Published in final edited form as:

J Appl Gerontol. 2021 October ; 40(10): 1389–1398. doi:10.1177/0733464820967594.

Alzheimer's Disease Screening Tools for Asian Americans: A Scoping Review

Sahnah Lim, PhD, MPH, MIA¹, Stella Chong¹, Deborah Min, MPH¹, Sadia Mohaimin, BA¹, Timothy Roberts, MLS, MPH², Chau Trinh-Shevrin, DrPH¹, Simona C. Kwon, DrPH, MPH¹

¹Department of Population Health, New York University Grossman School of Medicine

²Health Science Library, New York University Grossman School of Medicine

Abstract

With growing numbers of aging Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPIs), the availability of culturally and linguistically appropriate screening tools for Alzheimer's disease and its related dementias (ADRD) are needed. The aim of this scoping review is to summarize the tools that have been adapted for and validated among the AANHPI population. Following the PRISMA Protocol for Systematic Reviews, six databases were searched for peer-reviewed articles describing ADRD among AANHPIs. Among 1,477 articles screened for inclusion, 15 articles were included in the final analysis. Results showed a paucity of studies that psychometrically validate tools among this population. Further, studies that culturally adapted and/or translated existing tools mostly targeted East Asian American populations. Our review provides a first step in mapping the extant literature on ADRD screening tools for this under-researched population and will serve as a guide for future research, policy and intervention.

Keywords

Asian Americans; Alzheimer's Disease; Dementia; Screening tools

Alzheimer's disease and its related dementias (ADRD) are characterized by a decline in memory, language, problem-solving, and other cognitive skills that impair a person's ability to perform daily activities. Alzheimer's disease (AD), the most common form of dementia, is the sixth leading cause of death in the United States and the fifth leading cause of death for U.S. adults aged 65 years and older (Heron, 2018). According to recent estimates by Brookmeyer and colleagues, the number of individuals in the United States with clinical AD or mild cognitive impairment (MCI) is expected to more than double between 2017 and 2060, from 6.1 million to 15.0 million (Brookmeyer, Abdalla, Kawas, & Corrada, 2018). Among U.S. adults aged 65 years and older, the number of ADRD diagnoses are projected to rise from 5.0 million in 2014 to 13.9 million in 2060, or 1.6% to 3.3% of the population,

Correspondence concerning this article should be addressed to Sahnah Lim, New York University Grossman School of Medicine, Department of Population Health, 180 Madison Ave 8-12 New York, NY 10012. Sahnah.lim@nyulangone.org.

Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

respectively (Matthews et al., 2019). With an increasing aging population, the United States will experience a heightened burden of ADRD, whose primary risk factor is older age.

Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPIs) are the fastest growing racial and ethnic minority group in the United States. Additionally, the older adult AANHPI population is projected to surge 145% between 2010 and 2030 (U.S. Census Bureau, 2010). Despite this, prevalence data is limited and factors influencing ADRD among AANHPIs are not well understood (Mehta & Yeo, 2017). Results from a population-based cohort study indicate that Asian Americans (AAs) have the lowest incidence of dementia compared to all other racial/ethnic groups (Mayeda, Glymour, Quesenberry, & Whitmer, 2016). However, reliable data on prevalence or incidence of dementia among Asian Americans (AA) are not available for most AA subgroups (Mehta & Yeo, 2017) with the exception of Japanese Americans, who indicate a dementia prevalence between 6.3% (Graves et al., 1996) and 7.6% (White et al., 1996) among those aged 65 years and older; Korean Americans aged 60 years and older exhibit a 7.0% prevalence rate for probable dementia (H. B. Lee, Han, Huh, Kim, & Kim, 2014). The only known prevalence or incidence study among Pacific Islanders (Mehta & Yeo, 2017) examines the Chamorros, the indigenous population of Guam, whose dementia prevalence among adults aged 65 years and older is 12.2% (Galasko et al., 2007). These limited data suggest subgroup-level variations of ADRD among the vastly heterogeneous AANHPI population exist, for which further research is warranted to identify and address such differences.

Many older adults with dementia have delays in diagnosis, resulting in reduced treatment options and poorer outcomes (Bradford, Kunik, Schulz, Williams, & Singh, 2009). Early detection of ADRD is critical for timely and appropriate care, symptom management, and reduction of disease progression. Several screening instruments are available for detecting dementia of which the Mini-Mental State Exam (MMSE) is the most widely used test by frontline physicians (Folstein, Folstein, & McHugh, 1975). Another commonly used screening tool is the Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005), a brief cognitive screening test designed as a tool to distinguish individuals with MCI who perform in the normal range of the MMSE from the cognitively normal older adults. Despite the widespread use of the MMSE, there are additional screening tools that have comparable or better diagnostic performance (Tsoi, Chan, Hirai, Wong, & Kwok, 2015). A systematic review and meta-analysis (Tsoi et al., 2015) assessing the accuracy of commonly used screening assessments for ADRD showed the Mini-Cog test (Borson, Scanlan, Brush, Vitaliano, & Dokmak, 2000) and the Addenbrooke's Cognitive Examination-Revised (ACE-R) (Mioshi, Dawson, Mitchell, Arnold, & Hodges, 2006) to have better diagnostic performance for dementia relative to other screening tests, and the MoCA to have better diagnostic performance for MCI.

With growing numbers of AANHPIs in the United States, the availability of culturally appropriate and linguistically sensitive screening tools to detect cognitive impairment are needed to facilitate early diagnosis and intervention of dementia among older adults in this population. While a number of brief screening tools have been translated, only a few have been culturally adapted and validated to assess ADRD in AANHPI subgroups in the United States (e.g., the MMSE (Spering et al., 2012; Valcour, Masaki, & Blanchette, 2002), MoCA

(Zheng et al., 2012), and Cognitive Abilities Screening Instrument (CASI E-1.0) (Gibbons et al., 2009)). AANHPIs are an incredibly diverse group in terms of religion, socioeconomic status, language, and country of origin, with over 20 countries represented in the United States (“2015 American Community Survey 1-year estimates (American FactFinder),”). Given the diversity of the AANHPI population, there is a need for further subgroup-specific validation of ADRD screening tools.

To our knowledge, a systematic review of ADRD screening tools implemented among AANHPI populations has not been conducted. Accordingly, the objective of this scoping review is to summarize the screening tools that have been adapted for and validated among the AANHPI population to identify gaps in and opportunities towards enhancing early detection in this growing but underserved population.

Method

Inclusion and exclusion criteria

This scoping review on ADRD screening tools was conducted as part of a larger scoping review that included all peer-reviewed and grey literature reporting on ADRD among AANHPI populations (Lim et al., 2020). A scoping review uses rigorous methods and is still systematic but differs from a systematic review in that it does not have a specific research question. Instead, scoping reviews seek to provide a broad overview of the available literature, and as a result, often include a greater range of study designs (Pham et al., 2014).

The inclusion criteria for the larger study included articles that reported on Asian American and Native Hawaiian (AANH) populations residing in the United States and Pacific Islanders residing in the United States or Pacific Islands and published after 1990. Exclusion criteria included dissertations and articles not in English.

Search strategy

Scoping reviews synthesize knowledge using a systematic approach. The literature search was conducted in December 2018 following the PRISMA Protocol for Scoping Reviews, which was developed by an expert panel in order to improve methodological and reporting quality of scoping reviews (Tricco et al., 2018). Co-author (TR), an experienced Medical Librarian, searched databases that include journals that publish on aging and included PubMed, EMBASE, PsycINFO, Cochrane Central of Clinical Trials, Ageline and Web of Science. Peer-reviewed articles describing ADRD among AANHPIs were searched; the PubMed Search Strategy is included in Table 1, which expanded on different types of dementia (e.g., dementia, Alzheimer’s, “lewy body disease”) and various terms describing AANHPI populations and subgroups (e.g., “Asian Americans,” “Vietnamese Americans”; See Table 1).

Review process

Duplicate articles were identified and removed from the database prior to and during screening. Each citation was reviewed by two trained independent reviewers and conflicts were resolved through consensus. Citations were managed using Covidence (Covidence

systematic review software). The preliminary search of the electronic databases identified 2,436 potentially relevant articles as part of the larger scoping review. After removal of duplicates, 1,477 articles remained. Screening by title and abstracted resulted in 588 articles for full-text review. Most common reasons for exclusion were: 1) Wrong study population; 2) Article did not disaggregate results specifically for AANHPI individuals; 3) Article not in English. Full-text review resulted in 244 articles for qualitative synthesis for the larger ADRD scoping review. 15 of those 244 articles were analyzed for the current manuscript specifically on ADRD screening tools; because of the specificity and richness of the content of these 15 articles focusing on measurement issues, the authors felt that it was important to highlight these articles as part of a separate scoping review. Figure 1 is a consort diagram outlining the search process including reasons for excluding studies at each stage.

Thematic synthesis was guided by an approach outlined by Arksey and Omalley (Arksey & O'Malley, 2005), which involved description of data by themes identified a-priori (i.e., types of screening tools).

Results

The final articles were organized into different categories of tools, assessments, batteries and scales and included the following: Symptom recognition tools, brief screening cognitive assessments, informant-based assessments, neuropsychological batteries, and ADRD-related scales.

ADRD Symptom Recognition Tools

With the cultural misconceptions and stigma around ADRD among AANHPI populations, it is imperative that AANHPI populations be assessed in their knowledge of ADRD in order to prevent under-detection and early diagnosis and treatment. In a quantitative study, 209 middle-aged and older Korean American immigrants from Los Angeles, California were given a self-administered, translated questionnaire based on the 17-item Alzheimer's Disease Awareness Test (ADAT) to assess their understanding of Alzheimer's (S. E. Lee, Lee, & Diwan, 2010). Study results revealed the lack of awareness around AD in the Korean American population and the need to bridge the gap in AD education (S. E. Lee et al., 2010). In another study, authors assessed the validity of the Alzheimer's Disease Symptom Recognition Scale (ADSRS) for measuring the level of AD knowledge among Korean Americans (S. E. Lee & Casado, 2015). Psychometric analysis indicated that ADSRS is a valid and reliable tool for assessing Korean Americans' ability to recognize Alzheimer's symptoms such as disorientation and confusion, cognitive and social dysfunction, neuropsychiatric changes, and loss of basic human functioning (S. E. Lee & Casado, 2015). The study highlighted the potential use of ADSRS in clinical settings by social workers with Korean American clients (S. E. Lee & Casado, 2015). No other studies were identified in this review to evaluate ADRD knowledge and symptom recognition tools among other AANHPI subgroups.

Existing Screening Tools for AANHPI Older Adults

Our review search identified 13 key articles on existing screening tools for AANHPI populations. Screening tools included brief screening cognitive assessments, informant-based assessments, neuropsychological batteries, and ADRD-related scales that have been either translated or culturally and linguistically modified for use in AANHPI populations (Dick, Teng, Kempler, Davis, & Taussig, 2002; Fillenbaum et al., 2005; Gibbons et al., 2009; Graves et al., 1996; Li et al., 2019; Makoni, Lin, & Schrauf, 2005; McCurry et al., 2001; Spering et al., 2012; Teng et al., 1994; Tokuhaara, Valcour, Masaki, & Blanchette, 2006; Valcour et al., 2002; Valcour, Masaki, Curb, & Blanchette, 2000; Zheng et al., 2012). Culturally-adapted and validated tools for AANHPI populations include MoCA, CASI, Cross-Cultural Neuropsychological Test Battery (CCNB), the Consortium to Establish a Registry for Alzheimer's disease Neuropsychological Battery (CERAD), the Informant Questionnaire Cognitive Decline (IQCODE), Chinese-specific cognitive test battery, and storytelling (Dick et al., 2002; Fillenbaum et al., 2005; Gibbons et al., 2009; Graves et al., 1996; Li et al., 2019; Makoni et al., 2005; McCurry et al., 2001; Teng et al., 1994; Tokuhaara et al., 2006; Valcour et al., 2000; Zheng et al., 2012). The MMSE has not been culturally-adapted but has been tested in original form (in English) among Asian American (AA) populations (Spering et al., 2012; Valcour et al., 2002). Refer to Table 2 for a comprehensive overview of all screening tools identified in this current review.

Brief Screening Cognitive Assessments: MMSE, MoCA, CASI

An enumeration of screening tools revealed that the brief screening cognitive assessment tests used among AA populations are MMSE, MoCA, and CASI. Of the three brief screening cognitive assessment tests, MMSE is most frequently administered screening instrument for mild cognitive impairment (MCI) and dementia (Chen, Foo, & Ury, 2002; Dick, Dick-Muehlke, & Teng, 2006). A small number of studies have been conducted to test the validity and applicability of MMSE in AA populations. A 2002 study examined the clinical utility of the repetitive phrase "No ifs, ands, or buts" for a brief cognitive assessment AA individuals, primarily Japanese Americans in Honolulu, Hawaii (Valcour et al., 2002). 68% of the participants in the study, regardless of their cognitive status, were unable to say the phrase "No ifs, and, or buts," indicating that cultural and linguistic modifications may be necessary for accurate evaluation of cognitive status among AA populations (Valcour et al., 2002). Another study concluded that the cut-off score of 24 should be raised to 27 for college-educated individuals of all races and ethnicities in order to engender more accurate clinical diagnoses (Spering et al., 2012).

Similar to MMSE, there has been limited studies exploring the validity and feasibility of MoCA in AA populations. Our search identified only one study that developed a culturally and linguistically adapted version of MoCA (MoCA-ChLA) for the Mandarin-, Cantonese-, and Taiwanese-speaking Chinese Americans in Los Angeles, California (Zheng et al., 2012). MoCA-ChLA was found to be a valid screening tool for MCI for Mandarin- and Cantonese-speakers based on item response theory analysis, which showed validity in the measures for function and memory (Zheng et al., 2012).

Originally developed for cross-cultural applicability in the United States and Japan, CASI is another screening instrument that has measures adapted from the MMSE and Hasegawa Dementia Scale Revised (HDS-R) (Teng et al., 1994). CASI assesses cognitive items such as memory, orientation, concentration, attention, and judgement (Teng et al., 1994). Culturally and linguistically adapted versions of CASI have been developed for various AA populations such as Japanese older adults in Honolulu and Seattle (Graves et al., 1996). Though CASI is often used among Japanese American and Japanese older adults, the measure equivalence of Japanese and English measure has only been evaluated and confirmed in one study (Gibbons et al., 2009).

Informant-based Cognitive Assessment(s): IQCODE

Although a few existing screening tools for AD/ADRD among AA older adults was identified in our search, only one informant-based cognitive assessment was found: IQCODE (Tokuhara et al., 2006). IQCODE is a 5-minute structured interview with a close informant to understand a patient's cognitive status (Tokuhara et al., 2006). Accuracy of IQCODE in AA populations can be hampered when the informant may be reluctant to disclose patient details due to cultural stigma (Tokuhara et al., 2006). Additionally, IQCODE can be influenced by the subjective relationship between an informant and patient, resulting in invalid assessments (Tokuhara et al., 2006). One study in Honolulu, Hawaii concluded that IQCODE provides good sensitivity and specificity among Japanese Americans (Tokuhara et al., 2006).

Neuropsychological Batteries: CCNB, CERAD Battery, Chinese-specific Cognitive Battery

Screening tools for AD/ADRD in AA populations also include neuropsychological batteries. Contrary to brief screening cognitive assessments and informant-based cognitive assessments, which have all largely been evaluated among Asians residing in Asian countries, extant neuropsychological batteries such as CCNB and CERAD Battery have been developed and tested in AA communities (Dick et al., 2002; Fillenbaum et al., 2005; McCurry et al., 2001). CCNB, which includes 11 well-established tests, was developed specifically for assessing cognitive status in racial/ethnic minority populations in the United States (Dick et al., 2002). The battery was initially tested in a study with 336 healthy older adult from five racial/ethnic groups including Chinese, Vietnamese, Hispanic, African American, and Caucasian populations (Dick et al., 2002). The 90-minute battery was translated and administered to participants in their preferred choice of language (Dick et al., 2002). Performance differed by race/ethnicity in the cognitive domains of attention, verbal fluency, and visual-spatial functions (Dick et al., 2002). Additional research is being done to develop a shorter version of CCNB. Our review did not find any additional studies on culturally and linguistically modified versions of CCNB for use in AA populations.

The CERAD battery is another neuropsychological test battery that is widely used for cognitive screening (McCurry et al., 2001). In our review, we found two specific studies that examined the performance of the CERAD Battery in older Japanese Americans (Fillenbaum et al., 2005; McCurry et al., 2001). In the 2001 study, the expanded version of CERAD was translated into Japanese and administered in either English or Japanese to older Japanese Americans in Seattle, Washington (McCurry et al., 2001). The study found that lower performance scores were associated with older age and lower levels of

education (McCurry et al., 2001). Factors such as gender and language were also found to influence performance on the CERAD battery with female participants and English-speaking participants performing higher than their counterparts (McCurry et al., 2001). Such findings suggest that researchers need to consider factors including age, education, gender, and language in tailoring the CERAD battery for Japanese Americans. A subsequent study tested the criterion validity of the CERAD battery among older Japanese Americans and found that the instrument performs well in distinguishing demented individuals from those who are non-demented (Fillenbaum et al., 2005).

A pilot study at the Mount Sinai Alzheimer's Disease Research Center assessed the diagnostic efficacy of a cognitive test battery specific to the Chinese American population (Li et al., 2019). The test battery included cognitive tests that had been translated into Mandarin for use in Beijing, and was administered to 122 older Chinese Americans (Li et al., 2019). The study demonstrated utility of the test battery in distinguishing individuals with normal cognition, MCI, and Alzheimer's (Li et al., 2019). This study suggests that Chinese versions of a common test battery are needed to assess cognitive status in older Chinese immigrants (Li et al., 2019). However, the study is limited by a relatively small sample size of participants recruited in New York City, which only included Chinese participants who spoke Mandarin or Cantonese, which may not be applicable to other Chinese American populations across the United States (Li et al., 2019).

Storytelling

Storytelling is emerging as an innovative assessment method that prioritizes the perspectives of the patients themselves (Makoni et al., 2005). One study examined the feasibility of using storytelling as a screening tool for dementia. The study asked participants at a New York City senior center to tell a story based on the Cookie Theft Picture from the Boston Diagnostic Aphasia Exam (Makoni et al., 2005). Analysis of the collected data demonstrated that narrative complexity can adequately measure cognitive function and impairment (Makoni et al., 2005). Additionally, storytelling can be a useful tool in individuals with low levels of education as storytelling does not require writing or reading elements commonly required of other screening tools (Makoni et al., 2005).

Discussion

This study sought to summarize the existing literature that examines ADRD screening tools among AANHPI populations. Results showed that there is a paucity of studies that psychometrically validate tools among this population. Further, studies that culturally adapted and/or translated existing tools heavily targeted East Asian American populations, and particularly Japanese Americans. This relative emphasis on Japanese Americans in the literature is reflective of the existence of two sister cohort studies among Japanese American men that seek to understand cognitive decline and dementia (Gelber, Launer, & White, 2012). There are very few studies conducted among other Asian subgroups, including South Asian, Southeast Asian, Pacific Islander, and Native Hawaiian populations. Future studies should continue to translate and culturally adapt tools among all AANHPI populations with an emphasis on including underrepresented AANHPI subgroups, which would first

necessitate studies to enroll an increased and sufficient number of AANHPI individuals. Engaging community partners who work closely with underserved AANHPI subgroups could be a sound strategy to enhance the validity and sustainability of efforts for early screening and detection. More specifically, it would additionally garner their input in the development and psychometric validation of tools (e.g., expert review). In addition, our study showed that qualitative methods are useful but underutilized in improving cultural appropriateness of tools, a strategy future studies should consider employing. Lastly, innovative tools such as storytelling should be further developed and validated in order to accommodate at-risk individuals with lower education and/or literacy.

While valid screening tools are essential for early screening and detection of ADRD, other barriers must also be addressed in tandem. Screening and detection are stymied by cultural misconceptions around ADRD (Benuto, Wainwright, & Leany, 2014; Dick et al., 2006; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010), such as the view that cognitive decline and dementia is a part of the normal aging process where old age is associated with natural mental and physical deterioration and memory loss (Dick et al., 2006; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010). This normalization of aging leads many older adults and caregivers to overlook apparent symptoms and markers of ADRD such as memory loss and behavioral changes, leading to prolonged delays in appropriate medical assessments and interventions (Benuto et al., 2014; Dick et al., 2006; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010). In addition, ADRD is commonly misattributed to sociocultural causes such as mental illness, spiritual imbalance of the yin and yang, stress from immigration and acculturation, and punishment for past wrongdoings rather than biomedical causes (Benuto et al., 2014; Dick et al., 2006; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010). Asian cultural stigma towards ADRD is perpetuated by such misattributions, which is exemplified by lexicon for ADRD that carries negative connotations of insanity, foolishness, stupidity, and slowness (Chen et al., 2002; Dick et al., 2006; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010). To save face – an important cultural ideal rooted in Confucianism, many patients and family caregivers tend to delay seeking diagnosis and intervention until symptoms can no longer be managed (Chen et al., 2002; S. E. Lee & Casado, 2015; S. E. Lee et al., 2010).

Assessment of ADRD is further complicated by under-recognition or misdiagnosis in clinical settings (Dick et al., 2006; Valcour et al., 2002). An ethnographic study conducted at an AD clinic in San Francisco found that Chinese American patients are more likely to be misdiagnosed with AD due to non-Asian American physicians' misinterpretations of cultural behaviors (Elliott & Di Minno, 2006). For instance, clinicians misconstrued an elderly Chinese female patient's adamant refusal of an evaluation as being abnormal and related to AD without recognizing the assertive authority of older adults that is common in Chinese culture (Elliott & Di Minno, 2006). Clinicians also quickly assumed a Chinese American patient's belief of supernatural beings as an inability to differentiate between dreams and reality without taking into account of the diversity of religious beliefs among Chinese communities (Elliott & Di Minno, 2006). A cross-sectional study conducted at a private primary care clinic in Honolulu, Hawaii revealed that a significant number of dementia patients were either not recognized during initial visits or not recorded in medical records (Valcour et al., 2002). This lack of recognition is due to several reasons, including: the normalization of cognitive decline and dementia in Asian cultures; physicians'

insufficient understanding of dementia and available treatment options' time constraints and under-reimbursements for in-depth evaluations; and heterogeneity of dementia symptoms in diverse populations (Dick et al., 2006; Valcour et al., 2002).

This study was characterized by some limitations. First, this study did not examine screening tools that have been used and validated in Asian countries, which may be an important resource for researchers in the selection of potential tools for adaptation. In addition, tools were presented as valid when psychometrically evaluated in the articles, but another round of psychometric validation may be necessary when applying them to other Asian subgroups with different cultural norms or languages. Second, this review did not assess the methodological quality of the included studies, which was beyond the scope of this review. Despite these limitations, our study conducted a systematic scoping review of all available tools and their psychometric performance with the goal to inform future research efforts around development and validation of tools for ADRD among AANHPI populations.

In conclusion, our study found that there is a lack of culturally and linguistically appropriate screening tools for ADRD among AANHPI populations and particularly among non-East Asian subgroups. Under the misassumption of universal applicability, many of the original Western screening tools have been adapted and translated for screening use in AA populations (Benuto et al., 2014; Chen et al., 2002; Dick et al., 2006). Neuropsychological measures do not account for the extensive diversity of languages, cultural mores, and beliefs in various Asian ethnicities, making it challenging to accurately assess cognitive status in AA populations (Benuto et al., 2014; Chen et al., 2002; Dick et al., 2006). The difficulty of ADRD identification is further exacerbated by the lack of a representative reference population for screening tests, specifically for the AANHPI population (Dick et al., 2006; Dick et al., 2002). Cross-culturally developed and validated screening tools are thus necessary to adequately address such challenges.

Acknowledgments

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Institutes of Health – National Institute on Minority Health and Health Disparities [grant number U54MD000538].

References

- 2015 American Community Survey 1-year estimates (American FactFinder). Retrieved from <https://www.census.gov/acs/www/data/data-tables-and-tools/american-factfinder/>
- Arksey H, & O'Malley L (2005). Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*, 8(1), 19–32.
- Benuto LT, Wainwright KA, & Leany BD (2014). Assessment of dementia: Screening for cognitive decline with Asian clients. In (pp. 291–304). New York, NY: Springer Science + Business Media; US.
- Borson S, Scanlan J, Brush M, Vitaliano P, & Dokmak A (2000). The mini-cog: a cognitive 'vital signs' measure for dementia screening in multi-lingual elderly. *International Journal of Geriatric Psychiatry*, 15(11), 1021–1027. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/11113982> [PubMed: 11113982]

- Bradford A, Kunik ME, Schulz P, Williams SP, & Singh H (2009). Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors. *Alzheimer Disease and Associated Disorders*, 23(4), 306–314. doi:10.1097/WAD.0b013e3181a6bebc [PubMed: 19568149]
- Brookmeyer R, Abdalla N, Kawas CH, & Corrada MM (2018). Forecasting the prevalence of preclinical and clinical Alzheimer's disease in the United States. *Alzheimers Dement*, 14(2), 121–129. doi:10.1016/j.jalz.2017.10.009 [PubMed: 29233480]
- Chen H, Foo SH, & Ury W (2002). Recognizing dementia. *West J Med*, 176(4), 267–270. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1071748/pdf/wjml17600267.pdf> [PubMed: 12208836]
- Covidence systematic review software. Melbourne, Australia: Veritas Health Innovation. Retrieved from www.covidence.org
- Dick MB, Dick-Muehlke C, & Teng EL (2006). Assessment of cognitive status in asians. In (pp. 55–69). New York, NY: Routledge/Taylor & Francis Group; US.
- Dick MB, Teng EL, Kempler D, Davis DS, & Taussig IM (2002). The Cross-Cultural Neuropsychological Test Battery (CCNB): Effects of age, education, ethnicity, and cognitive status on performance. In (pp. 17–41). Lisse, Netherlands: Swets & Zeitlinger Publishers; Netherlands.
- Elliott KS, & Di Minno M (2006). Unruly grandmothers, ghosts and ancestors: Chinese elders and the importance of culture in dementia evaluations. *Journal of Cross-Cultural Gerontology*, 21(3–4), 157–177. doi:10.1007/s10823-006-9030-2 [PubMed: 17225192]
- Fillenbaum GG, McCurry SM, Kuchibhatla M, Masaki KH, Borenstein AR, Foley DJ, ... White L (2005). Performance on the CERAD neuropsychology battery of two samples of Japanese-American elders: norms for persons with and without dementia. *Journal of the International Neuropsychological Society : JINS*, 11(2), 192–201. [PubMed: 15966108]
- Folstein MF, Folstein SE, & McHugh PR (1975). "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*, 12(3), 189–198. doi:10.1016/0022-3956(75)90026-6 [PubMed: 1202204]
- Galasko D, Salmon D, Gamst A, Olichney J, Thal LJ, Silbert L, ... Borenstein AR (2007). Prevalence of dementia in Chamorros on Guam: relationship to age, gender, education, and APOE. *Neurology*, 68(21), 1772–1781. doi:10.1212/01.wnl.0000262028.16738.64 [PubMed: 17515539]
- Gelber RP, Launer LJ, & White LR (2012). The Honolulu-Asia Aging Study: epidemiologic and neuropathologic research on cognitive impairment. *Current Alzheimer research*, 9(6), 664–672. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4795939/pdf/nihms-739153.pdf> [PubMed: 22471866]
- Gibbons LE, McCurry S, Rhoads K, Masaki K, White L, Borenstein AR, ... Crane PK (2009). Japanese-English language equivalence of the Cognitive Abilities Screening Instrument among Japanese-Americans. *International Psychogeriatrics*, 21(1), 129–137. doi:10.1017/S1041610208007862 [PubMed: 18947456]
- Graves AB, Larson EB, Edland SD, Bowen JD, McCormick WC, McCurry SM, ... Uomoto JM (1996). Prevalence of dementia and its subtypes in the Japanese American population of King County, Washington state. The Kame Project. *Am J Epidemiol*, 144(8), 760–771. [PubMed: 8857825]
- Heron M (2018). Deaths: Leading Causes for 2016. *National Vital Statistics Reports*, 67(6), 1–77. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30248017>
- Lee HB, Han HR, Huh BY, Kim KB, & Kim MT (2014). Mental health service utilization among Korean elders in Korean churches: preliminary findings from the Memory and Aging Study of Koreans in Maryland (MASK-MD). *Aging Ment Health*, 18(1), 102–109. doi:10.1080/13607863.2013.814099 [PubMed: 23889338]
- Lee SE, & Casado BL (2015). Assessment of Alzheimer's disease symptom recognition in Korean Americans and psychometric analysis of Alzheimer's Disease Symptom Recognition Scale (ADSRS). *Journal of Gerontological Social Work*, 58(3), 289–305. doi:10.1080/01634372.2015.1005785 [PubMed: 25602359]
- Lee SE, Lee HY, & Diwan S (2010). What do Korean American immigrants know about Alzheimer's disease (AD)? The impact of acculturation and exposure to the disease on AD knowledge.

- International Journal of Geriatric Psychiatry, 25(1), 66–73. doi:10.1002/gps.2299 [PubMed: 19551701]
- Li C, Neugroschl J, Zhu CW, Umpierre M, Martin J, Zeng X, ... Sano, M. (2019). Cognitive test battery for evaluating elderly Chinese Americans. *International Psychogeriatrics*, 31(4), 505–511. doi:10.1017/s1041610218001060 [PubMed: 30277186]
- Lim S, Mohaimin S, Min D, Roberts T, Sohn YJ, Wong J, ... Trinh-Shevrin C (2020). Alzheimer's Disease and its Related Dementias among Asian Americans, Native Hawaiians, and Pacific Islanders: A Scoping Review. *J Alzheimers Dis*. doi:10.3233/JAD-200509
- Makoni S, Lin H-B, & Schrauf R (2005). The Effects of Age and Education on Narrative Complexity in Older Chinese in the USA. In: Clevedon Buffalo : Multilingual Matters Ltd.
- Matthews KA, Xu W, Gaglioti AH, Holt JB, Croft JB, Mack D, & McGuire LC (2019). Racial and ethnic estimates of Alzheimer's disease and related dementias in the United States (2015–2060) in adults aged ≥ 65 years. *Alzheimers Dement*, 15(1), 17–24. doi:10.1016/j.jalz.2018.06.3063 [PubMed: 30243772]
- Mayeda ER, Glymour MM, Quesenberry CP, & Whitmer RA (2016). Inequalities in dementia incidence between six racial and ethnic groups over 14 years. *Alzheimers Dement*, 12(3), 216–224. doi:10.1016/j.jalz.2015.12.007 [PubMed: 26874595]
- McCurry SM, Gibbons LE, Uomoto JM, Thompson ML, Graves AB, Edland SD, ... Larson, E. B. (2001). Neuropsychological test performance in a cognitively intact sample of older Japanese American adults. *Archives of clinical neuropsychology : the official journal of the National Academy of Neuropsychologists*, 16(5), 447–459. [PubMed: 14590159]
- Mehta KM, & Yeo GW (2017). Systematic review of dementia prevalence and incidence in United States race/ethnic populations. *Alzheimer's & dementia : the journal of the Alzheimer's Association*, 13(1), 72–83. doi:10.1016/j.jalz.2016.06.2360
- Mioshi E, Dawson K, Mitchell J, Arnold R, & Hodges JR (2006). The Addenbrooke's Cognitive Examination Revised (ACE-R): a brief cognitive test battery for dementia screening. *International Journal of Geriatric Psychiatry*, 21(11), 1078–1085. doi:10.1002/gps.1610 [PubMed: 16977673]
- Nasreddine ZS, Phillips NA, Bedirian V, Charbonneau S, Whitehead V, Collin I, ... Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695–699. doi:10.1111/j.1532-5415.2005.53221.x
- Pham MT, Rajic A, Greig JD, Sargeant JM, Papadopoulos A, & McEwen SA (2014). A scoping review of scoping reviews: advancing the approach and enhancing the consistency. *Res Synth Methods*, 5(4), 371–385. doi:10.1002/jrsm.1123 [PubMed: 26052958]
- Spering CC, Hobson V, Lucas JA, Menon CV, Hall JR, & O'Bryant SE (2012). Diagnostic accuracy of the MMSE in detecting probable and possible Alzheimer's disease in ethnically diverse highly educated individuals: an analysis of the NACC database. *The journals of gerontology. Series A, Biological sciences and medical sciences*, 67(8), 890–896. doi:10.1093/gerona/gls006
- Teng EL, Hasegawa K, Homma A, Imai Y, Larson E, Graves A, ... et al. (1994). The Cognitive Abilities Screening Instrument (CASI): a practical test for cross-cultural epidemiological studies of dementia. *International Psychogeriatrics*, 6(1), 45–58; discussion 62. doi:10.1017/s1041610294001602 [PubMed: 8054493]
- Tokuhara KG, Valcour VG, Masaki KH, & Blanchette PL (2006). Utility of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) for dementia in a Japanese-American population. *Hawaii medical journal*, 65(3), 72–75. [PubMed: 16724448]
- Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, ... Straus SE (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, 169(7), 467–473. doi:10.7326/M18-0850 [PubMed: 30178033]
- Tsoi KK, Chan JY, Hirai HW, Wong SY, & Kwok TC (2015). Cognitive Tests to Detect Dementia: A Systematic Review and Meta-analysis. *JAMA Intern Med*, 175(9), 1450–1458. doi:10.1001/jamainternmed.2015.2152 [PubMed: 26052687]
- U.S. Census Bureau. (2010). 2010 Census. Retrieved October 2019

- Valcour VG, Masaki KH, & Blanchette PL (2002). The phrase: “no ifs, ands, or buts” and cognitive testing. Lessons from an Asian-American community. *Hawaii medical journal*, 61(4), 72–74. [PubMed: 12050961]
- Valcour VG, Masaki KH, Curb JD, & Blanchette PL (2000). The detection of dementia in the primary care setting. *Arch Intern Med*, 160(19), 2964–2968. [PubMed: 11041904]
- White L, Petrovitch H, Ross GW, Masaki KH, Abbott RD, Teng EL, ... Curb JD (1996). Prevalence of dementia in older Japanese-American men in Hawaii: The Honolulu-Asia Aging Study. *JAMA*, 276(12), 955–960. Retrieved from https://jamanetwork.com/journals/jama/articlepdf/408263/jama_276_12_030.pdf [PubMed: 8805729]
- Zheng L, Teng EL, Varma R, Mack WJ, Mungas D, Lu PH, & Chui HC (2012). Chinese-language montreal cognitive assessment for cantonese or mandarin speakers: age, education, and gender effects. *International journal of Alzheimer's disease*, 2012, 204623. doi:10.1155/2012/204623

Figure 1.
Consort diagram

Table 1.**PubMed Search Terms**

((("Alzheimer Disease"[Mesh] OR "dementia"[MeSH Terms:noexp]) OR "lewy body disease"[MeSH Terms]) OR (Alzheimer[TIAB] OR Alzheimers[TIAB] OR Dementia[TIAB] OR Dementias[TIAB] OR "Lewy Body Dementia"[TIAB])) AND (((("oceanic ancestry group"[MeSH Terms] OR ("Pacific Islander"[TIAB] OR "Pacific Islanders"[TIAB] OR Hawaiians[TIAB] OR "Hawaiian"[TIAB] OR Maori[TIAB] OR Maoris[TIAB])) OR ("Pacific Islands"[Mesh:noexp] OR "Melanesia"[Mesh] OR "Micronesia"[Mesh] OR "Polynesia"[Mesh])) OR (Melanesia[TIAB] OR Melanesian[TIAB] OR Melanesians[TIAB] OR Fiji[TIAB] OR Fijian[TIAB] OR Fijians[TIAB] OR "New Caledonia"[TIAB] OR "New Caledonian"[TIAB] OR "New Caledonians"[TIAB] OR "Papua New Guinea"[TIAB] OR Papuan[TIAB] OR Papuans[TIAB] OR Vanuatu[TIAB] OR Vanuatuan[TIAB] OR Vanuatians[TIAB] OR Micronesia[TIAB] OR Micronesian[TIAB] OR Micronesians[TIAB] OR Guam[TIAB] OR Palau[TIAB] OR Palauan[TIAB] OR Palauans[TIAB] OR Polynesia[TIAB] OR Polynesian[TIAB] OR Polynesians[TIAB] OR "Pitcairn Island"[TIAB] OR Samoa[TIAB] OR Samoan[TIAB] OR Samoans[TIAB] OR Tonga[TIAB] OR Tongan[TIAB] OR Tongans[TIAB])) OR ("Asian American"[TIAB] OR "Asian Americans"[TIAB] OR "Taiwanese American"[TIAB] OR "Taiwanese Americans"[TIAB] OR "Chinese American"[TIAB] OR "Chinese Americans"[TIAB] OR "Indian American"[TIAB] OR "Indian Americans"[TIAB] OR "Filipino"[TIAB] OR "Filipinos"[TIAB] OR "Vietnamese American"[TIAB] OR "Vietnamese Americans"[TIAB] OR "Japanese American"[TIAB] OR "Japanese Americans"[TIAB])) OR "Asian Americans"[Mesh])) NOT ("animals"[MeSH Terms] NOT "humans"[MeSH Terms])

Table 2.

Screening Tools Used among Asian American, Native Hawaiian, and Pacific Islander Populations

Brief Screening Tool	Study Objective	Study Population	Procedures/ Adaptations	Results	Reference
MoCA	To assess the discriminant validity of the newly developed MoCA-ChLA	Chinese Americans	<ul style="list-style-type: none"> • The original MoCA was translated into Mandarin, Cantonese, and Taiwanese-speaking Chinese Americans • MoCA-ChLA incorporated appropriate sections of the extant Chinese versions of MoCA-ChLA. • Linguistic modifications were made to replace words with their more culturally appropriate counter parts such as the replacement of “face” with “hair” and “velvet” with “teacup. • Alterations were made in the phonemic fluency task to a semantic fluency task since Chinese is a monosyllabic language. 	<ul style="list-style-type: none"> • MoCA-ChLA demonstrated good internal consistency and had a small ceiling effect. • MoCA-ChLA is a useful screening tool for dementia when appropriate adjustments for educational levels are made. 	Zheng et al., 2012
Mini Mental State Exam (MMSE)	To test the clinical utility of MMSE	Asian Americans in Hawaii		<ul style="list-style-type: none"> • MMSE has high sensitivity for screening dementia. • Application of MMSE in this population has poor sensitivity. • The phrase “No ifs, ands, or buts” in the repetition assessment in MMSE is not culturally and linguistically appropriate for Japanese Americans as the majority of study participants were unable to repeat the phrase regardless of cognitive status. 	Valcour et al., 2002
	To test the diagnostic accuracy of MMSE	Multi-racial/ethnic (including AANHPI)	<ul style="list-style-type: none"> • No translations or adaptations (i.e., original MMSE was administered to English-speaking population) 	<ul style="list-style-type: none"> • The MMSE is a sensitive assessment for detecting overt dementia among ethnically diverse population. • No subgroup results among AANHPI. • The standard cut-off score on MMSE is not sensitive enough to detect early dementia in highly-educated individuals. It is suggested that the cut-off score be raise to 27 from the standard cut-off score of 24 to account for higher levels of education. 	Spering et al., 2012
Cognitive Abilities Screening Instrument (CASI E-1.0)	To test the Japanese-English language equivalence	Japanese Americans		<ul style="list-style-type: none"> • The CASI measures cognitive function equivalently in Japanese and English. 	Gibbons et al., 2009
Storytelling	To develop and test storytelling as a screening tool	Chinese Americans	<ul style="list-style-type: none"> • Participants were asked to tell a story based on the Cookie Theft Picture 	<ul style="list-style-type: none"> • Narrative complexity can be used as valid measure of cognitive functioning and impairment 	Makoni et al., 2005

			from the Boston Diagnostic Aphasia Exam in Cantonese or Mandarin.	<ul style="list-style-type: none"> • Storytelling is a method that is not restricted by participants' educational levels • Story telling as a screening tool utilizes visual cues to elicit evaluation of dementia and Alzheimer's, which thereby bypasses illiteracy • Additional studies on storytelling need to show that cognitive decline is independent of aging. 	
Informant-Based Cognitive Assessment Tool	Study Objective	Study Population	Procedures/ Adaptations	Results	Original Source
IQCODE	Determine the specificity and sensitivity of the tool when compared to patient screening results	Japanese Americans		<ul style="list-style-type: none"> • IQCODE minimizes the influence of confounding factors such as patients' educational backgrounds and pre-morbid intelligence. • IQCODE is a fairly simple and short test that requires 5 minutes and can be administered by medical staff. • Screening of IQCODE may be influenced by the informant or setting where it is implemented as well as the subjective relationship between an informant and the patient. 	Tokuahara et al., 2006
Neuropsychological Batteries	Study Objective	Study Population	Procedures/ Adaptations	Results	Original Source
Cross-Cultural Neuropsychological Test Battery (CCNB)	To develop and assess the validity of the CCNB	Multi-racial/ethnic, including Chinese and Vietnamese Americans	<ul style="list-style-type: none"> • CCNB included tests that were selected and translated into Chinese and Vietnamese by experts. The translated versions were then back-translated into English. In order for the battery to be applicable across the different ethnic groups, the battery only included the names of body parts that exist in all languages in the Body Part Naming Test. 	<ul style="list-style-type: none"> • CCNB can effectively differentiate cognitively impaired individuals with healthy, non-cognitively impaired individuals • The battery is relatively short and can be easily administered. • Performance on the CCNB is impacted by low education and ethnicity: Chinese and Vietnamese participants perform better in the Digit Span test and Animal Fluency task. • Application of CCNB in clinical settings may be time consuming as it takes 90 minutes to fully administer, which could be replaced by a shortened core battery. 	Dick et al., 2002
Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Neuropsychological Assessment Battery	To assess test neuropsychological test performance	Japanese Americans	<ul style="list-style-type: none"> • The original battery was translated into Japanese and back-translated into English to ensure accuracy. The battery was administered in either English or Japanese. 	<ul style="list-style-type: none"> • The CERAD battery is able to effectively distinguish non-demented from demented individuals in Japanese Americans. • Performance on the CERAD battery is impacted by factors including education, gender, and preferred language of administration. • The battery is not consistent in distinguishing levels of severity of dementia. 	McCurry et al., 2001; Fillenbaum et al., 2005
Chinese-specific Cognitive Battery	To test the diagnostic utility of a battery currently administered in China	Chinese Americans	<ul style="list-style-type: none"> • Battery included various brief cognitive assessment tools (e.g., MoCA) and other tools assessing memory, 	<ul style="list-style-type: none"> • Performance in overall cognition, memory, and attention executive function was significantly worse in Alzheimer's disease patients compared to those mildly 	Li et al., 2018

			language, and attention executive function.	cognitively impaired and normal controls. • Sample size of participants for the pilot testing of the Chinese-specific Cognitive Battery is too small to conclude battery's validity • The battery was tested only in Mandarin, which may not be applicable to other Chinese dialectal speakers.	
Author Manuscript	Author Manuscript	Author Manuscript	Author Manuscript	Author Manuscript	Author Manuscript
ADRD-Related Scales & Tools	Study Objective	Study Population	Procedures/ Adaptations	Results	Original Source
Alzheimer's Disease Symptom Recognition Scale (ADSRS)	To assess validity of a translated and tailored instrument	Korean Americans	<ul style="list-style-type: none"> • The original English version of ADSRS was translated using the translation and back-translation method. • The Korean version was initially pilot-tested in focus groups – It was found that the Korean immigrant community uses the term dementia (“chimae”) rather than Alzheimer's Disease and was accordingly revised. 	<ul style="list-style-type: none"> • The Korean version of ADSRS was shown to be valid and reliable in assessing AD knowledge and AD symptoms recognition in Korean Americans. • AD knowledge sub-scale showed low internal consistency. • Measurement of exposure to dementia was limited to one item. 	Lee and Casado 2015