



# Application of cognitive screening guidelines by health care providers in diabetes care: A cross-sectional descriptive study

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## Abstract

**Rationale, aims, and objectives:** The risk of cognitive dysfunction is higher in people with diabetes than in the general population, and approximately 50% of those with diabetes will develop cognitive impairments as they age. Screening for cognitive dysfunction in people with diabetes can help identify both pathology and those who are at risk for higher health care utilization, but we do not know how health care providers implement cognitive screening recommendations in this population. In this study, we examined health care providers' knowledge of those recommendations and their application of them, as well as factors associated with guideline use.

**Methods:** This study used a cross-sectional, descriptive correlational design with a convenience sample. All data were collected with a 20-question online survey sent to advanced practice nurses (APNs), medical doctors/doctor of osteopathic medicines (MDs/DOs), and physician assistants (PAs) in Central Texas.

**Results:** One-hundred eighty-one health care providers responded. Participants most frequently said they were "moderately familiar" with guidelines for cognitive impairment screening (60.9%). Twenty-three per cent of physicians, 37.4% of APNs, and 8.3% of PAs indicated that they incorporated routine screening into daily practice. However, 64% did not use standardized tools to assess cognitive function. The most common clinical tasks related to cognitive screening were referral for more in-depth cognitive screening (44%) and education of families regarding cognitive problems (29%). Lack of time was the most common barrier to screening (57.7%).

**Conclusions:** Most respondents believed that there was a good rationale for assessing cognitive function in people with diabetes. However, despite some familiarity with guidelines for cognitive function screening, most respondents did not use standardized assessment tools. The results indicate variability in clinical practice regarding assessment and practices, such that there may be some variability in outcomes for patients.

## KEYWORDS

cognitive screening, diabetes, guideline implementation

## 1 | INTRODUCTION

The risk of cognitive dysfunction is higher in people with diabetes than in the general population, and approximately 50% of those with

diabetes will develop cognitive impairments as they age.<sup>1</sup> The exact mechanisms of this decline are unclear, but research has shown that hypoglycaemia and hyperglycaemia, inflammatory cytokines, and insulin resistance all play some part in cognitive decline.<sup>2</sup> Additionally,

once cognitive problems have been diagnosed, those with diabetes have a faster cognitive decline than do those without diabetes.<sup>1</sup> Nevertheless, despite these factors, little attention has been paid to screening for cognitive problems in patients with type 2 diabetes mellitus (T2DM). Given the risks for cognitive impairment associated with diabetes and the interest in determining whether treatments for diabetes can also decrease rates of dementia, a logical next step is to consider cognitive function as a target for screening and therapy in people with T2DM.

Evidence-based practice includes guidelines and programmes to implement screening for numerous health problems. Although not every patient is a “textbook” case, it remains problematic that clinical practice may not necessarily follow recommendations that are based on the most up-to-date evidence. For example, 30% to 75% of people with dementia remain undiagnosed in primary care, even though organizations such as the American Geriatrics Society (AGS) recommend that older adults be screened yearly for cognitive dysfunction.<sup>3,4</sup> Across-the-board screening of older adults for cognitive dysfunction is not recommended, but the United States Preventive Services Task Force (USPSTF) includes diabetes as a potential predictive factor for cognitive problems and advises those with T2DM be screened.<sup>4</sup> Both the American Diabetes Association (ADA) and the AGS advise that cognitive screening be a standard of care in older adults with T2DM, first at initial clinic visits and again if patients exhibit changes or increased problems in self-management (eg, missing medications, missed appointments, or new problems with skills such as glucose self-monitoring).<sup>5,6</sup>

For those under age 65, screening guidelines have not yet been established despite the risks that come with developing T2DM in mid-life or younger.<sup>7</sup> To be effective, interventions may need to be deployed earlier; when they are delayed, their usefulness is reduced. Current diagnostic criteria focus on dementia, a later-stage pathology, so that the window of opportunity for effective cognitive interventions in those with T2DM may be missed.<sup>8</sup>

Not only may such screening help identify pathology, but it can also assist the identification of those at risk for higher health care utilization. Estimates of annual costs for dementia care range from 150 to 215 billion per year, and earlier intervention can help reduce those costs.<sup>9</sup> Hanson et al examined costs specifically related to cognitive function screening.<sup>10</sup> Patient records were analysed over 18 months, and patients who failed screening using the Mini-Cog tool were found to have higher rates of hospitalization, emergency room (ER) visits, appointment no-shows, and cancelled visits.<sup>10</sup> Screening for cognitive impairment may also help trigger review of a patient's ability to adhere to treatment and self-management regimens and may also provide the opportunity to consider other needed support and to review treatment goals such as those for glucose and blood pressure.<sup>11</sup>

Despite screening's potential benefits, barriers such as time constraints, practice setting issues, and the need for familiarity with guidelines can make it difficult to balance efficient and effective patient care with guidelines' recommendations.<sup>12</sup> One way to help reconcile guidelines' recommendations and clinical practice is to determine whether health care providers implement guidelines in practice, and if so, how. The objective of this project was to examine health care providers' knowledge of cognitive function screening guidelines and

their application of those guidelines in treating patients with T2DM, as well as factors associated with such guidelines' use. The following questions guided this study:

1. How familiar are health care providers with current cognitive function screening guidelines?
2. How do health care providers assess cognitive problems in patients with diabetes?
3. What other tasks related to cognitive function (eg, staff education and patient teaching) do health care providers perform?
4. What are the barriers to screening for cognitive problems?

## 2 | METHODS

This was a nonexperimental study with a convenience sample, using a cross-sectional descriptive correlational design. The online survey programme Qualtrics (<http://www.qualtrics.com>) was used to collect all of the study's data. The study questionnaire consisted of 20 items that covered three domains: participants' demographic characteristics, familiarity with cognitive screening guidelines, and experience with cognitive screening and tasks related to cognitive function. Nineteen items were categorical or Likert-type questions. A remaining open-ended question asked participants to specify the cognitive screening tool they most frequently used. Ten clinicians (five MDs and five advanced practice nurses [APNs]) working in an endocrinology practice piloted the questionnaire for content and validity, which enabled identification of unclear or redundant items. Modifications were then made to some of the items.

Links to the survey were sent out statewide via three professional organizations for nurse practitioners, clinical nurse specialists, and endocrinologists; email distributions through group practice managers; and face-to-face visits with health care providers across Texas. It is estimated that the surveys reached approximately 4000 providers via the email links sent by the professional organizations. Participants were included if within the last 3 months they had attained a minimum of 2 years' clinical experience as an APN, MD/DO, or physician assistant (PA) and currently treated patients with diabetes. Prior to distribution of the survey, ethics approval was obtained from the Institutional Review Board of the University of Texas at Austin. Participants gave informed consent before completing the survey by clicking an online check box after reading the consent form.

Data were collected over three 2-week periods (in May 2017, July 2017-August 2017, and September 2017-October 2017). Data were analysed using SPSS version 23. Descriptive statistics (means and frequencies) were used to describe the categorical data and Likert scale responses.

## 3 | RESULTS

A total of 181 respondents completed the survey, 54.4% of whom were APNs and 36.3% physicians. Response rate was low at approximately 5%. However, because of the email distribution of the survey

link, it is unclear how many providers did not meet inclusion criteria. The response rate may have been slightly higher if only those who met the criteria were included in the calculation. Years in professional practice ranged from 3 to more than 30. Details of participants' characteristics are given in Table 1.

### 3.1 | Familiarity with guidelines

Participants most frequently said they were "moderately familiar" with the ADA and/or AGS guidelines for cognitive impairment screening (60.9%,  $n = 110$ ). Others said they were either "not at all familiar" (22.8%) or "very familiar" (12.2%). A majority had read articles about cognitive screening guidelines (52.4%). However, more than half had not attended any training, read any publications regarding application of the screening guidelines, or read publications of studies specifically examining the relationship of cognitive function to diabetes (60.9%). Those most familiar with the guidelines worked in private practices (35%), followed by those who worked in community health clinics (33%) and emergency departments (8.8%). There was little difference in guideline familiarity between those in practice for 2 to 20 years (18%), 11 to 20 years (16.5%), 21 to 30 years (19%), or more than 30 years (16%).

### 3.2 | Assessment of cognitive problems

Health care providers often become aware of cognitive problems when patients complain of specific issues such as forgetting medications or appointments.<sup>13</sup> Very few providers in this study indicated that they had heard complaints of cognitive problems daily from a patient or caregiver (2.44%) without prompting. The most frequent occurrence was several times a year (55.37%), followed by once a year (21.95%). Twenty per cent had never heard complaints of cognitive problems from either a patient or a caregiver.

Twenty-three per cent ( $n = 15$ ) of the physicians, 37.4% ( $n = 37$ ) of the APNs, and 8.3% ( $n = 1$ ) of the PAs indicated that they incorporated routine screening into their daily practice. Twenty-eight per cent

of those who screened patients had been in practice for 2 to 10 years and 15% of screeners had been in practice for 11 to 20 years. However, 64% of all participants did not use any standardized tools to assess cognitive function in patients with diabetes. Of those using standardized tools, 75% used the Mini-Cog, 20% used the Mini-Mental Status Exam (MMSE), and 5% used the Montreal Cognitive Assessment (MoCa). The remaining respondents indicated that they assessed cognitive function only if a patient or a family member brought up a concern.

Respondents were asked to indicate which questions they routinely asked patients in order to assess cognitive function. The most frequent question pertained to difficulty remembering medications (32%). The next most frequent was to ask patients whether they had difficulty remembering what was discussed at an office visit (30%). The least frequent was to ask whether a patient had difficulty in concentrating on things such as reading a book or watching TV (14%). Twenty-two per cent of respondents said that they asked questions about difficulty with cognitive function following hypoglycaemic episodes.

For some assessment questions, there were differences among providers' roles. More APNs assessed difficulty with reading pill bottle instructions ( $P = 0.022$ ), difficulty with cognition after hypoglycaemic episodes ( $P = 0.040$ ), and difficulty with organization ( $P = 0.020$ ) than did either MDs or PAs, but all other assessment practices were not significantly different.

### 3.3 | Clinical tasks related to cognitive problems

The most common clinical tasks were referral to other health care providers for more in-depth cognitive screening (44%) and education of families about cognitive problems (29%). The third most frequent clinical task was referral to outside/community resources for older adults with memory problems (25%). More APNs provided education to families/patients than did other providers, but the difference was not statistically significant. None of the physicians indicated that they utilized external community resources for patients and families, but 44% of the APNs and 25% of the PAs did. APNs also made more referrals to other health care providers than did MDs.

### 3.4 | Barriers to facilitating practices related to cognitive function

Lack of time with patients was the most common barrier to screening, educating, or planning cognitive function interventions (57.7% of the total sample: 26% MDs, 50% APNs, and 75% PAs). The next most frequently reported barriers were lack of resources for patient support and language barriers with patients—each at approximately 42%. Lack of knowledge regarding cognitive function and uncertainty about how to handle a patient with cognitive dysfunction were 37.2% and 25.6%, respectively. Five per cent of respondents said that there was no utility or benefit for cognitive screening in diabetes. Thirty-eight per cent of MDs, 27% of APNs, and 25% of PAs hesitated to add yet another screening tool.

**TABLE 1** Participant characteristics

		n (%)
Provider role	MD/DO	66 (36.3)
	APN	99 (54.4)
	PA	16 (8.8)
Practice setting	Hospital	9 (4.9)
	Free-standing ER/urgent care	16 (8.8)
	Community health clinic	61 (33.5)
	Private practice	64 (35.2)
	Specialty clinic	9 (4.9)
	Other	22 (12.1)
Patient population	Family medicine	61 (33.5)
	Adult medicine	98 (53.8)
	OB/GYN	12 (6.6)
	Other	10 (5.5)
Years in practice	2-10	66 (36.4)
	11-20	50 (27.6)
	21-30	36 (19.8)
	>30	29 (16.0)

Abbreviations: APN, advanced practice nurse; ER, emergency room; OB/GYN, obstetrician-gynaecologist; PA, physician assistant.

## 4 | DISCUSSION

Adherence to recommended screenings in diabetes care such as monofilament tests and retinal evaluations have been associated with lower risk of complications and death.<sup>14</sup> Most of the attention in studying adherence to guidelines has focused on medications, but examining adherence to cognitive screening recommendations may be important for delaying or avoiding diabetes-related complications and may promote cognitive health.<sup>15</sup> Indeed, a few potentially reversible causes of cognitive impairment are treatable if caught early. Polypharmacy, depression, and metabolic disorders such as hypercalcaemia and hypothyroidism are examples. Defects in vision and hearing can also lead to failure of cognitive tests even in the absence of cognitive dysfunction, and performance can be improved if these are corrected.<sup>16</sup>

Most respondents thought that there was a good rationale for the assessment of cognitive function in people with diabetes. However, despite their awareness of guidelines for cognitive function screening, most respondents did not use standardized assessment tools, and fewer than half routinely asked patients and/or caregivers about cognitive issues. Frequently, respondents lacked knowledge about appropriate screening measures. This inconsistency may be related to setting (ie, private practice and emergency department) as this study demonstrates, but it is problematic and may result in unsatisfactory outcomes for patients.

The USPSTF has also found that lack of knowledge is a barrier to missing or delaying a diagnosis of cognitive impairment.<sup>4</sup> Several interventions have been recommended to address these issues, such as continuing medical education for individual providers as well as reminder systems, and reimbursement for screening has also been advocated. The Alzheimer's Foundation of America has recommended that the Centers for Medicare & Medicaid Services require all health care professionals to have some training in geriatrics or dementia.<sup>17</sup> Providers should also be made aware of the Cognitive Assessment Toolkit from the Alzheimer's Association, which is free and easily accessible online.<sup>17</sup>

Instead of using formal assessment tools to screen for cognitive issues, most providers in our survey relied on patient and/or family reports of cognitive problems such as forgetting medications, appointments, or planning self-management regimens. This lack of formal screening tools does not necessarily invalidate subjective reports of cognitive difficulties. Pathologic changes may occur years prior to a diagnosis of a neurodegenerative process such as Alzheimer disease, and subjective problems have been significantly associated with cognitive impairment nearly 20 years after the first complaint.<sup>18</sup> For example, in the PREADVICE trial, 4271 men were followed up for 12 years to determine how subjective memory complaints were associated with risk for dementia. After dementia risk factors were controlled for, those who reported memory difficulties at baseline had an almost six-fold increase in incident dementia versus those who did not have memory complaints.<sup>19</sup> More work needs to be done in diverse populations and in those with chronic illnesses, but the results of that study suggest that providers should investigate perceived problems earlier.

The providers who did perform screening with an objective tool still varied in the measures that they used. This is consistent with findings from several studies indicating a large variation in types of

screening done for cognitive problems.<sup>18,20</sup> It is a frequent problem for attempts to compare results across studies, and it calls for research to determine definitive guidelines.<sup>21</sup> Health care providers may, therefore, feel unsure about how best to screen for cognitive problems in the population with T2DM. Ideally, the test should be disease specific, but we lack validated cognitive screening tests for many chronic diseases, including diabetes.<sup>22,23</sup> Many screening tools that do exist 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 minutes and require little training for health care personnel to be able to administer them.<sup>24,25</sup> Scharre et al have developed one such tool to screen for mild cognitive impairment and early dementia, the Self-Administered Gerocognitive Examination (SAGE).<sup>9</sup> Its administration does not require staff or training, and it can be completed in approximately 10 minutes. Their study of SAGE's functionality identified 28% of those screened as having cognitive impairment,<sup>9</sup> which is similar to results with other assessment tools, and SAGE may be one option to overcome barriers of time and lack of resources.

Perceived usefulness was another key finding in this study. Five per cent of the health care providers objected to cognitive screening because they believed that patients do not want to be told that they are at risk for a condition with no cure (eg, Alzheimer), and it is important to recognize that some providers do object to routine cognitive screening. However, although the USPSTF determined in 2003 and 2014 that more research was needed,<sup>4,26</sup> the USPSTF also stated that routine cognitive screening could increase detection of cognitive impairment that would otherwise go unrecognized, with the potential to reduce health care costs and promote patient independence.<sup>27</sup> It is unlikely that one single intervention would be sufficient to help health care providers adhere to guidelines, and a multipronged approach will certainly be necessary. In fact, prior studies have demonstrated that the most lasting effect comes from facilitating behaviour change on multiple levels and including ancillary staff in interventions. It is important to raise societal awareness of the need for screening and to include support staff such as medical assistants in the administration of simple screening tools.<sup>24</sup>

In our survey, the clinical task most frequently related to cognitive screening was referral to other health care providers. This is appropriate; the National Academy of Neuropsychology (NAN) differentiates between cognitive screening and comprehensive neuropsychological assessments.<sup>28</sup> Those outside of the neuropsychology setting are unlikely to be trained in in-depth assessment of cognitive function, nor can such assessments be administered during a routine clinical visit when other issues may take precedence. Reduced service utilization after neuropsychological evaluation has been well documented, and the NAN has proposed a model of referral that includes cognitive screening as a step in the process to determine whether comprehensive neuropsychological evaluation is needed.<sup>28</sup> Additionally, a better partnership between diabetes and dementia specialists may help prevent unnecessary hospitalizations.

### 4.1 | Limitations

The sample size for this project was small, and it was not possible to conduct inferential statistical analyses. A descriptive approach was

taken instead. In addition, because the survey was composed of self-reports, it might have reflected the respondents' best practices and not necessarily their actual practice. In the future, we plan on targeting specific clinics as well as hospital systems to increase provider interest in completing the survey.

Assessment of the frequency of cognitive assessment tool use could not be based on chart review, so the responses were based on practitioners' recall. Ideally, one would assess chart data to determine the severity of cognitive impairment in those who were assessed, as well as what treatments were chosen and/or whether referral was made to specialty clinics. To conduct a multisite audit of charts would be costly and difficult. Despite these limitations, however, this study did include nonphysician health care providers; previous studies have reported on guideline usage, but only from physicians' perspectives.<sup>29</sup> The research team attempted to contact the state Physician Assistant Association but were unsuccessful. This is unfortunate because APNs and PAs are utilized more today than in the past, and having greater APN/PA involvement might help streamline guideline use in clinical practice.<sup>30</sup> Perez et al, in reporting results of a similar study examining barriers to chronic obstructive pulmonary disease guideline adherence, have suggested that having all members of the health care team involved in guideline implementation would help overcome certain system-wide barriers.<sup>31</sup>

## 5 | CONCLUSIONS

This study surveyed health care providers' practice with adults with diabetes who are at greater risk for cognitive problems. There was wide variability in guideline application and use of cognitive screening tools, which were influenced by a number of factors including comfort levels in administering screening tools and structural barriers such as time allowed for patient consultations. At present, how best practices are implemented in this patient population is unclear. There has been some lack of agreement about how early to begin screening, especially in those who have conditions, such as diabetes, that put one at risk for earlier onset of dementia. Further research should investigate actual implementation of the guidelines set out by the AGS and ADA. And implementation interventions should then be evaluated on a larger scale to determine the efficacy of screenings and their impact on patient outcomes. Longitudinal studies of follow-through with referrals for in-depth cognitive testing are also needed.

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