



Patient and Provider Views on Psychosocial Screening in a Comprehensive Diabetes Center

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Abstract

Guidelines recommend routinely screening adults with diabetes for psychological concerns, but few diabetes clinics have adopted screening procedures. This study assessed patient and provider perspectives regarding the role of mental health in diabetes care, psychosocial screening procedures, and patients' support needs. Patients with diabetes ($n = 15$; 73.3% type 2) and their medical providers ($n = 11$) participated in qualitative interviews. Thematic content analysis was used to categorize results. Participants believed that mental health was important to address within comprehensive diabetes care. Patients expressed positive or neutral opinions about psychosocial screening. Providers had mixed reactions; many thought that screening would be too time-consuming. Both groups emphasized that screening must include referral procedures to direct patients to mental health services. Patients and providers interviewed in this study viewed psychosocial screening as compatible with diabetes care. Including a mental health professional on the treatment team could reduce potential burden on other team members.

Keywords Diabetes · Psychosocial screening · Depression · Diabetes distress

Approximately one-third of adults with diabetes report clinically significant levels of psychological distress (Perrin et al., 2017), which is linked to increased morbidity, mortality, hospitalizations, and healthcare costs (Lloyd et al., 2013; Owens-Gary et al., 2019). However, psychological distress often goes undetected in patients with diabetes (Barnacle et al., 2016; Li et al., 2009). To address this problem, the American Diabetes Association recommends routine, standardized screening for psychosocial concerns as part of clinical care (Young-Hyman et al., 2016), but routine screening has yet to be widely adopted in comprehensive diabetes centers in the United States (US) (Owens-Gary et al., 2019). For example, only half of healthcare providers who work primarily with patients who have diabetes report ever having used a depression screening questionnaire in their practice, and less than 10% report routine use of a validated screening

tool (Osborn et al., 2010). Studies involving routine screening for other psychosocial concerns, such as diabetes distress and anxiety, are unavailable, suggesting that screening for these issues may be even less common.

Research is needed to clarify barriers that prevent diabetes clinics from implementing routine psychosocial screening. In a model proposed by Scaccia et al. (2015), an organization's readiness to implement an innovation, such as routine screening, depends on three interacting components: motivation, the organization's general capacity, and the organization's innovation-specific capacity. The model holds that stakeholder views and expectations related to the innovation are the driving force behind motivation. As such, engaging stakeholders (i.e., endocrinologists, patients with diabetes) and obtaining their perspectives is critical for effective and sustainable implementation of psychosocial screening procedures within diabetes care. To date, research that evaluates stakeholder perspectives on the use of routine psychosocial screening in adult diabetes care is extremely limited.

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Provider Perspectives

Research evaluating medical providers' perspectives on mental health in the context of diabetes care is scarce and comes exclusively from outside of the US. For example, diabetes specialists in Denmark reported that barriers to addressing their patients' psychological issues included limited consultation time, lack of referral options, discomfort asking questions about mental health, and lack of skills and training to manage psychological concerns (Johansen et al., 2014). Specialists also felt that psychological concerns were not their responsibility and that patients lacked the motivation to change. In a separate study (Joensen et al., 2019), analysis of comments from a variety of provider stakeholders in diabetes care (physicians, nurses, diabetes educators, mental health providers) identified challenges at the level of the patient-provider relationship (e.g., stigma, provider concerns about addressing psychosocial issues without skills or training, lack of time during interaction) and the healthcare system (e.g., focus on biomedical rather than psychosocial indicators of health status, lack of resources to fund psychosocial support).

Screening

Research assessing diabetes care providers' perspectives on implementing psychosocial screening within routine diabetes care is even more limited. To this end, we recently assessed the views of pediatric diabetes care providers caring for youth with type 1 diabetes in a clinic that had implemented a psychosocial screening program and psychological consultations as part of routine clinical care (Brodar et al., 2021a, 2021b). Findings indicated that diabetes care providers liked the screening program and valued the opportunity to collaborate with their clinic's psychology team. Because providers' perspectives were obtained after the screening program was implemented, we were unable to assess diabetes care providers' *a priori* views concerning screening. Likewise, it is unclear how providers who care for adults (and accordingly receive training in internal medicine rather than pediatrics), or patients with type 2 diabetes, view psychosocial screening practices.

Research conducted in primary care facilities and other healthcare settings with adults is informative. In Scotland, only one-third of patients with multiple chronic conditions were screened for depression, even when local health boards provided incentives to clinics (Jani et al., 2013). When asked to describe why screening was difficult, providers reported that (1) administering questionnaires to

patients felt mechanistic; (2) it was difficult to incorporate screening when time is limited; and (3) discussing depression might "open a can of worms" (Maxwell et al., 2013). Similarly, a survey of US-based infertility providers found that, although most believed psychological conditions negatively impact fertility, only one-quarter reported any type of mental health screening (Hoff et al., 2018). Common physician-reported barriers to screening included lack of time, feeling uncomfortable, not knowing what screening tool to use, feeling unsure about current evidence-based practices for managing mental health concerns, and not having referral options available. It remains unknown whether the barriers to psychosocial screening reported by physicians in other fields generalize to diabetes specialty care providers, particularly those caring for adults with type 2 diabetes.

Patient Perspectives

Few studies have examined patients' beliefs about the role of mental health within diabetes care. Gonzalez et al. (2011) suggest that patients appreciate health care providers asking about their emotional well-being and one study found that patients with diabetes wanted their physicians to spend more time attending to psychosocial concerns (Burke et al., 2006). Other work, however, suggests that patients with diabetes rarely bring concerns about emotional distress to their physician's attention (Cherrington et al., 2006; Egede, 2002; Ruiz & Praetorius, 2016). Adults with diabetes may struggle to initiate conversations about psychosocial concerns with medical providers. Patients with more complex medical presentations, as seen with diabetes, tend to view their communication with medical providers more negatively than healthier patients (Fung et al., 2008). In turn, providers are less likely to engage in patient-centered communication when working with patients that have multiple chronic conditions (Green et al., 2012), perhaps due to the time burden of addressing several concerns in one visit. As such, patients with diabetes may be particularly unlikely to bring up psychosocial topics during a medical appointment, even though they may be at a heightened risk for psychological distress (Albertorio-Diaz et al., 2017).

Past work in primary care settings identifies other reasons patients might feel reluctant to raise psychosocial concerns with their medical provider, which may extend to diabetes care. Specifically, patients may not know how to initiate the conversation or whether the medical setting is an appropriate context for emotional disclosures (Kravitz et al., 2011; Wittink et al., 2006). They also may not believe that medical providers' training and philosophy aligns well with addressing emotional concerns (Kravitz et al., 2011). Some patients may also worry

that bringing up mental health issues could create distance with their provider (Wittink et al., 2006).

Screening

To our knowledge, no prior studies have examined the perspectives of adults with diabetes regarding psychosocial screening. However, research on this topic in adolescents with type 1 diabetes is growing and largely suggests that youth have a positive view of psychosocial screening and find it helpful, particularly if it is kept brief (Corathers et al., 2019; Iturralde et al., 2017; Perfect et al., 2011; Wong et al., 2020). However, some work suggests that youth who have higher depression scores and/or more glycemic instability tend to view psychosocial screening more negatively (Wong et al., 2020).

Although research on adults with diabetes is lacking, in primary care settings, adult patients generally express positive views of screening measures (Samuels et al., 2015; Shah et al., 2018). Research also suggests that screening may facilitate conversations with medical providers about mental health. For example, older adults reported that it was easy to speak with their primary care provider about mental health after completing depression and anxiety measures (Samuels et al., 2015). In other work, patients felt that screening enabled disclosures about mental health concerns, as they would have otherwise struggled to initiate the conversation (Wittkamp et al., 2008).

Current Study

Stakeholder perspectives are critically important for implementing routine psychosocial screening within diabetes care but largely remain unstudied. The current study used qualitative methods to describe the perspectives of adult patients with diabetes and their medical providers in a comprehensive diabetes center that has not yet implemented routine psychosocial screening regarding (1) the relationship between stress and diabetes management, (2) medical providers' role in helping patients navigate psychological concerns, (3) benefits and drawbacks to implementing routine psychosocial screening, and (4) issues related to connecting patients to care. Additionally, the study compared patient and provider perspectives to identify similarities and differences.

Methods

Participants

Participants were medical providers ($n = 11$) and adult patients with diabetes ($n = 15$) at a comprehensive diabetes center located within a large academic medical center in South Florida. Consistent with the most recent census data for the area (United States Census Bureau, 2019), the center serves a predominantly Hispanic/Latinx patient population in South Florida ($N = 1270$; 72.8% White; 67% Hispanic/Latinx; 50% female; mean age = 60 years, $SD = 14$; 88.7% type 2 diabetes; 10% on Medicaid; 47.9% on Medicare). At the time interviews were conducted, the center did not have routine psychosocial screening in place, though one physician was pilot-testing screening procedures with his patients. Provider and patient demographic characteristics are reported in Table 1. Participation rates were 57.9% for providers (11 out of 19 total providers at the clinic) and 1.2% for patients (15 out of patient census of 1270; participant recruitment continued until the research team determined that no new themes were emerging during interviews).

Interview Guide Development

We first developed a semi-structured interview guide to use with providers. It included four major topics: (1) the relationship between psychosocial concerns and diabetes management; (2) the provider's role in helping patients navigate psychosocial concerns; (3) assessment of psychosocial concerns during a patient visit; and (4) coordination with and/or referral to mental health professionals. The interview guide was developed via an iterative and collaborative process amongst research team members. Domains selected for inclusion in the interview guide reflected key practical questions that resulted from the clinic's pilot-testing of the screening procedures, as described above. Interview questions were informed by the scientific literature and consultation with experts in diabetes care. Once the guide was drafted, an expert in implementation science reviewed the questions and provided feedback. Minor adjustments were then made to the guide based upon this feedback to improve clarity and ensure that participants interpreted questions as intended. To aid in the discussion of assessment of psychosocial concerns, the interviewers showed participants copies of the Patient Health Questionnaire—8 (Kroenke et al., 2009) and the Diabetes Distress Scale (Polonsky et al., 2005) and asked for their opinions on using the measures in routine clinical care. Minor adjustments were made to improve question clarity

Table 1 Participant demographics

Participant characteristics	Providers (<i>n</i> = 11)		Patients (<i>n</i> = 15)	
	<i>N</i> ; Range	%; <i>M</i> , <i>SD</i>		
Age (in years)	Range = 29–73	<i>M</i> = 46.27, <i>SD</i> = 13.65	Range = 26–79	<i>M</i> = 49.14, <i>SD</i> = 13.53
Years working with patients with diabetes	Range = 4–50	<i>M</i> = 16.20, <i>SD</i> = 14.00	–	–
Years lived with diabetes diagnosis				
1–5 years	–	–	5	33.3
6–15 years	–	–	8	53.3
15 years or more	–	–	2	13.3
Diabetes type				
Type 1	–	–	4	26.7
Type 2	–	–	11	73.3
Sex				
Male	7	63.6	8	53.3
Female	4	36.4	7	46.7
Race and Ethnicity				
Asian, Non-Hispanic/Latinx	1	9.1	0	0.0
Black/African American, Hispanic/Latinx	0	0.0	1	6.7
Black/African American, Non-Hispanic/Latinx	0	0.0	2	13.3
Hispanic/Latinx (did not report race)	0	0.0	1	6.7
More than one race, Hispanic/Latinx	0	0.0	1	6.7
White, Hispanic/Latinx	5	45.5	9	60.0
White, Non-Hispanic/Latinx	5	45.5	1	6.7
Preferred language for clinical interactions				
English only	4	36.4	8	53.3
English or Spanish	7	63.6	5	33.3
Spanish only	0	0.0	2	13.3
Provider role				
Attending endocrinologist	5	45.5	–	–
Endocrinology fellow	3	27.3	–	–
Dietician/certified diabetes educator	1	9.1	–	–
Nurse practitioner	1	9.1	–	–
Podiatrist	1	9.1	–	–
Patient education level				
Did not complete high school	–	–	1	6.7
High school diploma/GED	–	–	4	26.7
Some college or associate degree	–	–	2	13.3
Bachelor's degree or higher	–	–	8	53.3

and reduce interview length after the first two interviews. The provider interview guide was then adapted for use with patients. Two doctoral students fluent in English and Spanish translated and back-translated the patient version of the guide. Appendix A includes both interview guides.

Procedures

The university's Institutional Review Board approved all study procedures. Medical providers received an email from the director of the comprehensive diabetes center inviting

them to participate in qualitative interviews and, if interested, to contact the first author to schedule an interview. The center's medical providers recruited patients to participate by providing them with a flyer describing the study during their appointment. If patients expressed interest in participating, the medical provider introduced them to the interviewer, who explained the purpose of the study and conducted the interview.

Advanced doctoral students in clinical psychology fluent in English and Spanish conducted the interviews in a quiet room at the center. They wrote memos after each interview

to document key themes and observations. Patient interviews were completed from September 2019 to November 2019 and provider interviews were conducted from September 2019 to June 2020. All participants gave verbal consent to participate and completed a short demographic questionnaire. Provider interviews ranged from 19 to 50 min and patient interviews ranged from 18 to 56 min. Providers did not receive compensation for participating; patients received a \$10 Amazon gift card. Interviews were audio-recorded. Trained undergraduate research assistants transcribed the interviews; authors checked the transcripts for accuracy. Two bilingual research assistants transcribed, translated, and back-translated the two patient interviews conducted in Spanish.

Data Analysis

Data analysis followed the procedures for Thematic Content Analysis as outlined by Green and Thorogood (2018). Four doctoral students in clinical psychology developed a codebook for the provider interviews based on key themes from initial observations and used NVivo 12 Plus (QSR International) to code the transcripts. They coded one transcript and then met to resolve discrepancies and adjust the codebook. They repeated this process three times, then two of the students coded each transcript. Next, for the patient transcripts, the first author modified the provider codebook, and the doctoral students completed two rounds of preliminary coding. Afterwards, the patient codebook was finalized, and two of the students coded each transcript. Cohen's kappa assessed reliability. Once the transcripts were coded, the first author summarized themes for provider and patient transcripts separately. The research team reviewed the summaries and provided feedback. The first author then used quote matrices to compare patient and provider themes for areas of overlap and unique contributions.

Results

The final round of coding yielded an overall kappa of 0.62 for the 11 provider transcripts and 0.66 for the 15 patient transcripts. Kappa values above 0.60 are considered acceptable in qualitative research (Burla et al., 2008). We observed substantial overlap in themes across providers and patients, although the two groups also provided unique and sometimes contradictory responses. Below, we highlight the major themes that emerged from the coding process. Within each domain, we first review themes shared by providers and patients. Then, we discuss any patient-specific and provider-specific themes within that domain. Permeating throughout was that patients and providers both valued the patient-provider relationship and felt that trust, empathy, and active

listening were critical for discussing psychological concerns in a productive manner. Stigma, limited time, and lack of personnel to coordinate and follow-up on screening results emerged as cross-cutting themes that may complicate the implementation of psychosocial screening and intervention within diabetes care.

Diabetes Creates Stress, and Stress Makes It Hard to Manage Diabetes

Shared Themes

As indicated in Table 2, providers and patients articulated the same themes in regard to the relationship between stress and diabetes. These themes included that diabetes is stressful, exacerbates typical life stressors, and requires major life changes, particularly related to accepting and adjusting to a new diagnosis. Additionally, patients and providers alike maintained that stress obstructs diabetes management and, consequently, that stressors often need to be addressed during the medical visit. Both groups also emphasized that stress might prevent patients with diabetes from prioritizing self-care and lead to maladaptive health behaviors (e.g., overeating, substance use) to cope with stress.

Medical Providers Play a (Minor) Role in Addressing Stress and Mental Health Concerns

Shared Themes

As shown in Table 2, patients and providers largely agreed that medical providers do not have the time or the appropriate training to manage mental health concerns. Both groups also felt that medical providers' primary role is to listen, empathize, and provide referrals, in addition to adjusting the treatment plan as needed to reduce patients' stress related to diabetes management.

Patient-Specific Themes

Patients felt that medical providers often leave the psychological side of diabetes unaddressed. While most patients would appreciate their provider checking in about stress and coping, they did not think the provider was the right person to provide emotional support. They explained that providers only see the patient every few months, focus on numbers (e.g., HbA1c), and often seem unaware of the psychological toll of diabetes. One patient compared the diabetes clinic to a "car shop," where the focus is mechanical—identifying the part that is not functioning correctly and fixing it.

Patients likewise expressed that providers do not always seem to understand the other demands in their life that complicate diabetes management. Notably, all patients felt that

Table 2 Themes relevant to stress in the context of diabetes and the medical provider's role in addressing such concerns

Themes	Representative quotes from providers	Representative quotes from patients
Daily diabetes management is stressful	<p>"I think it's a huge hindrance. On top of just leading a busy life, they're asked to stop and check their blood sugar or take their medication."</p>	<p>"Going through all [the stresses from life] plus a sugar low or high... It's like making somebody run a race only with one leg or with something tied behind their back or weighing them down... everybody else gets to run free."</p>
Diabetes requires major life changes	<p>"Just think about someone 65, 70 years old [who likes] café con leche. Get up in the morning and put two spoons of sugar and milk, and that is what they have done all their lives. And now they have diabetes and they're being told, 'Oh, you can't have that. You can't put sugar in that.' ... you are asking them to change their whole lifestyle."</p>	<p>"All of the sudden they tell you you're diabetic and you need to take insulin, and this and that. You cannot do that anymore; you cannot do this. It is kind of frustrating... you have to adjust your life."</p>
Stress complicates diabetes management	<p>"[Stress] makes the management of your diabetes more difficult, it makes the sugars go up, the control gets worse. Also, if you have a chronic condition then you have more stress, so it goes both ways. It definitely has an impact on the ability of the patient to control the disease."</p>	<p>"[Stress] gets in the way of taking care of themselves, basically. When they have outside stress thinking about other people—not thinking about themselves—their diabetes starts to get out of control... you're going to be thinking about the stress instead of managing your diabetes."</p>
Medical providers lack time to address stress/mental health	<p>"Do we become our patient's psychologist?... The system, I think, is not designed, at this point, for us to have the time to provide that... if the idea is for us to be able to identify and refer them, that's great. But I don't think it should be our role as endocrinologists to manage the psychological aspect."</p>	<p>"The doctor helps, yes, but for the time frame that they have to see other patients, I think it would be too stressful for the doctor, because they would have to hear the same story constantly, the same thing as the psychologist, but the psychologist is prepared mentally to listen."</p>
Medical providers lack appropriate training	<p>"I mean, we are not trying to be the psychiatrists or psychologists. We're physicians. We're trained in different ways."</p>	<p>"That's like changing thousands of years of doctors. Doctors are about numbers and the physical things, so... a doctor needs help from that side. Because, doctors have been trained to be a little bit impassionate."</p>
Medical providers' primary role is to listen, empathize, and provide referrals	<p>"Establish trust, listening, having lines of communications outside of your appointment so the patient can reach out to you, and being able to have resources for them instead of just passing the buck, which is what they're used to. At least that's what I do with my patients."</p>	<p>"Get to somebody else. [The doctor] won't be that one. [The doctor] can say, 'Look, if it's stress, it's gonna put your numbers up even more. You know, what we are trying to do is control those numbers and control your diabetes. So, I would like to refer you to blah, blah, blah.'"</p>
Medical providers can adjust treatment plan to reduce patient's stress	<p>"I'll tell them, okay, you don't test, you don't do this. I know. Everything is too hard for you for now... Like offering them the help, psychiatry referral, but if that is not acceptable or available or feasible, then working with them slowly because it's always also the life situations. They need more understanding and fitting our medical treatment into their situation. Like aiming low... Accepting the imperfect."</p>	<p>"If you know this person is a busy mom that has three kids, you need to be, like, catering her system of care to the fact that she's a busy mom with three kids. Like not the fact that she came in with an A1C that's 8. Like, trying to help her figure out like how can I get this A1C down <i>being</i> a busy mom with three kids... half of the problem of diabetes is just trying to figure out how to work it into your life."</p>

providers should ask questions about their stress and coping, and several suggested that most patients are waiting for providers to do so: “I think people are waiting to be asked... they would be relieved, because it takes decisions out of their hands.” They explained that when providers ask about stress and coping, it demonstrates that they understand the burden diabetes places on patients.

Provider-Specific Themes

Providers emphasized that they sometimes end up “playing therapist,” whether they want to or not. Providers generally reported feeling comfortable identifying mental illness and making referrals but did not believe treating mental health issues fell within their scope of practice. Yet, three providers explicitly referenced “playing psychologist,” and others described providing psychological care during medical visits, even though they might not feel qualified to do so: “I guess I constantly play psychologist, with no training obviously... Sometimes just listening, sometimes giving advice or making them think through ways to manage stress better.” Some providers also reported prescribing psychotropic medications for their patients, especially those who clearly needed support but refused to see another provider. Providers emphasized how stressful it can be to feel pressured to provide psychological care for patients yet lack adequate training and tools to do so:

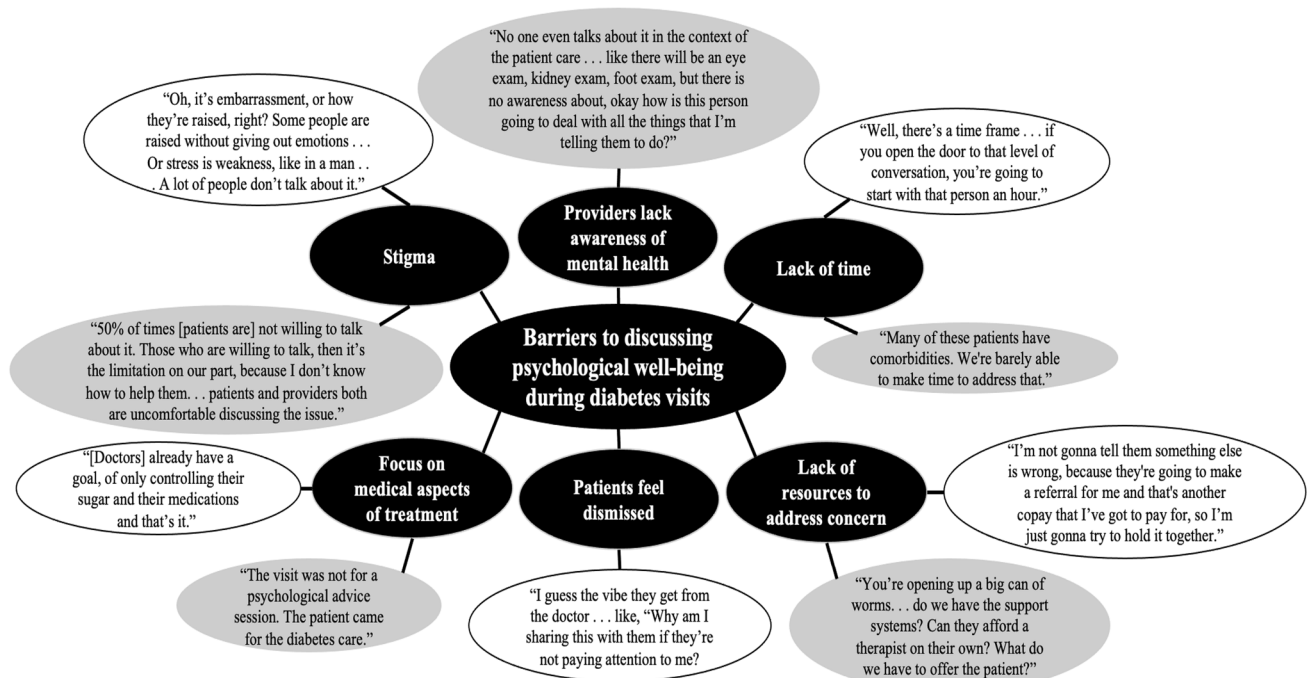
“It’s really, really hard. It’s not fair to the patient, because I’m not a specialist... I always end up trying to like, put out a fire, you know?”

Overall, patients and providers both acknowledged the important role of stress and mental health within diabetes care, but also recognized factors that complicate providers’ involvement in navigating patients’ psychosocial concerns.

Several Barriers Prevent Medical Providers’ Assessment and Patients’ Disclosure of Concerns

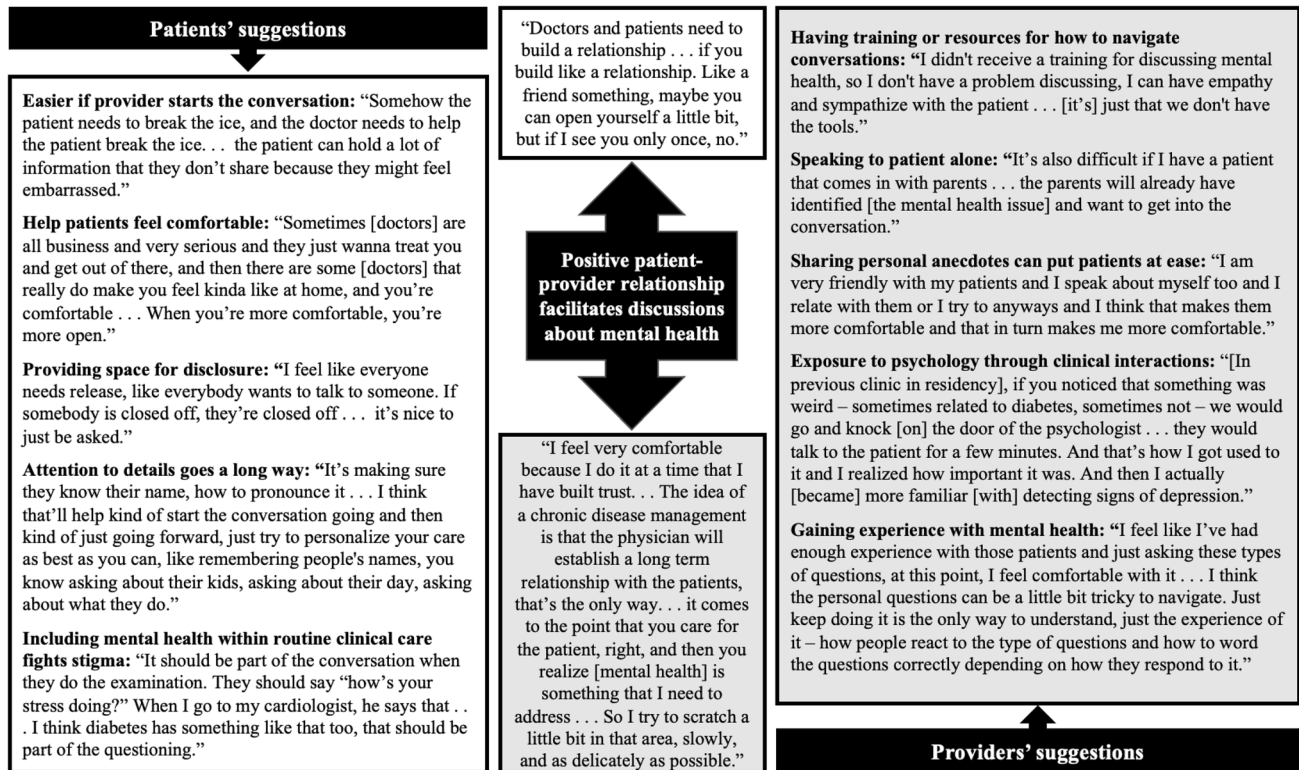
Shared Themes

Participants identified several barriers that prevent discussion of mental health during diabetes visits. As depicted in Fig. 1, barriers highlighted by both patients and their providers included lack of time during the visit, lack of resources and support options for patients experiencing concerns, an overt focus on medical rather than psychological concerns, and stigma. As shown in Fig. 2, patients and providers both felt that a pre-existing positive patient-provider relationship facilitates conversations about mental health. Both groups also suggested that incorporating discussions about stress and mental health within routine care decreases stigma by normalizing the topic.



Note: White ovals denote patient quotes; gray ovals denote provider quotes. “Providers lack awareness of mental health” is a theme that emerged from providers specifically. “Patients feel dismissed” is a theme that emerged from patients specifically. All other themes were identified by both groups.

Fig. 1 Barriers to discussing mental health during diabetes visits



Note: White rectangles denote patient quotes; gray rectangles denote provider quotes.

Fig. 2 Patient and provider suggestions for increasing comfort discussing mental health during diabetes appointments

Patient-Specific Themes

Patients noted that it is often difficult to bring up emotional concerns because they do not want to deviate from the provider's focus on medical issues during the visit. Likewise, some patients noted feeling dismissed by providers, who might be focused note-taking or appear too busy to be bothered (Fig. 1). Patients offered several unique suggestions for how providers can facilitate conversations about mental health during visits (Fig. 2).

Provider-Specific Themes

Providers felt that they should prioritize the medical side of care, particularly given their limited visit time. A few providers also noted that mental health generally receives little attention in diabetes care (Fig. 1), and some specifically reported feeling uncomfortable navigating suicidal ideation: "When they are in that bad of a place, I wouldn't risk my limited mental health knowledge." Providers also noted that because they do not routinely assess patients' stress and emotional functioning, they may not be aware that stress is impacting patients' ability to manage diabetes effectively. Like patients, providers offered several strategies

to make conversations about mental health more comfortable (Fig. 2).

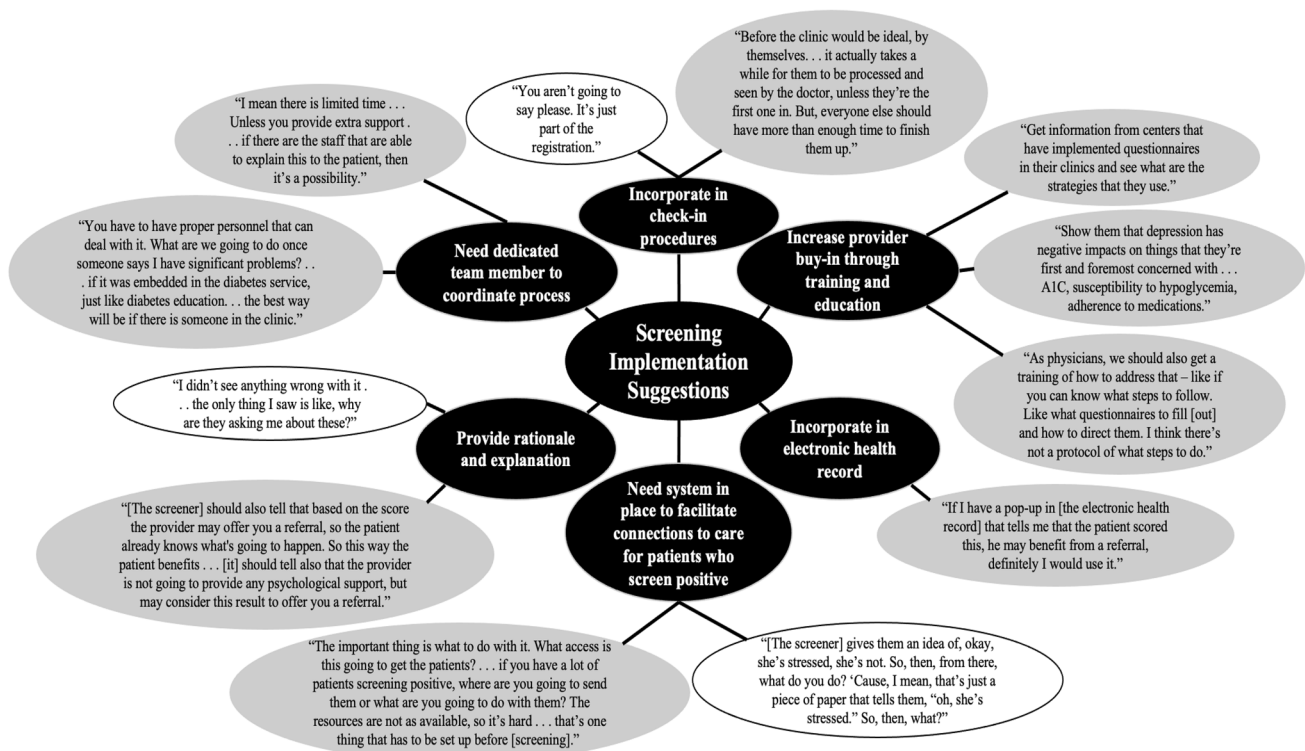
Routine Psychosocial Screening Could Help If It Translates to Patients Accessing Care

Shared Themes

Patients and providers generally agreed that screening is worth pursuing if it results in accessing services or improving diabetes management. Table 3 contains a list of the benefits and challenges identified by both patients and providers. The two groups provided some overlapping implementation suggestions for screening (Fig. 3), including that the clinic should only screen patients if they also have a system in place to facilitate connections to care for patients who screen positive for mental health concerns. Likewise, they felt that the clinic should provide patients with a rationale for screening and explanation of procedures, rather than giving out the screener without context. Participants also commented on how to incorporate the screener within the flow of a clinic visit. Most felt the screener should be completed in the waiting room, before the visit, or within the check-in or triage process.

Table 3 Patient and provider perspectives on the benefits and drawbacks of routine psychosocial screening

Theme	Representative quotes from providers	Representative quotes from patients
Benefits of Screening		
Does not rely on providers to identify symptoms	<p>"If you don't have something that everybody should follow it's going to be hard. Because you can't trust the feeling of each provider because each provider has a different experience."</p>	<p>"[The doctor]'s not that expert. So, why is he going tell me I'm stressed? Just out of the blue, I'm stressed? Why? It's not [the doctor's] call to say that... I think that paper is great, because that would tell him okay, they're stressed."</p>
Starts conversations	<p>"Like pain score, every patient who walks into the clinic gets asked about pain. I think it starts at that level, that those screening questions get asked... it will break the ice, bring on the conversation."</p>	<p>"This is a good way to break the ice... I think that if the doctor cannot break the ice then this is a good way to start."</p>
Supports tailoring of treatment plan	<p>"This guides me toward thinking the problem is not with the medication, so then maybe I start thinking that the patient needs a different type of help."</p>	<p>"I think [the doctor] should ask all the questions he can. The more questions he asks, the more info he can get, and he can help the patient better."</p>
Helps provider understand patient	<p>"To be a good a diabetologist, you have to be willing to get into the person's life. So, I think diabetologists are a good group of specialists to approach with the idea of them being the initiator of the process."</p>	<p>"I think it is a good thing to do, for the doctor to know what they are going through and how they are feeling... It's part of the doctor getting to know you and getting to know how you manage."</p>
Offers non-verbal option for disclosures	<p>"It doesn't require you to ask questions, so [the patient] is able to do it while he's waiting... it becomes more efficient for the patient and for us."</p>	<p>"That's a very touchy situation. So, that's why, if you have it on paper like that, that was easy for me... A questionnaire is good, to open up maybe something if they still want to be truthful about it."</p>
Drawbacks of Screening		
Additional burden for patients	<p>"A patient may take 30 min filling [it] out, and some may feel uncomfortable, and some may say, 'I don't have time for this.'"</p>	<p>"I know some patients don't want to go through the hassle just because of time or they have somewhere to be."</p>
Some prefer face-to-face	<p>"There is no better way than face to face... some of the things that you're asking maybe don't reflect exactly what the patient wants to tell you."</p>	<p>"Sometimes they fill it out just to fill it out, it doesn't connect to them... It's different when you are talking to a person and you open up to that person."</p>
Patients might not respond honestly	<p>"How many of them really take the time to fill it [out]? I don't know how accurate that will be."</p>	<p>"People might just say yay and just put that you're all okay because I don't want anybody to think that I'm crazy or depressed or whatever... there might be a stigma filling out the form by some people."</p>
May not be valid	<p>"Between a 3 and a 4, what is the difference? It's subjective in that regard... so it will not be super accurate."</p>	<p>"Sometimes you fill it out just to finish, like a test... it's hard for the doctor to figure out how you feel, because you are filling out whatever you are feeling in that moment. That's why I say I don't trust it."</p>
Wastes time	<p>"I won't put them through this because my time with them is more important than filling this out, because I'm teaching as I'm doing my visit... I'm not cutting visits short 5 min to fill this out."</p>	<p>"I'm going to talk about that when I get there, and I don't even think the doctor looks at it... 'cause the doctor comes in with his own questions. If he looked at what you wrote on here, he would know it all. So, there's no sense."</p>
Does not directly translate into care/support	<p>"It's opening up issues that, if you do not have [resources] or know where to go next, you've just compounded the issue with them."</p>	<p>"I don't see any of these flagging anything in me that would be at all what true stress is about... that is not gonna get solved by a form, that's gonna get solved by identifying that person's issues or problems and setting the course to meet the immediate needs."</p>



Note: White ovals denote patient quotes; gray ovals denote provider quotes. “Need dedicated team member to coordinate process,” “increase provider buy-in through training and education,” and “incorporate in electronic health record are suggestions that came from providers specifically. All others were noted by both patients and providers.

Fig. 3 Patient and provider recommendations for screening procedures

Patient-Specific Themes

Patients expressed mostly ambivalent reactions about screening. While they identified pros and cons, they tended to express a general willingness to answer whatever questions their provider poses. A few patients expressed positive views of screening, and none expressed negative reactions.

Provider-Specific Themes

Providers’ opinions on screening were more mixed; over half (54.5%) expressed positive feelings about routine screening and felt it was the best way to identify patients in need, three (27.3%) had mostly negative reactions, and two (18.2%) reported ambivalence. In addition to benefits noted in Table 3, providers additionally suggested that patients may become aware of a problem when they respond to screening questions and that screening could alert physicians to refer patients to mental health services. Likewise, they identified some unique concerns about their role in the screening process, particularly that the screener would place extra work on physicians and take up too much time during patient visits. Further, providers expressed concerns

about how to proceed if patients screened positive. They felt screening was problematic if patients could not subsequently access care. Providers’ responses regarding implementation suggestions (Fig. 3) highlighted the importance of having a dedicated team member to coordinate screening and incorporating the screener in the electronic health record. Providers had varied opinions about how frequently patients should complete the screener and highlighted the need for training on the screening process.

How Medical Providers Communicate Feedback from Screening and Referrals Matters

Shared Themes

As shown in Table 4, providers and patients expressed similar views on how providers should navigate positive screening results. They agreed that providers should indicate that they reviewed the patient’s responses, probe for additional details, and communicate their availability and willingness to support the patient. Participants from both groups also articulated similar strategies for how providers can approach

Table 4 How providers should communicate feedback about screening results and provide referrals to mental health services

Themes	Representative quotes from providers	Representative quotes from patients
Provider communication		
Positive relationship facilitates conversation	<p>“Once a relationship has been built with the patient and I have trust with the patient, we can go into that, but initially I try to help them, you know, make them feel comfortable.”</p> <p>“You’re not saying they’re crazy but rather that they are not being effective... [it’s] taking away from their ability to manage their diabetes... you gotta empathize, I think empathizing and being able to put yourself in the shoes of the patient.”</p> <p>“It’s not that they’re crazy. It’s not that you think that they need help. You just tell them, like, this is an important aspect of the disease itself.”</p>	<p>“You feel important, I’ll feel like [the doctor] really cares... he’s not trying to start any problems, he’s trying to help me.”</p> <p>“If the doctor forces you—“You need to go to a...” “I’m not crazy, I don’t need it,” you know. But if the doctor talks with you in a different approach, it’s different. Everything depends [on] how you communicate.”</p> <p>“I think that sometimes, the reality of diabetes and the things that are going on, that’s a perfectly logical way to feel. So, it’s important not to make them feel like they are crazy.”</p>
Validate and normalize patient concerns		
Referrals to mental health services		
Frame as routine part of care	<p>“They are more likely to seek help and be receptive to it if it is part of their diabetes care. If they think about it [as] separate, like psychiatric clinic, they are going to freak out. That sort of labels them as having problems.”</p>	<p>“If they—almost order it... like almost mandatory... if it was part of the whole program. I need steps, I think a counselor would be a step, a diabetic counselor. Like with stress and all the psychological things... you would have the endo, but you would have somebody alongside.”</p>
Connect to diabetes management	<p>“I tell them that I think psychological support would truly help them and deal better with the disease.”</p>	<p>You’re coming here for diabetes. So, if they explain that, you know, diabetes can add to stress... so it’s gonna be helpful if you talk to somebody. Then, yeah. I don’t see why people wouldn’t do it</p>
Communicate the benefits of therapy	<p>“I actually start to tell them that I’ve seen a huge difference in patients that I’ve treated... Like I try to tell them all the benefits.”</p>	<p>“[Providers] don’t have a lot of time, but they’ve gotta kind of sell it, like, ‘Hey, I’m really on board with this... this is part of your care.’”</p>
Referrals need to be accessible	<p>“If I could figure out exactly, what insurance the patient has and what exactly the insurance provided... if I could give them all the help, instead of step-by-step seeing if they can or cannot get it.”</p>	<p>“It’s no good to refer somebody to a psychologist if they have no coverage or no insurance.”</p>
Repeat referral at every visit	<p>“Like when you do tobacco cessation and you try to bring it up every time until they’re ready... So, in a delicate way to bring it up again, to see whether they finally accept it.”</p>	<p>“Today I may not be willing to open up, but maybe tomorrow, I change my mind. And if that offer still stands, and I see that it still stands, then I’ll reach out.”</p>
Patients want referrals, but providers do not know where to refer	<p>“I personally don’t even know exactly where to refer them, because I don’t know who actually is able to offer this type of expertise, and actually most of the time, when the patients are referred in-network here there is actually no availability... it is quite frustrating.”</p>	<p>“I would rather the physician refer me... it might get me stressed that I might have to look for somebody to deal with this... I mean I can call but at least give us a name or a list or something.”</p>
Referrals need to be accessible	<p>“If I could figure out exactly, what insurance the patient has and what exactly the insurance provided... if I could give them all the help, instead of step-by-step seeing if they can or cannot get it.”</p>	<p>“It’s no good to refer somebody to a psychologist if they have no coverage or no insurance.”</p>

Table 4 (continued)

Themes	Representative quotes from providers	Representative quotes from patients
Patients need education with referral, but providers lack knowledge	“We don’t have much interaction with [mental health professionals] and so we don’t know exactly what they do... Mental health is an important part that is not always recognized by providers. I think more awareness for us, some sort of mini training would be helpful.”	“What is a psychologist going to do, what are they going to say?... just being referred may not be enough information to encourage them to go, because they don’t know what they’re going to get out of it.”

the conversation about referrals in a way that builds rapport and motivates patients to seek services (see Table 4).

Patient-Specific Themes

Patients felt that providers’ broaching the topic of mental health and communicating their willingness to offer support was helpful in and of itself. They emphasized their need for support from providers to seek professional mental health services. Patients described how they trust and value their provider’s advice and recommendations: “We listen to a doctor more than anybody else.” However, patients need support to follow provider recommendations (Table 4). Patients often do not know where or how to seek mental health services or what to expect from a mental health provider, so leaving the visit with an accessible referral in hand is critical. Further, patients want to understand the rationale for mental health treatment as well as what treatment typically entails.

Provider-Specific Themes

More than half of the providers identified not knowing where to refer patients as a major problem that contributes to self-imposed pressure on providers to take on the therapist role themselves. Providers also felt unsure of (1) what type of mental health professional would be most appropriate; (2) which professionals have experience working with patients who have diabetes; and (3) what services are covered by insurance. They also expressed some concerns that patients may take offense or react negatively to the referral. Given these concerns, providers wanted more training and education about mental health service offerings to better facilitate patients’ access to care.

Patients Need Multi-faceted Support to Deal with the Emotional Toll of Diabetes

Shared Themes

Both patients and providers believed that patients need more support to deal with the emotional aspects of diabetes. They highlighted how support should come from a variety of sources, including family and friends, peers, medical providers, diabetes educators, and mental health professionals (Fig. 4). Both groups strongly emphasized the benefits of diabetes education and interaction with peers with diabetes, and they expressed an interest in having the center offer support groups, especially after the initial diagnosis. Patients and providers also both expressed that patients would ideally have access to support from both their medical provider and a mental health professional. They also emphasized the difficulty that patients have in accessing professional mental health services. As depicted in Fig. 4, the two groups

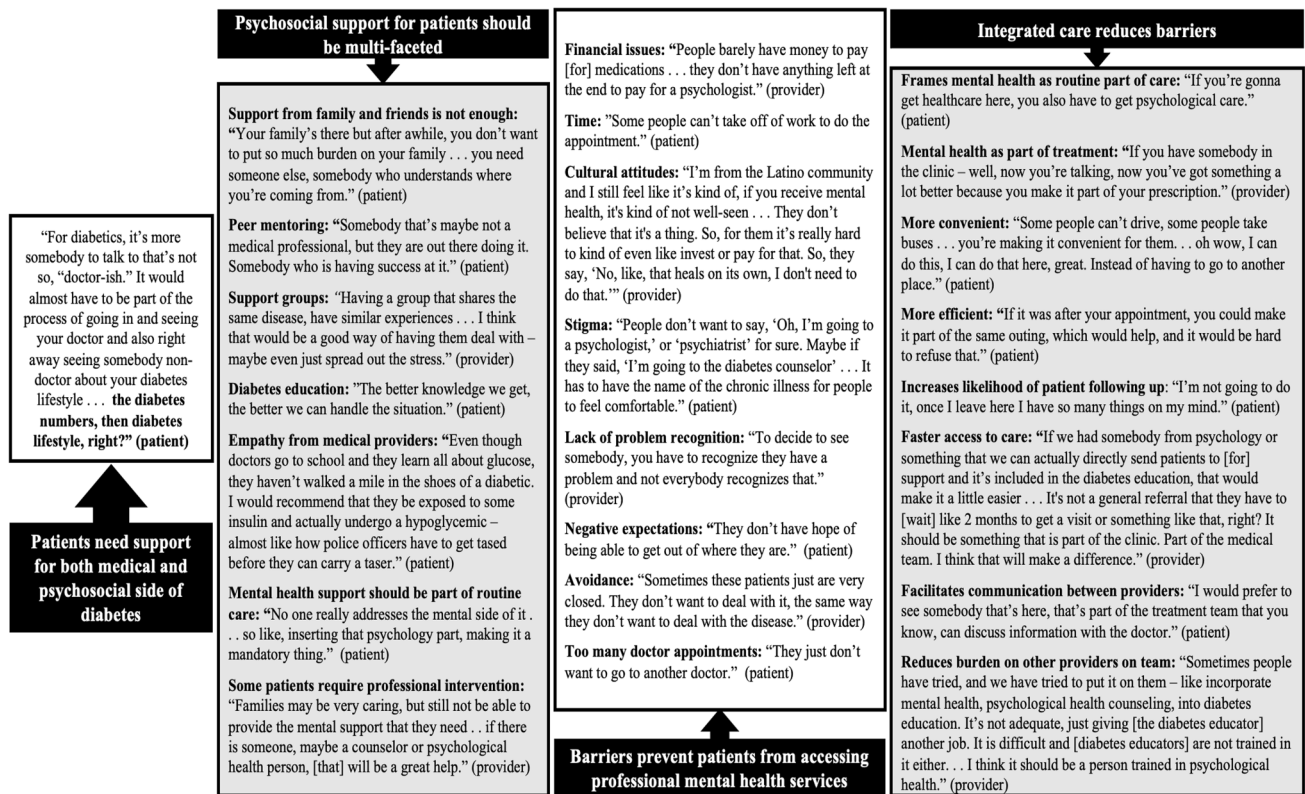


Fig. 4 Psychosocial support for patients, barriers to accessing professional mental health services, and benefits of integrated care

articulated the same set of barriers to seeking professional mental health support.

Patient-Specific Themes

While some patients wanted to have peers to talk to about living with diabetes, others simply wanted to *interact* with peers and suggested the center host activities like exercise groups. For example, one patient recommended that the diabetes clinic create an on-site fitness center for patients to use, which could serve as a place for peer support to occur naturally.

Diabetes Treatment Team Should Include a Mental Health Professional

Shared Themes

Most patients and providers thought the best option for meeting patients' psychosocial needs would be to include mental health professionals as central members of the diabetes treatment team. They suggested that doing so frames mental health as part of diabetes care and increases the flexibility, convenience, and accessibility of mental health services.

Patient-Specific Themes

Although most patients felt that psychosocial support should be available at the diabetes clinic, two patients preferred off-site care due to privacy concerns and the medical office not feeling like a "cozy" enough place to attend therapy.

Provider-Specific Themes

Providers expressed some concerns about how to sustainably fund a mental health professional as a member of the treatment team, with some suggesting a model similar to how podiatry, nutrition, and diabetes education operate in the center (i.e., consultations available following medical encounters and billed separately by those professionals).

Mental Health Professionals Should Know About Diabetes

Shared Themes

Whether care is offered in or outside of the comprehensive diabetes center, providers and patients agreed that it was

important for mental health professionals to understand diabetes. However, they had different views on what “understanding diabetes” looks like.

Patient-Specific Themes

Most patients felt that mental health professionals should understand the emotional side of diabetes and that psychological care should be tailored to address their specific disease-related stressors. Patients also wanted mental health professionals to be supportive and non-judgmental: “No judgment. Because a lot of diabetics think they’re judged for being overweight or maybe uncontrolled diabetes. Or that they’re just not taking care of themselves.” One patient recommended branding mental health support as diabetes-specific, to reduce stigma: “It has to have diabetes in the name... like “diabetes counseling”... it has to have the name of the chronic illness for people to feel comfortable and go to it.”

Provider-Specific Themes

Providers wanted mental health professionals to understand the more practical side of diabetes—chronic disease model, the disease process, and the daily requirements of effective disease management: “All the better if that person knows a little bit about insulin algorithms and A1cs... it just makes them more effective.”

Discussion

Addressing mental health in diabetes care, particularly via routine psychosocial screening procedures, represents an innovation that has yet to be widely adopted in comprehensive diabetes centers in the US (Barnacle et al., 2016). This study elicited the perspectives of key stakeholders—adult patients with diabetes and their medical providers—regarding how to best identify and address psychosocial concerns within the context of diabetes care. Overall, patients and providers agreed that (1) stress and mental health are strongly related to diabetes management, (2) patients with diabetes need more psychosocial support, and (3) ready access to mental health professionals who understand diabetes is important. Patients and providers were open to routine psychosocial screening, with several important caveats.

Psychosocial Screening is Compatible with Diabetes Care

Findings suggested that screening procedures fit well with participants’ beliefs and attitudes regarding the role of mental health within diabetes care. Participants agreed that (1)

diabetes is stressful, (2) stress impedes effective diabetes management, (3) psychosocial issues are common among adults with diabetes, (4) medical providers play at least a small role in addressing psychosocial concerns, and (5) patients experiencing psychological distress require more support. Moreover, patients emphasized that they want providers to ask them about stress and coping, consistent with recent calls for greater attention to psychosocial issues in patients with diabetes (Albertorio-Diaz et al., 2017; Jones et al., 2015). One notable finding was that simply opening the door to conversations about stress and mental health during diabetes visits may help patients feel supported by their medical providers, as it acknowledges the difficulties of living with diabetes. Routine screening may thus positively impact patients’ perceptions of their providers. Future research should assess this possible impact of routine screening.

Routine Screening “Breaks The Ice”

Both providers and patients interviewed in this study generally felt uncomfortable initiating conversations about mental health. This finding aligns with research suggesting that diabetes care providers often feel unequipped to discuss mental health with patients (Joensen et al., 2019; Johansen et al., 2014) and that patients infrequently bring up such concerns in diabetes visits (Cherrington et al., 2006; Egede, 2002; Ruiz & Praetorius, 2016). Routine psychosocial screening might act as a conversation piece and facilitate discussions about mental health (Wittkamp et al., 2008). Routine screening also presents mental health as an important component of care for all patients, which may normalize the topic. Universal approaches to mental health care (i.e., mental health “check-ins”) may decrease stigma and facilitate access to care (Williams, 2020).

Routine Screening Offers More Standardized Assessment

Although providers in this study generally reported feeling capable of identifying psychological distress, a few patients and providers expressed concerns about relying on medical providers’ subjective judgments of whether a patient requires psychological intervention. This concern aligns with literature suggesting that standardized, validated screening tools are superior to medical providers’ observations of mental health concerns (Boogerd et al., 2015; Silverstein et al., 2015).

Routine Screening Could Increase Efficiency

Participants emphasized how time constraints limit discussion of psychological functioning during visits, especially

when patients have multiple comorbidities to address. Routine screening may address this problem by offering increased efficiency over verbal assessments of emotional functioning, particularly if clinics leverage technology. For example, brief screening measures can be embedded within the electronic health record (EHR), so that patients complete the measures during the check-in process and the system automatically alerts providers when patients score above a particular threshold (Bajracharya et al., 2016). Integrating measures within the EHR increases efficiency by helping providers tailor their conversations to specific problems (Zhang et al., 2019), which may explain why physicians are more likely to screen patients for depression when the measures are electronic rather than on paper (Akincigil & Matthews, 2017).

Screening Should not be Implemented without System for Connecting Patients to Care

Participants felt that screening was only useful and acceptable if it was connected to action (e.g., referring patients to mental health services, offering services on-site, directing patients toward resources). They also emphasized the importance of having a system—and ideally an integrated mental health professional—to follow up on positive screening results, which should be in place before initiating screening procedures. An outpatient diabetes clinic in the Netherlands reported that implementing screening procedures with adults resulted in a seven-fold increase in referrals to psychological care (Fleer et al., 2013). However, referrals do not directly translate to patients' accessing care or improving diabetes management. In pediatric diabetes care, less than 25% of youth obtain outpatient mental health services after receiving a referral due to a positive mental health screen (Vassilopoulos et al., 2019). This issue remains unstudied in adult diabetes care, but in the general population, only half of adults with psychiatric diagnoses access behavioral health services (Han et al., 2017) and primary care physicians report more difficulty referring patients to mental health services than to any other specialty (Cunningham, 2009).

Screening may be a key strategy to identify patients with diabetes who need professional mental health support. However, securing access to supportive options is a critical first step. Integrated care models have the potential to increase access to mental health services (Jackson-Triche et al., 2020; Wolff et al., 2021). Comprehensive diabetes centers might also consider implementing peer support programs to meet the diverse support needs of their patient population (Litchman et al., 2020); an integrated mental health professional could coordinate such a program.

Challenges to Implementing Routine Psychosocial Screening

Participants' perceptions of barriers to screening were largely consistent with past work, including that: screening will be time-consuming, providers lack adequate training to navigate positive screening results, clinics lack resources to provide in-house support for patients who endorse concerns, and patients struggle to access supportive services once referred (Johansen et al., 2014; Owens-Gary et al., 2019). Although patients reported needing significant support to seek mental health care, providers did not feel they had adequate time to help patients find a mental health provider, training to determine which provider is most appropriate for the patient's needs, or knowledge of what typically happens during therapy to be able to provide education. Collaboration and consultation with mental health professionals could allow medical providers to develop referral lists and learn more about the referral process. Likewise, the American Psychological Association and American Diabetes Association maintain a list of mental health professionals who have completed training specific to working with patients who have diabetes (American Psychological Association, 2021). Providers can use this resource to identify appropriate referral options in their area. However, conversations regarding mental health referrals need to involve more than the transfer of contact information. Namely, medical providers need to provide education to patients about how psychological well-being relates to disease management and explain the role of a mental health provider within the patient's diabetes care.

Should medical providers become their patients' therapist, as one participant asked? Most participants agreed the providers' role in navigating psychological concerns should be limited. As suggested, a better solution is to include a mental health professional on the treatment team, who could coordinate screening, review results, offer consultations with patients, provide brief interventions and patient education, direct patients toward appropriate resources for support, and build patient motivation to seek mental health services (Kichler et al., 2015). Of note, screening for depression may lead to patient disclosures of suicidality, which the providers in our study did not feel confident navigating. This finding aligns with research suggesting physicians are uncertain how to manage suicidal ideation beyond a basic risk assessment (Leavey et al., 2017; Vannoy et al., 2011). Inclusion of a mental health professional on the treatment team would ensure immediate access to someone trained to assess risk, develop a safety plan, and provide coping resources. Additional training for medical providers may also be warranted, including training on the basics of navigating suicidal ideation (e.g., providing suicide hotline number, helping patients create a coping card with distracting or relaxing activities) and using motivational interviewing

(e.g., Thepwongsa et al., 2017) to build patients' motivation to seek psychological services.

Strategies for Improving Medical Providers' Buy-In

More so than patients, providers interviewed in this study were somewhat skeptical and wanted to see data on how other clinics have implemented routine screening. A growing literature describes the implementation of screening procedures in pediatric diabetes specialty care (Hilliard et al., 2018) and may be informative for adult diabetes care. However, research also needs to assess screening outcomes more comprehensively. Key outcomes might include feasibility, acceptability, screening rates, rates of referrals to mental health services, and percentage of patients referred for services who subsequently access services. Comprehensive diabetes centers can partner with researchers to pilot-test and evaluate screening procedures to increase providers' buy-in and participation.

Screening in the Era of Telehealth

Although not a topic presented to participants in the current study, an important avenue for future research is how to implement screening programs and integrated mental health services for patients with diabetes via telehealth. Demand for telehealth services have increased dramatically as a result of the COVID-19 pandemic (Wong et al., 2021), and telehealth appears to be an effective modality (Snoswell et al., 2021). Some patients will undoubtedly continue to prefer telehealth services even after the pandemic wanes given the increased convenience and flexibility. As such, it will be important that diabetes clinics seeking to implement routine psychosocial screening consider how to conduct screening both in person and virtually. Our recent study detailed how a pediatric diabetes clinic transitioned their psychology screening and consultation program to telehealth during the pandemic (Brodar et al., 2021a, 2021b). Key recommendations included leveraging the electronic health record to collect and store screening information, as well as addressing potential ethical issues related to confidentiality and patient disclosures of suicidality.

Perhaps even more so than medical care, mental health services have rapidly transitioned to videoconferencing platforms during the pandemic (Pierce et al., 2021). As such, telehealth offers exciting avenues to improve patients' access to psychological care. For example, patients in diabetes clinics may be able to meet with a health psychologist via videoconferencing, which may be especially helpful for clinics in which physical space is a limitation to offering such services. Likewise, telehealth would allow patients to meet with a mental health provider outside of their diabetes clinic appointments, without requiring them to make an extra trip. Telehealth may also

allow mental health professionals who are integrated in diabetes clinics to provide care to a greater number of patients.

Strengths and Limitations

To our knowledge, this is the first study to examine perspectives of US-based patients with diabetes and their medical providers regarding routine psychosocial screening in diabetes care. The study followed well-established procedures for conducting qualitative research and interview guides were developed in consultation with experts in both medical and psychological aspects of diabetes care. Participants came from diverse racial and ethnic backgrounds, which is important given documented disparities in access to mental health services (Villatoro et al., 2018). Likewise, some research suggests greater stigma toward mental health amongst Hispanic/Latinx individuals (Benuto et al., 2019), who comprised most of our sample.

This study's limitations require acknowledgement. This study included a small sample of patients and medical providers from a single comprehensive diabetes center at a large academic medical center in South Florida. While recruitment continued until we obtained a variety of perspectives on screening (i.e., positive, negative, and neutral reactions) and no new themes were emerging, our data may be biased in that those who chose to participate may be more interested in or willing to talk about mental health than others at the center. As such, our results may not fully represent perspectives at the center and may not be generalized to clinics in other settings or locations. Additionally, medical providers at the center were aware that the center was interested in implementing a screening program when they participated in the interviews, which may have influenced their responses. Despite these limitations, findings aligned with past research in this area (e.g., Joensen et al., 2019) and offer important considerations for the field as more clinics move to integrate routine psychosocial screening programs within comprehensive diabetes care. Another limitation is the lack of participation by administrators and clinic managers; future research should include these individuals in addition to medical providers, as they may be involved in the administration of screening measures. Critically, many of the themes that came out of our interviews related to aspects of time, money, and space that would need other stakeholders' involvement for implementation.

Conclusions

Patients with diabetes and their medical providers interviewed in this study believed mental health is an important aspect of comprehensive diabetes care, though numerous barriers prevent routine discussion of stress and mental

health concerns during visits. Patients and providers were open to routine psychosocial screening to start conversations about mental health, as long as screening does not place additional burdens on patients or providers and leads to observable positive impacts on clinical care and patient well-being. Integrating a mental health professional on the treatment team may be critical for effective, sustainable, and ethical implementation of psychosocial screening programs. Research suggests that incorporating qualified mental health professionals and addressing psychological distress within diabetes care is cost-effective (Heilbrun & Drossos, 2020; Siegel et al., 2020). Given the well-documented negative effects of emotional distress on diabetes management (Lloyd et al., 2013), developing effective models to deliver psychological intervention within the context of comprehensive diabetes care is crucial. Such models are available in pediatric diabetes (Kichler et al., 2015) as well as adult primary care settings (Kroenke & Unutzer, 2017; Wolff et al., 2021) and can inform implementation in adult diabetes care. Future research should assess the feasibility, cost-effectiveness, and impact of psychosocial screening and integrated mental health professionals on patients' emotional, behavioral, and medical outcomes, as well as on patients' perceptions of the quality of their medical care and relationships with providers.

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Author Contributions KB, RL, DM, and MJ conducted and coded the interviews and completed the data analysis. RG helped with participant recruitment. KB, AL, PS, RG, and ML developed the interview guide and were responsible for project conceptualization. All authors reviewed and discussed the results. KB drafted the manuscript, and all authors provided feedback.

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Data Availability Interview guides are available as supplementary material.

Code Availability Not applicable.

Declarations

Conflict of interest Kaitlyn E. Brodar, Annette M. La Greca, Rafael O. Leite, Daniella Marchetti, Manuela Jaramillo, Maria Luzuriaga, Rajesh Garg, Patrice Saab declare that they have no conflict of interest.

Ethical Approval The University of Miami IRB approved this study.

Consent to Participate All participants consented to participate.

Consent for Publication All participants consented to publication.

Human and Animal Rights All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The present study was approved by the Institutional Review Board at the University of Miami.

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