Article

Social and Emotional Loneliness among older people living in Nursing Homes in Spain: a cross-sectional study

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Abstract: (1) Background: Loneliness, little studied in Nursing Homes (NHs), can affect physical and mental health. We aimed to verify the prevalence of loneliness in 5 NHs and its associated factors. (2) Methods: Cross-sectional study. Older adults aged 65 or over with preserved cognitive status were included. The De Jong Gierveld Loneliness Scale was used to assess overall, social, and emotional loneliness; sociodemographic and health-related variables were collected. The chi-square (or Fisher's) test and logistic regression were used for bivariate and multivariate analysis respectively. (3) Results: The final sample consisted of 65 participants (81.5% female) with a mean age of 84±7.13. Prevalence of overall loneliness was 70.7% (95%CI:58.2-81.4), social loneliness 44.6% (95% CI: 33.1-56.6) and emotional loneliness 46.2% (95% CI: 34.5–58.1). Overall loneliness was associated with lower perceived quality of life (Odds Ratio-OR= 5.52, 95% CI:1.25-24.38) and NH with state subsidized places (OR=0.19, 95% CI: 0.05-0.74); social loneliness with having 0-1 children (OR=0.25, 95% CI: 0.08-0.77), and emotional loneliness with depression (OR=4.54, 95% CI: 1.28-16.08) and urinary incontinence (UI) (OR=4.65, 95% CI: 1.23-17.52). (4) Conclusions: Loneliness was present in almost 71% of residents and was associated with the type of NH and poorer quality of life, emotional loneliness with depression and UI and social loneliness with having less than 2 children.

Keywords: emotional loneliness; social loneliness; nursing homes; older adults; social isolation.

1. Introduction

Loneliness is a subjective, unpleasant experience that implies a discrepancy between the desired and actual social relationships experienced by a person (1). For some years now, it has been stablished as one of the psychosocial risk factors for physical and psychological health (2). Some authors have concluded that loneliness can worsen quality of life, cause suffering and be considered a risk factor for health or negative health outcomes including mortality (3), affecting well-being and cognitive functioning of older adults (4). The same phenomenon has been contemplated within the screening criteria for the detection of frail older adults in primary care (5). It has been highlighted its two-dimensional character, understanding the existence of emotional loneliness (lack of close emotional ties) and social loneliness (deficient social network, lack of relevance to a group) (6). The latter has also been defined from a humanistic and social perspective as a social isolation derived from the absence of a relationship with family or friends on whom to rely in case of need (7).

The feeling of loneliness can appear at any stage of old age, related with various losses that can occur, such as moving into a Nursing Home (NH) (8). In Spain, according to data from the Spanish Government portal *"Envejecimiento en red"*, in 2019 322,180 people aged 65 years or over were living in NHs, accounting for 85% of the total number of places (9). This highlights the possibility of finding an over-aged population in this setting with the presence of physical limitations, chronic conditions, and cognitive and psychological impairments is common and the likely presence of unwanted loneliness might be highly prevalent (10,11).

The risk factors associated with loneliness during the aging process are diverse. The sociodemographic factors of greatest risk include being a woman, advanced age, low educational level, not having a partner or being widowed, not having children (12,13) and the environment of the NH (14). Regarding physical and psychological health conditions, the presence of comorbidity, loss of mobility, functional decline, as well as depression (15,16) represent health and psychological factors associated with higher levels of loneliness. A longitudinal study on aging in the Canadian population suggested that dementia could be developed 1.6 times more in people with high levels of loneliness compared to individuals with a preserved social network (17). The same phenomenon has also been associated with impaired cognitive status, alterations in the immune system, increased blood pressure and mortality (18,19). Furthermore, a meta-analysis showed that the risk of mortality due to alcohol use disorder and smoking is comparable to the risk of death associated with loneliness, and with more harmful effects on health than the factors associated with obesity (20).

Living in NHs was associated with higher degrees of loneliness and that loneliness may increase the risk of admission to a NH (21). It has also been considered that changes in the social networks (family and/or friends) of older people who move into a NH may also be involved in loneliness (16). The residents of these institutions are often female, with low socioeconomic status and have diminished cognitive status, which coincide with some of the risk factors associated with loneliness (22,23). On the other hand, evidence indicates that frailty may be a risk factor for loneliness and social isolation, due to low social connections (15,16). Even though it is known that t loneliness is associated with an increased risk of mortality a (16,24) interventions aimed at its prevention or reduction of loneliness in NHs are remarkably scarce.

Although the phenomenon of loneliness in aging has received attention in the scientific literature, most studies have focused on older people living in the community; and research in the context of NHs is scarce (25). There are few studies considering the risk factors associated with loneliness in older NH residents and far fewer studies analyzing

resident's emotional and social loneliness, and possible associated physical, psychological, and social factors. Therefore, the main aim of this study was to verify the prevalence of overall, social, and emotional loneliness and its associated (psychological, social, and physical health) factors among older adults living in NHs of the Osona region (Barcelona, Spain).

2. Materials and Methods

2.1. Methodology and participants

This is a multicenter cross-sectional study, which was conducted in 5 NHs in the Osona region (Central Catalonia region, Barcelona province, Spain), of which three had state subsidized places and two were totally private. It is a sub-study of the OsoNaH project (26) registered in Clinical Trials (CNT04297904); whose data collection was conducted from January to March 2020, until the onset of the COVID-19 pandemic. The study followed the standards of STROBE (Strengthening Reporting of Observational studies in Epidemiology) guidelines for cross-sectional studies (27) and met the criteria required in the Helsinki Declaration, as well as the Spanish Organic Law 3/2018 (December 5) on the Protection of Personal Data and Guarantee of Digital Rights. The project was approved by the Ethics Committee and Research (CER) of University of Vic-Central University of Catalonia (UVic-UCC) (registration number 92/2019 and 109/2020) and Clinical Research Ethics Committee of the Osona Foundation for Health research and Education (FORES) (code 2020118/PR249).

All the residents aged 65 years or over with who were living permanently in NHS were included, and those in palliative care and who refused to participate in the study were excluded. In addition, for the present loneliness sub study, participants were excluded if they had severe cognitive impairment, which prevented them from understanding and responding to the assessment questionnaires. All NHs were contacted by e-mail and telephone offering them the possibility of collaborating in the study. A document explaining the project was sent together with a formal consent document, which was signed by the director of each NH if they accepted participating in the study. The participants were selected according to the inclusion criteria, from a list of the residents which was obtained by the NH's Directors; and a simple randomization was done with the IBM SPSS Statistics software (IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). Residents were informed that their data would be treated anonymously and that they could withdraw from the study at any time without giving any explanation. Both the residents and the NHs professionals received detailed information about the project and provided informed consent of acceptance. The research team received training through standard operating procedures to ensure de reliability of the data.

2.2. Variables and measurement instruments

The dependent variable of the study was the presence of loneliness (yes/no), collected using the 6-item De Jong Gierveld Loneliness Scale (DJGLS-6, Spanish version) (28). This reduced version consists of 3 items for each of the two subscales: for social loneliness, referring to the feeling of missing a wider social network, and for emotional loneliness, referring to missing a "more intimate relationship". There are negatively worded items, in

which the neutral and positive responses (plus or minus and yes) and the "no" response with 0; and in the positively worded items, the neutral and negative responses (plus or minus and no) are scored with 1 and the yes response with a 0. This gives a total score range of 0 to 6, which can be interpreted from the lowest to the highest levels as "less alone or more alone". However, in the present study, to define the presence of loneliness levels, scores between 0 and 2 were considered normal, and scores above 2 were considered as a cut-off point, in line with authors of previous studies on older adults living in NHs (29-31).

Several psychosocial factors were also collected from the residents, such as the number of visits they received monthly from family and/or friends, and the following variables described below: the reduced version of the Lubben Social Network Scale (LSNS-6) was used to measure the presence and degree of social isolation, which presents 3 items regarding family ties and 3 regarding friendly relationships (32). The maximum score of the scale is 30 and 12 can be used as a cut-off point to consider the presence of risk of social isolation of the participants. The lower the perceived social support from family and/or friends, the higher the risk of social isolation for the person (32). The EuroQoL-5D (EQ-5D-5L), consists of a self-description of current health-related quality of life (QoL) on five domains: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression (33). Each dimension has five response levels: no problems, slight, moderate, severe problems, unable to/extreme problems. Total of 245 combinations representing health states, which are from 11111 (the best health state) to 55555 (the worst health state), or it can also be converted into a single index "utility" score using a scoring algorithm based on public preferences (34), of a country or region. These weights lie in a range in which full health has a value of 1 and death a value of 0. The cross-index values for the scores of each dimension can be calculated with the "EQ-5D-5L" crossover tool (available on the EuroQol website) (35); which are shown as the set of standard values for Spain divided by the value 0.5, corresponding to the mean of the range of possible values. The reduced and Spanish version of the Yesavage Geriatric Depression Scale (GDS) was used to measure the presence or absence of depressive symptoms, with scores above 5 being considered as an indicator of possible depression (36). The anxiety subscale of the Anxiety and Depression Scale (HADS), which considers scores above 8 as possible cases of anxiety and scores above 11 as cases of anxiety, was used to collect the presence of anxious symptomatology (37). The cognitive capacity of the participants was verified using the Pfeiffer SPMSQ Scale (Short portable Mental State Questionnaire) which briefly evaluates functions such as orientation, memory, concentration, and arithmetic, and by which the inclusion of participants was decided (people with severe cognitive impairment were excluded according to the questionnaire). The instrument allows classification of older adults (≥65 years) according to their preserved mental function, mild, moderate, or severe cognitive impairment, considering the educational level of the person being evaluated (38).

To record the presence of UI (yes/no), section H of the minimum data set (MDS) version 3.0 was applied according to the answers given by the proxy (39) and the international consultation on incontinence questionnaire urinary incontinence-short form (ICIQ-SF) (40) which assesses the quantity and frequency of urine leakage and the impact on the individual's QoL. The responses provided by the residents were compared with those of the proxy using the MDS. Functional independence was measured using the Barthel Index modified by Shah et al., 1989, excluding the continence items, as covered by MDS (40,41). The frailty status of the participants was assessed using the clinical frailty scale (CFS), which places the person in one grade or another, depending on the information provided by the caregiver about mobility, functionality, and cognition (42). Physical performance was recorded using the brief physical performance battery (SPPB), measuring hand grip strength with the JAMAR Plus Digital Hand dynamometer (43) positioning the elbow at 90° of flexion (44) The result was adjusted for gender and body mass index and was the highest value recorded with the dominant hand after 3 repetitions with both handsTo

quantify mobility, the Rivermead Mobility Index (RMI) was used, which presents self-reported and directly observed elements (45). To measure the risk of sarcopenia, the SARC-F screening questionnaire was used, based on 5 components: strength, assistance with walking, rise from a chair, climb stairs, and falls (46). The body mass index (BMI) was measures with a Seca 213 measuring device (Seca Medizinische Messsysteme und Waagen, Hamburg, Deutschland), the Tanita TBF-300 bioimpedance device (Tanita Institute., Tokyo, Japan). Using the Mini Nutritional Assessment (MNA) screening tool, participants' nutritional status was assessed by classifying them into different categories within a maximum score of 30 points: (score <17) malnourished, (17-23.5) at risk of malnutrition and normal (≥ 24) nutritional status (47). Sedentary behavior was assessed by the gold standard activPAL³ activity monitor (48)(PAL Technologies Ltd., Glasgow, UK) device worn by participants on the thigh, which distinguishes, and records time spent sitting, standing, and walking during 7 consecutive days (49).

For each participant, information was collected on sociodemographic (age, gender, educational level, marital status, number of children, type of NH and time of institutionalization), on health conditions (medication intake, presence of chronic diseases, tobacco and alcohol, functional and cognitive capacities) – and the collection of diagnosed diseases for residents: urinary incontinence (UI), fecal incontinence, depression, renal insufficiency, chronic pain, hypertension, hypothyroidism, dyslipemia, mental illness). This information was collected through the clinical history of the residents and checked with a NH professional (auxiliary, nursing technician or physiotherapist).

2.3. Statistical analysis

The sample size was calculated by population estimation, taking as the reference population the total number of places in all the NHs in the Osona region (1.182 places offered in 19 NHs). Due to aspects unrelated to the research, such as the consent of the NHs, the present study could only be carried out in 5 NHs, corresponding to 433 total persons, but of which only 185 could be accessed due to the Covid-19 pandemic (68 residents of the first NH studied, 144 of the second, 42 of the third, 65 of the fourth and 114 of the fifth NH of the study). This figure represents 15.7% of the total reference population (1.182). Thus, this 15.7% was established as the proportion of the population to calculate the sample size. In addition to the above, a confidence level of 95% was established with an estimation precision of 0.087 for the same. Thus, the remaining calculation revealed that a random sample of 65 individuals was sufficient to estimate with 95% confidence and a precision of +/- 8.7 percentage units, an expected population percentage of around 15.7%, without the need for replacements. After the sample calculation, the recruitment phase began, in which a total of 65 individuals were recruited who met all the inclusion criteria and no exclusion criteria, thus complying with the previously calculated sample size.

The statistical analysis was carried out with the program IBM SPSS Statistics software (IBC Corp. Released 2021.IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp). First, data were presented through descriptive statistics; categorical variables were shown as absolute frequency and percentages. Continuous variables were presented as means and standard deviations or as medians and interquartile range. To contrast the normality of the data set, the Shapiro-Wilk test was used; for parametric variables the Student's T-test and for nonparametric variables the U-Mann Whitney test were used. We calculated the absolute frequency and percentage of the different types of loneliness variables: overall, emotional, and social loneliness, unadjusted odds ratio (OR) and their 95% confidence interval (CI) according to potential variables to verify the magnitude of the association. Categorical data were compared using Chi Square test or Fisher's exact test.

Finally, logistic regression was used to test potential associations between residents reporting loneliness and independent variables, controlled by principal confounders: sex and age. All variables with p-value under 0.20 were tested in the multivariate analysis using the forward method. A value of p ≤0.05 was considered statistically significant and CIs were at 95%.

3. Results

The final sample consisted of 65 residents from 5 included NHs. **Figure 1** shows the flowchart of the sampling process.
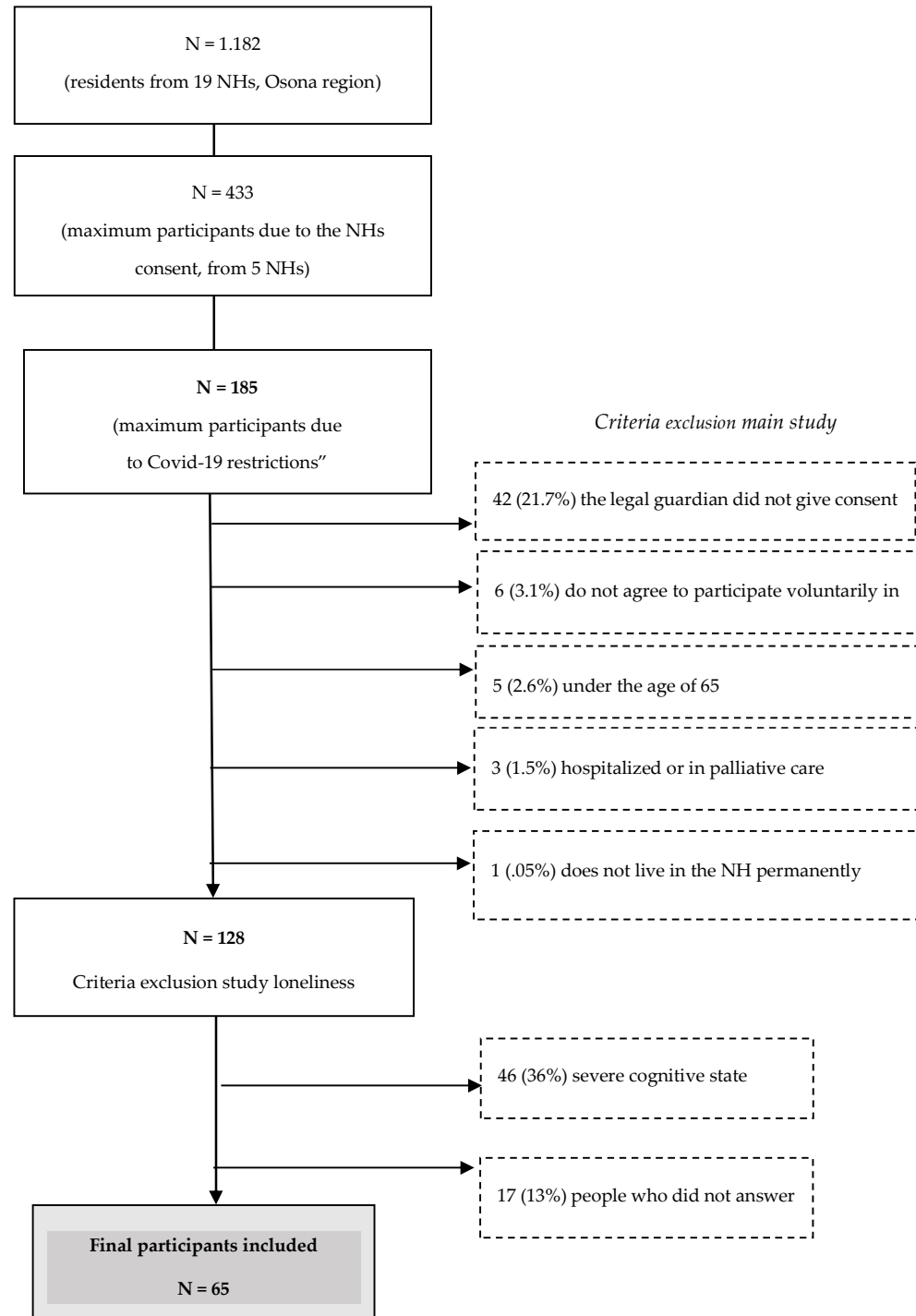

Figure 1. Flowchart of the cross-sectional study with number of participants according to exclusion criteria and for the final sample of the study

Of the final sample of 65 residents, 53 (81.5%) were women, with a mean age of 83.9 (SD: 7.45) and mean number of children of 1.6 (SD: 1.54); 50 (76.9%) lived in private with state-subsidized places NHs and 15 (23.1%) in private NHs. **Table 1** shows the sociodemographic characteristics of the sample and health-related information of the participants.

Table 1. Descriptive analysis including sociodemogrophic and health-related information of institutionalized older people in Osona region (Barcelona, Spain), 2020.

Variable	n	%
Marital status		
Widowers	45	69.2
Singles	10	15.4
Married	6	9.2
With partner	1	1.5
Separated or divorced	1	1.5
Level of Education		
Illiterate	0	0.0
Primary	20	35.7
Secondary	28	50.0
High school	5	8.9
University	3	5.4
Cognitive status (Pfeiffer)		
Intact	10	15.4
Slight cognitive impairment	16	24.6
Moderate cognitive impairment	21	32.3
Severe cognitive impairment	18	27.7
Functional capacity (Barthel)		
Independent	4	8.3
Slight dependency	25	52.1
Moderate dependency	7	14.6
Severe dependency	10	20.8
Total dependence	2	4.2
Physicall condition (Clinical Frailty Scale)		
Very fit	1	1.5
Well	13	20.0
Managing well	3	4.6
Vulnerable	2	3.1
Mildy frail	16	24.6
Moderately frail	23	35.4
Severely frail	6	9.2
Very severely frail	1	1.5
Terminally ill	0	0.0
Physicial performance (SPPB)		
Robustness	3	4.8
Prefrailty	9	14.5
Frailty	18	29.0
Disability	32	51.6
Body Mass Index (BMI)		
Under weight	10	19.2
Normal/Overweight	26	50.0
Obese	16	30.8
Nutritional state (Mini Nutritional Assesment)		
Normal nutritional status	27	46.6
At risk of malnutrition	30	51.7
Malnourshed	1	1.7
Toxic habits *		
Alcoholism or ex-alcoholic	7	16.7
Smoker or ex-smoker	6	14.0

Note: Source: own elaboration

Concerning the psychosocial variables, 46 participants (70.8%) suffered from overall loneliness, scored on the loneliness dimension, 17 (26.2%) of social loneliness, and 12 (18.3%) of emotional loneliness according to the De Jong Gierveld Loneliness Scale (DGLS-6). Regarding the participants' risk of social isolation, 25 (40.3%) were at high risk of social isolation, 13 (21%) at low risk, and 24 (38.7%) not at risk of isolation. Regarding the number of visits received per month from family and/or friends (median) was 8 (Range: 3-16). According to the GDSVE-6 questionnaire for rapid screening of depressive symptoms, 55 (84.6%) of the residents had symptoms, and 15 (23.8%) were probable cases of anxiety according to the subscale of the HADS questionnaire for assessment of anxious symptoms. In addition, the results of the EQ-5D-5L showed that the percentages of residents who did have problems or difficulties for each of the dimensions were: problems with mobility (71%), self-care (63%), usual activities (46%), pain/discomfort (58.5%) and anxiety/depression (46%).

Residents had significant co-morbidities, presenting with a mean of 5.2 (SD: 2.34) diagnosed conditions, with 41 (63.1%) having five or more. Specifically: 44 (67.7%) arterial hypertension, 28 (43.1%) heart disease, 26 (40%) dementia, 22 (33.8%) both dyslipemia and diabetes, 16 (24.6%) delirium, 14 (21.5%) lung disease, 13 (20%) strokes, 11 (16. 9%) digestive, circulatory, and mental illnesses, 10 (15.4%) Parkinson's and cancer, 9 (13.8%) osteoporosis, 7 (10.8%) arthrosis and anemia, 5 (7.7%) anxiety, chronic pain, and visual deficit and 2 (3.1%) ulcers and epilepsy. In addition, 41 (65%) had UI and 11 (17%) fecal incontinence. The presence of obesity (BMI >23) was observed in 45 (69%) participants and risk of malnutrition or in malnutrition in 26 (4%) individuals of them and 8 (12.3%) presented weight loss in the last year.

With respect to the medication, the use of one or more drugs from the following groups was observed: analgesics and psycholeptics in 45 (70%), psychoanaleptics in 40 (63%), antiepileptics in 11 (17%) and antiparkinsonians in 10 (15.6%) participants. There was a mean of 8.82 (SD: 1.6) and 79.4 (SD: 15.8) for the hours and total percentage of sedentary behavior respectively. 49 (84.5%) residents were in risk of sarcopenia and 23 (45%) of them had fallen in the previous year.

3.2. Prevalence and associated factors of the main study variables (overall, emotional, and social loneliness)

3.2.1. Overall loneliness:

The prevalence of perceived loneliness was 70.7% (95% CI: 58.2-81.4). There was a significant difference according to the type of NH: the prevalence in private NHs was 46.6% vs. 78.0% in those with State subsidized places. The other variables that were significantly associated with loneliness were lower levels of perceived health related QoL, and anxiety, with 100% of residents with anxious symptoms presenting feelings of loneliness. There was no significant association with the rest of the variables. **Table 2** shows the results of the bivariate analysis between the dependent variable and the independent variables with p under .200 that were not included in the multivariate analysis, and the multivariate analysis with independent variables included in the final model. The relevant factors from the previous bivariate analysis were selected to adjust the multiple logistic regression, also adjusting for the confounding variables sex and age. The results showed that the type of NH and perceived QoL remained factors associated with overall loneliness. The goodness of fit of the logistic regression model was p=0.861 for the Hosmer-Lemeshow test.

3.2.2. Emotional loneliness:

For emotional loneliness, the diagnosis of depression was statiscally significant; with a prevalence of emotional loneliness of 73.6% in residents diagnosed with depression, compared to 34.7% in those without the disorder. Other conditions that were significant were: anxiety symptoms and UI, with a 58.5% of residents with anxiety compared to 18.18% in those without anxiety. There was no significant association with the remaining variables. **Table 3** shows the results of the bivariate analysis between the dependent variable (emotional loneliness) and the independent variables with p under .200 that were not included in the multivariate analysis, and the results of the multivariate analysis. Depression and UI were significantly associated with emotional loneliness in the final model, with a p=0.721 in the Hosmer-Lemesho test.

3.2.3. Social loneliness:

The prevalence of social loneliness was 44.6% (95% [CI]: 33.1 – 56.6). The bivariate analysis showed that having no children or only one child was an associated factor for social loneliness, with a prevalence in residents without children or with only one child of 60.6%. The other variable that was significant was being at risk of social isolation. **Table 4,** shows the results of the bivariate analysis between the dependent variable (social loneliness) and the independent variables with p under .200 that were not included in the multivariate analysis, and the significant variables in the final model. The logistic regression showed that the condition of having only one child or not having one was an associated factor in the final model (Hosmer-Lemeshow test p=0.959).

Table 2. Associations between overall Loneliness and independent variables with p ≤ 0.200, Osona region (Barcelona, Spain), 2020 and multivariate analysis

| Variable | Overall Loneliness | | | | | | Multivariate analysis | | | |
| | Yes (n = 46) | | No (n = 19) | | | | | | | |
	n	%	n	%	p	OR (95% CI)	p	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)
Anxiety symptoms (HADS)					.006[a] *					
No	31	64.6	17	35.4						
Yes	15	100	0	0.0						
Type of NH					.019 *		.019	0.24 (0.73-0.83)	0.17	0.19 (0.05-0.74)
Private with State subsidized places	39	78.0	11	22.0		1				
Private	7	46.7	8	53.3		0.247 (0.73-0.83)				
EuroQoL-5D (EQ-5D-5L)					.045[a] *		.045	4.26 (1.08-16.72)	.024	5.52 (1.25-24.38)
≥ 0.5	25	61.0	16	39.0		1				
< 0.5	20	87.0	3	13.0		4.267 (1.08-16.72)				
Gender					.080					
Men	6	50.0	6	50.0		1				
Women	40	75.5	13	24.5		3.077 (0.84-11.21)				
Age					.095					
≤85	25	80.6	6	19.4		1				
>85	21	61.8	13	38.2		0.388 (0.12-1.19)				
Hypothyroidism					.116					
No	41	74.5	14	25.5		1				
Yes	5	50.0	5	50.0		0.341 (0.08-1.35)				
Renal insufficiency					.0139					
No	33	76.7	10	23.3		1				
Yes	13	59.1	9	40.9		0.438 (0.14-1.32)				
Chronic pain					.144[a]					
No	44	73.3	16	26.7		1				
Yes	2	40.0	3	60.0		0.242 (0.03-1.58)				
Diagnosed depression					.0148[a]					
No	30	65.2	16	34.8		1				
Yes	16	84.2	3	15.8		2.844 (0.72-11.24)				
Cognitive status (Pfeiffer)					.0182					
Slight/absent	16	61.5	10	38.5		1				
Moderate/severe	30	76.9	9	23.1		2.083 (0.70-6.17)				

Note: Source: own elaboration.
[a] Fisher's exact text.
*Statistically significant (<0.005)

Table 3. Associations between Emotional Loneliness and independent variables withs p ≤ 0.200, that were not included in the final model, Osona region (Barcelona, Spain), 2020 and multivariate analysis

| Variable | Emotional Loneliness (n = 65) | | | | | | Multivariate analysis | | | |
| | Yes (n = 30) | | No (n = 35) | | | | | | | |
	n	%	n	%	p	OR (95% CI)	p	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)
Anxiety symptoms					<.001[a]*					
No	16	33.3	32	66.7		1				
Yes	14	93.3	1	6.7		28 (3.37-232.26)				
Urinary Incontinence					.003[a]*		.003	6.35 (1.82-22.15)	.023	4.65 (1.23-17.52)
No	4	18.2	18	81.1		1				
Yes	24	58.5	17	41.5		6.35 (1.82-22.15)				
Diagnosed depression					.004 *		.006	5.25 (1.60-17.21)	.019	4.54 (1.28-16.08)
No	16	34.8	30	65.2		1				
Yes	14	73.7	5	26.3		5.25 (1.60-17.21)				
Level of studies					.107					
Illiterate/primary/secondary	25	52.1	23	47.9		1				
High school/university	5	29.4	12	70.6		0.38 (0.11-1.25)				
Total number of diseases					.113					
≤5	8	33.3	16	66.7		1				
>5	22	53.7	19	46.3		2.31 (0.81-6.60)				
Gender					.122[a]					
Men	3	25.0	9	75.0		1				
Woman	27	50.9	26	49.1		3.12 (0.75-12.80)				
Cognitive status (Pfeiffer)					.128					
Slight/absent	9	34.6	17	65.4		1				
Moderate/severe	21	53.8	18	46.2		2.20 (0.79-6.13)				
Type of NH					.139[a]					
Private with State-subsidized places	26	52.0	24	48.0		1				
Private	4	26.7	11	73.3		0.34 (0.09-1.19)				
Hypertension					.152					
No	7	33.3	14	66.7		1				
Yes	23	52.3	21	47.7		2.19 (0.74-6.47)				

Note: own elaboration.
[a]Fisher's exact text.
*Statistically significant (<0.005)

Table 4. Associations between Social Loneliness and independent variables withs p ≤ 0.200 that were not included in the final model, Osona region (Barcelona, Spain), 2020 and multivariate analysis

| Variable | Social Loneliness (n = 65) | | | | | | Multivariate analysis | | | |
| | Yes (n = 29) | | No (n = 36) | | | | | | | |
	n	%	n	%	p	OR (95% CI)	p	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)
Number of children					.011 *		.011	0.26 (0.27-0.84)	.016	0.25 (0.08-0.77)
≤ 1	20	60.6	13	39.4		1				
>1	9	29.0	22	71.0		0.27 (0.27-0.84)				
Social Network (LSNS-6)					.019 *		.019	3.70 (0.09-0.75)		
No risk of social isolation	6	25.0	18	75.0		1				
Social isolation (low or high)	21	55.3	17	44.7		3.71 (0.09-0.75)				
Renal insufficiency					.138					
No	22	51.2	21	48.8		1				
Yes	7	31.8	15	68.2		0.445 (0.15-1.30)				
Type of NH					.144a					
Private with State-subsidized places	25	50.0	25	50.0		1				
Private	4	26.7	11	73.3		0.364 (0.10-1.29)				
Mental Illness					.196a					
No	22	40.7	32	59.3		1				
Yes	7	63.6	4	36.4		2.545 (0.66-9.75)				
Fecal incontinence					.196a					
No	22	40.7	32	59.3		1				
Yes	7	63.6	4	36.4		2.545 (0.66-9.75)				

Note: own elaboration.
a Fisher's exact text.
*Statistically significant (<0.005)

4. Discussion

The objective of this study was to determine the prevalence of perceived loneliness in older adults institutionalized in NHs and, in turn, to identify the associated factors. Data collected showed high prevalence of global loneliness, as well as emotional and social loneliness (70.7%, 46.2% and 44.6% respectively). The results found that the factors associated with the presence of feelings of loneliness were the type of residence and the poor perception of health-related quality of life. In addition, a diagnosis of depression and UI were associated with emotional loneliness and having a child or not having a child and being at risk of isolation were associated with social loneliness.

Over the years, several investigations from different geographical areas of the world found higher rates of loneliness among older adults residing in NH (50–52). A prevalence of loneliness like ours (71.6%) was found in in people over 60 years old living in Spanish NHs (53). A qualitative systematic review with 10 studies examining the social relationships of institutionalized older adults in NH noted a high prevalence of loneliness, specifically, emotional loneliness (54). Another recent systematic review, considering 13 studies on the prevalence of loneliness in NH's residents, showed slightly lower rates compared to those in our study (61% and 35% of severe loneliness and moderate loneliness respectively)(25). There are, however, very few studies specifically on the prevalence of emotional and/or social loneliness in NHs (53,55,56), compared to research of overall loneliness among older adults in the community (57).

The present study showed significant association between the presence of loneliness and the presence of poor self-reported QoL. This association has been shown before (58). QoL is often reported as better in older people living in the community compared to those living in NHs (59). Other recent studies postulated that the QoL of older NH residents was lower, the greater the sense of loneliness (60,61). QoL can be impacted by the quality of the care received in a NH, for example, the degree of dependency of older adults, combined with the staffing level, the facilities, and the typology of the center (private or NH with state subsidized places)   (8). In addition, poorly qualified staff and many occupied beds can diminish both the care received and the quality of care and QoL (62).
Some of these factors can differentiate a private NH from a public NH, or one with many States subsidized places. Of course, even with the risk of loneliness in some state subsidized NHs, the wide range of health care, personal care, and long-term support services they offer may also prove to be protective factors for the maintenance of the health of their residents (62). Some institutions, prioritize person-centered care by attending to psychosocial aspects and by ensuring their NH facilities, as much as possible, are a home which may help improve QoL and reduce loneliness   (63). Encouraging this person-centered care and social relationships in institutionalized older adults are fundamental from the perspective of healthy aging, because they can contribute to well-being (64) and to combat emotional and social loneliness during the stay in NH by increasing their QoL (65).

One recent study showed a significant correlation between loneliness and mental health, especially with depressive symptoms (67). The results of our study also postulate a significant association between the perception of emotional loneliness and the presence of mental health problems; specifically, with the diagnosis of depression. These findings are consistent with the conclusions of previous studies (50,66), which showed a relationship between depression in older adults and the presence of emotional loneliness, but not social loneliness. Unlike our study one study also showed an association between loneliness and depressive symptomatology collected by the GDSVE-6 screening, which we also used in our study (59). Other recent research in depressed older adults showed loneliness as a risk factor, associated with both cognitive impairment and elevated mortality (67,68).

Ausín et al.,2017, identified several variables as predictive of loneliness in Spanish adults over sixty-five years of age, including functional deterioration and low satisfaction with QoL and social contacts, and the presence of mental disorders, especially anxiety (57). In our study sample, all residents with anxious symptomatology also presented feelings of loneliness. These results are consistent with those found in NHs in Egypt; where it was observed that recurrent feelings of loneliness could be a cause for the presence of anxiety in older adults, along with other psychosocial and health factors (69). Overall, the risk of developing loneliness in old age has been seen to increase with diagnoses of major depressive disorder, generalized anxiety disorder and social anxiety (70–72).

One of the physical health issues collected in our study sample was the presence of UI, which presented a statistically significant association with the emotional loneliness. In an Irish macro study, higher odds of loneliness were found among older adults with UI, although the sample focused on community-dwelling older adults (73). Currently, scientific evidence linking UI to loneliness is scarce, although much earlier studies already confirmed the increased risk of feeling lonely in middle-aged and older incontinent adults, with respect to continent people (74,75). In contrast, the association of UI with anxiety disorders and depression is known (76,77) which, in turn, may be reciprocally related to loneliness in older adults and, therefore, it might be interesting to further investigate (73).

However, recent studies have also suggested that the very act of becoming institutionalized and entering a NH has an impact on loneliness   (78). Entering to live in a long-term care facility can affect older adults due to the changes in their daily habits and customs, causing feelings of loneliness, as well as depressive and/or anxiety symptoms (79). For example, decreased frequency of contact with loved ones and friends and the discomfort of sharing a room with others may alter their intimacy and increase the perception of feeling lonely (80). Although it may appear that older adults residing in NHs exhibit less social isolation due to daily contact with staff and other residents (81), the reality is that moving to a NH does not exempt them from continuing to need family and friendship support. But unfortunately, not all older adults can count on external social support, and this can have effects on their QoL and health (82, 83).

In terms of social loneliness, the results of our study could suggest that a poor social network and support may be a risk factor for people living in NHs. We observed that 61.3% were at risk of social isolation and a diminished social network (0 to 12 monthly family and/or friend visits). One systematic review proposed that the social network and social support are related and may influence health during aging (84). More recently, one study showed how the size of the social network could influence the relationship between loneliness and depression (85), where 60.6% of residents without children, or with only one child, presented with social loneliness. A study in twelve European countries revealed that in several countries, especially in the most traditionalist ones, childlessness was strongly associated with loneliness in old age (86). This is reinforced by another study in China which suggested family support is a protective factor for loneliness, both for people with and without children (87).

Our study has some limitations. The relatively small size was due to the appearance of the Covid-19 pandemic and the successive waves, leading to very restrictive measures regarding social contact. This meant we could not continue collecting data fand ceased in March 2020. Despite the small sample size, it was sufficient to detect statistical differences in the different variables considered significant in other scientific literature, as discussed above. Since loneliness is considered a subjective construct, we had to exclude 36% of the participants from the initial sample due to the presence of severe cognitive impairment, and 13% did not accept or could not answer the questionnaires for the evaluation of

psychosocial variables. Dementia is more common in NHs in Catalonia, (70% of cases), compared with the population residing in the community (88). If we had been able to examine loneliness in these excluded participants, the rates of loneliness could have been higher.

The cross-sectional nature of our research could be another limiting factor, as it does not allow us to draw conclusions about causal relationships between associated factors and loneliness. Furthermore, as this was a descriptive study, it was not possible to collect in-depth data and valuable information such as the opinion and experience of the residents themselves, which would require a qualitative methodological approach. Such an approach would provide quality knowledge to rethink intervention strategies for the reduction of loneliness rates in NHs.

Because of the high levels of depression and depressive symptomatology in our study, some findings could be influenced by cognitive distortions (89). The sample consisted of a greater number of women than men, and this prevents generalizing conclusions about the existence of the difference between gender and the perception of loneliness among the older men living in NHs.

The strengths of this study were the assessment of loneliness, social and emotional, at the same time as QoL and other health and sociodemographic data within 5 NHs. More specifically, there is no evidence collected on the prevalence rates of loneliness among NH's residents before the Covid-19 pandemic, and before the confinements were imposed. Thus, the present research on loneliness in NH residents is interesting, especially at the present time, when NHs have been forced to impose restrictive measures on social contact and even social isolation in some of the waves of the pandemic and the need to address unwanted loneliness has become more visible for institutionalized older adults, and to health professionals working to improve their daily care. The wide diversity in the type of variables collected in the study (physical, psychological, social and health variables) contribute to the knowledge of the general health status of the group studied. Our study highlights the importance of person-centered care, considering the psychological and social dimension, which may be changed with the process of institutionalization in a NH. Finally, the information gathered in this study can contribute to the better planning of prevention and treatment and to improve the well-being and QoL of NH residents.

5. Conclusions

Loneliness can be a health risk factor and worsen the overall quality of life among older adults living in NHs. With the recent experiences of social isolation due to the Covid-19 pandemic, loneliness has been very present among institutionalized older adults. This study shows the high prevalence rate of loneliness (approximately 71%) in people over 65 years old living in 5 NHs in the Osona region (Barcelona, Spain). The phenomenon was associated with a worse perception of health related QoL. Diagnosis of UI and depression were associated with emotional loneliness and a poor social network and having no or only one child associated with social loneliness. These findings suggest the importance of addressing the psychosocial needs of NH residents to prevent loneliness and improve their well-being and QoL. Studies with larger and more representative samples, as well as longitudinal studies, would allow us to infer the causality of the associations between loneliness and related psychosocial factors, in addition to physical and health conditions.

6. Patents

References

1.   Yanguas J, Pinazo-Henandis S, Tarazona-Santabalbina FJ. The complexity of loneliness. Acta Bio Medica : Atenei Parmensis. 2018 Jun 29;89(2):302.

2.   Giné-Garriga M, Jerez-Roig J, Coll-Planas L, Skelton DA, Inzitari M, Booth J, et al. Is loneliness a predictor of the modern geriatric giants? Analysis from the survey of health, ageing, and retirement in Europe. Maturitas. 2021;144(August 2020):93–101.

3.   Courtin E, Knapp M. Social isolation, loneliness and health in old age: a scoping review. Vol. 25, Health and Social Care in the Community. Blackwell Publishing Ltd; 2017. p. 799–812.

4.   Ayalon L. Loneliness and Anxiety About Aging in Adult Day Care Centers and Continuing Care Retirement Communities. Innovation in aging. 2018 Jun 1;2(2).

5.   Lesende IM, Iturbe AG, Pavón JG, Cortés JJB, Soler PA. El anciano frágil. Detección y tratamiento en AP. Atencion Primaria. 2010;42(7):388.

6.   PS O, S G, A S. Loneliness, Living Alone, and All-Cause Mortality: The Role of Emotional and Social Loneliness in the Elderly During 19 Years of Follow-Up. Psychosomatic medicine. 2019 Jul 1;81(6):521–6.

7.   Machielse A. The Heterogeneity of Socially Isolated Older Adults: A Social Isolation Typology. Journal of Gerontological Social Work. 2015 May 19;58(4):338–56.

8.   Gardiner C, Laud P, Heaton T, Gott M. What is the prevalence of loneliness amongst older people living in residential and nursing care homes? A systematic review and meta-analysis. Vol. 49, Age and Ageing. Oxford University Press; 2020. p. 748–57.

9.   Abellán, A; Aceituno, M.P., Ramiro, D. 2019. Estadísticas sobre residencias: distribución de centros y plazas residenciales por provincia. Datos de abril de 2019. – EnR? [Internet]. [cited 2021 Jan 15]. Available from: http://envejecimientoenred.es/estadisticas-sobre-residencias-distribucion-de-centros-y-plazas-residenciales-por-provincia-datos-de-abril-de-2019/

10.   Semra G, Fatma A, Gökhan K. Dependence Level and Quality of Life of Older Adults Living in Nursing Home. Journal of Geriatric Medicine and Gerontology. 2019 Nov 1;5(4).

11.   Jaul E, Barron J. Age-Related Diseases and Clinical and Public Health Implications for the 85 Years Old and Over Population. Frontiers in Public Health. 2017 Dec 11;5:335.

12.   Cotterell N, Buffel T, Phillipson C. Preventing social isolation in older people. Vol. 113, Maturitas. Elsevier Ireland Ltd; 2018. p. 80–4.

13.   M L, A T, D A, JH L, Y S, AR S. Loneliness is associated with risk of cognitive impairment in the Survey of Health, Ageing and Retirement in Europe. International journal of geriatric psychiatry. 2020 Jul 1;35(7):794–801.

14.   Chen LW, Shea DG. The Economies of Scale for Nursing Home Care. Medical Care Research and Review. 2004 Mar;61(1):38–63.

15.   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 and Ageing. 2018 May 1;47(3):392–7.

16.   Cohen-Mansfield J, Hazan H, Lerman Y, Shalom V. Correlates and predictors of loneliness in older-adults: A review of quantitative results informed by qualitative insights. Vol. 28, International Psychogeriatrics. Cambridge University Press; 2016. p. 557–76.

17.   Gilmour H, Ramage-Morin PL. Social isolation and mortality among Canadian seniors. Health reports. 2020;31(3):27–38.

18.   Muntsant A, Giménez-Llort L. Impact of Social Isolation on the Behavioral, Functional Profiles, and Hippocampal Atrophy Asymmetry in Dementia in Times of Coronavirus Pandemic (COVID-19): A Translational Neuroscience Approach. Frontiers in Psychiatry. 2020;11:1126.

19.   C H, L P-R, M V, M J, M K, M E. Social isolation and loneliness as risk factors for myocardial infarction, stroke and mortality: UK Biobank cohort study of 479 054 men and women. Heart (British Cardiac Society). 2018;104(18):1536–42.

20.   Leigh-Hunt N, Bagguley D, Bash K, Turner V, Turnbull S, Valtorta N, et al. An overview of systematic reviews on the public health consequences of social isolation and loneliness. Public Health. 2017 Nov 1;152:157–71.

21.   B H, D S, D CM, NK V, F M. Loneliness as a risk factor for care home admission in the English Longitudinal Study of Ageing. Age and ageing. 2018 Nov 1;47(6):896–900.

22.   T von S, M L, T H, D G. Development of loneliness in midlife and old age: Its nature and correlates. Journal of personality and social psychology. 2020;118(2).

23.   R P, AN C, MF S, H B. The Association between Social Engagement, Loneliness, and Risk of Dementia: A Systematic Review and Meta-Analysis. Journal of Alzheimer's disease : JAD. 2018;66(4):1619–33.

24.   J A, H L, M A, EE S. The experience of daily life of acutely admitted frail elderly patients one week after discharge from the hospital. International journal of qualitative studies on health and well-being. 2015 Jun 1;10:1–11.

25.   Gardiner C, Laud P, Heaton T, Gott M. What is the prevalence of loneliness amongst older people living in residential and nursing care homes? A systematic review and meta-analysis. Age and ageing. 2020 Aug 24;49(5):748–57.

26.   Farrés-Godayol P, Jerez-Roig J, Minobes-Molina E, Yildirim M, Goutan-Roura E, Coll-Planas L, et al. Urinary incontinence and sedentary behaviour in nursing home residents in Osona, Catalonia: protocol for the OsoNaH project, a multicentre observational study. BMJ Open. 2021 Apr 1;11(4):e041152.

27.   von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. Journal of clinical epidemiology. 2008 Apr;61(4):344–9.

28.   Gierveld JDJ, Van Tilburg T. A 6-item scale for overall, emotional, and social loneliness: Confirmatory tests on survey data. Research on Aging. 2006;28(5):582–98.

29.   Jongenelis, K., Pot,A.M., Eisser, A.M.H, Beekman, A.T.F, Kluiter, H., Ribbe, M.W. Prevalence and risk indicators of depression inelederly nursing home patients: the AGED study. J Affect Disord. 2004 Dec 1,83 (2-3):135-42.

30.   Prieto-Flores ME, Forjaz MJ, Fernandez-Mayoralas, G, Rojo-Perez, F, Martinez-Martin, P. Factors associated with loneliness of noninstituionalized and institutionalized older adults. J Aging Health [Internet].2011 Feb [cited 2021 Nov 21]; 23(1): 177-94. Availabe from: https://journals.sagepub.com/doi/1177/0898264310382658

31.   Victor CR. Loneliness in care homes: A neglected area of research? Aging health.2012 Dec; 8(6):637-46

32.   Lubben J, Blozik E, Gillmann G, Iliffe S, Von Kruse WR, Beck JC, et al. Performance of an abbreviated version of the lubben social network scale among three European community-dwelling older adult populations. Gerontologist. 2006;46(4):503–13.

33.   Ramos-Goñi JM, Craig BM, Oppe M, Ramallo-Fariña Y, Pinto-Prades JL, Luo N, et al. Handling Data Quality Issues to Estimate the Spanish EQ-5D-5L Value Set Using a Hybrid Interval Regression Approach. Value in health : the journal of the International Society for Pharmacoeconomics and Outcomes Research. 2018 May 1;21(5):596–604.

34.   Rabin R, De Charro F. EQ-5D: a measure of health status from the EuroQol Group. Annals of medicine. 2001;33(5):337–43.

35.   Valuation – EQ-5D [Internet]. [cited 2021 Dec 26]. Available from: https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/valuation-standard-value-sets/

36.   Ortega Orcos R, Salinero Fort MA, Kazemzadeh Khajoui A, Vidal Aparicio S de D del VR. Validación de la versión española de 5 y 15 ítems de la Escala de Depresión Geriátrica den personas mayores en Atención Primaria. Rev Clin Esp. 2007;207(11):559–62.

37.   Herrero MJ, Blanch J, Peri JM, De Pablo J, Pintor L, Bulbena A. A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. General Hospital Psychiatry. 2003 Jul 1;25(4):277–83.

38.   Martínez De La Iglesia J, Herrero RD, Vilches MCO, Taberné CA, Colomer CA, Luque RL. Cross-cultural adaptation and validation of Pfeiffer's test (Short Portable Mental Status Questionnaire [SPMSQ]) to screen cognitive impairment in general population aged 65 or older. Medicina Clinica. 2001 Jun 30;117(4):129–34.

39.   Klush L. The MDS 3.0 and its impact on bladder and bowel care - PubMed [Internet]. [cited 2021 Dec 9]. Available from: https://pubmed.ncbi.nlm.nih.gov/22834204/

40.   Espuña Pons M, Rebollo Álvarez P, Puig Clota M. [Validation of the Spanish version of the International Consultation on Incontinence Questionnaire-Short Form. A questionnaire for assessing the urinary incontinence]. Medicina clinica. 2004 Jan;122(8):288–92.

41.   Shah S, Vanclay F, Cooper B. Improving the sensitivity of the Barthel Index for stroke rehabilitation. Journal of clinical epidemiology. 1989;42(8):703–9.

42.   Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I, et al. A global clinical measure of fitness and frailty in elderly people. CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne. 2005 Aug 30;173(5):489–95.

43.   Sipers WMWH, Verdijk LB, Sipers SJE, Schols JMGA, van Loon LJC. The Martin Vigorimeter Represents a Reliable and More Practical Tool Than the Jamar Dynamometer to Assess Handgrip Strength in the Geriatric Patient. Journal of the American Medical Directors Association. 2016 May 1;17(5):466.e1-466.e7.

44.   Guralnik JM, Simonsick EM, Ferrucci L, Glynn RJ, Berkman LF, Blazer DG, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. Journal of gerontology. 1994;49(2).

45. Collen FM, Wade DT, Robb GF, Bradshaw CM. The Rivermead Mobility Index: a further development of the Rivermead Motor Assessment. International Disability Studies. 1991 Apr 1;13(2):50–4.

46. Sánchez-Rodríguez D, Marco E, Dávalos-Yerovi V, López-Escobar J, Messaggi-Sartor M, Barrera C, et al. Translation and Validation of the Spanish Version of the SARC-F Questionnaire to Assess Sarcopenia in Older People. The journal of nutrition, health & aging. 2019 Jun 1;23(6):518–24.

47. Vellas B, Guigoz Y, Garry PJ, Nourhashemi F, Bennahum D, Lauque S, et al. The Mini Nutritional Assessment (MNA) and its use in grading the nutritional state of elderly patients. Nutrition (Burbank, Los Angeles County, Calif). 1999 Feb;15(2):116–22.

48. Grant PM, Dall PM, Mitchell SL, Granat MH. Activity-monitor accuracy in measuring step number and cadence in community-dwelling older adults. Journal of aging and physical activity. 2008;16(2):201–14.

49. Lyden K, Keadle SK, Staudenmayer J, Freedson PS. The activPAL™ Accurately Classifies Activity Intensity Categories in Healthy Adults. Medicine and science in sports and exercise. 2017 May 1;49(5):1022.

50. Drageset J, Espehaug B, Kirkevold M. The impact of depression and sense of coherence on emotional and social loneliness among nursing home residents without cognitive impairment – a questionnaire survey. Journal of Clinical Nursing. 2012 Apr 1;21(7–8):965–74.

51. Aung KT, Aung K, Said M, Wan N, Syakirah N, Bukhari W. LONELINESS AMONG ELDERLY IN NURSING HOMES Attitude of critical care Personnel Towards Family presence During Resuscitation View project LONELINESS AMONG ELDERLY IN NURSING HOMES. International Journal for Studies on Children, Women, Elderly And Disabled. 2.

52. Xxxi V, Marii Curie-Skłodowskiej Lublinie Wydział Pedagogiki Psychologii U, Uniwersytet Lubelski Jana Pawła Wydział Nauk Społecznych KI, Młodych Naukowców S, Herman A, Ciszek P, et al. Samoocena i poczucie samotności a zadowolenie z życia u pensjonariuszy domów pomocy społecznej. Annales Universitatis Mariae Curie-Skłodowska, sectio J – Paedagogia-Psychologia. 2018 Aug 20;31(1):219–27.

53. Prieto-Flores M-E, João Forjaz M, Fernandez-Mayoralas G, Rojo-Perez F, Martinez-Martin P. Factors Associated With Loneliness of Noninstitutionalized and Institutionalized Older Adults. Journal of Aging and Health. 23(1):177–94.

54. Mikkelsen ASB, Petersen S, Dragsted AC, Kristiansen M. Social interventions targeting social relations among older people at nursing homes: A qualitative synthesized systematic review. Inquiry (United States). 2019 Feb 7;56:1–16.

55. Drageset J, Eide GE, Kirkevold M, Ranhoff AH. Emotional loneliness is associated with mortality among mentally intact nursing home residents with and without cancer: a five-year follow-up study. Journal of Clinical Nursing. 2013 Jan 1;22(1–2):106–14.

56. Amzat IH, Jayawardena P. Emotional Loneliness and Coping Strategies: A Reference to Older Malaysians at Nursing Homes. Journal of Population Ageing 2015 9:3. 2015 Nov 13;9(3):227–47.

57. Ausín B, Muñoz M, Castellanos MA. Loneliness, Sociodemographic and Mental Health Variables in Spanish Adults over 65 Years Old. The Spanish Journal of Psychology. 2017 Oct 11;20.

58. Jansson, A.H., Muurinen, S., Savikko, N., Soini, H., Suominen, M.M., Kautiainen, H., Pitkäla KH. LONELINESS IN NURSING HOMES AND ASSISTED LIVING FACILITIES: PREVALENCE, ASSOCIATED FACTORS AND PROGNOSIS • The Journal of Nursing Home Research [Internet]. [cited 2021 Dec 12]. Available from: https://www.jnursinghomeresearch.com/919-loneliness-in-nursing-homes-and-assisted-living-facilities-prevalence-associated-factors-and-prognosis.html

59. Prieto-Flores ME, Forjaz MJ, Fernandez-Mayoralas G, Rojo-Perez F, Martinez-Martin P. Factors associated with loneliness of noninstitutionalized and institutionalized older adults. Journal of Aging and Health. 2011 Feb;23(1):177–94.

60. Trybusińska D, Saracen A. Loneliness in the Context of Quality of Life of Nursing Home Residents. Open medicine (Warsaw, Poland). 2019;14(1):354–61.

61. Gerino E, Rollè L, Sechi C, Brustia P. Loneliness, resilience, mental health, and quality of life in old age: A structural equation model. Frontiers in Psychology. 2017 Nov 14;8(NOV):2003.

62. Harris-Kojetin L, Sengupta M, Park-Lee E, Valverde R, Caffrey C, Rome V, et al. Long-Term Care Providers and services users in the United States: data from the National Study of Long-Term Care Providers, 2013-2014. Vital & Health statistics Series 3, Analytical and Epidemiological Studies. 2016 Feb 1;(38):x–xii; 1.

63. Andrew N, Meeks S. Fulfilled preferences, perceived control, life satisfaction, and loneliness in elderly long-term care residents. Aging & mental health. 2018 Feb 1;22(2):183–9.

64. Tran A, Nguyen KH, Gray L, Comans T. A Systematic Literature Review of Efficiency Measurement in Nursing Homes. International journal of environmental research and public health. 2019 Jun 1;16(12).

65. Bowling A, Iliffe S. Psychological approach to successful ageing predicts future quality of life in older adults. Health and Quality of Life Outcomes. 2011 Mar 9;9:13.

66. Peerenboom L, Collard RM, Naarding P, Comijs HC. The association between depression and emotional and social loneliness in older persons and the influence of social support, cognitive functioning and personality: a cross-sectional study. Journal of Affective Disorders. 2015;

67. Holwerda TJ, Van Tilburg TG, Deeg DJH, Schutter N, Van R, Dekker J, et al. Impact of loneliness and depression on mortality: results from the Longitudinal Ageing Study Amsterdam.

68. Lam CLM, Yu J, Lee TMC. Perceived loneliness and general cognitive status in community-dwelling older adults: the moderating influence of depression. https://doi.org/101080/1382558520161226246. 2016 Sep 3;24(5):471–80.

69. Barakat, M., Elattar, N.F., Zaki H. (PDF) Anxiety and Loneliness among Elderly Living in Geriatric Homes [Internet]. [cited 2021 Dec 12]. Available from: https://www.researchgate.net/publication/338868262_Anxiety_and_Loneliness_among_Elderly_Living_in_Geriatric_Homes

70. Lim MH, Rodebaugh TL, Zyphur MJ, Gleeson JFM. Loneliness over time: The crucial role of social anxiety. Journal of abnormal psychology. 2016 Jul 1;125(5):620–30.

71. Domènech-Abella J, Mundó J, Haro JM, Rubio-Valera M. Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA). Journal of Affective Disorders. 2019 Mar 1;246:82–8.

72. McHugh Power J, Hannigan C, Hyland P, Brennan S, Kee F, Lawlor BA. Depressive symptoms predict increased social and emotional loneliness in older adults. https://doi.org/101080/1360786320181517728. 2018 Jan 2;24(1):110–8.

73. Stickley A, Santini ZI, Koyanagi A. Urinary incontinence, mental health and loneliness among community-dwelling older adults in Ireland. BMC urology. 2017 Apr 8;17(1).

74. Yip SO, Dick MA, McPencow AM, Martin DK, Ciarleglio MM, Erekson EA. The association between urinary and fecal incontinence and social isolation in older women. American journal of obstetrics and gynecology. 2013;208(2):146.e1-146.e7.

75. Fultz NH, Regula Herzog A. Self-reported social and emotional impact of urinary incontinence. Journal of the American Geriatrics Society. 2001;49(7):892–9.

76. Felde G, Ebbesen MH, Hunskaar S. Anxiety and depression associated with urinary incontinence. A 10-year follow-up study from the Norwegian HUNT study (EPINCONT). Neurourology and urodynamics. 2017 Feb 1;36(2):322–8.

77. Kwak YH, Kwon HJ, Kim YJ. Health-related quality of life and mental health in older women with urinary incontinence. https://doi.org/101080/1360786320151033682. 2015 Jul 2;20(7):719–26.

78. Simard J, Volicer L. Loneliness and Isolation in Long-term Care and the COVID-19 Pandemic. Journal of the American Medical Directors Association. 2020 Jul 1;21(7):966.

79. Vasilopoulos, A., Marinou, S., Rammou, M., Sotiropoulou, P., Roupa, Z., & Siamaga, E. (2018). A research on anxiety and depression of the elderly in the community. Hellenic Journal of Nursing Science 11(3): 59-66. [Internet]. [cited 2021 Dec 12]. Available from: http://www.sciepub.com/reference/280688

80. 2019 T and S. Risk and Protective Factors for Social Isolation and Loneliness - Social Isolation and Loneliness in Older Adults - NCBI Bookshelf [Internet]. [cited 2021 Dec 12]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557971/

81. Theurer K, Mortenson W Ben, Stone R, Suto M, Timonen V, Rozanova J. The need for a social revolution in residential care. Journal of Aging Studies. 2015 Dec 1;35:201–10.

82. Barken R, Daly TJ, Armstrong P. Family Matters: The Work and Skills of Family/Friend Carers in Long-Term Residential Care. http://dx.doi.org/103138/jcs502321. 2017 Jun 5;50(2):321–47.

83. Chamberlain S, Baik S, Estabrooks C. Going it Alone: A Scoping Review of Unbefriended Older Adults. Canadian Journal on Aging / La Revue canadienne du vieillissement. 2018 Mar 1;37(1):1–11.

84. Santini ZI, Koyanagi A, Tyrovolas S, Mason C, Haro JM. The association between social relationships and depression: A systematic review. Journal of Affective Disorders. 2015 Apr 1;175:53–65.

85. Domènech-Abella J, Lara E, Rubio-Valera M, Olaya B, Moneta MV, Rico-Uribe LA, et al. Loneliness and depression in the elderly: the role of social network. Social psychiatry and psychiatric epidemiology. 2017 Apr 1;52(4):381–90.

86. Zoutewelle-Terovan M, Liefbroer AC. Swimming Against the Stream: Non-normative Family Transitions and Loneliness in Later Life Across 12 Nations. Gerontologist. 2018 Nov 3;58(6):1096–108.

87. Cheng P, Jin Y, Sun H, Tang Z, Zhang C, Chen Y, et al. Disparities in prevalence and risk indicators of loneliness between rural empty nest and non-empty nest older adults in Chizhou, China. Geriatrics & Gerontology International. 2015 Mar 1;15(3):356–64.

88. Amblàs-Novellas J, Santaeugènia SJ, Vela E, Clèries M, Contel JC. What lies beneath: A retrospective, population-based cohort study investigating clinical and resource-use characteristics of institutionalized older people in Catalonia. BMC Geriatrics. 2020 Jun 2;20(1).

89. Hitchcott PK, Fastame MC, Langiu D, Penna MP. Cognitive failures in late adulthood: The role of age, social context and depressive symptoms. PLoS ONE. 2017 Dec 1;12(12).