
The Phrase: "No ifs, Ands, or Buts" and Cognitive Testing. Lessons from an Asian-American community.

Victor G. Valcour MD, Kamal H. Masaki MD, and Patricia L. Blanchette MD, MPH

Abstract

This study assessed the clinical utility of repeating the phrase "No ifs, ands, or buts" for cognitive testing in Hawaii. 242 subjects were screened; 25 (10%) had cognitive impairment. 68% of all subjects were unable to say the phrase "No ifs, ands, or buts" (83% of cognitively impaired and 67% of cognitively intact, $p=0.122$). Specificity for cognitive impairment was poor.

Introduction

Dementia is a chronic debilitating disease primarily of the old. While prevalence rates vary, most experts concur that the rate doubles approximately every five years from age sixty. This yields a dementia prevalence rate of greater than 30% for people over 85 years of age.¹

Appropriate care of patients with dementia requires early detection, which, in turn, requires sensitive screening tools. Maximum sensitivity for any cognitive test must consider baseline ability to communicate in the language of the test and must recognize nuances of various dialects that might affect testing. This latter issue is noted in Hawaii where the primary language is English, yet other influences, including cultural factors and education, affect the expression of this language and may affect results on cognitive tests. Not recognizing these aspects can lead to inappropriately labeling a person with an acquired deficiency in memory and thinking when none exists.

The islands of Hawaii have developed with influences from a number of Asian and Pacific Island countries.² As such, a large degree of cultural diversity is present. Increased cultural diversity throughout the United States, particularly in the older population is expected in the future.³ Lessons learned from Hawaii concerning cultural influences on cognitive testing will become broadly important.

We evaluated the clinical utility of the phrase "No ifs, ands, or buts" in the Folstein Mini-Mental State exam (MMSE). Folstein

originally described his Mini-Mental State Exam in 1975.² The population described consisted of psychiatric ward inpatients and ambulatory elders from a senior center in New York State. The ethnic makeup of the population is not described. While normal ranges for age and level of education have been described previously, little data are available concerning applicability in culturally diverse communities where English is the primary language.⁴

The phrase "No ifs, ands, or buts" is generally regarded as a test for two domains of cognition: attention and language. Since these domains are important in normal human cognition, it is essential that they be evaluated properly. In this study, we determine how well this portion of the Mini-Mental State Exam correlates with the diagnosis of cognitive impairment in an Asian-American community. We also evaluate the clinical utility of two other phrases from the Cognitive Abilities Screening Instrument (CASI).⁵

Methods

The study took place in a multi-physician group practice within a predominantly Asian-American community of Honolulu, Hawaii. A list of all patients 65 years of age or greater was generated as patients were seen in a busy multi-physician group practice. Subsequently, patients on the list were called, in the order that they were seen, and asked to participate in a one-hour interview by a geriatrician. Further details of methods have been previously published.⁶ Participants self-reported their ethnicity. All participants reported sufficient language skills to complete the cognitive testing in English.

Cognition was assessed by the Cognitive Abilities Screening Instrument (CASI), past memory testing, and a clock drawing task.^{5,7} Participants also completed the Mini-Mental State Exam. The CASI includes several questions that are part of the MMSE and also tests other cognitive domains not tested by the MMSE. CASI scores range from 0 to 100. Overlapping questions on both the MMSE and the CASI were not duplicated. However, in the writing portion of the CASI the examiner dictates the sentence to be written: "He would like to go home". Participants are simply asked to write it. In contrast, in the standard MMSE, participants write a sentence of their choosing. For this question, the CASI sentence was accepted for the MMSE despite this small difference. Notably, the phrase "He would like to go home" is repeated prior to being written. Thus, the use of this phrase for the written portion would not affect the repetition portion.

Correspondence to:
Victor G. Valcour MD,
Assistant Professor of Medicine
HPM-9, 347 North Kuakini Street
Honolulu, HI 96817
Email: Vvalcour@aol.com.
Phone: (808)-523-8461. Fax: (808)-528-1897

In our study, all participants were asked to say the phrase: “No ifs, ands, or buts”. They were prompted with this phrase: “Listen carefully and repeat exactly what I say”. The phrase was stated only once. Participants’ best response was graded. The phrase had to be repeated correctly to get full credit, including the appropriate use of plurals.

The CASI evaluation requires repetition of two phrases with different levels of difficulty: “He would like to go home” and “This yellow circle is heavier than blue square”. Subjects were prompted with: “Repeat exactly what I say.” Sentences were stated only once, smoothly, and without pause. The first sentence was stated in 2 seconds and the second in 3 seconds.

Screening for the presence of depression was included as well, using the Geriatric Depression Scale – modified 15-question version (GDS-15) and a physician interview based on major depression criteria from the Diagnostic and Statistical Manual, fourth edition (DSM-IV).^{8,9}

Participants identified a second person, usually a family member, to provide subjective data on cognition. These proxy interviews included a Jorms and Korten 26 item Questionnaire, the Blessed Activities of Daily Living (ADL) assessment tool, the Behavioral Pathology in Alzheimer’s Disease Rating Scale (BEHAVE-AD), and a questionnaire concerning occupational and social function.¹⁰⁻¹² A geriatrician provided an opinion regarding the presence of dementia using Benson and Cummings criteria.¹³ Stage of disease was rated using the Clinical Dementia Rating scale (CDR).¹⁴

For the purpose of this analysis, cognitive impairment was defined as a CASI score of less than 74 and a CDR greater than 0. Thus, to be considered impaired, subjects were required to have both the presence of poor performance on testing and functional decline due to cognition. A CASI score of 74 corresponds closely to an MMSE of 22. Ninety-six percent of men ultimately diagnosed with dementia in the Honolulu-Asia Aging Study had a score of 74 or less on CASI screening.¹⁵ Cognitive impairment was considered mild if the CDR was equal to 0.5 or 1, moderate if the CDR was equal to 2, and severe if the CDR was 3 or greater.

We used the SAS software, version 7 (SAS Institute, Inc., Cary, North Carolina) for all statistical analysis. A series of chi squared and Fisher Exact analyses were used to determine the sensitivities of various phrases when compared to cognition. Informed consent was obtained in all cases and an Institutional Review Board approved the protocol.

Results

One thousand and thirty-eight patients over 64 years old were seen in the physicians’ offices during the study period. Forty-six (4.4%) were excluded due to lack of home phone or our inability to contact them by phone. Sixty patients (5.8%) were excluded due to known enrollment in the Honolulu-Asia Aging Study, a longitudinal study of Japanese-American men which includes regular cognitive testing.¹⁶ These subjects would have been previously exposed to cognitive testing with the CASI which could have affected their performance in our study.

Of the remaining 932 possible participants, 533 (51.3%) reported they were too busy or not interested in participating and 68 (6.6%) felt too ill, were caregivers, or had died before they were called to participate. Other reasons, including transportation problems, ac-

counted for the final 2.6% of subjects who refused.

The final participation rate was 29.3% yielding 306 subjects. Two hundred and forty-four participants completed the MMSE portion of the testing, which was added to the main study after the original study began. Two of these subjects were excluded from analysis because of a positive depression screen thought to affect cognition. Twenty-five of the 242 patients (10%) were found to have cognitive impairment.

Demographic information comparing subjects with and without cognitive impairment is provided in table 1. The average age of participants was 74.6 years. Greater than 95% of subjects reported an Asian or Pacific Island heritage, the vast majority being Japanese-American. Cognitive test scores were significantly different between the two groups.

Table 1.– Demographic Data and Characteristics of Subjects

	Cognitive Impairment Status			p value
	Impaired	Not impaired	All	
Age (yrs.)	80.2	73.8	74.6	<0.001*
Education (yrs.)	8.9	12.4	12.0	<0.001*
% Asian-Amer.	96	96	96	1.000
% Female	80	60	62	0.050
Number of Meds	2.36	2.87	2.81	0.204
CASI Score (Ave.)	57.3	87.0	84.0	<0.001*
MMSE Score (Ave.)	17.0	25.5	24.6	<0.001*

2-tailed t-test for continuous data, chi-square test or Fisher’s Exact test for dichotomous data.

The mean number of years of formal education was 12. There were significant differences between the two groups, with lower educational achievement noted for the cognitively impaired group. Cognitively impaired subjects were more often women and were older.

Sixty-eight percent of participants, regardless of cognitive status, were unable to say the phrase “No ifs ands or buts” (table 2) Both the cognitively intact and cognitively impaired groups correctly pronounced the phrase “He would like to go home” more often than the MMSE phrase. All subjects without cognitive impairment were able to say this phrase. In contrast, the second CASI phrase was seldom pronounced correctly despite cognitive status, similar to repetition of the phrase “No ifs, ands, or buts”.

Table 2.– Subjects’ inability to say three phrases (% unable to say)

	Cognitive Impairment Status			p value
	Impaired	Not impaired	All	
“No ifs, ands, or buts”	83	67	68	0.112
“He would like to go home”	20	0	2	<0.001*
“This yellow circle is heavier than blue square”	84	66	68	0.067

Chi-square test for Fisher’s Exact test.

The sensitivity, specificity, and predictive values of the MMSE phrase and the two CASI phrases are displayed in table 3. When considering the MMSE phrase and the second CASI phrase, an inability to repeat each phrase was a sensitive predictor of cognitive impairment. However, the specificity for each was poor. Alternatively, the phrase "He would like to go home" had less sensitivity, but much more specificity for the diagnosis of cognitive impairment in this population.

Table 3.— Sensitivity and Specificity for cognitive impairment (inability to say phrases)

	<u>Sensitivity</u>	<u>Specificity</u>	<u>Positive Predictive Value</u>	<u>Negative Predictive Value</u>
"No ifs, ands, or buts"	82.6	33.2	11.6	94.7
"He would like to go home"	20.0	100	100	91.6
"This yellow circle is heavier than blue square"	83.3	34.1	12.3	94.9

Discussion

Language is an important domain in the evaluation of cognitive impairment. Three questions directly address this domain correlating to three points out of 30 potential points in the MMSE. An inability to repeat this phrase, regardless of cognitive status, has a significant impact on the evaluation of this domain. These data suggest that the functional maximum attainable points on the MMSE in this population would be 29 almost seventy percent of the time.

Most people would consider the MMSE a screening test for dementia. In such a capacity, a high sensitivity is favorable, even at the cost of specificity. The MMSE phrase does meet this criterion in our study. For a confirmatory test, on the other hand, high specificity is sought. The phrase "He would like to go home" may be a more suitable choice for a confirmatory test in this population. We recommend judicious use of each phrase in the Japanese-American population of Hawaii. Readers should be aware that similar substitutions for other English speaking ethnically diverse populations might be appropriate, however, further research is needed.

There may be limitations to generalizing these data to other populations. This is particularly true for mainland United States populations that may have had a different degree of exposure to people of Asian descent compared to European descent. It is possible that local customs and traditions have affected language locally in Hawaii, thus affecting ability to say the phrases. Clinical utility of these phrases in Caucasian populations may have similar limitations; further research is needed.

It is also possible that past familiarity with a phrase affects repetitive ability in a test. Nevertheless, it remains important to consider local language nuances in any population when testing for presence of acquired cognitive abnormalities. A larger analysis, considering people of more varied ethnic origin could clarify this issue.

Some clinicians suggest that there may be more merit to repetition of these phrases than testing language and attention. Some examiners appreciate the linguistic manipulation needed to say the MMSE phrase and use it to observe facial muscle symmetry and dysphonias. The CASI phrases might not provide the same degree of usefulness within this arena.

Our investigation took place in a multi-physician group private practice setting. Since subjects were called and asked to participate, a selection bias may possibly be present. Since little data is known about subjects who declined, it is not possible to rate the degree of bias, if present.

This study exemplifies the limitations in clinical utility of the sentence repetition portion of the MMSE. It may imply the importance of language and dialect in the appropriate interpretation of cognitive testing within an Asian-American community of Hawaii, however further data on other populations including Caucasian populations is needed. It is timely, as ethnic diversity in the population of elders will increase in the future.^{3,17}

Authors

All authors: Geriatric Medicine Program, John A. Burns School of Medicine, University of Hawaii, Honolulu, Hawaii and Kuakini Medical Center, Honolulu, Hawaii.

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