


An Overview of Research in the Field of Elderly Health: Bibliometric Analysis

Yaşlı Sağlığı Alanında Yapılan Araştırmalara Genel Bir Bakış: Bibliyometrik Analiz

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How to Cite:

Nal M, Nal B. An Overview
of Research in The
Field of Elderly Health:
Bibliometric Analysis.
Journal of Geriatric
Science 2024;7(1):14-21.
Doi: 10.47141/
geriatrik.1382709

Received: 28.10.2023

Accepted: 05.02.2024

ABSTRACT

Aim: The proportion of the elderly population in the world continues to increase rapidly, and many health problems arise in old age. This study aims to provide information for future research by conducting a bibliometric analysis of research on elderly health.

Materials and Methods: Data on works published in the Web of Science (WoS) database on elderly health until the end of 2022 were obtained. A total of 1,031 works from different disciplines were accessed and analyzed. The VOSviewer 1.6.18 program and Excel Office package program were used for the data analysis. The distribution of the works by year, citation analysis of the works, the country where the research was conducted, the institution conducting the research, and the organizations that provided the most funding were compared.

Results: It was determined that the first work on elderly health was published in 1983, the number of publications increased every year after 2005, and most publications were published in 2022 (f = 133). It was determined that the most frequently used keywords were “elderly health” (f = 130), the most publications were in China (265), the country with the highest citation density was the United States of America (USA), and the organization that provides the largest number of funding for research was the National Natural Science Foundation of China (NSFC) (f = 78).

Conclusion: Findings that the issue of elderly health is still up to date and that the interest of researchers in this subject is increasing with each passing year. The results of the study will provide useful clues for future research and scientific strategies in the field of elderly health.

Keywords: Aged, Bibliometric Analysis, Elderly Health

ÖZ

Amaç: Dünyadaki yaşlı nüfusun oranı hızla artmaya devam etmekte ve yaşlılıkta birçok sağlık sorunu ortaya çıkmaktadır. Bu çalışma, yaşlı sağlığına ilişkin araştırmaların bibliyometrik analizini yaparak gelecekteki araştırmalara bilgi sağlamayı amaçlamaktadır.

Gereç ve Yöntemler: Web of Science (WoS) veri tabanında yaşlı sağlığına ilişkin 2022 yılı sonuna kadar yayınlanan çalışmaların verileri elde edildi. Farklı disiplinlerden toplam 1.031 esere ulaşıldı ve analiz edildi. Verilerin analizinde VOSviewer 1.6.18 programı ve Excel Office paket programı kullanılmıştır. Eserlerin yıllara göre dağılımı, eserlerin atıf analizleri, araştırmanın yapıldığı ülke, araştırmayı yapan kurum ve en çok fon sağlayan kuruluşlar karşılaştırıldı.

Bulgular: Yaşlı sağlığı ile ilgili ilk çalışmanın 1983 yılında yayınlandığı, 2005 yılından sonra yayın sayısının her yıl arttığı, en fazla yayının 2022 yılında yayınlandığı (f=133) belirlendi. En sık kullanılan anahtar kelimenin “yaşlı sağlığı” (f=130) olduğu, en fazla yayının Çin’de (265) olduğu, en fazla atıf yoğunluğuna sahip ülkenin Amerika Birleşik Devletleri (ABD) olduğu ve araştırmalar için en fazla fon (f = 78) sağlayan kuruluş Çin Ulusal Doğa Bilimleri Vakfı (NSFC) olduğu belirlenmiştir.

Sonuç: Yaşlı sağlığı konusunun halen güncel olduğu ve araştırmacıların bu konuya ilgisinin her geçen yıl arttığı yönünde bulgular bulunmaktadır. Çalışmanın sonuçları yaşlı sağlığı alanında gelecekte yapılacak araştırmalara ve bilimsel stratejilere faydalı ipuçları sağlayacaktır.

Anahtar Kelimeler: Yaşlı, Bibliyometrik Analiz, Yaşlı Sağlığı



INTRODUCTION

The world's population is getting older every day (1). The World Health Organization (WHO) divides old age into three categories: youngest old (65–74), middle old (75–84), and oldest old (85+). In general, those over the age of 65 are elderly (2). According to the United Nations (UN) Report, the population aged 65 and over is estimated to more than double, from 761 million in 2021 to 1.6 billion in 2050. It is estimated that one in six people worldwide will be over 65 years of age in 2050 (3). According to the World Social Report 2023, the elderly should be at the center of the steps taken to achieve a sustainable future (3).

With aging, physiological changes occur in the respiratory, cardiovascular, gastrointestinal, neurological, endocrine, immune, musculoskeletal, and excretory systems, skin, and senses, such as vision, hearing, taste, and smell. With advancing age, loss of function in tissues and organs, psychomotor decline, consequent limitations in daily activities, an increase in accident rates, and more frequent and serious infections are expected. For this reason, elderly individuals often have more than one chronic systemic disease and use multiple medications (4). These health problems that develop in old age will increase the healthcare needs of the elderly and thus directly affect the burden of the health system. Therefore, elderly health is an important issue for the quality of life of elderly individuals and countries' health systems. While the increase in the absolute number and share of the elderly population in society is indicative of social, economic, and epidemiological/health achievements, on the other hand, it creates a demographic burden on countries with inadequate social security systems and very low public investment in health and

other welfare programs (5). Inadequate funding will strain the ability of healthcare professionals to provide quality healthcare (6).

When the literature is examined, it can be seen that several bibliometric analyses have been conducted on aging. Zhou and Zhang (2021) analyzed the progress and trends of multimorbidity in the elderly in China and internationally from a bibliometric perspective and found that research fronts are moving from disease-centered to patient-centered (7). In a bibliometric analysis of research articles on pain in the elderly, Zhao et al. (2021) found that the main types of pain in the elderly included back pain, arthritis, and postoperative pain (8). Moura (2020), in a bibliometric analysis of scientific evidence on violence against the elderly, found insufficient data on interventions in cases of violence against the elderly (9).

Although there are many bibliometric analysis studies on the elderly in the literature, we could not find a bibliometric analysis examining directly the issue of "elderly health". The answers to questions such as the distribution of publications on "elderly health" by year, what is the most cited work, in which country was the most research conducted, and which institutions provided the most funding for publications on this subject are important for researchers. To the best of our knowledge, this is the first study to examine elderly health using a VOSviewer analysis. This study aims to guide researchers for future research by examining the distribution of the works published in the Web of Science (WoS) database in the field of elderly health by year, citation analysis of the works, the country where the research was conducted, the institution conducting the research, and the organizations that provide the most funding.

MATERIAL AND METHOD

In this research, the bibliometric analysis method was used. In bibliometric and scientometric research, much attention has been paid to the analysis of networks (e.g., documents, keywords, authors, or journals). Mapping and clustering techniques are often used to study such networks. These techniques aim to provide information about the structure of a network. The techniques are used to address questions such as: What are the main topics or research areas in each scientific field? How are these topics or fields related to each other? How has a particular scientific field developed over time? (10).

Data Collection

To create a network in The WOSviewer 1.6.18 program, bibliographic database files (e.g. Web of Science, Scopus, Dimensions, Lens, and PubMed files) and reference manager files (e.g. RIS, EndNote, and RefWorks files) can be provided as input to VOSviewer (11). We collected data from publications published in the Web of Science (WoS) database.

Works in the WoS database when word groups are scanned in the following ways; “older health” 89, “older people health” 57, “advancing age health” 3, “elderly health” 1031, publications were detected. Since most publications appeared in the word group “elderly health”, studies containing the word “elderly health” were analyzed in all fields in the WoS database. A total of 1,031 publications from different disciplines, including 750 articles, 139 proceeding papers, 70 meeting abstracts, 45 review articles, 9 editorial materials, 9 book chapters, 3 book reviews, 2 letters, 2 early access, 1 correction, and 1 news item were reached. It was determined that the oldest article in this field was published in 1983, and the most recent publication was published in

2022. The data obtained, the distribution of the works by year, the citation analysis of the works, the country where the research was conducted, the institution conducting the research, and the organizations that provided the most funding were examined.

Statistics

The WOSviewer 1.6.18 program and Excel Office package program were used for the data analysis. In this context, the citation (journal, author, institution, and document), coauthor (institution), and co-citation (author) analyses described above were used. Clustering, density, and mapping analyses were performed using the WOSviewer program. Frequency, percentage tables, and graphs of the data were created in the Excel program.

In the analysis evaluation in the overlay visualization analysis, the color of the item is determined by the item’s score; by default, the colors are blue for the lowest score, green for the middle score, and yellow for the highest score. In network visualization analysis, the larger the weight of an item, the larger its circle and label. The stronger the connection between the two items, the thicker the lines (12).

Ethics

Ethical principles were followed throughout the study. The authors declare that the Helsinki Declaration has been complied with. Ethics committee approval was received from Kütahya Health Sciences University (decision no: 2023/10-10).

RESULTS

When the word “elderly health” was searched in the WoS database in all fields, it was seen that the first study published in WoS on the subject

was published in 1983. The highest number of publications in this field was published in 2022, with 133 works. Figure 1 shows that the number of publications in this field has gradually increased in the past 15 years.

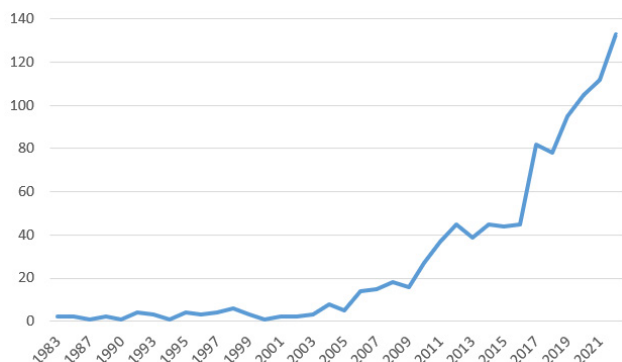


Figure 1. Distribution of publications by year

Keyword Analysis

The keyword network map is shown in Figure 2. To show the most frequently used keywords together on a network map, “co-occurrence analysis” was used, and “author keywords” were selected. The minimum number of repetitions of a keyword was 10, and 30 keywords were

subjected to analysis by the program of 2,342 related keywords. When the map was analyzed, it was determined that the most frequently used keywords were “elderly health” ($f = 130$), “elderly” ($f = 114$), “aging” ($f = 57$), and “aged” ($f = 33$). The keywords shown in yellow on the image are the most recent keywords (Figure 2). In this field, the research topics that have been studied together in the field of elderly health in recent years are “mental health,” “older adults,” “osteoporosis,” and “physical activity.”

Work Citation Analysis

Density visualization analysis was performed by selecting the “citations” and “documents” options to determine which publications were cited the most among the works published in the WoS related to elderly health. The minimum number of citations per document was chosen as “100,” and 15 documents meeting this requirement were subjected to analysis. The results of the analysis are shown in Figure 3. According to the citation network analysis results, the highest density of

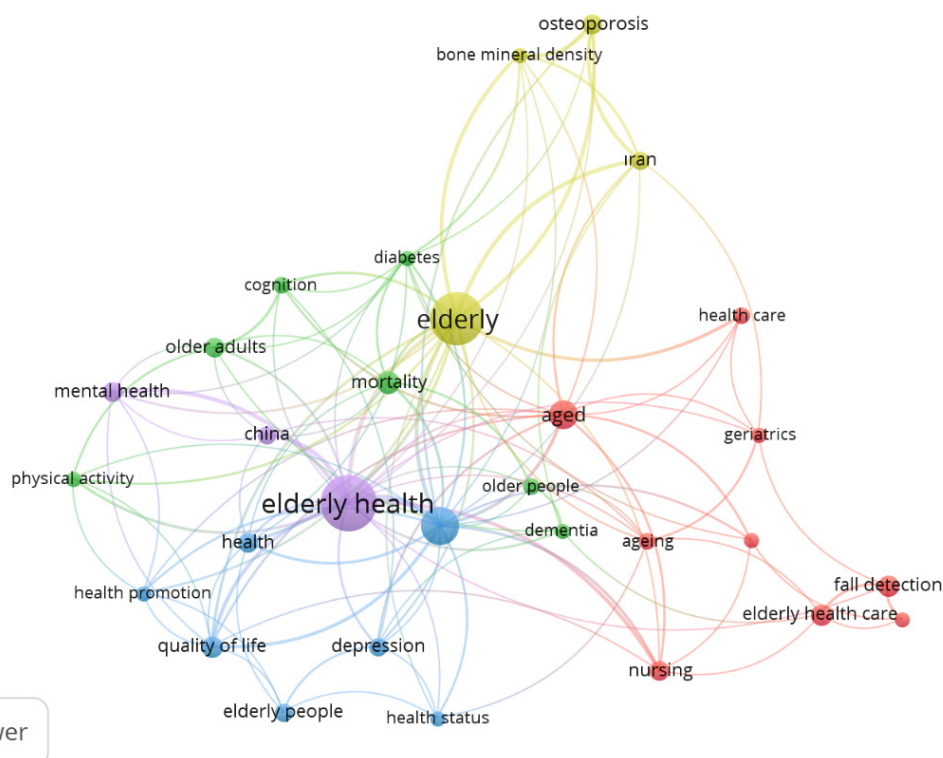


Figure 2. Keyword network map

cited works is in the yellow areas. In this context, the most cited works were Han et al. (2008) ($f = 253$), Majumder et al. (2017) ($f = 208$), Leung

(Leung et al., 2008) ($f = 192$), Javier Ordonez (2013) ($f = 163$), and Schooling (2006) ($f = 127$) (Figure 3).

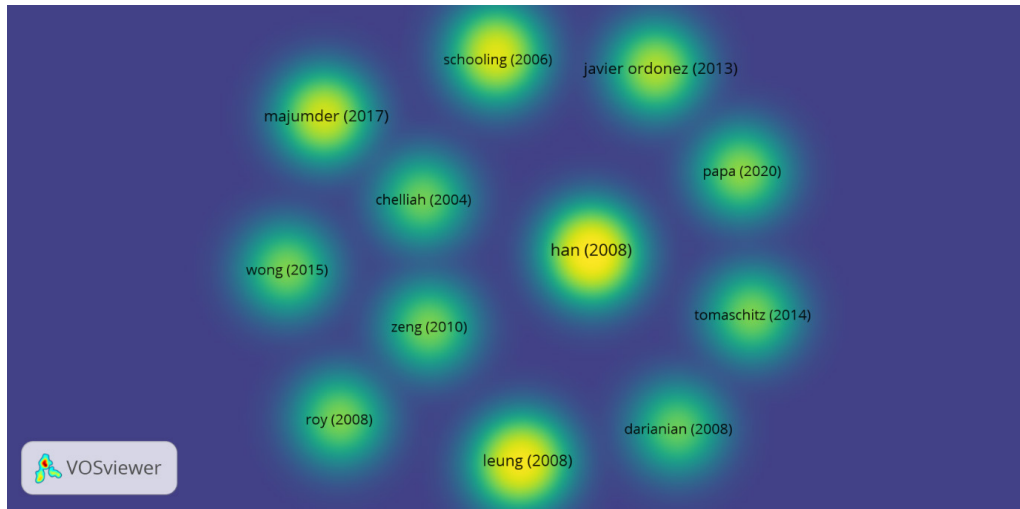


Figure 3. Publication citation analysis network map

Countries Researched

To analyze the countries researching elderly health, “bibliographic coupling” and “countries” options were selected, and an overlay visualization analysis was performed. The minimum number of publications per country was selected as “2,” and the number of citations as “1.” The data from 54 countries selected by the program from 81 countries meeting this requirement were analyzed. The results of the

analysis are shown in Figure 4. It was determined that China ($f = 265$), the USA ($f = 150$), Brazil ($f = 140$), Iran ($f = 117$), Taiwan ($f = 56$), Japan ($f = 41$), India ($f = 36$), the UK ($f = 28$), Türkiye ($f = 27$), and South Korea ($f = 27$) had the most publications, respectively. When this network map is analyzed, it is seen that the country with the highest citation density is the USA. Brazil, Iran, and Türkiye are among the countries with the lowest citation densities.

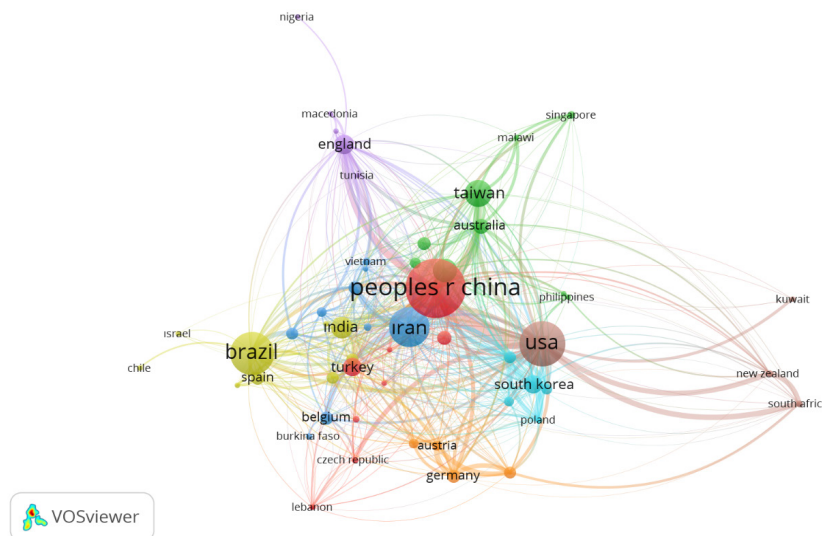


Figure 4. Distribution of publications by country

Institutions Conducting Research

To analyze the institutions researching elderly health, “bibliographic coupling” and “organizations” options were selected, and an overlay visualization analysis was performed. The minimum number of publications per country was selected as “5,” the number of citations as “0,” and 68 organizations that met this requirement were determined among 1,257 organizations and analyzed. The results of the

overlay visualization analysis of organizations publishing in the field of elderly health are shown in Figure 5. Institutions that have conducted intensive research in this field in recent years include the University Tehran of Medical Sciences ($f = 87$), Bushehr University of Medical Sciences ($f = 77$), University Hong Kong (65), Pasteur Institute of Iran ($f = 26$), and Chinese University Hong Kong ($f = 25$).

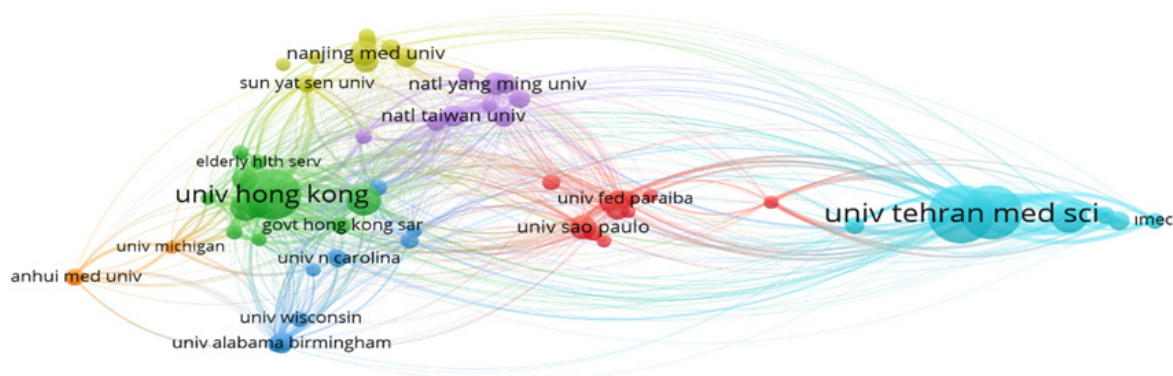


Figure 5. Institutions conducting research

Top Funding Agencies

It was determined that 741 publications received funding support from different research agencies. When the agencies providing funding support for research in the field of elderly health were examined, it was determined that the most funding support was provided by the “National Natural Science Foundation of China (NSFC)” with 10.4% ($n = 78$) funding support (Table 1).

Table 1. Funding organizations

Order	Funding Agencies	n	%
1	National Natural Science Foundation of China	78	10.4
2	United States Department of Health Human Services	34	4.5
3	National Institutes of Health	33	4.4
4	National Institute on Aging	26	3.5
5	Conselho Nacional De Desenvolvimento Cientifico E Tecnologico	17	2.3
6	Ministry Of Science and Technology Taiwan	17	2.3
7	Coordenacao De Aperfeicoamento De Pessoal De Nivel Superior Capes	15	2.0
8	Natural Science Foundation of Jiangsu Province	12	1.6
9	Hong Kong Research Grants Council	11	1.5
10	Elderly Health Research Project of Jiangsu Province	10	1.3

DISCUSSION

Although there are many studies in the literature on topics involving elderly health, we could not find a bibliometric analysis directly addressing the word group “elderly health”. To the best of our knowledge, this is the first study to examine elderly health using WOSviewer analysis in terms of the distribution of research by year, citation analysis of the research, the country where the research was conducted, the institution conducting the research, and the institution providing the most funding.

In this study, it was determined that research on elderly health has increased significantly in recent years. According to a United Nations report, the number of older people has grown rapidly, from around 260 million in 1980 to 761 million in 2021. In 1950, 1 in 20 people was aged 65 and over, while in 2021, 1 in 10 people worldwide was 65 (3). The reason for the rapid increase in research on elderly health in recent years is thought to be the increase in the elderly population worldwide. We recommend conducting research that will contribute to policy development on elderly health.

In this study, it was determined that there has been an increase in the number of studies on elderly health in the WoS database in recent years. It is also estimated that by 2050, one out of every six people will be over the age of 65 (13). The WHO declared 1999 the “International Year of Older Persons” (14). All of these developments may have drawn the attention of researchers to the issue of elderly health. This result shows that the importance of elderly health is increasing for researchers today.

In this study, it was determined that the keywords used with elderly health in recent years are “mental health,” “older adults,” “osteoporosis,”

and “physical activity.” According to these findings, in recent years, researchers have mostly focused on mental health, osteoporosis, and physical activity in research on elderly health. 15% of people over 60 suffer from a mental health problem (2). This may be the reason for the increase in research on mental health in older adults in recent years. Osteoporosis is a disease characterized by low bone mass and deterioration of bone architecture, leading to compromised bone strength and an increased risk of fractures (15). Osteoporosis and related complications are common causes of morbidity and mortality in older adults (16). Worldwide, osteoporosis causes more than 8.9 million fractures per year, resulting in an osteoporotic fracture every three seconds (17). Osteoporosis has been described as a silent disease of the 21st century that has become a public health problem due to its severity, chronicity, and progression, particularly affecting postmenopausal women and older adults (18). Since osteoporosis is one of the most important health problems in the elderly, it is one of the most frequently discussed issues in the research on elderly health. In content analysis, keywords are examined for repetition frequency and theme emphasis. However, this analysis provides the researcher with information about the progress of the studies by providing clues about the concepts related to the keywords (19).

The most cited studies were conducted on depression in the elderly (20), information technology products used in elderly health (21), diabetes mellitus (22), monitoring of daily living activities (23), obesity, and the relationship of physical activity with mortality in elderly individuals (24). The most recently published research among the most cited studies is related to information technology products. The reason for this situation may be recent developments in information technology and the effort to use this

technology in health services.

Although the organization with the most research publications on elderly health is Tehran University of Medical Sciences, the most cited organization is University Hong Kong. This result shows us that too many publications do not receive too many citations. The reason for this situation may be due to factors such as the nature, originality, and quality of the work.

The National Natural Science Foundation of China (NSFC) is the largest fundraising organization for elderly health. This organization supported about twice as many publications as the United States Department of Health Human Services, which ranks second. It is located in the same country as the agency that provides the most broadcast support and the organization that broadcasts the most. According to this result, providing funds for publications increases the number of publications.

CONCLUSION

This study provided us with a bibliometric view, along with an evaluation of the elderly health literature. It shows that the subject of old age health is still up to date, and the interest of researchers on this subject is increasing with each passing year. Interestingly, the study showed that the subjects investigated changes in the health of the elderly. We think that these results will be beneficial for researchers because they can plan their research according to current issues. In addition, these results can contribute to policymakers on the issues of “mental health,” “older adults,” “osteoporosis,” “physical activity,” and elderly health. Authors who want to receive publication support on these issues can examine the application conditions of the institutions that provide the most funding support. Organizations that want to increase the

number of publications in the WoS database can achieve these goals by providing funding support to researchers. Our results will provide useful clues for future research and scientific strategies in the field of elderly health.

Limitations

The research is limited to publications containing the word group “elderly health” and scanned in the WoS database. Research results are limited to works published until 31 December 2022.

ACKNOWLEDGEMENT

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

Financial Disclosure

The authors received no financial support for the research, authorship and/or publication of this article.

Ethics Committee Approval

This study was approved by the Kütahya Health Sciences University Non-Interventional Clinical Research Ethics Committee (approval number 2023/10-10 and date 6 September 2023).

Author Contributions

Concept: MN, BN, Design: MN, BN, Supervision: MN, BN, Resources: MN, BN, Materials: MN, BN, Data Collection and/or Processing: MN, BN, Analysis and/or Interpretation: MN, BN, Literature Search: MN, BN, Writing Manuscript: MN, BN

REFERENCES

1. Türkbeyler İ H, Öztürk Z A, Kalem A, Abiyev A. Gelişen ve yaşlanan toplumumuzda yaşlılık

- algısı. Nobel Medicus. 2018;14(2):17-21.
2. World Health Organization. (2016). Global strategy and action plan on ageing and health (2016–2020). World Health Organization.
 3. United Nations. Leaving No One Behind in an Aging World. World Social Report 2023. 2023.
 4. Açar A. Physiological changes in the elderly. Ordu University Journal of Nursing Studies. 2020 Dec 31;3(3):347–54.
 5. Banerjee S. Determinants of rural-urban differential in healthcare utilization among the elderly population in India. BMC Public Health. 2021 Dec 17;21(939):1–18.
 6. Institute of Medicine (US) Committee on the Future Health Care Workforce for Older Americans. Retooling for an aging America: Building the health care workforce. 2008.
 7. Zhou X, Zhang D. Multimorbidity in the Elderly: A Systematic Bibliometric Analysis of Research Output. Int J Environ Res Public Health. 2021 Dec 30;19(1):353.
 8. Zhao Y, Zhang Z, Guo S, et al. Bibliometric Analysis of Research Articles on Pain in the Elderly Published from 2000-2019. J Pain Res. 2021 Apr;Volume 14:1007–25.
 9. Moura LKB, Azevedo UN de, Wingerter DG, et al. Análise bibliométrica das evidências científicas sobre violência contra a pessoa idosa. Cien Saude Colet. 2020 Jun;25(6):2143–52.
 10. Waltman L, Van Eck NJ, Noyons ECM. A unified approach to mapping and clustering of bibliometric networks. J Informetr. 2010 Oct;4(4):629–35.
 11. Van Eck NJ, Waltman L. VOSviewer Manual: Manual for VOSviewer version 1.6.18. Leiden: Centre for Science and Technology Studies (CWTS) of Leiden University.; 2022.
 12. Eck NJ van, Waltman L. Universiteit Leiden. 2022. p. 1–53 VOSviewer Manual.
 13. United Nations. United Nations. 2019. p. 1–38. World Population Aging 2019. Available from: <https://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2019-Highlights.pdf> Cited: 2023 Jul 1
 14. Gökçek Karaca N. Uluslararası İlke ve Standartlar Bağlamında Yaşlı Hakları ve Sosyal Hizmet Uygulamaları. Sosyal Güvenlik Dergisi. 2019 Dec 19;9(2):255–74.
 15. Johnston CB, Dagar M. Osteoporosis in Older Adults. Medical Clinics of North America. 2020 Sep;104(5):873–84.
 16. LeBoff MS, Greenspan SL, Insogna KL, et al. The clinician’s guide to prevention and treatment of osteoporosis. Osteoporosis International. 2022 Oct 28;33(10):2049–102.
 17. Johnell O, Kanis JA. An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. Osteoporosis International. 2006 Oct 19;17(12):1726–33.
 18. Aibar-Almazán A, Voltes-Martínez A, Castellote-Caballero Y, et al. Current status of the diagnosis and management of osteoporosis. Int J Mol Sci. 2022 Aug 21;23(16):1–27.
 19. Baş H. Bibliometric Analysis of Publications on Brain Drain with VOSviewer. Turkish Journal of Social Policy. 2023;4(1):52–65.
 20. Han C, Jo SA, Kwak JH, et al. Validation of the Patient Health Questionnaire-9 Korean version in the elderly population: The Ansan geriatric study. Compr Psychiatry. 2008 Mar;49(2):218–23.
 21. Majumder S, Aghayi E, Noferesti M, et al. Smart homes for elderly healthcare—Recent advances and research challenges. Sensors. 2017 Oct 31;17(11):2496.
 22. Leung CC, Lam TH, Chan WM, et al. Diabetic control and risk of tuberculosis: A cohort study. Am J Epidemiol. 2008 Apr 29;167(12):1486–94.
 23. Ordóñez FcoJ, de Toledo P, Sanchis A. Activity Recognition Using Hybrid Generative/Discriminative Models on Home Environments Using Binary Sensors. Sensors. 2013 Apr 24;13(5):5460–77.
 24. Schooling CM, Lam TH, Li Z Bin, et al. Obesity, physical activity, and mortality in a prospective Chinese elderly cohort. Arch Intern Med. 2006 Jul 24;166(14):1498.