SYSTEMATIC REVIEW

What is the prevalence of loneliness amongst older people living in residential and nursing care homes? A systematic review and meta-analysis

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Abstract

Background: the number of older people living in residential and nursing care homes is rising. Loneliness is a major problem for older people, but little is known about the prevalence of loneliness amongst older people living in care homes.
Aim: to undertake a systematic review of literature on the prevalence of moderate and severe loneliness amongst older people living in residential and nursing care homes.
Design: we systematically reviewed the databases Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, PsycINFO, Embase, Scopus, Cochrane and Allied and Complementary Medicine Database (AMED) from inception to January 2019. We included all studies reporting data on the prevalence of loneliness amongst older people living in care homes. A random-effects meta-analysis was conducted on all eligible data.
Results: a total of 13 articles were included, representing 5,115 participants (age range of 55–102 years, mean age 83.5 years, 68% female). There was a significant variation between studies in estimates of prevalence. The prevalence of moderate loneliness ranged from 31 to 100%, and the prevalence of severe loneliness ranged from 9 to 81%. The estimated mean prevalence of 'moderate loneliness' was 61% (95% confidence interval (CI): 0.41, 0.80). The estimated mean prevalence of 'severe loneliness' was 35% (95% CI: 0.14, 0.60).
Conclusion: the prevalence of both moderate loneliness and severe loneliness amongst care home residents is high enough to warrant concern. However, the significant variation in prevalence estimates warrants further research. Future studies should identify which interventions can address loneliness and promote meaningful social engagement to enhance quality of life in care homes.

Key points

- Little is known about the prevalence of loneliness amongst older people living in care homes.
- Our meta-analysis estimates the mean prevalence of moderate and severe loneliness at 61% and 35%, respectively.
- We found substantial variation between different studies in estimates of the prevalence of loneliness.
- Studies are required to assess whether interventions can affect loneliness and enhance quality of life in care homes.

Background

Across the developed world, it is estimated that between 2 and 5% of the older population reside in care homes [1]. Population ageing and the associated increase in care needs mean that we are likely to see a substantial increase in demand for care home services globally, over the coming years [2].

Care homes play a key role in maintaining physical health, managing health conditions and providing personal care. Whilst care homes are well placed to meet these physical and safety requirements, evidence suggests they are less well equipped to meet the more complex social needs of residents, including social engagement and the prevention of loneliness [3]. Loneliness is a major health problem for older people and is associated with a range of negative health consequences including depression, dementia, cardiovascular disease, malnutrition, poor quality of life and mortality [4,5,6]. Evidence from a number of countries on the prevalence of loneliness amongst community-dwelling older adults suggests that rates are concerningly high. Across Australia, Northern Europe and North America, the prevalence of severe loneliness is estimated between 5 and 10%, in Southern Europe rates of 10–18% are reported [7,8] and studies from Asia have reported rates of around 25–30% [9].

There is ongoing debate about optimum strategies to promote well-being, safety and efficacy amongst care home residents. Studies from the United States (USA), Canada, Japan and Korea show that older adults living in care homes report lower quality of life and less happiness than community-dwelling adults [10,11,12]. Despite the established link between loneliness and health, the evidence base on loneliness amongst older people living in care homes is limited. Nonetheless, a 2015 study suggested loss of family and friends, lack of meaningful communication with fellow residents and staff members lacking time for conversations can lead to sadness and loneliness, despite the apparent social nature of care home life [13]. Loneliness in care homes is therefore an important area for research as living in a care home may exacerbate loneliness and related health issues. In 2012, Victor published an overview of the state of the evidence on loneliness in care homes and highlighted the lack of 'research focusing exclusively on loneliness in care homes either from a qualitative or quantitative perspective' (p. 642). She concluded that whilst loneliness levels in care home populations are probably higher than in the community, this conclusion is based on a weak evidence base, and there is a need for greater research attention [8].

The aim of our research is therefore to systematically review the literature on the prevalence of moderate and severe loneliness amongst older people living in residential and nursing care homes and synthesise the evidence in a meta-analysis.

Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [14]. The full review protocol is available from the authors on request. We used the following definitions of terms. 'Loneliness' is a subjective feeling state of being alone, separated or apart from others and is an imbalance between desired social contacts and actual social contacts [15]. 'Residential and nursing care homes' are settings providing 24-hour residential accommodation and personal and/or nursing care to older people [16].

Search strategy

The electronic databases, CINAHL (via EBSCO), MED-LINE, PsycINFO, Embase, Scopus, Cochrane and AMED (via OVID), were searched from 2000 to January 2019. Grey literature was searched using Internet search engines Google and Google Scholar. Following scoping, a search strategy was devised by MG, CG and another researcher in consultation with an information specialist. Search terms included MeSH headings and keywords, which are presented as supplementary data available online (Appendix A1). We conducted citation searching of reference lists of included articles and forward citation searching. Relevant review papers were also considered to identify potentially omitted articles.
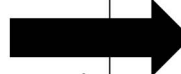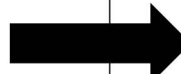
Eligibility criteria

Studies were eligible if they met the following inclusion criteria: (i) English language papers (scoping identified that the majority of literature in this field was in the English language); (ii) papers reporting data on older people (we did not specify a minimum age but only included papers where the sample was described as older/elderly people and data on ages was provided); (iii) papers presenting data from residential or nursing care homes (see definitions); (iv) papers reporting on the prevalence or incidence of loneliness (see definitions); and (v) articles published between 2000 and January 2019.

If we encountered studies which presented data as a mean score on a scale rather than as a prevalence or incidence, we contacted the authors to acquire the raw data. If we encountered multiple publications from the same cohort, we used the data from the first paper in the series. Whilst there is an established evidence base which shows differences between world regions in the prevalence of loneliness amongst community-dwelling older people, there are no comparable data on regional differences in loneliness amongst care home populations. Therefore we included studies from all countries and world regions.

Study identification

A researcher reviewed the titles and abstracts of all papers identified through the searches, and CG double reviewed 10% of these articles. The full texts of potentially eligible

Table 1. Conversion of response options from self-rated measures of loneliness into *severely lonely*, *moderately lonely* and *not lonely*, for inclusion in the meta-analysis.

Various response options from self-rated measures of loneliness	Response options to be included in meta-analysis
- Always lonely - Often lonely - Severe loneliness - High degree of loneliness - Lonely most of the time	**SEVERELY LONELY**
- Lonely half of the time - Moderate degree of loneliness - Sometimes lonely - Where a dichotomous variable was used [lonely vs not lonely] those who responded 'lonely' were coded moderately lonely	**MODERATELY LONELY**
- Never lonely - Rarely lonely - Seldom lonely - Low degree of loneliness - Not lonely	**NOT LONELY**

papers were then reviewed independently by CG and MG and another researcher before making a final decision on eligibility. Any disagreements were resolved through discussion between the authors.

Outcome measures

The outcomes of interest were prevalence of moderate loneliness and prevalence of severe loneliness. Moderate loneliness was defined as those who are moderately lonely 'or worse' and therefore included all of those who were severely lonely.

The measurement of loneliness varies considerably, but broadly speaking two methods are used: (i) self-rating scales where respondents report the frequency of loneliness in response to a single-item question such as 'Do you ever feel lonely?' and (ii) validated loneliness scales that measure the intensity of loneliness rather than the frequency. Where self-rating scales are used, responses are recorded on an ordinal scale with usually three or four response options. The number of response options and the label descriptors vary; some studies use 'lonely vs not lonely', whereas others use up to four response options 'never lonely/sometimes lonely/often lonely/always lonely'. In order to convert these different response options into 'moderately lonely' and 'severely lonely', we used the categorisation presented in Table 1. This process was guided by the classification of loneliness measures developed by Valtorta in 2016 [17].

Where loneliness is measured using a validated instrument, there are established thresholds for identifying moderate and severe loneliness using values from the scales (e.g. Russell 1996 [18] for the University of California, Los Angeles (UCLA) Loneliness Assessment; Victor 2012 [8] for De Jong Gierveld; and Hawthorn 2006 [19] and Casey 2015 [20] for the Friendship Scale). Whilst the range of different approaches to measuring loneliness means that comparisons between different studies should be treated with caution, Victor *et al*. [21] report that the various scales show good comparability in terms of identifying the 'never lonely' and the 'significantly lonely'.

Quality appraisal

Each paper was appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for studies reporting prevalence data [22]. This is a tool for assessing methodological quality and estimating the extent to which a study has addressed the possibility of bias in its design, conduct and analysis. No studies were excluded on the basis of quality appraisal; rather this was used to assess bias and the quality of the overall state of evidence. Quality appraisal is detailed in the online supplementary material (Appendix A2).

Data analysis

We used random-effects meta-analyses to pool studies for moderate loneliness and severe loneliness separately. Such a model allows the estimation of the variability in prevalence across studies, as well as the pooled mean. In the presence of

significant between-study heterogeneity, such that a 'common effect' assumption is not reasonable, the estimate of mean prevalence (with its associated confidence interval) is an insufficient summary of the data [23]. The random-effects confidence interval for the estimated mean does not represent the true range seen across studies. We therefore present both the confidence interval and the prediction interval. The prediction interval represents the range of loneliness that one might expect to be present in a hypothetical future study (e.g. the prevalence of loneliness in a different care home or a different population). This is an approach recommended by Higgins *et al*. [23] for representing the full extent of heterogeneity. Results for each analysis are displayed in a forest plot (Figures 2 and 3), showing the prediction interval along with confidence intervals for the estimated prevalence from each study.

Potential risk factors for loneliness were entered into separate meta-regression models (there were insufficient studies to consider the simultaneous effects of multiple covariates). The risk factors included in the meta-regression models were as follows:

- Gender: proportion of sample that were female
- Mean age of sample
- Minimum age of sample
- Gross domestic product (GDP): the approximate GDP of the country in which the research took place [24]
- Dementia: whether or not those with dementia were included

Assessment of publication bias was not considered to be relevant in this setting as there were no group comparisons or hypothesis tests of 'treatment effect'. Confidence intervals for individual study prevalence estimates use the Skewness-Corrected Asymptotic Score method [25], using the scoreci function in the R 'ratesci' package. Random-effects meta-analysis (including prediction intervals) uses the Hartung–Knapp method [26] applied to the Freeman–Tukey transformed proportions [27], using the metaprop function in the R 'meta' package.

Results

A total of 578 articles were identified; from these 13 articles were included in the final review (see Figure 1). For a full reference list of the included articles, please see the online supplementary material (Appendix A3).

Characteristics of included studies

Study characteristics are noted in Table 2 and full references are given in the online supplementary material (Appendix A3). A total of 5,115 participants were included in the 13 papers, with an age range of 55–102 years and a mean age of 83.5 years. About 68% of the participants were female. Three papers did not provide a mean age, one paper did not provide an age range, and one paper did not provide

a gender breakdown. There were two studies each from Finland and Malaysia and one study from each of the following countries: Norway, Cyprus, Malta, Australia, Egypt, Spain, the Netherlands and China. One study collected data from both Sweden and Finland. The majority of studies excluded people with dementia or severe cognitive impairment; only four studies included those with cognitive impairment or dementia.

A range of different methods were used to measure loneliness in the included studies. The majority ($n = 7$) used single-item self-rating scales, e.g. 'Do you ever feel lonely?' or similar. Other studies used validated tools: the UCLA ($n = 1$), the De Jong Gierveld loneliness scale ($n = 2$) and the Friendship Scale ($n = 2$). One study did not state the method used. Data on moderate loneliness was available from 11 articles and data on severe loneliness was available from 9 articles.

The prevalence of moderate loneliness ranged from 31 to 100%, with the majority of studies ($n = 9$) reporting rates of over 40%. The prevalence of severe loneliness ranged from 9 to 81%, with over half ($n = 5$) reporting rates of over 20%. Four studies (Liu 2012, Nvquist 2013, Prieto-Flores 2011, Savikko 2005) also reported the prevalence of loneliness amongst a comparable population living in the community. All four studies found that rates of loneliness were significantly higher amongst care home residents than those living in the community (significance ranging from $P < 0.05$ to $P < 0.001$).

The pooled estimate for the prevalence of 'moderate loneliness' across 11 studies (3,933 participants) amongst older people living in care homes is 61%, with a random-effects 95% confidence interval of (0.41, 0.80). The pooled estimate for 'severe loneliness' across 9 studies (4,232 participants) is 35%, (95% CI: 0.14, 0.60). However, as there is a very large amount of heterogeneity between studies, the prediction interval for the proportion of care home residents with 'moderate loneliness' one might see in a hypothetical future study is (0.09, 1.00). The prediction interval for the 'severely lonely' data is (0.01, 0.91) (Figures 2 and 3).

Five potential risk factors for loneliness were entered as single covariates in separate meta-regression models (gender, mean age, minimum age, GDP of country, inclusion or not of dementia residents). The results of the meta-regression are displayed in the bubble plots in the supplementary data online (Appendix A4). Studies with missing values were excluded from the meta-regression.

No significant associations were observed between any risk factor and severe loneliness. There was some evidence of an association of moderate loneliness with gender (with the highest loneliness prevalence reported in studies with an equal gender split) and, to a lesser extent, mean age (with higher loneliness prevalence reported in studies with lower mean age). However, there was some confounding between these two factors, and also with country, the effect of both of these covariates was mainly due to the results from the two studies conducted in Malaysia. Without further data, it is impossible to determine which of these three risk
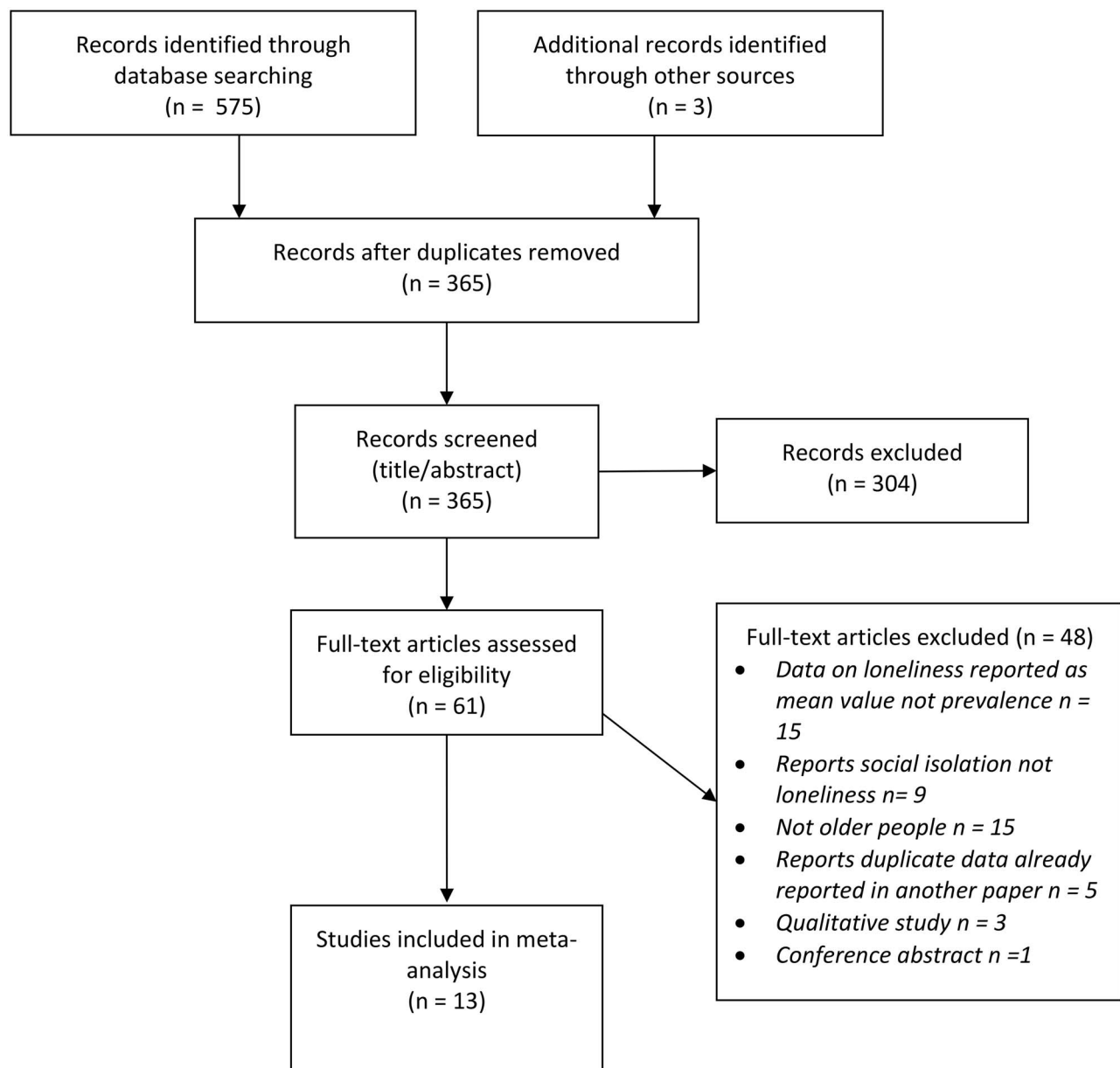
Figure 1. PRISMA diagram: summary of search results [14].

factors (gender, age, country) is independently associated with 'moderate loneliness'.

One must be careful not to interpret from these meta-regressions that younger individuals have a higher prevalence of loneliness or that females are less likely to feel lonely. We only have summary information on the overall study and no individual level information. Hence we do not know which individuals in a particular study reported loneliness. We can only say that those studies with a younger overall mean age, or a more even gender split, appeared to report higher rates of loneliness. In particular, it should be noted that the studies with the most evenly matched gender balance had the highest reported loneliness rates (almost 100% moderately lonely or worse; see Figure in SI) suggesting it is not simply a consequence of females in general feeling less lonely. Instead,

increasing the gender balance seemed to increase the overall loneliness.

Discussion

Our findings indicate that around 61% of older people living in care homes may be moderately lonely and around 35% may be severely lonely. The significant heterogeneity between studies means that these findings should be interpreted with caution. Nonetheless, the findings are suggestive that loneliness is a significant problem amongst older people living in residential and nursing care homes and the prevalence of loneliness in this population is at least comparable to, if not greater than, amongst community-dwelling older adults [28]. Of the four studies that provided
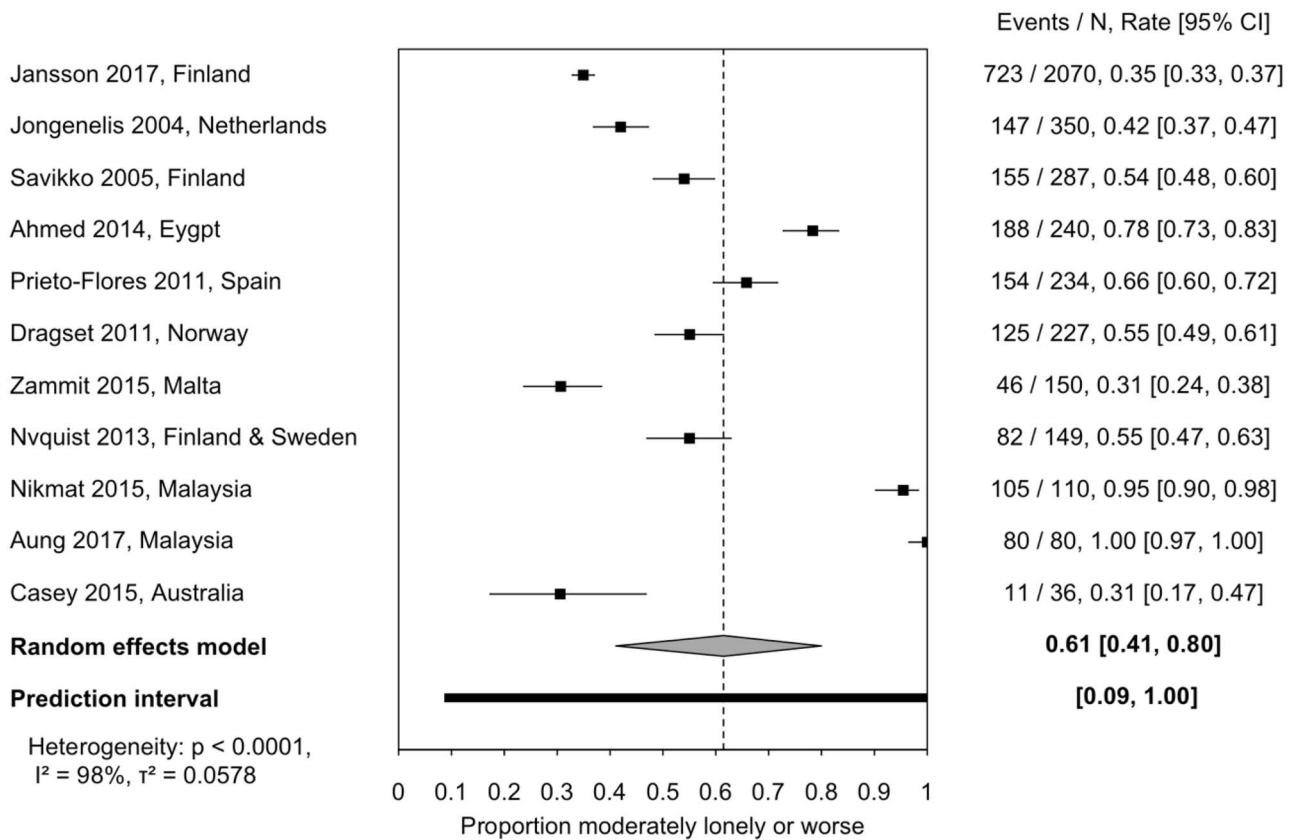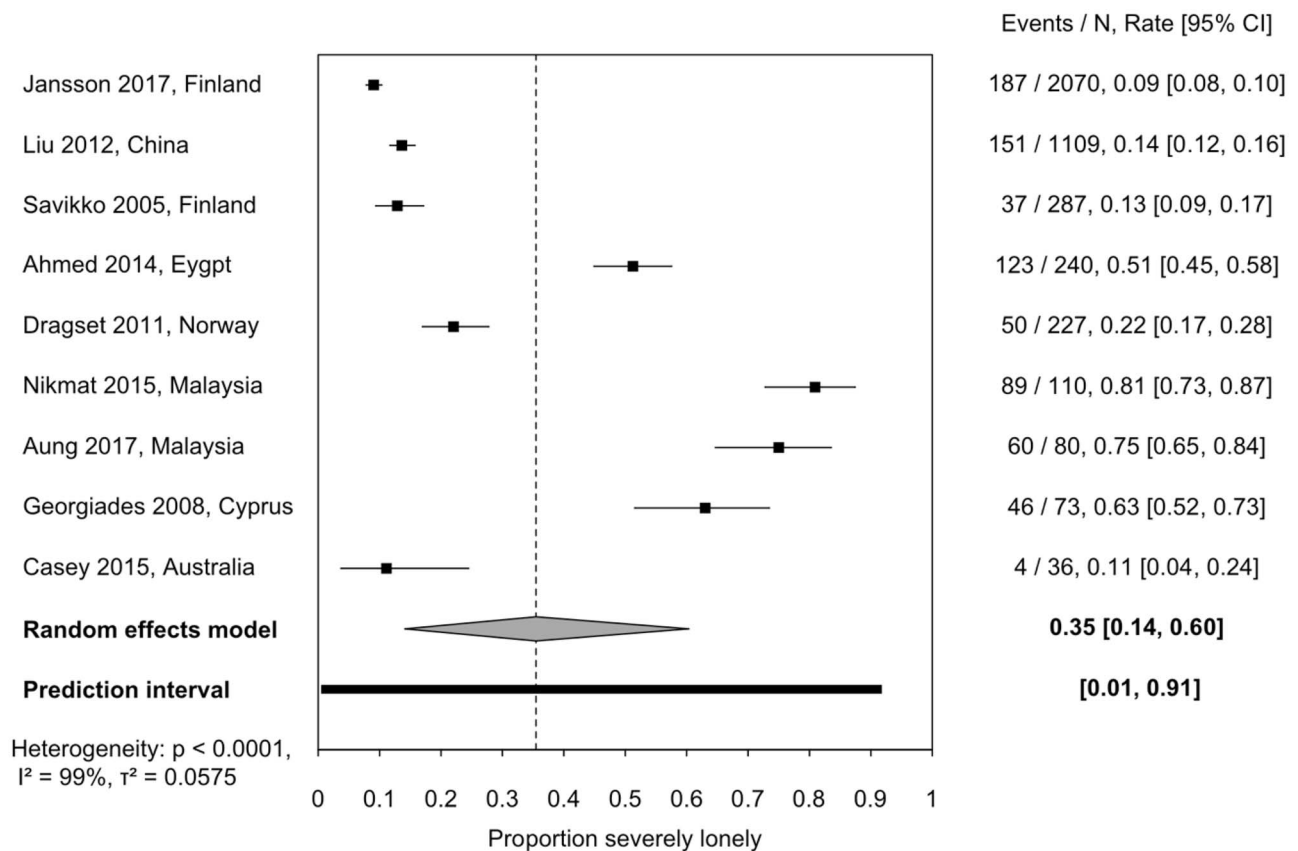
Figure 2. Forest plot for meta-analysis of the prevalence of 'moderately lonely or worse', with studies presented in order of study size (n) from largest to smallest.

a direct comparison between care home residents and those living in their own homes, all reported significantly higher rates of loneliness in the care home populations. In addition, studies in our review reported higher rates of loneliness than previous studies of community-dwelling older people, from the same countries. For example, in Northern Europe rates of severe loneliness amongst community-dwelling older people are mostly below 6% [7]. The studies in our review from Northern Europe reported rates of severe loneliness amongst care home residents between 9 and 22%. Similarly, rates of loneliness amongst Southern European community-dwelling older people have been reported between 10 and 18% [7,8] yet studies in our review report rates of up to 63% for care home residents from this region.

High rates of loneliness in care homes may seem counter to what is an inherently social living arrangement, where residents are surrounded by staff, other residents and visitors. However, research suggests that superficial relationships with other residents and staff, a feeling of 'not belonging' and difficulty connecting with residents of differing mental capacity are all factors underpinning loss of social connectedness [29]. Residents in care homes may have few opportunities to make personal decisions or exercise control over their life. This lack of control in combination with time spent in passive activities, such as doing nothing, sleeping and waiting, can lead to feelings of boredom and loneliness [30].

High levels of loneliness may also precede entry into a care home. The loss of a partner, increased frailty and dependency and loneliness are all predictive of admission into a care home [30]. Consequently, a high proportion of older people enter care homes with reduced social networks and with high levels of loneliness already established [31]. The evidence base on interventions to address loneliness in care homes is mixed [32], and there is little compelling evidence for the effectiveness of interventions [8]. A key challenge for care homes is therefore to determine ways of developing and nurturing social relationships in the care home setting and to engage residents in activities which can help alleviate loneliness.

As noted above, there was considerable variation between studies in terms of prevalence estimates. This variability may be due to differences in study design or bias (i.e. differences in sample, measurement tool, response rate, sample bias) or relate to unreported factors such as time from admission to care home and reason for admission. These data are rarely reported in prevalence studies yet may be important for understanding variation in loneliness estimates. Variability in estimates may also reflect genuine differences in loneliness between care homes and different countries. It seems likely that all of these factors have contributed somewhat to the variability. There is a well-established evidence base which demonstrates differences in loneliness amongst

Events / N, Rate [95% CI]

Jansson 2017, Finland — 187 / 2070, 0.09 [0.08, 0.10]
Liu 2012, China — 151 / 1109, 0.14 [0.12, 0.16]
Savikko 2005, Finland — 37 / 287, 0.13 [0.09, 0.17]
Ahmed 2014, Eygpt — 123 / 240, 0.51 [0.45, 0.58]
Dragset 2011, Norway — 50 / 227, 0.22 [0.17, 0.28]
Nikmat 2015, Malaysia — 89 / 110, 0.81 [0.73, 0.87]
Aung 2017, Malaysia — 60 / 80, 0.75 [0.65, 0.84]
Georgiades 2008, Cyprus — 46 / 73, 0.63 [0.52, 0.73]
Casey 2015, Australia — 4 / 36, 0.11 [0.04, 0.24]
Random effects model — **0.35 [0.14, 0.60]**
Prediction interval — **[0.01, 0.91]**

Heterogeneity: p < 0.0001, I² = 99%, τ² = 0.0575

Proportion severely lonely

Figure 3. Forest plot for meta-analysis of the prevalence of 'severely lonely', with studies presented in order of study size (*n*) from largest to smallest.

community-dwelling older people by country [7]. However, it is not known to what extent this between-country variability exists in the care home population or if it exists at all. Our meta-regressions did not identify any significant associations between country GDP and loneliness; nonetheless other country-specific factors (geographical, cultural, economic) should be considered as potentially influencing loneliness in the care home setting.

It is also probable that differences between individual care homes contribute to variability in loneliness. The term 'care home' encompasses a wide range of residential accommodation types, and care homes differ widely in what opportunities they offer for social engagement and social activities [33]. In turn this may depend on local/national policy, the funding model of the care home (public versus private) and size, location and proportion of residents with dementia. Further research should seek to explore in more detail those care homes which report low levels of loneliness, to identify how they maintain social engagement and highlight examples of good practice, so that successful interventions can be shared and implemented more widely. A clearer assessment of what works well, for whom and under what circumstances is necessary to gain insights into how loneliness may be addressed more consistently in this setting.

Few of the studies in this review included older people with dementia; in most cases this was due to concerns that people with cognitive impairment would struggle to complete the loneliness assessment measures. Nonetheless, people with dementia comprise a large proportion of the resident population of care homes; in the UK around two-thirds of people living in care homes have dementia [33]. There are suggestions that dementia confers additional risk of loneliness [34] and compounds related problems such as apathy [35]. Assessing loneliness in people with communication impairments is challenging and may require alternative methods such as observation or proxy report, rather than relying on self-report scales. Relatively little research exists which focuses on assessing loneliness in people with dementia, and this is an important area for future research if we are to establish a more complete understanding of loneliness in care homes.

Limitations

Titles and abstract of potentially relevant studies were only reviewed by a single individual (although 10% were double reviewed); therefore some potentially relevant articles could have been omitted. A range of different instruments were used to measure loneliness in the included studies, and whilst attempts were made to standardise responses between studies, we acknowledge a direct comparison is likely to be subject to some error. As a consequence, it is probable

Table 2. Details of included studies (n = 13)

Author, year, country	Aim	Design	Sample characteristics	Measurement tool	Findings
Ahmed 2014, Egypt	To determine the prevalence and predictors of depression, anxiety and mixed form (i.e. depression and anxiety) in the elderly living at geriatric homes	Quantitative cross-sectional	240 older people aged 60–74 years from four geriatric homes, free from dementia. Mean age 64.8 years, 65% female	Three-item loneliness scale: 1 = hardly ever 2 = some of the time 3 = often	n = 188 (78.3%) were moderately lonely or worse n = 123 (51.3%) were severely lonely
Aung 2017, Malaysia	The aim of this study was to explore the level of loneliness amongst elderly in nursing homes using the UCLA Lonliness Scale	Quantitative cross-sectional	80 older people from nursing homes in Malaysia, aged 61–100 years. No mean age given. 54% female. Does not state any exclusion criteria relating to dementia	UCLA 20-item loneliness scale, scores summed: 20–34 = low degree of loneliness; 53–49 = moderate degree of loneliness; 50–80 = moderately high degree of loneliness	n = 80 (100%) were moderately lonely or worse n = 60 (75%) were severely lonely or worse
Casey 2016, Australia	To investigate co-resident social networks in three units of a 94-bed Australian nursing home	Quantitative cross-sectional	36 residents of a single nursing home, age range 63–94 years. Mean age 81.8 years. 61% female. Excluding those who were acutely ill but including those with dementia	The Friendship Scale	n = 11 (31%) were moderately lonely or worse n = 4 (11%) were severely lonely
Dragset 2011, Norway	To examine the frequency of contact and loneliness and the association between loneliness and social support dimensions	Cross-sectional, descriptive, correlational design	227 residents of 30 nursing homes, 65–102 years; mean age 85.4 years. 72% female. Excluded those with cognitive impairment	Single question 'Do you sometimes feel lonely?' [1 = often, 2 = sometimes, 3 = rarely, 4 = never]. Dichotomised into 1 and 2 = lonely, 3 and 4 = not lonely	n = 125 (56%) were moderately lonely or worse n = 50 (22%) were severely lonely
Georgiades 2008, Cyprus	What are life satisfaction levels of nursing home residents in Cyprus?	Quantitative, cross-sectional, descriptive design	73 residents from 4 nursing homes. Age range: 65–100 years; mean age 83 years. 77% female. Those with severe communication deficits excluded	One-item question: 'I often feel lonely here' [yes/no]	Number of moderately lonely or worse not stated n = 46 (63%) were severely lonely
Jansson 2017, Finland	To examine the prevalence, associated factors and prognosis of loneliness amongst older people in institutional settings	Quantitative cross-sectional	2,070 residents from 61 nursing homes. No data on age range. Mean age 84 years; 75% female. Those with dementia excluded	Single question 'Do you suffer from loneliness?' [seldom or never, sometimes, often or always]	n = 723 (35%) were moderately lonely or worse n = 187 (9%) were severely lonely
Jongenelis 2004, the Netherlands	To investigate the prevalence of depression, measured with a rating scale and a diagnostic instrument, and to identify risk indicators of depression in the nursing home population	Quantitative cross-sectional surveys	350 nursing home residents, age range 55–99 years. Mean age 79.4 years; 69% female. Significant cognitive impairment excluded	11-item De Jong Gierveld Loneliness Scale used to measure loneliness. 'As recommended by the authors, a cut-off score of 3 was used to distinguish between lonely and not lonely'	n = 147 (42%) were moderately lonely or worse. Number of severely lonely not stated
Liu 2012, China	Explores the role of children in differences in psychological well-being between institutionalised and community-residing oldest-old adults in China	Data from longitudinal health survey, collected in the 1998, 2000 and 2002 waves	1,109 older adults aged 80–>100 years living in a residential setting. Mean age 89.4%; 55% female. Including those with cognitive impairment	Single-item question: 'Do you often feel lonely and isolated?' Responses dichotomised so responses to feeling lonely and isolated (always/often) are coded 1	Number of moderately lonely or worse not stated n = 151 (13.6%) were severely lonely
Nikmat 2015, Malaysia	To determine the prevalence of loneliness/social isolation and late-life depression amongst older adults with cognitive impairment living in institutional care	Cross-sectional, quantitative, survey design	110 residents of 4 nursing homes. Aged 60–89 years. Mean age 71.6 years; 50% female. All cognitively impaired, but excluded if extremely cognitively impaired	The Friendship Scale	n = 105 (95.5%) were moderately lonely or worse n = 89 (80.9%) were severely lonely
Nyquist 2013, Finland and Sweden	To investigate the links between social capital and loneliness amongst the very old living either at home or in institutional settings	Quantitative, cross-sectional	149 people aged 85–>95 years living in institutional settings. 80% female. No mean age given. No exclusion based on dementia but those with communication difficulties 'unlikely to have responded'	One-item question: 'Do you ever feel lonely?' [1 = often, 2 = sometimes, 3 = seldom, 4 = never]. Dichotomised into 1 and 2 = lonely; 3 and 4 = not lonely	n = 82 (55%) were moderately lonely or worse. Number of severely lonely not stated
Prieto-Flores 2011, Spain	To seek if sociodemographic and health factors contribute differentially to the explanation of loneliness in institutionalised and noninstitutionalised older adults	Quantitative cross-sectional surveys	234 nursing home residents aged 60–97 years, mean age 81 years. 65% female. Excluding those with severe cognitive impairment	Six-item De Jong Gierveld Loneliness Scale used and then transformed into a dichotomous variable 'lonely' versus 'not lonely'	n = 154 (71.6%) were moderately lonely or worse. Number of severely lonely not stated
Savikko 2005, Finland	To examine the prevalence and self-reported causes of loneliness amongst Finnish older population	Quantitative, cross-sectional design Postal survey	287 older nursing home residents >75 years. No data on age range, mean age or gender of the residential sample (only on combined sample). No exclusion criteria stated relating to dementia	One-item question 'Do you suffer from loneliness?' (1 = seldom or never; 2 = sometimes; 3 = often or always)	n = 155 (54%) were moderately lonely or worse n = 37 (13%) were severely lonely
Zammit 2015, Malta	What is the prevalence of depression in older persons living in nursing homes in Malta, and what factors are associated with depression in nursing home residents in Malta?	Cross-sectional, quantitative design	150 patients from 2 nursing homes. Age range 60–96 years; mean age 80.3 years; 75% female. Excluded from the study if cognitively impaired	Not stated	n = 46 (31.7%) were moderately lonely or worse. Number of severely lonely not stated

that the process of standardisation contributed to the significant variability in prevalence rates between studies. Studies were included in a single meta-analysis regardless of country or world region, but we acknowledge that cultural, economic and demographic factors may point to a need for country-specific research. Future work should seek to establish whether differences in loneliness in care homes reflect between-country differences in loneliness which have been observed amongst community-dwelling older people.

Conclusion

According to our estimates, the prevalence of both moderate loneliness and severe loneliness amongst care home residents is high enough to warrant concern. However, the significant variation in prevalence estimates warrants further research to establish why loneliness rates vary so widely. Addressing loneliness and promoting meaningful social engagement have significant potential for enhancing quality of life in care homes, and therefore priority should be given to acknowledging and further exploring loneliness in this setting.

Supplementary Data: Supplementary data mentioned in the text are available to subscribers in *Age and Ageing* online.

Declaration of Conflicts of Interest: None.

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