

Challenges in the Development of Smart Elderly Care Services: Focusing on the Needs of the Elderly and Artificial Intelligence Technology

Li Jia*

Waterford Institute, Nanjing University of Information Science and Technology, Nan Jing, China

*Corresponding author: 202283910015@nuist.edu.cn

Abstract. This paper addresses the critical issue of global population aging, with a special focus on the severe challenges posed by the aging trend in China. Smart elderly care services have emerged as a key strategy to address this demographic shift, and their current state of development and associated challenges have become key areas of research. Through a comprehensive analysis employing literature review and questionnaire surveys, the study delves into the needs of the elderly for smart elderly care services, especially in daily living, healthcare, safety monitoring, and other aspects. The research findings indicate that factors like age, personal income, and the level of awareness about smart elderly care significantly impact the preferences of the elderly. This underscores the need to expand the scope of smart elderly care services to encompass their spiritual, cultural, and recreational needs. Although the integration of artificial intelligence (AI) technology in the elderly care sector has shown initial positive outcomes, it still faces challenges such as incomplete big data, a shortage of skilled personnel, undeveloped business models, and privacy protection issues. In the future, advancements in AI and digital technologies are anticipated to narrow the digital divide among the elderly. Governments are expected to increase investments in infrastructure improvements, while intelligent devices and services will be optimized to cater to the specific requirements of the elderly. Additionally, elderly education is poised to encounter greater opportunities for development, marking a significant transformation in the elderly care landscape.

Keywords: Global Population Aging; Smart Elderly Care Services; Needs of the Elderly; Artificial Intelligence Technology; Elderly Education.

1. Introduction

On a global scale, population aging has emerged as a significant social issue of profound impact that cannot be disregarded, with China demonstrating a particularly notable aging trend in this process. As society progresses continuously and the population structure undergoes substantial adjustments, the scale of the elderly population in China is expanding at an astonishing rate. In recent years, the number of elderly individuals in China has consistently increased, making the challenge of population aging particularly severe in the country. According to data from the Seventh National Population Census, the elderly population aged 60 and above has reached nearly 290 million, with projections indicating that this figure will surpass 300 million by 2025. This vast elderly demographic has not only spurred a rapid growth in demand for elderly care services but has also posed unprecedented challenges to the existing elderly care service system, prompting the active exploration of new response strategies.

In the face of this backdrop, the notion of smart elderly care services has progressively come into prominence and swiftly ascended to become a crucial tool in tackling the aging issue. By harnessing advanced technologies, including the Internet of Things, big data, cloud computing, and artificial intelligence, smart elderly care services strive to offer more convenient, efficient, and tailored services to the elderly. This revolutionary service model not only possesses the potential to markedly elevate the quality and efficiency of elderly care services but also adeptly addresses the elderly's growing diverse and personalized needs, thereby establishing a solid groundwork for fostering a harmonious aging society.

At present, while China's smart elderly care industry has formed a preliminary system, it remains in its early stages of development [1]. Challenges include low input-output efficiency, a need for stronger policy guidance, small enterprise sizes, and inadequate technological innovation. Simultaneously, artificial intelligence and wearable devices have found extensive applications in smart elderly care, encompassing AI-powered interactive robots for elderly health monitoring systems [2], as well as wearable devices for the elderly that cater to fall prediction, continuous physiological monitoring, disease management, and daily exercise analysis [3]. These technologies not only address the multi-faceted health care needs of the elderly but also propel the further advancement of the smart health and elderly care industry. Yet, the smart elderly care industry still faces numerous hurdles, such as unifying technical standards, regulating market order, and scaling up the industry. Collaborative efforts from the government, enterprises, and various sectors of society are imperative to foster the healthy and sustainable growth of the smart elderly care industry.

Meanwhile, the rapid development of artificial intelligence (AI) technology in recent years, particularly the breakthroughs in generative AI technology represented by ChatGPT, has injected new vitality into smart elderly care services. AI technology is gradually penetrating various industries, including those related to the elderly and elderly-oriented products. However, how to fully leverage AI technology to enhance the quality of life for the elderly while addressing the relationships between technological development and practical application, between general technology and the specificity of elderly care scenarios, and between meeting the needs of the elderly and commercial sustainability, has become an important topic that urgently requires in-depth research and resolution.

It is particularly noteworthy that the digital divide faced by rural elderly individuals in the era of intelligence is particularly acute. When compared to urban elderly, rural elderly tend to feel even more helpless and bewildered in the face of this digital divide. Consequently, while benefiting from the convenience and efficiency offered by the intelligent age, the question of how to address and resolve the digital divide for rural elderly has emerged as a pressing and significant practical issue that demands urgent attention.

In summary, this study aims to comprehensively and thoroughly analyze and examine the current status and challenges of smart elderly care services against the backdrop of population aging, and to delve deeply into the service needs of the elderly as well as the application of artificial intelligence technology in smart elderly care. Through this research, the paper hopes to provide valuable references and countermeasures for further promoting the development of smart elderly care services, bridging the digital divide among the elderly, and fostering the healthy development of elderly education. It contributes our wisdom and strength to the construction of a more harmonious and inclusive aging society.

2. Method Overview

2.1. Research methods

2.1.1 Literature research method

Through extensive research via the internet, libraries, and other channels, a significant amount of literature, including books, academic journals, master's and doctoral dissertations, and other documents related to smart elderly care, as well as the problems and solutions currently faced by smart elderly care, was reviewed. From these sources, data tables were summarized, and the existing theoretical foundations were consolidated.

2.1.2 Questionnaire survey method

Upon discovering through online research that Changzhou and Changchun have both implemented smart elderly care initiatives in real life, field investigations were conducted in both cities [4,5]. Questionnaires were distributed to collect basic information about the elderly, as well as their needs and satisfaction levels regarding smart elderly care. Intuitive analysis was performed on the relevant data collected.

2.2. Research object

The data were sourced from CNKI literature and collected from 270 elderly individuals in selected residential communities in Chaoyang District of Changchun City and 270 elderly individuals aged 60 and above in Changzhou City. Data collection was conducted through electronic questionnaires and offline community interviews.

2.3. Research content

Changzhou: The survey questionnaire encompassed five categories, namely physiological needs (such as basic necessities of life including clothing, food, shelter, and transportation), medical needs (such as health monitoring, assistance in registration for medical appointments, emergency rescue, etc.), safety needs (such as home safety, travel safety, and protection of rights and interests), emotional needs (such as mental health counseling, matchmaking centers, etc.), and self-actualization needs (such as learning services, elderly activity organizations, etc.).

Changchun: The factors influencing the demand for smart elderly care included individual needs for smart elderly care content, ease of use, pricing, external factors, and risk factors. Data analysis was conducted based on the collected survey questionnaires.

2.4. Statistical method

Fig.1 is used to compare the demand factors and needs of smart elderly care in the two places

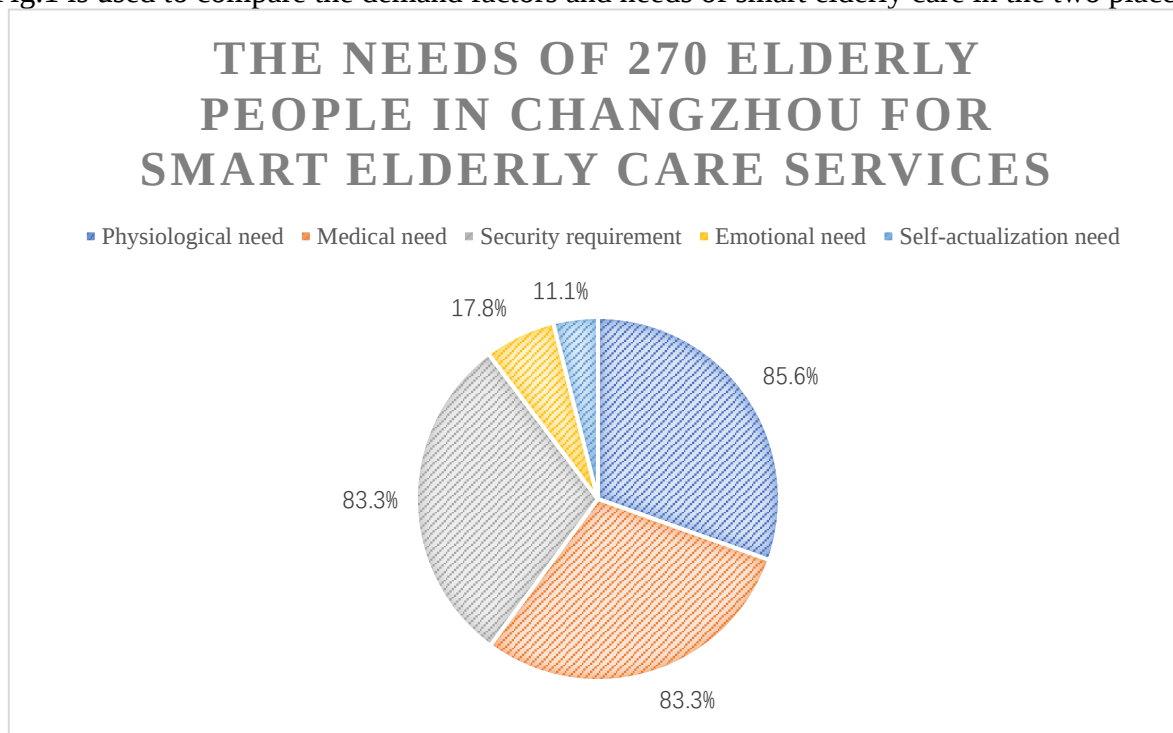


Fig. 1 The needs of 270 elderly people in Changzhou for smart elderly care services

This survey [4], grounded in Maslow's hierarchy of needs, categorizes the demands for smart elderly care services into five primary categories: physiological, medical, safety, emotional, and self-actualization. The findings reveal that the physiological needs for smart elderly care are the highest among seniors, reaching 85.6%. Medical and safety needs closely follow, both standing at 83.3%. In contrast, the emotional and self-actualization needs are relatively lower, accounting for 17.8% and 11.1%, respectively.

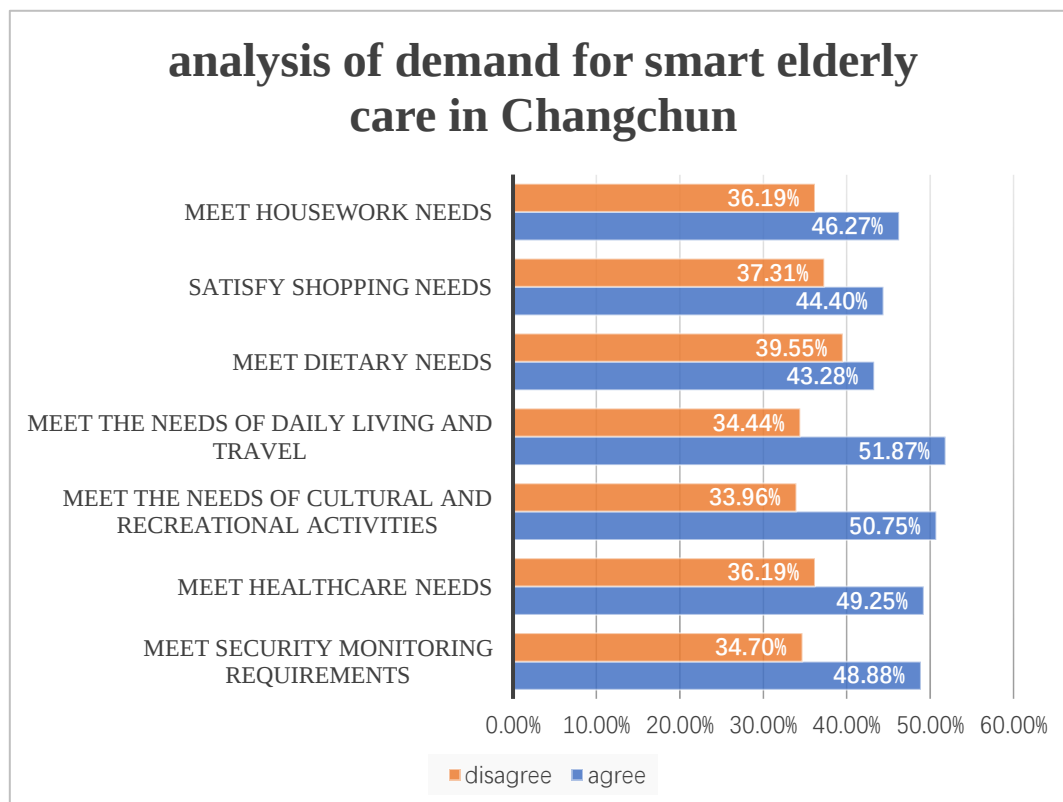


Fig. 2 analysis of demand for smart elderly care in Changchun

As shown in fig.2, the survey [5] indicates that among 227 elderly individuals, a staggering 84.7% expressed a strong willingness to adopt smart elderly care services after their initial exposure to the concept. Notably, the demands for "daily living and mobility," "medical healthcare," and "safety monitoring" services stood out prominently, garnering approval from 86.19%, 85.44%, and 83.58% of the elderly respondents respectively. This heightened demand is primarily attributed to the prevalence of geriatric illnesses and the gradual decline in physical functions. Furthermore, more than 80% of the elderly also exhibited a need for "cultural entertainment," "dietary advice," and "purchasing assistance" services. The survey further reveals that age, personal income level, and the degree of understanding of smart elderly care are significant factors influencing the choice of such services among the elderly. The scope of smart elderly care should not be confined solely to medical and health maintenance but should also extend to enriching spiritual and cultural life and satisfying entertainment needs, ultimately aiming to comprehensively enhance the elderly's happiness index.

3. Research Status of Intelligent Elderly Care

3.1. Analysis of the current situation of intelligent elderly care

Since China first proposed strengthening the informationization of elderly care services in 2011, the smart elderly care industry has gradually developed. In 2017, the smart elderly care industry was incorporated into the national development strategy. In 2021, the "14th Five-Year Plan for the Development of National Aging Causes and Elderly Care Service Systems" was released, explicitly setting a target of achieving 4.5 million nursing beds by 2025 and formulating a series of policies related to smart elderly care. With policy support, the smart elderly care industry has initially formed a vast system. However, due to its extensive scope, it still faces numerous challenges [1].

3.1.1 Smart pension industry policy support

At the national level, in 2011, the State Council issued a document proposing to advance the "Informationization Construction for the Elderly," marking a step towards informationization and intelligentization in China's elderly care industry. This was the first policy document related to smart

elderly care issued by the nation, and subsequently, the government accelerated the top-level design for the industry's development. As of 2023, China has issued 47 national-level policy documents concerning smart elderly care.

At the local level, around 2013, various provinces in China initiated explorations into smart elderly care, however, the distribution of policy promulgation was uneven. Eastern coastal provinces such as Jiangsu, Shanxi, and Henan issued a relatively high number of documents, each exceeding 20, while the northwestern regions saw fewer initiatives. Zhejiang was the first to propose smart elderly care, and most other provinces first mentioned it around 2015.

3.1.2 Development of smart elderly care industry

1. Smart elderly care products and services:

(Wearable health testing equipment, health testing equipment, family doctor follow-up kit, community self-service health testing equipment)
Health management intelligent products

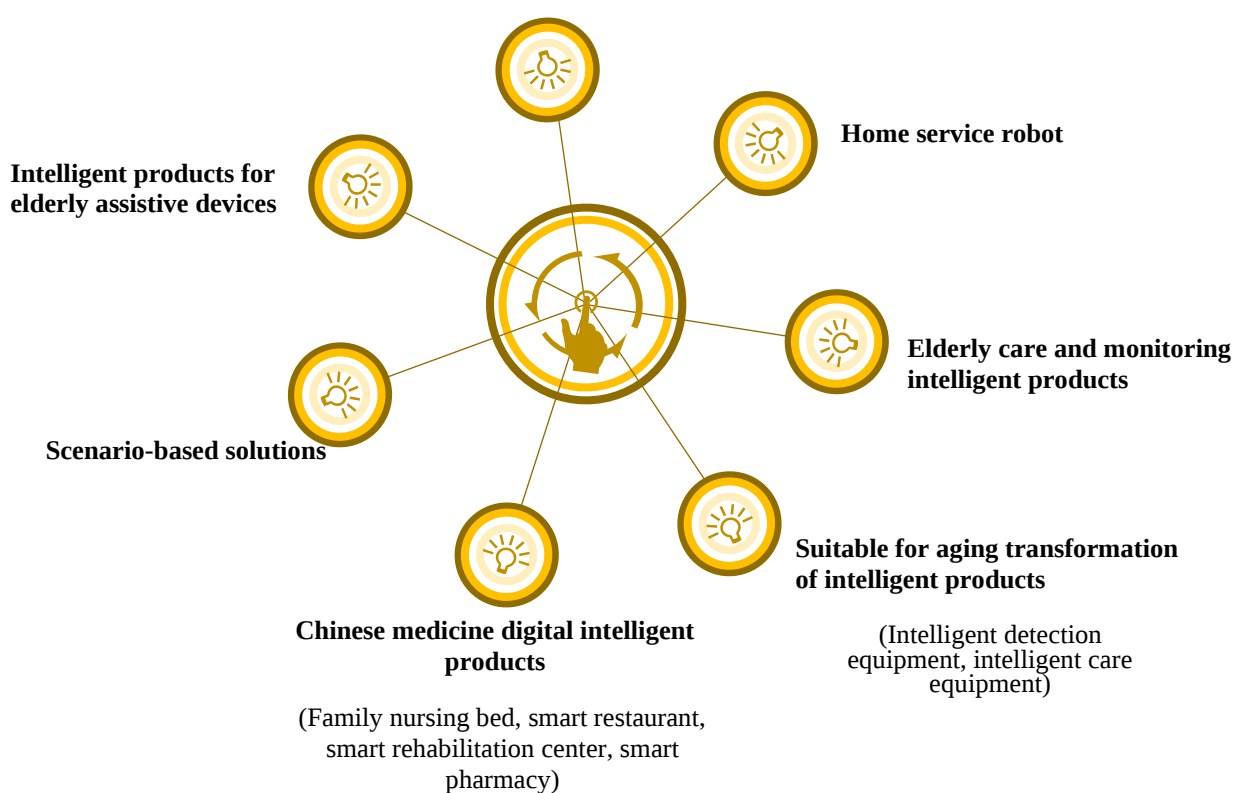


Fig. 3 Smart elderly care products[1]

Fig. 3 shows the distribution of different elderly care devices. The official platform of the Chinese government has released the Promotion Directory of Smart Health and Elderly Care Products and Services (2022 Edition). This directory meticulously categorizes smart elderly care products into seven major types: health management products, elderly assistance devices, elderly care monitoring systems, digital Traditional Chinese Medicine products, household service robots, smart aging-friendly modifications, and detailed scenario-based application solutions (covering five practical scenarios such as home-based elderly care beds and smart elderly-friendly restaurants). Compared to the 2020 edition, the new directory not only introduces a significant new category of "smart aging-friendly modifications" but also expands extensively on "scenario-based application solutions". This

reflects the trend of smart elderly care in multi-industry integration and the profound emphasis on aging-friendly modifications.

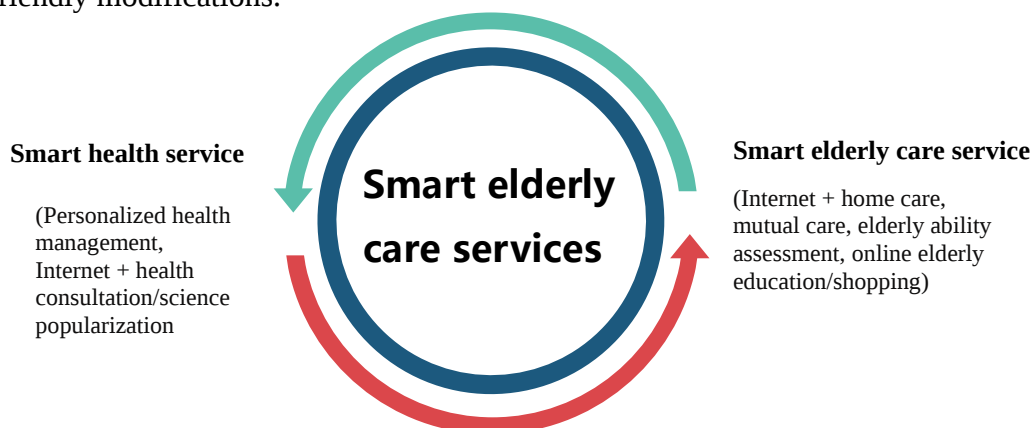


Fig. 4 Smart elderly care services[1]

As shown in fig.4, At the level of smart health and elderly care services, the new edition of the directory merges the previous categories of smart health services and smart elderly care services into a single "smart health service" category, and innovatively introduces new service items such as the "mutual assistance elderly care" model based on big data and blockchain technology, online elderly education and shopping platforms, as well as elderly capability assessments. These adjustments and additions undoubtedly serve as powerful evidence of the steady progress of the "smart elderly care" and "smart assistance for the elderly" initiatives. Table 1 shows the characteristics of different wearable devices.

Table 1. Comparison of different types of wearable devices for the elderly

Type of wearing position	Feature	peculiarity	Representative works
head-mounted	Prompt, help to complete daily tasks, correct wrong behavior, etc	Display information in the user's natural field of view; Using bone conduction or headphones to send private sound signals; It is highly related to the user's visual field and head movement	ADAMAAS smart glasses, Muse 2 Brain sensing headband
wristband	Record daily activities, abnormal alarm, reminder function and real-time monitoring of health status	Small display screen; Easy to measure pulse, blood pressure and other parameters; It is highly closely related to the user's limb movement; Use low-power communication technologies, such as Bluetooth, in conjunction with mobile apps	UnaliWear'sKanega watch; Garmin Vivosmart 3; Fitbit Charge 3; CarePredict's Tempo watch; Reemo Hea1th Smartwatch; Mobi1eHe1p Smart; Freedom Guardian
portable	Real-time monitoring activity, activity tracking function, emergency call function, etc	The display is small; Not worn directly on the body; Can be used as an external device for mobile devices; Use low-power communication technologies, such as Bluetooth, in conjunction with mobile apps	KardiaMobi1e; Amu1yte intelligent monitor; Zibrio's smart sca1e; Bay A1arm Medica1

Clothing type	Positioning lost prevention, sports monitoring health management, fall warning risk warning and safe area warning functions	Generally does not have a display or a small display; Little disruption to daily activities; Wear in conjunction with everyday clothing; Special clothing materials are needed for induction	Qwe11 Wearable Pain Relief Technology Kit; GPS SmartSole; Double chi smart shoes for the elderly
---------------	---	--	--

2. Smart elderly care service system:

The smart elderly care service system relies on a real and accurate basic information database, which encompasses comprehensive data from various aspects including the elderly, their families, institutions, and hospitals. At its core is a stable elderly care service operation system that necessitates the integration of multiple key systems. The operational application systems at the service end need to be directly connected to multiple terminals, with a focus on user-friendliness for elderly users and others. Fig. 5 shows the basic database structure of the elderly service system.

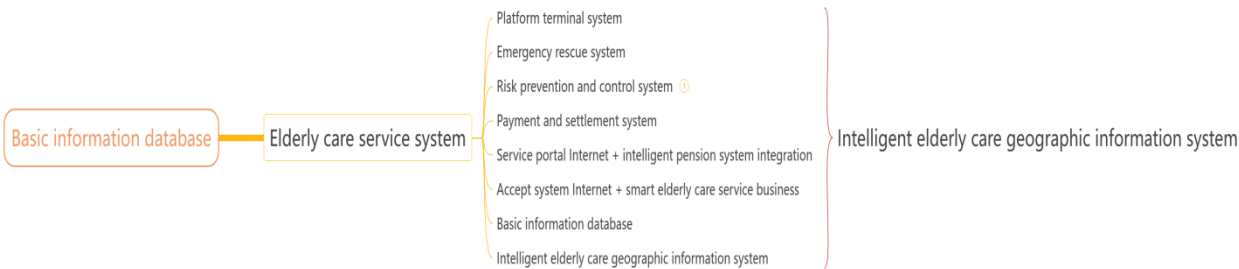


Fig. 5 Basic information database

3.2. Analysis of elderly service needs

3.2.1 Hierarchy of needs theory

Abraham Maslow's hierarchy of needs theory states that human needs are organized into five levels, ranging from basic physiological needs to self-actualization, ascending step by step. Higher-level needs emerge only after the lower-level needs have been met. Fig. 6 shows hierarchy of needs theory.

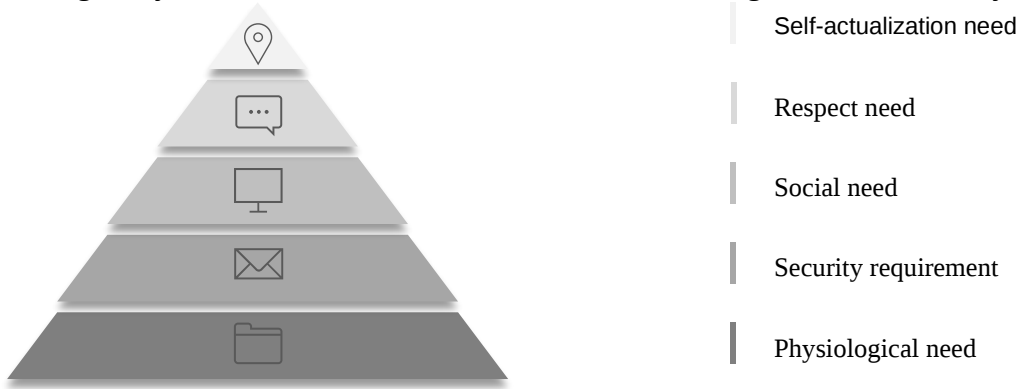


Fig. 6 Hierarchy of needs theory

3.2.2 Demand analysis

By referring to literature [6] and investigating the status quo and needs of social care services for the elderly in Xicheng District of Beijing, the following points can be drawn:

1. There is a strong demand for medical and healthcare services:

Nearly half of the elderly have a need for home visits by healthcare professionals, but the utilization rate is extremely low. Additionally, 46% of the elderly believe that community health service stations cannot meet their daily medical needs.

Over 38% of the elderly express a desire for enhancements in other medical services, such as simplifying procedures and increasing the variety of medications available.

2. Daily Care Needs Urgently Require Attention:

Half of the elderly have a demand for rehabilitation services, and over 23% require home nursing services, yet there is a shortage of communities providing these services. Among daily care services, elderly dining services are the most demanded, followed by accompaniment for medical visits and daily shopping services, however, the coverage of these services is low.

3. Strong Awareness of Social Participation Needs:

Gathering for conversations and watching television are the primary forms of entertainment and leisure for the elderly. Participation in educational training and public welfare activities is relatively low among the elderly, however, 34% of them express a desire to engage in community training.

4. High Demand for Emotional Support:

More than 24% of the elderly express a wish to receive services for chatting and alleviating boredom, yet such services are inadequately provided. The elderly hope to fulfill their emotional needs through regular home visits, telephone calls, peer support arrangements, and other means. Additionally, many elderly individuals wish for their children to visit more often or participate in community activities to share their thoughts and feelings.

5. Moderate Demand for Institutional Elderly Care Services:

Approximately 12.5% of the elderly are willing to choose institutional care, with the majority being middle-aged to younger elderly individuals. The proportion of older and disabled elderly individuals opting for institutional care is relatively low.

6. The Most Pressing Needs for Services Among Disabled Elderly:

Nearly half of disabled elderly individuals require assistance with daily living and personal care. Accessing healthcare services is the greatest challenge for disabled elderly individuals, apart from daily living care. Currently, only 25% of disabled elderly individuals have received specialized services from their communities.

3.3. Application and influence of artificial intelligence technology

3.3.1 The application of artificial intelligence technology in the field of elderly care

1. Enhancing Medical Convenience:

APPs and smart mini-programs, medical assistance services such as registration, consultation, and medication management are provided for the elderly, and a universally accessible electronic medical record system across hospitals is established.

2. Health Management and Nursing:

Utilizing software and hardware equipped with artificial intelligence technology, comprehensive health data is provided for the elderly to assist doctors in disease assessment and consultation, offering data feedback and suggestions for daily nursing and health improvement.

3. Prevention and Treatment of Cognitive Impairment:

Artificial intelligence technology is employed to assess the cognitive status of the elderly and digital therapy is utilized for training purposes.

Intelligent Monitoring:

4. Devices such as surveillance cameras and smart mattresses are used to track the movement patterns and sleep data of elderly individuals living alone, ensuring their safety.

5. Rehabilitation and Nursing Robots:

Rehabilitation robots and nursing robots are utilized to assist the elderly in physical rehabilitation and daily services, such as aiding in walking, mobility, and feeding.

6. Companion Robots and Robot Pets:

These meet the social needs of the elderly by using reminiscence therapy and music therapy to guide them in recalling past events, providing personalized companionship.

3.3.2 The main problems in the application of artificial intelligence technology

1. Imperfections in Big Data and Knowledge Bases:

The elderly population involves a vast amount of data with strong scenario characteristics, and existing databases and knowledge bases are unable to meet the needs of product development and technological iteration.

2. Shortage of Composite Talents:

There is a lack of composite talents who possess expertise in both artificial intelligence and the elderly care sector, which impacts the efficiency of product development.

3. Absence of Formed Business Models:

The application of new technologies and products has not yet formed an effective network of pathways to reach consumers and a viable business model.

4. Privacy Protection and Consumer Rights Safeguarding:

The elderly population generally has a weaker awareness of risk prevention, making the issue of privacy protection around data security even more crucial. It is necessary to guard against security risks associated with the use of artificial intelligence products.

3.3.3 Make good use of artificial intelligence to serve the elderly

1. Policy Support and Encouragement:

Policies should be introduced to encourage the application of artificial intelligence products, regulate technological advancements in the process of development, and foster a favorable environment for nurturing new productive forces in the elderly care sector.

2. Formation of a "Government-Industry-Academia-Research" Collaboration:

The government should coordinate public resources, research institutions should drive technological innovation, enterprises should undertake technology transfer, and academic institutions should intensify research on the needs of the elderly, jointly promoting the application of artificial intelligence technology in the field of elderly care.

3. In-depth Community Promotion:

To break through the "last mile" in the popularization of new products and technologies, smart elderly care products should be actively applied in demonstration projects within streets and communities.

4. Focus on Wellness and Care Robots as a Landmark Product:

Efforts should be made in research, design, production, and promotion centered around wellness and care robots, meeting the needs of the elderly in medical treatment, health management, rehabilitation nursing, and daily companionship.

5. Continuous Advancement of Consumer Rights Protection Systems:

Proactive judgments and risk warnings should be given regarding behaviors and consequences that may harm consumer rights in the application of artificial intelligence technology in the elderly care sector. Consumer rights protection should be promoted through industry self-regulation, credit commitments, and other means.

3.4. Suggestion

3.4.1 Suggestions on promoting the development of smart elderly care services

1. Enhancing Policy Guidance and Information Security Measures

The government must play a pivotal role by refining laws and regulations pertinent to smart elderly care, thereby providing a robust legal framework for safeguarding the information security of seniors. Furthermore, the government ought to introduce an array of citizen-friendly policies, alleviating the financial burdens of the elderly and fostering their enthusiasm for embracing smart elderly care services. Additionally, bolstering regulatory mechanisms to combat deceptive advertising and ensuring that seniors can avail themselves of smart elderly care services in a secure and dependable environment constitutes a vital facet of safeguarding their rights and interests.

2. Advancing Information Platform Development and Smart Product Innovation

To propel the progression of smart elderly care services, the government should forge close collaborations with enterprises, leveraging big data platforms to construct a comprehensive smart elderly care service system. Moreover, fostering active engagement from diverse sectors of society to collectively develop integrated smart elderly care service management software is imperative for augmenting service efficiency. In the realm of product innovation, focus should be placed on simplifying usability to empower the elderly to effortlessly navigate and adopt smart products, thereby elevating their acceptance and utilization rates.

3. Precisely Aligning with Needs and Elevating Service Quality

To propel the progression of smart elderly care services, the government should forge close collaborations with enterprises, leveraging big data platforms to construct a comprehensive smart elderly care service system. Moreover, fostering active engagement from diverse sectors of society to collectively develop integrated smart elderly care service management software is imperative for augmenting service efficiency. In the realm of product innovation, focus should be placed on simplifying usability to empower the elderly to effortlessly navigate and adopt smart products, thereby elevating their acceptance and utilization rates.

3.4.2 Countermeasures to narrow the silver digital divide for the elderly

1. Causes of the Silver Digital Divide

(1) External Factors: Rapid Technological Development and Developers' Preferences

With the rapid development of technology, intelligent devices have become widely accessible, bringing great convenience to people's lives [7]. However, for elderly individuals in rural areas, adapting to these emerging technologies poses a significant challenge. They often struggle to keep pace with the advancements in technology and are unable to operate intelligent devices proficiently. Furthermore, developers of intelligent devices tend to prioritize the needs of younger consumers, neglecting the specific requirements of the elderly population, resulting in a lack of intelligent products suitable for older adults on the market.

(2) Social Factors: Inadequate Communications Infrastructure and Scarcity of Digital Literacy Support

The communications infrastructure in rural areas is relatively underdeveloped, with incomplete network coverage, which limits the opportunities for elderly individuals to access digital services. Additionally, the frequent occurrence of cybercrime has instilled a fear of the online world among the elderly, making them afraid of becoming victims of online fraud. Moreover, the scarcity of digital literacy support is another crucial factor contributing to the silver digital divide. With young people often migrating for work or engrossed in their own lives, elderly individuals lack the necessary technical support and learning opportunities to effectively integrate into the digital society.

(3) Personal Factors of the Elderly: Low Educational Attainment and Declining Physiological Functions

The elderly themselves often have lower educational attainment, making it difficult for them to master the basic operations of intelligent devices. Additionally, as they age, their physiological functions gradually decline, including hearing, vision, comprehension, and learning abilities, which further increases the difficulty of using digital products. Furthermore, psychological factors also play a significant role in preventing the elderly from bridging the digital divide. Their distrust of digital technology, fear of mobile devices, and lack of confidence due to memory decline all make them feel overwhelmed when confronted with digital products.

2. Counterplan

President Xi Jinping has pointed out that "sharing the fruits of reform and development among the broad masses of the people is an essential requirement of socialism and an important manifestation of our party's fundamental purpose of serving the people wholeheartedly."

(1) Government Level:

The government should strive to improve the communications infrastructure in rural areas, ensuring comprehensive broadband network coverage and vigorously promoting the construction of digital villages. Additionally, it should formulate and refine laws and policies to protect the online

rights and interests of the elderly, and enhance their cybersecurity awareness by conducting anti-fraud and anti-scam promotional activities. Furthermore, the government should retain appropriate manual service windows or services to assist the elderly in smoothly transitioning and adapting to digital life. To meet the learning needs of the elderly, the government should also offer suitable learning courses and services tailored for them, teaching relevant knowledge and operational skills, and establishing personnel for answering questions to help them overcome difficulties encountered when using digital products.

(2) Social Level:

Manufacturers and developers of intelligent devices should prioritize the usage needs of the elderly from the outset, developing apps suitable for them by simplifying operational procedures and optimizing human-computer interaction interfaces. Meanwhile, all sectors of society should work together to reduce or exempt rural elderly individuals from internet usage fees or provide mobile phones and other devices free of charge, thereby enhancing their internet access capabilities. Additionally, social organizations and volunteers can actively conduct digital skills training and tutoring activities targeted at the elderly, helping them better integrate into the digital society and enjoy the conveniences brought by digitization.

(3) Personal Level of the Elderly:

The elderly should proactively change their mindset, actively embrace the era of intelligence, exert their subjective initiative, and diligently learn relevant digital technologies and skills. At the same time, family members and relatives should provide the elderly with more support and assistance, encouraging them to use digital products and services. With the companionship and guidance of family members, the elderly can face digital challenges with greater confidence, enjoying the fun and conveniences brought by digital life.

3.4.3 Suggestions on promoting the healthy development of education for the aged

1. Government Support:

The government must prioritize the advancement of elderly education, augmenting its investment to establish a greater number of educational institutions and platforms tailored for seniors. This endeavor should be complemented by the formulation of policies that incentivize societal participation, fostering a multifaceted educational ecosystem that caters to the diverse learning aspirations of the elderly.

2. Course Content:

In devising the curriculum for elderly education, it is imperative to align content with the interests and requirements of this demographic. Courses should encompass a broad spectrum, including digital literacy, health and wellness, cultural arts, and more, aimed at equipping seniors with fresh knowledge and skills to enrich their lives. The curriculum should blend practicality with enjoyment, ensuring that learners find delight and fulfillment in their educational pursuits, thereby igniting their passion for lifelong learning.

3. Teaching Methods:

The efficacy of elderly education hinges significantly on its instructional approach. A seamless integration of online and offline methodologies is essential to accommodate the learning preferences of seniors. Online platforms eliminate geographical and temporal barriers, enabling flexible learning from any location with internet access. Conversely, offline sessions offer hands-on experiences and social interactions, enhancing the learning journey. Interactive and practical teaching strategies, such as group discussions and practical exercises, should be employed to maximize learning outcomes and ensure a fulfilling educational experience.

4. Teacher Resources:

The quality of the teaching faculty is a pivotal factor in the success of elderly education. Efforts must be directed towards elevating the professional expertise and instructional prowess of educators, ensuring they possess the requisite skills and educational insight. Additionally, fostering collaboration with volunteers and community members can broaden the pool of resources and support

available to seniors, cultivating a diverse and highly qualified teaching force dedicated to elderly education.

4. Conclusion

In the contemporary discourse on harnessing artificial intelligence (AI) technology to augment support and services for the elderly, extensive literature reveals significant advancements across multiple domains tailored to this demographic. Specifically, in the realm of career support, AI-powered career recommendation platforms have been designed to present personalized career pathways and tailored skills training programs to elderly individuals desiring to remain professionally active, thereby facilitating seamless career transitions during their later years.

Moreover, in the crucial domain of health monitoring and care, AI-driven interactive intelligent robots have demonstrated remarkable capabilities. These robots not only continuously monitor the health status of the elderly but also offer remote medical consultations and provide emotional support, ultimately contributing to a substantial improvement in their overall quality of life.

Despite these promising developments, several factors, including the complexity of technological operations, perceptions of technological worth, and individual health statuses, continue to influence the adoption and utilization of these technologies among the elderly. Consequently, future research endeavors should prioritize enhancing the user-friendliness of technology, fostering digital literacy among the elderly, and exploring innovative strategies to bolster their acceptance and effective utilization of AI technology.

As technological advancements continue to unfold, there is an anticipation for the emergence of more sophisticated AI applications. These could include more intelligent health monitoring devices and more personalized career recommendation systems, all tailored to meet the diverse needs of the elderly. By doing so, these innovations can significantly contribute to enabling elderly individuals to lead healthy, fulfilling, and dignified lives during their twilight years.

References

- [1] Wang A & Li A H. Analysis of development status, problems and countermeasures of China's intelligent pension industry. Scientific, economic, social, 2024, (01), 28 to 40. The doi: 10.19946 / j.i SSN. 1006-2815.2024.01.004.
- [2] Baby Chithra R, & Joy S. Patient Monitoring System for Elderly Care using AI Robot. In Proceedings of the Relevant Conference or Journal Name (Volume Number, if available). IEEE. 2022.
- [3] Zhu Y Z. Analysis on the application status of wearable devices for the elderly in the context of smart elderly care. Science and Technology Innovation and Application, 2023, (05), 151-155.doi:10.19981/j.CN23-1581/G3.2023.05.038.
- [4] Zhou C C. Investigation and countermeasure analysis on the demand of smart elderly care service industry -- A case study of Changzhou City. China Science and Technology Investment, 2024, (22),58-61.
- [5] He C Y, Sun D W & Li W. Demand analysis and optimization path of smart elderly care in Changchun. Science and technology information, 2024, (07), 249-252. The doi: 10.16661 / j.carol carroll nki. 1672-3791.2312-5042-8402.
- [6] Song W D & Zhao W. What the elderly need most. China Society News, 2014, 007.Shiwani T, Relton S, Evans R, Kale A, Heaven A, Clegg A, ... & Todd O. New Horizons in artificial intelligence in the healthcare of older people. Ageing Research Reviews. 2023.
- [7] Wang W Z. Adversity and crossing over: A realistic analysis of the rural silver digital divide in the era of artificial intelligence. Rural Practical Technology, 2024, (03), 7-9.