriers to healthy lifestyle changes can be a necessary adjunct to diabetes education (6,7,44). Potential approaches include problem solving around healthy lifestyle challenges and creating client-centered goals (7,44). Alternatively, health-behaviour information could be guided by what clients perceive as being relevant within their lives (7). Yarborough and colleagues (42) suggested finding a sense of balance by teaching "flexible thinking," where lapses are perceived as opportunities for improvement.

The literature also suggests that social support in diabetes education settings can help to empower clients to incorporate diabetes self-management behaviours into their lives. For instance, peers can share experiences and ideas about how to overcome barriers and make positive changes (17,45,46,49). Partnerships could be formed in which healthy behaviour changes are made together (7,42). Seeing how positive changes lead to health improvements in peers could further motivate change (7). However, our findings suggest that care needs to be taken to create a positive group dynamic in which attendees have the same intentions.

Limitations

The focus on a population living in a specific geographic region may reduce the generalizability of this study. Additionally, how the duration and treatment of type 2 diabetes may impact self-care and education needs for people with mental illness was not explored. Furthermore, although the diversity of professional perspectives in our mental health-care provider sample contributed to the richness of perspectives, 95% of the participants were employed by community health organizations. This also limits generalizability because health-care providers working in home care or inpatient settings may have different suggestions about how to tailor diabetes education care because they support clients in a different capacity. Regardless of the limitation on generalizability, our

findings align with similar qualitative research exploring how to tailor lifestyle programs for people with mental illness. This suggests similarities between our study sample and the mental illness and mental health-care provider populations as a whole.

Finally, given that this is an exploratory pilot project, future research should seek to adequately represent the health-care providers employed in various geographic and employment settings to further their ability to tailor appropriate diabetes education strategies to individual needs.

Conclusions

Our study contributes to the literature by providing clinicians with a strategy for applying Diabetes Canada's self-management education guidelines to the needs of people with mental illness by using suggestions from both clients and clinicians. This approach includes letting clients' needs guide diabetes education, applying flexibility in teaching to meet individual needs and empowering clients to self-manage. We have also highlighted the perspectives that can differ between mental health-care providers and clients, which can adversely impact the ability of diabetes educators to meet clients' needs and highlights the importance of being client centred. Taken together, providing tailored diabetes education care to clients with mental health issues can better support the adoption of the healthy lifestyle behaviours required for successful diabetes self-management. This may, in turn, improve the increasing rates of morbidity and mortality currently observed in this population. Future research can expand these findings by identifying which teaching strategies are most helpful and for whom they are most helpful.

Supplementary Material

To access the supplementary material accompanying this article, visit the online version of the *Canadian Journal of Diabetes* at www.canadianjournalofdiabetes.com.

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Author Contributions

AC and CSD led the conception, design, analysis and interpretation of the data and the writing of the manuscript and supervised

the acquisition of the data. Both authors read and approved the final manuscript.

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Supplementary Material

Supplementary Table 1
Supporting quotes for the 3 themes

(A) Supporting quotes for theme 1: Let the client guide diabetes education			
Global theme	Open code	Proportion of agreement	Supporting quotes
Variations in clients' needs	Motivation and accountability from attending appointments	100%	C12: Trying to find a place that will keep you motivated C16: …and focused (client group 3). C8: I think I want, like the lady said, somebody who keeps a watch over me and I can communicate with them because I have problems with self-motivation, and if somebody would be there…not to direct me but to discuss. Well, that's a difficult one because I also don't like being controlled. I need a little bit of things that make me feel like I'm in control so…it's a tough one…. It's difficult, but let me put it this way: alone, I cannot do it (client group 1).
	Finding self-motivation	100%	C11: It's mostly within myself. Things I need to do, try not to be so forgetful about my pills and keep my motivation up. I can't think of anything else…. I think it's just within myself. It's just the biggest thing. I just have to focus, and my focus needs to be stronger. I don't think them pushing me will make it better, it might make me angrier, actually. C9: I'm totally on her side. I just got frustrated with all of the appointments. It's a matter of self-motivation (client group 2).
	Low literacy level	75%	C17: I'm illiterate! I can't read or spell. C14: I can't read nothing (client group 3).
	Not understanding appointments	75%	C9: I don't think I really understood what [the diabetes educators] were trying to tell me (client group 2).
	Detailed information required	50%	C6: Yeah, I think [the education class] was aimed at a lower level…it would have been good if they didn't have the assumption that…you know, if they could maybe do something at a higher level (client group 1).
	Groups attended for sense of community, belonging and support	50% 75%	C8: I actually like the social aspect because it's like a teaching sort of thing. And I like talking to a lot of people, so it is good for me…. For me, it's that I have a lot of time on my hands. It doesn't seem like a reason or a trigger but it is actually the reason: I have nothing to do. I'd like to go learn or just be there…you know, different faces, not the 4 walls at home (client group 1). P17: For many people also, going to a group has another meaning. Like going to a group, the intention could be to break isolation or coming once a month because I will see other people then actually really be conscious that they are coming for the education (provider group 4). P18: They really support each other. If someone is getting worried or anxious, or if someone doesn't understand, it's impressive how they rally around, more so, probably, than people without a mental illness (provider group 4).
	Groups attended for education purposes	25%	C6: Sometimes you can only talk about general things in a group. There are people that want to talk about their own personal things, and other people don't have patience for that (client group 1). C5: I think because of my mental health disabilities…like my mind always goes crazy when people go off on tangents that are unrelated to the subject, and it's not their fault, it's my fault for being bothered by it, you know (client group 1).
	Appropriate group referrals should be made	25%	P14: Really matching what program is appropriate for every client, right? So if that person is seeking the social aspect, matching them with a group (provider group 4).
Incorporate individual clients' needs into diabetes education	Use client priorities to guide education	100%	P10: Meeting them where they're at…not coming in with your own agenda, but basing the assessment and the education around what [the client is] accepting at the time (provider group 3). P13: I think, too, it's important to talk about what their concerns are, because if they're dealing with mental illness and other issues, you have to prioritize. What's most important to them, learning how to eat as a diabetic from the food bank, or is it monitoring your glucose levels that they need help with. I think that's important, it's key to giving them health information, because if it's not a priority to them, you're talking to a wall (provider group 3) .
		100%	C11: [The diabetes education team is] the best. Like I said, they're very informative to me, because they're helping me. They're giving me the information I need to know. My concern is staying healthy, and they're giving me what I need to do that (client group 2).
	Establish client-centred goals	100%	P11: Maybe starting with small, manageable steps. If they're feeling overwhelmed, they might not want to do everything all at once and prefer to start with small goals (provider group 3).
(B) Supporting quotes for theme 2: The clinician's role is to be flexible			
Consider health beyond diabetes	Address mental and physical health	100%	P5: The client is a full human being just as the rest of us are, and everything needs to be addressed, not just the 1 issue (provider group 1).
	Consider mental illness symptom severity	75%	P2: It depends on what kind of state they're in. If they're somewhat psychotic or really depressed, they're not going to be retaining that information very well (provider group 1). P19: I just came from a client, just before this, who has schizophrenia, who is extremely stable. So, there is nothing different that I would do with this individual. If they're not medicated, chances of actually having him address diabetes would be very difficult (provider group 4).
	Mental health addressed by specialists	75%	P6: Lots of times, with me, I will actively listen to what they are talking about. And as I'm listening and listening, then I'm able to assess that this an area I need to move to the specialist…the mental health nurse. So my initial is paying attention to what they're saying and trying to separate the diabetes part…but then I will also bring to them the referral piece. That you have someone to support you more, that is specialized and knows what they are dealing with (provider group 2).
	Mental and physical health addressed by same clinician	25%	C8: This is what I really think should happen is that medical professionals should be educated about other fields than their own and realize that there are things we have to consider. And they don't do that, you know? They're just really stuck on their own…it really doesn't help; diabetes or schizophrenia with cardiology, nothing it's just a…just nothing else (client group 1).
		100%	P11: Just talking to [clients] in a way that doesn't keep the diabetes separate from the mental illness. Talking about it as their lifestyle and how they can work on it, both at the same time (provider group 3).

Supplementary Table 1 (continued)

(B) Supporting quotes for theme 2: The clinician's role is to be flexible		(continued)	
Consider readiness to change	Change motivated with awareness of outcomes can be improved	25%	Facilitator: So what made you want to start checking your blood sugars? C1: Because they said my kidneys are getting affected and I didn't want to, or I don't want to, go on dialysis (client group 1). C10: My aunts and uncles died from diabetes, and I didn't want to die from diabetes. That's why I feel it's extremely important (client group 2). C9: I know people that got their legs cut off and another guy that actually passed away, and I don't want to be like that (client group 2).
Engage in flexible teaching methods	Recognize how to adjust literacy level of education material provided	100%	P14: I was just reinforcing that message where literacy…I don't think that would necessarily be an issue. We have a number of high-functioning people where literacy wouldn't be an issue as much as effective communication (provider group 4). P13: I think making sure if you give them take-home information, that it's written in a way that they can understand. Whether they require plain language, whether they have other issues with comprehending written materials, making sure that the information you do give them is appropriate for whatever their situation is (provider group 3).
	Use visual aids	75%	C13: Menu planning, you know what I mean? And they got these things, like plastic things, that resemble food and you put this much of that food on a plate and this much of that food (client group 3).
		100%	C12: Show pictures…everybody understands pictures, not words (client group 3). P6: Whatever resources has to be really basic. What I mean by basic is show them exactly what they could use in their real life instead of whatever we learn in the books and stuff like that…. So instead of handing them teaching material, it's more of showing them the items…. (provider group 2).
	Learn through conversation	75%	C11: For me, it's mostly conversation. I'm not a big reader for stuff like that (client group 2). C5: Like you are learning together instead of being taught a lesson (client group 1). C1: It's not that we're sitting here doing all the talking and teaching them and, like, drawing out all these pictures and giving them handouts to take home and read by themselves. So they're coming here, they get a chance to talk, and we just help them with whatever they need (provider group 1).
		25%	P13: Rather than asking questions and trying to pull out the conversation, you can have a conversation and let them come to you with their concerns (provider focus group 3).
	Define terms and explain mechanisms	75%	C4: Like when you said they told you your blood sugar was high, but how do you know what's high? What's low? If they don't tell you? (client group 1). C6: There are a few psych medications that cause diabetes, you know, they slow your metabolism down.… So that would be nice to just put it out there, but there isn't much you can do about it.…" (client group 1).
		75%	P1: Basic information about what an A1C is, what blood sugar is, what the long-term consequences are (provider group 1).
	Explain concepts using opposing principles	75%	C9: But I don't want to have another stroke because of all the time in the hospital. So I'm just trying to stay away from pop (client group 2). C15: There's foods that are better for you to help keep your diabetes under control and what not…. To educate you more on certain foods and what not, right. Like what are good and what are bad for you, right (client group 3).
		75%	P12: Like, if you're going to go to McDonald's, what is the healthiest thing to choose? Or if you're going to eat fast food or chips, which one should you eat? (provider group 3). P1: I also often have a conversation about if you're going to the soup kitchen, try to eat this and not this. And if you're at the coffeehouse, why don't you try and avoid the cookies and try for something like.…" (provider group 1).
	Provide action-based strategies	100%	C12: Tell you things that you can do like, "go walk around the block a couple times, bring your sugars down" (client group 3). C9: I'd like to learn what the more serious ramifications are of what diabetes can do to you…. The guy I was saying that had his legs cut off, I was talking to his daughter and she said it started under the toenails. And now I'm looking under my toenails for something, but I don't know what I'm looking for (client group 2).
	Caution with repetition	25%	P5: Whether they are coming in with addictions and possibly will forget what is talked about a few hours later, or if they are going through some form of psychosis as well. So there is definite repetition needed (provider group 1). P19: Sometimes it becomes like 50 first dates…. So that we're rolling it over and over and over again, in the midst of a struggle with mental illness (provider group 4).
		100%	C11: I felt like I was sleeping because I already know all of it…but in one-to-one, it's the information that you want to ask them…and it's personal (client group 2). C8: Oh the promise of learning something new! That sort of thing. We go in but what for? Like the basic idea to learn something. … I don't have to know the details but have a promise that I will learn something new, so at least there is a real reason to go in (client group 1).

(C) Supporting quotes for theme 3: Empower clients to self-manage			
Transfer knowledge into action	Tailor diabetes education to lifestyle changes	75%	C11: But the information [in the classes] is all about food portions and how long you should walk and trying to get to the gym. But I already got all of that. What was happening is that I was afraid to eat because my sugars were getting high. So I would try to eat a tiny little bit just to make sure I was alive still. And now I eat a little more (client group 2).
	Personalize education according to social determinants of health	100%	P19: Always thinking about the determinants of health and often looking at not well-managed mental health, and so you need to tailor it to the individual (provider group 4).
		100%	P19: Teaching someone about diabetes who eats out of the food bank for half a month, how to cook…is totally irrelevant. They might not have a can opener. It becomes barriers (provider group 4). C1: Yeah I think generally, too, when people learn that they have diabetes or any kind of condition, they just feel that it's going to be expensive.… And that's why seeing them regularly over and over and over does help because it is kind of really talking to them and teaching them very carefully about how they can manage with what they currently have. Whether they are eating at a food bank or a soup kitchen, or they just have very limited budget. But it is possible (provider group 1).

Supplementary Table 1 (*continued*)

(C) Supporting quotes for theme 3: Empower clients to self-manage (*continued*)			
	Problem-solve around specific challenges	50%	P8: Sometimes you'll pick up little pieces that are important to the whole picture. You know, that client that you're visiting with. And sometimes problem solving around a few issues that are weighing them down a little bit (provider group 2).
			P13: I had a conversation with someone who had mental illness and diabetes, and she was concerned about hypoglycemia. And I asked her if she carried her glucometer with her. And she said, "Well, no, because if I get psychotic somewhere, I'll forget and leave it." Which is fair. So planning otherwise. Can she bring food with her because if she loses it, who cares?… So I think it's also about simplifying and coming up with solutions for how we can strategically deal with episodes that happen when you're not near us (provider group 3).
	Tailor recommendations according to everyday life	75%	P17: Everybody has different eating habits, and diabetes is related to the food, obviously. The customs people have, I think it's important for the providers to understand the eating dynamic at home, where the client comes from (provider group 4).
Help clients build self-care skills	Build practical skills required to apply diabetes-management guidelines	75%	P13: Having programs that are less formal and more engaging are really important. Like holding cooking classes with a dietitian and using the groceries that they all bought together (provider group 3).
		100%	C7: Have cooking groups where people get together and do recipes.… Just be like, "Okay, well, we're going to do our own little spin on that and make some diabetic-friendly foods" (client group 1).
			C13: You also got to remember, you got to do this stuff in terms of budget and what stuff people will actually look at (client group 3).
			C12: Then you've got somebody to say, "Hey, okay, I do insulin, this is the way I do it, would you like us to do it?" Instead of just sort of sitting there (client group 3).
	Find a sense of balance when adhering to recommendations	100%	C7: You can't constantly be punishing yourself, you have to find a balance. Treat yourself every once in a while. Life's too short. Not saying go buy a bunch of cigarettes or go crazy, but you know, the self-punishing is not going to help. The more you worry about it, the more it's going to make you depressed and anxious and that (client group 1).
		25%	P6: And one thing we add to that makes me furious all these we do, it's not either do it all or nothing. The level of anything the person does is a success. So they are aware of that, that don't think, "I wasn't able to eat a small portion of grapes so I failed." No. If you weren't able to do it yesterday, and you couldn't yesterday, it's fine (provider group 2).
Enable motivation from peers	Collaborate with and learn from peers	75%	P6: They listen to [peers] actually more than you because they feel like, "They are just like me!" So if they are able to do it, then I can do it (provider group 2).
		100%	C6: Groups like this help. Even if you don't have anything else, asking a question is something that helps, believe it or not. It's a complicated disease; I think I'm on 4 pills just because of it, so… every little bit helps. Everyone has a different angle on it, so just talking about it helps (client group 1).
	Information from peers viewed as more credible	100%	C12: Like [somebody with diabetes can] give you strategies if they're on insulin.… You're going to trust another diabetic more than somebody.… (client group 3).