

Digital Technology in the Health Field of Older People: Bibliometric Analysis

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Abstract: The purpose of this study is to conduct bibliometric analysis of published papers on the digital technology in health field of older people. Data were obtained from Web of Science. The results were evaluated and visualized by using CiteSpace software. Overall, Quantity and citations of relevant literature show a general tendency to increase yearly. The highest number of publications was conducted in America. Two large hotspots were “Internet” and “digital divide”, but researches has tended to be diversified in recent year.

1 INTRODUCTION

Digital technology as a new general technique is developed with occurrence of electronic computers. It contains Internet of Things (IoT), cloud computing, artificial intelligence, blockchain technology and big-data analytics (Chandra, 2022; Carlsson, 2004). Digital technology has three characteristics: re-programmability, homogenization of data and self-reinforcement in comparison with other technology innovation (Youngjin, 2010). Nowadays, digital technology is playing an important role in the health field of older people with the aggravation of the aging population (Bail, 2022). Scholars (Ho, 2022) made a survey about the impact of telehealth for older people. Alexander (Castleton, 2022) investigated older people use of tablet to promote the digital inclusion of them. As digital technology is gaining more and more applying in the field of older people health, there are increasing concerns and attentions from researchers.

Bibliometric study is a measurable informatics method focusing on quantification, and was proposed by British scientist Pritchard in 1969 (Pritchard, 1969; Le, 2021). It has been widely used for exploring the research hotspots and development trend. However, there is currently no bibliometric analysis

on digital technology in the health field of older people. Therefore, this study was to carry a bibliometric analysis in the area.

2 METHODS

Bibliometric analysis was carried out based on the Web of Science (WoS) Core Collection, which ensured the quality of literature. The search terms were set as follows: (TS= (“Digital Technologies”) OR TS= (“Technologies, Digital”) OR TS= (“Technology, Digital”) OR TS= (“Digital Electronics”) OR TS= (“Electronics, Digital”)) AND (TS= (“older people”) OR TS= (“aged”) OR TS= (“elderly”)) AND TS= (“health”). Each paper for analysis had to fulfill the following criteria: (1) the types were articles or review articles, (2) were written in the English language. Only Publications before 2021 were included. Finally, a total of 1619 papers that were available according to the search criteria (Fig.1).

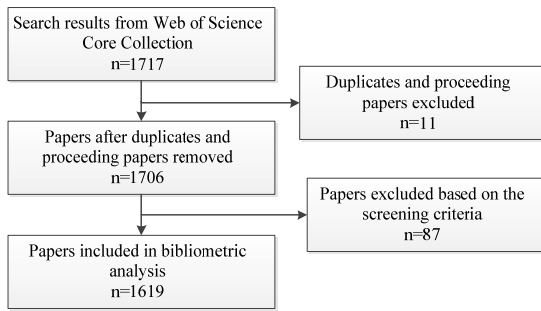


Figure 1: Flowchart of the paper collection and screening process.

3 RESULTS AND DISCUSSIONS

3.1 Chronological Map of the Literature

The papers about digital technology in the health field of older people were published from 2006. The number of publications shows slow increments from 2006 to 2014, and the growth rate was 26.96%. The growth rate from 2015 to 2021 was 48.51%, growth rate = $((\text{number of publications in the last year} / \text{number of publications in the first year})^{1/(\text{last year} - \text{first year})} - 1) * 100$. Meanwhile, the publications were cited with high frequency from 2018 to 2021 and peaked in 2021 (Fig.2).

3.2 Country Analysis

In total, 1619 articles were collected and analyzed. Tab.1 shows the country of the most articles was

America (USA), which had 601 articles, accounting for 37.12%. The number of the articles ranked the second and third were England and Australia. American average citations per item (ACI = 19.55) and H-index (54) were the highest in all country, which indicates American relevant articles published were highly influential. USA and Australia did research firstly on digital technology in the health field of older people in 2006. Although the related researches presented late in China, the quality of Chinese literatures is high according to value of ACI.

3.3 Burst Keywords Analysis

Burst keywords refer to the keywords that appear frequently in a short time. It indicates research hotspots for some time and trends in future (Le, 2021). Fig.3 displays the top 10 keywords with the strongest citation bursts. The strongest burst occurred in 2008, that internet had a burst strength of 11.1067, and lasted 8 years. Digital divide and health information are ranked the second and third respectively according to burst strength. Some scholars (Gracia, 2009) think digital technology can improve health of the elderly, but they could be at risk of losing out benefits from digital technology because of digital divide. Mobile technology was considered to be vital to cease digital divide (Olphert, 2013). In recent years, the research of digital technology has been increasingly involved in the field of elderly health and diverse keywords. It might cause dilution of the citation bursts.

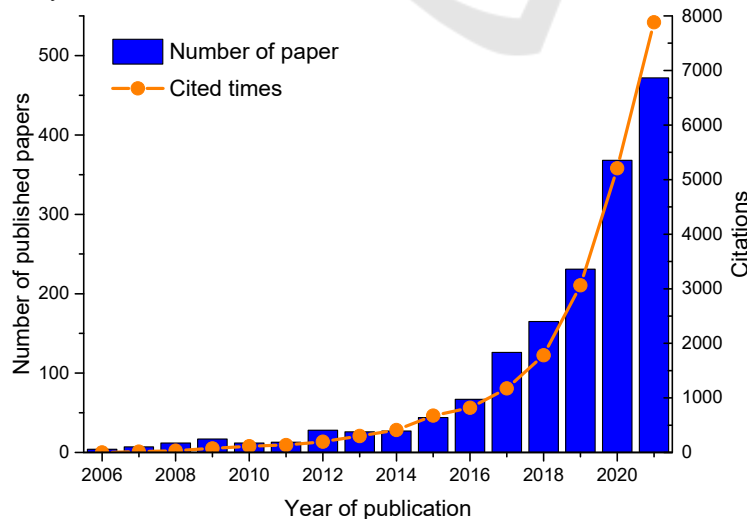


Figure 2. Trends in the growth of the publications and total citation per year

Table 1: Top 10 productive country publishing papers.

Rank	Country	Quantity (N)	Percentage (N/1619)	ACI	H-index	Begin
1	USA	601	37.12	19.55	54	2006
2	England	259	16.00	15.13	31	2008
3	Australia	175	10.81	12.95	25	2006
4	Canada	129	7.97	12.21	22	2010
5	Germany	98	6.05	12.15	18	2013
6	Netherlands	74	4.57	13.00	16	2012
7	Spain	70	4.32	5.77	12	2016
8	Italy	69	4.26	6.77	12	2015
9	Sweden	68	4.20	9.37	13	2009
10	China	62	3.83	16.50	12	2014

^aACI, average citations per item. ^bBegin, the year of the first literature published.

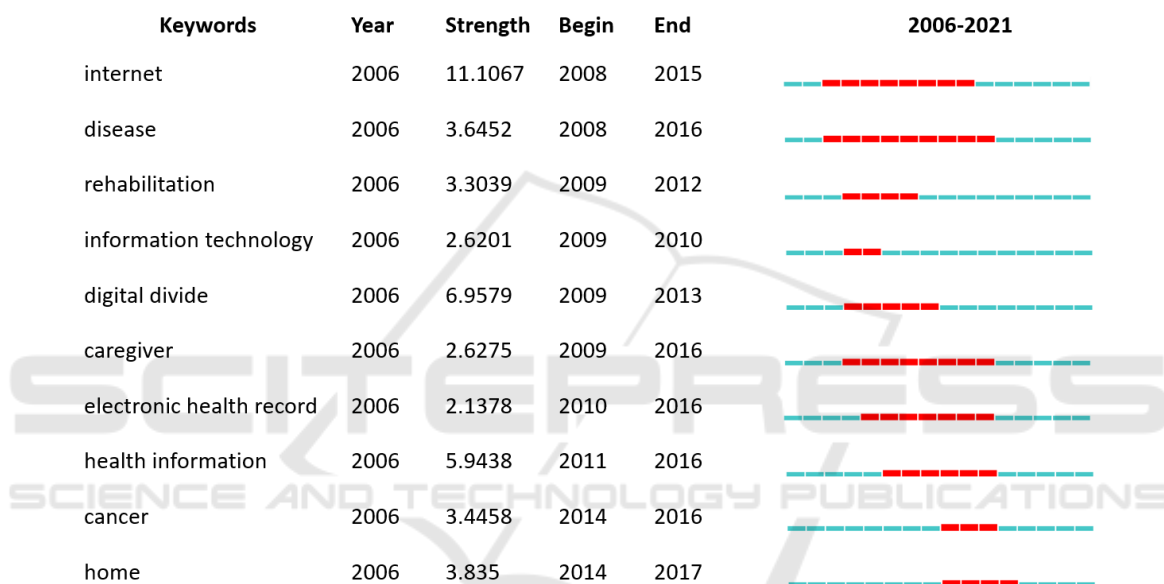


Figure 3: Top 10 keywords with the strongest citation bursts.

4 CONCLUSION

This study aims to conduct a bibliometric analysis of digital technology in health field of older people by CiteSpace software. The findings showed that the number of relevant publications and citation have been increasing. The highest number of publications was conducted in America (37.12%). The keywords “Internet” and “digital divide” occurred burst in short term, but researches tend to be diversified in recent years. In this study, data was only retrieved from WoS. Therefore, the analysis may limit the generalizability of the results.

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