Salsabila et al. Scr Med. 2026 Mar-Apr;57(2):445-59. DOI:10.5937/scriptamed57-60482

CURRENT TOPIC

# Global Research Trends and Risk Factors for Loneliness in Older Adults

Riskita Ayudira Salsabila,[1] Vernonia Yora Saki,[2] Ahmad Azmi Nasution,[3] Rizkianti Anggraini,[4] Onetusfifsi Putra[5]

## Abstract

Loneliness was defined as an unpleasant feeling for a person when there is a gap between expectations of desired social connection with actual number of social relationships owned, both in terms of quantity and especially the quality. This research was systematic literature review with bibliometric analysis employs a two-phase quantitative approach. In the first phase, scientific publications were collected from two databases, *Scopus* and *Web of Science (WoS)*. The analysis and visualisation showed that loneliness among older adults is an increasingly prominent topic in global research, especially since the COVID-19 pandemic. This research reveals that loneliness was closely linked to multidimensionality and was receiving attention from various fields, including neuroscience, behavioural health and geriatric care. The main themes of this research included psychological and cognitive factors, social isolation and geriatric vulnerability. Although the topic of loneliness among the elderly is gaining high attention in global academic interest, there was still a gap in innovative research, which calls for a multidisciplinary approach, especially in the discussion of risk factors for loneliness among the elderly. Some of the potential topics for further research are the relationship of loneliness among the elderly with socioeconomic factors, technology and digitalisation, elderly care, religion and culture and the direct relationship of loneliness with biomedical risks in geriatric clinical conditions such as atrial fibrillation, cognitive impairment, osteoporosis and fall risk. These topics will provide researchers with valuable opportunities to contribute to and advance this field.

**Key words:** Aged; Population; Loneliness; Risk.

1. Faculty of Medicine and Health Sciences, University of Bengkulu, Bengkulu, Indonesia.
2. Department of Community Medicine, Faculty of Medicine and Health Sciences, University of Bengkulu, Bengkulu, Indonesia.
3. Department of Anatomy, Faculty of Medicine and Health Sciences, University of Bengkulu, Bengkulu, Indonesia.
4. Department of Community Medicine, Faculty of Medicine and Health Sciences, University of Bengkulu, Bengkulu, Indonesia.
5. Department of Public Health, Faculty of Health Sciences, University of Teuku Umar, Aceh, Indonesia.

**Citation:**
Salsabila RA, Saki VY, Nasution AA, Anggraini R, Putra O. Global research trends and risk factors for loneliness in older adults. Scr Med. 2026 Mar-Apr;57(2):445-59.

**Corresponding author:**
VERNONIA YORA SAKI
E: yorasaki@unib.ac.id

Received: 28 July 2025
Revision received: 13 August 2025
Accepted: 13 August 2025

## Introduction

Loneliness among older adults is becoming a global public health concern affecting every sector of health, wellbeing and quality of life. Driven by the rapid growth of the aging population and societal transformations that often reduce social engagement in later life. Loneliness is defined as an unpleasant feeling for a person when there is a gap between expectations of desired social connection with actual number of social relationships owned, both in terms of quantity and especially the quality. This exacerbates the impact of chronic diseases associated with negative physical and mental health outcomes.[1]

Generally, loneliness can occur in all age categories, however, recent studies estimate that 3 from 10 older adults experience loneliness, with prevalence rates varying widely across conti-

nents.[1] The term "older adults" generally refers to individuals aged 60 years and above, although the specific age threshold can vary according to context, organisation and research purpose. The World Health Organization and many global health studies frequently use the age of 60 or over as the defining cutoff, especially in low- and middle-income countries, while in high-income contexts, the threshold often starts at age 65. This demographic is not homogeneous and is typically further classified into subgroups such as the middle age group (45-59 years), elderly age group (60-74 years), old age group (75-90 years) and the very old group (90-years and above), based on differences in health status, functional capacity and social needs.[2, 3]

This research is very important to achieve the global health goals listed in the United Nations Sustainable Development Goals, especially the third goal, namely "Ensure healthy lives and promote well-being for all at all ages". In this goal, mental health is one of the requirement for physical health and is strongly interlinked with other development factors such as poverty, work and economic growth or peace and justice.[4] Despite its importance, the global research landscape on loneliness in older adults remains fragmented and unevenly distributed across regions.[5] Bibliometric analysis offers a robust methodological tool to systematically map and evaluate research output, highlight knowledge gaps and identify emerging trends and risk factors associated with loneliness in older adults, utilising data from *Scopus* and *Web of Science (WoS)* databases.

This study focused on trends in publications about loneliness among adults over the past 10 years and risk factors associated with loneliness in older adults and lack of a multidisciplinary approach to loneliness in older adults.

## Methods

This research was systematic literature review with bibliometric analysis employs a two-phase quantitative approach. In the first phase, a systematic literature review to identify research trends over the past 10 years was conducted by analysing scientific publications collected from two databases, *Scopus* and *WoS*. Figure 1 illustrates the process of searching and identifying sources based on systematic literature review guidelines using a PRISMA flow chart. The most comprehensive academic databases (*Scopus* and *WoS*) were used, which support the collection of bibliometric data using parameters such as the H-index, citation count, collaboration analysis, author metrics, keyword analysis and many others.[6] The data obtained was filtered based on the search criteria in the *Scopus* and *WoS* databases to clean the data. The inclusion and exclusion criteria are depicted in Figure 1. Some of the criteria included as inclusions were language, only English-language articles were analysed because articles tend to have higher methodological and scientific contribution standards compared to other types and most high-reputation and indexed journals are published in English.[7] Then, the bibliometric data were merged and duplicates were eliminated using *R* software, resulting in 2.927 publications. The final data were exported in *Excel* and *BibTeX* formats.

In the second phase, the data were quantitatively analysed and the results were visualised as a citation map to identify trends in research related to risk factors for loneliness among older adults. Two software programs were used for the data analysis and visualisation: *Biblioshiny* and *VOSviewer*. The *R* package version 2025.05.0-496 was used in this analysis. This version offers tools for categorising and analysing vast quantities of historical data obtained from research undertaken during a certain period, extracting information from the repository.[8] The main information obtained is shown in Figure 2.

*VOSviewer* is software used to construct and visualise bibliometric networks based on citation, bibliographic coupling, co-citation, or co-authorship relations. Version 1.6.20 of *VOSviewer* was employed and the results are presented as overlapping circles. Then, a thorough explanation of the current state of knowledge based on pertinent subjects within the context of loneliness risk factors was given. This software program can manage large amounts of data and ensured that all viewpoints were considered when analysing the research and development patterns of loneliness risk factors among the elderly.[9]

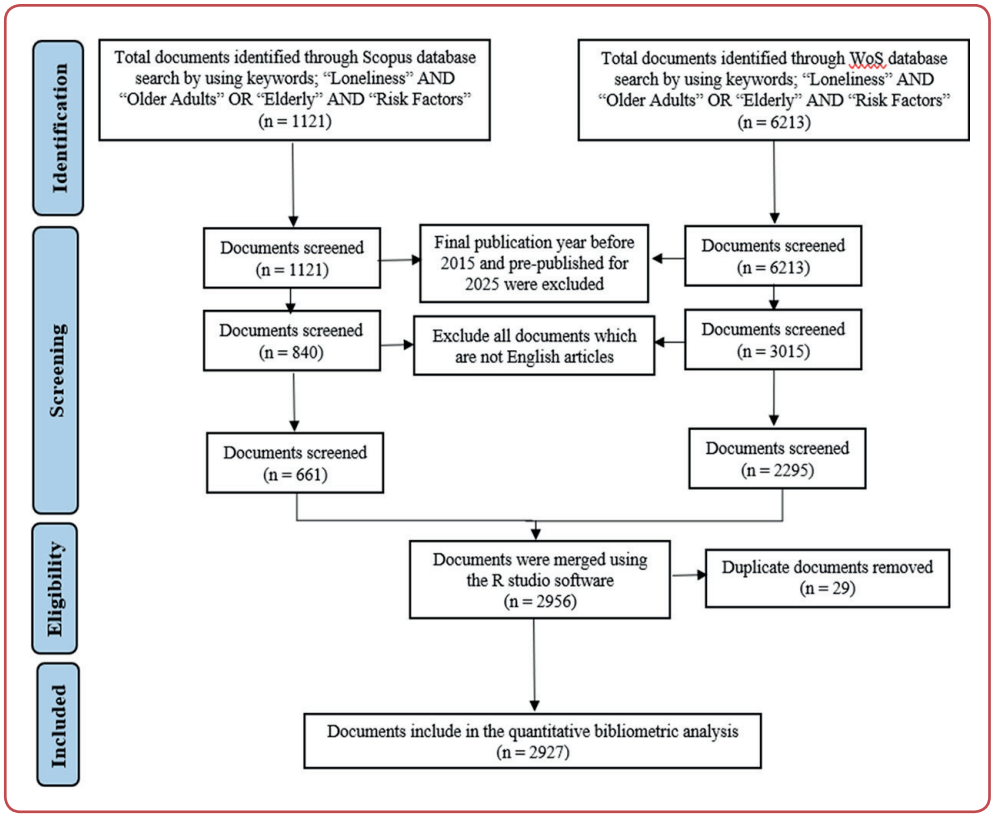


*Figure 1: PRISMA flow diagram for bibliometric analysis in the global trends and risk factors for loneliness among older adults*


*Figure 2: Main information about risk factors of loneliness among older-adults-related articles publications year 2015-2024*

# Results

## Publication trends

This bibliometric analysis shows 2.927 final publications from the *Scopus* and *Web of Science* database. The analysis output as shown (Figure 3), demonstrates the annual scientific output on the risk factors of loneliness among older adults from 2015-2024. There was a clear upward trend in publication volume over the analysed period, starting from below 220 articles in 2015 and peaking at over 350 articles by 2024. A marked increase was observed around 2020, suggesting a significant surge in academic interest, despite

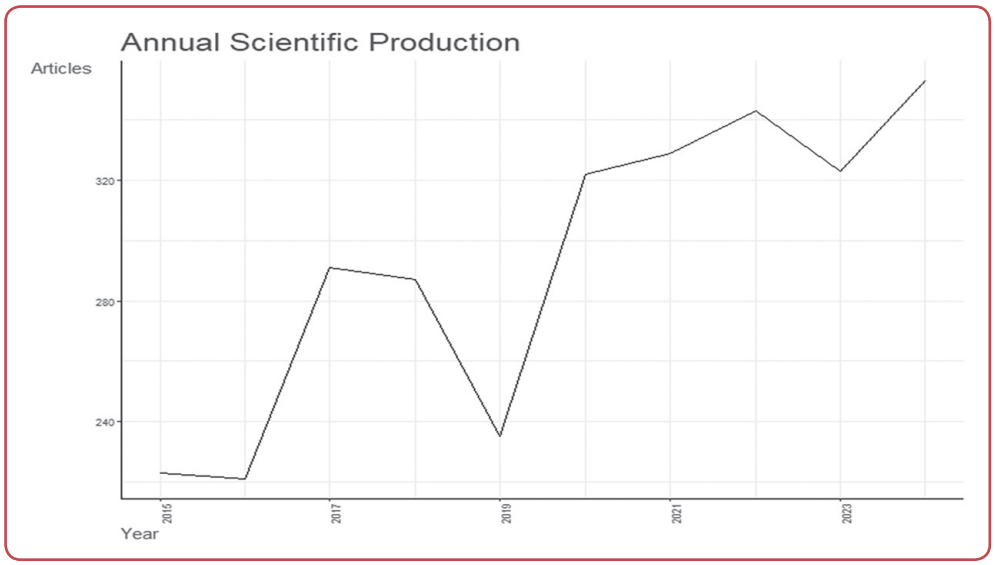


*Figure 3: Annual scientific output for risk factors of loneliness among older-adults-related research, 2015-2024*

a decline around 2019. This pattern highlights a steady and positive growth trajectory, especially during the COVID-19 pandemic era, 2020 onward. Even though there was a slight decline in publications from 2022 to 2023, this may not reflect a decrease in the relevance and interest of this topic. Rather, it is a combination of technical factors, such as indexing and editorial journal dynamics. This significant surge reflects heightened global interest and concern about the psychosocial well-being of older adults during prolonged periods of social restriction.

The 15 highest global citation documents have been displayed (Figure 4). This output reveals the central role of a select group of studies in shaping the academic discourse on loneliness among older adults. The most cited study was by Prince et al (2015) with 1.372 global citations, followed by O'Brien et al (2015) with 774 citations and Montero-Odasso et al (2022) with 664 citations. These highly cited works serve as foundational references in the field, indicating their influence on subsequent publications within the local dataset. The bar chart shows that the publication with the most articles in a given year was the one from 2020.

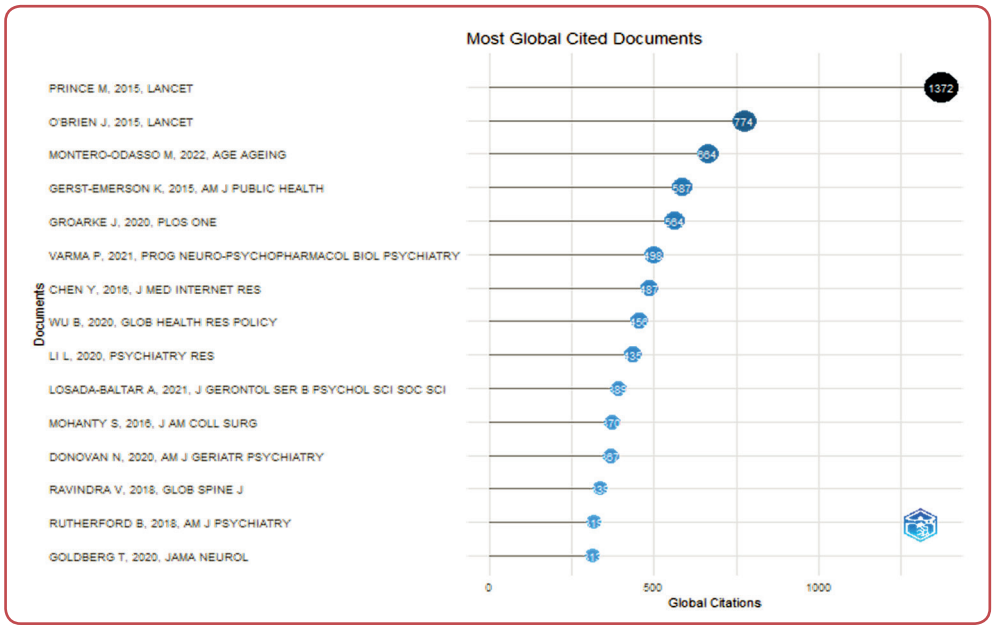


*Figure 4: Top 15 global cited flies published on risk factor of loneliness among older-adults-related research area*

## Most author keywords

Based on the information that was gained from *VOSviewer* output, the most author's keywords that co-occurrence network map cab be obtained (Figure 5). The size of the circles represents keyword frequency and the thickness of the lines reflects the strength of co-occurrence between terms. Thicker lines indicate stronger associations between terms. This visualisation represents the keywords, which have been divided into four clusters, as well as the connections between them. Each cluster contains some keywords that have similarity on the structure that is significant with the previous study, which can be seen in Table 1. The most frequently occurring keyword for the first cluster were "Elderly", "Aging" and "Older adults" underlining the psychosocial and geriatric health; for the second cluster, "Loneliness", "Aged" and "Human" suggesting the significance of demographic and methodological terms; for the third cluster, "Risk factors", "Social support" and "Cross-sectional study" focuses on transitional phases of aging and emotional factors; and for the fourth cluster, "Depression", "COVID-19" and "Quality of life", indicating socio-political crises related to the topic. Besides that, "Loneliness" was the keyword that appears most often compared to other keywords in the four clusters. This form of data makes it possible to identify and discuss the primary research issues and developments in the field of risk factors for loneliness among older adults.

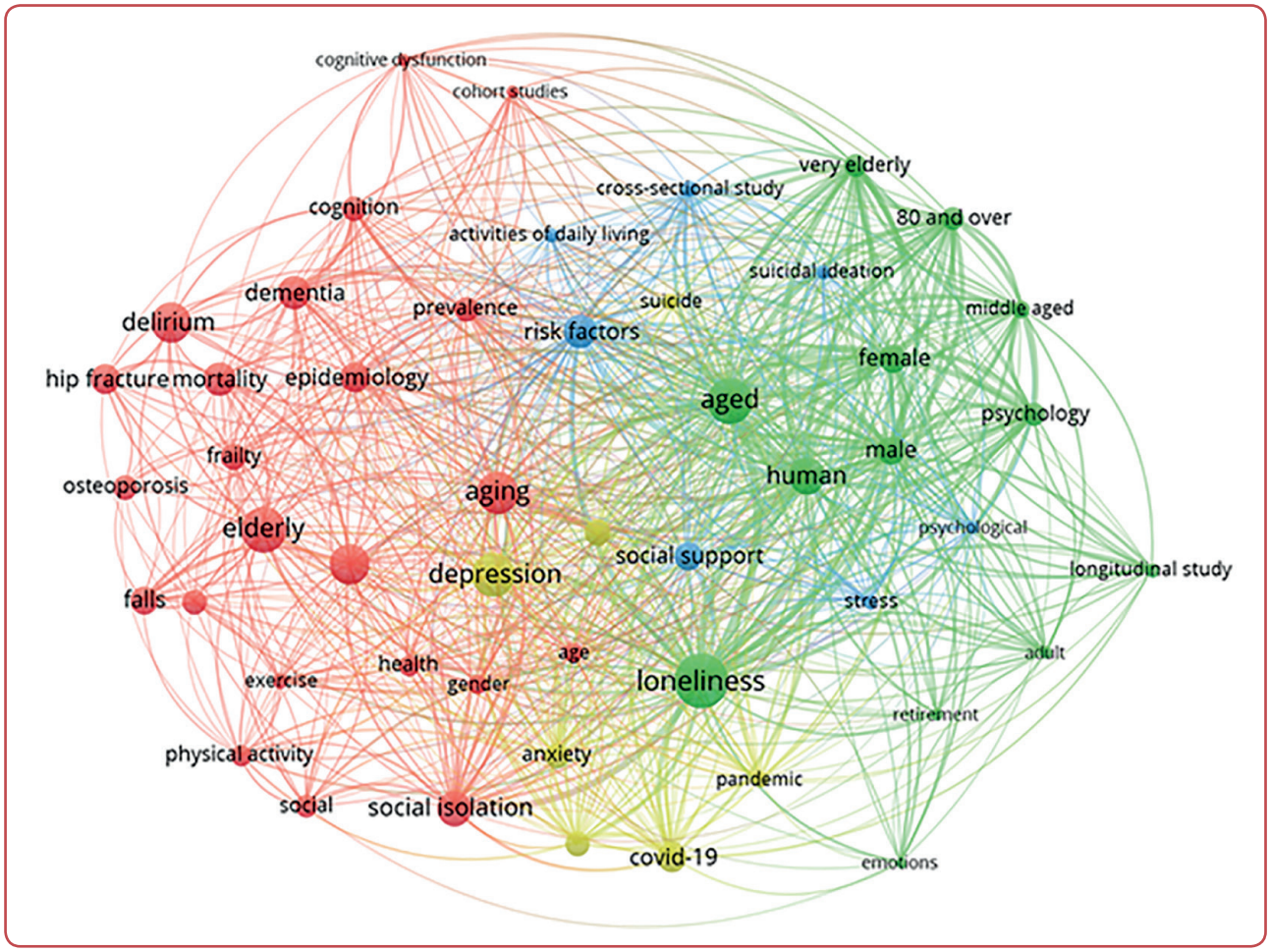


*Figure 5: Network visualisation of top 50 author's keywords in risk factors for loneliness among older-adults-related publications*

*The size of the circles represents keyword frequency and the thickness of the lines reflects the strength of co-occurrence between terms. Thicker lines indicate stronger associations between terms.*

*Table 1: The result of cluster analysis on risk factors for loneliness among older-adults-publications*

| Cluster | Most frequent keywords | Key words |
|---|---|---|
| **1st/red cluster** (23 items) | Elderly (143), Aging (122), Older adults (119) | Delirium (115), Social isolation (85), Mortality (83), Dementia (82), Epidemiology (61), Hip fracture (61), Falls (60), Frailty (51), Osteoporosis (47), Cognition (43), Older people (43), Prevalence (43), Social (36), Physical activity (34), Health (32), Age (29), Gender (28), Exercise (21), Cognitive dysfunction (11), Cohort study (11) |
| **2nd/green cluster** (13 items) | Loneliness (210), Aged (145), Human (99) | Loneliness (210), Aged (145), Human (99), Male (57), Female (55), Psychology (39), 80 and over (37), Very elderly (37), Middle aged (22), Longitudinal study (14), Adult (13), Retirement (11), Emotions (10) |
| **3rd/dark blue cluster** (7 items) | Risk factors (83), Social support (54), Cross-sectional study (20) | Activity of daily living (16), Stress (14), Suicidal ideation (14), Psychological (11) |
| **4th/yellow cluster** (7 items) | Depression (135), COVID-19 (62), Quality of life (49) | Mental health (45), Anxiety (42), Pandemic (21), Suicide (20) |

## Innovative research directions and gaps

Another output from *VOSviewer* analysis is a density visualisation map of author keywords related to risk factors for loneliness among older adults (Figure 6). The variation of density colour illustrates how frequently certain keywords appear and co-occur in the literature. Gradient ranges from blue to yellow with diffuse hue suggest as the lowest frequency and potential topic that provide the opportunities for researchers to contribute and develop the issues, for example like peripheral yet visible keywords such as "Retirement," "Emotions," and "Cognitive dysfunction" indicate emerging or context-specific factors that were less frequently addressed but still part of the conceptual field. Meanwhile, gradient ranges from yellow to blue highest density suggest the highest frequency topic and suggesting these were the most studied and central themes, like "Loneliness," "Older adults," "Depression," "Social isolation," "Elderly," and "Aged". Meanwhile, the green area such as "Frailty," "Mortality" and "Epidemiology" were moderately frequent.

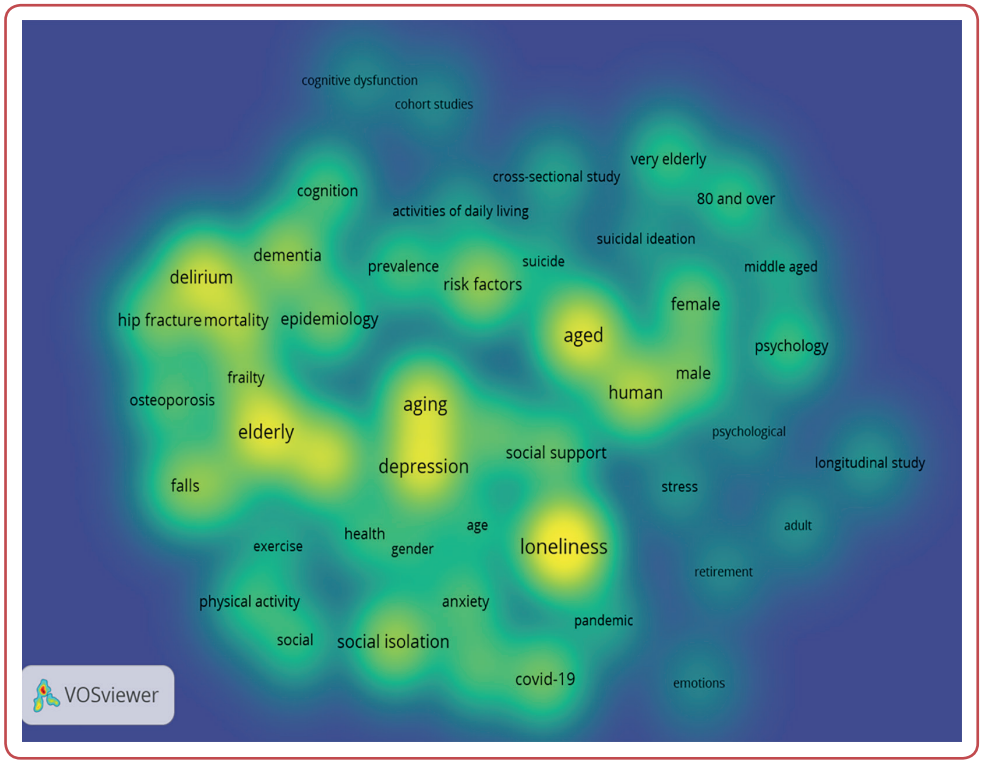


*Figure 6: Density visualisation of top author's keywords in risk factors for loneliness among older-adults-related publications*

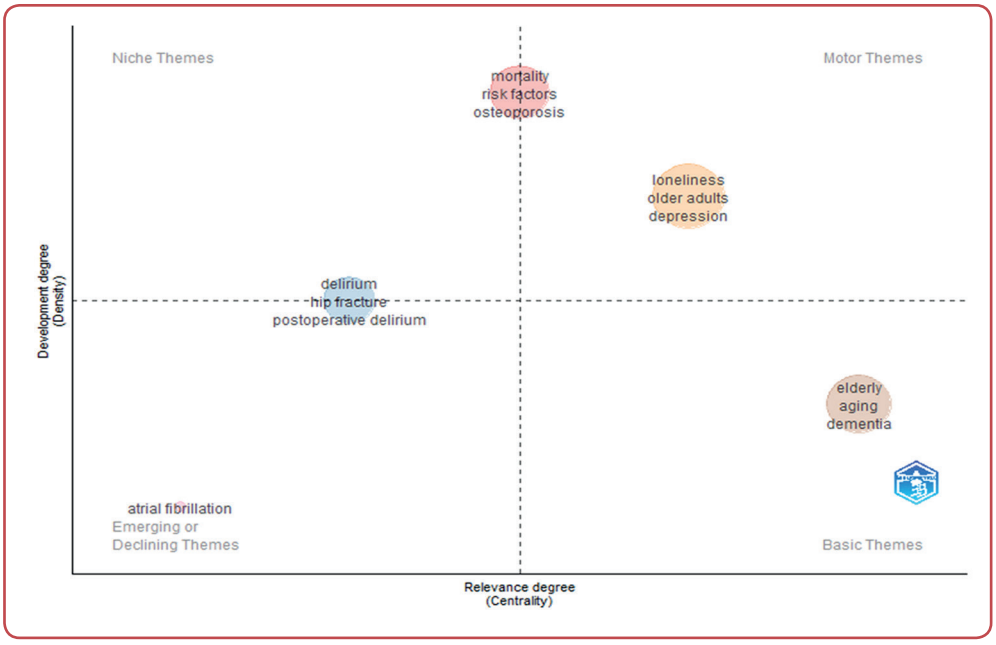


*Figure 7: Mapping themes and networks of keyword clusters in risk factors for loneliness among older-adults-related publications*

*The size of the circles represents the frequency of occurrence of the same keywords and the position of the circles represents the level of importance of the topic under study.*

Themes are groups of multiple keywords that can be mapped based on centrality and density and each keyword includes only one theme. Thematic map that groups the authors' keywords related to risk factors for loneliness among the elderly into four quadrants based on two dimensions, centrality or level of relevance and density or level of development (Figure 7). The size of the circles represents the frequency of occurrence of the same keywords and the position of the circles represents the level of importance of the topic under study. The keywords displayed on the thematic map are 150 keywords that appear together. The motor themes in the upper right quadrant are highly relevant and well-developed themes, such as loneliness, older adults and depression, indicating a mature area that is driving the field forward. The niche or highly specialised topics in the upper left quadrant are specialised but isolated topics that are highly relevant but also highly challenging, such as mortality, risk factors and osteoporosis, which are well-developed but less central to the broader discourse and hence the research goals of specific professional groups. The foundational themes in the lower right are core topics with high importance but lower density, including elderly, aging and dementia, indicating a fundamental but still evolving area of research. The emerging or declining themes in the lower left are topics such as atrial fibrillation that may be less explored or lose research interest over time. The presence of a moderately dense and central medical cluster around such as delirium hip fracture and postoperative delirium in the transitional zone implies a growing recognition of acute hospital-related risk factors for loneliness, especially in frail or post-surgical elderly. These keywords could mature into full motor themes as research on hospital-induced cognitive decline and loneliness increases.

The top 15 trend topics based on a time-based perspective of risk factors of loneliness among older adults are also presented. By analysing trends and annual rates, the study can help researchers stay current and focus their research on relevant and current issues in the field (Figure 8). The horizontal lines represent the time span during which each topic appeared, while the size of each circle indicates the frequency of the keyword, with larger circles signifying greater term usage. Prominent and highly frequent topics that have gained notable attention in recent years (2020–2023) included "Loneliness," "Older adults," "Social isolation," "Depression" and "COVID-19" each represented with large bubbles, indicating a sharp increase in research attention, likely fuelled by the COVID-19 pandemic, which exacerbated isolation in aging populations. The earlier terms such as "Osteoporosis" and "Falls" appeared before 2020

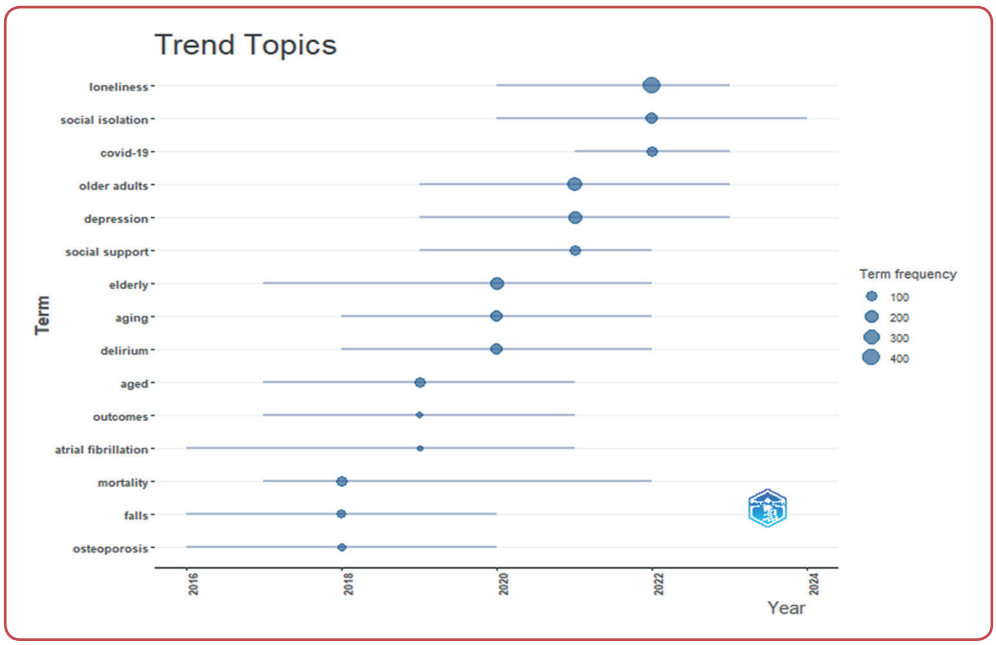


*Figure 8: Top 15 trend topics and the distribution of risk factors for loneliness among older-adults-related studies*

*The horizontal lines represent the time span during which each topic appeared, while the size of each circle indicates the frequency of the keyword, with larger circles signifying greater term usage.*

and may reflect either foundational discussions or suggesting these were once areas of attention but have received relatively less focus in recent years. Terms like "Elderly," "Aged" and "Aging" have appeared consistently over the years but with smaller bubbles, suggesting they are well-established descriptors but less central as trending risk concepts. Themes with long timelines and smallest circles such as "Atrial fibrillation" indicate minor topics that consistently appear in publications but lower term frequency, suggesting they are niche or clinically specific themes that haven't dominated recent discourse. The spread of each term over time also reflects its longevity and continued relevance within the literature.

## Global contribution

There were 88 countries that contributed to the publication of 2.927 documents related to risk factors for loneliness among older adults, illustrates the top countries for co-publishing papers in the form of a world map (Figure 9). The intensity of the shading represents the volume of publications, with darker blue areas indicating higher productivity, while the shades of grey indicate countries that have not contributed to the topic of risk factors for loneliness among older adults. The United States of America has the darkest blue colour among other countries, indicating that the United States of America is a central research hub for the topic of risk factors for loneliness among older adults, followed by China and Italy. In contrast, research contributions from regions such as Africa remain limited, as indicated by the grey shading. Beside China, Asian nations such as Japan are in the top 4 in terms of contributions, followed by South Korea in the top 10 (Table 2). Meanwhile, Indonesia ranks 39th in its contribution to research on risk factors for loneliness among older adults.

*Table 2: Frequency of production of countries that contribute to research related to loneliness among older-adults-related field*

| Country | Production frequency |
|---|---|
| USA | 2885 |
| China | 1796 |
| Italy | 1243 |
| Japan | 1002 |
| UK | 775 |

The red line represents a visualisation of scientific collaboration between countries in publications related to risk factors for loneliness among older adults (Figure 10). The connecting lines indicate networks of co-authorship, signifying international research partnerships. Collaboration from the United States to China had the highest number of collaborations, that is, followed by the

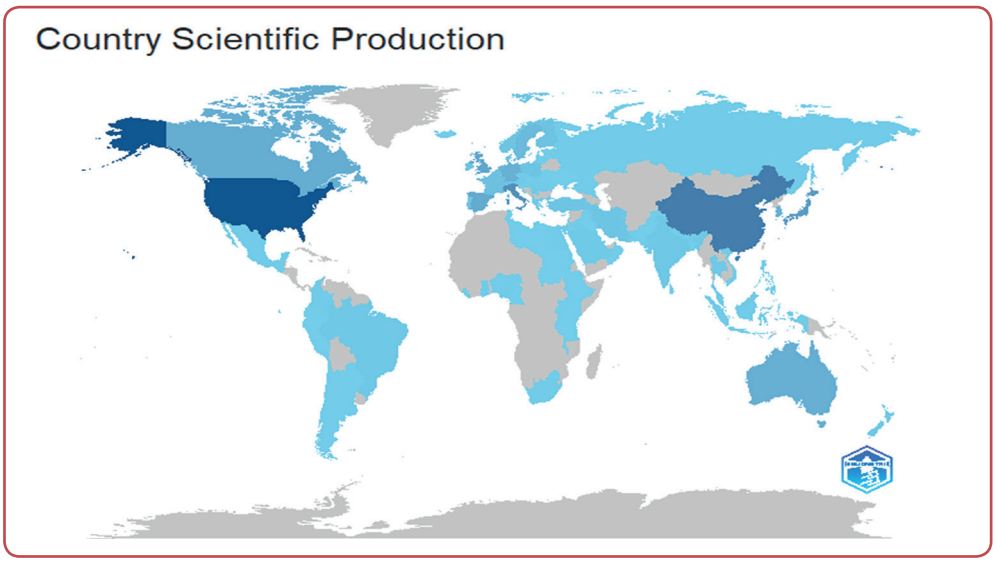


*Figure 9:* *Nations cooperation world map in risk factors for loneliness among older-adults-related research area*

*Darker blue areas indicating higher productivity, while the shades of grey indicate countries that have not contributed to the topic.*

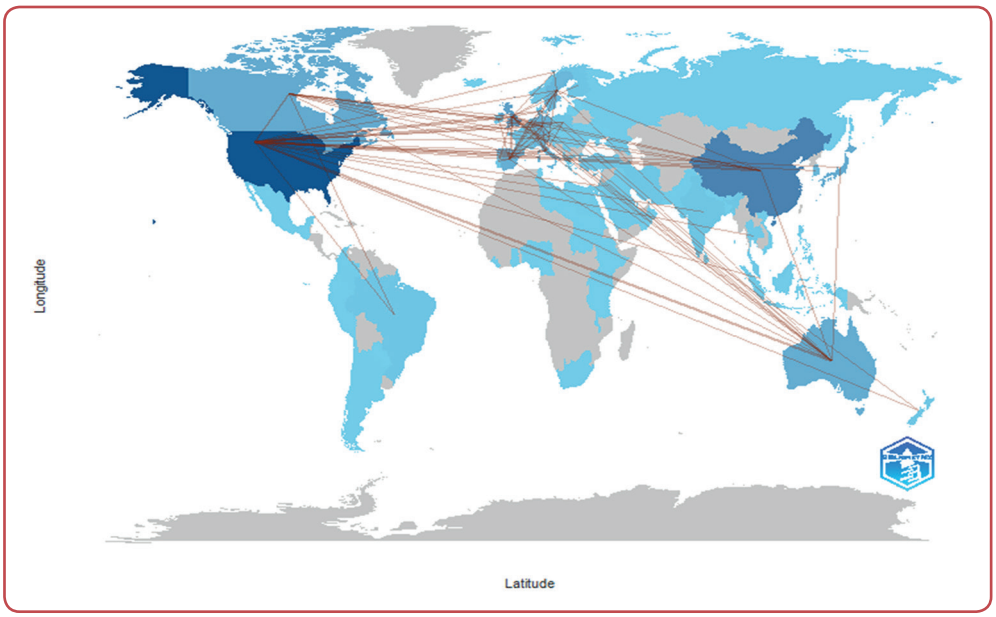


*Figure 10:* *Nations cooperation world map in risk factors for loneliness among older-adults-related research*

*The connecting lines indicate networks of co-authorship, signifying international research partnerships.*

United State to Canada. The United States was the dominant node, with 54 collaborations, showing extensive collaboration with countries across Europe, Asia, Australia and South America. China and several European countries also act as secondary nodes, forming several bilateral and multilateral partnerships. Indonesia in particular, with 5 collaborations with other countries, shows it's no less important contribution.

Depicted bar chart that visualises the most 15 countries based on the number of citations received by publications on the risk factors of loneliness among older adults, grouped by country of origin (Figure 11). The United States leads by a significant margin, with over 1.6903 citations, followed by the United Kingdom with 7.076 citations and China with 6891 citations. Asian countries such as China, Japan and Korea also contribute

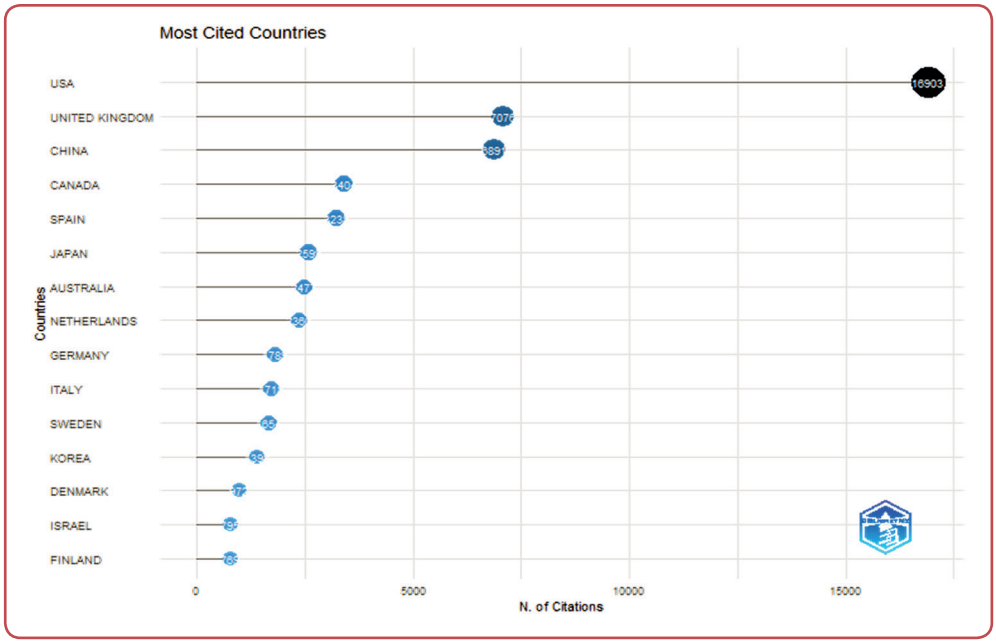


*Figure 11: Top 15 cited countries of risk factors for loneliness among older-adults-related publications*

meaningfully, though with a noticeably lower citation count. Indonesia has contributed with 25 total citations and is ranked 49th. The chart reflects both the volume of influential research output and the global recognition or usage of publications from each country.

## Discussion

This bibliometric review highlights the growing global interest in addressing loneliness among older adults. Notably, publication activity spiked after 2020, likely driven by pandemic-induced isolation. This emphasises that the issue received global academic attention after a global social crisis. The issue of loneliness arises and is exacerbated by the presence of the COVID-19 pandemic due to policies that limit face-to-face contact which ultimately reduces the quantity and quality aspects of social interaction in the community, work or education environment.[10]

The steady growth in recent years, as shown by an average annual publication rate of 20.94 % from 2015 to 2024, suggests that loneliness is increasingly recognised as a multidimensional public health concern, encompassing mental health, cognitive decline, physical frailty and socio-environmental determinants. Several studies have linked loneliness as a risk factor for mental health problems such as depression, anxiety and suicidal ideation among older individuals. This is due to physiological changes, cognitive biases and heightened vigilance.[11, 12] Depression is of particular concern, as it can increase the risk of cognitive decline such as dementia, indicating an indirect relationship between loneliness and dementia.[13] From a physiological perspective, loneliness has also been found to contribute to increased frailty, where low social contact is associated with decreased access to healthcare and medication adherence and depression-induced symptoms such as psychomotor retardation and slow gait speed can increase the risk of falls and disability.[14] Furthermore, socio-environmental factors such as reduced social engagement and COVID-19 pandemic particularly intensified this issue.

The inclusion of journals such as *JAMA Neurology, Psychiatry Research* and *Global Health Research Policy* on the list further emphasises that research on loneliness among older adults is receiving attention across specialties, highlights that the issue is now being approached through interdisciplinary lenses, particularly involving neurology, psychiatry, geriatrics and public health policy. Among these, psychiatry and geriatric medicine emerge as the most influential disciplines shaping the research trajectory. For instance, studies published in *The American Journal of Geriatric Psychiatry* and *Psychiatry Research* have consistently examined loneliness as a clinical factor associated with depression, cognitive impairment, suicidal ideation and frailty in later life. These

psychiatric perspectives position loneliness not only as an emotional state but also as a diagnosable and modifiable health determinant.[15] The contribution of publications produced in 2020 serves as the basis for subsequent publications, appearing five times in the top 15 most-cited papers on the research area of risk factors of loneliness among older adults.

In the context of loneliness among older adults, keywords such as "Loneliness," "Depression," "Social isolation," and "Older adults" consistently appear as the most prominent in bibliometric analyses, indicating a strong emphasis on psychosocial dimensions. Studies have shown that loneliness often arises from subjective dissatisfaction with one's social connections, even when objective social contact may still exist.[16] Psychosocial models suggest a bidirectional relationship between loneliness and depression: loneliness increases vulnerability to depression and anxiety, while existing depressive symptoms may in turn lead to greater perceived loneliness.[17] The evolution of trend topics, primarily caused by social crises such as pandemics, gives rise to new issues, such as "COVID-19," which has a significant impact on loneliness levels, especially among vulnerable groups. One recent study found that for every one-point increase in the lockdown restriction index, the likelihood of experiencing loneliness increases by 2 %. This impact is greatest for elderly individuals who live alone.[18]

Despite the focus on psychosocial and clinical aspects, there are still gaps in multidisciplinary research and unaddressed risk factors. Some of these areas include socioeconomic factors, such as income, retirement and poverty. Income status and well-being significantly impact the level of loneliness in the elderly.[19] Keywords related to technology and digitalisation include "Technology," "Social media," "Telemedicine" and "Internet use," none of which were found in the analysis of the top 50 authors' keywords. Although using the internet and social media for communication and social contact can reduce loneliness, few studies directly discuss this relationship.[20] Keywords related to elderly care and religious culture, such as religiosity, spirituality, care homes, nursing homes and caregiver burden, are not dominant. Earlier-emerging and low-frequency terms, such as "Cognitive dysfunction," "Falls," "Osteoporosis," and "Atrial fibrillation," point to underrepresented biomedical risks. These topics underscore the necessity of integrative frameworks that examine how clinical geriatric conditions may exacerbate emotional vulnerability in later life. One study found that loneliness is an independent risk factor for atrial fibrillation (AF) recurrence after catheter ablation. Older adults experiencing severe or extreme loneliness were five times more likely to experience AF recurrence than those who were not lonely, even after adjusting for confounders.[21] Also, cognitive dysfunction and disability play a role in the development of loneliness in older adults, but this topic is rarely discussed in relation to AF recurrence. Cognitive impairment often leads to social withdrawal and reduced social interaction, both of which contribute to increased feelings of loneliness.[22]

Some risk factors can be grouped based on their interconnected aspects. In this analysis, five groups of risk factors were assessed based on the co-occurrence of authors' keywords, thematic clustering and frequent topic trends. This demonstrates that the topic of risk factors for loneliness among older adults is multidimensional. The first group is psychosocial aspects and the social environment. Social networks, relationship quality and the emotional and instrumental support received from others are all related to these factors. Some examples of these factors include social isolation, social support, marital status and living alone. The second group is clinical and functional aspects. These factors include physical and mental health issues that interfere with older adults' ability to engage in social activities or feel comfortable in interpersonal relationships. Examples include neurocognitive decline, depression, delirium, osteoporosis and falls. The third group comprises epidemiological and public health concerns. This group includes individual characteristics that naturally affect the potential for loneliness due to social structure, mental health or biological factors. These characteristics include age, gender, resilience, self-perceived aging, low well-being and rural residence. The fourth group includes pandemic and global contextual aspects, such as the impact of the pandemic and public health restrictions.

The global distribution of research on loneliness among older adults shows that scientific productivity and contributions in citations are highest in clusters of developed and high-income countries, about 28.5 %, such as the United State of America, China and the United Kingdom.[23] This is in line with the high access to adequate health infrastructure, investment in research and signifi-

cant knowledge gaps, which are difficult for low- and middle-income countries (LMICs) to achieve. Besides that, economic disparities at the country level can impact aspects of education, work, access to healthcare and social relationships, making individuals more vulnerable to loneliness due to limited social involvement and a lack of community suppor.[24] Unfortunately, the relationship between loneliness and socioeconomic factors is under-explored, but it has the potential to be an innovative research direction. The United States emerges as the undisputed leader, reflecting its extensive funding capacity, aging population demographics and longstanding academic interest in geriatric psychiatry and public health.[25] Countries such as China, the United Kingdom and Australia also demonstrate substantial output, underscoring their growing prioritisation of elderly mental health amid rapid demographic transitions. Additionally, much of the local research in developing countries is not published in internationally reputable journals. Therefore, it is missing from the bibliometric records in this study, which are obtained from databases such as *Scopus* and *WoS*. This creates a geographical bias in global research mapping.

The total publication volume and international collaboration from ASEAN member states are generally lower than those from western countries.[26] However, China as one of the most prominent contributors from Asia shows a high level of productivity and has established many international collaborations, especially with the United State of America. The low average number of citations from Asian countries suggests possible differences in the visibility of global impact research, possibly because most Asian countries are LMICs.[27] Nonetheless, Asia's role is expanding and these countries are becoming increasingly involved in international research collaborations, a trend that will likely continue to grow given the rapid aging of populations across the continent.[28]

Indonesia's position in the bibliometric landscape, although still developing, presents an encouraging sign of increasing scholarly attention toward the issue of loneliness. This is because Indonesia is the country with the highest level of social inequality in Asia, where Indonesia is experiencing socio-economic transition and rapid urbanisation.[26] The low citation impact suggests that while Indonesia is beginning to contribute to the scholarly conversation, its research outputs have not yet achieved wide recognition or influence. Despite these challenges, Indonesia's emerging role should not be underestimated. Given the country's rapidly aging population and cultural factors that influence social support systems for the elderly, there is a pressing need for more targeted research in this area.[29] Strengthening local research capacities and fostering more international collaborations could significantly enhance Indonesia's contribution to this important field in the coming years.

Research findings indicate that loneliness among the elderly is influenced by numerous factors, including psychosocial, clinical, epidemiological and public health determinants. Therefore, practical interventions are necessary, including routine health screenings at primary healthcare facilities, strengthening family interactions and involving community health workers in elderly care, as well as developing community programs that facilitate social interaction, such as elderly health posts, skill training and other social group activities. From a clinical perspective, interventions based on healthcare services can be implemented by providing digital-based mental health services. Practical implications and mapping trends in loneliness among the elderly are crucial in formulating evidence-based and targeted policies and interventions for the community. Mapping trends among the elderly also significantly contributes to identifying the most vulnerable population groups and geographical areas with the highest burden, including Indonesia.

## Conclusion

This bibliometric analysis provides a systematic literature review of research through *Scopus* reviews and WoS articles published on academic topics related to risk factors for loneliness among older adults over the past decade. The analysis and visualisation show that loneliness among older adults is an increasingly prominent topic in global research, especially since the COVID-19 pandemic. This research reveals that loneliness is closely linked to multidimensionality and is receiving attention from various fields, including neuroscience, behavioural health and geriatric care. The main themes of this research include psychological and cognitive factors, social isolation and geriatric vulnerability.

Although the topic of loneliness among the elderly is gaining high attention in global academic interest, there is still a gap in innovative research, which calls for a multidisciplinary approach, especially in the discussion of risk factors for loneliness among the elderly. Some of the potential topics for further research are the relationship of loneliness among the elderly with socioeconomic factors, technology and digitalisation, elderly care, religion and culture and the direct relationship of loneliness with biomedical risks in geriatric clinical conditions such as atrial fibrillation, cognitive impairment, osteoporosis and fall risk. These topics will open up great opportunities for researchers to contribute to and develop the advancement of this issue.

The results of clustering keywords related to loneliness in older adults reveal four risk factor groups: psychosocial aspects and social environment, clinical and functional health, epidemiological and public health concerns and pandemics and the global context. The field is evolving from descriptive studies toward more integrative, interdisciplinary models, offering opportunities for innovation in policy, care models and cross-sectoral interventions. Future research should focus on emerging themes, such as resilience, social connectedness and digital inclusion, while ensuring the equitable participation of individuals from all global regions.

The dominance of scholarly output from Western and developed countries highlights the notable gap in representation from developing nations. The high contributions from developed countries underscore the need for more inclusive research representation from developing nations, including those in Asia, such as Indonesia. The current distribution also suggests opportunities for future bibliometric collaboration studies assessing co-authorship networks and transcontinental partnerships. Strategic alliances between high-output countries and underrepresented regions could accelerate the development of globally inclusive frameworks to more effectively address loneliness in older adults. In conclusion, loneliness among older adults is a multidimensional problem requiring integrated responses, not only a medical or psychological issue. As the global population continues to age, research in this field must evolve to address the complexity of the human experience in later life with empathy, inclusivity and scientific rigor.

## Ethics

This study was a secondary analysis based on the currently existing data and did not directly involve with human participants or experimental animals. Therefore, the ethics approval was not required in this paper.

## Acknowledgement

Authors are thankful to their respective institutions.

## Conflicts of interest

The authors declare that there is no conflict of interest.

## Funding

This research was internal funded by Faculty of Medicine and Health Sciences, University of Bengkulu.

## Data access

The data supporting the findings of this study is available from two databases, namely *Scopus* and *the Web of Science (WoS).*

## Author ORCID numbers

Riskita Ayudira Salsabila (RAS):
0009-0000-1684-9744
Vernonia Yora Saki (VYS):
0000-0003-0606-6919
Ahmad Azmi Nasution (AAN):
0000-0002-6580-7329
Rizkianti Anggraini (RA):
0009-0009-1219-8388
Onetusfifsi Putra (OP):
0000-0002-9937-1017

## Author contributions

Conceptualisation: RAS, VYS
Data curation: RAS, VYS, AAN
Writing - original draft: RAS, VYS, AAN, RA
Writing - review and editing: VYS, AAN, RA, OP
Project administration: RA, OP .

## References

1. Susanty S, Nadirawati N, Setiawan A, Haroen H, Pebrianti S, Harun H, et al. Overview of the prevalence of loneliness and associated risk factors among older adults across six continents: a meta-analysis. Arch Gerontol Geriatr. 2025;128:105627. doi: 10.1016/j.archger.2024.105627.
2. Tkatch R, Musich S, MacLeod S, Alsgaard K, Hawkins K, Yeh CS. Population health management for older adults. Gerontol Geriatr Med. 2016;2:1–13. doi: 10.1177/2333721416667877.
3. Sabilla M, Sukma F, Arum Ariasih R, Efendi R, Febrianti T, et al. Community services in pandemic situation: preparing quality of life in middle age group through social media education "Kulwap" (Kuliah WhatsApp). Int Conf Health Sci. 2020 Oct 26:20–5.
4. Votruba N, Thornicroft G; Funda Mental SDG Steering Group. Sustainable Development Goals and mental health: learnings from the contribution of the Funda Mental SDG Global Initiative. Glob Ment Health (Lond). 2016;3:e20. doi: 10.1017/gmh.2016.20.
5. Bandari R, Khankeh HR, Shahboulaghi FM, Ebadi A, Keshtkar AA, Montazeri A. Defining loneliness in older adults: protocol for a systematic review. Syst Rev. 2019;8(1):xx. doi: 10.1186/s13643-018-0935-y.
6. Chadegani AA, Salehi H, Yunus MM, Farhadi H, Fooladi M, Farhadi M, et al. A comparison between two main academic literature collections: Web of Science and Scopus databases. Asian Soc Sci. 2013 Apr 27;9(5):18–26. doi: 10.5539/ass.v9n5p18.
7. Ellwanger MP, et al. Trends in clinical reasoning assessment: a bibliometric analysis spanning 1974–2024. ARACÊ. 2024 Oct 24;6(2):3573–89. doi: 10.56238/arev6n2-187.
8. Aria M, Cuccurullo C. Bibliometrix: an R tool for comprehensive science mapping analysis. J Informetrics. 2017 Nov;11(4):959–75. doi: 10.1016/j.joi.2017.08.007.
9. van Eck NJ, Waltman L. Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics. 2010;84(2):523–38. doi: 10.1007/s11192-009-0146-3.
10. Köster F, Lipps O. How loneliness increased among different age groups during COVID 19: a longitudinal analysis. Eur J Ageing. 2024 Dec;21(1):xx. doi: 10.1007/s10433-023-00798-3.
11. Ma R, Zhou Y, Xu W. Guardianship from being present: the moderation of mindfulness in the longitudinal relationship of loneliness to quality of life and mental health problems among the oldest old. Curr Psychol. 2024 Jan 24;43(2):1545–54. doi: 10.1007/s12144-023-04418-2.
12. Bandyopadhyay S. Loneliness and depression in older adults: living well in older age. Med (Baltim). 2024 Nov;52(11):719–24. doi: 10.1016/j.mpmed.2024.08.009.
13. Oken BS, Kaplan J, Klee D, Gallegos AM. Contributions of loneliness to cognitive impairment and dementia in older adults are independent of other risk factors and Alzheimer's pathology: a narrative review. Front Hum Neurosci. 2024 May 30;18:1380002. doi: 10.3389/fnhum.2024.1380002.
14. Bally ELS, Ye L, van Grieken A, Tan SS, Mattace Raso F, Procaccini E, et al. Factors associated with falls among hospitalized and community dwelling older adults: the APPCARE Study. Front Public Health. 2023;11:1180914. doi: 10.3389/fpubh.2023.1180914.
15. Donovan NJ, Blazer D. Social isolation and loneliness in older adults: review and commentary of a National Academies report. Am J Geriatr Psychiatry. 2020 Dec;28(12):1233–44. doi: 10.1016/j.jagp.2020.08.005.
16. Niimura H. Social isolation, loneliness, anxiety, and depression in older adults. Brain Nerve. 2025;77(2):133–39. doi: 10.11477/mf.188160960770020133.
17. Zhang Y, Kuang J, Xin Z, Fang J, Song R, Yang Y, et al. Loneliness, social isolation, depression and anxiety among the elderly in Shanghai: findings from a longitudinal study. Arch Gerontol Geriatr. 2023 Jul;110:104980. doi: 10.1016/j.archger.2023.104980.
18. Stolz E, Mayerl H, Freidl W. The impact of COVID 19 restrictions on older adults' loneliness: evidence from high frequency panel data in Austria (2020–2022). Arch Gerontol Geriatr. 2023 Apr;107:104907. doi: 10.1016/j.archger.2022.104907.
19. Wu J, Zhang J, Fokkema T. The micro macro interplay of economic factors in late life loneliness: evidence from Europe and China. Front Public Health. 2022 Sep 13;10:968411. doi: 10.3389/fpubh.2022.968411.
20. Silva P, Matos AD, Martinez Pecino R. Can the internet reduce the loneliness of 50+ living alone? Inf Commun Soc. 2022 Jan;25(1):17–33. doi: 10.1080/1369118X.2020.1760917.
21. Sun H, Huang W, Luo Y, Xiong S, Tang Y, Yang G, et al. Utility of loneliness status to risk stratification and prediction of recurrent atrial fibrillation after catheter ablation. Adv Ther. 2025;42(1):456–70. doi: 10.1007/s12325-024-03046-x.
22. Burholt V, Windle G, Morgan DJ. A social model of loneliness: the roles of disability, social resources, and cognitive impairment. Gerontologist. 2017 Dec;57(6):1020–30. doi: 10.1093/geront/gnw125.
23. Chawla K, Kunonga TP, Stow D, Barker R, Craig D, Hanratty B. Prevalence of loneliness amongst older people in high income countries: a systematic review and meta analysis. PLoS One. 2021 Jul;16(7):e0255088. doi: 10.1371/journal.pone.0255088.
24. Tapia Muñoz T, Staudinger UM, Allel K, Steptoe A, Miranda Castillo C, Medina JT, et al. Income inequality and its relationship with loneliness prevalence: a cross sectional study among older adults in the US and 16 European countries. PLoS One. 2022 Dec;17(12):e0274518. doi: 10.1371/journal.pone.0274518.
25. Bhutani S, Greenwald B. Loneliness in the elderly during the COVID 19 pandemic: a literature review in preparation for a future study. Am J Geriatr Psychiatry. 2021;29(4):587–88. doi: 10.1016/j.jagp.2021.01.081.

26. Peltzer K, Pengpid S. Loneliness correlates and associations with health variables in the general population in Indonesia. Int J Ment Health Syst. 2019 Apr;13:28. doi: 10.1186/s13033-019-0281-z.
27. World Bank Group. New World Bank Group country classifications by income level for FY24 (July 1, 2023–June 30, 2024) [Internet]. 2023 [Cited: 29-May-25]. Available from: https://blogs.worldbank.org/en/opendata/new-world-bank-group-country-classifications-income-level-fy24.
28. Pin N, Muthuswamy B, Fenech M, Richard H, Sofia A, Loke SC. Research and policy to achieve healthy aging in Asia: recommendations from an expert workshop. Open Longev Sci. 2013;7:1–10. doi: 10.2174/1876326X01307010001.
29. Fitriana KN. Collaborative governance in handling COVID 19 for elderly social services. J Soc Stud. 2022 May 17;18(1):119–46. doi: 10.21831/jss.v18i1.49569.