Twenty Years of Digital Media Use Research on China's Silver Hair Group (2005-2024) : A CiteSpace-based Knowledge Graph Analysis

Zhaoyu lu[1]

1 Faculty of Letters and Journalism and Communication, Chengdu University

Chengdu, Si Chuan, China, 610106

Abstract: China's population over 60 years old has accounted for 21.1% of the total population, and the topic of digital media use among the silver-haired group has witnessed unprecedented academic discussions, which makes it more and more necessary to comprehensively sort out the academic lineage of this topic. Using 2,293 articles in the China Knowledge Network database from 2005 to 2024 as the data source, and based on CiteSpace software, this study draws a knowledge map in terms of publication trend, keyword co-occurrence, keyword clustering, and the evolution of the research lineage, and finds that over the past two decades, research on the use of digital media by the silver-haired group in China has mainly focused on the barriers to digital integration and social adaptation, the smart elderly service system and social adaptation, and the digital media use of the silver-haired group. It is found that over the past two decades, research on the digital media use of the silver-haired population in China has mainly focused on the digital integration barriers and social adaptation of the silver-haired population, the smart elderly service system and the silver-haired economy, and health communication. This study suggests that in the future, research on the digital media use of the silver-haired population may need to focus on deepening the two-way mutual support mechanism between the new quality of productivity and the silver-haired economy, constructing a localised explanatory framework, and strengthening the practical orientation of technological ethics and ageing-friendly design.

Keywords: silver-haired group;ndigital media use; CiteSpace; knowledge mapping; bibliometrics

DOI：10.63887/jse.2025.1.2.14

1.Introduction

With the positive response to population aging rising as a national strategy, the issue of digital media use among the silver-haired group has become a focus of increasing attention in the academic community. Digital media provide new paths for information acquisition, social interaction and public participation for the silver-haired group, but the superposition of digital transition and demographic transition also puts the silver-haired group at risk of digital exclusion, making it difficult for them to fully integrate into the digital society and realise digital survival. China attaches great importance to the use of digital media by the silver-haired group. The 14th Five-Year Plan for the Development of the National Elderly

Programme and Elderly Service System explicitly proposes the implementation of the Wisdom Help for the Elderly Action, which emphasises the enhancement of digital literacy of the silver-haired group and helps them cross the digital divide. The policy orientation provides an anchor point for academic research. A group of researchers has carried out a large number of studies on the use of digital media by the silver-haired group, making an important contribution to enriching and enriching academic research on journalism and communication and promoting the development of the cause of the elderly.

Generally speaking, there is still no research result that grasps and analyses the topic of digital media usage of the silver-haired group in China as a whole. Journalism and communication is a study of the times and a study of practice. It is of great significance to track the progress of research on the digital media use of the silver-haired group and systematically analyse its research dynamics: firstly, it helps to grasp the current situation, hotspots, and changes in the issues of China's silver-haired group's digital media use research, so as to broaden the research horizons and enrich the research results; secondly, it helps to explore and solve the practical problems in the process of population aging, to promote the high-quality development of the silver-haired cause and industry, and to advance the Chinese-style modernization. Facing the new demographic environment and conditions, the research progress made and the existing practical problems in the current results should be clearly grasped. Based on this, this paper follows the bibliometric approach, taking 2,293 documents from China Knowledge Network (CNKI) from 2005 to 2024 as samples, and using CiteSpace scientific bibliometric tools to systematically map the knowledge of the research on the use of digital media by China's silver-haired population, with the aim of revealing the hotspots and evolution direction of the research in this field, and providing knowledge increment for the subsequent theoretical exploration and practical innovation. The aim is to reveal the research hotspots and evolutionary direction of this field, and provide knowledge increment for subsequent theoretical exploration and practical innovation.

2.Research Methodology and Data Sources

2.1 Data Sources

In order to ensure the accuracy and completeness of the literature, the data in this paper were obtained from the China Knowledge Network (CNN) Data Base, and the search conditions were set as follows: (Topic = silver-haired group + elderly people + elderly group + silver-haired people + elderly population) and (Topic = digital media + new media + social media + smart media + Internet) and (Topic = use + application + application + contact), and 2,325 pieces of literature were initially retrieved. By screening and ranking the retrieved literature and manually eliminating duplicates as well as literature unrelated to the research topic, 2,293 pieces of literature were finally used as the data source for bibliometric analyses conducted in this paper, with a time coverage of January 2005 to December 2024.

2.2 Research Methods

In this study, 2,293 retrieved documents were imported into CiteSpace to map the

knowledge of digital media usage of China's silver-haired population. We analyse the output trend and development characteristics of research results in this field through the annual publication trend, identify the core themes and their logical links using keyword co-occurrence and keyword clustering, and combine keyword time-zone mapping and keyword emergence mapping to understand the thematic evolution trend in this field, so as to map the academic landscape of China's silver-haired community's use of digital media, and to discuss the thematic characteristics of this field and its possible future direction of development. We will also map the academic map of digital media use by the silver-haired group in China, and explore the thematic characteristics and possible directions of future development in this field.

3.Analysis of annual publication trends

The trend in the number of articles can intuitively reflect the overall development of the research field. As shown in Figure 1, between 2005 and 2015, the annual average number of publications was only in the single digit, with a slow overall increase, implying that the topic gradually appeared in the field of vision of researchers. 2016 to 2023, the relevant research results ushered in a high growth rate, with a significant increase in the annual number of publications, a total of 1,890, accounting for more than 82% of the total number of literature, which is 18 times more than that of the previous period, indicating that domestic scholars hold a high research enthusiasm for digital media use of silver-haired people in China. In 2024, the number of articles will fall from the peak, but still maintain a high level, indicating that the academic community continues to pay attention to this topic.

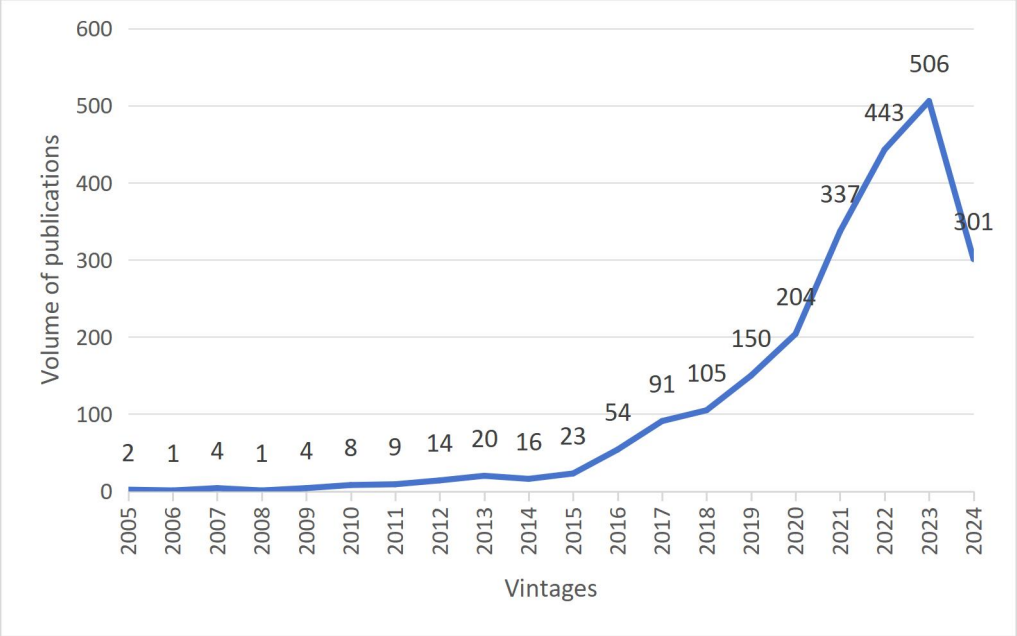

Figure 1. Annual trend of articles published in the study of digital media use by China's silver-haired group

4.Analysis of research hotspots

4.1 Keyword co-occurrence analysis

Keywords are highly condensed by researchers, and their distribution characteristics can effectively identify the research focus and knowledge evolution trend in the field. In this study, keyword co-occurrence analysis was carried out on 2293 articles based on CiteSpace tool, and

the co-occurrence map was drawn (Fig. 2), and the keywords with the top 20 word frequencies were extracted to construct the research hotspot characterisation matrix (Table 1).

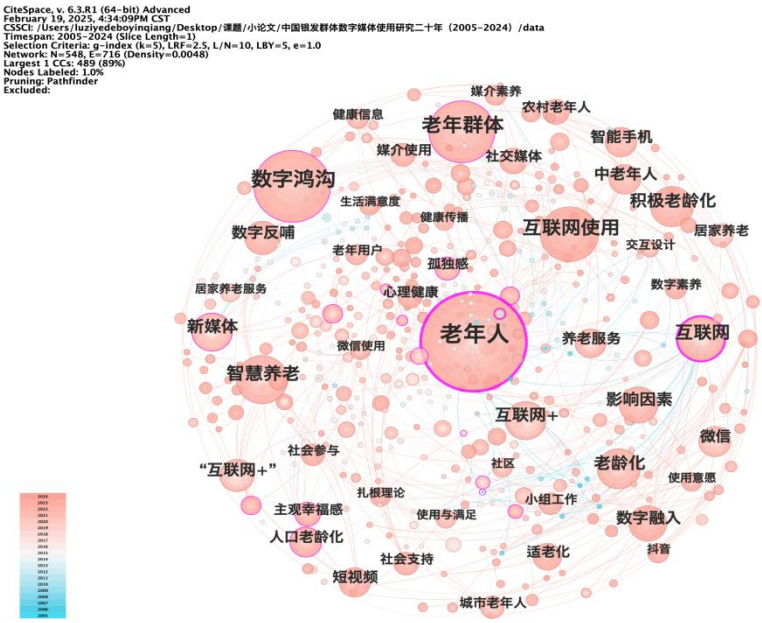

Figure 2. Co-occurrence mapping of keywords in the study of Chinese silver-haired people's digital media usage

Table 1. Research hotspot characterisation matrix of digital media use among China's silver-haired group (top 20 in terms of word frequency)

No.	Frequency	Keyword	Betweenness	No.	Frequency	Keyword	Betweenness
1	489	Older people	0.74	11	72	Influencing factors	0.09
2	259	Digital Divide	0.19	12	63	Digital integration	0
3	202	Older Adults	0.13	13	61	‘Internet Plus’	0.05
4	161	Internet Use	0.03	14	58	Digital Feedback	0.01
5	120	Smart Elderly	0.05	15	56	Middle-aged and elderly people	0.09
6	111	Internet	0.43	16	54	WeChat	0.05
7	87	Ageing	0.09	17	50	Smartphone	0.04
8	86	Active Ageing	0.04	18	45	Short Video	0.03
9	80	New Media	0.18	19	44	Elderly Services	0.05
10	77	Internet+	0.04	20	44	Population Ageing	0.11

In keyword co-occurrence analysis, word frequency and mediocentricity are two important parameters. The higher the word frequency of keywords, the richer the related research results. As shown in Figure 2 and Table 1, the five keywords with the highest frequency are ‘the elderly (489 times),’ ‘digital divide (259 times),’ ’ Elderly (202 times),’ “Internet use (161 times),” and “Smart Aging (121 times),” which are the core nodes in the study of digital media use among China's silver-haired population. Betweenness is another key indicator for analysing the importance of keywords. A mediator betweenness of a node greater than 0.1 is usually considered highly important for that mediator node. In Table 1, the keywords with a betweenness greater than 0.1 include ‘older people’, ‘digital divide’, ‘older groups’, ‘Internet’, ‘new media’, ‘digital divide’ and ‘new media’. ’, ‘new media’ and ‘population ageing’, indicating that the above keywords have a pivotal position in the research network. Generally speaking, the higher the word frequency, the more research hotspots are

highlighted, and the centrality level is not too low. However, there are cases where the keywords have high centrality but low word frequency, for example, the keyword 'population aging', which is ranked 20th in the word frequency ranking, has a centrality of 0.1 and a word frequency of only 44 times. In contrast, the keyword 'Internet use' in the 4th place has 161 occurrences, but its centrality is only 0.03. Therefore, the relationship between word frequency and centrality is not positive.

Keyword co-occurrence analysis can visually present the core content of the research area and the frequency of occurrence. The colour of the relationship line of the graph transitions from blue to pink as time progresses, and the node size characterizes the frequency of keywords. In the graph, the number of nodes N=548, the line E=716, 'elderly', 'digital divide', 'elderly groups', 'Internet use', 'smart aging', 'digital divide', 'digital divide', 'elderly people', 'smart aging', and so on. Keywords with large nodes such as 'elderly', 'digital divide', 'elderly groups', 'Internet use', 'smart elderly', etc., indicating that these keywords appear more frequently in 2293 documents, and that the academic community pays closer attention to the related topics. Although some of the nodes are in the fringe of lower attention, such as 'population aging', 'elderly care service', 'short video', etc., they still have different degrees of co-occurrence with the main nodes in the map. However, they still have different degrees of co-occurrence with the main nodes in the map, which is still of great significance for promoting the study of digital media usage of the silver-haired group. In addition, there are only a few blue nodes and more pink nodes, indicating that the topic of digital media use by the silver-haired group has been discussed more in recent years.

4.2 Keyword clustering analysis

Based on keyword co-occurrence analysis for clustering, this study generates a keyword clustering map for digital media use research in the silver-haired group (Figure 3). Co-occurrence analysis explores the strength of association between different keywords; cluster analysis aims to classify hot words into different clusters based on a certain division pattern, and through the process of keyword clustering to quickly discover the overall research structure of the field, and then summarise the main research topics and subfields. The keyword clustering map presents 10 clusters such as #0 elderly people, #1 ageing in place, #2 elderly groups, #3 smartphones, etc., with a modularity Q value of 0.844, which is greater than the critical value of 0.3, indicating that the clustering effect is significant and the boundaries between the clusters are clear. The average profile value S is 0.9605, which is far more than the critical value 0.5 and higher than the standard value of 0.7, indicating a high degree of consistency and tightness within each cluster. On this basis, the cluster labels were further extracted by the log-likelihood ratio algorithm (Table 2), and it was found that the contents of the clusters crossed each other, so this paper carried out secondary clustering. Accordingly, the research in the past 20 years can be summarised into three core themes: digital inclusion barriers and social adaptation (clusters #6, #9), smart ageing and silver hair economy (clusters #1, #4, #7, #8) and health communication (clusters #0, #2, #3, #5).

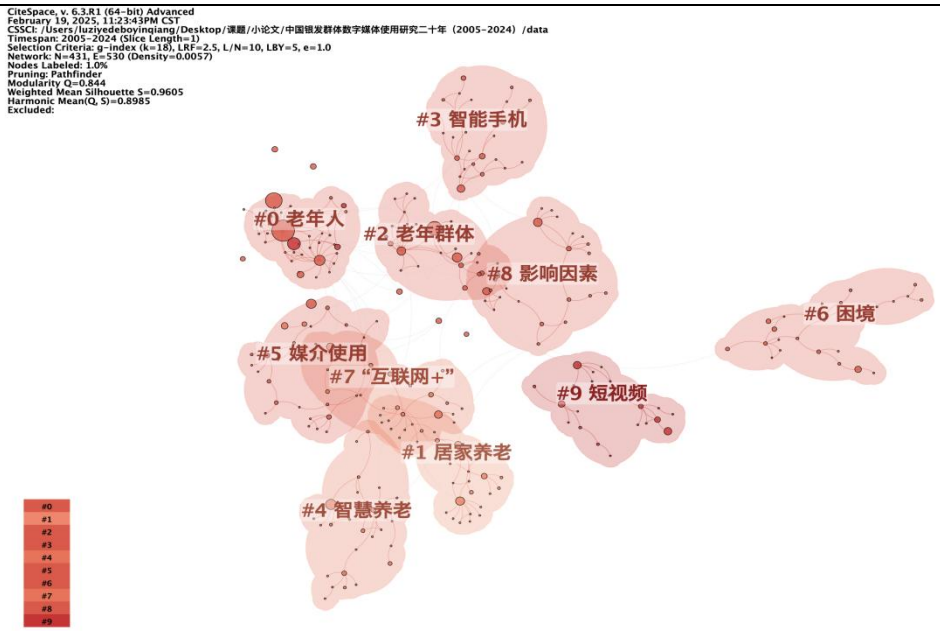

Figure 3. Keyword clustering mapping for the study of digital media use among China's silver-haired group

Table 2. Keyword Clustering Label List for the Study of Digital Media Usage by Chinese Silver Hair Groups

Cluster number	Cluster name	Profile value	Cluster label (research topic)
#0	The Elderly	0.973	Internet; elderly population; quality of life; middle-aged and elderly people
#1	Ageing in Place	0.996	Internet+; big data; population ageing; service model
#2	Senior Citizens	0.969	New media; media literacy; health communication; middle-aged and older people
#3	Smartphone	0.95	Rural elderly; usage behaviour; technology acceptance model; well-being
#4	Smart Aging	0.959	Home-based elderly services; healthcare integration; Internet of Things; urban communities
#5	Media Use	0.864	Mediating effects; health information; urban elderly groups; empirical research
#6	Dilemma	0.987	Service design; digital literacy; user experience; older people
#7	‘Internet+’	0.917	Elderly model; middle-aged and elderly; old age; health management
#8	Influencing factors	0.971	Willingness to use; mental health; smart ageing services; internet+care services
#9	Short Video	0.964	Digital integration; digital feedback; social adaptation; group work

4.2.1 Study of digital inclusion barriers and social adaptation in the silver-haired group

The matching clusters under this theme are #6 (Difficulties), #9 (Short videos), and the core keywords include ‘digital literacy’, ‘user experience’, ‘digital feedback’ and ‘social adaptation’. ‘social adaptation’. The digitalisation of media technology and the ageing of the population structure have brought the digital inclusion barriers of the silver-haired group to the forefront of research. It is widely recognised that the exclusion faced by the elderly in terms of technology access, usage skills, psychological trust and knowledge literacy is essentially a structural dilemma in which technological, social and cultural logics are intertwined. Existing studies can be divided into the following two categories. (1) The generation mechanism of digital divide. The main viewpoints derive from two paths: technical criticism and social structure analysis. The technology critique path emphasises the exclusion of the elderly by interface design and algorithmic logic, such as the skill barrier created by the complex operation of short video platforms[1], and the technological alienation caused by the youth-centred design of smart devices. In contrast, the social structure path focuses on analysing the impact of urban-rural differences and stratification from a social

perspective: rural older people face more serious exclusion due to weak digital infrastructure and intergenerational support[2], while older people's digital socialisation, as a form of ‘immediate integration’, is often ‘disconnected’, further exacerbating the problem of ‘disconnection’. ‘This further exacerbates the passivity of older people. The above studies show that the digital divide has moved away from a purely technological discussion and has developed into an enquiry into the phenomenon of uneven social development. It is worth further pondering how the silver-haired group can achieve digital survival under the double exclusion of technological access and social support. This becomes the focus of attention of the second category of research. (2) Practical paths of digital inclusion. The main debate in this type of research lies in the issue of the limits of older people's subjectivity. Some scholars emphasise the ability of technology domestication, such as the ‘appropriation -integration -repeated domestication’ of elderly gamers through family collaboration, and the reconstruction of social identity and cultural capital by silver-haired netizens through short videos[3]. Another group of studies warns of the limitations of technological empowerment, pointing out that older people are prone to algorithmic dependence and ‘information bias’[4], and that their expression is limited by the cultural framework of older stereotypes. On the whole, some studies have broken through the ‘technology empowerment theory’ and proposed localised concepts such as psychological adaptation and domestication theory, but the results focus on urban groups, with insufficient attention paid to rural and low-income older people, and research on practical paths to digital inclusion has not yet effectively solved the problem of digital survival for silver-haired groups.

4.2.2 Research on smart elderly service system and silver hair economy

The matching clusters under this theme are #1 (ageing in place), #4 (smart ageing), #7 (Internet+), #8 (influencing factors), and the core keywords include ‘Internet of Things’, ‘healthcare integration’, ‘smart ageing’ and so on. services’ and so on. Existing studies can be subdivided into the following three categories. (1) The balance between universality and precision in policy design. The mainstream view is that the integration and interoperability of the digital economy and the silver-haired economy can provide strong support for the cultivation of new growth points and the formation of new kinetic energy for economic development.However, some scholars have also pointed out the problems, such as the blind spot in the coverage of universal policies for disadvantaged groups such as single-parent families, and the lack of a synergistic mechanism for multiple actors may also weaken the actual effect of the policies[5]. The absence of a synergistic mechanism of multiple subjects may also weaken the actual effect of the policies.The absence of a synergistic mechanism of multiple subjects may also weaken the actual effect of the policies. It can be seen that, under the macro background of accelerated technology iteration, the policy design needs to co-ordinate the macro layout and micro adaptation, and there is still a certain gap in the explanation of its reasonable adaptation mechanism in the existing research. (2) Technology-enabled path innovation. Some

scholars emphasise supply-side breakthroughs, such as new productivity to drive the upgrading of the silver economy[6] or optimising the suitability of smart products for the elderly; In contrast, the logic of two-way empowerment calls for simultaneous activation of demand-side potential. However, the absence of a factor guarantee system may constrain the resolution of blockage problems such as technical barriers, capital dilemmas, supply-demand imbalance and market disorder[7]. This suggests that the technology path needs to shift from instrumental rationality to humanistic logic and explore a practical mechanism with feasibility and scientificity. (3) Homogeneous presuppositions and heterogeneous realities of group behaviour. Most studies regard the convergence of the behaviour of silver-haired groups as the default condition, such as the general benefits of the digital economy for silver-haired groups[8] or the commonality of the commercial logic of short videos, which creates the problem of neglecting the heterogeneity of the needs of the elderly, rural, low-income and low-education groups. In short, existing research has begun to build a preliminary interpretative framework of 'system-technology-group', but a systematic practical path has not yet been formed, and the heterogeneity of the silver-haired group is often neglected, and the actual needs of the elderly, rural elderly and other groups have not been adequately taken into account. The heterogeneity of the silver-haired group is often overlooked, and the actual needs of the elderly and the rural elderly are not fully considered.

4.2.3 Health communication research

In the mapping, #0 (older people), #2 (older groups), #3 (smartphones), and #5 (media use) can be assembled into the same knowledge cluster, which mainly focuses on health communication issues, with the core keywords of 'health communication' 'health information' 'mental health' "health management" and so on. Specifically, they can be grouped into two categories. (1) Coexistence of media technology empowerment and digital exclusion. One viewpoint emphasises the ageing potential of media technology, such as short videos, WeChat and other platforms that lower the threshold of access to health information through visualisation and their social attributes, and improve the health literacy of urban silver-haired groups[9]. Another viewpoint criticises the limitations of technological empowerment, pointing out that algorithmic recommendations are more likely to exacerbate the information cocoon for rural older people, while traditional media (e.g. loudspeakers) have instead become the main vehicle for rural health communication due to their cultural appropriateness.It can be seen that the final effect of media technology is highly dependent on the degree of digitisation and the synergy of social support networks. So, why are rural silver-haired people still caught in the dilemma of 'information encounter' when digital technology has become popular? This is the focus of the second type of research. (2) Social embeddedness and cultural context of health communication. The core proposition of this type of research is to optimise health communication practices through the logic of community, family and culture. From the perspective of intergenerational interaction, some scholars have revealed how children's health persuasion behaviour is embedded in family power relations, which in turn affects

older people's information adoption behaviour[10].Some scholars have also discussed the effectiveness of the online-offline linkage model in enhancing the health literacy of the elderly based on the community governance perspective[11]. Scholars with a critical viewpoint point out from an ethical perspective the problems of privacy leakage and over-commercialisation of information caused by the digital divide, and call for the construction of a communication ecology in which technology is good[12]. Compared with the first type of research, the latter places more emphasis on the socio-cultural rootedness of communication behaviours rather than simply exploring technological empowerment, which opens up the possibility of innovation in local theories.

5.Analysis of the Evolution of the Research Lineage

In order to have a clearer understanding of the development of research on digital media use among the silver-haired group in China, this study draws a keyword time-zone mapping (Figure 4) based on the CiteSpace tool. By combining annual publication trends, time zone mapping, emergence mapping, and literature content, this paper divides the twenty-year research lineage of digital media use among China's silver-haired population into three phases.

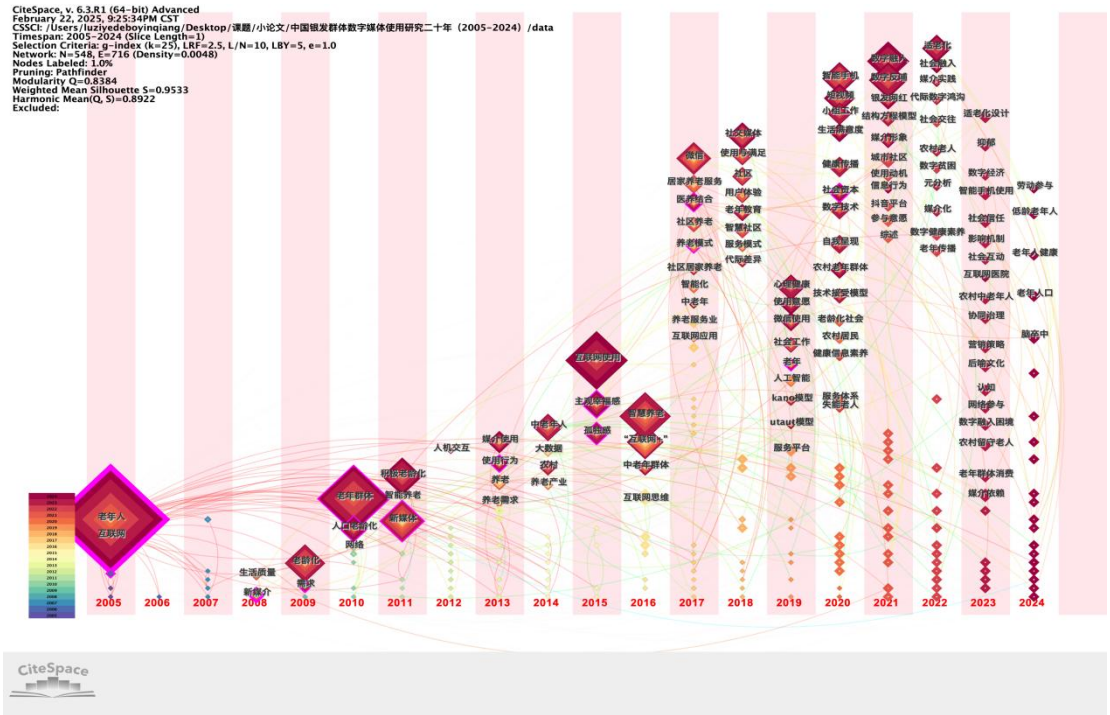

Figure 4. Keyword time zone mapping for a study of digital media use among China's silver-haired population

5.1 Preliminary exploration period (2005-2015)

The academic lineage of research on digital media use among China's silver-haired population can be traced back to 2005. Chen Juan put forward the proposition of Internet use of the elderly [13], which lays a theoretical foundation for the subsequent research on the digital media use of the silver-haired group. The results at this stage mainly focus on the social needs of silver-haired groups, such as enhancing the subjective sense of happiness, Optimising the Lifestyle of the Elderly etc. It is worth noting

that the academic discussion on 'new media and quality of life' has initially shown the possibility of technological intervention in elderly services. The emergence of concepts such as 'active ageing', 'demand' and 'elderly care' in the CiteSpace keyword time zone mapping and emergence mapping also confirms this shift. The research results of the initial exploration period have initially established the connection between new media technologies and social needs, but the attention to group differences and cultural contexts is still insufficient at this time.

5.2 Rapid development period (2016-2020)

After 2016, under the dual background of policy-driven and technological iteration, the research on digital media use of China's silver-haired group produced a large number of academic results. With the successive introduction of policies such as the 'Internet+' Artificial Intelligence Three-Year Action Implementation Plan (2016)' and the "Action Plan for the Development of the Smart Healthy Aging Industry (2017)", "technology empowerment" has become the mainstream paradigm. Scholars have focused on the reconstruction of the elderly care model by emerging digital technologies such as the Internet of Things and artificial intelligence, and have proposed a development path for the integration of the digital economy and the silver-haired economy, emphasising the enhancement of the consumption level of the elderly population through the development of the digital economy[14]. However, there are also studies pointing out the shortcomings, the current youth-centred design thinking of smart devices is not conducive to the exposure and use of the elderly, and the tension between instrumental rationality and humanistic logic is further highlighted. With the global outbreak of public health emergencies, the urban-rural divide in health communication has gradually come to the forefront of researchers' minds. Researchers have found that urban silver-haired people can efficiently access health information through short videos, WeChat and other platforms, thus reducing the risk of public health events; in contrast, most rural elderly people have to fall into the 'information encounter' dilemma due to digital poverty. It is noteworthy that the platform's algorithmic recommendation mechanism fails to effectively bridge the digital divide, but instead creates an 'information cocoon' to further widen the disparity between urban and rural health information exposure. This has prompted academics to seek explanatory paradigms other than 'technological empowerment', and to gradually shift to a more holistic perspective in examining the problems in health communication practice.

5.3 Research Turning Period (2021-2024)

Research in this phase mainly focuses on the structural contradictions of the digital divide. During this period, academics reveal the exclusion faced by the elderly at the level of technology exposure, skill acquisition and psychological trust, reflecting the implicit inequality and discrimination in the digital society. The frequency of keywords such as digital integration, digital feedback, and rural elderly also highlights the academic community's concern about urban-rural differences in the use of digital media by silver-haired groups. In addition, although the '14th Five-Year' National Development Plan for the Elderly (2021) has long explicitly stated that

it promotes the standardisation of ageing-friendly retrofitting, there are still many difficulties at the practical level. Relevant studies have been conducted from multiple perspectives: Cao Shule explores the dual growth mechanism of personal digital capital and social capital of the elderly through digital media with the case of silver-haired netizens; Wu Weihua provides an in-depth analysis of the mechanism and social construction of the flourishing silver-haired netizens phenomenon ; Liu Yuting criticises the problem of commercialisation of health communication and the imbalance of information, and calls for building an ethical ecosystem that is technologically oriented towards goodness. Meanwhile, as the driving role of the new quality productivity is becoming more and more obvious, researchers in this period have also begun to explore the two-way empowerment path between the silver hair economy and the new quality productivity. For example, Li Fang emphasises the strategic value of elements such as science and technology and data in unblocking the real blockage; Du Peng believes that while cultivating the new quality productivity, it is necessary to build a new type of production relationship that matches it to break the current blockage in the transformation [1]of scientific and technological fruits[15]. In short, research at this stage begins to probe deeply into the structural contradictions of the digital divide and actively seeks synergistic paths to solve this systemic dilemma.

6.Conclusion

Over the past two decades, in the complex context of demographic transition, digital technology iteration and policy system evolution, academic attention to the issue of digital media use by the silver-haired group has continued to heat up, resulting in a series of research results that have provided important doctrinal support for exploring and solving practical problems in the process of population aging in China. On the basis of the existing fruitful research results, future research may continue to deepen in the following aspects. We will focus on the two-way mutual support mechanism between new quality productivity and silver hair economy, focus on silver hair content production and virtual companion technology, and promote the transformation of the elderly from passive users to value co-creators; based on the localised urban and rural structure and family characteristics, we will integrate the disciplines of communication science, sociology and gerontology to build a localised interpretative framework; we will strengthen the practical orientation of technological ethics and design for aging, and focus on the conflicts between the decline of the elderly users' senses and the adaptation of the media to their own bodies. We will strengthen the practical orientation of technological ethics and ageing-friendly design, pay more attention to the contradiction between the sensory decline of elderly users and media adaptation, and promote intergenerational knowledge sharing and cultural feedback.

References

[1]Liu G.S. The sorrow of aging in the digital age: The "silver-haired group" lost in short videos [J]. Audio-Visual, 2021, (6): 190-192.

[2]Wang Y.L., Jiang Y.N. The pain of the elderly digital divide and paths to bridging it [J]. Journalism Enthusiast, 2021, (7): 31-34.

[3]Cao S.L., Wang X.L. Bridging the gap and returning to the stage: A study on platform participation patterns of "silver-haired influencers" from the perspective of active aging [J]. Journal of Soochow University (Philosophy & Social Science Edition), 2024, 45(4): 162-171.

[4]Xin Y., Chen Y.H. Digital integration of "silver-haired surfers" from the perspective of short videos [J]. Jiangsu Social Sciences, 2024, (5): 214-222.

[5]Zhou K., He R.R. Taming games: An intergenerational study of online gaming behaviors among silver-haired players [J]. Journalism Research, 2021, (9): 72-85.

[6]Ma Y. Promoting the integrated development of digital economy and silver-haired economy [J].Macroeconomic Management, 2022, (3): 56-62.

[7]Zhang G. Coupling logic and path construction between elderly care service system and silver-haired economy [J]. Academic Journal of Zhongzhou, 2024, (10): 80-88.

[8]Yang L., Sun X.F. The impact and mechanism of digital economy on elderly household consumption [J].Consumer Economics, 2022, 38(5): 86-96.

[9]Ren H., Sun Y.P. Study on short video exposure of elderly groups from the perspective of health communication [J]. Media, 2022, (6): 57-59.

[10]Cao B.L. "Silent protagonists": Epidemic prevention behavior logic and risk coping strategies of middle-aged and elderly people under COVID-19 [J]. Academic Research, 2022, (2): 59-66.

[11]Chen B.L. The value and development path of community health communication in aging society [J]. Youth Journalist, 2022, (2): 75-76. DOI:10.15997/j.cnki.qnjz.2022.02.012.

[12]Lai X.P. Research on health communication dilemmas and strategies for the elderly based on KAP model [J]. Media, 2015, (16): 76-78.

[13]Chen J. Research on motivations, characteristics and development of China's elderly internet industry [D]. Hebei Normal University, 2005.

[14]Qiu W.W. Digital economy empowering elderly consumption growth: Moderating effect analysis based on silver-haired economy [J]. Journal of Commercial Economics, 2024, (6): 76-79.

[15]Du P., Wang F. Empowering silver-haired economy development with new quality productive forces [J]. Beijing Social Sciences, 2025, (1): 109-119.