

New Exploration of Smart Elderly Care Development under the Background of “Internet +”

Chunyan Liu^{1*}

¹ Department of Labor and Social Security, Faculty of Law, Guang Dong Peizheng College, Shantou, Guangdong, China

Email Address

253130376@qq.com (Chunyan Liu)

*Correspondence: 253130376@qq.com

Received: 25 August 2023; Accepted: 14 September 2023; Published: 23 October 2023

Abstract:

Smart elderly care has innovative significance in terms of value concept, technology application and resource allocation, which effectively responds to the problem of aging population, and also becomes the driving force to improve the high-quality development of elderly care services. In the context of “Internet +”, the development status of smart pension is analyzed from four aspects: smart pension supporting policies, smart pension pilot demonstration sites, smart pension platform and smart pension data, and the problems existing in the development and operation of smart pension are analyzed. Optimization countermeasures are proposed from five aspects: enhancing the awareness of smart elderly care, building a professional service team, building a resource sharing service platform, building a smart product market and strengthening smart information supervision, so as to provide references for the formulation of feasible and sustainable smart elderly care service plans for the elderly.

Keywords:

“Internet +”, Intelligent Elderly Care, Smart Elderly Care Platform

1. Introduction

By the end of 2021, the number of elderly people aged 60 and above in China reached 267 million, accounting for 18.9% of the country's total population. The rapid aging of the population and the increasing number of disabled and mentally retarded elderly people undoubtedly pose a huge challenge to the traditional aging industry, and the intelligent upgrading of the elderly care industry is of great importance [1]. In order to integrate information technology into elderly care services and improve the quality and utilization efficiency of elderly care service resources, the state carries out top-level design from the policy aspect to support the development of the smart elderly care industry. Smart elderly care refers to the sensor network system and information platform for the elderly at home, communities and elderly care institutions, and on this basis to provide real-time, fast, efficient, low-cost, iot, interconnected, intelligent elderly care services.

2. The Development Status of Smart Elderly Care Under the Background of “Internet +”

2.1. Smart elderly care supporting policies to guide and support

In order to actively respond to the aging population, on the basis of learning advanced experience at home and abroad, investigating the domestic elderly care service market, and listening to the opinions and suggestions of relevant experts, the Ministry of Industry and Information Technology, the Ministry of Civil Affairs, and the National Health and Health Commission announced the “Smart Health elderly Care Products and Services Promotion Catalog (2022 version)”, and launched the “Smart Health care products and services Promotion catalog (2022 edition) in 2023”[2]; In 2023, the General office (office) of 13 departments including the Ministry of Commerce issued the notice of the Three-year Action Plan for Comprehensively Promoting the construction of the City's Quarter Hour Convenient Living Circle (2023-2025), carried out systematic planning and design, and optimized the commercial layout of the community's smart pension policy in China and 31 provinces and cities in 2023[3]. In the same year, the Ministry of Commerce and other 13 departments on a number of measures to promote home consumption notice, proposed to support the development of artificial intelligence enterprise technology, accelerate the research and development of furniture products such as smart health care, smart home appliances and smart security, through the transformation of home indoor equipment to improve the level of home aging, the relevant policies of smart pension greatly promoted the development process of China's smart pension.

2.2. Smart elderly care pilot demonstration sites are blooming everywhere

With the encouragement and support of the policy, smart elderly care pilots have blossomed all over the country. In 2022, the General Office of the Ministry of Industry and Information Technology, the General Office of the Ministry of Civil Affairs, and the General Office of the National Health and Health Commission jointly announced the 2021 smart health elderly care application pilot demonstration list, and a total of 35 demonstration enterprises, 2 demonstration parks, 45 demonstration streets (townships), and 17 demonstration bases were selected. The implementation of the smart elderly care demonstration construction is an important prerequisite and foundation for the development and growth of the smart elderly care industry, and is related to the success or failure of the smart elderly care construction[4]. The demonstration construction of smart elderly care not only implements the main responsibility of smart elderly care construction, but also guides and promotes the direction of smart elderly care industry through the construction experience of pilot areas, provides a practice base and valuable experience reference for the construction of smart elderly care service system, and pushes the excellent pilot experience of smart elderly care to the whole country[5].

2.3. The smart pension platform breaks space restrictions and connects multiple resource entities

Smart elderly care involves the government, elderly groups, medical institutions, elderly services and smart equipment suppliers, elderly care institutions, communities and non-profit organizations, etc. The effective integration of multi-subjects is a winning weapon for the smooth operation of smart elderly care services[6]. Smart elderly care relies on the needs of community home care, builds a smart elderly care

service platform based on big data and cloud computing, connects multiple resource entities, breaks the limitations of time and space, integrates the data information of more than 40,000 elderly care institutions, 1.033 million medical and health institutions and 267 million elderly people across the country, and accurately matching smart elderly care services and needs[7]. Through smart tools, the elderly can enjoy efficient embedded pension at home.

2.4. Smart elderly care to achieve visual data, remote monitoring

By the end of 2022, China has 1.032 billion Internet users, 119 million elderly Internet users, of which 62 million elderly Internet users can independently complete the purchase of daily necessities, accounting for 6%; The number of elderly netizens who can independently search for information and other online activities is 55 million, accounting for 5.3%, which is an important basis for promoting the smart elderly care service model[8]. The smart comprehensive service management system for the elderly realizes the visual sharing of information of various elderly service institutions. The smart elderly integrates the basic information of elderly service institutions such as nursing homes, elderly apartments and nursing homes, and transmits data information such as operation, charging standards, service personnel and location distribution to the elderly through the Internet and other technologies. Smart elderly care not only realizes the visualization of elderly care data information, but also monitors the real-time service status within the institution, and children do not have to visit the nursing home in person, but also smart devices or smart elderly care service monitoring platforms can understand the status quo of the elderly in real time. The visual development of smart elderly care services effectively reduces the security risks of the elderly alone, and realizes the remote monitoring of the disabled and mentally retarded elderly.

2.5. Smart elderly care connects online and offline to achieve a “15-minute” community service circle

Relying on information technology such as the Internet and the Internet of Things, smart elderly care relies on big data for the elderly at home, and connects service institutions such as hospitals, elderly care institutions, market enterprises, and social organizations to create a smart elderly care platform with online and offline connectivity. If you want to achieve a “15-minute” community service circle, enjoy smart elderly care services at home, and smart furniture is essential for aging transformation. In 2022, the monitoring data of Shanghai elderly care service was released, and 6,804 homes in Shanghai were renovated to fit the aging environment within a year[9]. Guangdong has promoted home-based community services for elderly care, and implemented age-appropriate renovations for 16,000 families of elderly people with special difficulties, and built more than 17,000 beds for family elderly care. Urumqi city provides home bed construction for disabled elderly with economic difficulties, transforms smart mattresses to monitor the health signs of the elderly, which involves the transformation of home environment hardware facilities, collects data information of the elderly through smart devices, and connects big data, intelligent platforms and service institutions to achieve a “15-minute” community service circle. The “last meter” of home care service was opened.

3. The Main Difficulties of Smart Elderly Care Under the Background of “Internet +”

3.1. The elderly have limited cognition and low acceptance of Smart Elderly Care

The elderly's acceptance of smart pension affects the vigorous development of the smart pension industry to a certain extent. The “14th Five-Year Plan” urban and rural community Service System construction Plan specifies that about 5,000 smart communities (villages) will be built by 2025, and smart communities are still under construction, indicating that there are still more elderly people in the country who have not yet been exposed to smart old-age care, and their awareness of smart old-age care is limited. Secondly, the promotion of smart elderly care benefits from intelligent equipment and scientific and technological means, and the use of smart devices is essential for the elderly to enjoy a more convenient and intelligent old life. By the end of 2021, although more than 90% of elderly netizens in the elderly group can use smart devices such as mobile phones to surf the Internet, less than 10% of elderly people can use wearable devices such as smart wristbands or smart furniture devices to surf the Internet, indicating that the elderly have a low use rate of smart products.

3.2. Professional talents are scarce, and the quality of service team needs to be improved

With the development and operation of the long-term care insurance system, 267 million elderly people and 40 million disabled and semi-disabled elderly people can enjoy on-site nursing services at home, but the number and quality of existing smart elderly care service personnel are far from meeting the needs of elderly people. In terms of quantity, there are only 300,000 elderly care practitioners, and the ratio between nursing staff and the elderly is seriously insufficient, which is 1:112; From the quality level, since 2019, nursing practitioners have been relaxed and adjusted to “no education requirement”, any educational group can engage in smart elderly care services, and the overall educational level of the smart elderly care team is low, and the certificate holding rate is relatively reduced[10]. Limited by the generally low salary level, the mobility of nursing service personnel in most pension institutions is relatively large, and the stable employment is the middle-aged and elderly people aged 40-60 years old, which further restricts the construction of pension service team.

3.3. The integration degree of smart elderly care resources is low, and the supply and demand match is not in place

The accurate matching of smart elderly care supply and demand and the effective guarantee of service quality depend on the high integration of smart elderly care resources. However, the current integration of smart elderly care resources is not ideal. For example, the integration level of smart elderly care online platform and offline service is relatively low, and there is a certain gap between the smart elderly care services provided and the actual services needed by the elderly. The elderly care services provided by the intelligent service platform are not closely related to the daily life scenes of the elderly. The reasons are mainly reflected in the following two aspects: First, in the elderly living areas such as community institutions and families, the application popularity of smart devices and Internet technology is not high, by the end of 2021, less than 10% of the elderly use smart home and wearable devices to access the Internet, and the current smart products are also slightly insufficient; Second, the construction of the smart elderly care data information sharing platform is

not perfect, the personal information of the elderly has not been fully synchronized to the smart elderly care platform, and the information of the offline elderly care service institutions has not been passed to the hands of the elderly through the smart platform, and there is a fault in information connectivity. Although the number of smart pension communities in the country exceeds 100,000, it only accounts for more than 10% of the pension service market, among which the number of smart pension communities in the eastern region is relatively large, while the number of smart pension communities in the western region is relatively small.

3.4. The development of smart pension products is not mature, and the product research and development ability is weak

The smart elderly care platform is an indispensable key part of the operation of smart elderly care, which affects the operational efficiency of smart elderly care services. At present, the quality of the smart elderly care products circulating on the market is uneven, and the accurate qualitative data collected and the ability to analyze and integrate product data need to be strengthened. For example, the accuracy of the measurement of blood oxygen and heart rate by the smart bracelet has not maintained a stable level. In recent years, the development of smart elderly care products has advanced by leaps and bounds, and there are many kinds of health management equipment, safety management equipment and intelligent assistance equipment, but the domestic smart products are relatively single, mostly smart bracelets and intelligent detectors, while the research and development ability of relatively complex safety management or health management equipment is weak, and relatively few products can be used. This makes the high level of intelligent elderly care still stay at the theoretical level, and the current "telemedicine" can not meet the needs of the elderly.

3.5. Intelligent information technology is not mature, and data supervision is not in place

Under the mode of smart pension, the smart pension platform needs to collect and sort out data on the health management of the elderly, and in this process, the private personal information of the elderly is at risk of being leaked. The smart pension platform is still in the early stage of construction, key technologies such as big data and information security are still insufficient, and the smart pension industry has not stipulated a unified data management standard at present, and the management methods are uneven, and the risk of information leakage is greater. The elderly and their children lack standardized operation in the process of inputting personal health and property information, and once the information is leaked, it will seriously harm the personal interests of the elderly. According to the "Research Report on the Internet behavior of middle-aged and elderly groups in 2021", "personal information leakage" is the most worried problem of middle-aged and elderly groups when using apps, accounting for 90.2%. It can be seen that middle-aged and elderly people attach great importance to personal privacy, and protecting private information according to law is an urgent problem to be solved in the development of smart elderly care services.

4. Countermeasures and Suggestions for the Development of Smart Elderly Care Under the Background of “Internet +”

4.1. Help the elderly to cross the “digital divide” and enhance the awareness of smart elderly care

To crack the intelligent gap faced by the elderly and help the elderly enjoy the intelligent pension convenience brought by scientific and technological progress, we can start from the following two aspects: The first is the online and offline synchronous learning of smart help for the elderly, relying on the offline “smart Help for the elderly” project carried out by local communities and senior universities, as well as the online learning exchange platform established by the National Open University and other subjects, to achieve the integration of online and offline smart help for the elderly. Second, communities around the country actively carry out smart elder training activities, such as carrying out smart training courses to train the elderly to use smart devices to upload personal health information, consult online elderly care service information, and place online orders, so that the elderly can master the necessary skills for smart elderly care. Secondly, the state and society should strengthen the relevant publicity of smart elderly care services, popularize the information of smart elderly care services in all aspects, such as Weibo and wechat, advertising leaflets, offline activities, etc., so that the concept of smart elderly care will be deeply rooted in people's hearts and improve the cognition and acceptance of smart elderly care.

4.2. Accurately train intelligent elderly care service talents and build a professional service team

To improve the professionalism of the smart elderly care service team, first, professional colleges and universities accurately train smart elderly care service talents, and increase the training of professional talents such as elderly care services, medical care, and health management; Strengthen the merger of schools and enterprises, invite senior intelligent elderly care practitioners to join the school to impart experience, and college students can also actively engage in social practice activities and accumulate professional experience in practice. The second is to improve the vocational skills training activities of intelligent elderly care employees, set up training bases, and improve the professional skills of intelligent elderly care consultants and medical service personnel. The third is to increase the financial investment in smart elderly care services, effectively improve the salary level of talents in the industry, attract more professionals to engage in the industry from the income level, especially senior talents with professional certificates, and improve the financial treatment simultaneously is a strong backing for the construction of professional teams.

4.3. Build a resource sharing platform and improve the construction of big data for smart elderly care

To eliminate the problems of low integration of smart elderly care resources and inadequate supply and demand matching, it is necessary to build a comprehensive, multi-subject, multi-faceted resource sharing service platform. The intelligent elderly care resource sharing platform is composed of three levels: perception layer, business operation and management layer, and application layer. As shown in Figure 1, the sensing layer collects first-hand health data of the elderly through smart devices such

as smart wristbands, sphygmomanometer, blood glucose meter, one-button pager, and smart mattress. The business operation and management support layer is mainly responsible for basic data management and supply and demand deployment of elderly care services. Basic data management involves information management of elderly files, medical staff, service providers and volunteers. The supply and demand deployment of elderly care services involves four services: health management (such as health examination and health assessment), life services (such as nutrition meal delivery and commodity purchase), safety protection (such as emergency call and security alarm), and spiritual entertainment (such as micro chat and care video). Through wechat public accounts, community official websites, mobile terminal apps of various roles (such as the elderly and their relatives, service providers, medical staff, volunteers) and other channels, the application layer realizes the supply and demand deployment of elderly care services for various subjects and platforms, and provides personalized services for different elderly groups. The smart elderly care resource sharing service platform unites families, communities, service providers, and medical personnel to effectively connect the needs of the elderly with professional services, and realize the integration of big data for smart elderly care.

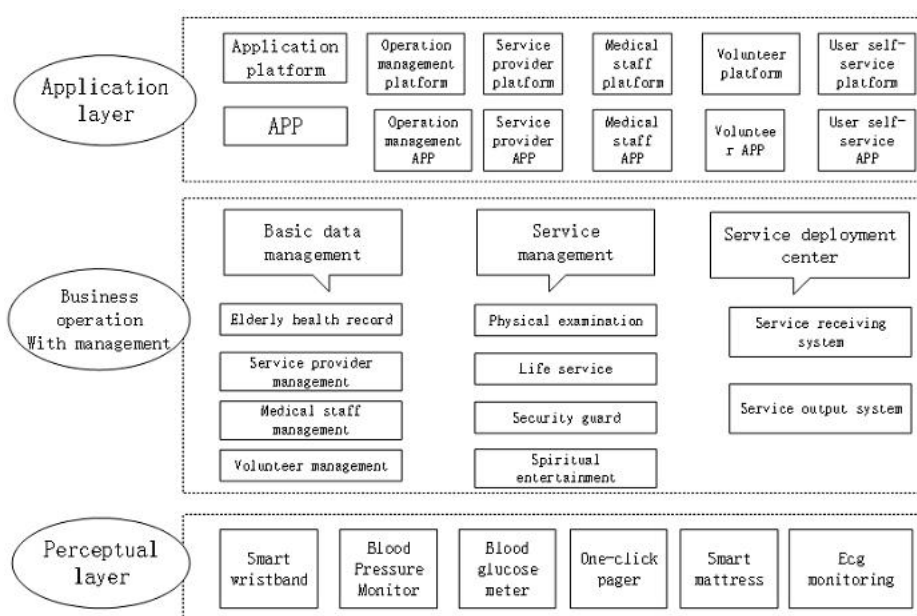


Figure 1. Architecture diagram of intelligent elderly care resource sharing platform.

4.4. Build a smart product market with health management, security and intelligent help

At present, there are fewer types of smart elderly care products, which cannot meet the market demand, and it is necessary to build a smart product market that includes health management, safety and security, and intelligent assistance. The first is health management equipment, such as intelligent blood pressure meter, intelligent blood glucose meter, intelligent thermometer, etc., which can monitor the physical condition of the elderly in real time and prevent diseases in time; The smart mattress can monitor the sleep state of the elderly in real time through pressure sensors, weight sensors and other technologies, and provide sleep quality assessment and improvement suggestions; The smart sports bracelet can record the exercise data of the elderly, such as the number of steps, calories consumed, etc., to help the elderly maintain a healthy lifestyle. The second is security equipment, For example, smart

door locks, the elderly do not need to carry keys, open the door through fingerprints, passwords, etc., to avoid the embarrassing situation of losing the key or forgetting the key; Intelligent smoke alarm, once the smoke is detected, can issue an alarm in time to avoid the occurrence of fire. The third is intelligent power equipment, such as intelligent voice assistant, the elderly can control home equipment through voice commands, such as turning on the TV, adjusting the light, etc. Intelligent rehabilitation trainers, such as intelligent step machines, intelligent rehabilitation vehicles, etc., can help the elderly to carry out rehabilitation training; Smart home control center, through smart phones and other mobile devices, can control home equipment and home environment, such as turning on air conditioning, adjusting humidity and so on.

4.5. Improve legal construction and strengthen information security supervision of smart elderly care

The construction of smart elderly care should actively play the role of the government and the market, realize the dynamic supervision function of the government and the market, and urge the healthy development of the smart elderly care industry. On the one hand, strengthen the data security protection of the market supervision information system, enhance the ability to prevent and control security risks, protect personal information, in accordance with the requirements of the provincial bureau and Municipal Committee network information Office notice, strengthen the network security work on the original basis, in accordance with the principle of “who is in charge of who is responsible, who is responsible for who uses who is responsible, who makes the release who is responsible”, set up a special class to strengthen the protection of personal information for smart elderly care. Strictly implement responsibilities, carry out special cleaning work, and eliminate risks and hidden dangers. On the other hand, strengthen the publicity and education related to network security and personal information protection, strengthen the awareness of the elderly's smart pension security responsibility, and effectively implement security management and responsibilities. If there is information leakage of the elderly during the operation of the smart elderly care, check and clean up the information leakage situation, and conduct a comprehensive inspection of the self-built information system and maintenance and management of the data, focus on the risk of personal information data leakage, find problems, immediately rectify, and eliminate security risks in time.

5. Conclusions

Smart elderly care has innovative significance in terms of value concept, technology application and resource allocation, which is a necessary factor for upgrading the traditional elderly care model and optimizing the system, and is also an innovation channel to cope with the aging population. Although smart elderly care has injected new vitality into the cause of elderly care, if it wants to achieve long-term development, it should continue to give full play to the advantages of information technology, rationally use information technology such as the Internet, logistics network and big data, actively promote the integrated development of multiple subjects, build a team of professional talents, enrich the types of smart products, and improve relevant laws and regulations of information supervision, so that the elderly can truly achieve healthy aging. Enjoy the old age security life.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

References

- [1] Zhao, Y.; Sazlina, S.G.; Rokhani, F.Z; et al. The expectations and acceptability of a smart nursing home model among Chinese elderly people: a mixed methods study protocol. *PLoS One*, 2021, 16(8), 255865.
- [2] Jeongjy; Jeonjh; Baekh; et al. Smart care based on telemonitor - ing and telemedicine for type 2 diabetes care: multi-center randomized controlled trial. *Telemed J E Health*, 2018, 24(8), 604-613.
- [3] Tian, H. Thinking on the development of pension institutions in Urumqi under the background of population aging. *Journal of Party School of the CPC Urumqi Municipal Committee*, 2022, 02, 6-68.
- [4] Tian, Y. Discussion on “Internet +” community smart elderly care service model. *Cooperative Economy and Technology*, 2022, 22, 170-172.
- [5] Wu, X. Development trend, realistic dilemma and optimization path of smart pension industry. *East China Economic Management*, 2019, 35(7), 1-9.
- [6] Zhang, H.X.; Jin, A. Optimization path of smart elderly care service from the perspective of social work. *Journal of Changchun University of Science and Technology (Social Science Edition)*, 2021, 34(6), 81-84.
- [7] Li, S.S.; Han, S.F; et al. A visual analysis of the research hotspots of elderly care services in the United States. *Nursing Research*, 2019, 33(10), 1686-1691.
- [8] Ge, Y.; Tang, A.L.; Xu, F.L; et al. Qualitative study on the willingness of nursing staff to participate in “Internet + nursing service”. *Soft Science of Health*, 2022, 36(6), 89-92.
- [9] Hou, H.P.; Wei, H.; Wang, Y.C; et al. Research on the construction path of intelligent health platform for the elderly in China. *Engineering Science*, 2022, 24(2), 170-178.
- [10] Li, J.; Liu, Y.; Yang, L.M. Research on the path of promoting the construction of smart elderly care in Tangshan. *Journal of North China University of Technology (Social Sciences Edition)*, 2021, 21(03), 57-60.



© 2023 by the author(s); licensee International Technology and Science Publications (ITS), this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (<http://creativecommons.org/licenses/by/4.0/>)