Review

A global perspective on risk factors for social isolation in community-dwelling older adults: A systematic review and meta-analysis

Meiqian Chen [a,b,1], Xiang Cao [b,1], Afeng Wang [b,1], Yi Zhu [b], Guanzhen Lu [a,b,*], Li Zhang [a], Lijuan Shen [b]

[a] *Department of Scientific Research, Huzhou Central Hospital, Affiliated Central Hospital Huzhou University, 1558 Sanhuan North Road, Huzhou, Zhejiang, 313000, China*
[b] *School of Medicine and Nursing, Huzhou University, 759 Erhuan East Road, Huzhou, Zhejiang, 313000, China*

HIGHLIGHTS

- It is a systematic review with a global perspective.
- Social isolation of elder in the global community has multidimensional factors.
- The factors that lead to elder's social isolation in the community vary by area.

ARTICLE INFO

ABSTRACT

Purpose: Older people's physical and mental health are now significantly impacted by social isolation, a major threat to public health. Our goal was to identify the connections between risk factors and social isolation among this population across various geographic areas.
Methods: Seven databases were thoroughly searched, from their inception until April 2023. Inclusion and exclusion criteria were used to choose the studies. For the included cross-sectional studies, we used the Agency for Healthcare Research and Quality (AHRQ) to assess the probability of bias, and the Newcastle-Ottawa scale for the cohort studies. The statistical analysis was performed using STATA 15 to calculate pooled odds ratios (OR) and 95% CI.
Results: All 3043 papers were carefully examined, and 42 satisfied the criteria for inclusion. The results indicated that multi-domain risk factors and social isolation among older persons worldwide are significantly correlated. These multi-domain risk factors included biological factors, socioeconomic factors, and psychological and behavioral factors. It is also important to note that these factors may vary from region to region.
Conclusion: Many domain factors were linked to social isolation in older individuals living in communities throughout the world. To develop effective strategies for controlling social isolation, it is crucial to conduct assessments of social isolation risk factors in local communities.

1. Introduction

Globally, over 25 % of older individuals who live in the community face social isolation (Teo et al., 2023). This is a significant concern given that the population of people 65 and older is expected to surpass that of children under five in human history (Bincy et al., 2022). Social isolation is a critical indicator for assessing an individual's social relationships, which are fundamental to human life due to our group living nature.

Social isolation has been cited by international organizations like the World Health Organization (WHO) as a significant social and policy concern in aging (Merchant et al., 2020). Social isolation is defined by a limited network of social relationships and can be objectively measured using scales that assess the size, frequency, or quality of social networks (Gorji et al., 2019; Lubben et al., 2006).

Social isolation among older persons in the community has grown to be a common and serious health problem as a result of urbanization and

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mass migration. In the community, social isolation has been associated with early mortality and functional impairment(Gale et al., 2018; Holt-Lunstad et al., 2015), as evidenced by increased risks of adverse outcomes such as falls, cardiovascular disease, malnutrition, depression, dementia, elder abuse, and a nearly 1 % increased risk of death (Freedman & Nicolle, 2020; Gronewold et al., 2021; Holt-Lunstad et al., 2015). Furthermore, older persons who experienced social isolation utilized health services more frequently, which places a significant burden on state finances and family caregivers (Freedman & Nicolle, 2020). Additionally, it has been discovered that social isolation raises the risk of cancer-related illness and death (Kotian et al., 2018).

Older persons are increasingly choosing to age in place, staying in their own homes and communities, as this preserves their freedom (Stone, 2013). The acknowledgment of this preference, coupled with the insufficiency of nursing home facilities to accommodate the future care needs of older adults, has propelled the emergence and widespread adoption of community-based care models (Nilsen et al., 2018). From a social policy perspective, this shift has presented a challenge to policymakers and stakeholders, necessitating the identification of pertinent risk and protective factors. These factors are crucial for informing the implementation of community-based policies aimed at promoting the overall well-being of socially isolated older individuals.

Given that social isolation is a potentially reversible state, there is a growing interest in identifying socially isolated older adults as early as possible (Siviero et al., 2020). Although little is currently known about these variances, cultural distinctions and individual attitudes about social isolation may lead to variations in the risk associated with social isolation among older people in different areas. Our study intended to examine the multidimensional and multilevel variables that affect the danger of social isolation in older persons aged 60 and over in the community to fill this knowledge gap. We also correlate and describe these factors at different continental levels to give trustworthy evidence for bettering policy measures connected to the management of the health of older individuals in the community. By doing so, we hope to contribute to the development of effective interventions that may cater to the particular requirements of older folks in various locales and enhance their general well-being.

2. Methodology

The present study was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, a commonly acknowledged standard for conducting systematic reviews and meta-analyses. The review was pre-registered and complied with the highest standards of openness and rigor in the research process because it has been enrolled with PROSPERO under its registration code CRD42023417680.

2.1. Search strategy and selection criteria

Between the beginning of our study and April 2023, we conducted a thorough search through a wide range of electronic databases, including Embase, CINAHL (EBSCO), Cochrane Library, Scopus, PsycINFO (EBSCO), Web of Science, and PubMed. To find pertinent studies, we also manually scanned the citation lists of acceptable papers and carried out a complimentary search in Google Scholar. MeSH words and free terms were combined in our search method, including (older OR elderly) AND (social isolation OR social network) AND (influencing factor OR risk factor OR associated factor) AND (community OR community residence OR community learning OR residence). Supplement A1 contains a summary of the whole search plan. To make sure that no pertinent research was overlooked, we also personally checked all of the initial author's references and citations in addition to other publications.

2.2. Inclusion and exclusion criteria

The suitability of papers for inclusion in our evaluation was determined by two independent researchers, and any disagreements were settled by agreement with a third reviewer. Studies had to meet the following requirements to be considered for our review: (i) observational study design: cross-sectional, case-control, and cohort studies; (ii) Participants had to be at least 60 years old and a resident of the community to participate; (iii) social isolation could be diagnosed using any criterion, but a specific definition required to be given; (iv) the study offered a thorough examination of social isolation risk factors.

Conversely, studies were rejected if they satisfied any of the exclusion standards listed below: (i) non-research articles: conferences, and reviews; (ii) dissertations; (iii) those who participated had serious illness or hospitalization.

2.3. Data extraction

Two independent researchers conducted a thorough screening of the literature's titles and abstracts using the established inclusion and exclusion criteria to exclude any irrelevant studies. The full-text publications were then independently evaluated by the researchers to see if they satisfied the inclusion requirements. During the article review process, any discrepancies were settled by consensus. Based on several important aspects, such as the first author's name, the publication year, the country, the study design, social isolation criteria, and risk factors for social isolation, data were retrieved from the included papers.

2.4. Quality evaluation

We used the 11-item criteria suggested by the US Agency for Healthcare Quality and Research (AHRQ) to evaluate the cross-sectional study's quality. Results were evaluated based on a scoring system ranging from 0 to 11. Study quality was categorized as low (0–3), medium (4–7), or high (8–11) based on the achieved scores. To assess the quality of the cohort studies, we utilized the Newcastle-Ottawa Scale (NOS) as a tool. By taking into account eight elements relating to participant selection, the comparability of research groups, and the determination of outcome or exposure, this scale rated the quality of the study. Two independent researchers rigorously evaluated the included studies' methodological quality and bias risk.

2.5. Data analysis

We exported the data summarized in Office 2021 to STATA 15 for statistical analysis. We estimated the effects of the factors of interest by combining ORs and 95% Cis, and used I^2 values to measure statistical heterogeneity. A random-effects model was employed to determine the combined effect size, and an I^2 value larger than 50% was regarded as indicative of statistical heterogeneity. On the other hand, a fixed-effects model was applied when I^2 was lower than 50%. To account for the heterogeneity among the included research, we also carried out sensitivity analyses by eliminating studies one by one. Subgroup studies were also carried out to investigate the potential effects of various nations and areas (Pradipta et al., 2017). Finally, we utilized Egger's test to determine whether there was any potential bias.

3. Results

Initially, we identified 3403 relevant papers through our comprehensive search strategy. Additionally, we manually searched for 1 article from the reference list and Google Scholar. After using Endnote software to check for duplicates, 1264 duplicate papers were excluded, and 1797 were included. We excluded 1692 papers that did not match the type and purpose of the study or the study population after reading the title and abstract, and included 106 papers that were eligible for inclusion. In

the end, 64 articles that did not satisfy the criteria were eliminated following an additional reading of the complete text, leaving 42 publications for our meta-analysis. Fig. 1 shows a thorough flowchart of the research selection procedure as well as the explanations for exclusion.

3.1. Characteristics of the studies

In Supplement A2, a list of the characteristics of the study is provided. The studies that were included were published between 1982 and 2022. The research were carried out in 18 various countries and locations, with 17 studies conducted in Asia(Bincy et al., 2022; Ejiri et al., 2018; Eslami et al., 2022; Fujii et al., 2021; Gouda & Okamoto, 2012; Ibrahim et al., 2013; Kotian et al., 2018; Kumar et al., 2022; Lai et al., 2023; Li et al., 2022; Li et al., 2023; Merchant et al., 2020; Shimada et al., 2014; Sunarti et al., 2021; Taghvaei et al., 2021; Takahashi et al., 2020; Wu & Chan, 2012),13 in North America(Adams et al., 1989; Chan et al., 2020; Coyle et al., 2017; Cudjoe et al., 2020; Havens et al., 2004; Jang et al., 2016; Kobayashi et al., 2009; Mick et al., 2014; Mick & Pichora-Fuller, 2016; Nilsen et al., 2018; Sourial et al., 2023; Umoh et al., 2022; Weinstein & Ventry, 1982),9 in Europe (Blozik et al., 2009; De Koning et al., 2017; Gené-Badia et al., 2020; Herbolsheimer e al., 2017; Iliffe et al., 2007; Lubben et al., 2006; Scharf et al., 2005; Siviero et al., 2020; Tavares et al., 2023),2 in Oceania (Hawthorne & epidemiology, 2008; Robins et al., 2018),and 1 in Africa (Mapoma & Masaiti, 2012). The Asian study comes from six countries, including China, India, Iran, Japan, Malaysia, and Singapore. The European investigations were carried out in Germany, Italy, Spain, the Netherlands, Portugal, Sweden, Switzerland, and the UK, whilst the North American research was carried out in Canada and the USA. There is only Zambia in Africa. The Oceania studies were all from Australia

Thirteen of the forty-two research used the Lubben Social Network Scale 6 (LSNS-6), while the Social Isolation Score (SIS) was used in only four studies each. The Lubben Social Network Scale 18 (LSNS-18), and the Friendship Scale (FS) were all used in only two studies each. The Lubben Social Network Scale 10 (LSNS-10), the Life Space Index (LSI), the Subjective Isolation Scale (SI), the Objective Isolation Scale (OI), and the Social isolation questionnaire were in one investigation. The remaining studies had clear definitions of social isolation.

Almost all of those included ($n = 28$) were cross-sectional in design, with four longitudinal cohort studies, one based on randomized controlled trials, six on baseline information from prospective cohorts, and three on baseline information from retrospective cohorts. For cross-sectional baseline data from random controlled trials and some cross-sectional data from cohort-based studies, we used the AHRQ for quality assessment. Three of the included studies in the cross-sectional research scored highly on the quality scale in Supplement A3, with an average of 8 points. The remaining studies yielded medium-quality results, scoring between 5 and 7 points. The research studies that were included were judged to have low bias overall. All cross-sectional studies failed to meet this criterion because of the nature of the research design, which prevented these studies from being followed up. Seven cohort studies scored between 7 and 9, indicating that they were high-quality studies (Supplement A4).

3.2. Meta-analysis results

The goal of the current study was to conduct a systematic review of research on the risk factors for social isolation in older individuals. To facilitate the synthesis of the findings, we identified factors that were reported in at least 2 studies and grouped the eleven factors associated with social isolation into four main categories: biological factors, environmental factors, psychological and behavioral factors, and socioeconomic factors. For statistical testing in this review, a statistical threshold of 0.05 was employed. Fig. 2 displays the results of the meta-analysis of all categories. The regional subgroup analysis outcomes have been effectively summarized in Fig. 3.
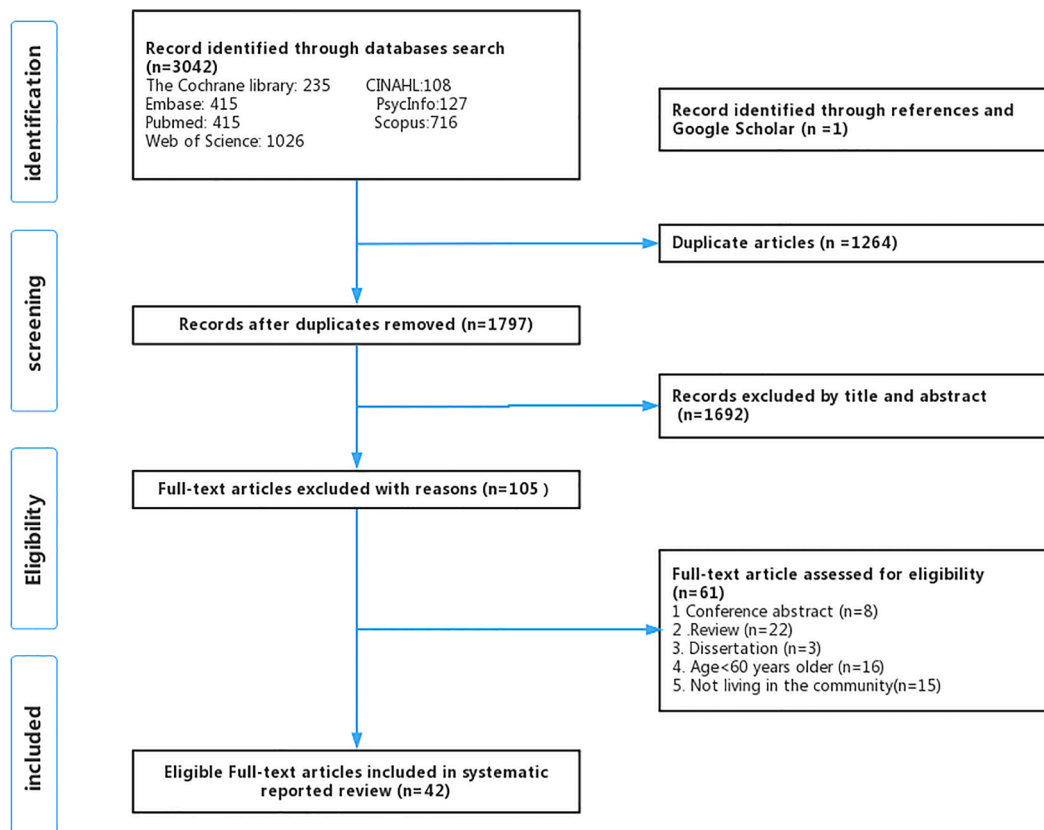

Fig. 1. PRISMA flow diagram.

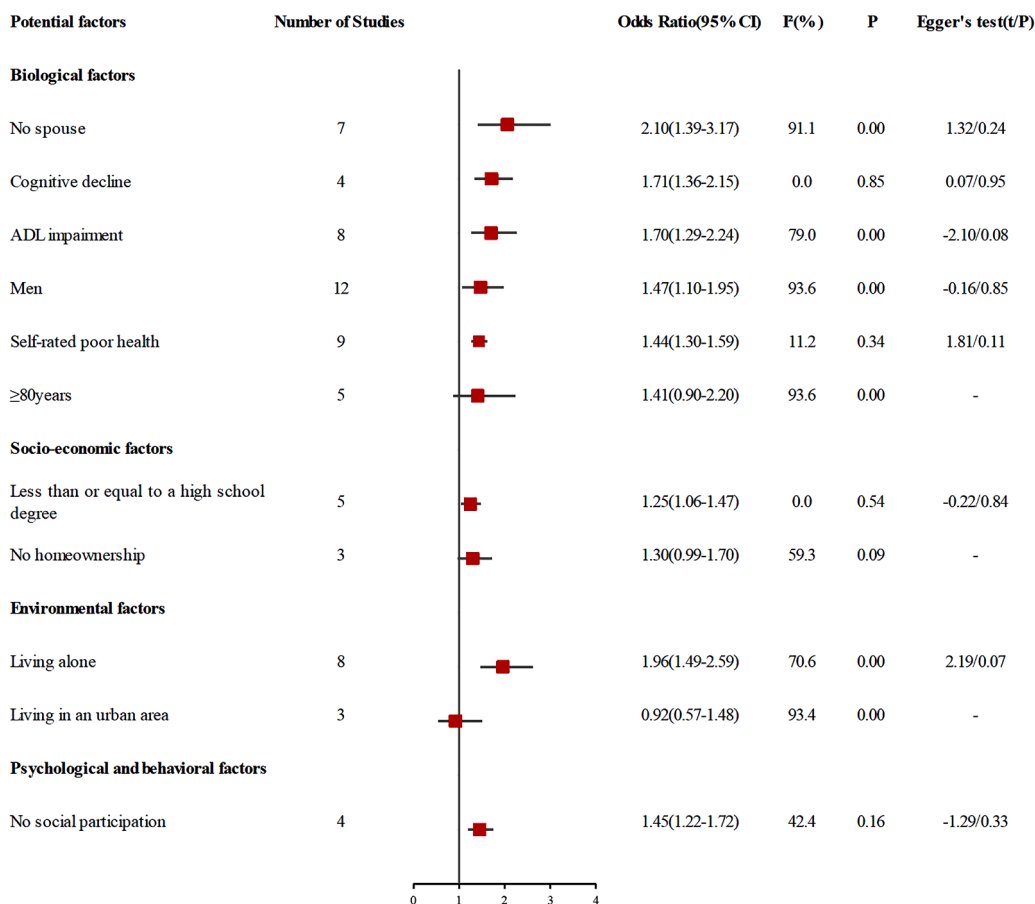| Potential factors	Number of Studies		Odds Ratio(95% CI)	I²(%)	P	Egger's test(t/P)
Biological factors						
No spouse	7		2.10(1.39-3.17)	91.1	0.00	1.32/0.24
Cognitive decline	4		1.71(1.36-2.15)	0.0	0.85	0.07/0.95
ADL impairment	8		1.70(1.29-2.24)	79.0	0.00	-2.10/0.08
Men	12		1.47(1.10-1.95)	93.6	0.00	-0.16/0.85
Self-rated poor health	9		1.44(1.30-1.59)	11.2	0.34	1.81/0.11
≥80years	5		1.41(0.90-2.20)	93.6	0.00	-
Socio-economic factors						
Less than or equal to a high school degree	5		1.25(1.06-1.47)	0.0	0.54	-0.22/0.84
No homeownership	3		1.30(0.99-1.70)	59.3	0.09	-
Environmental factors						
Living alone	8		1.96(1.49-2.59)	70.6	0.00	2.19/0.07
Living in an urban area	3		0.92(0.57-1.48)	93.4	0.00	-
Psychological and behavioral factors						
No social participation	4		1.45(1.22-1.72)	42.4	0.16	-1.29/0.33

Fig. 2. A meta-analysis of the variables and how they relate to social isolation. 1 factor is represented by each row. 95 % CI is shown as black horizontal lines and OR as red squares.

3.2.1. Biological factors

3.2.1.1. Men. Twelve studies in all, with representation from Asia (n=5), Europe (n=3), North America (n=3), and Oceania (n=1), were included in the study. These studies explored the relationship between men and social isolation. When the results were combined (OR=1.47, 95% CI 1.10–1.95), a statistically significant association was observed (I^2=93.6%, *P*=0.00). Sensitivity analysis showed stable results. In subgroup analysis conducted by the study continent, the forest plot depicting community isolation risk factors consistently portrayed the same direction of effect across these subgroups. The persistence of a substantial link between male gender and social isolation within the community among elderly individuals is apparent in Europe (OR=1.34, 95% CI 1.17–1.55). And, there is a notable reduction in heterogeneity within this association (I^2=0.0%, *P*=0.59).

3.2.1.2. No spouse. In the conducted meta-analyses, a total of seven studies examined the relationship between marital status and social isolation. The results demonstrated a positive association between not having a spouse and social isolation (OR=2.10,95% CI 1.39–3.17). However, significant heterogeneity was observed as evident from the heterogeneity tests (I^2=91.1%, *P*=0.00). To investigate the underlying causes contributing to the notable heterogeneity observed in marital status, a sensitivity analysis was conducted. Notably, research by Ibrahim et al. and Kotian et al., carried out in Malaysia and India, respectively, provided light on the protective function of men in terms of social segregation. Given that men are considered as a protected group under local marriage policies, their marital status potentially exhibits gender-related differences. Following the exclusion of these two articles from

the analysis, the results from the remaining five studies indicated a substantial odds ratio value of 2.88 (2.45-3.39) and a noteworthy reduction in heterogeneity (I^2=0.0%, *P*=0.91). Upon conducting subgroup analyses based on the continent of origin of the studies, it was observed that in North America (OR=2.86, 95% CI 2.41–3.38), I^2=0.0%, *P*=0.51) and Oceania (OR=3.15, 95% CI 1.63–6.09, I^2=0.0%, *P*=0.51), not having a partner remained significantly associated with social isolation. Furthermore, forest plots were generated for three continents, revealing consistent directions of the effect size estimates across the subgroups.

3.2.1.3. ADL impairment. A total of eight studies, two from Asia, four from North America, and two from Europe, evaluated the impairment of ADL. Findings consistently indicated that ADL impairment serves as a statistically significant risk factor for social isolation amongst older individuals residing in the community (OR=1.70, 95% CI 1.29–2.24, I^2=79.0%, *P*=0.00). Notably, the results exhibited stability following sensitivity analyses specifically addressing this factor. Additionally, the forest maps generated from the three aforementioned regional studies concurred in terms of the directionality of the observed effects, further supporting the robustness of the findings.

3.2.1.4. Self-rated poor health. The risk factor analysis encompassed a total of night studies, with the majority originating from Asia (seven studies), and one study each from North America and Europe. Among older persons residing in the community, a correlation between poor self-rated health and social isolation was found (OR=1.44, 95% CI 1.30–1.59, I^2=11.2%, *P*=0.34). Upon conducting sensitivity analyses, no discernible alterations or fluctuations were observed. Furthermore,

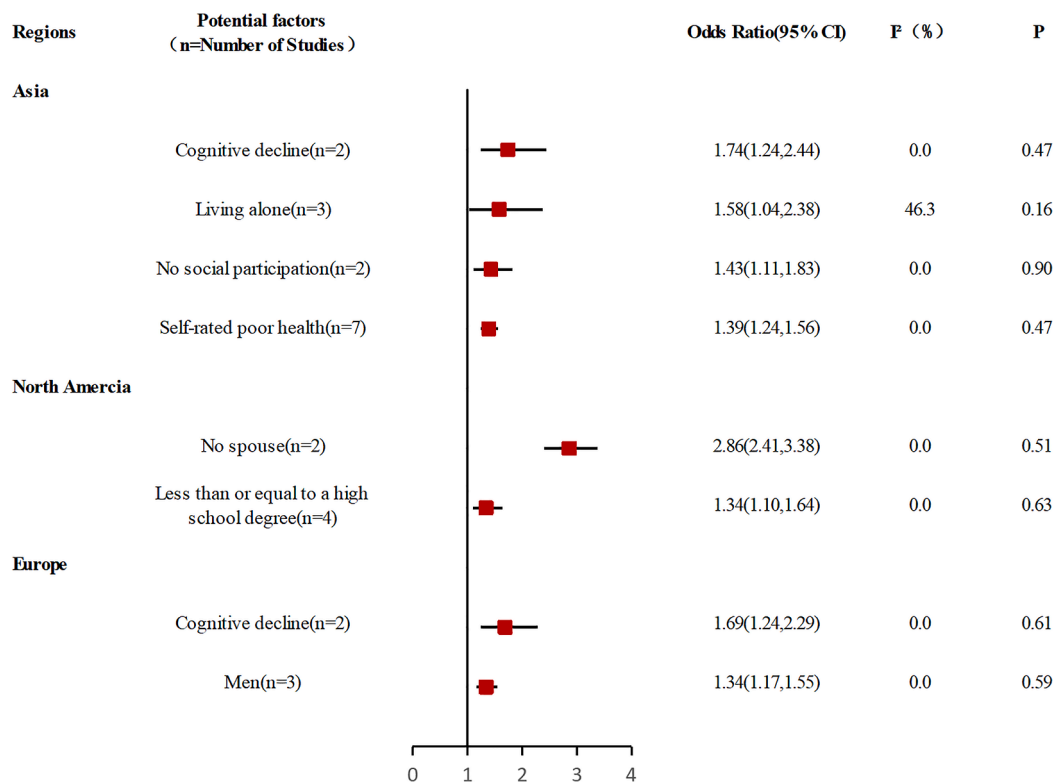| Regions	Potential factors (n=Number of Studies)		Odds Ratio(95% CI)	I² (%)	P
Asia					
	Cognitive decline(n=2)		1.74(1.24,2.44)	0.0	0.47
	Living alone(n=3)		1.58(1.04,2.38)	46.3	0.16
	No social participation(n=2)		1.43(1.11,1.83)	0.0	0.90
	Self-rated poor health(n=7)		1.39(1.24,1.56)	0.0	0.47
North Amercia					
	No spouse(n=2)		2.86(2.41,3.38)	0.0	0.51
	Less than or equal to a high school degree(n=4)		1.34(1.10,1.64)	0.0	0.63
Europe					
	Cognitive decline(n=2)		1.69(1.24,2.29)	0.0	0.61
	Men(n=3)		1.34(1.17,1.55)	0.0	0.59

Fig. 3. Associations between factors and social isolation in subgroup analyses. 1 factor is represented by each row. 95 % CI is shown as black horizontal lines and OR as red squares.

subgroup analyses were performed, which shed light into the association between Asian older persons' self-rated poor health and social isolation (OR=1.39, 95% CI 1.24-1.56, I²=0.0%, P=0.47).

3.2.1.5. Cognitive decline. A total of four studies, originating from both Asia and Europe, investigated the relationship between cognitive impairment and social isolation. Cognitive decline emerged as a statistically significant contributing risk factor for social isolation (OR=1.71, 95% CI 1.36-2.15, I²=0.0%, P=0.85). Upon conducting subgroup analyses based on the continent of origin of the studies, it was observed that in Asia (OR=1.74, 95% CI 1.24–2.44, I²=0.0%, P=0.47) and Europe (OR=1.69, 95% CI 1.24–2.29, I²=0.0%, P=0.61), not having a partner remained significantly associated with social isolation. Furthermore, forest plots were generated for three continents, revealing consistent directions of the effect size estimates across the subgroups.

3.2.1.6. ≥80years. There were two studies from Europe, two from North America, and one from Asia that specifically delved into the association between ≥80 years and social isolation. Upon conducting meta-analyses, the results yielded no statistically significant for ≥80 years.

3.2.2. Socioeconomic factors

3.2.2.1. Less than or equal to a high school degree. A total of five studies, encompassing both Europe and North America, examined the association between educational attainment up to the level of upper secondary education and social isolation. It is only one study in Europe specifically investigated this relationship. Meta-analysis suggested that less than or equal to a high school degree is associated with social isolation (OR=1.25, 95% CI 1.06–1.47, I²=0.0%, P=0.54). The results remained stable after the sensitivity analysis is finished. An odds ratio of 1.34 (95% CI 1.10–1.64) from subgroup analysis showed a strong correlation between having a high school degree or less with social isolation in

North America. The level of heterogeneity remained unaffected, as indicated by an unchanged I² value of 0.0% and a non-significant p-value of 0.63.

3.2.2.2. No homeownership. Two studies from Asia and one study from North America explored the impact of the absence of home ownership. Upon pooling the results, no statistically significant association was observed for having no homeownership about social isolation among older individuals residing in the community.

3.2.3. Environmental factors

3.2.3.1. Living alone. Studies encompassing the variable of living alone were distributed across a diverse range of regions, including Asia (n=3), Europe (n=1), North America (n=3), and Oceania (n=1). Meta-analysis showed a positive correlation between living alone and social isolation (OR=1.96, 95% CI 1.49-2.59, I²=70.6%, P=0.00). Upon conducting sensitivity analyses, no discernible alterations or fluctuations were observed. When subgroup analyses were conducted, stratifying the studies based on the continent to which they belonged, a notable and consistent association between living alone (OR=1.58, 95% CI 1.04–2.38) and social isolation was observed specifically within the Asian context (I²=46.3%, P=0.16).

3.2.3.2. Living in an urban area . The pooled studies also failed to find any statistically significant links between social isolation and residing in an urban region.

3.2.4. Psychological and behavioral factors

Results from four included studies, hailing from Asia (n=2), Europe (n=1), and North America (n=1), consistently demonstrated a significant association between no social participation and higher odds of social isolation (OR=1.45,95% CI 1.22–1.72, I²=42.4%, P=0.16). Subsequent subgroup analyses were conducted, stratifying the studies

based on their continent of affiliation. Within Asian (OR=1.43, 95% CI 1.11–1.83) contexts, the absence of social participation remained significantly associated with social isolation(I^2=0.0%, *P*=0.90). On the forest map, the results for regions are orientated in the same direction.

3.2.5. Publication bias assessment

To assess the presence of publication bias, Egger's test was employed, revealing no evidence of publication bias across all examined factors.

4. Discussion

This research is the first comprehensive evaluation and meta-analysis of the risk variables for social isolation among community-dwelling older persons worldwide. By analyzing studies from four continents, we combined and summarized a variety of risk factors for social isolation in older adults, including biological, socioeconomic, environmental, and psychological and behavioral factors. Our review also revealed a lack of evidence to examine risk factors for social isolation among elderly residents in South America and Africa. However, this under-representation may be attributed to the strict inclusion criteria for this review, which may have excluded some relevant studies on social isolation.

Our study revealed a significant inequity between global studies on older adults' social isolation. The majority of social isolation research has been carried out in middle- and high-income nations, where older people benefit from well-funded healthcare systems, adequate staffing, and simple access to health services, potentially reducing certain of the adverse impacts of social isolation on isolated older individuals within the community. However, social isolation among senior individuals is still more common in low-income nations, such as in India in Asia and Zambia in Africa, and this issue should be addressed on a global scale. The lack of attention to low-income countries may be attributed to geographical, cultural, economic, and technological underdevelopment, and future research in this area is warranted to determine the impact on older people in communities in low-income countries (Naito et al., 2021).

The findings of this study have demonstrated a number of biological risk factors for social isolation for older adults in the community, including cognitive decline and self-rated poor health. Older adults with deteriorating physiological functions and multimorbid coexistence, along with varying degrees of cognitive decline, have limited ability and range of activities, reducing contact with the outside world and increasing the risk of social isolation, in line with previous reviews (Evans et al., 2019). The Oceania study found that gender was not statistically significant, presumably because the Friendship Scale utilized did not take into account the quantity and structure of social connections, making it challenging to evaluate the perceived value of social contacts between the sexes (Hawthorne & epidemiology, 2008; Robins et al., 2018). It's interesting to note that in Asian countries, the male population in India and Malaysia was often a protective factor of social isolation, which may be the result of polygamy, female discrimination, and a lack of financial independence (Ibrahim et al., 2013; Kotian et al., 2018). Moreover, the influence of marital status on social segregation could potentially exhibit gender-specific variations. Hence, it is essential to conduct additional investigations to gain a more comprehensive understanding of the intricate interplay between these factors and their potential correlation with social isolation among older adults within community settings.

The present study indicated socioeconomic risk factors for social isolation among older people in the community, including less than or equal to a high school degree. The correlation between distinct levels of education and corresponding economic resources, social relationship resources, and social prestige has been established. Elderly people with higher levels of education have been found to have a broader social network and a stronger sense of social support. This result is in line with

a prior study that stressed the value of literacy in maintaining connections among older persons (Wu & Sheng, 2020).

Regarding psychological and behavioral factors, this study solely examined between no social participation and social isolation, which is consistent with findings from a longitudinal study in Japan (Ejiri et al., 2019). In a rapidly aging society, positive social participation can prevent older people from feeling alone while also having a number of positive consequences on their health and well-being (Golinowska et al., 2016).

Our comprehensive review indicated that the risk factors associated with social isolation among older adults vary based on geographic region. In Asian communities, older adults with poor self-rated health, cognitive decline, no social participation, and living alone are more prone to social isolation. Conversely, in North American communities, individuals having no spouse and less than or equal to a high school degree. Likewise, in European communities, a notable likelihood of social isolation is observed among older adults with male gender or cognitive decline. Two reasons may explain this result. Firstly, our review encompassed a larger number of studies from Asian (*n*=17) and North American (*n*=13) countries, allowing for a more extensive analysis and comprehensive identification of a broader range of risk factors associated with social isolation. Secondly, the countries in Europe, especially in the Nordic countries, rank prominently in World Happiness REPORT (Kalseth et al., 2022). Europe demonstrates significant efficiency in translating available resources such as income, health, and education into well-being, improving the overall life satisfaction among its elderly people, and greatly reducing the likelihood of social isolation among this demographic group (Dahl & Malmberg-Heimonen, 2010).

It is noteworthy that the elderly population received aid from both formal and informal support systems, with the latter often lacking the requisite preparedness to cater to their needs (O'Conor et al., 2019). Therefore, it is unlikely that implementing interventions for potentially isolated older people identified by the Use Risk Scale will reduce the use of healthcare services. However, those older people in the community who are identified as being socially isolated may benefit as they are better able to access social support during their illness (Kittle et al., 2022). Currently, there is less research into the risk factors for social isolation of older people in the community in terms of healthcare factors, with primary care playing a gatekeeper role in many healthcare systems. Further study is needed to investigate the influence of community aspects on older people's social isolation in the community, so that community health workers are well placed to identify and address isolation and social isolation in older people.

Only one Japanese study has investigated recovery factors from social isolation in older people in the community (Takahashi et al., 2020). The study identified younger age, better mental health, more frequent trips, and involvement in community groups as predictors of participants' recovery from social isolation. It's interesting to note that there were no gender differences between the social isolation recovery factors compared to the social isolation risk factors, suggesting that difficulties in recovering from social isolation are common to both men and women. Future research should actively explore the factors of recovery from social isolation in different regions and avoid being too rigid in using generic policies and measures.

There were a number of notable limitations in this study that need to be noted. Firstly, despite exhaustive searches of numerous databases, changes in database indexing may cause us to miss relevant studies. Secondly, the majority of the included studies were cross-sectional in nature, limiting the establishment of causal relationships. Lastly, heterogeneity was observed for some factors, and the limited number of studies precluded a comprehensive discussion on the potential sources of this heterogeneity.

5. Conclusion

In summary, our study found multi-domain factors, including

biological factors, socioeconomic factors, psychological and behavioral factors, that were associated with social isolation among older people in the community. Given the high degree of heterogeneity observed across multiple factors and the potential presence of publication bias, researchers should exercise caution when utilizing the results. Nevertheless, the present study offers crucial evidence-based insights that can serve as a foundation for future epidemiological inquiries into the impact of social isolation among older adults residing in the community. It is also important to note that risk factors for social isolation may vary by setting. Therefore, an assessment of risk factors for social isolation in older people should be conducted in communities across the region to develop the most effective strategies for social isolation control.

Supplementary materials

This paper has supplementary material available to authorized readers only in the online version.

CRediT authorship contribution statement

Meiqian Chen: Writing – original draft, Software. **Xiang Cao:** Methodology, Data curation. **Afeng Wang:** Data curation, Visualization. **Yi Zhu:** Data curation. **Guanzhen Lu:** Writing – review & editing, Conceptualization. **Li Zhang:** Writing – review & editing. **Lijuan Shen:** Data curation.

Declaration of Competing Interest

We declare that we have no financial and personal relationships with other people or organizations that can inappropriately influence our work, there is no professional or other personal interest of any nature or kind in any product, service and/or company that could be construed as influencing the position presented in, or the review of the manuscript entitled.

Acknowledgments

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.archger.2023.105211.

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