ELSEVIER

Journal of Affective Disorders 83 (2004) 135–142

JOURNAL OF AFFECTIVE DISORDERS

www.elsevier.com/locate/jad

Prevalence and risk indicators of depression in elderly nursing home patients: the AGED study

K. Jongenelis[a,b,*], A.M. Pot[a,b], A.M.H. Eisses[c], A.T.F. Beekman[a,b], H. Kluiter[c], M.W. Ribbe[a,b]

[a]*Department of Nursing Home Medicine, VU Medical Center, Institute for Research in Extramural Medicine, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands*

[b]*Department of Psychiatry, Amsterdam, The Netherlands*

[c]*Department of Social Psychiatry, University of Groningen, Groningen, The Netherlands*

Received 23 September 2003; received in revised form 9 June 2004; accepted 14 June 2004

Abstract

Background: Depression is a common and disabling psychiatric disorder in later life. Particular frail nursing home patients seem to be at increased risk. Nursing home-based studies on risk indicators of depression are scarce.

Methods: Prevalence and risk indicators of depression were assessed in 333 nursing home patients living on somatic wards of 14 nursing homes in the North West of the Netherlands. Depressive symptoms were measured by means of the Geriatric Depression Scale (GDS). Major and minor depression were diagnosed according to the DSM-IV criteria, sub-clinical depression was defined as a GDS score >10 while not meeting the DSM-V criteria for depression.

Results: The prevalence of major depression was assessed to be 8.1% and the prevalence of minor depression was 14.1%, while a further 24% of the patients suffered from sub-clinical depression. For major depression significant risk indicators were found for pain, functional limitations, visual impairment, stroke, loneliness, lack of social support, negative life events and perceived inadequacy of care. For sub-clinical depression the same risk indicators were found, with the exception of lack of social support.

Limitations: Data were collected cross-sectional.

Conclusions: The prevalence of depression in the nursing home population is very high. Whichever way defined, the prevalence rates found were three to four times higher than in the community-dwelling elderly. Age, pain, visual impairment, stroke, functional limitations, negative life events, loneliness, lack of social support and perceived inadequacy of care were found to be risk indicators for depression. Consequently, optimal physical treatment and special attention and focus on psychosocial factors must be major goals in developing care programs for this frail population.

Keywords: Depression; Prevalence; Risk indicators; Older nursing home patients

* Corresponding author. Department of Nursing Home Medicine, VU Medical Center, Institute for Research in Extramural Medicine, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands. Tel.: +31 20 444 9816; fax: +31 20 444 8387.

E-mail address: k.jongenelis@vumc.nl (K. Jongenelis).

0165-0327/$ - see front matter © 2004 Elsevier B.V. All rights reserved.
doi:10.1016/j.jad.2004.06.001

1. Introduction

Depression is a common and disabling psychiatric disorder in later life. It is well known that depression increases mortality and has a negative impact on the well-being and daily functioning of the elderly (Beekman et al., 2002a,b; Rovner et al., 1991; Wells et al., 1989). In particular, institutionalized elderly people seem to be at increased risk of developing depressive symptoms due to frequently occurring chronic physical illness, a factor that is closely related to depression in old age (Godlove et al., 2000; Gurland et al., 1979; Henderson et al., 1993; Parmelee et al., 1992; Stek et al., 2003).

Among nursing home patients, prevalence rates have been found ranging from 6% to 26% for major depression, from 11% to 50% for minor depression and from 30% to 48% for depressive symptoms, as measured by symptom rating scales (Jongenelis et al., 2003).

Despite its high prevalence, depression remains poorly recognized in the nursing home environment. By implication it is under-treated, whilst there is ample evidence of treatment efficacy (Katz, 1993; Llewellyn-Jones et al., 1999; Rovner, 1993). To enhance detection, an important strategy might be to identify patient characteristics associated with a high risk of depression. Nevertheless, nursing home-based studies on risk indicators of depression are scarce, and the findings are conflicting. For instance, with regard to cognitive impairment and functional limitations, not only positive and negative, but also a lack of associations with depression have been reported. Concerning visual and hearing impairments, both positive associations and an absence of associations with depression have been found (Gerety et al., 1994; Godlove et al., 2000; Henderson et al., 1993; Kay et al., 1987; Parmelee et al., 1989, 1992; Rovner et al., 1991; Rozzini et al., 1996; Shah et al., 1992). Remarkably, in contrast with the findings in community-dwelling elderly, no relationship between depression and gender or age has been found in nursing home-based studies (Gerety et al., 1994; Godlove et al., 2000; Henderson et al., 1993; Rozzini et al., 1996; Schumacher et al., 1997). These results suggest that depression in nursing homes may have a specific profile of risk indicators. In addition to physical health, other, perhaps more social-environmental or care-related factors might be responsible for developing depressive symptoms during nursing home residence. A group that is of special interest consists of patients who have depressive symptoms, without meeting the DSM-IV criteria for depression. It is of clinical importance to identify these patients in order to evaluate their need for special care and treatment.

The increasing number of elderly people in the population will probably lead to an increase in the number of nursing home patients. Insight into the prevalence rates and risk indicators of depression, is therefore, of great importance in order to develop adequate prevention and treatment strategies.

The aim of the present study was to investigate the prevalence of depression, measured with a rating scale and a diagnostic instrument, and to identify risk indicators of depression in the nursing home population.

2. Method

2.1. Sample and procedure

This study is based on data collected in the Amsterdam Groningen Elderly Depression (AGED) study. All nursing homes with both 24 h nursing staff and medical care in the North West of the Netherlands were asked to participate. Nursing homes for patients with specific illnesses (e.g. Huntington, Korsakow, rheumatic diseases) or religion categories were excluded. Also excluded were homes involved in major reorganizations or refurbishing, because of possible influence on the mood of the respondents. As a result, 14 nursing homes representative for all nursing homes in the North West of the Netherlands were included.

To be eligible for participation in the study, residents had to be aged 55 years or over, able to communicate sufficiently in the Dutch language, with no severe cognitive impairment (MMSE $\geq$15) (Folstein et al., 1975). Short admissions, planned to last less than 6 months, were excluded. All eligible patients were informed both verbally and in writing, informed consent was obtained from all respondents

prior to inclusion. There was no significant difference found in sex distribution comparing the AGED data with national data on nursing home patients on somatic wards, but men were slightly older.

The study was approved by the Medical Ethical Committee of the VU Medical Center. Between November 1999 and May 2001, data were collected by trained interviewers. All measurements were administered in face-to-face interviews, lasting between 1 and 3 h, spread over one to three interview sessions. Data concerning physical illness and disability were also obtained from the attending physician and the nursing staff.

2.2. Measurements

Depression was measured using the Geriatric Depression Scale (GDS) (Yesavage et al., 1983) and the Schedule of Clinical Assessment in Neuropsychiatry (SCAN) (World Health Organization, 1992). The GDS is a, 30-item questionnaire, specifically developed for the elderly. The instrument has been found to be reliable and valid in multiple settings and has also been recommended for use in the nursing home population (McGivney et al., 1994; Gerety et al., 1994; Lesher, 1986). In accordance with the original cut-off point, in this study a score >10 was considered to be indicative of clinically relevant depression.

The SCAN is a semi-structured diagnostic interview that generates diagnoses of major and minor depression according to the DSM-IV (research) criteria (American Psychiatric Association, 1994). Sub-clinical depression was defined as GDS scores >10 while not meeting the DSM-IV criteria for major or minor depression.

The following *demographic characteristics* were gathered by means of a standard questionnaire: age, gender, partner status, widowhood, level of education, level of urbanization of the residence, religious affiliation and length of stay in the nursing home.

Cognitive functioning was assessed with the MMSE (Folstein et al., 1975). Sum scores <24 were taken to indicate the presence of cognitive impairment.

Information about the presence of *physical diseases* was obtained from the attending physician, using a questionnaire concerning questions about 13 main groups of disorders, such as for example cardiovascular diseases, pulmonary diseases and neurological diseases. The number of main groups was dichotomized at the median.

Visual and hearing acuity were assessed by means of a standard questionnaire and by observations made during the interview. The scores were dichotomized: no visual impairment versus visual impairment including blindness, and no hearing impairment versus hearing impairment.

Perceived *pain* was measured according to the eight items concerning pain in the Nottingham Health Profile and *functional limitations* were measured according to the 17 items concerning activities of daily living in the somatic autonomy scale of the Dutch version of the Sickness Impact Profile 68. Both scales were embedded in an instrument for measuring quality of life that was specifically developed for nursing home patients (van Campen et al., 1997). The sum scores were dichotomized at the median.

Loneliness was measured according to the 11-item Loneliness Scale, developed for the elderly (de Jong Gierveld et al., 1999). As recommended the by the authors, a cut-off score of 3 was used to distinguish between lonely and not lonely.

Social support was assessed with the SSL12-I questionnaire, a scale consisting of 12 items developed and validated in the Netherlands, for use in the elderly (van Eijk et al., 1994). Dichotomization of sum scores was carried out at the median.

Negative life events were inquired about in a single question with a yes/no response format.

Perceived adequacy of care was measured according to a five-item scale derived from a Dutch Quality of Life scale designed specifically for older nursing home patients (NIVEL report).

2.3. Analysis

A bivariate analysis, using contingency tables, was first carried out to compare demographic, functional and health related correlates in patients with and without sub-clinical depression, and in patients with and without clinical depression (major or minor) according to the formal DSM-IV (research) diagnosis. The odds ratios, with their 95% confidence limits (CI) were calculated to determine the significance of the correlated factors. Subsequently, a stepwise multi-

variate logistic regression analysis was performed to identify characteristics independently associated with sub-clinical, major and minor depression. To be included in the multivariate model, variables had to show a statistically significant association in bivariate analysis.

3. Results

The source population for this study consisted of 1422 nursing home patients. Of these, 350 patients were finally included in this study (see Fig. 1).

Demographic characteristics are shown in Table 1.

The overall point prevalence for GDS scores >10 was estimated at 44.3%. In terms of diagnostic categories, the prevalence of sub-clinical depression was 24.0%, for minor depression the prevalence was 14.1% and for major depression it was 8.1% (see Table 2). Demographic, health and psychosocial associations with sub-clinical depression, minor and major depression found in bivariate analysis are summarized in Table 3.

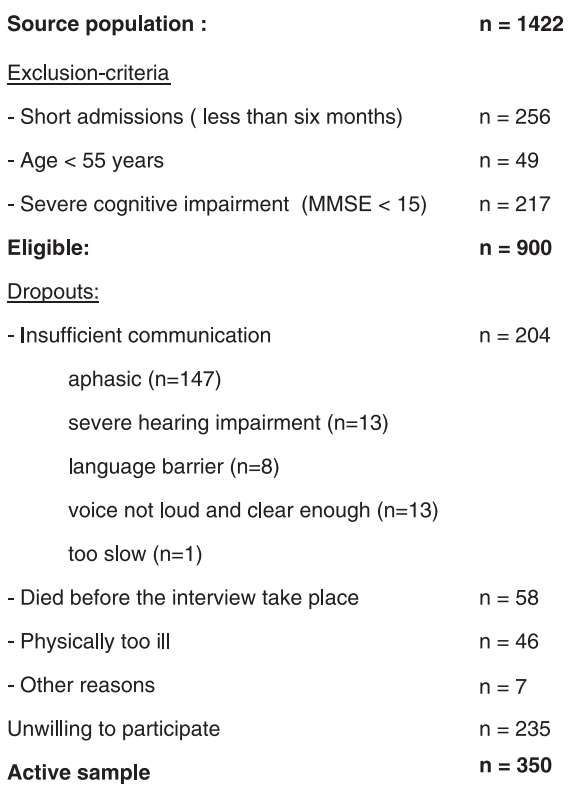

Fig. 1. Dropouts in the AGED study.

Table 1
Characteristics of the nursing home participants in the AGED study (n=350)

Characteristic		n	%
Age (mean 79.4 S.D.* 8.3)	55–79	169	48
	80–99	181	52
Gender	Male	109	31
	Female	241	69
Partner status	Partner	103	29
	No partner	247	71
Widowhood	Yes	196	56
	No	154	44
Level of education	Low (≤6 years)	146	42
	Intermediate/high (>6 years)	202	58
Urban area nursing home	Medium/densely urbanized	258	74
	Very densely urbanized	92	26
Religious affiliation	Yes	191	55
	No	157	45
Length of stay	≤1 year	141	40
	>1 year	209	60
Cognitive functioning (mean 21.9, S.D. 3.8)	Mild dysfunction (MMSE† 15–23)	221	63
	No dysfunction (MMSE† >23)	129	37

* S.D., standard deviation.
† MMSE, mini-mental state examination.

Except for the association of age with sub-clinical (OR=1.99, 95% CI=1.16–3.40) and minor depression (OR=1.95, 95% CI=1.02–3.75), none of the demographic factors were significantly associated with depression. No difference in cognitive functioning was found between patients with or without depression, whichever way defined.

Pain, although in major depression not significant, (OR=2.76, 95% CI=1.58–4.79, respectively, OR=2.25, 95% CI=0.97–5.16), functional limitations, although only borderline significant in sub-clinical depression, (OR=1.70, 95% CI=1.00–2.90 and OR=3.24, 95% CI=1.37–7.61), visual impairment (OR=2.33, 95% CI=1.17–4.24 and OR=3.39, 95% CI=1.43–8.38), stroke (OR=2.48, 95% CI=1.40–4.37 and OR=4.02, 95% CI=1.50–10.43) and recent negative life event (OR=1.80, 95% CI=1.16–2.80 and OR=2.71, 95% CI=1.13–6.53), were found to be associated with both sub-clinical

Table 2
Prevalence of sub-clinical*, major and minor depression in nursing home patients according to age and gender

Age (years)	Men				Women				Total sample			
	n	Sub-clinical depression *n* (%)	Minor depression *n* (%)	Major depression *n* (%)	*n*	Sub-clinical depression *n* (%)	Minor depression *n* (%)	Major depression *n* (%)	*n*	Sub-clinical depression *n* (%)	Minor depression *n* (%)	Major depression *n* (%)
55–64	8	4 (50.0)	1 (12.5)	–	12	3 (25.0)	2 (16.7)	–	20	7 (35.0)	3 (15.0)	–
65–79	55	13 (24.5)	14 (26.4)	2 (3.8)	94	28 (31.8)	11 (12.5)	6 (6.8)	149	41 (29.1)	25 (17.7)	8 (5.7)
80–99	46	10 (23.3)	4 (9.3)	5 (11.6)	135	22 (17.1)	15 (11.6)	14 (10.9)	181	32 (18.6)	19 (11.0)	19 (11.0)
Total†	109 (104)	27 (26.0)	19 (18.3)	7 (6.7)	241 (229)	53 (23.1)	28 (12.2)	20 (8.7)	350 (333)	80 (24.0)	47 (14.1)	27 (8.1)

* Sub-clinical depression was defined as GDS≥11 and no clinical depression according to DSM-IV (research) criteria.
† Due to missing data, prevalence rates of minor and major depression conform DSM-IV criteria were estimated on *n*=333.

and major depression in bivariate analysis. Lack of social support (OR=3.42, 95% CI=1.37–8.44) was found to be associated with major depression. Perceived inadequacy of care (OR=2.34, 95% CI=1.35–4.04 and OR=2.70, 95% CI=1.53–4.75) and loneliness (OR=3.44, 95% CI=1.90–6.21, OR=4.52, 95% CI=2.06–9.90, OR=13.37, 95% CI=308–58.15), were found to be associated with all three outcomes of depression in bivariate analysis. Remarkably, minor depression was besides loneliness only found to be associated with age below 80 (OR=1.95, CI=1.02–3.75).

In multivariate analysis (see Table 4) pain, visual impairment, stroke and loneliness remained

Table 3
Bivariate risk indicators of sub-clinical, minor and major depression in older nursing home patients (AGED study)

Risk indicators	*n*	Sub-clinical depression (%)	OR	95% CI	*n*	Minor depression (%)	OR	95%CI	*n*	Major depression %	OR	95% CI
Age <80 years	125	38.4	1.99	1.16–3.40	105	26.2	1.95	1.02–3.75	85	9.4	0.56	0.23–1.34
Female gender	181	29.3	0.78	0.44–1.37	156	17.9	0.59	0.30–1.14	148	13.5	1.14	0.45–2.86
No partner	180	28.3	0.68	0.39–1.19	162	20.4	0.91	0.45–1.85	151	14.6	1.70	0.61–4.75
Widowhood	142	26.8	0.65	0.35–1.11	131	20.6	0.97	0.51–1.86	121	14.0	1.23	0.53–2.83
Low education	111	36.0	1.51	0.89–2.56	92	22.8	1.22	0.64–2.33	80	11.3	0.75	0.32–1.77
Densely urbanized area	64	32.8	1.13	0.62–2.06	57	24.6	1.34	0.66–2.70	53	18.9	1.86	0.79–4.36
No religious affiliation	113	32.7	1.17	0.69–1.98	102	25.5	1.68	0.88–3.20	89	14.6	1.25	0.56–2.83
Institutionalized >1 year	159	28.9	0.79	0.46–1.35	138	18.1	0.66	0.35–1.27	128	11.7	0.73	0.32–1.65
Physical co-morbidity >3	119	34.5	1.41	0.80–2.46	98	20.4	1.18	0.58–2.40	91	14.3	1.54	0.62–3.80
Cognitive dysfunction	156	30.1	0.92	0.54–1.57	140	22.1	1.24	0.63–2.44	128	14.8	1.53	0.63–3.67
Pain	131	41.2	2.76	1.58–4.79	99	22.2	1.17	0.61–2.22	94	18.1	2.25	0.97–5.16
Functional limitations	109	37.6	1.70	1.00–2.90	85	20.0	0.92	0.47–1.79	86	20.9	3.24	1.37–7.61
Visual impairment	48	45.8	2.33	1.17–4.24	35	25.7	1.39	0.60–3.21	36	27.8	3.39	1.43–8.38
Hearing impairment	22	31.8	1.06	0.42–2.72	18	16.7	0.75	0.21–2.69	18	16.7	1.37	0.37–5.07
Stroke	97	42.3	2.48	1.40–4.37	73	23.3	1.52	0.74–3.11	71	21.1	4.02	1.5–10.43
Loneliness	147	41.5	3.44	1.90–6.21	124	30.6	4.52	2.06–9.90	111	22.5	13.37	3.08–58.15
Lack of social support	121	51.5	1.20	0.71–2.03	110	26.4	1.93	0.99–3.73	101	19.8	3.42	1.37–8.44
Recent negative life event	174	52.9	1.80	1.16–2.80	112	25.9	1.84	0.96–3.56	102	18.6	2.71	1.13–6.53
Perceived inadequacy of care	118	39.8	2.34	1.35–4.04	98	27.6	2.12	1.10–4.10	91	22.0	4.27	1.71–10.62

Depressive symptoms, *n*=350; minor and major depression, *n*=333 were compared each with the group that scored negative on both GDS and SCAN. Sub-clinical depression was defined as GDS≥11 and no clinical depression according to DSM-IV (research) criteria. Due to missing data risk indicators of minor and major depression conform DSM-IV criteria were estimated on *n*=333. OR, odds ratio; CI, confidence interval.

Table 4
Multivariate risk indicators of sub-clinical*, minor and major depression in nursing home patients n=333

Risk indicators	Sub-clinical depression (n=80)		Minor depression (n=47)		Major depression (n=27)	
	OR	95% CI	OR	95% CI	OR	95% CI
Age >80	0.35	0.35–0.18–0.68	–	–	–	–
Female gender	–	–	–	–	–	–
Cognitive dysfunction	–	–	–	–	–	–
Pain	2.68	1.41–5.10	–	–	3.84	1.24–11.90
Functional limitations	–	–	–	–	–	–
Visual impairment	2.83	1.29–6.22	–	–	4.93	1.43–16.90
Stroke	2.35	1.25–4.43	–	–	4.93	1.62–15.04
Presence of loneliness	3.38	1.72–6.63	4.52	2.06–9.90	22.32	2.55–195.66
Lack of social support	–	–	–	–	3.32	1.01–10.94
Recent negative life event	–	–	–	–	–	–
Perceived inadequacy of care	–	–	–	–	–	–

OR, odds ratio; CI, confidence interval.

* Sub-clinical depression was defined as GDS ≥11 and no clinical depression according to DSM-IV (research) criteria. Due to missing data risk indicators of minor and major depression conform DSM-IV criteria were estimated on n=333.

significant risk indicators for both sub-clinical and major depression.

4. Discussion

This study investigated the prevalence and risk indicators of depression in older people residing in nursing homes in the Netherlands. The results confirm the previously reported high prevalence of depression in this frail population. In the present study the prevalence of major depression and minor depression was found to be 8.1% and 14.1%, respectively, while a further 24% of the patients had significant depressive symptoms but no diagnosis of depression according to the DSM-IV (research) criteria. This implies that 46.2% of the elderly nursing home residents are suffering from some type of depression. Whichever way defined, the prevalence rates were approximately three to four times higher than those found in the majority of earlier community-based studies of elderly people.

With regard to factors associated with depression, the following risk indicators were found: age below 80 years, visual impairment, stroke, functional limitations, recent negative life events, lack of social support, loneliness and perceived inadequacy of care. No association was found for mild or moderate cognitive impairment.

The strength of the present study is that depression was assessed in a well-defined sample of nursing home residents by means of a symptom rating scale and a diagnostic tool. Although time-consuming, this makes it possible to compare the results obtained by both methods and enhances comparison of the results with the findings of previous studies.

The study also has some limitations. Firstly, in line with previous studies, there are a considerable number of dropouts due to severe physical illness and cognitive dysfunction, insufficient communication and refusal. It can be hypothesized that for people who are aphasic there is a higher risk of developing depressive symptoms because of their inability to communicate and express their complaints and feelings. Moreover, since depressed elderly may be more strongly opposed to the intrusion of a research interviewer, it seems quite possible that depression may be even more prevalent among patients who are unwilling to participate. As a consequence, the prevalence rates found are likely to underestimate the true prevalence rates of depression in this setting. Possibly, research on depression using observation scales instead of face-to-face interviews in this setting is more suitable for this very frail population.

Secondly, because cross-sectional data were used, the possibility can not be excluded that this group was already depressed and in need of care, before admission to the nursing home and it is not possible to specify any causal relationship between the risk

indicators found and depression. Finally, because the risk indicators of major and minor depression were not found to be equal, we were not able to lump these together on order to diminish the power problem.

Given the above limitations, the results demonstrate that depression is an important health problem in the elderly nursing home population.

In contrast with findings in elderly in the community, no association was found between (sub-clinical) depression and gender or cognitive impairment. Moreover, a negative association was found for older age and depression, whereas in previous studies no association was found.

Health related factors like pain, visual impairment, stroke and functional limitations appeared to be associated consistently with both sub-clinical and major depression in bivariate analysis. In perspective of the finding that in community-dwelling elderly, people with sub-threshold depression, are clearly at risk of developing DSM-IV affective disorders (Beekman et al., 2002a,b), adequate treatment of pain, visual impairment stroke and functional limitations should be given special attention in the group of patients with depressive symptoms but no formal diagnosis of depression.

Remarkably, no association between health related factors and minor depression was found in contrast with psychosocial and care-related factors like negative life events, loneliness and perceived inadequacy of care, factors that were consistently associated with depression whichever way defined in bivariate analysis.

The regression analysis that was applied to identify the independent major risk indicators of depression shows that besides the health related factors, loneliness plays a prominent role. This finding is in line with previous findings in the community and the community-dwelling oldest old and suggests that lonely patients in particular, need to be screened for depression. Prevention of loneliness should be a major goal in developing a care program also for patients a nursing home setting.

In conclusion, depression appears to be a major health problem among elderly nursing home patients. The results of this study emphasize the major importance of optimal physical treatment and care for patients with pain, visual impairment and stroke. Furthermore, special attention and care must focus on psychosocial factors such as loneliness, recent negative life events, lack of social support and perceived inadequacy of care. Given the enormous number of patients involved, there is a need for further research to develop intervention and management strategies for depression that is specifically tailored to meet the needs of the frail nursing home population.

Acknowledgments

The AGED study was primarily funded by the Netherlands Organization for Scientific Research (NWO; grant number 94033041). Additional financial support by Lundbeck B.V. was gratefully acknowledged.

References

American Psychiatric Association, 1994. Diagnostic and Statistical Manual of Mental Disorders. (fourth ed.) (Washington).

Beekman, A.T.F., Penninx, B.W.J.H., Deeg, D.J.H., de Beurs, E., Geerlings, S.W., van Tilburg, W., 2002. The impact of depression on the well-being, disability and use of services in older adults: a longitudinal perspective. Acta Psychiatr. Scand. 105, 20–27.

Beekman, A.T.F., Geerlings, S.W., Deeg, D.J.H., Smit, J.H., Schoevers, R.S., de Beurs, E., Braam, A.W., Penninx, W.J.H., van Tilburg, W., 2002. The natural history of late-life depression: a 6-year prospective study in the community. Arch. Gen. Psychiatry 59, 605–611.

de Jong Gierveld, J., van Tilburg, T., 1999. Manual of the Loneliness Scale. Department of Social Research Methodology, VU University Hospital, Amsterdam.

Folstein, M.F., Folstein, S.E., McHugh, P.R., 1975. Mini-mental state. A practical method for grading cognitive state of patients for the clinician. J. Psychiatr. Res. 12, 189–198.

Gerety, M.B., Williams Jr., J.W., Mulrow, C.D., Cornell, J.E., Kadri, A.A., Rosenberg, J., Chiodo, L.K., Long, M., 1994. Performance of case-findings tools for depression in the nursing home: influence of clinical and functional characteristics and selection of optimal threshold scores. J. Am. Geriatr. Soc. 4, 1103–1109.

Godlove, M.C., Challis, D., Sutcliffe, C., Bagley, H., Burns, A., Huxley, P., Cordingley, L., 2000. Psychiatric symptomatology in elderly people admitted to nursing and residential homes. Ageing Mental Health 4 (2), 136–141.

Gurland, B.J., Cross, P., Delfiguerido, J., et al., 1979. A cross-national comparison of the institutionalised elderly in the cities of New York and London. Psychol. Med. 9, 781–788.

Henderson, A.S., Jorm, A.F., Mackinnon, A., Christense, H., Scott, L.R., Korten, A.E., Doyle, C., 1993. The prevalence of depressive

disorders and the distribution of depressive symptoms in later life: a survey using draft ICD-10 and DSM-III R. Psychol. Med. 23, 719–729.

Jongenelis, K., Pot, A.M., Eisses, A.M.H., Beekman, A.T.F., Kluiter, H., van Tilburg, W., Ribbe, M.W., 2003. Depression among older nursing home patients: a review. Tijdschr. Gerontol. Geriatr. 34, 52–59.

Katz, I.R., 1993. Drug treatment of depression in the frail elderly; discussion of the NIH consensus development conference on the diagnosis and treatment of depression in late life. Psychofarmacol. Bull. 29 (1), 101–108.

Kay, D.W.K., Holding, T.A., Jones, B., Littler, S., 1987. Psychiatric morbidity in Hobart's dependent aged. Aust. New Zealand J. Psychiatry 21, 463–475.

Lesher, E.L., 1986. Validation of Geriatric Depression Scale among nursing home residents. Clin. Gerontol. 4, 21–28.

Llewellyn-Jones, R.H., Baikie, K.A., Smithers, H., Cohen, Snowdon, J., Tennant, C.C., 1999. Multifaceted shared care intervention for later life depression in residential care: randomised controlled trial. Br. Med. J. 319, 676–682.

McGivney, S.A., Mulvihill, M.M., Taylor, B., 1994. Validating the GDS depression screen in the nursing home. J. Am. Geriatr. Soc. 42, 490–492.

Parmelee, P.A., Katz, I.R., Lawton, M.P., 1989. Depression among institutionalised aged: assessment and prevalence estimation. J. Gerontol. Med. Sci. 44, M22–M29.

Parmelee, P.A., Katz, I.R., Lawton, M.P., 1992. Incidence of depression in long-term care settings. J. Gerontol. 47 (6), M189–96.

Rovner, B.W., 1993. Depression and increased risk of mortality in the nursing home patient. Am. J. Med. 5A, 19S–22S.

Rovner, B.W., German, P.S., Brant, L.J., Clark, R., Burton, L., Folstein, M.F., 1991. Depression and mortality in nursing homes. J. Am. Med. Assoc. 265, 993–996.

Rozzini, R., Boffeli, S., Franzoni, S., Frisoni, G.B., Trarucchi, M., 1996. Prevalence and predictors of depressive symptoms in a nursing home. Int. J. Geriatr. Psychiatry 11 (7), 629–634.

Schumacher, J., Zedlick, D., Frenzel, G., 1997. Depressivitaet und kognitive beeintrachtigungen bei altenpflegeheim-bewohnern. Z. Gerontol. Geriatr. 30 (1), 46–53.

Shah, A., Phongsathorn, V., George, C., Bielawska, C., Katona, C., 1992. Psychiatric morbidity among continuing care geriatric inpatients. Int. J. Geriatr. Psychiatry 7, 517–525.

Stek, M.L., Gussekloo, J., Beekman, A.T.F., van Tilburg, W., Westendorp, R.G.J., 2003. Prevalence, correlates and recognition of depression in the oldest old: the Leiden 85-plus study. J. Affect. Disord. 78 (3), 193–200.

van Campen, C., Kerkstra, A., Taes, C.G.J., 1997. The Assessment of Perceived Quality of Life in Older Nursing Home Patients. NIVEL, Utrecht.

van Eijk, L.M., Kempen, G.I.J.M., van Sonderen, F.L.P., 1994. A short scale for measuring social support in the elderly: the SSL12-I. Tijdschr. Gerontol. Geriatr. 25, 192–196.

Wells, K.B., Stewart, A., Hays, R.D.S., 1989. The functioning and wellbeing of depressed patients: results from the medical outcomes study. J. Am. Med. Assoc. 262, 914–919.

World Health Organization, 1992. SCAN, Schedules for Clinical Assessment in Neuropsychiatry. WHO, Geneva.

Yesavage, J., Brink, T., Rose, T., Lum, O., Huang, V., Adey, M., Leirer, V., 1983. Development and validation of a Geriatric Depression Scale: a preliminary report. J. Psychiatr. Res. 17, 37–49.