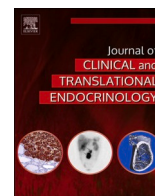




Contents lists available at ScienceDirect

## Journal of Clinical &amp; Translational Endocrinology

journal homepage: [www.elsevier.com/locate/jcte](http://www.elsevier.com/locate/jcte)

## Factors affecting cognitive dysfunction screening for Latinx adults with type 2 diabetes

Heather Cuevas<sup>a,\*</sup>, Luryn John-Miller<sup>b</sup>, Julie Zuñiga<sup>a</sup><sup>a</sup> The University of Texas at Austin, School of Nursing, 1710 Red River, Austin, TX 78712, United States<sup>b</sup> The University of Texas at Austin, College of Liberal Arts, 116 Inner Campus Drive, Austin, TX 78712, United States

## ARTICLE INFO

## Keywords:

Type 2 diabetes  
Cognitive function  
Screening  
Latinx  
Mixed-methods  
Clinic

## ABSTRACT

**Aim:** To examine influences on screening of Latinx adults with type 2 diabetes for cognitive problems by identifying patient-, clinician-, and clinic-level factors.

**Methods:** This was a mixed methods study consisting of semi-structured interviews with Latinx adults with type 2 diabetes ( $n = 30$ ; mean age = 68; 57% Mexican American) and surveys and interviews with health care providers ( $n = 15$ ) in Central Texas. Data were examined with thematic analysis (interviews) and descriptive statistics (surveys and inventories).

**Results:** For the interviewed patients, screening was important, but inability to work related to a possible diagnosis of dementia was a concern. Both providers and patients agreed that other health issues (e.g., hyperglycemia) took precedence over cognitive screening. Providers (96.7%) were expected to screen patients but lacked clinic support and time; they relied on patients for initial prompts. Only one clinic required staff education on cognitive screening, with an emphasis on potential cultural differences in test results and adequate resources related to dementia for Latinx adults.

**Conclusions:** Clinics serving Latinx adults have a responsibility to deliver appropriate care. Leadership should consider innovative practices such as the creation, with patients, of educational materials for screening—a need highlighted by most participants.

## Introduction

The Centers for Disease Control and Prevention (CDC) have found that Latinx adults are more than twice as likely to be diagnosed with diabetes than non-Latinx whites [1]. Latinx adults with type 2 diabetes (T2DM) have a higher risk of developing cognitive dysfunction, and they experience symptoms of cognitive problems 6.8 years earlier than do non-Latinx whites [2,3]. Additionally, compared with those who have cognitive dysfunction alone, Latinx adults with cognitive dysfunction and T2DM are significantly more likely to have diabetic retinopathy, hypoglycemia, and cardiovascular disease—all of which are complications of T2DM [4,5].

Past guidelines from the American Geriatrics Society and current guidelines from the Alzheimer's Association recommend annual screening of older adults who are at risk for cognitive dysfunction, and the United States Preventative Services Task Force classifies those with T2DM as being of high risk and in need of cognitive screening [6–8]. However, fewer than one in seven of at-risk Latinx older adults are

screened for cognitive dysfunction [4]. Factors contributing to low screening rates for cognitive dysfunction include poor communication, provider time, and breaks in the referral system [9]. In qualitative interviews, we have found that people with T2DM frequently avoid asking about cognitive problems or cognitive health, owing to stigma or discrimination [10]. Access to diagnosis and treatment is hampered by language proficiency, personal beliefs, and economic status, delaying diagnosis by as many as 5 years [11]. Our prior survey work has also revealed wide variability in guideline application and use of cognitive screening tools by clinicians, who face structural barriers such as time allotted for patient consultations [12].

Whether mild cognitive impairment, dementia, or Alzheimer's Disease, cognitive dysfunction affects activities of daily living and complicates effective self-management of all acute and chronic disease diagnoses [13]. Discussing screening with patients can open up conversations on “brain health” and self-management [8]. Unfortunately, low screening rates for cognitive dysfunction in Latinx adults with T2DM are a lost opportunity to address disease prevention and health

\* Corresponding author.

E-mail address: [hcuevas@mail.nur.utexas.edu](mailto:hcuevas@mail.nur.utexas.edu) (H. Cuevas).<https://doi.org/10.1016/j.jcte.2022.100294>

Received 14 October 2021; Received in revised form 20 January 2022; Accepted 24 January 2022

Available online 1 February 2022

2214-6237/© 2022 The Author(s).

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promotion in a group with 60% increased risk for all-cause dementia [14], who, once diagnosed, have twice the rate of cognitive decline [15] as that of those without T2DM. Primary care can address this gap in cognitive screening of Latinx patients with T2DM by performing rapid assessments of cognitive function and triggering specialist referrals. Assessing cognitive dysfunction via routine, rapid screening during primary care visits is essential to early diagnosis and intervention for Latinx populations. Therefore, the aim of this project is to identify patient, clinician, and clinic factors that may promote or hinder screening for cognitive dysfunction in Latinx adults with T2DM.

## Participants

A convenience sample of patients and clinicians was recruited from two non-academic outpatient clinics and two clinics affiliated with university hospitals in Central Texas. These 4 clinics oversee the healthcare of over 2,000 patients per month; of them, about 60% have T2DM, and 35% are Latinx. Patient inclusion criteria were as follows: (1) age 45 to 70 years old; (2) diagnosis of T2DM; (3) self-identification as Latinx. Exclusion criteria were (1) limitations that precluded study activities or (2) prior diagnoses of dementia or cognitive dysfunction. Clinicians who were licensed to practice as an MD/DO, advanced practice nurse (APN), or physician assistant (PA) and who treated Latinx patients with T2DM were included in recruitment. Recruitment occurred through word of mouth, face-to-face visits with healthcare providers, face-to-face visits with practice managers, email distributions sent through practice managers, email attachments sent to individuals (e.g., flyers), and postings on professional organizations' websites.

## Materials and methods

This was a mixed-methods study with a convergent parallel design. Cabana's [16] conceptual framework for describing clinicians' use of treatment guidelines was also used to examine facilitators and barriers related to screening. Patients' perspectives were included as an addition to Cabana's framework. Ethics approval was obtained from the University's Institutional Review Board prior to the start of study activities. The Consolidated Criteria for Reported Qualitative Research (COREQ) protocol was used to maintain transparency and ensure rigor, comprehensiveness, and credibility [17].

### *Instruments and procedures*

#### *Qualitative measures*

Qualitative descriptive interviews with post-hoc analysis and evaluation of data saturation were conducted. To ensure trustworthiness, the researchers used Lincoln and Guba's [18] criteria. Trustworthiness has four components: credibility, transferability, dependability, and confirmability. For credibility, peer debriefing and persistent observation were used. For transferability, a thick description of the phenomena was obtained. A qualitative expert conducted an external audit to evaluate findings and conclusions. For confirmability, an audit trail was maintained—a journal in which researchers reflected on the data, given their own values and beliefs.

Open-ended descriptive, probing, and opinion questions [19] were used to obtain descriptions of participants' feelings, experiences, and actions. This method is consistent with Cabana and Kim's [20] assessment of health care professionals' use of guidelines, as well as the Alzheimer's Association's recommendations for talking with patients about screening [21]. Interviewers, trained in qualitative research interview techniques, kept detailed field notes that included descriptions of interview settings, body language, and preliminary themes. The interviews were audio recorded and transcribed, with transcriptions checked for accuracy against recordings. The interview guide for patients consisted of open-ended questions regarding (1) changes in cognitive abilities; (2) possible contributing factors to cognitive

changes; (3) what might lead participants to have cognitive screening or not; and (4) preferences for supportive care from health care providers.

Five main interview questions were asked of clinicians ( $n = 15$ ), based on Cabana and Kim's [20] model: (1) How familiar are you with dementia screening guidelines? (2) How do you feel about the application of dementia screening guidelines? Do you agree/disagree with their application? (3) What do you think inhibits implementation of screening guidelines? (4) What do you think facilitates implementation of screening guidelines? (5) What is your process for screening someone with T2DM for cognitive problems? Probing questions enabled the interviewers to delve deeper into topics through reflective listening and reflecting back what the interviewers believed to have been said, in order to verify statements and encourage elaboration. All data were collected by the researchers online via weblinks and Zoom. Spanish interview data were translated into English prior to analysis.

#### *Quantitative measures*

All participants received a sociodemographic survey that included gender, ethnicity, race, and age. Clinicians were also asked to provide their length of time in practice, primary specialty (e.g., family medicine), and professional role (e.g., MD/DO, APN, PA). The clinicians also completed an 11-item Clinic Climate Survey. Because no measures have been specifically designed to assess clinics' practices in relation to screening for cognitive dysfunction, this survey was adapted from the Practice Culture Assessment, which was part of the Enhancing Practice, Improving Care (EPIC) trial to assess diabetes quality measures in primary care practices [22]. Respondents answered "yes" or "no" to items such as "I am expected to screen a certain number of patients for cognitive problems" and "The clinic has provided education to staff regarding screening for cognitive problems."

#### *Data analysis*

Interview transcripts were analyzed deductively, based on theories of implementation and behavioral change that include cognitive, educational, organizational, social, and economic factors [23]. This method reflected the interviews' purpose: to understand barriers and facilitators related to screening for cognitive dysfunction. Transcripts were entered into NVivo software for analysis. Items were categorized according to level: clinician, patient, clinic. All transcripts were read independently to ensure the data's reliability. Differences in coding were discussed, with final decisions on items and categories made by the three interviewers. For the quantitative surveys, descriptive statistics and non-parametric tests (e.g., Spearman's correlations) were used to describe clinic culture. Associations between sociodemographic data and the Clinic Climate Survey were also examined.

In convergent, parallel mixed methods analysis, qualitative and quantitative data are analyzed concurrently [24]. The goal of analysis was to determine corresponding or diverging patterns in the data in order to create a more holistic assessment. Survey responses and interview transcripts that examined similar concepts were examined for similar or different patterns. The findings were then merged in order to give a fuller description of perceptions related to cognitive screening.

## Results

### *Study participants*

Interviews ranged in length from 30 to 97 min. Eight of the interviews with patients were conducted in Spanish and 22 in English, per participants' preferences. In total, 30 Latinx adults with T2DM and 15 clinicians providing care to Latinx with T2DM participated in interviews. The patients' mean age was 66.4 years; 53% were female, and the patients' average time with diabetes was 7.8 years. Their ethnicities reflected the Central Texas population, with 57% describing themselves as Mexican American, 23% as Cuban American, 13% as Puerto Rican,

and 3% each, as Guatemalan and El Salvadorian. Ten percent of the participants lacked health insurance (Table 1).

Of the 15 interviewed clinicians, 33% were MDs/DOs, 47% were APNs, and 20% were PAs; their average age was 55 years. Twenty-five percent described themselves as Latinx. Fifty-three percent worked primarily in outpatient endocrinology clinics, 20% in internal medicine, and 13% each in family medicine and geriatrics. None of the clinicians specialized in dementia care (see Table 2)

On the Clinic Climate Survey, most of the clinicians (93%) reported that they were not expected to screen a given number of patients for cognitive problems, but 73% reported that they were nonetheless expected to screen for cognitive problems. Most clinicians reported a lack of support from the clinics for screening patients (97%), and 67% felt that their clinic's referral system was inadequate when patients were identified as needing further neuropsychological testing (Table 3).

*Thematic analysis*

Several themes regarding screening for cognitive dysfunction emerged from the interviews with both patients and providers: (1) familiarity with screening; (2) being understood; (3) more urgent needs, and (4) next steps (Table 4).

*Theme 1. Familiarity with screening*

Very few patients reported having been screened for cognitive problems, and no providers reported routine screening as part of their usual care, although they were familiar with cognitive screenings.

**Table 2**  
Participants' Characteristics: Clinicians (n = 15).

Age (years), Mean (SD), [range]	55 (10.2), [27–71]
Gender, n (%)	
Female	8 (53)
Male	7 (47)
Clinician Role, n (%)	
MD/DO	5 (33)
APN	7 (47)
PA	3 (20)
Clinical Setting, n (%)	
Family medicine	2 (13)
Endocrinology	8 (53)
Internal medicine	3 (20)
Geriatrics	2 (13)
Patients seen per day, n (%)	
5 – 10	1 (6)
11 – 20	7 (46)
21 – 30	6 (40)
>30	1 (6)
Time spent with each patient, n (%)	
5 – 10 min	5 (33)
11 – 15 min	4 (26)
16 – 20 min	3 (20)
21 – 30 min	2 (13)
>30 min	1 (6)

**Table 1**  
Participants' Characteristics: Patients (n = 30).

Age, years, Mean (SD), [range]	66.4 (8), [45–78]
Gender, n (%)	
Male	14 (47)
Female	16 (53)
Occupation, n (%)	
Retired	12 (40)
Homemaker	4 (13)
Finance	4 (13)
Sales	3 (10)
Lawn maintenance	3 (10)
Teacher	2 (7)
Real estate	1 (3)
Police officer	1 (3)
Diabetes duration, years, Mean (SD), [range]	7.8 (3), [2 –17]
HbA1c, Mean (SD), [range] %	9.2 (4), [6.2–10.7]
Mmol/mol	77 (17), [44–93]
Education, n (%)	
No school	2 (7)
Primary school	5 (17)
High school	8 (27)
College	14 (47)
Post-graduate	1 (3)
Insurance coverage, n (%)	
None	3 (10)
Medicare	15 (50)
Medicaid	4 (13)
Private	8 (27)
Latinx ethnic subgroup, n (%)	
Mexican	17 (57)
Cuban	7 (23)
Puerto Rican	4 (13)
Guatemalan	1 (3)
El Salvadorian	1 (3)

**Table 3**  
Clinic Climate Online Survey (n = 15).

	Yes (%)	No (%)
I am expected to screen a certain number of patients for cognitive problems	2 (6.7)	28 (93.3)
I am expected to help the clinic meet screening benchmarks	2 (6.7)	28 (93.3)
Health care providers (physicians, nurses, advanced practice nurses, etc.) in the clinic are expected to screen patients for cognitive problems.	22 (73.3)	8 (26.7)
I am expected to use a specific cognitive test (e.g. the Mini-Cog) to screen patients for cognitive problems.	5 (16.7)	25 (83.3)
I get support from the clinic to screen patients for cognitive problems (e.g. time).	1 (3.3)	29 (96.7)
The clinic has provided education to staff regarding screening for cognitive problems.	4 (13.3)	26 (86.7)
Staff receives appreciation when patients are identified for cognitive screening.	0 (0)	30 (100)
The referral system in place at the clinic is adequate for patients who need further neuropsychological testing.	10 (33.3)	20 (66.7)
I receive recognition when I screen patients for cognitive problems.	0 (0)	30 (100)
I am reimbursed by insurance for performing cognitive screening tests.	4 (13.3)	26 (96.7)

*Patients' perspectives.* Only 2 patients had been screened for cognitive problems. They reported that it was part of annual wellness exams done by nurse practitioners at a primary care clinic. Neither knew the names of the tests they were given, but both said that it involved recall of words, identification of pictures on a page, and statements of their name and location. Neither of them expressed concerns about this experience, other than an initial surprise at “going through the test.” One 67-year-old participant stated, “It was fine. The questions were easy, but I don't know why I needed it.” None of the 30 participants were aware of any guidelines (e.g., from the Alzheimer's Association or the American Diabetes Association) regarding diabetes and testing for cognitive dysfunction.

**Table 4**  
Results of Parallel Mixed-Methods Analysis.

Analysis		Synthesis	
Qualitative Inferences (InVivo Codes)	Quantitative Inferences (Online Provider Survey)	Meta-Inferences	Practice Implication
Cognitive screening expectations	73.3% were expected to screen patients for cognitive problems.	Providers are generally expected to screen but relied on patients for the initial prompt because of the demands of other patient needs.	Implementation of guidelines would involve putting measures in place to correct these barriers.
Initiating screening (familiarity with screening)		Patients are waiting for providers to recommend screening.	The creation of a patient version (in Spanish and English) of guidelines may assist, as patients will be in a better position to monitor their care and request interventions.
Prioritized health problems	93.3% did not have screening benchmarks or were not expected to screen a certain number of patients. 96.7% did not have support/time from their clinic to support screening.	Lack of time and other priorities affect screening for both providers and patients.	Train RNs and/or medical assistants to do simple screening tests.
Lack of time to screen (more urgent needs)			
Knowledge regarding cognitive screening	83.3% were not expected to use a specific screening tool. 86.7% did not have clinic-provided education for screening. 67.2% did not see the same patients regularly enough to notice changes in their cognitive function.	Despite the desire to screen patients for cognitive function, providers were unclear about best practices and lacked clinic support for themselves or for patients.	Inform providers of the Annual Wellness Visit annual memory screening and benefits of screening.
Patient-provider relationship (being understood)		Patients perceived flaws in the patient-provider relationship.	Patients' beliefs of being aware of a dementia diagnosis are important in order to plan for the future.
Need to know	66.7% did not have an adequate referral system for in-depth neurological testing.	Patients are worried about test outcomes and possible financial implications.	
Financial concerns		Patients want to discuss prevention and "brain health."	
Referrals/More testing			
Prevention discussions (next steps)			

*Clinicians' perspectives.* Five providers used screening questions to investigate cognitive problems (e.g. "do you have problems remembering your medication?") to determine whether a screening test was needed. Ten providers said that they used the Mini-Cog to screen, 3 used the Mini-Mental State Exam (MMSE), and 2 used the Montreal Cognitive Assessment (MoCa) if they identified a need for screening. None of the clinicians said that they were uncomfortable with testing, and all said that their training was sufficient, but only 6 were aware of specific guidelines for cognitive screening. Most clinicians noted surprised reactions from patients when asked to undergo screening, especially if the patients or family members did not bring cognitive problems to the provider's attention. One provider put it this way: "I don't want to ignore any problems, but sometimes if the patient doesn't bring it up, I don't want to stress them out with another exam that will take more time to explain. Some people are really worried about Alzheimer's and they'll go looking for problems if I mention it."

#### *Theme 2. Being understood.*

Patients were reluctant to bring up cognitive concerns if they did not have an established relationship with a provider. Providers were likely to screen only if patients or family members requested screening.

*Patients' perspectives.* Overall, patients were hesitant to bring up cognitive problems to health care providers because of what they felt were flaws in the patient-provider relationship. One talked about it this way: "I'm not sure. I don't think he [the APN] listens so much to what I have to say. He'd probably just write me another prescription or send me to another doctor. If I talked about memory problems, maybe he'd just tell me it's part of getting old. I don't like him, but I don't have a choice to not see him." A few others said something similar to the following statement by one woman: "I think she's [the MD's] fine. I'm not sure she gets that maybe I want to do all the tests. Let's see if something is wrong so we can fix it. I don't know how to tell her that, even though I've tried." Others saw a different clinician at each visit, which made it difficult to discuss concerns with each new provider. Seeing the same provider made a difference; as one man stated, "I trust her [the APN]. I've been seeing her for a long time. I think if I need something, like a

test, she will tell me. She sees my whole family for the diabetes so she will take care of us."

None of the patients had discussed cognitive problems in relation to diabetes (e.g., increased risk for dementia associated with sustained hyperglycemia), even though 75% of them had experienced what they felt were cognitive changes since their diagnosis. One woman had tried to tell her health care provider that she thought something was wrong: "I kept forgetting things. Maybe it's me getting older, and I'm stressed with all this COVID stuff, but I wanted to make sure things are ok. When I asked, she brushed it off like it was no big deal. And maybe it is, and that would be great, but can we at least check." Others felt that after being given more information about screening, they would be ok with talking about it more with their healthcare provider.

*Clinicians' perspectives.* Most clinicians said that they could get much information regarding a patient's need for screening simply from the patient's history or from lab results. All clinicians were knowledgeable about screening tools and assessment procedures, but when they might initiate screening varied, as did the tools that they used. To initiate screening, some began by discussing self-management: "I try to ask about how often they check sugars and if they say they forget I ask a follow-up question—"has the forgetting always been a problem?"—and move to the MiniCog if they say no." Others simply explained the tool they were going to use first or asked patients to answer questionnaire items as part of their examination without explanation: "I go through the MMSE as part of my exam—that way it's seamless and faster."

Some providers echoed patients' sentiments, saying that it was hard to determine how to best bring up cognitive issues when they might not be the patient's primary provider. As one said, "When a patient says, 'I'm having trouble with my memory,' I die inside a little. I'm not 100% ok with the process if I don't know them and want to refer immediately without screening." Others said that they might miss concrete signs of cognitive problems because they were unfamiliar with the patient. A few discussed language barriers, which created insecurity in working with Spanish-only speaking patients: "I want to help. But will the test be accurate if I can't be understood? Which test is best to use in this case? I can't speak Spanish and I'm not sure I can rely on a translator who's not

trained in these kinds of assessments.”

### Theme 3. I need to deal with more urgent needs first.

Both patients and providers felt that other health issues took priority over cognitive concerns.

**Patients' perspectives.** Many people with diabetes have competing health problems that can overshadow concerns about cognitive issues. As one man said, “I have diabetes. It's not good. My sugars are high, and I think if I had memory problems it would be because I'm getting older. So, let's work on the diabetes first.” Others said that they had family or work obligations that took priority over medical care. For example, one woman said, “What would I do about it if I had [cognitive] problems? There's no cure, right? I need to focus on my family and what is best for them and if there's a problem later, they can take care of me.” One man said, “I'll know if something's wrong, but I need to keep working and I think if I keep working then I can keep sharp.”

**Clinicians' perspectives.** All providers indicated that it was necessary to look for causes of cognitive issues (e.g., thyroid abnormalities, hypoglycemia) when symptoms were obvious. However, the prioritization of physical problems (e.g., diabetes, hypertension) instead of cognitive problems was a significant barrier: “They're here for me to see them for diabetes. I have to deal with a HbA1c of 9% (75 mmol/mol) before I can address any type of screening. And even when I do that, I still may not have time to screen. I tend to refer back to the primary care providers for that.” Another said, “Most of my patients have 5 or 6 other medical problems. Usually dementia, or screening for dementia, is at the bottom of my list.” One said, “Screening tests take time. I have a total of maybe 15 min to help them with everything else. Most of them are going to pass an MMSE anyway, so I need to take 5 min to do the test?” Physicians mentioned lack of time most. The APNs also talked about lack of time, but several did echo the following remark: “I may have the patient come in for another visit, maybe not >1–2 weeks after. If I suspect we need to do more, or if I need to, I'll have one of the RNs do a MMSE.”

### Theme 4. Next steps

**Patients' perspectives.** Seventy-eight percent of the patients wanted to share the results of any positive screening with their families. “My family needs to know. Who else is going to help me? I would be sad news, but my abuela had dementia and she lived with us for years. That's the way it works.” Others said that they would wait until a diagnosis of dementia was either confirmed or not confirmed, and one rejected telling anyone about any screening test result. When asked about seeing specialists (e.g., a neurologist or a dementia specialist), again most (87%) endorsed sharing the results. However, almost 50% were unsure that any treatments were available or that they could do anything to help cognitive function: “I bet by the time something like Alzheimer's is diagnosed, it's too late. I'll go to the doctor, but what are they going to tell me? More medicine? Maybe.” Others were concerned about cost and wondered whether “this would all be covered by insurance.” All but one patient wanted more information on how changes in cognitive function were related to diabetes and what they could do about it. And all expressed a desire to avoid dementia, whether through controlling diabetes or participating in cognitively stimulating activities (e.g., reading, games). Two participants asked about the possibility of joining a research project to help find “a way to fix brains affected by diabetes.”

**Clinicians' perspectives.** All clinicians said that they would make an appropriate referral if a screening test was positive, but their reasons for referral varied. One physician said, “The patient is going to need something more comprehensive than what I can offer at our office. Sure, I can order the CT and the rest of the tests, but they're going to have to go to the specialist anyway. Why not send them as soon as possible?” Another said, “It's tough to know how much to tell the patient at that time. Sometimes it's easier to let the other provider or the neuropsychologist do it. But I want to be honest. It could be nothing or it could be something, and I want to let them know that.” Others used the test as a

springboard to talk about healthy living, “Even if they clear the screening test, it's another opportunity to talk about eating right, staying active, all those things. And what they can do for their brain is only going to help their diabetes anyway.” Time spent waiting to see a specialist played a role in some of the discussions: “I know it's hard to get in anywhere. Especially with the lower socioeconomic group we see in our clinic. It's probably easier for everyone involved for me to get started. I'm not prescribing [medication for Alzheimer's], but at least I can start making the calls and helping them sort out all the social care services they might need—to plan for the future.”

## Discussion

Early detection of cognitive problems is critical for slowing the progression of cognitive decline and maintaining effective self-management. Annual screening for cognitive dysfunction in older or at-risk adults is recommended by several national organizations. However, little is known regarding screening for an at-risk population such as Latinx adults with T2DM and the providers who work with them. The patients interviewed for this study had various experiences with screening, as did the clinicians.

Most of the patients discussed their lack of experience with screening for cognitive problems, and most of the providers were unaware of specific guidelines for cognitive screening of people with diabetes. There is still a gap with regard to dementia awareness and screening for cognitive problems in the Latinx community [25–27]. Latinx patients are more likely than non-Latinx whites to report memory problems and cognitive changes [28], but their screening and diagnosis are delayed—despite higher dementia incidence than in non-Latinx whites [29]. This may be due to difficulties in clinicians' recognition of dementia, differences in patients' expectations about function, or bias in tools to assess cognitive function [29]. The most common tools in the United States to assess for cognitive problems have been designed with non-Latinx white English-speaking populations in mind [30].

Although information about brief cognitive screening tools is freely available, 9 of 10 primary care providers, like those in this sample, want more guidance on nearly all aspects of the brief cognitive assessment process, including which assessment tools to use, how to use those tools, which patients to assess, and what to do when an assessment indicates possible cognitive impairment [31].

Deciding what assessment tools to use, as well as what language to use in assessment, can be complicated, and guidelines for choosing the best language for testing are limited [32]. Simply translating tests from English to Spanish does not take into account linguistic and other cultural factors that may impact the accuracy of scores [33]. Cognitive screening tests may be simpler than neuropsychological tests, but studies of neuropsychological tests have shown that scores on Spanish language tests can be negatively influenced by instrument nonequivalence, years of education, and bilingualism [34]. Bilingualism, for example, may be protective for dementia [35]. Currently, the MMSE is recommended for screening Latinx adults, because it is the only instrument that has been tested with a large Latinx sample [30]. Future work in the norming of neuropsychological tests should include data on, for example, acculturation, language proficiency, and number of years in the United States. Rivera Mindt et al. [32] recommend that if clinicians are unsure about their cultural competence for examining a particular patient, consultation with colleagues who are competent, or referral, is necessary.

The present study further shows how integral the provider–patient relationship is in determining what is prioritized regarding the screening process. According to the participants in our project, the provider–patient relationship matters. Other studies have found a disconnect between what older adults want and what providers think is important. For example, the Alzheimer's Association has reported that 80% of older adults agree that cognitive screening is important [31], yet less than half of older adults were evaluated. This, as well as the results of the present



project, suggests that patients are waiting for providers to order tests and that providers are waiting for patients to bring up cognitive difficulties [31]. The disparity between what the patient understands to be important and what patients advocate for reveals nuances in the provider–patient relationship.

Some patients may interact with their providers as if following a “guidance cooperation model,” in which the provider is solely responsible for assessing the patient’s situation and deciding what is best [36]. This overreliance on the provider to assess and recommend poses an issue regarding screening, because providers cannot address what they are not aware of. In the present study, providers seemed to follow a “mutual participation model,” in which the patient is “an expert in his or her life experiences” [10,36]. Such an understanding requires the patient to provide a clear picture of all the difficulties that the patient is experiencing, but this approach does not take into account language barriers, a patient’s lack of prior history with a provider, or the inherent trust of the patient in the provider’s ability to determine severity. Both providers and patients said that it was sometimes difficult to adequately assess the need for cognitive screening because of inconsistencies in clinic schedules and variability in how providers saw patients. The nature of the patient–provider relationship impacts how and when screening is conducted, suggesting possible ways to increase cognitive screening among Latinx populations. Primary care providers’ offices are well situated to provide such tests, as is the Medicare annual wellness visit. Many providers have long-standing relationships with patients, and in their clinics, appointments may be more available than in specialty offices.

The barrier of time for adding tests or screening measures in clinical visits is well documented [16,37]. This is especially true when patients have multiple co-morbidities and when interventions include lifestyle counseling (e.g., diet, exercise) in a busy outpatient clinic with high patient loads or short visit times. Some of the participating providers thought that clinic policies should be enacted, yet they reported no efforts to do so. One suggestion is to focus on reducing time pressure and task complexity by using clinic team members such as RNs and medical assistants to assist in screening [38]. Many screening tools seem to have been developed with research in mind and have little utility in a rushed primary care setting. If possible, measures should take less than 10 min and require little training for health care personnel to be able to administer them [39]. Computerized cognitive testing may also be useful in primary care [40].

There are multiple barriers to dementia screening. Patients are worried about possible financial consequences and health insurance coverage, as well as loss of independence. However, there are also positive outcomes. For example, screening for cognitive problems can lead to further discussion of health maintenance or adaptation of self-management recommendations. In addition, as both the clinicians and the patients in this study mentioned, earlier screening and detection of dementia offer more time to plan for future needs. In this project, positive perceptions of screening outweighed barriers, except when it came to prioritization of other health or family needs.

Other studies have shown that screening for cognitive problems is feasible in diverse populations [41,42]. Galvin et al. [41] demonstrated that participants screened for mild cognitive impairment and Alzheimer’s and related dementia were interested in sharing results with family, and close to half of the participants in that study made lifestyle changes on the basis of those results. Similarly, Cuevas and Zuñiga [10] found that participants ( $n = 30$ ; 100% Latinx) were interested in “brain health,” but only one participant had ever had a health care provider who discussed it. Among their participants, maintaining cognitive health was based on family responsibilities and perceived societal roles [10]. Providers’ uncertainty regarding how to diagnose and follow up regarding mild cognitive impairment has been recognized as another barrier [41,43].

To our knowledge, this is the first study to examine screening for cognitive dysfunction that includes both providers’ and patients’

perspectives as well as the clinic environment in order to help determine best practices for Latinx adults with T2DM. However, some limitations of this study should be considered. First, the sample was small and did not permit analysis of perspectives by provider type. Second, a quantitative survey of patients’ perspectives of dementia screening was not used (e.g., the Perceptions Regarding Investigational Screening for Memory in Primary Care). Such an instrument might add useful information, but our intent was to gather perspectives of cognitive screening specific to diabetes. And although qualitative methods to investigate concepts related to diabetes and cognitive function have been used in other studies, those studies have not focused on Latinx adults.

The results of this study can contribute to the design and implementation of training and education that addresses the health needs of Latinx adults with T2DM while addressing the needs of both health care providers and patients. Such education would include information regarding the connections between diabetes and cognitive problems, as well as aspects of care such as referrals or care pathways and community resources, which both the patients and the providers valued. Our triangulated data took into account providers’ and patients’ views, and future research should include family or caregivers, especially if the research involves examinations of dementia care.

#### *CRedit authorship contribution statement*

**Heather Cuevas:** Conceptualization, Methodology, Investigation, Writing – original draft, Supervision, Writing – review & editing. **Luryn John-Miller:** Investigation, Writing – original draft. **Julie Zuñiga:** Visualization, Writing – review & editing.

#### *Acknowledgements*

This research did not receive any specific grant funding from funding agencies in the public, commercial, or not-for-profit sectors.

Editorial support was provided by Dr. John Bellquist at the Cain Center for Nursing Research and the Transdisciplinary Precision Health Intervention Methodology Training Program (PI Kim: T32 NR01903520) at The University of Texas at Austin School of Nursing.

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