Validating the GDS Depression Screen in the Nursing Home

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Objective: The GDS (Geriatric Depression Scale) has demonstrated validity among ambulatory elderly but is less useful in nursing home (NH) populations, probably because of high rates of cognitive impairment. We, therefore, sought the lowest level of Mini-Mental Status Exam (MMSE) score for which the GDS would remain valid.
Design: Validation Study.
Setting: Nursing Homes in New York City.
Participants: A total of 66 of 168 newly admitted residents to the NH were able to complete psychiatric assessment, undergo an MMSE, and complete the GDS. The psychiatrists and testers (all non-MDs) were blinded to each others' results. Using a cutoff of 10 or greater on the GDS to indicate depression, the GDS's validity (when compared with the psychiatric diagnoses) was sought at ever decreasing levels of cognitive function as measured by the MMSE.
Results: The results of all participants (n = 66) revealed a sensitivity of 63% and a specificity of 83%. When only those with an MMSE score ≥15 (the best cutoff score) were included, 44 (64%) participants were selected, with a sensitivity and specificity of 84% and 91%, respectively.
Conclusions: The two-step procedure of first selecting those with MMSE scores ≥15 and then giving the GDS significantly increases the utility of the GDS in detecting depression in NH residents and should improve the diagnostic process for this widely underdetected problem. **J Am Geriatr Soc 42:490–492, 1994**

Depression is a common and potentially lethal illness that has a prevalence of 13% in community dwelling elderly,[1] 20–35% in the ill elderly,[2] and 13–30% in the nursing home (NH) population.[3] However, depression responds well to treatment with antidepressants, electroconvulsive therapy and/or psychotherapy. In addition, demented patients with concurrent depression also respond to treatment, with up to 85% showing clear evidence of improvement in mood, Activities of Daily Living scores, and family satisfaction.[4]

Depression in the elderly is frequently masked by its overlap with many somatic conditions that distract health care professionals from finding (or looking for) the diagnosis of depression,[5,6] Likewise, the coexistence of dementia and depression in the NH patient frequently confounds the diagnosis of one or both of these disorders.[7–9] Indeed, there are numerous studies showing that the diagnosis of depression is frequently missed both in the NH[10,11] and in the community.[12–14]

In 1983, Yesavage developed the Geriatric Depression Scale (GDS) scale[15] to address this need. Yesavage focused on emotional factors of depression and eliminated the somatic questions that are so ubiquitous with the elderly and thus confound the diagnosis of depression in NH and older patients. The GDS scale has been validated for community dwelling, well elderly, and hospitalized elderly.[16,17] Koenig et al validated the GDS for the first time in hospitalized patients over age 70.[18] However, that study excluded those with Mini-Mental Status Exam (MMSE) scores less than 16 and did not report an average MMSE score for the remainder. Three recent studies concluded that the GDS was not valid for use with demented persons.[19–21]

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Thus, the goal was to find the minimum level of cognitive functioning, as measured by the MMSE, at which the GDS is valid. To determine this cut-off score, a validation study was done in which all new admissions to two large, urban NHs in the Bronx and Manhattan in New York City were screened.

METHOD

Participants and Instruments

Participants Every new admission to two NHs was screened starting 2 weeks after his/her admission but before s/he had been at the NH for 2 months. During a pilot-feasibility phase (7/1/91–11/30/91), admissions into one NH were screened; this validated the process. Thus, we began phase two, which lasted from July 1, 1992 to November 31, 1992. In phase two, all new admissions at the first site (Manhattan), and all those at a second, similar site in the Bronx, were screened. From a total of 166 screened, we selected 66 participants. See Table 1a for a summary of participants' characteristics.

Excluded Participants Patients were excluded if they (1) died within the first 2 months of admission, or (2) were unable to complete all three phases of testing (psychiatric interview, GDS, or MMSE); included in the latter group were those with MMSE scores less than 5 and those with aphasia, severe hearing deficiency, language deficiency, or a combination of the above. Also excluded were (3) those patients not seen by all of the team members within the designated time period and (4) those patients who did not wish to participate in the study.

Instruments

There were three components to the instrumentation.

Psychiatric Assessment During a pilot period, an

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TABLE 1. SUMMARY OF SELECTED CHARACTERISTICS OF NH RESIDENTS

A. Item	Score
Sample Size (n)	66
Ave age (±SD)	83 (±4)
Male/female	19/47
Loci of study	NH
% W/major depression	9%
% W/minor depression depressive symptoms	36%

B.		Psychiatrist A Depression	Psychiatrist A No Depression
Psychiatrist B	Depression	11	0
	No Depression	1	18

K = .93; P < 0.001.

initial series of NH residents was independently assessed by two psychiatrists using the same clinical scale and criteria: (1) major depression, (2) depressive symptoms, and (3) no depression. Both psychiatrists used DSM III-R criteria for major depression and applied their clinical judgment to separate into the two other classes (2 and 3 above) those patients with some symptoms but who did not meet a sufficient number of the formal DSM-III-R criteria for major depression. Analyses of their selections revealed a very high inter-rater reliability: a kappa of .93 (Table 1B). With this reliability level, it was decided that all subsequent patients would have to be seen by only one psychiatrist. All psychiatrists were board certified and had at least 6 years of clinical experience in the long-term care setting.

Each psychiatrist assigned patients to one of three clinical groups: (1) major depression, (2) depressive symptoms, and (3) no depression. For purposes of validating the GDS, those rated as having major depression were combined with those having any degree of depression into a single category of depressed.

GDS The geriatric depression scale is a 30-question yes/no, self-rated depression screen. Virtually all tests were administered through oral interviews by non-MD testers who had been instructed to accept almost any detectible, reproducible indicator of a positive or negative response. Where no response was noted, those patients were classified as unable.

While reports of cutoff points in the literature ranged between 10 and 17 in non-nursing home patients, no specific cutoff point for NH patients was found.[15, 18, 22] A GDS cutoff of 10 was chosen; this is in the range of 10 through 17, which is frequently quoted in literature as appropriate for classifying non-nursing home patients. The object was to find a point consistent with both high sensitivity to minimize false negative results and with high specificity to insure detection of those afflicted with depression.

MMSE The Folstein MMSE was used to assess cognitive function.[23] The full, 30-item scale was used. Variations were largely controlled by careful oral administration by well trained health care professionals, by excluding patients unable to do the testing, and by excluding those who scored 5 or below, where the MMSE is least sensitive. Also, this approach let the researchers combine test administration with the ethical goal of gaining patients' informed consent.

Blinded Testers All testing was completed within a period of 2 weeks to 2 months. The testers and psychiatrists were blinded to each other's results. Thus the independence of the assessment of depression by the psychiatrists and testers was protected. The GDS and MMSE were administered randomly by the non-physician testers; the psychiatric evaluations were also administered randomly.

RESULTS

The Criterion Standard As already noted, the interrater reliability of the diagnoses of depression established in separate interviews by the two psychiatrists yielded a Kappa of .93 ($P < 0.001$) (see Table 1B). Given this high rate of concordance among the initial 30 participants (with only one discrepant ranking), the rest were rated by only one psychiatrist.

The Participants There were 166 new admissions screened. Of these, 42 died or were transferred to the hospital before all evaluations could be done, 27 were unable, 30 were not seen by the psychiatrist in the appropriate time frame, and one refused to participate. Table 1 compares selected personal characteristics of the 66 new admissions who were enrolled in this study. Participants in this study included 47 women (71%) and 19 men (29%); ages averaged 83 ± 4 and ranged from 66 to 97.

Table 2A shows the entire group of 66 (ie, before screening) to have sensitivity and specificity values of 63% and 83%, respectively. Table 2B shows the distribution, sensitivity (84%), and specificity (91%), respectively, of those participants with MMSE scores ≥15.

TABLE 2. SUMMARY OF GDS SENSITIVITY AND SPECIFICITY AT THREE MMSE CUTOFF POINTS

A.	Depression	No Depression
GDS ≥ 10	19	6
GDS ≤ 9	11	30
Total	30	36

Sensitivity = 19/30 = 63%.
Specificity = 30/36 = 83%.

B.	Depression	No Depression
GDS ≥ 10	16	2
GDS ≤ 9	3	21
Total	19	23

Group (n = 42) with MMSE scores ≥15.
Sensitivity = 16/19 = 84%.
Specificity = 21/23 = 91%.

C.	Depression	No Depression
GDS ≥ 10	3	4
GDS ≤ 9	8	9
Total	11	13

Group (n = 48) with MMSE scores ≤14.
Sensitivity = 3/11 = 27%.
Specificity = 9/13 = 69%.

Table 2C shows the remaining group, with MMSE scores of ≤14 and with a sensitivity of 27% and a specificity of 69%.

DISCUSSION

Depression is very common both in the nursing home and in the community. Moreover, it is well known that depression is treatable when identified. This study demonstrated the GDS's ability to detect depression in NH patients who score 15 or more on the MMSE.

Implications of Validation This study has many important implications for policy and practice. These implications are far reaching not only because there are more nursing home patients beds than hospital patients beds but also because many hospital beds are currently filled with NH patients. Thus, most clinicians will encounter increasing numbers of geriatric patients both in the hospital and in the NH. This two step screening system can be applied to a significant portion of new admissions to NH's. While the proportion may vary (based largely on the rate of severe dementia), substantial numbers of admissions can be screened.

By grouping major and minor depression, we can compare the results of this study with other NH-based studies.[9, 11] Most depression research conducted in hospital and community populations has different environmental constraints than that conducted in a NH. Therefore, this distinction of grouping major and minor depression instead of using "just" DSM-III-R criteria alone is necessary because while DSM-III-R criteria are generally used to find major depression (and are used almost exclusively with outpatients), their application may be inappropriate for NH populations. For example, the requirement that four of eight "correct" answers "be found" to make the diagnosis of depression could not be applied in this study. This is because weight loss, decreased appetite, and many other criteria have causes other than depression in NH patients. Moreover, proper administration of DSM-III-R requires the tester to insure that the patient be free of such factors as adjustment disorder (recent change of environment), recent exposure to bereavement (death of a close family member or a friend), and co-morbid diseases. With NH patients, all of these DSM-III-R criteria are difficult to fulfill because these factors are almost always present in NH patients. It is also worthwhile noting that the following concerns affect NH residents' baseline mood and affect: (1) life expectancy of less than 2 years (a feature shared by groups such as those with end-stage AIDS, cancer, or heart disease) and (2) emotional issues such as the right to die and who exercises that right.

This two-step system, by clarifying patient needs, should reduce morbidity and mortality among NH populations. By helping diagnose the problem, this system will help to bring more and better treatment(s) to more NH residents than was heretofore possible.

This study has shown that the GDS' sensitivity can be raised from 63% to 84% by wedding the GDS to the MMSE (Tables 2A, 2B, and 2C). High sensitivity is very important because missing a diagnosis means appropriate treatment may never be given. Specificity (usually a trade-off for sensitivity) is much less important because a false-positive is more easily rectified. As a result of this study, health care providers serving NH populations will now be better able to detect depression. It must be remembered, however, that this system does not solve the problem of diagnosing (or screening for) depression in those with severe dementia.

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