

A Literature Review of China's Smart Elderly Care Industry

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Abstract: With the aging population in China, the issue of elderly care has gradually become a topic of concern in today's society. Traditional elderly care models can no longer meet the needs of contemporary elderly people. Therefore, smart elderly care, as a new type of elderly care model formed by the development of information technology, can provide efficient, convenient, and personalized services for the elderly, with broad market prospects and development space. Therefore, the smart elderly care industry is also receiving increasing attention from researchers, and the number of related papers is also increasing year by year. This article uses China National Knowledge Infrastructure (CNKI) as the database source and conducts a search under the theme of "smart elderly care industry" in the search box. A visual analysis is conducted on 525 articles found from 2013 to 2024. It is found that research on the smart elderly care industry in China began in 2013, and the annual circulation of related papers has been on the rise since 2019. This paper reviews the literature on three research directions including problems and strategies of the smart elderly care industry, the elderly care industry under Internet plus and artificial intelligence, and related policies of the smart elderly care industry. Through analysis, it finds that some researchers are committed to studying some problems of the smart elderly care industry, and put forward some suggestions, such as establishing a unified smart elderly care service standard and finding an appropriate industrial integration path based on the needs of the elderly. Some researchers believe that the Internet and artificial intelligence will bring opportunities to the elderly care industry, help to accurately position the market, and meet the needs of the elderly. Some policy researchers have also found that the Chinese government is increasingly valuing the smart elderly care industry. Hence, by summarizing and evaluating the current situation, development, and related policies of the smart elderly care industry, this study hopes to provide some ideas and directions for researchers in the research of the smart elderly care industry.

Keywords: China; Smart elderly care industry; Literature review

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1. Research background

When the birth rate decreases and the average life expectancy increases, there will be a dynamic in which the number of young people decreases and the number of old people increases, resulting in a corresponding

increase in the proportion of old people, that is, population aging. According to the criteria, a country or region has an aging population when 10% of the population is over 60, or 7% is over 65. The latest statistics show that in 2022, China's population over 60 years old has exceeded 280 million, and the population over 65 years old is nearly 210 million, accounting for 19.8% and 14.9% of the total population respectively ^[1]. China National Committee on Aging (CNCA) estimates that by 2050, the population over 60 years old will reach 487 million, nearly 35% of China's population ^[2]. In other words, China's aging population is becoming more and more serious, and the government has introduced a series of policies and measures to deal with the problem and alleviate the pressure of social elderly care. Topics related to the elderly care industry have also attracted more and more attention from scholars, especially smart elderly care, which has become a research hotspot with the continuous development of technology today.

Smart elderly care, also known as smart home-based elderly care, was initially proposed by the UK Life Trust Foundation, advocating the use of innovative technology to provide intelligent services for the elderly. It was not until 2013 that China collectively referred to such concepts as smart elderly care and technological elderly care ^[3]. The smart elderly care industry mainly utilizes advanced information technologies such as big data, the Internet of Things, and cloud computing to provide intelligent and personalized elderly care services for the elderly. Smart elderly care can provide intelligent detection for the elderly, allowing them to observe their heart rate, blood sugar, and so on at any time through smart devices. Various smart elderly care platforms can provide convenient services for the elderly, such as appointment registration and household services. Smart elderly care is gradually becoming a new trend in the development of the elderly care industry. Developed countries started early and have formed a complete industrial chain. China's smart elderly care is also constantly developing with the progress of technology and the upgrading of social demand, with broad prospects.

2. Literature review

2.1. Research methods and data analysis

This article adopts a literature review method, using China National Knowledge Infrastructure (CNKI) as the data source, to summarize and classify the research results related to the smart elderly care industry, and to evaluate some of the literature. The specific operation is as follows: by searching for “smart elderly care industry” in the keywords, visual analysis was conducted on all 664 papers found (2013–2024), and the analysis results are shown in **Figure 1**.

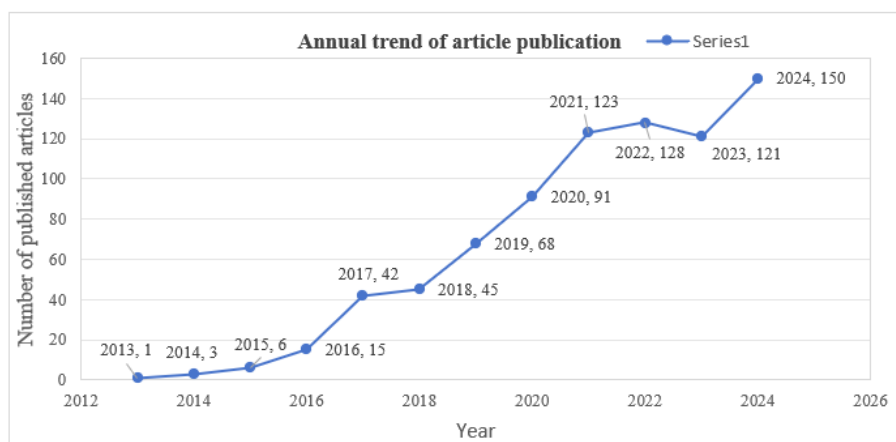


Figure 1. Visual analysis of the “smart elderly care industry”; data source: CNKI; search scope: total library; topic: smart elderly care industry; total number of literature: 664 articles ^[18]

From the visual analysis chart, it can be seen that China’s research on the smart elderly care industry began in 2013 and started relatively late. From 2019 to 2024, the circulation curve of papers showed an upward trend, indicating that the smart elderly care industry has gradually become a research hotspot and received attention.

The literature theme analysis results in **Figure 2** shows that the research of Chinese scholars on the smart elderly care industry mainly focuses on the following aspects: “smart elderly care” with 385 articles, followed by “smart elderly care services” (69), “elderly care industry” (61), “elderly care services” (51), “smart elderly care industry” (21), “Internet plus” (20), “background of Internet plus” (15), and “Big data” (15). This paper mainly reviews the literature on three topics: “smart elderly care industry”, “elderly care industry under Internet plus and artificial intelligence”, and “smart elderly care industry policy.”

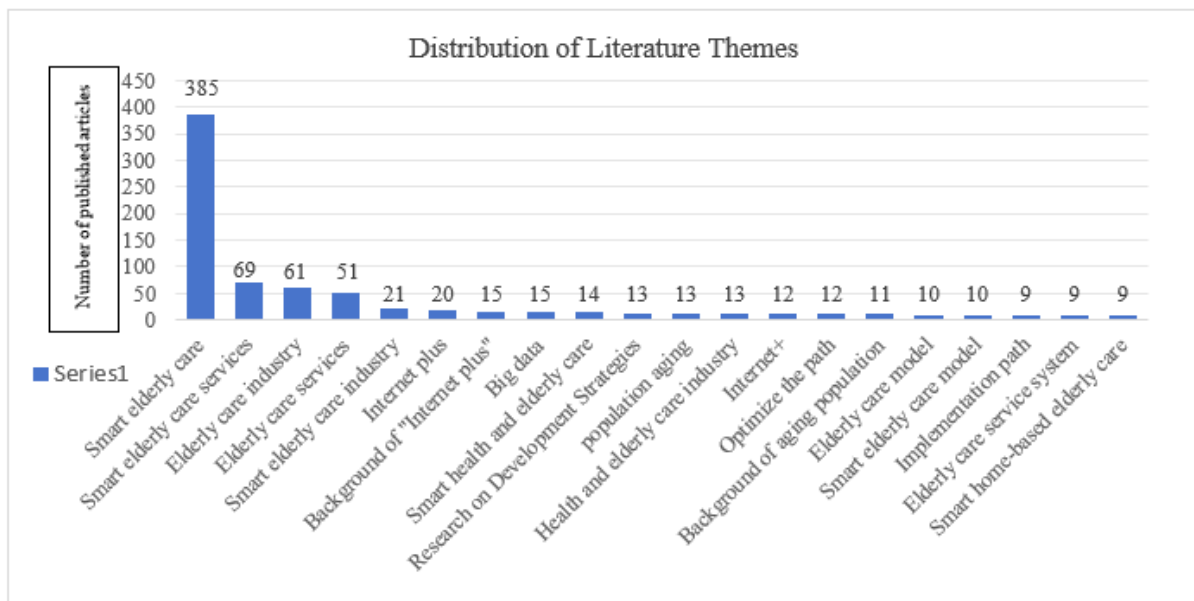


Figure 2. Theme analysis of literature on “smart elderly care industry”; data source: CNKI; search scope: total library; topic: smart elderly care industry; total number of literature: 664 articles ^[18]

2.2. The problems and solutions of the smart elderly care industry

After analyzing the problems in the smart elderly care industry, some researchers have provided suggestions on the following aspects: the formulation of intelligent service standards, demand-oriented industrial development, and the path of intelligent industry integration. For example, Li’s research suggests that smart elderly care is an inevitable trend in the development of the elderly care industry ^[4]. However, the current elderly are relatively unfamiliar with digital technology, and there is a lack of professional talents in elderly care. There is a mismatch between supply and demand in products and services. It is proposed to establish a unified standard for smart elderly care services, accurately match smart products and services, and vigorously cultivate professional elderly care service talents. Liang believes that although the development of science and information technology has laid the foundation for China’s smart elderly care industry, there are still shortcomings in its current development, mainly due to the lack of unified standards in the industry, striving to identify problems from an economic perspective and provide suggestions ^[5]. Pan studied the integration of sports, fitness, and smart elderly care industry, proposed a demand-oriented approach to cultivate composite talents who combine both aspects, improve the integration path of the two, achieve product diversity, and promote intelligent and sustainable development of both sides ^[6]. Hou analyzed the problems in the development of China’s smart elderly care industry, such as the lack of industry norms, difficulty in implementing policies, and shortage of funds ^[7]. Through exploring supply guarantee, demand-pull, and industrial environment optimization, solutions

should be sought to alleviate the current difficulties. Yang classified the elderly care and smart industries based on system hierarchy and domain classification, established a path for industrial integration, and obtained the derivative industries after integration ^[8]. Qin studied the problems and challenges that China's smart elderly care financial system faces, and proposed corresponding optimization paths, for example, to alleviate social elderly care conflicts, it is necessary to build a multi-level and all-round financial system ^[9].

2.3. Internet plus and AI-based elderly care industry

The combination of technology and elderly care is the key to the development of the smart elderly care industry. Some researchers discussed how to integrate the Internet and artificial intelligence into elderly care services to meet the needs of the elderly. For example, Geng analyzed the advantages, disadvantages, opportunities, and challenges of the elderly care industry under the Internet model with the SWOT model, and believed that the Internet platform would help optimize the allocation of elderly care resources, achieve a seamless connection between supply and demand, and provide accurate services to different needs ^[10]. Zhang studied the elderly care industry in China and found that the market positioning was unclear, the product type was limited, and the elderly care professionals were scarce ^[11]. He believed that the integration of the Internet and the elderly care industry was the inevitable trend of current development, whether at the national policy or information technology level. He proposed to use Internet technology such as big data to achieve precise elderly care market positioning, cultivate elderly care professionals through cooperation between schools and enterprises, schools and local cooperation, and reflect on the reasons for the limited product type to find diversified countermeasures. Ning explored the opportunities that the "Homestead Economy", an online economy and industrial chain, brings to the elderly care industry ^[12]. It is believed that this model can strengthen information services and ensure the health of the elderly. E-commerce can meet the daily needs of the elderly, and the online office model can also provide the possibility for capable elderly people to re-employment. Sui explored the feasibility of applying artificial intelligence in home-based elderly care from four dimensions: policy, system, economy, and psychological foundation, and believed that artificial intelligence can bring new opportunities to the elderly care industry ^[13]. Zhang has a relatively optimistic outlook on the prospects of the robot elderly care industry and believes that the market demand for this industry will reach over 230 billion yuan by 2030 ^[14]. China should seize the opportunity and vigorously research and manufacture elderly care service robots.

2.4. Policies related to the smart elderly care industry

Policies are an important guarantee for promoting the development of the smart elderly care industry, and some researchers have researched relevant policies. He used qualitative and quantitative research methods to sort out China's elderly care policies from 2013 to 2017 ^[15]. The TF-IDF algorithm was used to extract core keywords from the target text, and it was found that China's elderly care policies revolve around healthcare, social security, elderly care services, and development planning, with an increasing emphasis on the development of the smart elderly care industry. From the perspective of ecological elderly care, Zhou analyzed the advantages, disadvantages, opportunities, and threats of the Guizhou region, and it was believed that Guizhou has a good ecology and high forest coverage ^[16]. The climate is pleasant and suitable for elderly care, it is believed that the policies of big health and big data are opportunities for the development of Guizhou's elderly care industry. Xu studied the policy opinions of Guizhou Province on "comprehensively opening the elderly care service market and improving the quality of elderly care", such as lowering the threshold, simplifying the administrative procedures, reducing the approval process, accelerating the transformation of public elderly care institutions to enterprises, establishing a market pricing charging mechanism, ensuring the government's guaranteed elderly

care, using the Internet to improve the quality of home-based elderly care services, investing in medium and high-end elderly care services, creating a five in one elderly care model, encouraging the establishment of rural happy homes, promoting the barrier-free transformation of old residential areas and elderly housing, promoting smart elderly care, medical care integration, upgrading elderly products, developing pension finance, strengthening overall arrangement, land support, talent training, and financial security^[17].

3. Conclusions

Through the literature analysis of “smart elderly care industry”, “Internet plus and AI-based elderly care industry”, and “smart elderly care industry policy”, it is concluded that the smart elderly care industry lacks professional talents, supply and demand mismatch, and lack of industry rules and funds. Researchers propose a unified elderly care service standard and optimize the industrial integration path based on demand. Some scholars believe that the elderly care industry under artificial intelligence has broad prospects, and emerging technologies can provide more personalized and intelligent services for the elderly. Some researchers believe that China has introduced some policies to support the development of the smart elderly care industry, and also put forward some suggestions on how to formulate reasonable policies, regulate market order, and protect the rights and interests of the elderly.

However, some of the research details are too vague, without proposing specific solutions or mentioning some relevant policy details. Some studies have obvious shortcomings in market research and do not have a deep understanding of the needs of the elderly. Therefore, some of the suggestions proposed lack specificity and cannot meet the diverse needs of the elderly. Researchers can conduct more in-depth research in these areas. In addition, it is suggested that researchers can conduct research from the perspectives of talent cultivation in the smart elderly care industry, integration of the smart elderly care industry, and international development of the smart elderly care industry.

Smart elderly care, as a new type of elderly care model, has achieved intelligent management and services for the elderly through information technology, providing new ideas for solving elderly care problems. Due to the wide scope of the smart elderly care industry and the large number of relevant literature, there are inevitably shortcomings and limitations in the review process. Some research results may have duplication or overlap, and further in-depth research and discussion of related issues are needed.

Disclosure statement

The authors declare no conflict of interest.

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