Published in final edited form as:

Spec Care Dentist. 2013 ; 33(2): 48–55. doi:10.1111/scd.12005.

Assessment of Dentally-related Functional Competency for Older Adults with Cognitive Impairment – A Survey for Special-care Dental Professionals

Xi Chen, DDS, PhD and

Department of Dental Ecology, School of Dentistry, University of North Carolina, Chapel Hill, North Carolina

Jennifer JJ Clark, BS

Department of Biostatistics, UNC Gillings School of Global Public Health, Chapel Hill, North Carolina

Abstract

This survey was to study whether and how dental professional assess dental-related function in older adults with cognitive impairment (OACI). An invitation was sent to 525 special-care dental professionals, followed by a reminder in 2 weeks. Thirteen percent of the targeted participants completed the survey. Among them, 88% completed a hospital dentistry, geriatric dentistry or other post-graduate training program. Nearly 70% of the respondents considered somewhat to very difficult to assess dentally-related function; 45% did not ever or did not regularly assess dental-related function for OACI. Dental-related functional assessments were often based on a subjective, unstructured approach. Only 6% of the respondents routinely used standard instruments to assess the patients' function. These results indicate that an objective functional assessment based on a standardized instrument has not been routinely incorporated into dental care for OACI, raising concerns for quality of care in this vulnerable population.

Keywords

Oral health; Older adults; Dentally-related function; Cognitive impairment

Introduction

Cognitive impairment is a serious public health issue affecting one-third (8.8 million) of older Americans age 71 and older. About 14% of Americans age 71 and older have dementia¹ and another 22% suffer cognitive impairment that does not reach the threshold for a dementia diagnosis². The prevalence of cognitive impairment is even higher in nursing home (NH) residents. In 2008, 68 percent of US NH residents had some degree of cognitive impairment, including 27% with mild cognitive impairment and 41% with severe cognitive impairment³. Cognitive impairment can cause functional dependence^{4,5}, lower quality of life⁶, and increase health cost^{7,8} and mortality^{9,10}, all of which have a wide-ranging impact on individuals, families and healthcare systems.

Cognition is one key dimension of function, which regulates oral health related activities (e.g., brushing teeth, managing dentures, following post-surgical instructions and use of

medications etc.). Cognitive domains that, when impaired, will hamper an individual's dental self-care ability and complicate dental management for cognitively impaired patients include: (a) executive function –initiating, planning, sequencing, and carrying out daily oral hygiene care, other activities of daily living (ADLs) and instrumental activities of daily living (IADLs)¹¹⁻¹⁵; (b) working memory – the ability to hold information in mind for the purpose of completing a task (e.g., consenting for dental treatment)^{14,15}, comprehending and carrying out homecare instructions¹⁶, and learning denture use; (c) attention/concentration – the ability to stay on track long enough to complete oral hygiene care; (d) language – the ability to comprehend written or spoken post-operative instructions and the ability to communicate dental pain, discomfort or other dental needs; and (e) praxis – the ability to perform controlled, purposeful movement¹⁷ (e.g., follow instructions to open/close mouth, move tongue during denture impression taking, or coordinate muscles and jaws for central relation bite registration). One cognitive domain may relate to multiple dentally-related activities. For instance, executive function underlies how elderly people make treatment decisions, take medications, comply with homecare instructions and plan, sequence and carry out oral hygiene care^{18,19}. On the other hand, like other activities of daily living, multiple cognitive domains may only involve one dentally-related function. For instance, while an intact language function and praxis are required for elderly patients to comprehend instructions and carry out purposeful movements during the prosthodontic procedures (e.g., tongue movement during impression taking, coordinating muscles and jaws for central relation bite registration etc.), a good learning ability is also necessary for patients to develop skills to articulate tongue and masticatory and facial muscles to adapt to a new prosthesis and overcome the unusual and less comfortable sensations resulting from the new prosthetic appliance. Cognitive dysfunction may, therefore, remarkably complicate prosthodontic treatment for cognitively-impaired patients and increase the risk for an unpredictable outcome or treatment failure. For these reasons, dentally-relevant cognitive function should be integrated into the dental assessment and treatment planning. It can help dental professionals better identify candidates suitable for the proposed treatment, design safe and effective intervention strategies, minimize unnecessary treatment and improve quality of care for cognitively-impaired patients.

Under-recognition of cognitive impairment is a common issue in primary care settings. Research shows that only 20% of patients with suspected cognitive impairment were evaluated with cognitive test instruments in primary care prior to referral²⁰. One study shows that physicians were unaware of cognitive impairment in more than 40% of their cognitively impaired patients²¹. More than 50% of persons with dementia, including many with mild to moderate dementia, have never received a diagnosis of dementia from a physician^{22,23}. Persons with dementia who were older and lived alone were less likely to be diagnosed by their primary care physicians²⁴. Currently, whether and how dental professionals assess functional capacity in older adults with cognitive impairment remains unknown. However, given the lack of neuropsychological training in dental professionals, it is reasonable to suspect that under-recognition of cognitive dysfunction may also be a concern in dental settings.

To test this hypothesis, we conducted this survey. The objectives of this survey were to understand 1) whether special-care dental professionals assess the functional capacity of cognitively impaired patients to follow dental instructions; 2) if so, how dentally-related functional assessment is conducted; and 3) potential problems and issues in assessment of dentally-related functions in dental settings.

Material and Methods

Survey design and participant recruitment

A 17-item online survey was developed for this study. Prior to launching, the questionnaire was submitted to the University of North Carolina (UNC) IRB and the Special Care Dentistry Association (SCDA) for approval.

The targeted population of this study included geriatric dentists, hospital dentists and other dental professionals providing care for special-needs patients. Due to limited resources and support for this preliminary study, a convenient sample was used for this survey, which consisted of the 519 subscribers on the listserv of the Special Care Dentistry Association. This listserv included the current and past members of the SCDA. Compared to the traditional survey approach such as mailing the questionnaires to all the SCDA members, use of the SCDA listserv roster is more efficient and less costly, which enabled us to access as many targeted special-care dental professionals as possible given the limited resources available. In addition, all the Special-care dental professionals (2 geriatric dentists, 3 hospital dentists and 1 hygienist) in UNC were also invited to participate the survey. A recruitment email was sent to the targeted surveyees to invite them to participate in the survey. A follow-up email was sent to the sampled dental professionals 2 weeks after the initial email.

Measures

The measures of this survey included: 1) personal information (i.e., gender, profession, practice type and post-graduate training); 2) experience with older adults with cognitive impairment (i.e., years of experience with cognitively impaired patients, and number of cognitively impaired patients seen per week); 3) medications and home-care instructions provided to cognitively impaired patients (i.e., medications commonly prescribed, home-care instructions commonly given and perceived difficulty of home-care instructions for cognitively impaired patients to follow); 4) cognitive functional assessment for cognitively impaired patients (i.e., whether functional competency to follow home-care instructions is assessed, techniques used for functional assessment, perceived accuracy of functional assessment, perceived difficulty of functional assessment in cognitively impaired patients); 5) perceived needs for and acceptance to an objective instrument to assess dentally-related functions in cognitively impaired patients (i.e., perceived helpfulness of this instrument, how likely this instrument will be used in practice, factors contributing to the use of this instrument in practice, and acceptable length of time for administering a functional assessment).

Statistical analysis

Statistical analyses were completed using SAS Version 9.2 for Windows (SAS Institute, Inc. Cary, NC). Descriptive statistics were performed using frequencies, percentages, and means. Fisher's exact tests were used to analyze categorical data. A weighted analysis was used to rank the homecare instructions that were commonly given to cognitively-impaired patients and the perception of the respondents on the difficulty to follow these instructions. Multivariate logistic regression analysis did not reveal any significant relationships between subject characteristics and reported responses, and thus, those results are not reported here.

Results

Response rate

Out of the 525 targeted surveyees, 93 responded to the recruitment email. Among of them, 4 chose not to participate in the survey, 20 consented but did not take part in the survey, 4

participated the survey but were not dental professionals (i.e., physician, oral health coordinator etc.) The analyses were based on the 65 dental professionals (13% of the targeted population) who participated in the survey.

Characteristics of the respondents

The majority of the respondents were male (62%). Ninety-two percent were dentists and only 8% were dental hygienists. The respondents most commonly practiced in hospital-based clinics (43%), community-based clinics (22%) and school-based clinics (20%). Only a small proportion of the respondents provided dental care through mobile dental care programs (5%, Figure 1a). The vast majority of the respondents (88%) completed a post-graduate training program that was devoted to geriatric patients or patients with special needs, such as General Practice Residency (GPR), Advanced Education in General Dentistry programs (AEGD) or Geriatric Dentistry fellowships (Figure 1b). Many were experienced dental professional with more than 5 years experience working with cognitively impaired patients (94%). Only a small proportion (1.5%) of the respondents was new in the field with only 1-3 years experience with this type of patient (Figure 1c). Their experience with cognitively impaired patients highly varied. While one third of the respondents only saw 3 or fewer cognitively impaired patients in a week, on average, 23% of the respondents provided dental care for more than 10 cognitively impaired patients per week (Figure 1d).

Assessment of capacity to follow homecare instructions in cognitively impaired patients

The oral health homecare instruction that was most commonly provided was post-surgical instructions, followed by brushing techniques, use of medications, and instructions for caring for removable dentures (Table 1). The perceived difficulty to follow these homecare instructions also differed. The weighted analysis revealed that in the perception of the respondents, post-surgical instructions were the most difficult for cognitively-impaired patients to follow, followed by flossing techniques, use of medications and homecare instructions for removable dentures.

In response to the question on whether they assessed the patient's competency to follow these instructions, more than half of the respondents reported that they assessed dentally-related functions for all or most elderly patients with cognitive impairment (Figure 2). However, 45% of the respondents did not ever or regularly assess patients' function.

The approach that was most commonly used to assess dentally-related functions in cognitively-impaired patients was asking caregivers, followed by asking patients to repeat or demonstrate the instructions and verbal communication (Table 2). Only a small proportion (6%) of the respondents routinely used an objective cognitive/functional assessment tool (e.g., Mini-Mental State Exam (MMSE) or IADL) to assess patients' functional competencies. Whether the respondents performed a functional assessment for cognitively-impaired patients on a regular basis was not associated with their post-graduate training ($p=0.13$), years of experience in caring for these patients ($P=0.63$) or number of cognitively-impaired patients seen per week ($P=0.18$).

Perceived difficulty and accuracy of functional assessment

While nearly one quarter of the respondents did not perceive any difficulty in the functional assessment, the majority of the respondents considered it somewhat to very difficult to assess dentally-related function in cognitively impaired patients (Figure 3a). Perceived difficulty in functional assessment was significantly associated with how often the respondents performed functional assessments in their practice. While 42% of the respondents who performed functional assessments on a regular basis considered functional assessment was not very difficult, 92% of the respondents who occasionally performed

function assessment in practice felt it was somewhat to very difficult to assess dentally-related function in elderly patients with cognitive impairment ($P<0.001$, Table 3).

Based on these subjective, unstructured approaches, 19% of the respondents considered their assessments were very accurate; more than 62% considered their assessments were somewhat accurate; and only less than 10% of the respondents were concerned about the quality of their assessments (Figure 3b). Perceived accuracy of functional assessment was significantly associated with the number of cognitively-impaired patients seen per week ($P=0.01$) and whether functional assessment was performed on a regular base ($P<0.01$, Table 4). The respondents who saw 3 or fewer cognitively-impaired patients per week were less confident with the accuracy of their assessment than those who provided care for 4 or more patients per week with cognitive impairment. The respondents who performed functional assessment on a regular basis were also more comfortable with the quality of their assessment than those who occasionally assessed the patient's function.

Perceived need for an objective functional assessment tool

The vast majority of the respondents perceived a need to have an objective, reliable and easy-to-use instrument to assess dentally-related functions in cognitively impaired patients. Eighty-six percent of the respondents considered that such an instrument is very helpful or somewhat helpful to evaluate a patient's competency in following dental instructions (Figure 4a). More than 80% of the respondents stated that they would be very likely or somewhat likely to use such a functional assessment tool in their daily practice if it were available (Figure 4b). Only a small proportion (5%) of the respondents felt such an instrument would not be helpful (Figure 4a), and 11% stated they would not use this instrument in their practice (Figure 4b).

When asked which factor would contribute to their decision to use a functional assessment instrument in their practice, 43% of the respondents considered "The assessment based on this instrument can be completed in a reasonable time frame" to be a priority. Twenty-nine percent chose accuracy and 22% reported that easy-to-use was the most important factor affecting their decision. Eighty-three percent of the respondents believed that an acceptable time frame to complete a dentally-related functional assessment would be less than 5 minutes in order to be useful in a dental practice. Nine percent of the respondents considered 5-7 minutes are acceptable. An assessment that takes at least 7 minutes is highly unlikely to be accepted by dental professionals.

Discussion

The present study was a survey aimed at studying whether and how special-care dental professionals assessed dentally-related functions in cognitively-impaired patients. It revealed that more than 40% of the special-care dental professionals who participated in the survey did not ever or did not regularly evaluate patients' dentally-related functions in their practice. Among those who evaluated dentally-related function, cognitive assessment was usually subjective and unstructured. These findings indicate that an objective functional assessment based on a standardized instrument has not been routinely incorporated into dental care for cognitively-impaired elderly patients, raising concerns for quality of care for this vulnerable population.

Many factors might contribute to the lack of incorporating dentally-related functional assessment in clinical assessment and treatment planning for cognitively-impaired elderly patients. Currently, cognitive and functional assessment has not been widely included in dental school curriculums. Due to lack of training, some dental professionals may not fully understand the correlation between cognition and dentally-related activities and appreciate

the need to incorporate cognitive functional assessments into clinical assessments and treatment planning for cognitively-impaired patients. Insufficient time and inadequate reimbursement for services also contribute to the lack of integrating dentally-related functional assessment in routine dental management for cognitively-impaired patients. In addition, currently, there is no cognitive/functional assessment tool that is specifically designed to assess dentally-related function. Although multiple cognitive assessment instruments (i.e., the Montreal Cognitive Assessment (MoCA)²⁵, the Dementia Rate Scale-2 (DRS-2)²⁶, the MMSE²⁷, the IADL²⁸, the Mini-Cog test²⁹, and the trail making test A and B³⁰ etc.) are widely used in geriatric practice, they are not designed for use in a dental environment. These instruments are either too complicated to be appreciated and administered by dental professionals who lack training in cognitive assessment, or focus on assessment of global function, which may not accurately reflect the dentally-related function. Due to lack of a reliable and practical instrument, dental professionals face a great challenge in assessing dentally-related functional capacity for cognitively-impaired patients. The great majority of the special-care dental professionals who responded the survey considered that functional assessment in cognitively-impaired patients was difficult or very difficult. They tended to rely solely on clinical experiences rather than evidence-based approaches, raising concerns for suboptimal clinical outcomes, compromised quality of care and increased risk of avoidable complications.

A subjective, unstructured approach is commonly used to assess the capacity of cognitively-impaired patients to follow dental instructions. According to the survey, self-reported and/or proxy-based functional assessments are commonly used in dental settings to evaluate the impact of cognitive impairment on patients' daily functions, including their ability to follow dental instructions. These approaches are questionable and may lead to highly variable assessments. Evidence showed that cognitively impaired and demented patients tend to overestimate their functional abilities³¹⁻³³. Compared to the reports of patients themselves, caregivers' reports of functional decline of cognitively-impaired patients generally correlated better with deterioration in cognitive function³¹. Therefore, clinicians commonly rely on family caregivers to assess patients' functional performance during clinical assessment³⁴. However, studies have revealed that family caregivers are likely to misjudge the general functional abilities of patients with cognitive impairment, both over- and underestimating functional abilities, relative to their performance on objective measures of those abilities^{32,33,35,36}. One study found that in 40% of cases the reports of informants may be inaccurate when comparing with psychometric tests, particularly when the patient has low education and poor remote memory or when overall cognitive difficulties are mild³⁷. Asking patients to repeat or demonstrate the instructions was another approach commonly used in dental setting to assess patients' capacity to follow dental instructions. Depending on the instructions given, this approach tests a set of cognitive functions, including language function, working memory, executive function and praxis, that regulate oral health related activities and therefore can yield some useful information for intervention, management, and patient-specific planning. However, this approach is less likely to generate a reliable assessment to describe a dentally-related functional profile for cognitively-impaired patients since, like other unstructured cognitive assessments, it lacks a comprehensive and repetitive assessment of the cognitive function that is essential to maintain independence on oral health related activities. An objective, validated approach should therefore be used to better assess the impact of cognitive impairment on oral health related activities, guide dental treatment planning and improve clinical outcomes for this vulnerable population.

Due to limited resources, a convenient sample (the subscribers of the SCDA email listserv and UNC Special-care dentistry group) was used. Special-care dentists and dental hygienists were targeted because they were more likely to provide dental care for elderly patients with cognitive impairment on a regular basis than general dental professionals. Special-care

dental professionals also have additional training and skills to manage cognitively-impaired patients, and therefore are more likely to appreciate the need and benefit from incorporating functional assessment into clinical assessment and treatment planning. Although it made the present study feasible with the limited support, the sampling technique also had considerable limitations. First of all, it used the SCDA list-serve roster to recruit study sample. Therefore, the SCDA members who were not in the list-serve roster were automatically selected out. If these individuals represented a large group of members who significantly differed from those in the list-serve roster, a selection bias may have been introduced here. Secondly, in this study, the respondents were self-elected to participate the online survey. Therefore, they might be systemically different from those who received the invitation but did not participate in the survey. These differences could be in perceived needs and benefits of cognitive functional assessment, knowledge and skills in functional assessment, and motivation to perform functional assessment in a dental practice. Therefore, this selection bias may lead to overestimation in the percent of special-care dental professionals performing functional assessments for cognitively-impaired patients and underestimate of the issues regarding functional assessments in these patients. Moreover, among the 525 targeted surveyees, only 13% responded and completed the survey, indicating the response rate was fairly low. The low response rate and small sample size may limit our ability to accurately identify issues regarding the functional assessment of elderly patients in dental settings. Finally, the research question of the present study also applies to general dental professionals who treat a significant proportion of special needs or elderly patients. Given the different education and training background, general dental practitioners may be different from special-care dental professionals in many aspects (i.e., working experience with cognitively-impaired patients, cognitive functional assessment skills and techniques, and perceived needs of functional assessment for elderly patients with cognitive impairment etc.). Therefore, the present study based on a convenience sample of special care dental professionals cannot help us understand whether and how general dental practitioners assessed dentally-related functions in cognitively-impaired patients. Caution is needed when generalizing the results of this study to the entire special-care dental professional group and general dental professionals.

Conclusion

The results of this survey demonstrated that an objective functional assessment based on a standardized instrument has not been routinely incorporated into dental care for cognitively-impaired elderly patients. A considerable proportion of the special-care dental professionals who participated in the survey did not ever or did not regularly assess dentally-related function for elderly patients with cognitive impairment. The results of this study also highlight a need to develop an objective, easy-to-use instrument to help dental professional assess dentally-related function in the challenging cognitively-impaired patient population.

References

1. Plassman BL, Langa KM, Fisher GG, et al. Prevalence of dementia in the United States: the aging, demographics, and memory study. *Neuroepidemiology*. 2007; 29(1-2):125–32. [PubMed: 17975326]
2. Plassman BL, Langa KM, Fisher GG, et al. Prevalence of cognitive impairment without dementia in the United States. *Ann Intern Med*. 2008 Mar 18; 148(6):427–34. [PubMed: 18347351]
3. U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services. [Accessed on May 5] Nursing Home Data Compendium 2009 Edition. https://www.cms.gov/CertificationandCompliance/Downloads/nursinghomedatacompendium_508.pdf

4. Agüero-Torres H, Thomas VS, Winblad B, Fratiglioni L. The impact of somatic and cognitive disorders on the functional status of the elderly. *J Clin Epidemiol.* 2002; 55:1007–1012. [PubMed: 12464377]
5. Wang L, van Belle G, Kukull WB, Larson EB. Predictors of functional change: a longitudinal study of nondemented people aged 65 and older. *J Am Geriatr Soc.* 2002; 50:1525–1534. [PubMed: 12383150]
6. Broe GA, Jorm AF, Creasey H, et al. Impact of chronic systemic and neurological disorders on disability, depression and life satisfaction. *Int J Geriatr Psychiatry.* 1998; 13:667–673. [PubMed: 9818301]
7. Albert SM, Glied S, Andrews H, Stern Y, Mayeux R. Primary care expenditures before the onset of Alzheimer's disease. *Neurology.* 2002; 59:573–8. [PubMed: 12196651]
8. Ernst RL, Hay JW. Economic research on Alzheimer disease: a review of the literature. *Alzheimer Dis Assoc Disord.* 1997; 11(Suppl 6):135–45.
9. Scott WK, Macera CA, Cornman CB, Sharpe PA. Functional health status as a predictor of mortality in men and women over 65. *J Clin Epidemiol.* 1997; 50:291–296. [PubMed: 9120528]
10. Johnson JK, Lui LY, Yaffe K. Executive function, more than global cognition, predicts functional decline and mortality in elderly women. *J Gerontol A Biol Sci Med Sci.* 2007 Oct; 62(10):1134–41. [PubMed: 17921427]
11. Lezak, MD. *Neuropsychological Assessment.* Vol. 3. New York: Oxford University Press; 1995.
12. Boyle PA, Malloy PF, Salloway S, Cahn-Weiner DA, Cohen R, Cummings JL. Executive dysfunction and apathy predict functional impairment in Alzheimer disease. *Am J Geriatr Psychiatry.* 2003; 11:214–221. [PubMed: 12611751]
13. Boyle PA, Paul R, Moser D, Zawacki T, Gordon N, Cohen R. Cognitive and neurologic predictors of functional impairment in vascular dementia. *Am J Geriatr Psychiatry.* 2003; 11:103–106. [PubMed: 12527546]
14. Jefferson AL, Paul RH, Ozonoff A, Cohen RA. Evaluating elements of executive functioning as predictors of instrumental activities of daily living (IADLs). *Arch Clin Neuropsychol.* 2006; 21:311–320. [PubMed: 16814980]
15. Johnson JK, Lui LY, Yaffe K. Executive function, more than global cognition, predicts functional decline and mortality in elderly women. *J Gerontol A Biol Sci Med Sci.* 2007 Oct; 62(10):1134–41. [PubMed: 17921427]
16. Wilson EA, Wolf MS. Working memory and the design of health materials: a cognitive factors perspective. *Patient Educ Couns.* 2009 Mar; 74(3):318–22. [PubMed: 19121915]
17. Zadikoff C, Lang AE. Apraxia in movement disorders. *Brain.* 2005 Jul; 128(Pt 7):1480–97. [PubMed: 15930045]
18. Borson S. Cognition, aging, and disabilities: conceptual issues. *Phys Med Rehabil Clin N Am.* 2010 May; 21(2):375–82. [PubMed: 20494283]
19. Marcotte, TD.; Cobb Scott, J.; Kamat, R.; Heaton, RK. *Neuropsychology of everyday functioning.* Guilford Publications; 2010.
20. Fisher CA, Lerner AJ. Frequency and diagnostic utility of cognitive test instrument use by GPs prior to memory clinic referral. *Fam Pract.* 2007 Oct; 24(5):495–7. [PubMed: 17670806]
21. Chodosh J, Petitti DB, Elliott M, Hays RD, Crooks VC, Reuben DB, Galen Buckwalter J, Wenger N. Physician recognition of cognitive impairment: evaluating the need for improvement. *J Am Geriatr Soc.* 2004 Jul; 52(7):1051–9. [PubMed: 15209641]
22. Olafsdottir M, Skoog I, Marcusson J. Detection of dementia in primary care: the Linköping study. *Dement Geriatr Cogn Disord.* 2000; 11:223–9. [PubMed: 10867449]
23. Valcour VG, Masaki KH, Curb JD, Blanchette PL. The detection of dementia in the primary care setting. *Arch Intern Med.* 2000; 160:2964–8. [PubMed: 11041904]
24. Wilkins CH, Wilkins KL, Meisel M, Depke M, Williams J, Edwards DF. Dementia undiagnosed in poor older adults with functional impairment. *J Am Geriatr Soc.* 2007 Nov; 55(11):1771–6. [PubMed: 17916120]
25. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *J Am Geriatr Soc.* 2005 Apr; 53(4):695–9. [PubMed: 15817019]

26. Jurica, PJ.; Leitten, CL.; Mattis, S. Lutz: Psychological Assessment Resources. 2001. Dementia Rating Scale-2: Professional manual.
27. Folstein MF, Folstein SE, McHugh RP. 'Mini-Mental state' A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res.* 1975; 12:189–198. [PubMed: 1202204]
28. Lawton MP, Brody EM. Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist.* 1969; 9:179–186. [PubMed: 5349366]
29. Borson S. The mini-cog: a cognitive “vitals signs” measure for dementia screening in multi-lingual elderly. *Int J Geriatr Psychiatry.* 2000; 15(11):1021. [PubMed: 11113982]
30. Reitan RM. Validity of the Trail Making test as an indicator of organic brain damage. *Percept Mot Skills.* 1958; 8:271–276.
31. Kiyak HA, Teri L, Borson S. Physical and functional health assessment in normal aging and in Alzheimer's disease: Self reports versus family reports. *The Gerontologist.* 1994; 34:324–330. [PubMed: 8076873]
32. Wadley VG, Harrell LE, Marson DC. Self- and informant report of financial abilities in patients with Alzheimer's disease: reliable and valid? *J Am Geriatr Soc.* 2003 Nov; 51(11):1621–6. [PubMed: 14687393]
33. Wild K, Cotrell V. Identifying driving impairment in Alzheimer disease: a comparison of self and observer reports versus driving evaluation. *Alzheimer Dis Assoc Disord.* 2003 Jan-Mar; 17(1):27–34. [PubMed: 12621317]
34. Carswell, A.; Spiegel, R. Functional assessment. In: Wilcock, G.; Bucks, R.; Rockwood, K., editors. *Diagnosis and management of dementia: A manual for memory disorders teams.* Oxford, UK: Oxford University Press; 1999.
35. Zanetti O, Geroldi C, Frisoni G, et al. Contrasting results between caregiver's report and direct assessment of activities of daily living in patients affected by mild and very mild dementia. *J Am Geriatr Soc.* 1999; 47:324–330.
36. Loewenstein D, Arguelles S, Bravo M, et al. Caregivers' judgments of the functional abilities of the Alzheimer's disease patient: A comparison of proxy reports and objective measures. *J Gerontol B Psychol Sci Soc Sci.* 2001; 56B:78–84.
37. Kemp NM, Brodaty H, Pond D, Luscombe G. Diagnosing dementia in primary care: the accuracy of informant reports. *Alzheimer Dis Assoc Disord.* 2002 Jul-Sep; 16(3):171–6. [PubMed: 12218648]

Figure 1. Characteristics of the respondents

Figure 2. Do you assess patients' functional competency to follow dental instructions in your daily practice?

Figure 3. Perceived difficulty and accuracy of functional assessment

Figure 4. Perceived need for an instrument to assess dentally-related function for cognitively-impaired patients

Table 1

Oral health homecare instructions ranked by frequency of provision and perceived difficulty to follow.

Homecare instructions ranked by frequency of provision	Homecare instructions ranked by perceived difficulty to follow
1. Post-surgical Instructions	1. Post-surgical Instructions
2. Brushing techniques	2. Flossing techniques
3. Use of medications	3. Use of medications
4. Home care instructions for removable denture	4. Home care instructions for removable denture
5. Use of removable denture	5. Brushing techniques
6. Dietary advices	6. Dietary advices
7. Flossing techniques	7. Home care instructions for fixed partial denture
8. Home care instructions for fixed partial denture	8. Use of removable denture
9. Other	9. Other

Table 2
How do you assess functional competency of cognitively impaired elderly patients in following dental instructions?

Approach	Number (percent) of respondents*
ask caregiver	53 (76.8)
ask patient to repeat or demonstrate	51 (73.9)
through verbal communication	46 (66.7)
use standard instrument occasionally	12 (17.4)
use standard instrument routinely	4 (5.8)

* All the applicable approaches could be selected during the survey.

Table 3
Association between perceived difficulty in functional assessment and Functional assessment pattern

		Perceived Difficulty in Functional Assessment				P value
		Very difficult	Somewhat difficult	Not very difficult	Not difficult at all	
Functional assessment pattern	Regularly	1 (3.0%)	18 (54.6%)	14 (42.4%)	0 (0%)	<0.001*
	Occasionally	2 (7.7%)	22 (84.6%)	2 (7.7%)	0 (0%)	
	Do not do	1 (33.3%)	1 (33.3%)	0 (0%)	1 (33.3%)	

* Fisher's exact test
** N was not equal to 65 due to missing data

Table 4
Perceived accuracy of functional assessment, functional assessment pattern and number of cognitively-impaired patients seen per week

		Perceived Accuracy of Functional Assessment				P value
		Very accurate	Somewhat accurate	Not very accurate	Not accurate at all	Don't know
Functional assessment pattern	Regularly	11 (33.3%)	19 (57.6%)	2 (6.1%)	0 (0%)	1 (3.0%)
	Occasionally	1 (3.9%)	21 (80.8%)	3 (11.54%)	0 (0%)	1 (3.85%)
	Do not do	0 (0%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)
Number of cognitively impaired patients seen per week	3 or less	4 (22.2%)	9 (50.0%)	5 (27.8%)	0 (0%)	0 (0%)
	4 or more	8 (20.0%)	30 (75.0%)	1 (2.5%)	0 (0%)	1 (2.5%)
	Don't see this type of patients	0 (0%)	1 (50.0%)	0 (0%)	0 (0%)	1 (50.0%)

* Fisher's exact test

** N may not equal to 65 due to missing data