

# Reliability of the Geriatric Depression Scale for Use Among Elderly Asian Immigrants in the USA

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**ABSTRACT.** The increasing numbers of Asian and other immigrants in the United States have resulted in greater demands for research methodology sensitive to cross-cultural issues. A regional probability sample ( $n = 407$ ) of Asian elderly immigrants of different nationalities (Chinese, Korean, Indian, Filipino, Vietnamese, or Japanese) residing in New York City was used to examine the reliability of the Geriatric Depression Scale (GDS). Using the 30-item GDS, about 40% of this representative sample of Asian elderly immigrants was considered to be depressed, indicating higher depression rates than in the previous studies of other Asian elderly samples in the US and in Asia. Results also showed that the 30-item GDS and 15-item GDS Short Forms were reliable measures to assess depression in community-dwelling Asian immigrant elders. Data strongly suggest that Asian elderly immigrants in the US are at risk of depression, indicating a need for the design of culturally sensitive mental health programs.

**KEYWORDS:** GDS Long Form; GDS Short Form; depression; reliability; Asian American elders

The United States is facing two dramatic demographic changes: the aging and the increasing ethnic and racial diversification of its population. The population segment that is age 65 and over (35.0 million) now constitutes about 12.4% of the total U.S. population (Hetzl & Smith, 2001). It is expected to remain near its current level over the next 10 years. Between 2010 and 2030, the baby boomers will join this older

population, and by 2030, about 20% of the total population (69.4 million) is projected to be over 65. The non-Hispanic, White share of the population is projected to fall steadily from 74% in 1995 to 72% in 2000, to 64% in 2020, and to 53% in 2050. By the middle of the 21st century the Black population is expected to nearly double its 1995 size to 61 million. The racial/ethnic groups with the highest rates of increase, however,

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are expected to be those of Hispanic, Asian, and Pacific Islander origin. Data from the 2000 census indicate that the Asian Americans and Asian immigrant populations grew by 49.0% from 1990 to 2000 (U.S. Census Bureau, 1990, 2001) whereas the total U.S. population grew only by 13.2% (Meyer, 2001).

The increasing numbers of Asian and other immigrants have resulted in greater demands for research methodology sensitive to cross-cultural issues. Although depression is a common psychological problem among the elders, few researchers have studied depression in older Asian Americans or older Asian immigrants. The possibility of cultural effects confounding the measurement of depression has complicated the accurate assessment of depression in this population. Mui (1993) suggested that reported ethnic differences in depression might reflect different modes of expression rather than true differences in mental health status. In addition, instruments to measure depression may not be sufficiently culturally sensitive to assess the mental health status of the Asian immigrant elderly groups.

## LITERATURE REVIEW

In the United States, epidemiologic studies have examined the prevalence of depressive symptoms in community samples using a variety of scales (e.g., Center for Epidemiological Studies Depression Scale, Beck Depression Inventory, or Zung Self-Rating Depression Scale). Depending on the selected cutoff points and instruments, estimates of the prevalence of major depression vary widely. Using *Diagnostic and Statistical Manual of Mental Disorders* (DSM)-

based criteria for major depression, a 1-year prevalence rate is estimated at about 5% or less among community-dwelling persons aged 65 and older (Gurland et al., 1996). Depressive symptoms or syndromes are more prevalent, with about 15% to 20% of community-dwelling elders experiencing them (Gallo & Lebowitz, 1999). Both prevalence and incidence studies that rely on DSM-based diagnosis of major depression indicate age-related declines, whereas symptom-based assessment studies show increased rates of depression among elderly people, especially older women (U.S. Department of Health and Human Services, 1999). Using the Geriatric Depression Scale (GDS) as criteria, prevalence rates of depression among noninstitutionalized elders from different ethnic or national origin backgrounds ranged from 12% to 50%, indicating relatively high depressive symptomatology (see Table 1: Summary of Studies).

Data from the NIMH Epidemiological Catchment Area Study suggest there are few racial/ethnic group variations in either 1-year or lifetime prevalence rates for diagnosable mental disorders among older adults (Blazer et al., 1998). However, estimated prevalence rates for ethnic minority elderly populations may be biased due to low cultural relevance of standardized measures. Along with physical, cognitive, and functional impairment, sociocultural factors, such as differences in perception, interpretation, valuation, expression, and tolerance of symptoms, may contribute to this bias (Mui, 1996a, 1996b; Mui et al., 2001). The appropriateness of total standardized scales and specific items, which are typically normed on general populations of Western countries, thus

**TABLE 1. Summary of Studies on Prevalence Estimates of Depression in Elderly Populations Using Geriatric Depression Scale (GDS) Long Form and Short Form**

Reference	Sample/Setting	Measure	Prevalence Rates
Espino et al., 1996	<i>n</i> = 48, Mexican American elders in US	GDS Long Form	27.1%
Ferraro et al., 1997	<i>n</i> = 22, Native American elders in US	S&Y GDS Short Form <sup>a</sup>	23.0%
Haller et al., 1996	<i>n</i> = 880, European elders for SENECA (Survey Europe on Nutrition in the Elderly: A Concerted Action) study of 1993, male = 433; female = 452	S&Y GDS Short Form <sup>a</sup>	11.6% (males) 27.5% (females)
Hazuda et al., 1998	<i>n</i> = 451, Mexican American elders from San Antonio Longitudinal Study of Aging (SALSA) in U.S. metropolitan region	GDS Long Form	22.6%
Izal & Montorio, 1993	<i>n</i> = 60, Spanish elders in Spain	GDS Long Form	50.0%
Mui, 1996b	<i>n</i> = 50, Chinese immigrant elders in U.S. metropolitan region	GDS Long Form	18.0%
		S&Y GDS Short Form <sup>a</sup>	26.0%
		Mui GDS Short Form <sup>b</sup>	30.0%
Mui, 2001	<i>n</i> = 67, Korean immigrant elders in U.S. metropolitan region	GDS Long Form	44.8%
Norris et al., 1987	<i>n</i> = 31, medical outpatients from U.S. VA medical center	GDS Long Form	29.0%
Shibusawa & Mui, 2001	<i>n</i> = 131, Japanese elders in U.S. metropolitan region	GDS Long Form	25.0%
Woo et al., 1994	<i>n</i> = 1,611, male = 877; female = 734 in Hong Kong	S&Y GDS Short Form <sup>a</sup>	29.2% (males) 41.1% (females)

*Note.* Classification as depressed if GDS Long Form total score  $\geq 11$  or GDS Short Form total score  $\geq 5$ .

<sup>a</sup>S&Y GDS Short Form is Sheikh & Yesavage version (Sheikh & Yesavage, 1986). <sup>b</sup>Mui GDS Short Form is Mui version (Mui, 1996b).

needs to be properly evaluated for their applicability to different cultural groups within the United States and cross-nationally.

### Geriatric Depression Scale

Brink and his colleagues (1982) developed the GDS, a 30-item, easy-to-administer inventory, to serve as a screening test for depression among the elderly population. It was further validated by Yesavage and colleagues (1983) and has been shown to have excellent internal consistency ( $\alpha = .94$ ) and test-retest reliability ( $r = .85$ ). It has been used widely among community and institutionalized elders. Table 2 contains a list of GDS validation studies.

Sheikh and Yesavage (1986) developed a 15-item GDS Short Form in order to make this measure a simpler screening device for depression. Referred to as the S&Y GDS Short Form, they selected 15 questions from the 30-item GDS. The alpha coefficient of the 15-item Short Form was only .82 indicating moderate internal consistency. The correlation between the 30-item GDS and the 15-item Short Form was .84. Sheikh and Yesavage's (1986) findings (based on 18 normal elders and 17 depressed elders) provided support for the utility of the GDS Short Form in successfully differentiating depressed from nondepressed elderly respondents. The S&Y GDS Short Form included item numbers 1 to 4, 7 to 10, 12, 14, 15, 17, and 21 to 23 (see attributes listed in Table 3). Ten of the 15 items of the Mui GDS Short Form overlap with those on the S&Y GDS Short Form, but 5 of them are different (see Table 3). These items are: No. 11 (get restless and fidgety); No. 13 (worry about future); No. 16 (feel downhearted and blue); No. 24 (get upset about little

things); and No. 25 (feel like crying). The replaced items from the S&Y GDS Short Form are: No. 10 (feel helpless); No. 12 (prefer to stay home); No. 15 (wonderful to be alive); No. 21 (full of energy); and No. 22 (situation hopeless).

In Hong Kong, Chiu and his colleagues (1993) validated the 30-item GDS and established its reliability and validity ( $\alpha = .92$ ) among both normal and depressed Chinese elders. The S&Y GDS Short Form was also validated ( $\alpha = .90$ ) with both depressed and nondepressed Chinese elders in Hong Kong (Lee et al., 1993). Both the 30-item GDS and the S&Y GDS Short Form were found to be reliable instruments for the Chinese elders in a Hong Kong context. The S&Y GDS Short Form later was used to assess the prevalence of depressive symptoms among Chinese elders aged 70 and over in a Hong Kong citywide random sampling survey (Woo et al., 1994). The prevalence rate of depression for the elderly Chinese population in Hong Kong was 29.2% for men and 41.1% for women (cutoff point was 8). The data in the literature seem promising in terms of using the GDS in a cross-cultural context.

In order to continue to test the cross-cultural utility of the GDS, Mui (1996b) studied a group of Chinese immigrant elders and validated the 30-item GDS and the S&Y GDS Short Form. In her study, the Cronbach's alpha coefficients were .90 and .72 for the 30-item GDS and the S&Y GDS Short Form, respectively. Using her data, Mui created a new 15-item GDS Short Form (see Table 3 Nos. 1 to 4, 7 to 9, 11, 13, 14, 16, 17, and 23 to 25) because the selected 15 items were considered to be culturally more meaningful (Mui, 1996b). The Cronbach's

**TABLE 2. Summary of Geriatric Depression Scale (GDS) Validation Studies**

Reference	Sample/Setting	Measure	Reliability	Sensitivity/Specificity <sup>a</sup>
Abas et al., 1998	<i>n</i> = 164, African Caribbean elders in south London, UK	S&Y GDS Short Form <sup>b</sup>	Reliability data not reported	Cutoff score $\geq$ 5 Sensitivity = 82%; Specificity = 62%
Abraham, 1991	<i>n</i> = 76, depressed nursing home residents in US	GDS Long Form	Koder-Richardson KR-20 coefficients ranged from .69-.88	Not reported
Agrell & Dehlin, 1989	<i>n</i> = 40 stroke patients, <i>n</i> = 17 depressed patients, day-hospital & nursing home in US	GDS Long Form	Concurrent validity with SDS <sup>c</sup> = .88, with CES-D <sup>d</sup> = .82	Cutoff score $\geq$ 10 Sensitivity = 88%; Specificity = 64%
Alden et al., 1989	<i>n</i> = 81, 34 nursing home residents & 47 healthy elders in US	GDS Long Form	GDS Long & Short Forms correlated ( <i>r</i> = .66)	Not reported
Baker et al., 1993	<i>n</i> = 58, African American elders, <i>n</i> = 41, Mexican American elders in US	S&Y GDS Short Form <sup>b</sup>	Reliability data not reported	For African Americans, Cutoff score $\geq$ 6 Sensitivity = 35%; Specificity = 100%; For Mexican Americans, Cutoff score $\geq$ 6 Sensitivity = 64%; Specificity = 75%
Burke et al., 1989	<i>n</i> = 142, Alzheimer's patients in a geriatric assessment center in US; 70 intact; 72 mildly demented	GDS Long Form	Reliability data not reported	For intact group, Cutoff range = 14/16 (Sensitivity/Specificity 80%/78% to 73%/88%)
Burke et al., 1992	<i>n</i> = 194, cognitively intact & impaired patients in outpatient assessment clinic in US	GDS Long Form	Reliability data not reported	Cutoff score $\geq$ 11 For impaired group, Sensitivity = 74%; Specificity = 66%; For intact group, Sensitivity = 81%; Specificity = 61%

*(continued)*

**TABLE 2. Continued**

Reference	Sample/Setting	Measure	Reliability	Sensitivity/Specificity <sup>a</sup>
Chan, 1996	<i>n</i> = 461, Chinese psychiatric outpatients in Hong Kong	GDS Long Form	Concurrent validity with CES-D = .96, with psychiatrist diagnosis = .95; Alpha = .89; Test-retest = .85	Cutoff score ≥ 14 Sensitivity = 70.6%; Specificity = 70.1%
Cwikel & Ritchie, 1988	<i>n</i> = 40, 20 depressed, 20 controls elders in Jerusalem, Israel	S&Y GDS Short Form <sup>b</sup>	Reliability data not reported	Cutoff score ≥ 7 Sensitivity = 81%; Specificity = 61%
Dunn & Sacco, 1989	<i>n</i> = 439, community-dwelling elders in US	GDS Long Form	Concurrent validity with DSC <sup>e</sup> = .82, with SDS = .59; Alpha = .91	Cutoff score ≥ 11 Sensitivity = 83%; Specificity = 82%
Espino et al., 1996	<i>n</i> = 48, community-dwelling Mexican American elders in US	GDS Long Form	Reliability data not reported	Cutoff score ≥ 11 Sensitivity = 80%; Specificity = 61%
Feher et al., 1992	<i>n</i> = 83, mild to moderate probable Alzheimer's patients in US	GDS Long Form	Concurrent validity with HRS-D <sup>f</sup> = .58	Not reported
Izal & Montorio, 1993	<i>n</i> = 60, elders living in public residence attached to the National Institute of Social Services in Spain	GDS Long Form	Alpha = .89; Test-retest = .89	Not reported
Jamison & Scogin, 1992	<i>n</i> = 68, depressed and nondepressed elders in US		Concurrent validity with HRS-D = .72, with BDI <sup>g</sup> = .67; Alpha = .94; Split-half = .94	Cutoff score ≥ 11 Sensitivity = 84%; Specificity = 95%
Lee et al., 1993	<i>n</i> = 193, 113 normal & 80 depressed elders in Hong Kong	S&Y GDS Short Form <sup>b</sup>	Alpha = .90; Split-half = .84	Cutoff score ≥ 8 Sensitivity = 96.3%; Specificity = 87.5%
Lichtenberg et al., 1992	<i>n</i> = 34, demented patients in US	GDS Long Form	Reliability data not reported	Cutoff score ≥ 11 Sensitivity = 82%; Specificity = 88%

(continued)

**TABLE 2. Continued**

Reference	Sample/Setting	Measure	Reliability	Sensitivity/Specificity <sup>a</sup>
Mui, 1996b	<i>n</i> = 50, Chinese elderly immigrants in US	GDS Long Form S&Y GDS Short Form <sup>b</sup> Mui GDS Short Form <sup>h</sup>	Alpha = .90; split-half = .82 Alpha = .72 Alpha = .89	Not reported
Norris et al., 1987	<i>n</i> = 68, geriatric outpatients in US	GDS Long Form	Concurrent validity with BDI = .85	Cutoff score ≥ 10 Sensitivity = 89%; Specificity = 73%
Olin et al., 1992	<i>n</i> = 50, 25 depressed outpatients & 25 healthy controls in US	GDS Long Form	Concurrent validity with BDI = .91	Cutoff score ≥ 11 Sensitivity = 96% Specificity = 96%
O'Riordan et al., 1990	<i>n</i> = 111, patients in geriatric unit in US	GDS Long Form	Not reported	Cutoff score ≥ 11 Sensitivity = 96%; Specificity = 89%
Parmelee et al., 1989	<i>n</i> = 806, nursing home & congregate apartment residents in US	GDS Long Form	Alpha = .92 for impaired group; Alpha = .91 for intact group	Cutoff score ≥ 11 Sensitivity = 92.1% Specificity = 86.2%
Sheikh & Yesavage, 1986	<i>n</i> = 35, normal = 18; depressed patients = 17 in US	GDS Long Form	Correlation between GDS Long & Short Form = .84	Not reported
Snowdon, 1990	<i>n</i> = 69, 50 in aged hostels & 19 in nursing home in Sydney, Australia	GDS Long Form	Not reported	Cutoff score ≥ 11 Sensitivity = 93%; Specificity = 83%
Woo et al., 1994	Older men = 877, older women = 734 in US	S&Y GDS Short Form <sup>b</sup>	Not reported	Cutoff score ≥ 8 Sensitivity = 96.3%; Specificity = 87.5%
Yesavage et al., 1983	<i>n</i> = 100, 60 depressed patients & 40 community controls in US	S&Y GDS Short Form <sup>b</sup>	Convergent validity with HRS-D = .83; with SDS = .84 Alpha = .94; Split-half = .94; Test-retest = .85	Cutoff score ≥ 11 Sensitivity = 84%; Specificity = 95%

*Note.* <sup>a</sup>Sensitivity/specificity were determined according to physician's diagnosis of depression; <sup>b</sup>S&Y GDS Short Form is Sheikh & Yesavage version (Sheikh & Yesavage, 1986). <sup>c</sup>SDS = Zung Self-Rating Depression Scale; <sup>d</sup>CES-D = Center for Epidemiologic Studies Depression Scale; <sup>e</sup>DSC = Depression Symptom Checklist; <sup>f</sup>HRS-D = Hamilton Rating Scale for Depression; <sup>g</sup>BDI = Beck Depression Inventory. <sup>h</sup>Mui GDS Short Form is Mui version (Mui, 1996b).

**TABLE 3. Descriptive Statistics of the Geriatric Depression Scale (GDS) Attributes**

GDS Long Form Items	Chinese	Filipino	Indian	Japanese	Korean	Vietnamese	Total
	( <i>n</i> = 105)	( <i>n</i> = 52)	( <i>n</i> = 100)	( <i>n</i> = 25)	( <i>n</i> = 100)	( <i>n</i> = 25)	( <i>n</i> = 407)
	Percentage of Respondents Who Endorsed These Statements						
1. Satisfied with life <sup>a,b****</sup>	74.0	96.1	95.0	96.0	77.1	92.0	85.3
2. Dropped activities/interests <sup>a,b**</sup>	48.1	26.9	32.0	28.0	47.5	60.0	40.7
3. Life is empty <sup>a,b***</sup>	38.1	9.8	37.0	52.0	24.5	43.5	32.1
4. Often get bored <sup>a,b****</sup>	40.0	28.9	53.0	72.0	28.3	40.0	40.9
5. Hopeful about the future <sup>***</sup>	55.0	81.6	77.0	56.0	60.4	87.5	67.3
6. Obsessive thoughts <sup>****</sup>	36.9	21.6	47.0	68.0	11.0	52.0	33.9
7. In good spirits <sup>a,b*</sup>	69.5	82.7	77.0	56.0	81.1	62.5	74.6
8. Fear bad things <sup>a,b****</sup>	32.4	25.5	57.6	70.8	13.5	88.0	39.0
9. Happy most of the time <sup>a,b****</sup>	58.8	92.3	79.0	60.0	78.2	52.0	72.4
10. Often feel helpless <sup>a****</sup>	22.8	9.8	43.0	76.0	27.3	52.0	32.4
11. Often get restless <sup>b****</sup>	25.2	29.4	56.0	72.0	15.3	52.2	35.5
12. Prefer to stay home <sup>a**</sup>	50.0	38.5	27.0	48.0	56.1	44.0	43.8
13. Worry about the future <sup>b****</sup>	33.7	26.9	84.0	80.0	11.2	56.0	44.1
14. Problem with money <sup>a,b</sup>	36.5	26.9	33.0	40.0	44.9	16.0	35.4
15. Wonderful to be alive <sup>a****</sup>	91.9	100.0	90.0	80.0	74.7	96.0	88.4
16. Feel downhearted and blue <sup>b***</sup>	29.5	17.3	34.0	52.0	12.0	32.0	26.3

*(continued)*

**TABLE 3. Continued**

	Chinese ( <i>n</i> = 105)	Filipino ( <i>n</i> = 52)	Indian ( <i>n</i> = 100)	Japanese ( <i>n</i> = 25)	Korean ( <i>n</i> = 100)	Vietnamese ( <i>n</i> = 25)	Total ( <i>n</i> = 407)
GDS Long Form Items	Percentage of Respondents Who Endorsed These Statements						
17. Feel worthless <sup>a,b****</sup>	43.8	2.0	27.0	48.0	11.7	64.0	28.3
18. Worry about the past <sup>****</sup>	32.4	23.1	75.0	88.0	4.0	8.3	36.7
19. Life is exciting <sup>*</sup>	72.3	91.3	70.7	72.0	62.4	75.0	71.9
20. Hard to start new projects <sup>***</sup>	59.8	54.9	51.5	60.0	78.6	40.0	60.5
21. Full of energy <sup>a****</sup>	33.3	62.5	65.0	48.0	13.3	30.4	40.6
22. Situation hopeless <sup>a****</sup>	34.6	6.1	21.0	36.0	16.1	52.0	24.5
23. Others are better off <sup>a,b****</sup>	56.4	40.0	36.0	50.0	25.7	58.3	42.4
24. Upset over little things <sup>b****</sup>	39.4	17.7	44.0	68.0	8.0	32.0	31.4
25. Feel like crying <sup>b****</sup>	24.0	15.7	34.0	58.3	6.0	29.2	23.3
26. Trouble concentrating <sup>*</sup>	50.0	34.6	42.0	56.0	43.3	70.8	46.0
27. Enjoy getting up in the morning	85.6	84.0	78.0	88.0	82.5	64.0	81.6
28. Avoid social gatherings <sup>****</sup>	67.3	25.0	34.0	48.0	22.5	24.0	38.9
29. Easy to make decisions <sup>****</sup>	48.5	79.6	64.0	64.0	76.3	87.5	66.6
30. Mind as clear as used to be <sup>****</sup>	54.3	70.6	63.0	44.0	85.7	0.0	62.1

Note. Chi-square statistics were used. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001. \*\*\*\**p* < .0001.

<sup>a</sup>Items in S&Y GDS Short Form (Sheikh & Yesavage, 1986). <sup>b</sup>Items in Mui GDS Short Form (Mui, 1996b).

alpha coefficient of the Mui GDS Short Form was .89, almost as high as that of the 30-item GDS. The correlation between the 30-item and Mui GDS Short Form was .93, indicating that the Mui GDS Short Form may be an appropriate substitute for the 30-item GDS.

This article reports the use of a representative sample of Asian immigrant elders residing in the United States East Coast to further evaluate the utility and reliability of the 30-item GDS. These authors also tested the reliability and utility of the S&Y GDS Short Form (Sheikh & Yesavage, 1986) and the Mui GDS Short Form (Mui, 1996b) with this population. The Short Forms were tested because of the importance of having a short, reliable screening instrument for elderly respondents who may tire easily during the interview process. A reliable and culturally meaningful GDS Short Form will be crucial for early screening of, detection of, and intervention for depressed Asian immigrant elderly populations in the US or other part of the world.

## METHOD

Data are from the Survey of Asian American Elders in New York City, 2000. The Asian American Federation of New York sponsored the study. The study examined Asian elderly immigrants in the US who came from one of the following six national origins: Chinese, Korean, Indian, Filipino, Vietnamese, or Japanese. The survey was intended to examine overall health status, mental functioning, quantity and quality of informal support system, formal service utilization, acculturation and immigration experiences, and quality-of-life issues in terms of depression and overall life sat-

isfaction. Harris Interactive, Inc., on behalf of the Asian American Federation of New York conducted the sampling and data collection.

The sample was drawn from a 1990 U.S. census list of over 5,785 block groups in the five boroughs of New York City. Census block groups were ranked according to the percentage of Asian households recorded in the 1990 census. A cutoff was made at the census block group, which represented 70% of all Asians 65 and older. A random selection of block groups was drawn based on the Asian population aged 65 and older within each block group. The sample consisted of 60 block groups or primary sample units in the cross-section. This study utilized an area probability sample. Area probability samples are designed to give each eligible population member or household in the area a known chance of being interviewed. Using a map and specially designed listing sheets, the trained interviewers went to a randomly designated point in the area and listed housing units. These listed households then became the interviewer's assignment. For each of the 60 selected maps, 100 to 150 households were listed and screened for interviewing. For this study, interviewers were required to contact a selected household four times to determine eligibility and/or procure an interview. Elderly Asian immigrants in New York City who met the inclusion criteria were interviewed in their homes by trained interviewers. Interviews averaged 1 hour and 30 minutes in length and were conducted between February 2, 2000, and May 31, 2000. Interviews were conducted in English, Chinese, Korean, Hindi, Tagalog, and Vietnamese. The respondents were administered the

questionnaire in either English or the ethnic language they preferred. Most participants used the native language questionnaire consistent with their ethnicity except the Japanese elders, who all used the English questionnaire.

## MEASURES OF DEPRESSION

The GDS was chosen because it is one of the most widely used and highly recommended screening measures for depression in older adults (Mui, 1996a, 1996b; Thompson et al., 1988). Assessment of depression is more difficult among the elderly than among a younger group because of the higher prevalence of physical complaints, physical health problems, and medication use among elders. One of the benefits of using the GDS is that it contains no somatic items that can introduce age bias in the depression screening scale (Berry et al., 1984). Another benefit of the GDS is its simple yes/no response format for symptom endorsement; this is preferable for respondents with limited formal education, which was true for this cohort of Asian American elders and elderly Asian immigrants.

The 30-item GDS measures depression with scores ranging from 0 to 30. Those who report 10 or fewer depressive symptoms are considered as normal, 11-20 symptoms as mildly depressed, and 21 or more symptoms as moderately to severely depressed (Brink et al., 1982). All the respondents who gave consent and volunteered for the study were administered the GDS orally because many of them were illiterate. Only the 30-item GDS was administered to the elderly Asian immigrant respondents. Because respondents had

to answer a 75-page-long questionnaire, to administer a separate version of the GDS Short Form in the same interview was too exhausting for the elderly respondents. To measure the Short Forms' validity, a methodology of subsequently selecting for further analysis the S&Y GDS Short Form items and the Mui GDS Short Form items from each respondent's GDS Long Form answers was utilized. This procedure replicated that used by other researchers in the literature (Lee et al., 1993; Mui, 1996b). Both Short Forms measure depression with scores ranging from 0 to 15. Those who reported 4 or fewer symptoms are considered as normal, 5-9 symptoms as mildly depressed, and 10 or more symptoms as moderately to severely depressed (Sheikh & Yesavage, 1986).

## RESULTS

As indicated in Table 4, the ages of the respondents ranged from 65 to 96 (mean = 72.4,  $SD = 6.2$ ). A total of 56% were female ( $n = 228$ ) and 44% were male ( $n = 179$ ). The majority of respondents had a high school level of education in their home country. The average length of stay in the US was 21 years, and 100% were immigrants born in Asian countries. Their income levels were low with 61% receiving less than \$10,000 a year. The largest ethnic group was Chinese (26%) followed by Korean and Indian (25% each), Filipino (13%), and Japanese and Vietnamese (6% each).

Table 5 shows that scores on the 30-item GDS measure for the total sample ranged from 0 to 29 with a mean of 10.1 ( $SD = 7.0$ ). The median was 8, and the mode was 3. Using the normative score ranges for the 30-item GDS of "normal" (0-

**TABLE 4. Sociodemographic Characteristics of the Elderly Asian Immigrant Sample**

	Chinese	Filipino	Indian	Japanese	Korean	Vietnamese	Total
	Percentage						
Gender****							
Female	56.2	67.3	38.0	52.0	74.0	36.0	56.0
Male	43.8	32.7	62.0	48.0	26.0	64.0	44.0
Age****							
75+	47.6	42.3	17.0	24.0	37.0	8.0	32.9
65-74	52.4	57.7	83.0	76.0	63.0	92.0	67.0
Living arrangement****							
Living with others	67.6	96.2	97.0	72.0	75.0	76.0	81.1
Living alone	32.4	3.9	3.0	28.0	25.0	24.0	18.9
Marital status****							
Not married	46.7	48.1	38.0	60.0	71.0	32.0	50.6
Married	53.3	51.9	62.0	40.0	29.0	68.0	49.4
Self-reported education in home country****							
Less than high school	1.0	14.3	9.1	8.0	10.3	21.7	8.6
High school	98.0	51.0	64.7	8.0	86.6	78.3	74.3
Post high school	1.0	34.7	26.3	84.0	3.1	0.0	17.1
Household income****							
<\$6,000	36.0	48.4	24.5	0.0	30.2	48.0	30.9
\$6,000-10,000	34.7	16.1	20.2	13.0	51.2	52.0	30.2
>\$10,000	29.3	35.5	55.3	87.0	18.6	0.0	38.8
	Mean (SD)						
Age	75.1 (7.1) <sup>a</sup>	73.2 (6.6) <sup>a</sup>	70.3 (4.2) <sup>b</sup>	70.9 (4.7) <sup>b</sup>	72.3 (6.1) <sup>a</sup>	68.8 (3.5) <sup>c</sup>	72.4 (6.2)
Length of stay in US	26.2 (14.8) <sup>a</sup>	18.9 (14.6) <sup>b</sup>	21.2 (12.7) <sup>c</sup>	30.8 (10.1) <sup>a</sup>	16.3 (8.1) <sup>b</sup>	7.0 (3.0)	20.8 (13.2)

*Note.* Chi-square statistics were used to test percentage differences among different groups. \*\*\*\* $p < .0001$ . Analysis of variance statistics with post hoc multiple comparison were used to test mean differences on age and length of stay in US among different groups. <sup>a,b,c</sup>Means with the different letters are significantly different at less than the .05 level in the same variable.

**TABLE 5. Descriptive Statistics and Reliability Coefficients of the Geriatric Depression Scale (GDS)**

	Chinese	Filipino	Indian	Japanese	Korean	Vietnamese	Total
	Mean ( <i>SD</i> )						
GDS Long Form****	11.4 (7.7) <sup>a</sup>	6.2 (5.0) <sup>b</sup>	11.1 (6.8) <sup>a</sup>	15.0 (7.7) <sup>c</sup>	7.8 (5.8) <sup>d</sup>	12.4 (13.0) <sup>e</sup>	10.1 (7.0)
S&Y GDS Short Form <sup>f</sup> ****	5.7 (4.1) <sup>a</sup>	2.7 (2.4) <sup>b</sup>	4.6 (3.7) <sup>a</sup>	6.8 (3.7) <sup>c</sup>	4.5 (3.2) <sup>a</sup>	6.7 (3.5) <sup>c</sup>	4.9 (3.7)
Mui GDS Short Form <sup>g</sup> ****	5.4 (4.5) <sup>a</sup>	2.9 (2.8) <sup>b</sup>	5.8 (3.7) <sup>a</sup>	7.7 (3.9) <sup>c</sup>	3.0 (3.0) <sup>d</sup>	6.5 (3.4) <sup>a</sup>	4.8 (3.9)
	Rates of Depression, %						
GDS Long Form							
Normal (0–10)	54.3	84.6	50.0	24.0	76.0	36.0	59.5
Depressed (11–30)	<b>45.7</b>	<b>15.4</b>	<b>50.0</b>	<b>76.0</b>	<b>24.0</b>	<b>64.0</b>	<b>40.5</b>
S&Y GDS Short Form <sup>f</sup>							
Normal (0–4)	48.6	80.8	57.0	28.0	62.0	28.0	55.5
Depressed (5–15)	<b>51.4</b>	<b>19.2</b>	<b>43.0</b>	<b>72.0</b>	<b>38.0</b>	<b>72.0</b>	<b>44.4</b>
Mui GDS Short Form <sup>g</sup>							
Normal (0–4)	54.3	80.8	41.0	24.0	78.0	32.0	57.0
Depressed (5–15)	<b>45.7</b>	<b>19.2</b>	<b>59.0</b>	<b>76.0</b>	<b>22.0</b>	<b>68.0</b>	<b>43.0</b>
	Reliability Coefficients						
Cronbach alpha for 30-item GDS Long Form	.92	.85	.90	.92	.90	.86	.90
Split-half reliability of 30-item GDS Long Form	.85	.77	.79	.82	.76	.86	.81
Cronbach alpha for the S&Y GDS Short Form <sup>f</sup>	.87	.72	.85	.81	.82	.82	.84
Cronbach alpha for Mui GDS Short Form <sup>g</sup>	.90	.78	.83	.84	.84	.80	.86

*Note.* Chi-square statistics were used to test percentage of depression among different groups. Values in boldface indicate “depressed.” \*\*\*\* $p < .0001$ . Analysis of variance statistics with post hoc multiple comparisons were used to test the differences among GDS means. <sup>a,b,c,d,e</sup>Means with the different letters are significantly different at less than the .05 level in the same variable.

<sup>f</sup>S&Y GDS Short Form is Sheikh & Yesavage version (Sheikh & Yesavage, 1986). <sup>g</sup>Mui GDS Short Form is Mui version (Mui, 1996b).

10), "mild depression" (11-20), and "moderate to severe depression" (21-30), these results indicate that 40% of the total sample scored at 11 or above on the 30-item GDS, indicating possible depressive symptomatology. There were also within-group differences in terms of depression experienced by members of the six Asian immigrant groups. Japanese respondents reported significantly higher depression (mean = 15.0; *SD* = 7.7), followed by Vietnamese (mean = 12.4; *SD* = 5.7), Chinese (mean = 11.4; *SD* = 7.7), and Indian (mean = 11.1; *SD* = 6.8) respondents. Korean and Filipino respondents reported significantly lower levels of depressive symptoms (mean = 7.8; *SD* = 5.8 and mean = 6.2; *SD* = 5.0, respectively).

Table 5 also reports the mean statistics for the S&Y Short Form and Mui Short Form by immigrant group. These scales appear to have high sensitivity in detecting depression (a score of 5-15) among these elders (44% vs. 43%, respectively). Significant within-group differences were also found using the two GDS Short Forms. The prevalence rates of depression for the total sample and for each group using the GDS Long Form, the S&Y Short Form, and the Mui Short Form are as follows, respectively: Japanese respondents are at the top of the list (76%; 72%; 76%), followed by Vietnamese (64%; 72%; 68%), Asian Indians (50%; 43%; 59%), Chinese (45.7%; 51.4%; 45.7%), Koreans (24%; 38%; 22%), and Filipinos (15.4%; 19.2%; 19.2%).

Table 5 indicates that the Cronbach's alpha coefficient for the reliability of the 30-item GDS for the total sample was .90 and the split-half reliability coefficient was .81. The Cronbach's alpha coefficients of the 30-item GDS for different Asian subgroups ranged from .85 to .92

and the split-half reliability coefficients ranged from .76 to .86. The Cronbach's alpha coefficients of the S&Y GDS Short Form for different Asian subgroups ranged from .72 to .87. The Cronbach's alpha coefficients of the Mui GDS Short Form for different Asian subgroups ranged from .78 to .90. For the total sample, the Cronbach's alpha coefficient for the Mui GDS Short Form and S&Y GDS Short Form was .86 and .84, respectively.

In order to evaluate the validity and utility of the 30-item GDS and two GDS Short Forms, the authors ran parallel regression models of depression using the same set of independent variables. These included demographic variables (gender, living arrangement, marital status, age, length of stay); health-related stress (perceived health, number of medical conditions); life stresses (number of stressful life events, family responsibility expectation, perceived cultural gap between elders and their children); and coping resources (English proficiency, religiosity, children living within 2 hours' driving distance, assistance from children, Medicaid coverage). Results of the three regression models were relatively comparable in terms of the number of significant correlates and the amount of variance explained in depression (GDS Long Form = .47; S&Y GDS Short Form = .45; Mui GDS Short Form = .47). The relative importance of six significant correlates in the three models are poor self-rated health (Beta = .49/.53/.46), number of stressful life events (Beta = .27/.20/.30), perceived cultural gap (Beta = .15/.12/.14), religiosity (Beta = -.18/-.15/-.16), children living within 2 hours' driving distance (Beta = -.15/-.15/-.15), and assistance from children (Beta = .12/.05/.11).

## DISCUSSION AND CONCLUSION

The present study aimed at evaluating the utility and appropriateness of the GDS for use with an elderly Asian immigrant population in the US. Overall, the reliability data indicate that the 30-item GDS Long Form and two GDS Short Forms were all reliable measures for use among these elderly Asian immigrant groups. The internal consistency is shown to be adequate. The reliability coefficient indicators of the Mui GDS Short Form appeared to be slightly better than those of the S&Y GDS Short Form. This suggests that the construction of the Mui GDS Short Form may be culturally more appropriate for these elderly Asian immigrant groups because it was previously developed based on an elderly Chinese immigrant sample in New York City. Although there are 10 overlapping GDS Short Form items, the 5 unique items in the Mui Short Form may be culturally more meaningful to Asian elderly immigrant groups. These items are: No. 11 (get restless and fidgety); No. 13 (worry about future); No. 16 (feel downhearted and blue); No. 24 (get upset about little things); and No. 25 (feel like crying). The replaced items from the S&Y Short Form are: No. 10 (feel helpless); No. 12 (prefer to stay home); No. 15 (wonderful to be alive); No. 21 (full of energy); and No. 22 (situation hopeless). The five different items in the S&Y Short Form may be culturally less relevant for Asian elderly immigrant groups. For example, "Prefer to stay home" is almost a virtue in Asian culture and older Asian immigrant people usually stay home to take care of adult children's household as well as take care of grandchildren. Culturally,

this is a highly regarded activity. Endorsing this item may have very little to do with depression. Other unique items in the S&Y Short Form are quite extreme in terms of feelings and emotion expressed. To endorse these questions that indicate extreme responses to life situations is inconsistent with the Asian cultural values; many Asian elders put a lot of emphasis on doing things in moderation. In addition, some superstitious Asian elders may be afraid to endorse such extreme situations for fear that worse situations will come after them (Mui, 1996b).

Multiple regression analysis confirmed the predictive validity of the GDS Long Form and the two Short Forms. The multiple correlations between depression and poor health and stressful life events are consistent with findings in studies with White, Black, and Hispanic elders (Burnette & Mui, 1994; Mui, 1993). Other predictors, such as perceived cultural gap and children not living in proximity, are culturally not acceptable to elderly Asian American or Asian immigrant parents. These elders may well experience depression when they feel that they are emotionally and physically not connected to their children. The counter-intuitive finding is that elderly Asian immigrant parents reported a higher level of depression when they received more assistance from their children. This cohort of Asian elderly did not know English well and had very few financial resources. Receiving more assistance from their children may indicate higher levels of unmet medical and/or psychosocial needs among these elders. The resulting greater reliance and/or dependence on children could be a source of depression among these immigrants.

Other major findings of this study suggest that there are group differences in depression experiences among this U.S.-based elderly Asian immigrant probability sample. The percentage of elderly Asian immigrant groups varied widely, with a low of 15.4% for Filipino elders to 76% for Japanese elders. The prevalence of depression among these New York City-based Japanese, Vietnamese, and Indian immigrant elders appeared to be much higher than the 15% to 20% rate reported in research among the general older American population (Chiu et al., 1993; Gallo & Lebowitz, 1999; Mui, 1996b; Woo et al., 1994). The depression rates observed among these subgroups were also higher than the 12% to 50% rates reported in other ethnic elderly studies in the United States and in other parts of the world (see Table 1). Such results indicate the importance of paying special attention to the variance among Asian cultures where assessing the incidence of depression among different Asian ethnic groups.

Data presented here strongly suggest that elderly Asian immigrants in the United States are at risk of depression. This study supports use of the GDS Short Forms, especially the Mui Short Form, as reliable substitutes for the 30-item GDS Long Form in screening for depression among Asian elders living in the community. Findings point to important implications for mental health policy and practice. The variance observed in the incidence of depression among this probability sample indicates the need to design culturally sensitive, bilingual depression prevention and intervention programs for elderly Asian immigrants. Timely detection and culturally reliable assessment of depression are the first steps in

culturally appropriate interventions. The two GDS Short Forms analyzed here appear to be reliable tools to use in early detection screening.

It should be emphasized that the findings from this study are only preliminary. There are some limitations in this research. First, the sample size of each group is relatively small, especially the Japanese, Vietnamese, and Filipinos. It was not possible, therefore, to break down the nationality groups further for other analysis, such as factor analysis of the GDS structure. Similar studies with Asian American and immigrant elders should be replicated to validate the results. In addition, there is a measurement issue. To evaluate depressive symptoms accurately, the measure of depression must be sensitive to variations in the way symptoms are expressed in different Asian groups. A priority in future studies should be the development and validation of culturally appropriate and sensitive measures for use among different ethnic/nationality elderly groups. Despite these limitations, the results reported here point to the use of the GDS Short Forms as easy tools for health and mental health clinicians to utilize in depression screening among elderly Asian immigrants.

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