INTERNATIONAL JOURNAL OF GERIATRIC PSYCHIATRY
Int J Geriatr Psychiatry 2005; **20**: 911–918.
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/gps.1375

Development and initial validation of a 15-item informant version of the Geriatric Depression Scale

Lisa M. Brown[1]* and John A. Schinka[2,3]

[1]*Department of Aging and Mental Health, Florida Mental Health Institute, University of South Florida, FL, USA*
[2]*Haley VA Medical Center, Tampa, FL, USA*
[3]*Department of Psychiatry, University of South Florida, FL, USA*

SUMMARY

Objective To develop a brief informant version of the Geriatric Depression Scale for use in screening for depression in older adults.
Design A scale development and validation study.
Setting Internal medicine and geriatric outpatient clinics located at the James A. Haley Veterans' Medical Center and the University of South Florida Medical Center, Tampa, Florida.
Participants A total of 147 patients (81 females and 66 males) and their adult informants.
Measurements Self and informant versions of the 30-item Geriatric Depression Scale, NEO-FFI, and a health behaviors questionnaire.
Results The 15-item informant version of the GDS was found to have sufficient internal consistency reliability (alpha = 0.86) and retest reliability ($r = 0.81$) to support its use as a clinical instrument. Construct validity was demonstrated by a pattern of correlations with external demographic and personality variables consistent with those of other versions of the GDS, as well as substantive correlations with these other versions. Efficacy of the GDSI-15 was found to be as good as that for the full 30-item informant version of the GDS.
Conclusions The GDSI-15 may be a useful adjunct or alternative to standard screening methods in assessing patients in outpatient settings. Copyright © 2005 John Wiley & Sons, Ltd.

KEY WORDS — depression; GDS; assessment; informant report; aging

INTRODUCTION

Although depressive disorders are among the most common mental health conditions experienced by older adults, clinically significant depression is frequently undetected and untreated in primary care settings, general hospitals, and nursing homes (Lebowitz *et al.*, 1997; Mulsant and Ganguli, 1999). In part, the lack of detection may arise from the fact that health care professionals and patients alike often believe that depression is an expected byproduct of the interpersonal losses, declining functional capability, and medical illnesses that commonly occur with increasing age. Other obstacles in the identification of depressive disorders in older adults in primary care settings are system delivery barriers (e.g. time limited visits, restrictive reimbursement policies), and shortcomings in clinician expertise (e.g. lack of knowledge about differences in young *vs* older adult symptom manifestation and presentation, or management of treatment for a mental disorder). The most critical problem in the identification of depression in the elderly, however, likely lies in patient characteristics: the reluctance to admit depressive symptoms, the social stigma associated with mental illness, the

*Correspondence to: L. M. Brown, Department of Aging and Mental Health, FMHI, 1441, University of South Florida, 13301 Bruce B. Downs Blvd., Florida, USA. Tel: 001 813 974 0098. Fax: 813-974-1968. E-mail: lmbrown@fmhi.usf.edu

Contract/grant sponsor: University of South Florida Internal Awards Program; contract/grant number: 5860-RO48067.

Received 18 January 2005
Accepted 13 April 2005

tendency to report somatic complaints rather than psychological symptoms, the belief that depression is an inevitable, normal consequence of aging, and the preference for medical, not psychiatric, care (US Department of Health and Human Services, 1993).

Attempts to increase the identification of depressive disorders in the elderly have largely focused on the use of self-report scales comprised of items tapping various facets of depression (e.g. changes in cognition and mood, loss of interests). The most commonly used of these scales is the Geriatric Depression Scale (GDS-30), a 30-item scale specifically designed to distinguish between depression and dementia in geriatric patients (Yesavage *et al.*, 1983). The GDS-30 is a well-validated instrument that has gained wide acceptance for use in research as well as in clinical settings (Stiles and McGarrahan, 1998). A 15-item short form of the GDS (GDS-15) was later derived for use with patients where fatigue was an issue and in settings where limited time was a consideration (Sheikh and Yesavage, 1986). Depending upon the cut-off score and the population, the GDS-15 has acceptable sensitivity and specificity that ranges from 79%–100% and 67%–80%, respectively, and has been reported to demonstrate respectable criterion validity in cognitively mixed populations of older adults (Jackson and Baldwin, 1993; Lesher and Berryhill, 1994).

Recognizing the difficulty presented by depressed patients who deny symptoms of depression, an informant version of the GDS-30 was developed by making minor modifications to the sentence stems of each item (Nitcher *et al.*, 1993). In two studies, higher item endorsement rates were found with spouse informant ratings on the GDS-30 informant version (GDSI-30) than on self-report ratings by GDS-30 respondents (Nitcher *et al.*, 1993; Burke *et al.*, 1997) Little subsequent research attention, however, has been paid to the GDSI-30, despite a number of studies suggesting that inclusion of informant information can enhance screening and thus help to overcome many of the barriers hindering detection of psychiatric disorders in older adults (NIH Consensus Statement Update, 1994; Kendler and Roy, 1995; Ready *et al.*, 2002; Tierney *et al.*, 2003). The use of informant ratings, as a supplement to the patient's self-report, provides a structured method that allows clinicians to identify discrepancies between the patient's complaints and those of a spouse or caregiver. Additionally, informant ratings may serve as the only reliable source of information when a patient is unwilling or unable to provide a self-report. Previous research (Burke *et al.*, 1989) has shown that sensitivity and specificity of the self-report version is attenuated in Alzheimer's disease. Thus, the use of informant ratings may be particularly important when conditions such as apathy or cognitive impairment co-occur with depression and further impede clinicians' ability to detect depression by means of clinical interview or a self-report screening instrument.

Reluctance to adopt an informant version of the GDS-30 by clinicians and researchers may result from the time involved in administration (approximately 10 min) and the lack of a shorter 15-item informant version. The objective of this study was to develop and provide initial validation data for a 15-item informant version of the GDS (GDSI-15) for use in both clinical and research settings, either as an adjunctive measure to be used with self-report versions of the GDS or as independent measure of depression.

METHODS

Participants in this IRB-approved study were outpatients, 65 years and older, and their accompanying spouses, relatives, friends, or caregivers, 18 years and older, who served as informants. Voluntary participation was solicited while these patients were being seen at internal medicine or geriatric clinics of a large university medical school or its affiliated VA medical center. To be solicited for study participation, patients had to be accompanied by an adult. Only those patients whose accompanying adults also consented to participate as informants were included in the study. Patients were screened to exclude individuals with a diagnosis of a dementing disorder, psychotic disorder, or significant disability (e.g. vision problems) that would preclude reliable participation. In order to serve as an informant, accompanying adults were required to have extensive personal knowledge about the patient and be able to provide information about the patient's mood, personality, and health behaviors. Patients and informants were paid for participation.

Patients completed self-report versions of the GDS-30, the NEO Five-Factor Inventory (NEO-FFI) (Costa and McCrae, 1992), and a health behaviors questionnaire that addressed demographic information, medical and medication history, self-perception of health status, history and treatment of mental health disorders, attitudes about health care, and routine health behaviors. Research staff assisted patients who had minor disabilities that did not preclude their participation in the study (e.g. arthritis). Accompanying adults independently completed informant versions

of the GDS-30 (GDSI-30), NEO-FFI, and a subset of items on the health behaviors questionnaire dealing with attitudes and routine health behaviors. These activities took place in the clinic waiting room at the time of the appointment. Completion of these instruments took approximately 45 min.

A subsample of informants were also asked to complete a retest administration of the GDS-30. This second administration was mailed to the informant 10–12 days after the initial appointment. All informants who agreed to participate in the retest portion of the study returned completed materials within 21 days of the original appointment.

Statistical analyses included preliminary descriptive and reliability analyses of the GDS-30 and GDSI-30 to examine comparability with previous studies. In selecting items and developing a brief informant version of the GDS, we examined item analysis metrics per the recommendations of Clark and Watson (1995) and as demonstrated in Schinka *et al.* (2005): item means, corrected item-scale correlations, item squared multiple correlations, scale means and variances, and alpha reliability coefficients. The validity of the scale was investigated by examining convergent correlations with the other versions of the GDS and by evaluating the pattern of convergent and discriminant correlations with external demographic and personality variables. This approach to construct validation is particularly well-suited for examination of scales measuring multi-faceted constructs such as depression (Nunally and Bernstein, 1994). On the basis of previous models and studies, we proposed that supportive evidence for the validity of a brief informant version of the GDS would include: (a) a strong ($r > |0.50|$) correlation with the GDSI-30; (b) a correlation with the GDS-15 equivalent to that of the GDS-30 and GDSI-30; (c) small correlations ($r < |0.30|$) with age and education; and (d) a pattern of correlations with informant-rated personality domains consistent with those in previous studies of depression scales (e.g. Morey, 1991): strong correlation with Neuroticism, moderate negative correlation ($|0.30| < r < |0.50|$) with Extraversion, small correlation with Openness, and moderate negative correlations with Agreeableness and Conscientiousness.

To determine factors influencing the rating process, the distribution of GDSI-15 scores was then compared to the 15-item self-report version for the entire sample and in various subgroups of participants defined by treatment status, gender, and familial relationship. Finally, we conducted comparative efficacy analyses of all of the versions of the GDS.

RESULTS

A total of 147 patient-informant dyads participated in the study. The informants for the first 45 patient dyads that were recruited into the study also provided retest GDS ratings. The full sample consisted of 81 (55%) women and 66 (45%) men. Mean patient age was 76.4 years (SD = 6.8); mean years of education was 13.2 (SD = 2.9). The sample was predominantly Caucasian (93.9%), and the majority of patients lived with a family member (63.3% with spouses, 13.3% with children). Fifteen participants were currently in treatment for depression and 18 had previously been treated for depression. The remainder of the sample denied any history of treatment for depression.

Preliminary analyses revealed a mean for the GDS-30 of 6.8 (SD = 6.0) and for the GDSI-30 of 8.3 (SD = 7.3). Alpha coefficients for the 30-item self-report and informant versions were 0.90 and 0.93, respectively. Retest administrations were completed by all 45 informants who had consented to do so. The test–retest correlation for the 30-item informant version was 0.80.

Psychometric characteristics of the 30 items of the informant version of the GDS are presented in Table 1. The range of mean item responses is fairly substantial, ranging from 0.11 to 0.66 ($M = 0.27$). Inter-item relationships are fairly strong, as is represented in a median corrected item-total scale correlation of 0.54 and a median inter-item correlation of 0.31. The pool of items also shows substantial agreement on retest concordance, with an average of 81% (range = 69% to 91%) agreement between ratings at initial assessment and the retest assessment. Average concordance between item ratings on the self-report and informant versions was similarly high ($M = 76\%$, range = 64% to 89%).

In constructing a brief informant version of the GDS, the 15 items that comprise the brief self-report version of the GDS-15 were examined first (see items as identified in Table 1). This version had very similar characteristics to the 30-item version (item $M = 0.25$; median corrected item-total scale correlation of 0.54, median inter-item correlation = 0.31, retest concordance $M = 83\%$, self-report and informant version concordance $M = 75\%$), and produced a scale alpha of 0.86. This version had a quasi-normal distribution ($M = 3.8$, SD = 3.7, median = 2.0). The retest correlation coefficient for the 15 informant-rated items on the initial ratings and the three-week follow-up assessment was 0.81.

The pattern of item characteristics for informant ratings was examined for all items in the 30-item pool

Table 1. Psychometric characteristics of GDSI-30 items

Item	Content	Mean	Corrected item-total correlation	Scale mean if deleted	Scale alpha if deleted	Mean correlation with other items	Re-test concordance	Concordance between self and informant ratings
1*	Basically satisfied with your life	0.12	0.57	8.09	0.923	0.33	91%	67%
2*	Dropped many of your activities and interests	0.38	0.50	7.83	0.923	0.28	76%	64%
3*	Feel that your life is empty	0.16	0.57	8.05	0.923	0.34	82%	72%
4*	Often gets bored	0.33	0.53	7.88	0.923	0.30	78%	82%
5	Hopeful about the future	0.17	0.52	8.04	0.923	0.31	84%	86%
6	Bothered by thoughts . . . get out of your head	0.28	0.61	7.93	0.922	0.35	78%	82%
7*	In good spirits most of the time	0.12	0.48	8.09	0.924	0.28	89%	84%
8*	Afraid something bad . . . happen to you	0.23	0.54	7.98	0.923	0.31	78%	77%
9*	Feel happy most of the time	0.19	0.69	8.02	0.921	0.40	87%	78%
10*	Often feel helpless	0.26	0.66	7.95	0.921	0.38	78%	83%
11	Often get restless and fidgety	0.35	0.56	7.86	0.923	0.31	84%	82%
12*	Prefer to stay at home, rather than . . . out new things	0.41	0.26	7.80	0.927	0.15	78%	77%
13	Frequently worry about the future	0.29	0.47	7.92	0.924	0.27	73%	67%
14*	Feel you have more problems with memory than most	0.29	0.46	7.92	0.924	0.26	82%	61%
15*	Think it is wonderful to be alive now	0.11	0.48	8.10	0.924	0.28	87%	87%
16	Often feel downhearted and blue	0.22	0.66	7.99	0.921	0.38	80%	70%
17*	Feel pretty worthless the way you are now	0.19	0.64	8.02	0.922	0.37	87%	70%
18	Worry a lot about the past	0.16	0.45	8.05	0.924	0.26	76%	82%
19	Find life very interesting	0.46	0.55	7.75	0.923	0.31	76%	73%
20	Hard . . . get started on new projects	0.38	0.55	7.83	0.923	0.31	80%	85%
21*	Feel full of energy	0.66	0.48	7.55	0.924	0.27	84%	69%
22*	Feel that your situation is hopeless	0.12	0.57	8.09	0.923	0.33	80%	71%
23*	Think that most people are better off than you are	0.17	0.62	8.04	0.922	0.35	89%	81%
24	Frequently get upset over little things	0.46	0.49	7.75	0.924	0.27	78%	66%
25	Frequently feel like crying	0.14	0.46	8.07	0.924	0.26	87%	78%
26	Have trouble concentrating	0.28	0.60	7.93	0.922	0.34	84%	86%
27	Enjoy getting up in the morning	0.22	0.41	7.99	0.924	0.24	80%	71%
28	Prefer to avoid social gatherings	0.25	0.33	7.96	0.926	0.19	76%	89%
29	Easy for you to make decisions	0.32	0.50	7.89	0.923	0.29	69%	69%
30	Mind as clear as used to be	0.49	0.59	7.72	0.922	0.33	76%	65%
	Mean	0.27					81%	76%
	Median		0.54			0.31		

*These items comprise the 15-item version of the GDS.

Table 2. Correlation matrix of GDS version scores, demographic characteristics, and NEO-FFI scores

	GDSI-15	GDS-15	GDS-30	GDSI-30
GDS-15	0.55			
GDS-30	0.55	0.94		
GDSI-30	0.95	0.55	0.59	
Age	0.22	0.18	0.13	0.24
Education	−0.12	−0.18	−0.20	−0.16
NEO Self Report—Neuroticism	0.40	0.58	0.66	0.43
NEO Self Report—Extraversion	−0.35	−0.49	−0.48	−0.34
NEO Self Report—Openness	−0.09	−0.12	−0.09	−0.12
NEO Self Report—Agreeableness	−0.27	−0.24	−0.23	−0.25
NEO Self Report—Conscientiousness	−0.36	−0.43	−0.44	−0.35
NEO Informant—Neuroticism	0.70	0.47	0.51	0.78
NEO Informant—Extraversion	−0.54	−0.30	−0.31	−0.57
NEO Informant—Openness	−0.20	−0.17	−0.15	−0.25
NEO Informant—Agreeableness	−0.44	−0.29	−0.27	−0.46
NEO Informant—Conscientiousness	−0.52	−0.26	−0.25	−0.57

to develop 10-, 12-, and 15-item versions that would produce a quasi-normal scale score distribution with an alpha of at least 0.80. Several different iterations of each of these versions were subsequently produced; however, none had better scale characteristics than the version that used the same items that were included in the original version of the GDS-15. The following analyses proceeded to examine this 15-item form of the informant version (GDSI-15).

Table 2 presents the correlations of the GDSI-15 with other versions of the GDS, demographic variables, and the NEO-FFI variables. The correlation of the GDSI-15 with the 30-item informant version was 0.95, equivalent to the correlation between the 15- and 30-item self-report versions of the GDS ($r = 0.94$). The correlation of the GDSI-15 with the GDS-15 (0.55) was essentially equal to that of the GDSI-30 with the GDS-30 (0.59). The pattern of correlations with demographic variables was consistent with that of the 15-item self-report version, showing small (< 0.25) correlations with age and education.

The pattern of correlations of the GDSI-15 version with the informant NEO-FFI ratings was characterized by a strong positive correlation with Neuroticism, a small negative correlation with Openness, and moderate to large negative correlations with Extraversion, Agreeableness, and Conscientiousness. The pattern of GDSI-NEO-FFI informant correlations was also highly similar to that of the 15- item self-report version with the self-report NEO-FFI ratings.

The distribution of GDSI-15 scores was compared to the 15-item self-report version for the entire sample and in various subgroups of participants. Consistent with the findings of prior research (Nitcher *et al.*, 1993), informant scores ($M = 3.78$, $SD = 3.66$) were significantly higher than patient scores ($M = 3.02$, $SD = 2.91$) ($t = 2.86$, $df = 146$, $p < 0.01$). GDSI-15 scores for individuals currently in treatment for depression ($M = 6.20$, $SD = 4.77$) were significantly higher than for individuals who had never been treated ($M = 2.60$, $SD = 2.58$) ($t = 2.14$, $df = 15.99$, $p < 0.05$). There were no gender differences in the GDSI-15 scores ($t = 0.44$, $df = 145$, $p > 0.05$), nor were there differences based on whether the informant was a spouse or other individual ($t = 0.05$, $df = 145$, $p > 0.05$).

Finally, the screening efficacy of the GDS 15-item informant version was examined by examining scores for patients currently in treatment for depression with those who had never been treated for depression, using recommended cutoff scores. Table 3 presents the results of these analyses with comparison data from the GDS 15-item self-report version and the full 30-item self-report and informant versions. A cutoff score of 5 for the GDSI-15, one point higher than the conventional cutoff score for the GDS-15, was found to be optimal. The GDS-15 had efficacy equal to that of the 30-item version. Both informant versions had lower positive predictive power than the corresponding self-report versions, but did not differ from each other in efficacy characteristics. Combining GDSI-15 scores with GDS-30 scores did not improve efficacy beyond that of the GDS-30 alone.

To examine the mechanisms of efficacy for the 15-item self-report and informant versions, scores within the depression subgroups of the sample were examined. These analyses showed that informant scores were not higher than self-report scores for patients being treated for depression ($t = 0.62$, $df = 14$, $p > 0.05$), but were significantly higher for patients

Table 3. Screening efficacy of the GDS

GDS version	Cutoff score	True positive cases	True negative cases	False positive cases	False negative cases	Sensitivity	Specificity	Positive predictive power	Negative predictive power
GDS 30	>9	11	91	23	4	0.73	0.80	0.32	0.96
GDS 30 Informant	>9	9	76	38	6	0.60	0.67	0.19	0.93
GDS 15	>4	10	92	22	5	0.67	0.81	0.31	0.95
GDS 15 Informant	>5	9	84	30	6	0.60	0.74	0.23	0.93

Note: $n = 129$, 15 cases in treatment for depression, 114 cases with no history of treatment for depression.

who had never been treated for depression ($t = 2.79$, $df = 112$, $p > 0.01$). It was hypothesized that these differences might be related to characteristics of the patients; therefore, two subgroups of patients were defined on the basis of the difference between the 15-item informant and self-report scores (informant score minus self-report score < 0, informant score minus self-report score > 0). Although there were no differences on self-report NEO-FFI scores between these two groups, patients whose informants rated them higher on depression had significantly higher informant-rated scores on the NEO-FFI Neuroticism scale ($t = 2.92$, $df = 110$, $p > 0.01$) and significantly lower scores on the NEO-FFI Extraversion ($t = 5.06$, $df = 110$, $p > 0.001$), Agreeableness ($t = 2.90$, $df = 110$, $p > 0.01$), and Conscientiousness ($t = 4.34$, $df = 110$, $p > 0.001$) scales. Thus, in cases in which informants perceived more depressive characteristics in patients, they also perceived more negative aspects of personality.

DISCUSSION

The findings of this study provide initial evidence supporting the reliability and validity of the GDSI-15 as a screening instrument for depressive disorders in older adults. Preliminary analyses of the descriptive and reliability statistics for the 30-item self-report and informant versions of the GDS from the sample of elderly outpatients and their informants yielded results consistent with those of previous studies (e.g. Yesavage *et al.*, 1983; Lesher and Berryhill, 1994), thus providing a foundation against which to evaluate the psychometric characteristics of the GDSI-15, a brief informant version of the GDS. Reliability analyses of the GDSI-15 revealed that it showed internal consistency reliability equivalent to that of both the 30-item GDS and GDSI. Test–retest reliability was found to be equal to that of the longer GDSI-30.

The construct validity of the GDSI-15 was demonstrated by an expected strong correlation with the GDSI-30, similar to that reported for the association of the 15- and 30-item self-report versions (Sheikh and Yesavage, 1986). The correlation with the self-report versions was lower, reflecting differences in method (i.e. self *vs* informant rating), but consistent with that previously reported for the GDSI-30 with the GDS-30 (Nitcher *et al.*, 1993) and with that reported for self-raters and their informant spouses for the NEO Personality Inventory—R depression scale (Costa and McCrae, 1992). Examination of the discriminant and convergent correlations with external variables revealed only the expected small correlations with age and education. The pattern of correlations with personality variables was consistent with those found in previous work on the development of depression measures (Morey, 1991), showing a strong association of GDSI-15 scores with scores on a measure of Neuroticism and negative associations with measures of Extraversion, Agreeableness, and Conscientiousness. The influence of the method of rating (self *vs* informant) was reflected in higher correlations between informant ratings on the GDSI-15 and NEO than for the GDSI-15 and GDS-15.

Additional evidence of the validity of the GDSI-15 was provided by showing that patients being treated for depression had significantly higher scores than those not being treated. As has been shown previously for the GDSI-30 (Nitcher *et al.*, 1993), GDSI-15 scores were significantly higher than 15-item GDS self-report scores. Our data further show that this difference applied only to patients who were not being treated for depression. Gender of patient or of informant did not significantly affect ratings on the GDSI-15.

Stiles and McGarrahan (1998) concluded from their review of the GDS research that the GDS-15 had lower screening efficacy than the GDS-30. Our efficacy results for the GDSI-15 and GDSI-30 parallel those earlier findings, but do show that the GDSI-15 has essentially the same efficacy as the GDS-15. Thus, the GDSI-15 appears to be a suitable alternative when administration of a self-report version of the GDS is not possible.

Among older adults seen in medical settings, undetected depression is not uncommon largely in part to system constraints and patient characteristics. Additionally, patients with dementia may deny depressed mood despite evidence to the contrary. Collateral information that can be used to validate a patient's self-report is useful in situations where the clinician suspects underreporting or denial of mood symptoms. Discrepancies between the informant's report and the patient's self-report can promote valuable discussion between the physician and patient and provide information that guides follow-up and treatment. In primary care settings, the use of the GDSI-15 in addition to the GDS-15 adds little to clinician's burden, as both measures are self administered, brief, simple to score, and easy to interpret. In most situations, an informant can complete the GDSI-15 while the patient is being examined or interviewed. Thus, completion of a GDSI-15 adds no administration time to the five minutes required to administer the self-report version. Additionally, in situations in which the patient is unable or unwilling to provide self-report information, the GDSI-15 provides an alternative means of assessing the patient's mood.

This study, as well as previous research, demonstrated that the abbreviated versions of the GDS have lower efficacy than the full 30-item versions. This is not a surprising result, as psychometric theory clearly shows that full scales are more reliable than their abbreviated forms. The value of short forms and informant versions of screening instruments, however, lies in their application in circumstances that are less than ideal. The 15-item version of the GDS is likely to be more easily accepted by patients and informants and can be scored more quickly by clinical staff. Informant versions may provide the only source of information in cases in which the patient is unresponsive to questions regarding mood or may be denying significant depressive symptoms.

Additionally, some informants will be better able to provide valid data about patients' mood than others. A limitation of this study is that information about factors known to influence response on informant measures and affect collateral source accuracy, such as the quality of the patient-informant relationship, education level, personality traits of the informant, and frequency of informant patient contact, was not obtained. Studies that have examined the relationship between informant characteristics and the ability to identify and report memory problems in patients with mild dementia, have found that informant gender, age, education level, degree of cognitive decline, and depressive symptomatology were predictors of performance accuracy (Logsdon and Teri, 1995; Jorm, 1996; Cacchione *et al.*, 2003). However, when informant reports were used as an adjunct to information obtained from a clinical interview or data from cognitive testing, accuracy in detecting dementia was enhanced.

Other limitations of this study are that 94% of the participants were Caucasian and relatively well educated. Studies that investigated the use of the GDS and GDS-15 in detecting depression in non-Caucasian older adults have found that African-American (Baker *et al.*, 1995) and Mexican-Americans (Baker *et al.*, 1993) underreported depressive symptoms in comparison to endorsement rates of Caucasian elderly. Additional research needs to be conducted to determine if the addition of informant information improves the sensitivity of the GDS in screening for depression in non-Caucasian elderly patients. Examination of its efficacy with cognitively impaired patients, or those with significant loss of vision, is also a critical question. Pending future research, the GDSI-15 holds promise as an informant or proxy measure of depression in epidemiological studies as well as in a variety of clinical settings.

ACKNOWLEDGMENTS

Funding Sources and related paper presentations: This study was supported by the University of South Florida Internal Awards Program under Grant No. 5860-RO48067. Portions of this paper were presented at the Gerontological Society of America, 57th Annual Meeting, November 19-23, 2004, Washington, DC.

The authors thank Claudia Beghe, MD, Bryan Bognar, MD, and Ronald Schonwetter, MD for their assistance with this study.

REFERENCES

Baker FM, Expino DV, Robinson BH, *et al.* 1993. Depression among elderly African Americans and Mexican Americans. *Am J Psychiatry* **150**: 987–988.

Baker FM, Velli SA, Friedman J, *et al.* 1995. Screening test for depression in older Black vs. White patients. *Am J Geriatr Psychiatry* **3**: 43–51.

Burke WJ, Rangwani S, Roccaforte WH, *et al.* 1997. The reliability and validity of the collateral source version of the Geriatric Depression Rating Scale administered by telephone. *Int J Geriatr Psychiatry* **12**: 288–294.

Burke WJ, Houston MJ, Boust SJ, *et al.* 1989. Use of the Geriatric Depression Scale in Dementia of the Alzheimer's type. *J Amer Geriatr Soc* **37**: 856–860.

Cacchione P, Powlishta K, Grant EA, *et al.* 2003. Accuracy of collateral source reports in very mild to mild dementia of the Alzheimer type. *J Am Geriatr Soc* **51**: 819–823.

Clark LA, Watson D. 1995. Constructing validity: basic issues in objective scale development. *Psychol Assess* **17**: 309–319.

Costa PT, McCrae RR. 1992. *Revised NEO Personality Inventory and Five-Factor Inventory Professional Manual*. Psychological Assessment Resources: Odessa, FL.

Jackson R, Baldwin B. 1993. Detecting depression in elderly medically ill patients: the use of the Geriatric Depression Scale compared with medical and nursing observations. *Age Aging* **22**: 349–353.

Jorm AF. 1996 Assessment of cognitive impairment and dementia using informant reports. *Clin Psychol Rev* **16**: 51–73.

Kendler KS, Roy MA. 1995. Validity of a diagnosis of lifetime major depression obtained by personal interview versus family history. *Am J Psychiatry* **152**: 1608–1614.

Lebowitz BD, Pearson JL, Schneider LS, *et al.* 1997. Diagnosis and treatment of depression in late life. Consensus statement update. *JAMA* **278**: 1186–1190.

Lesher EL, Berryhill JS. 1994. Validation of the Geriatric Depression Scale—Short form among inpatients. *J Clin Psychol* **50**: 256–260.

Logsdon RG, Teri L. 1995. Depression in Alzheimer's disease patients: Caregivers as surrogate reporters. *J Am Geriatr Soc* **43**: 150–155.

Morey LC. 1991. *Personality Assessment Inventory.* Psychological Assessment Resources: Odessa, FL.

Mulsant BH, Ganguli M. 1999. Epidemiology and diagnosis of depression in late-life. *J Clin Psychiatry* **6**(S20): 9–15.

NIH Consensus Statement Update. 1994. Diagnosis and treatment of depression in late life. *JAMA* **278**: 1186–1190.

Nitcher RL, Burke WJ, Roccaforte WH, *et al.* 1993. A collateral source version of the Geriatric Depression Rating Scale. *Am Geriatr Psychiatry* **1**: 143–152.

Nunnally JC, Bernstein IH. 1994. *Psychometric Theory*, 3rd edn. McGraw-Hill: New York.

Ready RE, Watson D, Clark LA. 2002. Psychiatric patient and informant reported personality: predicting concurrent and future behavior. *Assessment* **9**: 361–372.

Schinka JA, McBride A, Vanderploeg RD, Tennyson K, Borenstein AR, Mortimer JA. 2005. Florida Cognitive Activities Scale: initial development and validation. *J Int Neuropsychol Soc* **11**: 108–116.

Sheikh JI, Yesavage JA. 1986. Geriatric Depression Scale (GDS): recent evidence and development of a shorter version. *Clin Gerontol* **5**: 165–173.

Stiles PG, McGarrahan JF. 1998. The Geriatric Depression Scale: a comprehensive review. *J Clin Gerontol* **4**: 89–110.

Tierney MC, Herrmann N, Geslani DM, *et al.* 2003. Contribution of informant and patient ratings to the accuracy of the mini -mental state examination in predicting probable Alzheimer's disease. *J Am Geriatr Soc* **51**: 813–818.

US Department of Health and Human Services. 1993. Public Health Service, Agency for Health Care Policy and Research. *Depression in Primary Care*, Vol. 1. Detection and Diagnosis. Rockville, MD: Government Printing Office: AHCPR publication no. 93-0550/1.

Yesavage JA, Brink TL, Rose TL, *et al.* 1983. Development and validation of a geriatric depression screening scale: a preliminary report. *J Psychiatr Res* **17**: 37–49.

