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Screening for depression and assessing change in severity of depression. Is the Geriatric Depression Scale (30-, 15- and 8-item versions) useful for both purposes in nursing home patients?

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The objectives of this study were to determine the ability of the 30-, 15- and 8-item versions of the GDS for screening and assessing change in severity of depression in nursing home patients. The GDS and the MADRS were administered to 350 elderly NH-patients by trained interviewers. The presence of major (MaD) or minor depression (MinD) was evaluated with the Schedules for Clinical Assessment in Neuropsychiatry. Receiver Operator Characteristic (ROC) curves of the GDS-versions were performed to measure the ability to screen on depression. The ability to measure change in severity of depression was measured by differences in mean GDS-scores and mean MADRS-scores between patients with MaD, MinD and no depression, and expressed in terms of effect sizes. It was found that in ROC-curves all three GDS-versions performed well. The MADRS showed larger effect sizes for the differences between MaD, MinD and no depression than the GDS-versions. The effect sizes of the three GDS versions were comparable. We conclude that all three versions of the GDS can be used for screening on depression among NH-patients. The MADRS is superior to the GDS for assessment of (changes in) severity of depression, but the GDS also appears to be an acceptable instrument for this purpose and is less time-consuming.

Keywords: depression; severity; screening; course; GDS; MADRS

Introduction

Depression is a common psychiatric disorder in nursing home patients, with prevalence rates ranging from 6–26% for major depression and from 11–50% for minor depression (Jongenelis et al., 2003). Given the consequences of depression, such as its impact on well-being and the associated excess mortality, disability and healthcare utilisation (Beekman, Deeg, Braam, Smit, & Van Tilburg, 1997; Beekman et al., 2002; Rovner et al., 1991; Smalbrugge et al., 2006; Wells, Steward, & Hays, 1989), accurate and timely diagnosis and treatment are important. However, both recognition and treatment of depression by nursing home staff is reported to be poor (Bagley et al., 2000; Boyle et al., 2004; Rovner, 1993).

For screening purposes, the Geriatric Depression Scale (GDS) has been shown to be a valid and reliable instrument among institutionalized elderly (Gerety, Williams et al., 1994; McGivney, Mulvihill, & Taylor, 1994; Jongenelis et al., 2005; Lesher, 1986; Yesavage et al., 1983). The GDS was developed to be self-administered, but in frail nursing home patients it is frequently administered in an interview (Jongenelis et al., 2007).

Instruments specifically developed to assess the severity of depression and to monitor the effects of treatment include the Montgomery Åsberg Depression Rating Scale (MADRS) (Montgomery & Åsberg, 1979) and the Hamilton Depression Rating Scale (HAM-D) (Hamilton, 1967). In physically ill patients the MADRS proved more reliable than the HAM-D (Hammond, 1998). The MADRS therefore appears to be a more suitable instrument for measuring the severity of depressive symptoms in the nursing home setting. The MADRS is based on interview and observation by trained clinicians.

It would, however, highly facilitate the management of depressive disorders in nursing homes if one instrument could cover both the screening and the assessment of (change in) severity of depression.

The present study compares three GDS-versions (the 30-, 15- and 8-item versions) on their efficacy as a screening device for depression among nursing home patients and it compares these three GDS-versions and the MADRS on their ability to measure (changes in) severity of depression.

Methods

Study population

This study is based on data collected in the Amsterdam Groningen Elderly Depression (AGED) study

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(Jongenelis et al., 2004). Fourteen nursing homes in the north west of the Netherlands were selected to participate. Nursing homes for specific disease categories were excluded, as were small nursing homes (<60 beds). No large reorganization or rebuilding activities were allowed because of possible influence on the mood of the respondents. To be eligible, subjects had to be aged 55 years and over and able to communicate sufficiently, without serious hearing problems or severe cognitive impairment (Mini-Mental State Examination [MMSE] ≥ 15) (Folstein, Folstein, & Mchugh, 1975). All eligible patients were informed verbally and in writing. Written informed consent was obtained from all respondents prior to inclusion. The Medical Ethical Committee of the VU University Medical Center approved the study.

Data were collected between November 1999 and May 2001. All measurements were administrated in a face-to-face interview, lasting between one and three hours, spread over one-to-three interview sessions.

From the source population (696 nursing home patients who met inclusion criteria) eventually an active sample of 350 patients remained who participated in the baseline data-collection (Jongenelis et al., 2004). Fifty-eight patients (8.3%) died before the interview could be started and 46 patients (6.6%) could not be interviewed because they were mentally or physically too ill to be interviewed; 235 patients (33.8%) refused to participate in this study; and 7 patients (1.0%) were not included for other reasons.

Measures

All patients were interviewed using the GDS and the MADRS. The GDS was not self-administered because of the frailty of the respondents. The MADRS was based on observation and interview.

Interviewers were one nursing home physician, two psychologists, one psychotherapist and two registered nurses.

The presence of major depressive disorder (MaD) and minor depression (MinD), used as reference standard for GDS and MADRS (DSM-IV criteria: American Psychiatric Association, 1994), was assessed with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN) by trained interviewers (one nursing home physician, one psychologist, one psychotherapist, one registered nurse) (World Health Organization, 1999).

Due to practical problems during the data-collection, blinding the SCAN-interviewers for GDS score was only possible in a minority of the cases (16%). However, no important differences in results between blinded and non-blinded interviewers were observed.

Demographic characteristics of respondents, including age, gender and level of education, were gathered using a standard questionnaire.

Cognitive functioning was assessed with the MMSE.

Information about the presence of physical illnesses was obtained from the attending physician using a questionnaire containing thirteen main groups of diseases. Functional limitations were measured using the 17 items concerning somatic autonomy of the Sickness Impact Profile 68 (SIP 68: de Bruin, 1996). The SIP was developed for patients with chronic diseases and is also used in nursing home populations (Gerety, Cornell et al., 1994).

Data analyses

Based on the SCAN results, the study-sample was divided into three groups: no depressive disorder, MinD and MaD.

For assessing the screening abilities of the three GDS-versions, the sensitivity and the specificity of the three tested GDS-versions were systematically compared and expressed in terms of the Areas Under the Curve (AUC) derived from Receiver Operator Characteristic (ROC) curves.

To compare the GDS and the MADRS in their ability to measure (changes in) severity of depression, the differences in mean GDS-scores (30-, 15- and 8-item version) and in mean MADRS scores between the three groups (MaD, MinD and no depression) were calculated. The differences in mean scores were also expressed as effect-sizes to facilitate the comparison of their abilities to measure (changes in) severity of depression ($d = \mu 1 - \mu 2/\text{pooled } \sigma$; d = effect size, $\mu 1$ = mean first group, $\mu 2$ = mean second group, σ = standard deviation) (Cohen, 1988). The larger the effect size, the better the instrument is able to measure (change in) severity of depression.

Results

Demographic and clinical characteristics are shown in Table 1. About two thirds of the sample were women; their mean age was 79.3 (SD: 8.3) years. All patients had moderate to severe functional impairments. A major depressive disorder was observed in 8.1% and minor depression in 14.1% of the sample.

Complete SCAN-data, GDS-data and MADRS data were available for 313 patients. The internal consistency of the three used GDS versions and the MADRS was good. Cronbach's alpha was 0.88 for the 30-item GDS; 0.79 for the 15-item GDS; and 0.80 for the 8-item GDS. Cronbach's alpha of the MADRS was 0.85.

In Table 2 the results (area under the curves: AUC) of the ROC curves of the GDS (30-, 15- and 8-item version) are summarized. The differences between the

Table 1. Demographic and clinical characteristics of a sample of nursing home patients in the Netherlands ($n = 350$).

Characteristic	*n*	%
Age (mean: 79.3; SD: 8.3; range: 55–99)		
55–79	169	48.3
80–99	181	51.7
Gender		
Male	109	31.1
Female	241	68.9
Level of education ($n = 348$)		
≤6 years	146	42.0
>6 years	202	58.0
Cognitive functioning (MMSE) (mean: 22.0; SD: 3.8; range 15–30)		
15–23	221	63.1
24–30	129	36.9
Number of physical illnesses ($n = 300$) (mean: 3.7; SD: 1.6; range: 1–9)		
≤3	145	48.3
>3	155	51.7
Functional impairments ($n = 340$)		
Severe	148	43.5
Moderate	192	56.5
Depression (DSM IV) ($n = 333$)		
Major depressive disorder (MDD)	27	8.1
Minor depression (MinD)	47	14.1

Notes: SD = standard deviation; MMSE = Mini-Mental State Examination; DSM IV = Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

Table 2. Area Under the Curves of the GDS (30, 15 and 8 item version) in Receiver Operator Characteric curves for MaD, MinD and no depression.

	MaD	MinD	No depression
AUC GDS-30	0.903	0.799	0.125
(95%CI)	(0.828–0.979)	(0.737–0.861)	(0.076–0.173)
AUC GDS-15	0.896	0.778	0.142
(95%CI)	(0.820–0.971)	(0.714–0.843)	(0.092–0.193)
AUC GDS-8	0.879	0.757	0.164
(95%CI)	(0.800–0.958)	(0.681–0.834)	(0.104–0.223)

AUCs of the GDS-versions for MaD, MinD and no depression are small and well within each others' 95% confidence intervals.

Mean GDS scores (30-, 15- and 8-item version) and mean MADRS scores are shown in Table 3. The differences in mean GDS scores (30-, 15- and 8-item version) and in mean MADRS scores between patients with MaD, MinD and no depression were statistically significant (One way ANOVA: $p < 0{,}001$ for all GDS versions and for the MADRS). Differences in mean GDS scores and mean MADRS scores between patients with MaD and MinD and between patients with MinD and no depression were expressed also in effect-sizes (see Table 4). Effect-sizes of the MADRS for both the difference between MinD and no depression and the difference between MaD and MinD were almost twice the effect-sizes of the three GDS versions (30-, 15- and 8-item version) for these differences. As can be seen, there were no large differences in effect sizes between the three used GDS-versions.

Table 3. Mean MADRS and mean GDS (30-, 15- and 8-item version) scores in patients with MaD, MinD and no depression.

	MaD	MinD	No depression
MADRS: mean (SD)	25.6 (5.2)	16.3 (6.3)	5.1 (5.2)
30-item GDS: mean (SD)	19.9 (5.3)	15.9 (5.4)	10.1 (6.3)
15-item GDS: mean (SD)	9.9 (2.7)	7.4 (3.1)	3.7 (2.7)
8-item GDS: mean (SD)	5.7 (1.8)	4.1 (2.2)	1.7 (1.8)

Notes: MADRS = Montgomery Åsberg Depression Rating Scale; GDS = Geriatric Depression Scale; MaD = major depressive disorder; MinD = minor depression; SD = standard deviation.

Table 4. Effect-sizes of MADRS and GDS (30-, 15- and 8-item version) for the differences between MaD and MinD and between MinD and no depression.

	Effect-size: MaD-MinD	Effect-size: MinD-no depression
MADRS	1.61	1.94
30-item GDS	0.75	0.99
15-item GDS	0.86	1.28
8-item GDS	0.80	1.19

Notes: MADRS = Montgomery Åsberg Depression Rating Scale; GDS = Geriatric Depression Scale; MaD = major depressive disorder; MinD = minor depression.

Discussion

Depression is a common mental disorder among nursing home patients, with considerable negative consequences. Sub-optimal recognition and treatment may be improved by introducing one instrument for screening and for assessment of treatment effects. The present study compared three GDS-versions (30-, 15- and 8-item interview versions) on their efficacy to screen for major and minor depression among nursing home patients and compared these GDS-versions and the MADRS (based on interview and observation) on their ability to measure (changes in) severity of depression among nursing home patients.

The AUCs of the GDS-versions for major depressive disorder, minor depression and no depression were all statistically significant. The shorter versions of the GDS performed less well than the

30-item version, but all GDS-versions can be viewed as acceptable screenings-instruments, based on these data.

Both the MADRS and the GDS-versions showed highly significant differences in mean scores between patients with a major depressive disorder, a minor depression or no depression. As the effect size of the MADRS was considerably larger than the effects sizes of the GDS-versions, the MADRS seems the most appropriate instrument for measuring (changes in) severity of depression and thus for assessment of treatment effects in nursing home patients. But, because the effect sizes of the three GDS-versions were also quite large, using the GDS for assessment of treatment effects in nursing home patients still may well be possible.

Advantages of the GDS, especially of its shorter versions, such as being easier to administer for care personnel and consuming less time than the MADRS, may outweigh the better performance of the MADRS in measuring the severity of depression and are arguments that favor use of the GDS.

In conclusion, the present investigation indicates that in search of one short and simple instrument that can be used both for screening and for assessment of treatment effects in nursing home patients, the GDS may be an acceptable candidate.

Some limitations of the study should be mentioned. One limitation of the present study is that GDS and MADRS were compared with rather broad diagnostic entities: major depressive disorder, minor depression and no depression. The severity of the major depression, for example, was not taken into account.

A second limitation is the generalizability of the results as only a selection of patients on somatic wards could be included. For patients on psychogeriatric wards and for patients with serious cognitive impairment we need other instruments for screening and assessment of severity as well as for diagnosing depression.

If these future studies corroborate our findings, screening and evaluation of treatment of depression could be done by one instrument in patients without severe cognitive impairments and without severe communications problems. This would be an important contribution to the management of depression in nursing home.

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