



# Research Evolution and Hotspots of Older Adult Media Use: A Visualized Analysis Using CiteSpace

**Shen Shuaizhi<sup>1\*</sup>, Ahlam Binti Abdul Aziz<sup>2,1,2</sup>** Faculty of Communication and Media Studies, University Technology MARA Shah Alam, Malaysia.<sup>1</sup>School of Media and Art Design, Guilin University of Aerospace Technology, China. \*Corresponding Author: [shenshuaizhi@gmail.com](mailto:shenshuaizhi@gmail.com)

Media use has a positive effect on improving the life satisfaction, wellbeing of the older adult and promoting their mental health. This study focuses on 3,126 pieces of research literature related to media use by older adults, which were retrieved from the SSCI database during 2010-2022. We use CiteSpace software to analyze the distribution of the main contributors, classic literature, and representative authors. Based on this analysis, the study further explores the evolution of research topics and hotspots. The results show that research on media use by the older adult is abundant, but lacking interdisciplinary and cross-disciplinary research. Classic literature has profound influence, and research objectives and significance are relatively consistent. Research topics and hotspots are concentrated, but they lag behind media practices development and application. Exploring interdisciplinary integration and cross-disciplinary research, innovative research ideas and methods, can ensure the vitality and innovation of research in the field of media use by the older adult.

**Keywords:** media use; internet; older adult; knowledge graph



## 1. Introduction

Population aging and technological innovation are the two global landmark changes of the 21st century, with the number and proportion of older people increasing faster than any other age group, driven by longer life spans and declining fertility rates (United Nations, 2020). Parallel to the aging process is digital development, and the role of digital technologies in various processes of information production, information distribution, fact-checking, and communication and interaction with users is deepening, rewriting the connotations of information dissemination and human communication, and reshaping the interaction between people, technology, and society (Chen, 2022). However, the presence of digital technology has not changed every aspect of every individual's life equally. The likelihood, frequency, and breadth of digital media use by older adults is consistently lower than that of the general population (Pew Research Center, 2017; König et al., 2018 ). The issue of digital media use among the older adult has also attracted widespread attention from researchers, and scholars have formed an awareness of the problem and academic concern from different perspectives, and have achieved more fruitful research results. Based on this, this study adopts a scientific knowledge graph approach to sort out and summarize the existing literature on digital media use among older adult, in an attempt to reveal the historical lineage, hotspots and developmental dynamics of digital media use among older adult, with a view to providing useful references for subsequent studies.

## 2. Methodology and Data

This study utilizes CiteSpace 6.2.R2 to perform a visualization analysis of the knowledge graph of research on older adults' media use in the Web of Science Social Sciences Citation Index (SSCI). CiteSpace information visualization analysis software is mainly based on co-citation analysis theory and Pathfinder network algorithm to quantify specific fields of literature (collections), explore the key path and knowledge turning points of the evolution of disciplinary fields, and form an analysis of potential driving mechanisms for disciplinary evolution and detection of the forefront of disciplinary development through a series of visual maps (Chen, Ibekwe-SanJuan & Hou, 2010).

In CiteSpace software, first of all, create a project and import literature in the Projects function and parameter area. Then, set the start and end year in the Time Slicing



function and parameter area, and divide the time into 1-year intervals. Next, select the title, abstract, author, keywords, and publication source in the Term Source area, and choose Burst Term as the term type for burst term detection. Regarding network types, node type selection, node threshold selection, network pruning, etc., choose and adjust them based on the actual situation of different maps, while the remaining parameters maintain their default values.

After the setup is complete, select the appropriate items under Node Types, such as Author, Institution, and Keyword, as the objects of analysis for the sample literature. By conducting cooperative network analysis, co-citation analysis, and clustering analysis on the objects of analysis, corresponding scientific knowledge maps are generated. In the CiteSpace visualization graph, nodes represent the objects of analysis, and the size of the nodes indicates the frequency of occurrence of the studied node types, with larger nodes indicating higher frequency of occurrence. The connections between nodes represent the relationships between the objects of analysis, with thicker lines indicating closer relationships.

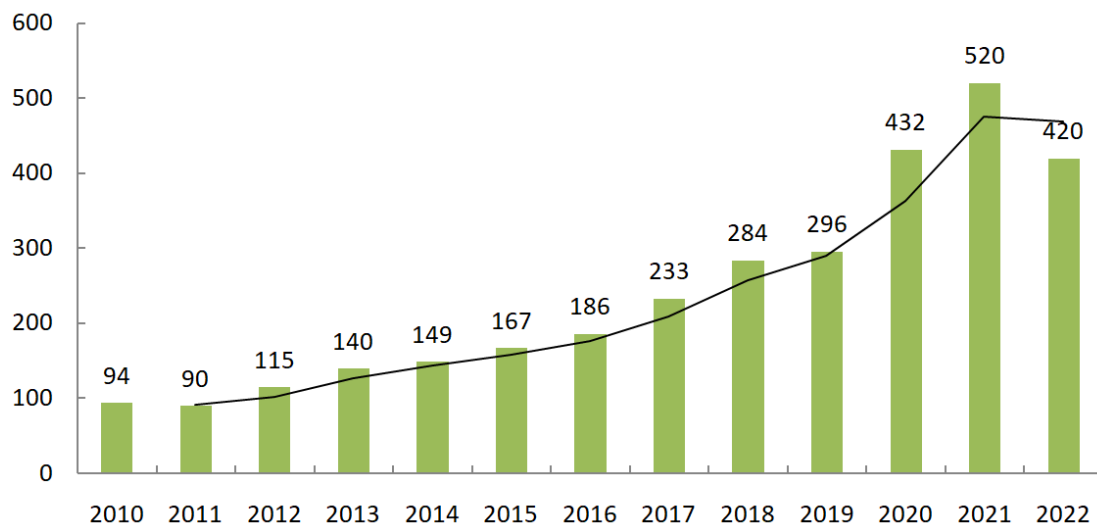
This study takes the Social Science Citation Index (SSCI) in the Web of Science as the data source. As one of the most authoritative citation indexing databases in the world, this search tool includes authoritative and influential academic journals in the field of social sciences in different countries and regions, and its literature coverage and traceable content span can meet the needs of this study.

The search content and search time frame are determined based on the history of digital media development. In a common sense people refer to digital media as any communication media in readable data format based on Web 2.0 mobile Internet technology, including text, audio, photos, video (e.g., streaming video services), software (e.g., mobile applications and video games), messaging and chat (e.g., email, instant messaging, video chat), websites and online services (e.g., social media, discussion boards, blogs) (Almeida, 2017). Therefore, for the search content selection, the topic =“Media Use”or “Internet Use”, and topic =“Older Adults” were used to set the subject search criteria. In the selection of publication time, according to the report of the International Telecommunication Union (ITU) in early 2010, the number of people accessing the Web through smart mobile devices has been increasing since 2010, and the search time range was determined to start from January 1, 2010, and end on December 31, 2022. The document type was restricted to “Article” and the language to “English”. Finally, 3126 bibliographic data were obtained.

### 3. Results and Discussion

#### 3.1 Yearly Outputs

From the annual distribution of the 3126 research papers on older adults' media use, the average annual number of articles published since 2012 exceeds 100. The overall trend increases year on year, as shown in Figure 1. One of the key turning points was 2020. Since the outbreak of COVID-19 in 2020, the population isolation effect of the epidemic has rapidly amplified the need for media involvement in people's lives. The use of digital media by older adults under the epidemic has attracted increasing attention and focus from the academic community. During the three years of the epidemic, 43.9% of the total number of studies on older adult media use were conducted in the past 12 years.



**Figure 1.** Yearly publication chart showing older adult media use research

#### 3.2 Analysis of Research institutions and distribution

##### 3.2.1 National and Institutional Collaborative Network Analysis

Collaborative network analysis describes the network of interpersonal relationships among researchers. Network nodes can be countries, regions, research institutions, and researchers, and if two entities have conducted research activities together, an edge can be constructed between the two nodes, and these nodes and edges constitute a network. Cooperative network has some basic characteristics, such as statistics of network behavior, complexity of node dynamic behavior, sparsity of network connections, complexity of connection structure, and complexity of network

space-time evolution (Wu, 2004).

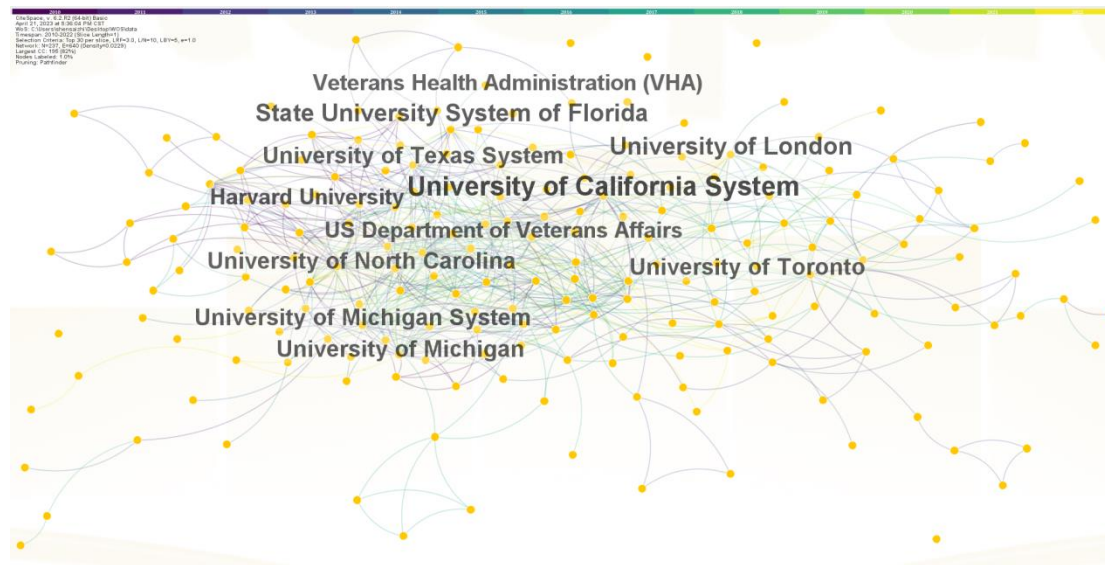
National collaborative network analysis is beneficial for rapidly understanding the contribution levels of different countries in a particular research topic, which countries are in central positions, whether there exist “center-periphery” relationships, and who is the main collaboration partner of a country, and institution collaborative network analysis could help researchers further understand the number of published papers of relevant institutions and their contributions in this field (Luukkonen et al., 1993; Guo et al., 2000). In the CiteSpace software, node types are set as “Country” and “Institution”, node data extraction standards are set as “Top30”, which selects the top 30 frequently appearing nodes in each time slice (per slice = 1 year), and the algorithm selected is “Pathfinder”. The results are shown in Figure 2 and Figure 3.



**Figure 2.** Analysis map of the national collaborative network for older adult media use research

In the analysis map of the national collaborative network for older adult media use research, the network is shown as follows: N=78, E=303, indicating a total of 78 nodes and 303 links. Among them, the United States, China, and the United Kingdom occupy significant node positions. They are the countries with the highest frequency of publications in the field of media use among older adults from 2010 to 2022. The others are Australia, Canada, the Netherlands, Germany, Spain, South Korea, Sweden, and Taiwan. The connections between these countries' nodes are extremely close, as

shown in Figure 2. This indicates that the United States, China, and the United Kingdom have made significant contributions and exerted considerable influence in the field of media use research among older adults. There is a close collaboration among these countries.



**Figure 3.** Analysis map of the institutional collaborative network for older adult media use research

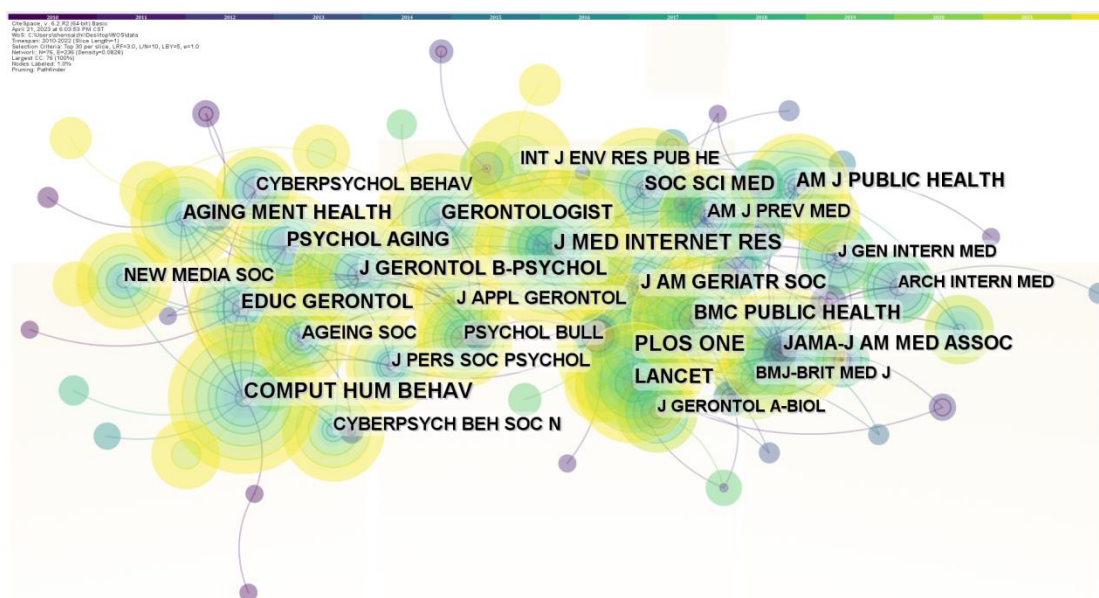
From the results of network analysis in collaboration with research institutions on the older adult media use research, it can be seen that Network:  $N=237$ ,  $E=640$ , indicating a total of 237 nodes and 640 connections. The University of California occupies the central position of each node, and its number of publications ranks first among all research institutions, followed by the University of London, State University System of Florida, University of Michigan, the University of Toronto, University of Texas, University of North Carolina, Harvard University, US Department of Veterans Affairs, and the Veterans Health Administration. The connections between various research institutions are relatively close, indicating that there is a certain level of cooperation among them.

### 3.2.2 Journal Co-Citation Analysis

The co-citation analysis of journals is a method of exploring the relationships between journals by examining their external perceptions. Journals are used as a unit of measurement for co-citation analysis, and the interdependence and cross-relationships between journals are analyzed based on the frequency with which the literature of two



academic journals is cited by other academic journals at the same time. Co-citation analysis can reflect the specific distribution of important sources of knowledge in a field, and help researchers easily and efficiently determine the relationships between high-frequency cited journals and the disciplinary fields to which they belong in that field (Zhao, 2009). In CiteSpace software, the node type is set as “Cited Journal”, the node data extraction standard is “Top30”, and the algorithm selected is “Pathfinder”. The results of the co-citation analysis of journals on the topic of older adult media use are shown in Figure 4. Network: N=76, E=236, indicating a total of 76 nodes and 236 edges.

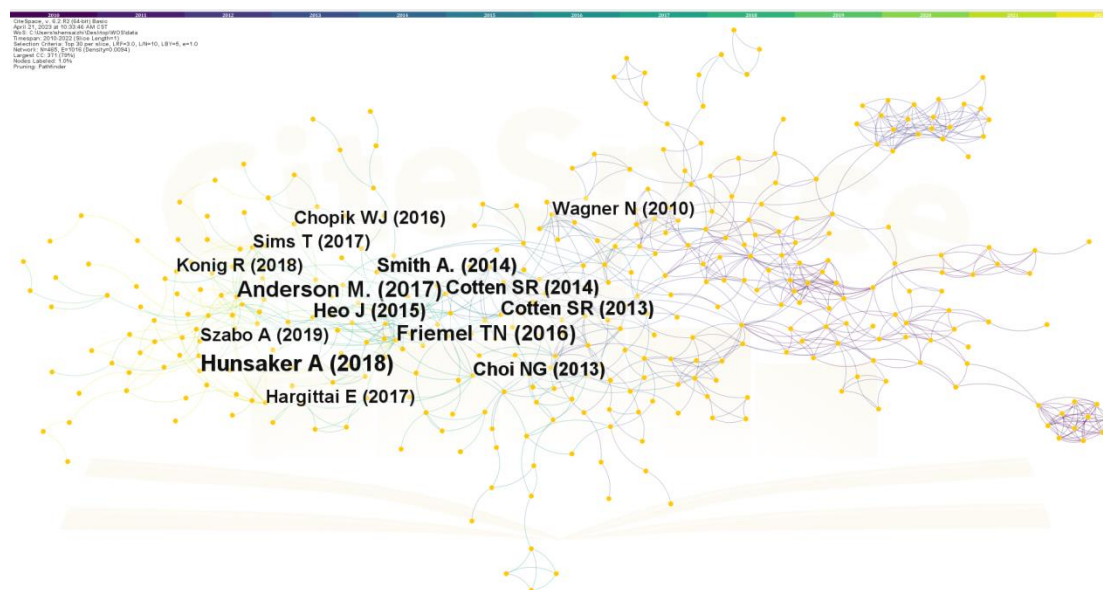


**Figure 4.** Analysis map of the journal co-citation for older adult media use research

According to the analysis of journal co-citation for older adult media use research, the top 10 core journals are ranked in descending order based on co-citation frequency. They are as follows: Journal of Medical Internet Research (J MED INTERNET RES), Computers in Human Behavior (COMPUT HUM BEHAV), Public Library of Science, One (PLOS ONE), Gerontologist, Journal of Gerontology Series B-Psychological Sciences and Social Sciences (J GERONTOL B-PSYCHOL), Jama-Journal of the American Medical Association (JAMA-J AM MED ASSOC), Social Science & Medicine (SOC SCI MED), Journal of the American Geriatrics Society (J AM GERIATR SOC), Lancet and BMC Public Health. From the top 10 ranking journals, it can be seen that research on older adult media usage mainly focuses on the two disciplines of geriatrics and medicine.

### 3.3 Analysis of Classical Literature and Authors

In CiteSpace, literatures with high co-citation frequencies are often referred to as classic literature, occupying significant node positions and acting as key connecting hubs in knowledge graphs. They play a significant role in building the knowledge base and promoting disciplinary development, generating profound impacts (She et al., 2022). Co-citation frequency refers to two documents that appear together in the reference list of a third cited document, forming a co-citation relationship. The co-citation relationship of literature reflects the close association between research directions or research themes, the higher the frequency of co-citation between two documents, the stronger the correlation between their academic research directions (White & Griffith, 1981). In CiteSpace software, the node type is set to "Reference", and the Top N threshold is set to 30, with the algorithm selected as "Pathfinder". The results are shown in Figure 5, with Network: N=465, E=1016, indicating a total of 465 nodes and 1016 connections.



**Figure 5.** Analysis map of the literature co-citation for older adult media use research

Co-citation frequency is a widely used important indicator to measure the social display and academic influence of academic literature. Based on the co-citation map of literature usage among older adults, the detailed information of the top 10 co-cited articles is organized, as shown in Table 1. Research generally believes that media usage plays a positive role in reducing depression, alleviating loneliness, obtaining social support, improving life satisfaction, happiness, and mental health among older





adults (Cotton, 2013, 2014; Heo, 2015; Szabo, 2019).

**Table 1.** Top 10 literature co-citation frequency in older adult media use research

<b>Co-citation Frequency</b>	<b>Author (Year)</b>	<b>Title</b>	<b>Published Journal</b>
74	Hunsaker A (2018)	A review of Internet use among older adults	New Media & Society (NEW MEDIA SOC)
67	Anderson M. (2017)	Technology adoption climbs among Older adults	Pew Research Center (PEW RESEARCH CENTER)
58	Friemel TN (2016)	The digital divide has grown old: Determinants of a digital divide among seniors	New Media & Society (NEW MEDIA SOC)
46	Smith A. (2014)	Older adults and technology	Pew Research Center (PEW RESEARCH CENTER)
39	Cotton SR (2014)	Internet use and depression among retired older adults in the United States: A longitudinal analysis	Journals Of Gerontology Series B-psychological Sciences And Social Sciences (J GERONTOL B-PSYCHOL)
38	Cotton SR (2013)	Impact of internet use on loneliness and contact with others among older adults: cross-sectional analysis	Journal Of Medical Internet Research (J MED INTERNET RES)
37	Heo J (2015)	Internet use and well-being in older adults	Cyberpsychology Behavior and Social Networking (CYBERPSYCH BEH SOC N)
33	Szabo A (2019)	Longitudinal analysis of the relationship between purposes of internet use and well-being among older adults	Gerontologist (GERONTOLOGIST)



32	Wagner N (2010)	Computer use by older adults: A multi-disciplinary review	Computers in Human Behavior (COMPUT HUM BEHAV)
32	Konig R (2018)	Internet use among older Europeans: an analysis based on SHARE data	Universal Access in the Information Society (UNIVERSAL ACCESS INF)

Hunsaker & Hargittai (2018) reviewed the quantitative literature on internet usage among older adults. They explored social inequalities in areas such as internet access, skills, and usage types. In addition, they explored the impact of internet usage on older adult health. The study, titled “A review of Internet use among older adults”, was published in the journal *New Media & Society*. It has become the most frequently cited literature in older adult media use research, with a co-citation frequency of 74. It has been cited in various fields, including Gerontology, Geriatrics, Behavioral Sciences, and Healthcare Services.

Anderson & Perrin (2017) research found that many older adults still stay away from digital life. However, among those aged 65 and above, nearly two-thirds of them use the internet, and the proportion of those who own smart phones has reached a record high. The research, titled “Technology adoption climbs among older adults”, was published by the Pew Research Center on the policy-commons website in the United States. It has been widely cited, with a co-citation frequency of 67.

Friemel (2016) conducted a survey on older adults aged 65 and above in Switzerland, and found a significant digital divide among them. Controlling for education, income, technological interests, pre-retirement computer use, and marital status, gender differences in internet use disappear. At the same time, social background has a multifaceted impact on internet use. Encouragement from family and friends is more effective in helping older adults use the internet than professional training courses. This study, titled “The digital divide has grown old: determinants of a digital divide among seniors”, was published in *New Media & Society*. It has been widely cited in various fields, including Computer Science, Behavioral Science, Healthcare Science, and Psychology, with a co-citation frequency of 58.

Smith (2014) investigated technology usage among Americans aged 65 and older and other demographic groups, through a large survey. The survey found that older



Americans were latecomers to the world of technology, but their pace of entry into digital life was increasing. This study, titled “Older adults and technology use”, was published by the Pew Research Center on the policy-commons website in the United States, and it has been widely cited by researchers, with a co-citation frequency of 46.

Cotton et al.'s (2014) research showed that internet use positively contributes to the mental health of older adult retirees in the United States. According to their study, internet use reduces depression risk among older Americans by one-third. The article, titled "Internet use and depression among retired older adults in the United States: a longitudinal analysis", was published in the Journal of Gerontology Series B: Psychological Sciences and Social Sciences. It has been widely cited in Gerontology, Geriatrics, Behavioral Science, Psychology and other fields, with a co-citation frequency of 39.

Cotton, Anderson & McCullough (2013) highlighted that internet use reduces loneliness among older adults, increasing their social contacts, and promoting assisted and independent living. Controlling for the number of friends and family members, social limitations in terms of physical/emotional factors, and age, for each one-point increase in internet usage frequency among older adults, their loneliness decreases by 0.147 points. With each additional point of internet usage frequency, older adults' identification with internet use increases. Internet use helps the older adult maintain their ability to connect with others. This makes it easier for them to make new friends and increases both the quantity and quality of their interactions with others. The research, titled “Impact of internet use on loneliness and contact with others among older adults: cross-sectional analysis”, was published in the Journal of Medical Internet Research. It was widely cited in Gerontology, Geriatrics, Psychology, Behavioral Science, Health Care Science Services, Computer Science and other fields, with a co-citation frequency of 38.

Heo et al (2015) used data from the Health and Retirement Study in the United States. They explored the relationship between internet use, social support, loneliness, life satisfaction, and psychological well-being. The study found that higher levels of internet use were significant predictors of higher levels of social support. This was due to reduced loneliness, and increased life satisfaction and psychological health. The study, titled “Internet use and well-being in older adults”, was published in Cyberpsychology, Behavior, and Social Networking. It was widely cited in fields such as Psychology, Behavioral Science, Gerontology, Geriatrics, and Computer Science,



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with a co-citation frequency of 37.

Szabo et al (2019) found through a survey of 1,165 aging people aged 60-77 that the older adults mainly use the internet for three purposes: socializing (keeping in touch with friends/family), using tools (banking), and obtaining information (reading health-related information). Among them, social use indirectly affects happiness by reducing loneliness and increasing social participation; informational and instrumental use allows the older adult to participate in a wider range of activities, indirectly influencing happiness. The research, titled “Longitudinal analysis of the relationship between the purposes of internet use and well-being among older adults”, was published in *The Gerontologist*. It was widely cited in *Gerontology*, *Geriatrics*, *Psychology*, *Behavioral Science* and other fields, with a co-citation frequency of 33.

Wagner, Hassanein & Head (2010) conducted a comprehensive analysis of interdisciplinary research on older adults' computer and internet use, from the perspective of social cognitive theory. They explained that there is a mutually beneficial relationship between older adults, computer use, and computer systems, forming a trinity. The study, titled “Computer use by older adults: A multi-disciplinary review”, was published in *Computers in Human Behavior*. It was widely cited in the fields of *Computer Science*, *Psychology*, *Behavior*, and other disciplines, with a co-citation frequency of 32.

König, Seifert & Doh (2018) indicated there are significant differences in internet use by older adults in European countries. In addition to age, gender, and social class, there is a positive correlation between computer experience during working years and internet use among older adults. The economic level and network infrastructure of the place of residence also contribute to promoting internet use by older adults in Europe. This research, titled “Internet use among older Europeans: an analysis based on SHARE data”, was published in *Universal Access in the Information Society*. It was widely cited in *Gerontology*, *Geriatrics*, *Health Care Science Services*, *Behavioral Science* and other fields, with a co-citation frequency of 32.

### **3.4 Evolution of Research Topics and Hotspots**

Keywords are a crucial component of research output literature and related materials, which clearly describe the main research object, research question, method used, and research conclusions of scientific research (Chen, 2014). By conducting

co-occurrence analysis on high-frequency keywords in literature in a certain field, it is possible to analyze the research hotspots and development directions of the discipline (Qiu & Wen, 2011). By selecting keyword nodes and constructing a keyword co-occurrence network, and then conducting keyword clustering analysis and keyword time zone analysis, it is possible to reveal the research hotspots of the field and the newly emerging hotspots evolving over time.

### 3.4.1 Keyword Co-Occurrence Analysis

Co-occurrence analysis can reveal the proximity of these keywords and enable researchers to determine the relationships between different studies in a discipline, as well as uncover research topics and hotspots within that field (Zhang & Xu, 2010). The more frequently two keywords appear together in the same field, the stronger the correlation between these two keywords. This indicates that they represent closely related or highly correlated research fields (Zhang & Wang, 2018).

Keyword co-occurrence analysis was performed on all literature using CiteSpace software, with the node type set to “Keyword”, a Top N threshold of 30, and the Pathfinder algorithm. CiteSpace can calculate the citation frequency and centrality of hot keywords using certain algorithms. Centrality measures the importance of a node in a network, and keywords with high centrality are usually hubs that connect different fields. The larger the centrality of a node, the more keywords it has, indicating that the node is more significant and influential in research (Li & Chen, 2017). According to the results of high-frequency keyword co-occurrence analysis in the study of older adult media use, the top 20 core keywords are shown in Table 2, sorted by centrality.

**Table 2.** Top 20 core keywords of centrality in older adult media use research

Serial Number	Keyword	Frequency	Centrality	Serial Number	Keyword	Frequency	Centrality
1	internet use	275	0.25	11	risk	188	0.09
2	information	195	0.22	12	physical activity	185	0.09
3	older adults	980	0.18	13	behavior	76	0.09



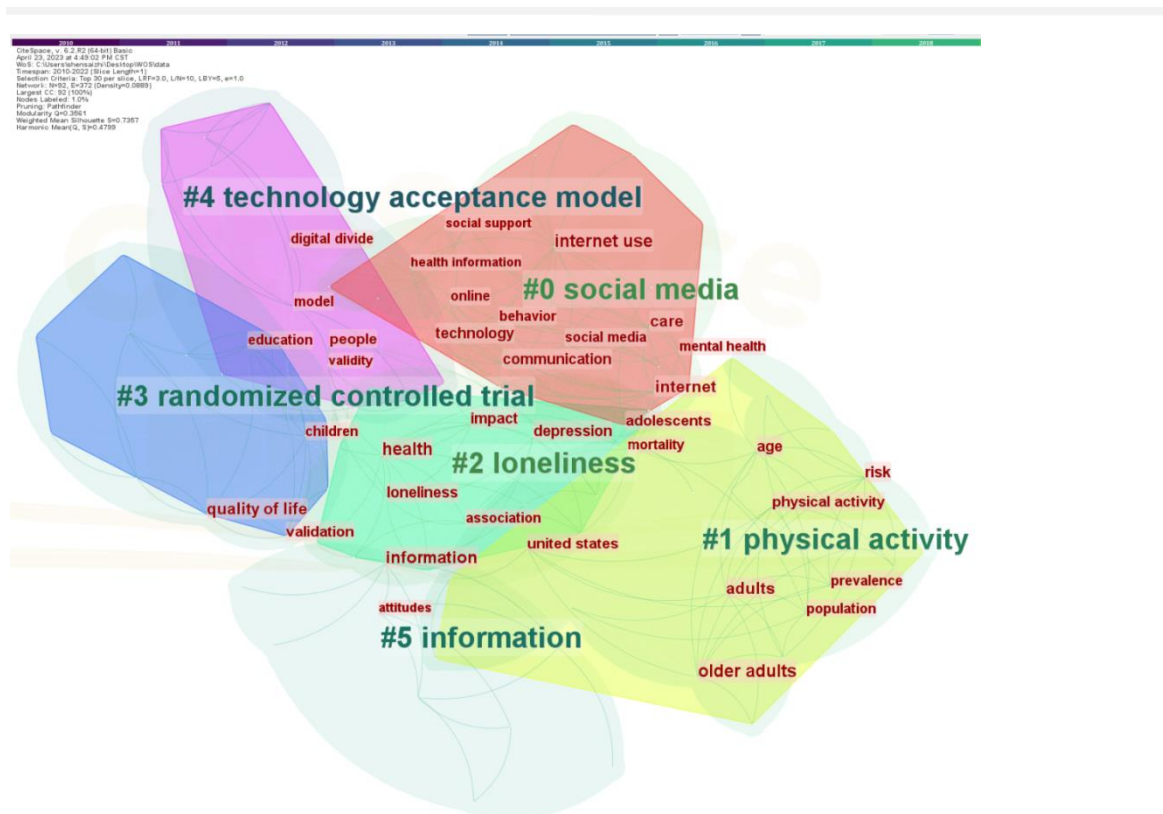
4	health	440	0.16	14	depression	184	0.08
5	care	152	0.13	15	quality of life	130	0.07
6	internet	294	0.12	16	adolescents	98	0.07
7	age	157	0.12	17	technology	220	0.06
8	united states	78	0.11	18	impact	194	0.06
9	adults	330	0.1	19	communication	115	0.06
10	model	40	0.1	20	anxiety	45	0.06

From the table 2, it can be seen that internet use is a core node in research on media use among older adults. It has a centrality of 0.25 and a frequency of 275, indicating that internet use is one of the most significant research topics. In addition, information, older adults, health, and care are also critical central nodes. The impact of media use on information literacy, physical and psychological health, and older adults' health care has become a focus of research on media use among older adults. At the same time, nodes such as risk, physical activity, behavior, impact, depression, anxiety, quality of life, and communication have a significant influence on research on media use among older adults, which to some extent reflects the diversified trend of research on media use among older adults.

### 3.4.2 Keyword Cluster Analysis

Cluster analysis is a group analysis method that divides multiple variables into different categories and groups based on the correlation and distance between variables. The closer the distance, the higher the similarity between variables or samples, and these variables are more likely to be grouped into small clusters (Zhang & Wang, 2018). Keyword cluster analysis can summarize the groups to which various core keywords belong and explore common research themes in the literature. Based on the co-occurrence analysis results of sample journal keywords, further cluster analysis was conducted in CiteSpace. Figure 6 shows the keyword cluster analysis of older adult media use research results.





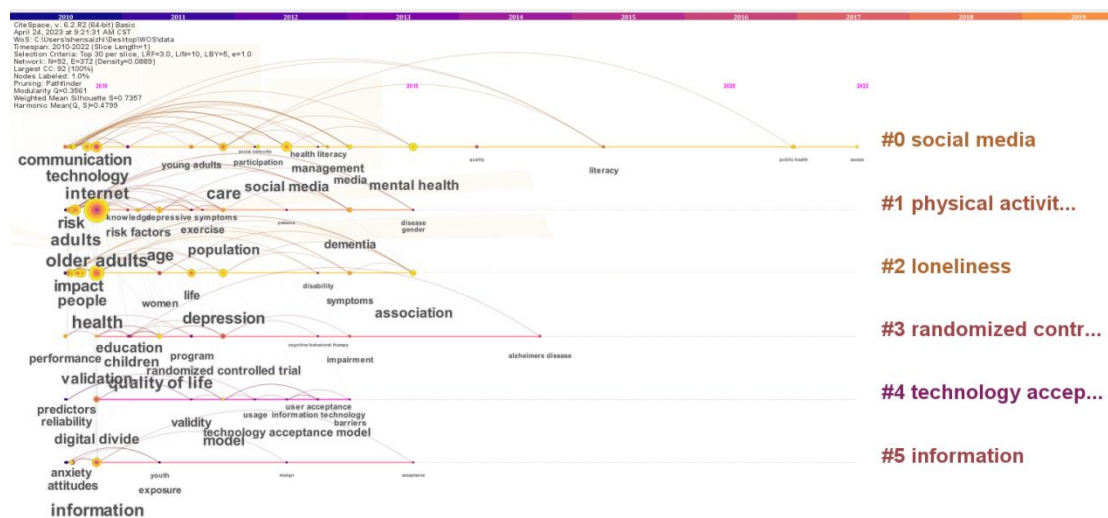
**Figure 6.** Analysis map of the keyword cluster for older adult media use research

Based on the analysis map of the keyword cluster for older adult media use research, it was determined that the cluster has  $N=92$  nodes and  $E=372$  edges, indicating that there are 92 keywords and 372 connections between them. The network density is 0.0889, and the Modularity  $Q = 0.3561$ . If the Modularity  $Q > 0.3$ , then the clustering structure identified is significant. The Silhouette value, which measures the network homogeneity, is 0.7357. A Silhouette  $> 0.7$  indicates high confidence in the clustering results (Chen et al., 2015). The clusters are numbered from “#0” to “#5”, with lower numbers indicating larger clusters. The cluster labels are derived from the citation keywords using the LLR algorithm in the CiteSpace software. The highest weighted label represents the main research topic of the cluster (Chen et al., 2015). The keyword clustering map reveals six relatively independent research themes: #0 is social media, #1 is physical activity, #2 is loneliness, #3 is randomized controlled trials, #4 is technology acceptance model, and #5 is information.

### 3.4.3 Evolutionary Analysis of Keywords

The timeline co-occurrence graph in CiteSpace software helps researchers to better

understand the research process of a particular topic, including research trends, keyword evolution, changes in hot issues, etc. (Li & Chen, 2017). It is conducive to sorting out the inherent inheritance relationship of related achievements under different historical backgrounds. Based on keyword cluster analysis, keyword time zone analysis is carried out, and the historical evolution of research topics and hotspots on older adult media usage is presented through timeline co-occurrence graph, as shown in Figure 7.



**Figure 7.** Analysis map of the timeline co-occurrence for older adult media use research

The timeline co-occurrence graph of cluster analysis reflects the keywords included in the cluster labels and the time span. The higher the co-occurrence frequency of keywords included in each cluster, the larger the font size of the keywords, and they are arranged from left to right according to the time of appearance. In the timeline co-occurrence graph of older adult media usage research, based on the time span of keywords and the thickness of the horizontal line, it can be seen that social media has always been a hot topic of concern. There are 24 core keywords in the research topic of social media, among which keywords such as “internet”, “care”, “communication”, “technology”, “social support”, “mental health”, and “health information” have a higher frequency of occurrence. From 2010 to 2022, relevant research focused on the impact of social media use on older adult health care. This included interpersonal communication, social support, mental health, and health information acquisition and use.



In the research theme of physical activity, there are 20 core keywords. These keywords include “older adults”, “risk/risk factors”, “exercise”, “depressive symptoms”, and “disease” which have a relatively high frequency of occurrence. Relevant studies mainly focused on the period of 2010-2015, in which researchers focused on the risks/risk factors associated with media use by older adults, the relationship between media use and physical activity in older adults, and the frequency of occurrence of the core keywords was high. The next focus was on the relationship between media use and older adults' exercise, depressive symptoms, and physical diseases. In addition, the occurrence of core keywords such as knowledge and gender also revealed further differentiation of aging individual attributes in media research, with related studies focusing on the use and impact of media on different attribute characteristics of older adults.

There are 14 core keywords in the research theme on loneliness. Among these core keywords, “health”, “depression”, “association”, and “impact” appear most frequently. Furthermore, these studies were concentrated between 2010-2015, with a focus on the effects of older adult individuals' media usage on their health status, depression, and interpersonal relationships.

In the theme of randomized controlled trials, there are 11 core keywords. Among these, “quality of life”, “education”, “validation”, “program”, and other keywords have a relatively high frequency of appearance. The related research focuses on 2010 to 2017. From the content of the research topics and core keywords, it is easy to see that this stage emphasizes the use of experimental methods to study the media usage behavior and effects of older adult, which has become a typical characteristic of related research at this stage.

In the theme of technology acceptance models, there are 10 core keywords. Of these, “digital divide” is the most critical core keyword with a frequency of 94, ranking first among all keywords. Others include “technology acceptance model”, “user acceptance”, “information technology”, and “self-efficacy”. Related research focused on 2010 to 2014. In this research theme, many studies analyzed older adult media use and reliance on technology acceptance and usage theories. Rich research results on the older adult digital divide, technology acceptance and usage barriers, older adult self-efficacy and technology acceptance have been obtained, thereby forming a research hotspot with the technology acceptance model as the theme.



In the theme of information research, there are nine core keywords, including “information”, “attitudes”, “anxiety”, “perceptions”, “exposure”, “acceptance”, etc. Relevant research mainly focused on 2010 to 2015, exploring the impact of information exposure, information acceptance, and information attitudes on the psychological activities of older adults, such as perception, attitude, and anxiety, forming a research hotspot on the theme of information during that period.

#### **4. Conclusion and Limitations**

##### **4.1 Conclusions**

This study utilizes CiteSpace software to analyze and present 3126 literatures on media use by older adults in the SSCI database between 2010 and 2022. The study systematically examines the number and trend of publications on media use by older adults in the SSCI database. It also examines the network of international and institutional collaborations, the distribution of journals, classic literature and its representative authors, research themes and hotspots evolution, and other aspects. Based on the analysis, the following research conclusions are summarized.

First, the research on the older adult media use has yielded fruitful results, but there is a lack of interdisciplinary integration and cross-disciplinary research. From the perspective of the number and trend of publications, the research results in this field have shown a trend of increasing year by year over the past 12 years, especially since 2020. Research on older adult media use has grown rapidly. The number of publications from 2020 to 2022 accounts for 43.9% of the total publications over the past 12 years. The United States, China, and the United Kingdom are significant sources of research results in this field. There is relatively close cooperation between countries and institutions. However, existing research results are mainly distributed in the two academic fields of gerontology and geriatric medicine, and cross-disciplinary research is not significant.

With the development of media technology, media plays an increasingly critical role in people's daily lives. Media is no longer just a tool for achieving specific functions such as information and entertainment, but evolves into a complete experiential environment and becomes a part of daily life and rituals (Bandura, 1999). It is necessary to advocate and explore interdisciplinary integration and cross-disciplinary research, expand diversified research perspectives, innovate research ideas and



methods, and promote the development and in-depth research into media use by older adults.

Second, Classic literature has a profound impact, but the research objectives and significance of classic literature are generally common. The top 10 classic literatures have all been co-cited more than 30 times, and these researches have been widely referenced in psychology, behavioral science, gerontology, geriatrics, computer science, and healthcare science services. This to some extent reflects the significant influence of research on older adult media use. At the same time, the top 10 classic literature articles focus on the impact of older adult media use on loneliness, depression, happiness, and the digital divide. These articles include two literature reviews and two survey articles from the Pew Research Center in the United States. The research objectives and significance are generally common. The high degree of commonality of research results has led to more in-depth research in this field, which improves its academic reputation and influence. However, the high degree of commonality of research results may also lead to the homogenization of research patterns. This may result in a lack of breadth and novelty in research findings.

Third, research themes and hot topics are concentrated, but relatively lag behind media practices development and application. From the perspective of the evolution of research topics and hotspots on older adult media use, social media, physical activity, loneliness, randomized controlled trials, technology acceptance models, and information are the six research topics and related hotspots that emerged in 2010. The concentration of research hotspots and topics effectively promoted the forward development of research on media use by older adults. It also facilitates communication and cooperation among research institutions. While the relationship between the media and people's daily lives has become increasingly close, the acceptance and usage rates of the media among older adults have continued to rise. However, during this period, there has been no new progress or breakthroughs in research topics and hotspots. Related research lags behind media practice development and application. This has limited the development of this research field. Therefore, it is necessary to continuously explore new research directions and ideas to ensure the vitality and innovation of the research field.



## **4.2 Limitations**

This study focuses on the development status of older adult media use research during 2010 to 2022. However, due to the rapidly changing media technology landscape, older adult media use is a dynamic process. It cannot predict research development direction based solely on past data. At the same time, there was no detailed analysis and classification of the six research themes of social media, physical activity, loneliness, randomized controlled trials, technology acceptance model, and information. In future research, it is hoped that a more in-depth exploration of these topics can be conducted.

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