BMJ Open

Chronic loneliness and chronic social isolation among older adults: a study protocol for a systematic review, meta-analysis and meta-regression

André Hajek , Giuliana Posi, Hans-Helmut König

To cite: Hajek A, Posi G, König H-H. Chronic loneliness and chronic social isolation among older adults: a study protocol for a systematic review, meta-analysis and meta-regression. *BMJ Open* 2024;**14**:e080399. doi:10.1136/bmjopen-2023-080399

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2023-080399).

Received 29 September 2023
Accepted 26 March 2024

Department of Health Economics and Health Services Research, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Correspondence to
Dr André Hajek; a.hajek@uke.de

ABSTRACT

Introduction There are around 20 studies identifying the prevalence of chronic loneliness and chronic social isolation in older adults. However, there is an absence of a systematic review, meta-analysis and meta-regression that consolidates the available observational studies. Therefore, our objective was to address this knowledge gap. Here, we present the study protocol for this upcoming work. Such knowledge can help in addressing older individuals at risk for chronic loneliness and chronic social isolation.

Methods and analysis Established electronic databases will be searched. Observational studies reporting the prevalence of chronic loneliness and chronic social isolation among individuals aged 60 years and over will be included. Disease-specific samples will be excluded. The focus of data extraction will be on methods, sample characteristics and key findings. The Joanna Briggs Institute (JBI) standardised critical appraisal instrument for prevalence studies will be used for assessing the quality of the studies. Two reviewers will be responsible for carrying out the study selection, data extraction and assessment of study quality. The results will be presented through the use of figures, tables, narrative summaries and a meta-analysis and meta-regression.

Ethics and dissemination No primary data will be collected. Thus, there is no need for approval from an ethics committee. We intend to share our results through publication in a peer-reviewed journal.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ First work: aimed to identify the prevalence and factors associated with chronic loneliness and chronic social isolation in older adults.
⇒ Study quality will be evaluated.
⇒ Key stages (such as study selection, data extraction and assessment of study quality) will be undertaken by two reviewers.
⇒ Meta-analysis and meta-regression are planned.
⇒ Search focused on peer-reviewed articles.

INTRODUCTION

In late life, individuals often encounter various challenges. Among these challenges, chronic loneliness and chronic social isolation emerge as significant concerns. With the progression of age, individuals may experience a reduction in their social relationships, influenced by factors such as retirement, the loss of close friends and family members, or physical limitations.[1] These transformations can contribute to (chronic) loneliness and social isolation[1] which can have detrimental impacts on mental as well as physical health and longevity among older adults.[2] More precisely, a previous review and meta-analysis showed medium-to-large effects of loneliness on different health outcomes such as physical health, general health, sleep, cognition or mental health—whereby the largest effects of loneliness were found for mental health outcomes.[3] Another systematic review of systematic reviews (ie, a systematic overview) also revealed (1) an association between social isolation and cardiovascular diseases and (2) an association between social isolation and all-cause mortality.[4] Moreover, particularly such *chronic* feelings (compared with temporary feelings of loneliness) can have harmful effects for health.[5 6]

Chronic loneliness among older adults is more than a temporary feeling of solitude; it reflects an enduring and distressing emotional state of dissatisfaction with one's own social connection.[7] It can be characterised as a deficiency in meaningful social interactions, companionship in their lives or emotional support.[8] Factors such as living alone, loss of spouse or friends, restricted access to transportation or a decreased social engagement can contribute to chronic loneliness.[9]

Chronic social isolation, although connected, establishes itself as a distinct concept apart from chronic loneliness. It indicates a situation in which older adults have restricted interactions with social networks and sustain a persistent lack of involvement in social activities.[10] A previous study also

showed that chronic social isolation is associated with higher subsequent depression scores.[11]

Thus far, numerous studies have examined (temporary) loneliness and social isolation in old age (as an overview, see Refs. 1 2). Considerably fewer studies have investigated the prevalence and determinants of *chronic* loneliness and social isolation in old age.[12–15] To date, a systematic review, meta-analysis and meta-regression is missing exploring the prevalence of chronic loneliness and chronic social isolation—and the factors associated with them. Identifying the prevalence of chronic loneliness and chronic social isolation is of great importance, especially in light of the ongoing rise in the population of individuals aged 60 and above. Furthermore, our upcoming work aimed to examine the factors associated with chronic loneliness and chronic social isolation in this specific age group. This can assist in addressing individuals at risk for chronic loneliness and chronic social isolation. This in turn can help to sustain health and can contribute to successful ageing.[16 17] Overall, addressing chronic loneliness and chronic social isolation is important for policy-makers, healthcare providers and society as a whole. Additionally, this future work has the potential to identify research gaps and thus to guide future research in this area.

Methods and analysis

The methodology for this review adheres to the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols.[18] Additionally, it is registered by the International Prospective Register of Systematic Reviews (PROSPERO, ID: CRD42023467646). This work began on mid-November 2023 (search) and we anticipate that it will be completed by 30 April 2024.

Eligibility criteria

Prior to establishing the final eligibility criteria, a preliminary examination was carried out involving the screening of 100 titles/abstracts. No adjustments to the criteria were made following this pretest. Detailed inclusion and exclusion criteria are shown in the subsequent sections.

Inclusion criteria

Final inclusion criteria were as follows:

- Cross-sectional and longitudinal observational studies centred on chronic loneliness or chronic social isolation prevalence within individuals aged 60 years and above.
- Validated instruments for evaluating loneliness/social isolation.
- Studies accessible in either English or German and released in peer-reviewed scientific journals.

Exclusion criteria

The final exclusion criteria were as follows:

- Studies solely focused on samples with particular conditions, such as samples only including individuals with cognitive or mental disorders.

Studies involving such disease-specific samples were excluded as it is unclear to what extent they can be generalised to the older population in general. However, it should be emphasised that samples are not excluded if they include people with diseases (as long as these studies are not purely disease-specific).

We focused on observational studies (and therefore excluded other designs such as randomised controlled trials so that respondents would not be influenced by any interventions). Moreover, it is important to highlight that the appropriateness of the instruments follows closely the criteria outlined in the COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) guidelines.[19] With regard to chronicity of loneliness (and social isolation), it will be based on the definition in the papers. We assume that the great majority of studies assume chronicity when loneliness (or social isolation) exists for several consecutive waves.

The electronic databases include PubMed, PsycInfo, CINAHL and Web of Science. The final search strategy for PubMed is displayed in table 1 (for the other databases: see online supplemental file 1). No restrictions will be applied in terms of time or location. Furthermore, two reviewers will manually explore the reference lists of studies that meet our ultimate inclusion criteria.

Table 1 Search strategy (PubMed)

#1	Chronic lonel* [MeSH Terms]
#2	Persistent lonel*
#3	Chronic social exclu*
#4	Persistent social exclu*
#5	Chronic social isolat*
#6	Persistent social isolat*
#7	#1 OR #2 OR #3 OR #4 OR #5 OR #6
#8	Older adults
#9	Elderly
#10	Oldest old
#11	Old age
#12	Aged [MeSH Terms]
#13	#8 OR #9 OR #10 OR #11 OR #12
#14	#7 AND #13

PubMed search algorithm.

Data management

We will use Endnote V.20, developed by Clarivate Analytics (Philadelphia, Pennsylvania, USA), for importing the data. Additionally, Stata V.18.0 (StataCorp) will be employed to conduct a potential meta-analysis and meta-regression if feasible (ie, when the studies are not too different in their design, methods or sample to be combined statistically).

Study selection process

On completing the search, two reviewers (AH and GP) will assess the titles/abstracts to determine their potential inclusion based on the eligibility criteria. Following this, the full texts will be evaluated by these aforementioned

two reviewers. If differences of opinions are present, discussions will be held to reach a consensus. If an agreement cannot be reached, a third party (H-HK) will be consulted.

Data collection process and data items

Data extraction will be carried out by two reviewers (AH and GP). The first reviewer (GP) will initially extract the data, and then the second reviewer (AH) will cross-verify it. In instances where clarification is needed, a third party (H-HK) will be engaged. Additionally, if necessary, communication with study authors via email will be initiated. Data extraction will encompass various elements such as study design, definition/assessment of key variables (ie, chronic loneliness and chronic social isolation), sample characteristics (if reported: sample size, mean age and proportion of female individuals), statistical analysis and key findings (prevalence of chronic loneliness and prevalence of chronic social isolation; also stratified by sex, if reported; correlates of chronic loneliness or chronic social isolation).

Regarding meta-analysis, random-effect models will be used to pool proportion across studies included in this upcoming work (since we assume heterogeneity across studies). We will use forest plots to display aggregated estimates and illustrate the degree of variation among the included studies. The Higgin's I^2 statistic will be employed to evaluate the heterogeneity among the studies using the following categorisation: (1) 25%–50%, indicating low heterogeneity; (2) 50%–75%, and (3) 75%–100%, representing high heterogeneity.[20] If possible, subgroup analysis will be conducted based on, for example, sex or living arrangement (community-dwelling vs institutionalised settings). We will use funnel plots and conduct the Egger test to investigate the presence of publication bias. If possible, we will conduct meta-regressions to investigate the origins of heterogeneity (eg, tool used to quantify chronic loneliness, proportion of women, average age or country of origin).

Assessment of study quality/risk of bias

The Joanna Briggs Institute standardised critical appraisal instrument for prevalence studies[21] will be used for assessing the quality of the studies. Two independent reviewers (AH and GP) will individually evaluate the study quality. If necessary, discussions will be conducted until a consensus is achieved. In cases where consensus remains elusive, a third party (H-HK) will be consulted.

Data synthesis

On completion of the screening process, a Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram will be generated to illustrate the study selection procedure. In a narrative synthesis, we will present the most important findings. Similar to recent reviews and books,[1 2] our intention is to categorise the correlates into: socioeconomic factors (eg, sex, age, education or income), lifestyle-related factors (eg, physical activity, smoking, alcohol intake) and health-related factors (eg, self-rated health). If possible, we will conduct a meta-analysis and meta-regression.

Patient and public involvement statement

The present review protocol did not involve individual patients or public agencies.

DISCUSSION

A bulk of studies examined loneliness and social isolation in old age. However, there are far less studies focusing on chronic loneliness and chronic social isolation. Thus, the aim of our upcoming systematic review, meta-analysis and meta-regression will be to give an overview of observational studies examining the prevalence and (ideally) the correlates of chronic loneliness and chronic social isolation. In addition, we will assess the quality of the studies included. Our upcoming work could enhance discussions surrounding loneliness and social isolation in old age (and in other age groups). This may contribute to maintaining general health in later life and successful ageing.

Our upcoming systematic review, meta-analysis and meta-regression have the potential to uncover gaps in research. For example, it may be the case that more studies exist focusing on the prevalence of chronic loneliness rather than chronic social isolation among older adults. It may also be the case that the existing longitudinal studies only use data from only a few years (rather than decades). Additionally, we assume that there is an imbalance between the countries studied so far. For example, many studies could come from North America, Europe and Asia. The prevalence could also depend on variables such as the proportion of women, the tool used to quantify chronic loneliness/chronic social isolation or the geographical region.

Strengths and limitations

This will be the first systematic review, meta-analysis and meta-regression regarding the prevalence and correlates of chronic loneliness and chronic isolation among older adults. The upcoming work engages two reviewers in various tasks, such as study selection and quality assessment. It is intended to do a meta-analysis and meta-regression. It should be noted that our work is restricted to peer-reviewed studies published in English or German language which may exclude potential relevant articles. Moreover, the exclusive focus on peer-reviewed articles may exclude some studies which may be relevant. However, this choice ensures a certain quality of included studies.

Ethics and dissemination

No primary data will be collected. Therefore, approval by an ethics committee is not required. Our findings are planned to be published in a peer-reviewed journal.

Contributors The study concept was developed by AH and H-HK. The manuscript of the protocol was drafted by AH and critically revised by GP and H-HK. The

search strategy was developed by AH and H-HK. Study selection, data extraction and quality assessment will be performed by AH and GP, with HH-K as a third party in case of disagreements. All authors have approved the final version of the manuscript.

Funding We acknowledge financial support from the Open Access Publication Fund of UKE - Universitätsklinikum Hamburg-Eppendorf.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs
André Hajek http://orcid.org/0000-0002-6886-2745
Hans-Helmut König http://orcid.org/0000-0001-5711-6862

REFERENCES

1 Ejiri M, Kawai H, Ishii K, *et al*. Predictors of older adults' objectively measured social isolation: a systematic review of observational studies. *Arch Gerontol Geriatr* 2021;94:104357.
2 Hajek A, Riedel-Heller SG, König H-H, eds. *Loneliness and Social Isolation in Old Age: Correlates and Implications*. London: Routledge, 2023. Available: https://www.taylorfrancis.com/books/9781003289012
3 Park C, Majeed A, Gill H, *et al*. The effect of loneliness on distinct health outcomes: a comprehensive review and meta-analysis. *Psychiatry Res* 2020;294:113514.
4 Leigh-Hunt N, Bagguley D, Bash K, *et al*. An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health* 2017;152:157–71.
5 Martín-María N, Caballero FF, Miret M, *et al*. Differential impact of transient and chronic loneliness on health status. A longitudinal study. *Psychology & Health* 2020;35:177–95.
6 Martín-María N, Caballero FF, Lara E, *et al*. Effects of transient and chronic loneliness on major depression in older adults: a longitudinal study. *Int J Geriatr Psychiatry* 2021;36:76–85.
7 Heinrich LM, Gullone E. The clinical significance of loneliness: a literature review. *Clin Psychol Rev* 2006;26:695–718.
8 Bessaha M, Persaud U, Asfe R, *et al*. Community-based providers' perspectives on addressing loneliness and mental health services for migrant youth and emerging adults. J Soc Serv Res 2023;49:93–104.
9 Newall NEG, Chipperfield JG, Bailis DS. Predicting stability and change in loneliness in later life. *J Soc Pers Relat* 2014;31:335–51.
10 Lee CR, Chen A, Tye KM. The neural circuitry of social homeostasis: consequences of acute versus chronic social isolation. *Cell* 2021;184:1500–16.
11 Zhang Y, Kuang J, Xin Z, *et al*. Loneliness, social isolation, depression and anxiety among the elderly in Shanghai: findings from a longitudinal study. *Arch Gerontol Geriatr* 2023;110:104980.
12 Lim MH, Manera KE, Owen KB, *et al*. The prevalence of chronic and episodic loneliness and social isolation from a longitudinal survey. *Sci Rep* 2023;13:12453.
13 Lara E, Matovic S, Vasiliadis H-M, *et al*. Correlates and trajectories of loneliness among community-dwelling older adults during the COVID-19 pandemic: a Canadian longitudinal study. *Arch Gerontol Geriatr* 2023;115:105133.
14 Panes Lundmark V, Josefsson M, Rieckmann A. Predictors of loneliness onset and maintenance in European older adults during the COVID-19 pandemic. *Front Psychol* 2023;14:1172552.
15 Kim J, Park GR. Chronic loneliness, gender, and trajectories of change in hand grip strength in older adults. *J Gerontol B Psychol Sci Soc Sci* 2023;78:649–58.
16 Gwak H, Yang S. The mediation effect of loneliness on the relationship between the different purposes of SNS use and successful aging in older adults. *The Korean Journal of Developmental Psychology* 2023;36:47–67.
17 Liu J, Gou RY, Jones RN, *et al*. Association of loneliness with change in physical and emotional health of older adults during the COVID-19 shutdown. *Am J Geriatr Psychiatry* 2023;31:1102–13.
18 Shamseer L, Moher D, Clarke M, *et al*. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ* 2015;350.
19 Prinsen CAC, Mokkink LB, Bouter LM, *et al*. COSMIN guideline for systematic reviews of patient-reported outcome measures. *Qual Life Res* 2018;27:1147–57.
20 Higgins JPT, Thompson SG, Deeks JJ, *et al*. Measuring inconsistency in meta-analyses. *BMJ* 2003;327:557–60.
21 Moola S, Munn Z, Tufanaru C, *et al*. Systematic reviews of etiology and risk. In: Aromataris E, Munn Z, eds. *Joanna Briggs Institute Reviewer's Manual*. Adelaide, Australia: The Joanna Briggs Institute, 2017: 219–26.