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# The Association Between Loneliness and Psychiatric Symptomatology in Older Psychiatric Outpatients

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Natasja Schutter, MD<sup>1</sup> , Tjalling J Holwerda, MD, PhD<sup>2</sup>, Hanna Kuipers, MSc<sup>3</sup>, Rien H. L. Van, MD PhD<sup>4</sup>, Max L. Stek, MD PhD<sup>5</sup>, Hannie C. Comijs, PhD<sup>5</sup>, Jaap Peen, PhD<sup>6</sup>, and Jack J M. Dekker, PhD<sup>6,7</sup>

## Abstract

**purpose:** Loneliness in adults increases with age. Although loneliness has been found to be associated with psychiatric disorders and dementia, no information is available on prevalence of loneliness in older psychiatric patients. The aims of this study were to examine prevalence of loneliness in older psychiatric outpatients, including gender differences and associations with psychiatric disorders and social isolation.

**Methods:** Cross-sectional study in an outpatient clinic for geriatric psychiatry between September 2013 and February 2018. Interviews were done in 181 patients.

**Results:** 80% of participants were lonely. Loneliness was associated with having contacts in less social network domains, in women but not in men. There were no associations with DSM-IV-TR-classifications. However, loneliness was associated with higher scores on questionnaires for depression and cognitive function. Intensity of treatment did not differ significantly between lonely and non-lonely participants.

**Conclusion:** Loneliness is highly prevalent in older psychiatric outpatients, with men and women equally affected. Loneliness should be assessed in all older psychiatric patients, especially when they show high scores on symptom checklists or have a restricted social network.

## Keywords

loneliness, older adults, psychiatric symptoms, social network

## Background

Loneliness is a condition of great concern in older adults in Western society, since prolonged loneliness can lead to depression, suicide and cognitive deterioration, as well as health problems and mortality.<sup>1-7</sup> Reported prevalence of loneliness in older adults vary between 20 and 40 %, and between 5 and 7 % for intense loneliness.<sup>8</sup> A recent meta-analysis calculated a pooled prevalence of 28.5%.<sup>9</sup> The prevalence of loneliness in adults appears to increase with age.<sup>10,11</sup> However, no information is available on the prevalence of loneliness among older psychiatric patients.

A common definition of loneliness is: ‘a negative psychological state occurring from a lack of quality relationships’.<sup>1</sup> An important feature of loneliness is that it concerns a subjective experience resulting from a discrepancy between the desired and achieved levels of social relations.<sup>12</sup>

The absence of interactions with a social network, or social isolation, is related to loneliness, although social

<sup>1</sup>Department of Geriatric Psychiatry, Arkin Mental Health Care, Amsterdam, Netherlands

<sup>2</sup>Department of Psychiatry, Arkin Mental Health Care, Amsterdam, Netherlands

<sup>3</sup>Department of Psychiatry, Amici Zorgt, Heerhugowaard, Netherlands

<sup>4</sup>Department of General Psychiatry Residency Training/Netherlands Psychoanalytical Institute, Arkin Mental Health Care, Amsterdam, Netherlands

<sup>5</sup>GGZ InGeest/Department of Psychiatry and the Amsterdam Public Health Research Institute, VU University Medical Center, Amsterdam, Netherlands

<sup>6</sup>Department of Clinical Research, Arkin Mental Health Care, Amsterdam, Netherlands

<sup>7</sup>Department of Psychology, VU University, Amsterdam, Netherlands.

## Corresponding Author:

Natasja Schutter, Department of Geriatric Psychiatry, Arkin Mental Health Care, Nieuwe Kerkstraat 156, Amsterdam 1018 VM, Netherlands.

Email: [natasja.schutter@arkinoudereren.nl](mailto:natasja.schutter@arkinoudereren.nl)

isolation appears to be a distinct concept.<sup>1,2,11</sup> Social isolation can be conceptualized in different ways, such as having a small social network, having infrequent contact with network members or living alone.<sup>13</sup> The interrelation between social isolation and loneliness is equivocal: a person with a small social network need not to be lonely, and a person with a large number of social contacts can still feel lonely.<sup>11</sup>

Loneliness has been found to be associated with depression.<sup>14-20</sup> For instance, loneliness is a risk factor for the development of depression,<sup>19</sup> just as depression is a risk factor for the development of loneliness.<sup>18</sup> A recent meta-analysis underscores the effect of loneliness on depression.<sup>21</sup> These studies suggest that loneliness is an independent risk factor for depressive symptoms, with Odds Ratios as high as 12.4 in a cross-sectional survey of participants aged 65 years and over.<sup>22</sup> However, loneliness also appears to be associated with other psychiatric disorders and with degenerative neurocognitive disorders. Several studies showed associations between loneliness and anxiety disorders,<sup>15</sup> schizophrenia,<sup>23,24</sup> psychosis,<sup>25,26</sup> obsessive-compulsive disorders,<sup>15</sup> autism<sup>27</sup> and dementia.<sup>28</sup> Levels of loneliness were higher in adults with these disorders compared to healthy controls, with figures for loneliness in schizophrenia as high as 80%.<sup>23</sup> These studies were either conducted in the general population<sup>15,28</sup> or in a group of younger adults,<sup>23-26</sup> emphasizing the importance of examining loneliness in older psychiatric patients, since loneliness might be more prevalent in this population than in the general population.

An interesting aspect is the role of gender. Previous studies demonstrated conflicting results, from no difference in loneliness levels between men and women<sup>2,13,29</sup> to more loneliness in women.<sup>4</sup>

Loneliness has been found to be associated with increased frailty, with a relative risk as high as 1.85.<sup>30</sup> Because both frailty and loneliness are associated with depression,<sup>31</sup> frailty might be a factor to take into account in the association between loneliness and depression.

In previous studies, loneliness appeared to be associated with the development of depression and dementia in older adults.<sup>18,19</sup> However, little research has been done to investigate loneliness in older adults who already suffer from psychiatric disorders or dementia. We only found one study in an older psychiatric population.<sup>32</sup> In this Mexican study, no association was found between loneliness scores and specific psychiatric diagnoses, including dementia. Additionally, one study examined a group of middle aged and older adults that suffered from severe mental illness and found high levels of loneliness and depression.<sup>20</sup>

## Purpose

This paucity of research led us to perform an explorative study to disentangle the associations between loneliness

and depression, anxiety and degenerative neurocognitive disorders, and between loneliness and different variables of social isolation. In our study in older psychiatric outpatients, we aimed to answer the following research questions:

1. What is the prevalence of loneliness in a population of older patients in a geriatric psychiatric outpatient clinic?
2. Are there differences between men and women with respect to prevalence of loneliness?
3. What are the associations between loneliness and depression, anxiety disorders and degenerative neurocognitive disorders? What is the association with measures of social isolation? Is frailty a factor of significance?
4. Is loneliness a complicating factor in the treatment of these disorders?

## Methods

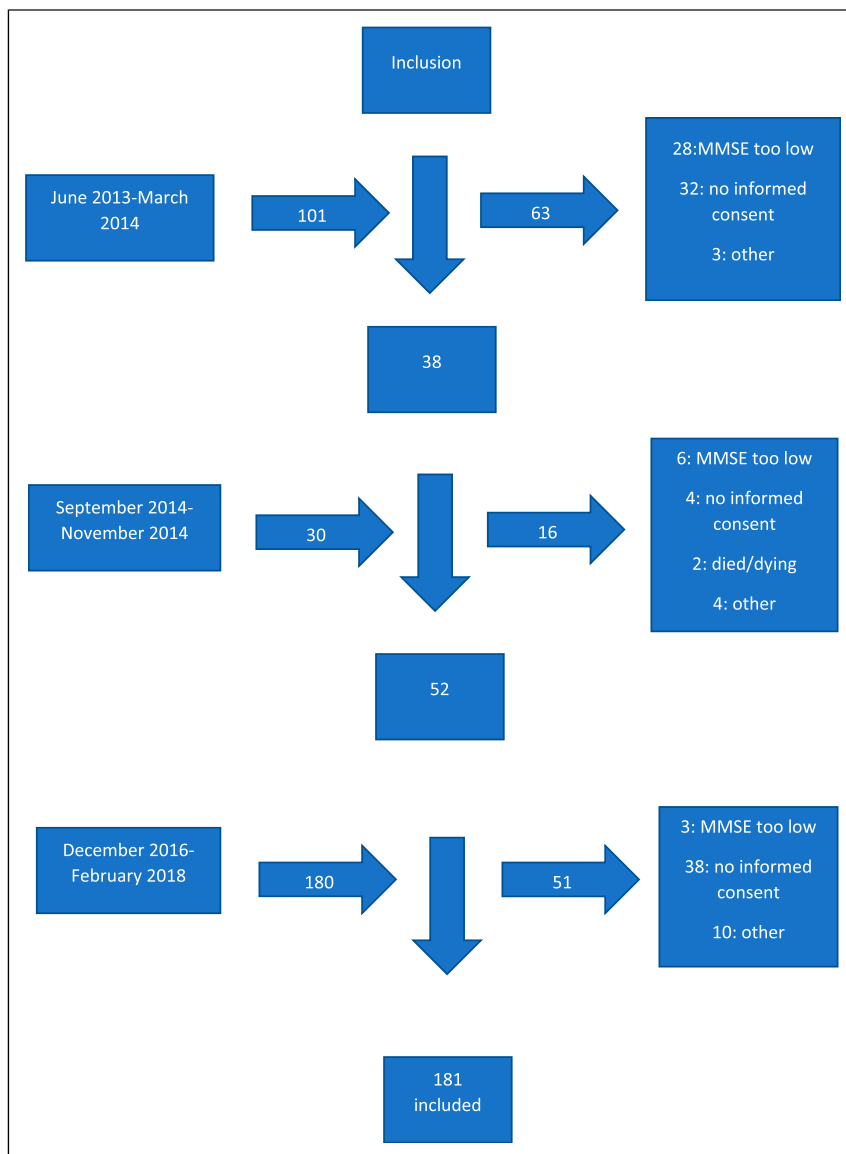
### Participants and Procedure

Study participants were derived from 3 outpatient clinics for geriatric psychiatry in the city of Amsterdam. Less than a third of admissions in these clinics concerns degenerative neurocognitive disorders. Every person 60 years or older with a Mini Mental State Examinations-score (MMSE-score) above 20 that was admitted was eligible. Inclusions took place in the period between September 2013 and February 2018. Because of varying availability of research assistants, inclusion periods were June 2013–March 2014; September 2014–November 2014 and December 2016–February 2018. [Figure 1](#) shows the flow diagram of inclusion. The mean duration of treatment was 15 months. The majority of treatments was performed by a specialized psychiatric nurse and a psychiatrist, a minority by a psychologist or psychotherapist.

The first examination was done by either a specialized psychiatric nurse or a psychologist. The second examination was done by a psychiatrist or in the case of possible degenerative neurocognitive pathology, a specialist in geriatric medicine. The psychiatric examination included gathering data on the psychiatric and medical history. The diagnosis was confirmed in a weekly multidisciplinary meeting.

After the initial appointment, every person received written information about the study. Within a few weeks after the intake procedure, a research assistant approached possible participants by telephone. If they agreed to participate, an appointment was made to further clarify the goals and procedure of the study, and written informed consent was gathered.

The study interviews, consisting of questionnaires, were done by trained interviewers.



**Figure 1.** Flow diagram of inclusion of study participants.

**Approval by Institutional Review Board.** The study was approved by the Institutional Review Board (Scientific Research Committee) of Arkin Mental Health Care. The Amsterdam University Medical Center Ethics Committee decided that approval was not necessary (W21\_251 # 21.277).

### Measurements

**Loneliness.** Loneliness was measured with the De Jong Gierveld Loneliness Scale.<sup>33</sup> This scale was developed for measuring loneliness in scientific surveys by means of eleven statements with five-category responses. These responses are dichotomized to contribute to a total loneliness score varying between 0 and 11, with a threshold of

3 indicating the presence of loneliness and a score of 9 or higher indicating severe loneliness.<sup>34</sup> The scale was demonstrated to be a valid and reliable instrument for the measurement of overall, emotional and social loneliness.<sup>35</sup> We used 3 as the cut-off for loneliness in our analyses.

**The question ‘do you feel lonely?’.** This question was added because the De Jong Gierveld loneliness scale has not been validated for clinical use in individual patients. Answers were either ‘yes’ or ‘no’.

**Social isolation.** The following aspects of social isolation were assessed: living situation, partner status and social network. The following questions were asked: 1. Do you live in a one-person household? 2. Do you have a partner?

These questions were chosen because of comparability to other studies, for instance the Amsterdam Study of the Elderly study (AMSTEL).<sup>36</sup>

**Social network.** Social network was assessed with a six-item questionnaire that measures the extent of contacts in six categories of people: children, grandchildren, in-law children, other family members, friends and acquaintances, and neighbors/community. For every category, the frequency of contact was asked, varying from no contact at all to contact on a daily basis. Every form of contact was counted, such as contact by telephone, email or visits. This instrument was developed for use in a large survey in the Netherlands.<sup>37</sup> For our analysis, the six categories were combined into three network domains: family members, friends and acquaintances, and neighbors/community. This division into domains is in accordance with other studies.<sup>38,39</sup>

**Depression.** Depressive symptoms were measured with the Geriatric Depression Scale-15 (GDS-15), a screening instrument for older adults that has been investigated in various clinical settings.<sup>40-42</sup> The original questionnaire consisted of thirty items. A shortened version, the GDS-15, consisting of fifteen items, has been found to be valid and reliable for depression-screening in older adults.<sup>41,42</sup> Every item can score 1 point, with a threshold of 5 for possible depression. A diagnosis of depression was determined in a multidisciplinary meeting and classified according to the criteria of the Diagnostic and Statistical Manual of mental disorders (DSM-IV-TR), either as the main diagnostic classification or as a comorbid classification.

**Anxiety.** Anxiety symptoms were measured with the Hospital Anxiety and Depression Scale – Anxiety version (HADS-A).<sup>43,44</sup> This seven-item questionnaire is a screening instrument for anxiety disorders. Every item yields 0 to 3 points resulting in a total score varying between 0 and 21, with a threshold of 7 for possible anxiety disorder. A diagnosis of anxiety disorder was determined in a multidisciplinary meeting and classified according to DSM-IV-TR-criteria, either as the main diagnostic classification or as a comorbid classification.

**Cognitive function.** The Mini Mental State Examination (MMSE)<sup>45</sup> is used for screening for cognitive disorders and for determining the severity of these disorders.<sup>45,46</sup> An eleven-item version was used with a total score varying between 0 and 30. Generally a threshold of 23 or 24 is used for screening purposes. A score between 10 and 21 is indicative of a probable moderate dementia, whereas a score of 20 or lower indicates a high risk of dementia.<sup>45</sup> A diagnosis of cognitive disorder was determined in a multidisciplinary meeting and classified according to

DSM-IV-TR-criteria, either as the main diagnostic classification or as a comorbid classification.

#### *Covariates*

**Sociodemographic factors.** Sociodemographic factors included age and gender.

**Alcohol disorders.** The Alcohol Use Disorders Identification Test (AUDIT) was used to screen for alcohol use disorders.<sup>47</sup>

**Somatic diseases.** Information about the number of somatic diseases was obtained from the general practitioner and from participants themselves during the initial examination.

**Frailty.** The Tilburg Frailty Indicator was used to measure frailty. This 15-item questionnaire covers somatic, psychologic and social aspects of frailty, with each item yielding a maximum of 1 point. Because of the overlap in psychologic and social items with both loneliness and psychiatric symptomatology, we only used the somatic items, resulting in a physical frailty score. The Tilburg Frailty Indicator is a valid and reliable instrument for frailty screening.<sup>48</sup>

**General functioning.** As a part of Routine Outcome Measurement, the Health of the Nation Outcome Scales for elderly people (HoNOS 65+)<sup>49</sup> was used. The HoNOS 65+ was administered at the start and at the end of treatment. This is an easily administrable instrument that measures mental, physical and social functioning of older adults. It was developed specifically for use in older adults with psychiatric problems and was found to possess good psychometric characteristics.<sup>49</sup> A practitioner that knows the patient reasonably well can fill out this questionnaire in approximately five minutes.

**Intensity of treatment.** Information about total time of treatment, number of sessions and number of practitioners involved was collected from the medical record database.

#### *Statistical Analyses*

We compared the study population with all patients seen in the clinic with respect to age, gender, HoNOS 65+-score and main DSM-IV-TR-classification. Distribution of characteristics between lonely and non-lonely participants was described using Chi-square statistics for categorical variables, Student's t-test for continuous variables and Mann-Whitney U tests in case of non-normal distribution. The associations between loneliness and individual social isolation variables as well as with the question 'do you feel lonely?' were studied using multivariate logistic regression

**Table 1.** Distribution of DSM-IV-TR-classifications in participants and non-participants.

DSM-classification	Non-participants (n=2911)	Participants (n=183)	
Dementia	896 (31%)	24 (13%)	Pearson Chi-square 56.28, p < .001
Depressive disorder	480 (17%)	49 (27%)	
Bipolar disorder	96 (3%)	7 (4%)	
Other affective disorder	157 (5%)	18 (10%)	
Panic disorder	40 (1%)	8 (4%)	
Other anxiety disorder	162 (6%)	17 (9%)	
Alcohol use disorder	108 (4%)	8 (4%)	
Schizophrenia	214 (7%)	6 (3%)	
Other psychotic disorder	182 (6%)	11 (6%)	
Personality disorder	117 (4%)	11 (6%)	
Other	305 (10%)	18 (10%)	
No disorder	154 (5%)	6 (3%)	

analyses. Additionally, a model was tested including all the social isolation variables. Age and gender were introduced as potential confounders. Additional covariates were number of somatic diseases, HoNOS 65+-score and physical TFI-score. Interaction between social isolation variables and gender was examined, with a two-tailed *P*-value of < 0.10 regarded as significant.<sup>50</sup>

As the loneliness variable was not normally distributed, associations between loneliness and DSM-IV-TR-classifications (main classification and comorbid classification) and severity scores were investigated with binary logistic regression analyses and with multinomial logistic regression analyses. The multinomial logistic regression analyses were performed with loneliness in three groups: not lonely, lonely (De Jong Gierveld score  $\geq 3$ ) and severely lonely (De Jong Gierveld score  $\geq 9$ ). Intensity of treatment was compared between lonely and non-lonely individuals regarding total time of treatment, number of sessions, number of practitioners involved and HoNOS 65+-score using Mann-Whitney U tests and ANOVA. Statistics were done with SPSS version 26.

## Results

### Characteristics of the Study Population

Figure 1 shows the flow diagram of inclusion of the 181 participants. To examine whether our study population was representative of all patients seen in our outpatient clinic, participants were compared with non-participants with respect to age, gender, HoNOS 65+-score and main DSM-IV-TR-classification. Only the distribution of DSM-IV-TR-classifications differed significantly: a classification of dementia was more prevalent in the group of non-participants, whereas depression was more prevalent in the group of participants (Table 1).

Table 2 shows the characteristics of the participants according to loneliness status. Of the 181 participants, 144 were lonely (80%), of which 46 were severely lonely (25%). Outcomes were as follows for social isolation variables: 132 participants (75%) lived in a one-person household; 45 participants (25%) had a partner. None of the outcomes differed between men and women (data not shown).

Lonely participants less often had a partner and more often lived alone. Lonely participants reported significantly higher depression scores, anxiety scores and total frailty scores. With respect to network domains, lonely participants more often had social contacts in only 1 or 2 domains.

### Regression Analyses

Multivariate logistic regression analyses were done to investigate the association between loneliness and social isolation variables. We introduced age, gender, number of somatic diseases, HoNOS 65+-score and physical TFI-score as potential confounders. The social isolation variables partner status, one-person household and network domains were all univariately significantly associated with loneliness, but when combined in one model, only number of network domains remained significantly associated with loneliness (Table 3). The interaction between gender and network domains was significant ( $P = .05$ ). We repeated the analyses of the association between network domains and loneliness in men and women separately: this association was not significant in men (OR .83, 95% CI .32 – 2.15,  $P = .69$ ), but significant in women (OR .09, 95% CI .01 – .74,  $p < 0.05$ ); both associations were adjusted for potential confounders.

The association between loneliness and the question ‘do you feel lonely?’ was highly significant (OR 23, 95% CI

**Table 2.** Characteristics of the study sample (n=181).

	Not lonely (n = 37)	Lonely (n = 144)	P-value
Age, mean (SD)	76.3 (9.2)	75.6 (8.4)	.67
Women, n (%)	21 (57)	80 (56)	.90
Partner status, n with partner (%)	16 (43)	29 (20)	<b>.004</b>
Living situation, n in one-person household (%)	21 (58)	111 (79)	<b>.01</b>
Network domains			<b>.006</b>
- 0, n (%)	0 (0)	1 (.7)	
- 1, n (%)	1 (2.6)	25 (18)	
- 2, n(%)	6 (16)	44 (31)	
- 3, n(%)	31 (82)	72 (51)	
Loneliness score, mean (SD)	.9 (.8)	7.0 (2.6)	< <b>.001</b>
GDS-15 score, mean (SD)	2.8 (2.6)	7.4 (3.5)	< <b>.001</b>
HADS-A score, mean (SD)	4.4 (4.3)	8.4 (5.4)	< <b>.001</b>
TFI-score, mean (SD)	5.2 (2.9)	8.3 (2.9)	< <b>.001</b>
Physical TFI-score, mean (SD)	2.8 (2.3)	3.8 (2.2)	<b>.02</b>
AUDIT-score, mean (SD)	2.2 (2.8)	2.4 (3.4)	.69
MMSE-score, mean (SD)	26.3 (2.7)	26.9 (2.4)	.19
No. of somatic illnesses, mean (SD)	3.6 (2.3)	3.0 (2.3)	.14
Main DSM-classification			.13
- Depression, n (%)	7 (19)	40 (28)	
- Anxiety disorder, n (%)	7 (19)	24 (17)	
- Dementia, n (%)	9 (24)	15 (10)	
- Other, n (%)	14 (30)	65 (45)	

GDS-15 Geriatric Depression Scale-15 items; HADS-A Hospital Anxiety and Depression Scale-Anxiety; TFI Tilburg Frailty Indicator; AUDIT Alcohol Use Disorders Identification Test; MMSE Mini Mental State Examination; DSM Diagnostic and Statistical Manual of mental disorders.

**Table 3.** Multivariate logistic regression analysis for the association between social isolation variables and loneliness.

	OR (95% CI)	P-value
Partner status	.33 (.16-.72)	< <b>0.01</b>
Partner status (adjusted)*	.27 (.11-.66)	< <b>0.001</b>
One-person household	2.73 (1.26-5.96)	<b>.01</b>
One-person household (adjusted)*	3.54 (1.42-8.85)	< <b>0.01</b>
Network domains	.32 (.16-.65)	< <b>0.01</b>
Network domains (adjusted)*	.35 (.16-.79)	<b>.01</b>
Partner status	.40 (.08-2.11)	.28
One-person household	1.73 (.32-9.40)	.52
Network domains	.28 (.13-.60)	< <b>0.01</b>
Partner status (adjusted)*	.28 (.04-1.86)	.28
One-person household (adjusted)*	2.03 (.29-14.0)	.47
Network domains (adjusted)*	.25 (.10-.62)	< <b>0.01</b>

\*adjusted for age, gender, number of somatic diseases, physical TFI-score, HoNOS 65+-score.

7.5 – 67.9,  $p < 0.001$ ) in both men and women. Of the participants that answered this question with ‘yes’, 96% scored lonely on the De Jong Gierveld loneliness scale. In contrast, 52% of the participants that answered this question with ‘no’ scored lonely on the De Jong Gierveld

loneliness scale. In other words, using this question has a high positive predictive value but a low negative predictive value.

The binary logistic regression analyses showed no significant associations between loneliness and the DSM-IV-TR-classifications of depressive disorder, anxiety disorder and neurocognitive disorder. Only in the adjusted analysis, loneliness was significantly associated with anxiety disorder. However, when not only the main DSM-IV-TR-classification was taken into account, but also comorbid classifications, this resulted in a significant association between loneliness and depression in the univariate analysis (Table 4), but there was no significant association for either anxiety or neurocognitive disorder (data not shown). Loneliness was significantly associated with higher scores on the GDS-15 and the MMSE, but not with HADS-A and physical TFI-score in the adjusted multinomial logistic regression analyses (Table 4).

### Intensity of Treatment

We compared lonely and non-lonely participants with respect to total time of treatment, number of treatment sessions, number of practitioners involved and HoNOS

**Table 4.** Associations between loneliness and DSM-IV-TR-classifications (binary logistic regression analyses) and scores on questionnaires (multinomial logistic regression analyses with loneliness in three groups).

	OR (95% CI)	P-value		
Depressive disorder (main)	1.39 (.59–3.31)	.45		
Depressive disorder (adjusted)*	1.27 (.48–3.35)	.63		
Depressive disorder (main or comorbid)*	2.35 (1.04–5.34)	<b>.04</b>		
Depressive disorder (main or comorbid)(adjusted)*	2.16 (.86–5.42)	.10		
Anxiety disorder	.47 (.19–1.16)	.10		
Anxiety disorder (adjusted)*	.34 (.12–.94)	<b>.04</b>		
Cognitive disorder	.74 (.27–2.01)	.55		
Cognitive disorder (adjusted)*	1.04 (.29–3.80)	.95		
	<b>OR (95% CI)</b>	<b>P-value</b>	<b>OR (95% CI)</b>	<b>P-value</b>
	<b>Lonely</b>		<b>Severely lonely</b>	
GDS-15-score	1.50 (1.24–1.82)	<b>&lt;.001</b>	1.86 (1.49–2.34)	<b>&lt;.001</b>
HADS-A-score	1.05 (.94–1.18)	.37	.99 (.87–1.13)	.87
Physical TFI-score	.92 (.75–1.14)	.44	.98 (.76–1.27)	.89
MMSE-score	1.22 (1.01–1.48)	<b>.04</b>	1.22 (.97–1.52)	.09
GDS-15-score	1.50 (1.20–1.87)	<b>&lt;.001</b>	1.89 (1.46–2.45)	<b>&lt;.001</b>
HADS-A-score	1.06 (.94–1.20)	.36	.99 (.85–1.14)	.87
Physical TFI-score	.92 (.69–1.21)	.53	1.00 (.72–1.40)	1.00
MMSE-score (adjusted)**	1.26 (1.01–1.56)	<b>.04</b>	1.34 (1.03–1.73)	<b>.03</b>

Reference group: not lonely \*adjusted for age, gender, number of somatic diseases, physical TFI-score, HoNOS 65+-score \*\*adjusted for age, gender, number of somatic diseases, HoNOS 65+-score

GDS-15 Geriatric Depression Scale-15 items; HADS-A Hospital Anxiety and Depression Scale-Anxiety; TFI Tilburg Frailty Indicator.

**Table 5.** Comparison of treatment complexity and level of functioning between lonely and non-lonely participants.

	Not lonely (n = 33)			Lonely (n = 120)			Mann–Whitney U test
	Mean	Median	Interquartile range	Mean	Median	Interquartile range	P-value
Total time of treatment, days	435	301	349	438	342	399	.91
Number of treatment sessions	23	10	28	69	16	152	.43
Number of practitioners involved	3	2	3	5	3	8	.52
HoNOS 65+-score (begin)	11.5	11.0	7.3	11.7	11.0	6.1	.19
HoNOS 65+-score (end)	6.3	6.5	10.0	8.8	7.5	9.6	.14
HoNOS 65+ (decline)	5.2	6.0	9.2	2.9	3.0	7.7	.09

HoNOS 65+ Health of the Nation Outcome Scales for elderly people

65+-scores. The results are shown in Table 5. There were no statistically significant differences.

## Discussion

### Main Findings

This study aimed to examine loneliness in a sample of older psychiatric outpatients. Of this population 80 % was lonely, and 25 % severely lonely. This is a much higher proportion than in the general population (20–40% lonely

and 5–7% severely lonely). There were no differences between men and women in levels of loneliness and no significant associations between DSM-IV-TR-classifications and loneliness. The only significant association was between loneliness and anxiety disorders, with higher levels of loneliness associated with less odds of a primary classification of anxiety disorder. However, loneliness was significantly associated with depression severity and higher level of cognitive function, but not with severity of anxiety. Intensity of treatment did not differ significantly between lonely and non-lonely participants (Table 5).



## Comparison With Existing Literature

The figure we found for loneliness (80%) is comparable with results from the Netherlands Study of Depression in Older adults (NESDO).<sup>51</sup> In this study, 82% of depressed participants were lonely.<sup>52</sup> Hence, it appears that the association between psychiatric disorders in general and loneliness is comparable to that between depression and loneliness.

Additionally, studies in younger psychiatric populations have shown that up to 80% of patients with schizophrenia are lonely.<sup>23</sup> Consequently, it can be concluded that there are no indications that loneliness levels in older psychiatric patients differ from those in younger psychiatric patients.

The existing literature is contradictory on the subject of gender differences in loneliness. A meta-analysis by Pinquart and Sörensen<sup>4</sup> revealed that, in general, women reported more loneliness than men. However, this appeared to be dependent on the questionnaires used: in studies using the UCLA loneliness scale women reported significantly more loneliness, whereas in studies using the De Jong Gierveld loneliness scale, this was not the case. This is in line with our study. In a study by Routasalo et al.,<sup>2</sup> female gender was significantly associated with loneliness in univariate, but not in multivariate analyses. The question whether gender differences in loneliness are important remains to be answered; in our sample of older psychiatric outpatients, men and women are equally lonely. However, we did find a gender difference regarding the association between network domains and loneliness. Having contacts in more network domains was associated with less loneliness in women but not in men. This is in line with results from previous studies. Whereas for men, not having a partner is one of the strongest predictors for loneliness, for women the functioning of the wider network is more important.<sup>53</sup> Unfortunately, we did not measure network size. As a consequence, we could not examine whether there are gender differences with respect to the association between loneliness and network size. However, network diversity might be an important aspect of social network, for example in the association with mortality.<sup>54</sup>

There were no significant associations between main DSM-IV-TR-classifications of psychiatric disorders and loneliness, except for the association with anxiety disorders. Contrarily, in the study by Lara et al.,<sup>32</sup> no associations between loneliness and DSM-IV-TR-classifications were found. Nevertheless, the association between loneliness and depression is well known.<sup>14-20</sup> The lack of significant association between loneliness and the main DSM-IV-classification depressive disorder could be explained by a lack of power, since in our sample only 7 participants with a classification of depressive disorder were not lonely (Table 2). Additional analyses with combined main and comorbid DSM-IV-TR-classifications of depression showed a significant association, but only

when unadjusted for confounders. Contrarily, depression severity was significantly associated with loneliness (Table 4). This might signify that in our sample of older psychiatric outpatients, it is not so much the diagnosis that is associated with being lonely, but rather the severity of symptoms (Table 4). This is however not mirrored in the association with the HoNOS 65+ scores, the number of treatment sessions and the number of practitioners involved. Mean and median values for number of treatment sessions and number of practitioners involved did not differ statistically significantly (Table 5). Although loneliness has previously been found to negatively affect the outcome of depression treatment in older adults,<sup>55,56</sup> in our study, this is not reflected in differences in intensity of treatment. However, this could be due to a lack of power, since there were only 33 not lonely participants. The finding that loneliness was associated with higher MMSE-scores (Table 4) could be in line with conflicting results in previous studies. In longitudinal studies, some authors concluded that loneliness was not associated with cognitive decline,<sup>57-59</sup> whereas in a systematic review the conclusion was that loneliness was associated with lower cognitive function.<sup>60</sup> In one study, loneliness was associated with better semantic memory,<sup>61</sup> and in another study, not feeling lonely was associated with lower Digit Symbol Coding scores.<sup>62</sup> However, since in our study older adults with MMSE-scores below 21 were excluded, no conclusions can be drawn with respect to associations between loneliness and neurocognitive dysfunction.

## Strengths

This is the third study examining loneliness in a group of older psychiatric patients. However, our study is larger than the previous two.<sup>20,32</sup> Our sample size was almost twice as large and contained a more even distribution between men and women in comparison with the study by Lara et al.<sup>32</sup> The study by Dell et al.<sup>20</sup> included not only older but also younger adults (aged 50 and over). The design of our study, consisting of face-to-face interviews as opposed to self-report questionnaires, allowed for the interviewers to check whether the participants understood the questions.

## Limitations

Of course, there are some limitations. The figures we found for loneliness are very high in comparison with the numbers in the general population. This might be explained by only including participants that wanted to participate in a loneliness study. This could have introduced a selection bias, since non-lonely persons might not have felt compelled to participate. However, when asking patients to participate, we explained that we needed both

lonely and not lonely persons in the study. In order to investigate whether the participants differed from the non-participants, we compared the two groups. The results showed that participants only differed from non-participants with respect to DSM-IV-TR-classification. This difference can probably be explained by the exclusion of patients with a MMSE-score below 21, as can be seen from Table 1. The choice to use 20 as a cut-off score on the MMSE meant that only participants with a diagnosis of dementia that still had a relatively high score on the MMSE (21 or higher) could be included. This is not uncommon for studies using questionnaires. The NESDO study<sup>51</sup> excluded persons with a primary diagnosis of dementia, persons who were suspected for dementia according to their physician, or had a MMSE-score below 18. As a consequence, there are more participants with a depressive disorder or an anxiety disorder. Since loneliness was not associated with DSM-IV-TR-classification, it is plausible that the inclusion of more depressed and anxious patients did not influence the presence of loneliness. Therefore, we assume that loneliness is more prevalent in older psychiatric patients compared with the general population.

A second limitation is the cross-sectional nature of this study. Since we only interviewed participants once, no causal inferences can be made from the associations we found. A third limitation concerns the choice to analyze associations with only the DSM-IV-TR-classifications depressive disorder, anxiety disorder and neurocognitive disorder. Since a questionnaire for psychotic disorder was not in use in daily practice in the ambulatory clinic, we decided not to include psychotic disorder. Given the existing literature on the associations between loneliness and schizophrenia in younger patients, it might have been more informative to include the DSM-IV-TR-classifications of psychotic disorders. However, when running post hoc analyses between loneliness and psychotic disorder, a significant association was not found. However, this may have been due to a lack of power, since only 17 participants had a classification of psychotic disorder. A fourth limitation is the possible lack of statistical power to examine differences between the lonely and non-lonely participants with respect to treatment intensity. Because of the relatively small number of non-lonely participants, only larger effect sizes could be detected. A final limitation concerns the generalizability to the population of older psychiatric outpatients in general, since our sample of patients in the highly urban region of Amsterdam, the Netherlands, may differ from patients in more rural regions.

## Conclusion

In our sample of 181 older psychiatric outpatients, loneliness is highly prevalent. Figures for loneliness are

roughly twice to three times those in the general older population, with men and women equally affected. Loneliness is associated with the amount of network domains, in women only. Furthermore, lonely participants show higher depression scores and cognitive scores. Apparently, in our sample of older psychiatric outpatients, it is not so much the diagnosis that is associated with being lonely, but rather the severity of the symptoms. We recommend that loneliness is assessed in all older psychiatric patients, especially when they show high scores on symptom checklists or have a restricted social network.

Whether loneliness affects the need for higher treatment intensity was not apparent in this study. However, this is an interesting subject for further study. Another aspect deserving further study is the development of loneliness scores during treatment.

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## Author Contributions

All authors were involved in the interpretation of the results, reviewed and critically revised the article, and approved of the final version for submission.

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## ORCID iD

Natasja Schutter  <https://orcid.org/0000-0003-3334-5294>

## References

1. Gierveld JDJ, Tilburg TV. A 6-item scale for overall, emotional, and social loneliness. *Res Aging*. 2006;28:582-598.
2. Routasalo PE, Savikko N, Tilvis RS, Strandberg TE, Pitkälä KH. Social contacts and their relationship to loneliness among aged people - a population-based study. *Gerontology*. 2006;52:181-187.

3. Fry PS, Debats DL. Self-efficacy beliefs as predictors of loneliness and psychological distress in older adults. *Int J Aging Hum Dev.* 2002;55:233-269.
4. Pinquart M, Sörensen S. Influences on loneliness in older adults: a meta-analysis. *Basic Appl Soc Psychol.* 2001;23:245-266.
5. Marangoni C, Ickes W. Loneliness: a theoretical review with implications for measurement. *J Soc Pers Relat.* 1989;6:93-128.
6. de Jong-Gierveld J. Developing and testing a model of loneliness. *J Pers Soc Psychol.* 1987;53:119-128.
7. Weiss RS. *Loneliness: The Experience of Emotional and Social Isolation.* MA, Cambridge: MIT Press; 1973.
8. Luo Y, Hawkey LC, Waite LJ, Cacioppo JT. Loneliness, health, and mortality in old age: a national longitudinal study. *Soc Sci Med.* 2012;74:907-914.
9. Chawla K, Kunonga TP, Stow D, Barker R, Craig D, Hanratty B. Prevalence of loneliness amongst older people in high-income countries: a systematic review and meta-analysis. *PLoS One.* 2021;16:e0255088.
10. Fokkema T, De Jong Gierveld J, Dykstra PA. Cross-national differences in older adult loneliness. *J Psychol.* 2011;146:201-228.
11. De Jong Gierveld J, Havens B. Cross-national comparisons of social isolation and loneliness: introduction and overview. *Can J Aging.* 2004;23:109-113.
12. Perlman D, Peplau LA. Towards a social psychology of loneliness. In: Gilmour R, Duck S, eds *Personal Relationships 3: Personal Relationships in Disorder.* London: Academic Press; 1981:31-56.
13. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *Journal of health and social behavior.* 2009;50:31-48.
14. Liu L, Gou Z, Zuo J. Social support mediates loneliness and depression in elderly people. *J Health Psychol.* 2016;21:750-758.
15. Meltzer H, Bebbington P, Dennis MS, Jenkins R, McManus S, Brugha TS. Feelings of loneliness among adults with mental disorder. *Soc Psychiatr Psychiatr Epidemiol.* 2013;48:5-13.
16. Aylaz R, Aktürk Ü, Erci B, Öztürk H, Aslan H. Relationship between depression and loneliness in elderly and examination of influential factors. *Arch Gerontol Geriatr.* 2012;55:548-554.
17. Golden J, Conroy RM, Bruce I, et al. Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *Int J Geriatr Psychiatr.* 2009;24:694-700.
18. Cacioppo JT, Hughes ME, Waite LJ, Hawkey LC, Thisted RA. Loneliness as a specific risk factor for depressive symptoms: cross-sectional and longitudinal analyses. *Psychol Aging.* 2006;21:140-151.
19. Beekman ATF, Deeg DJ, Van Tilburg TG, et al. The prevalence and risk factors associated with major and minor depression in later life. *Tijdschr Psychiatr.* 1997;39:294-308.
20. Dell NA, Pelham M, Murphy AM. Loneliness and depressive symptoms in middle aged and older adults experiencing serious mental illness. *Psychiatr Rehabil J.* 2019;42:113-120.
21. Erzen E, Çikrikci Ö. The effect of loneliness on depression: a meta-analysis. *Int J Soc Psychiatr.* 2018;64:427-435.
22. Prince MJ, Harwood RH, Blizard RA, Thomas A, Mann AH. Social support deficits, loneliness and life events as risk factors for depression in old age. The gospel oak project vi. *Psychol Med.* 1997;27:323-332.
23. Oughli HA, Eglit G, Palmer B, Lee E, Jeste D. Loneliness, age, cardiovascular and metabolic health in schizophrenia. *A J Geriatric Psychiatry Conf abstract.* 2020;28(4 Suppl):S138-S139.
24. Eglit GML, Palmer BW, Martin Av. S, Tu X, Jeste DV. Loneliness in schizophrenia: construct clarification, measurement, and clinical relevance. *PLoS One.* 2018;13:e0194021.
25. Chrostek A, Grygiel P, Anczewska M, Wciórka J, Świtaj P. The intensity and correlates of the feelings of loneliness in people with psychosis. *Compr Psychiatr.* 2016;70:190-199.
26. Sündermann O, Onwumere J, Kane F, Morgan C, Kuipers E. Social networks and support in first-episode psychosis: exploring the role of loneliness and anxiety. *Soc Psychiatr Psychiatr Epidemiol.* 2014;49:359-366.
27. Haigh S, Walford T. Feeling lonely and heart rate variability in autism and schizophrenia. *Biolog Psychiatry Conf abstract.* 2021;89(9 Suppl):S385-S386.
28. Holwerda TJ, Deeg DJH, Beekman ATF, et al. Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam study of the elderly (AMSTEL). *J Neurol Neurosurg Psychiatr.* 2014;85:135-142.
29. Van Tilburg T, Havens B, De Jong Gierveld J. Loneliness among older adults in the Netherlands, Italy, and Canada: a multifaceted comparison. *Can J Aging.* 2002;23:169-180.
30. Gale CR, Westbury L, Cooper C. Social isolation and loneliness as risk factors for the progression of frailty: the english longitudinal study of ageing. *Age Ageing.* 2018;47:392-397.
31. Mulasso A, Roppolo M, Giannotta F, Rabaglietti E. Associations of frailty and psychosocial factors with autonomy in daily activities: a cross-sectional study in Italian community-dwelling older adults. *Clin Interv Aging.* 2016;11:37-45.
32. Lara LM, Blas Luviano ME, Tejada Alcala VM, Alvarez Alzate A, Barajas Chavez C. Loneliness in older adults users of psychiatric services. *Psiquis.* 2017;26:177-182.
33. de Jong-Gierveld J, Kamphuls F. The development of a rasch-type loneliness scale. *Appl Psychol Meas.* 1985;9:289-299.
34. Van Tilburg TG, De Jong Gierveld J. [Reference standards for the loneliness scale]. *Tijdschr Gerontol Geriatr.* 1999;30:158-163.

35. De Jong Gierveld J, Van Tilburg TG. *Manual of the Loneliness Scale*. Amsterdam: Vrije Universiteit Amsterdam; 1999.
36. Holwerda TJ, Beekman ATF, Deeg DJH, et al. Increased risk of mortality associated with social isolation in older men: only when feeling lonely? Results from the Amsterdam study of the elderly (AMSTEL). *Psychol Med*. 2012;42:843-853.
37. De Boer A, Schellingerhout R. Social network and expected support. In: *Health and well-being of elderly immigrants*. The Hague: SCP; 2004.
38. Giles LC, Glonek GFV, Luszcz MA, Andrews GR. Effect of social networks on 10 year survival in very old Australians: the Australian longitudinal study of aging. *J Epidemiol Community Health*. 2005;59:574-579.
39. Vogt T, Mullooly JP, Ernst D, Pope CR, Hollis JF. Social networks as predictors of ischemic heart disease, cancer, stroke and hypertension: incidence, survival and mortality. *J Clin Epidemiol*. 1992;45:659-666.
40. Benedetti A, Wu Y, Levis B, Wilchesky M, Boruff J, Ioannidis JPA, et al. Diagnostic accuracy of the geriatric depression scale-30, geriatric depression scale-15, geriatric depression scale-5 and geriatric depression scale-4 for detecting major depression: protocol for a systematic review and individual participant data meta-analysis. *BMJ Open*. 2018;8:e026598. doi:10.1136/bmjopen-2018-026598.
41. Chiesi F, Primi C, Pigliautile M, et al. Is the 15-item geriatric depression scale a fair screening tool? A differential item functioning analysis across gender and age. *Psychol Rep*. 2018;121:1167-1182.
42. Sheikh JI, Yesavage JA. Geriatric depression Scale (GDS): recent evidence and development of a shorter version. *Clin Gerontol*. 1986;5:165-173.
43. Djukanovic I, Carlsson J, Årestedt K. Is the hospital anxiety and depression scale (HADS) a valid measure in a general population 65-80 years old? A psychometric evaluation study. *Health Qual Life Outcome*. 2017;15:193. doi:10.1186/s12955-017-0759-9.
44. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67:361-370.
45. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". *J Psychiatr Res*. 1975;12:189-198.
46. Pinto TCC, Machado L, Bulgacov TM, et al. Is the montreal cognitive assessment (MoCA) screening superior to the mini-mental state examination (MMSE) in the detection of mild cognitive impairment (MCI) and alzheimer's disease (AD) in the elderly? *Int Psychogeriatr*. 2019;31:491-504.
47. Babor TF, Kranzler HR, Lauerman RJ. Early detection of harmful alcohol consumption: comparison of clinical, laboratory, and self-report screening procedures. *Addict Behav*. 1989;14:139-157.
48. Gobbens RJJ, van Assen MALM, Luijckx KG, Schols JMGA. The predictive validity of the tilburg frailty indicator: disability, health care utilization, and quality of life in a population at risk. *Gerontol*. 2012;52:619-631.
49. Burns A, Beevor A, Lelliott P, et al. Health of the nation outcome scales for elderly people (HoNOS 65+). *Br J Psychiatry*. 1999;174:424-427.
50. Durand CP. Does raising type 1 error rate improve power to detect interactions in linear regression models? A simulation study. *PLoS One*. 2013;8:e71079.
51. Comijs HC, Van Marwijk HW, Van der Mast RC, et al. The Netherlands study of depression in older persons (NESDO); a prospective cohort study. *BMC Res Notes*. 2011;4:524.
52. Schutter N, Holwerda TJ, Stek ML, Dekker JJM, Rhebergen D, Comijs HC. Loneliness in older adults is associated with diminished cortisol output. *J Psychosom Res*. 2017;95:19-25.
53. Dykstra PA, De Jong Gierveld J. Gender and marital-history differences in emotional and social loneliness among Dutch older adults. *Can J Aging/La Revue canadienne du vieillissement*. 2004;23:141-155.
54. Ali T, Nilsson CJ, Weuve J, Rajan KB, Mendes de Leon CF. Effects of social network diversity on mortality, cognition and physical function in the elderly: a longitudinal analysis of the Chicago health and aging project (CHAP). *Journal of epidemiology and community health*. 2018;72:990-996.
55. Van den Brink RHS, Schutter N, Hanssen DJC, et al. Prognostic significance of social network, social support and loneliness for course of major depressive disorder in adulthood and old age. *Epidemiol Psychiatr Sci*. 2017;27:266-277. doi:10.1017/S2045796017000014.
56. Holvast F, Burger H, De Waal MMW, van Marwijk HWJ, Comijs HC, Verhaak PFM. Loneliness is associated with poor prognosis in late-life depression: longitudinal analysis of the Netherlands study of depression in older persons. *J Affect Disord*. 2015;185:1-7.
57. Kotwal AA, Waite L, Schumm P, Shega J, McClintock M, Dale W. The influence of social health on cognition: results from a nationally representative sample of older adults. *JAGS*. 2013;61(suppl 1):ppS12.
58. Tjihuis M, De Jong Gierveld J, Feskens EJM, Kromhout D. Changes in and factors related to loneliness in older men. The Zutphen elderly study. *Age Ageing*. 1999;28:491-495.
59. Wang H, Lee C, Hunter S, Fleming J, Brayne C. Longitudinal analysis of the impact of loneliness on cognitive function over a 20-year follow-up. *Aging Ment Health*. 2020;24:1815-1821.
60. Boss L, Kang D-H, Branson S. Loneliness and cognitive function in the older adult: a systematic review. *Int Psychogeriatr*. 2015;27:541-553.
61. Pugh E, De Vito A, Divers R, Robinson A, Weitzner DS, Calamia M. Social factors that predict cognitive decline in older African American adults. *Int J Geriatr Psychiatr*. 2021;36:403-410.
62. Badcock JC, Shah S, MacKinnon A, et al. Loneliness in psychotic disorders and its association with cognitive function and symptom profile. *Schizophr Res*. 2015;169:268-273.