Research on the Development and Countermeasures of Smart Elderly Care Demand in Chongqing

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Abstract. The elderly population aged 60 and above in Chongqing ranks second in the country, with an increasing aging population and strong demand in the smart elderly care market. This article distributed a questionnaire to the region of Chongqing to investigate the opinions and suggestions of young and elderly people in various districts and counties of Chongqing on smart elderly care, including their awareness and satisfaction with smart elderly care in Chongqing. A multidimensional analysis was conducted from the opinions and suggestions of different age groups. At present, Chongqing's understanding of smart elderly care is relatively shallow, with a high demand for smart elderly care products and services, and limited market supply. Additionally, there is a lack of professional composite service talents in the smart elderly care industry; At present, community services place more emphasis on traditional household services such as "indoor cleaning" and "indoor maintenance", while lacking targeted services such as medical care, spiritual entertainment, and psychological comfort. Therefore, solutions are proposed to enhance the awareness of intelligent elderly care among all age groups, strengthen professional talent skills training, and increase community spiritual care and intelligent elderly care projects.

1 Introduction

In the seventh population census 2021, Chongqing ranked second in the country with a proportion of 17.08% in the comparison of the proportion of people aged 65 and above, and 17.43% in the proportion of people aged 65 and above, further deepening the aging population.

The so-called smart elderly care refers to the use of advanced IT technology to develop an IoT system platform for elderly people at home, communities, and institutions, providing real-time, fast, efficient, IoT, and intelligent elderly care services. By 2020, a smart health and elderly care industry system covering the entire life cycle has been basically formed, indicating that smart elderly care has begun to rise to the national strategic level. Many supportive infrastructure and policy content for smart elderly care are not comprehensive enough to meet the continuously growing demand for smart elderly care[1].

In future development, the smart elderly care industry, as a new economic growth point in the aging society, will transform the pressure of population aging into the driving force of economic growth. Smart elderly care creates an information-based elderly care service system from multiple perspectives, including remote monitoring, real-time positioning, and unified platform information exchange, through technological means, to meet the modern, scientific, and humanized industrial needs of the elderly and their families[2]. By breaking through the difficulties and bottlenecks in home based care, community based care, and institutional care through technology, and coordinating and balancing China's elderly care model with home based care as the main body, community based care, and institutional support, we can effectively meet the growing demand and desire for higher quality services among different age groups, alleviate the supply contradiction of the elderly care industry, and solve social elderly care problems. Therefore, it is necessary to conduct in-depth research on the willingness and influencing factors of various age groups, based on which efforts can be made on the supply side to better meet people's multi-level and diversified elderly care needs.

2 Research status

With the support of the government and people from all walks of life in some cities in China, smart elderly care has also begun to take shape, and many excellent projects have been implemented. Like the smart elderly care park jointly created by Ping An Smart Elderly Care and World Alliance Xingye in Shenzhen - Yikang Home; The first smart elderly care demonstration station in Beijing has been officially put into use, with only one mobile phone available for online appointments, monitoring data viewing, elderly safety protection, and other functions; And one of the most representative application scenarios for smart elderly care at the 2019 World Artificial Intelligence Conference - the Zhoujiadu
Street Community Comprehensive Elderly Service Center, becoming a popular check-in place for community elderly people; Jiaxing Municipal Civil Affairs Bureau, together with Chunxiantang, has built a one-stop intelligent elderly care comprehensive information service platform of "Internet plus" to provide services such as service appointment, policy consultation and elderly care consulting for Jiaxing elderly[3].

2.1 A Study on the Factors Influencing the Demand for Smart Elderly Care Services

Li Yange, Gao Lin analyzed the influencing factors of their demand for smart elderly care services. The study found that the main factors affecting elderly people's choice of smart elderly care services include economic status, number of children, education level, number of elderly people, health self-evaluation, and mental state. On the basis of summarizing the existing research results on smart elderly care needs, Liu Yongjie analyzed four factors that affect elderly care needs, namely cognition and concepts, normative standards, ease of operation, and privacy security, and proposed relevant suggestions.

2.2 Literature review

Smart elderly care is still in its infancy in China, with a relatively weak foundation. Although its development speed is fast, its research perspective, scope, and methods are not perfect. Smart elderly care, with its unique advantages of combining information technology and the ability to integrate with any other elderly care model, is destined to become the mainstream elderly care model in the future. And as the elderly population is constantly changing, with more and more young and middle-aged people growing up with the Internet entering the elderly queue, smart elderly care will have broader development space. In future development, we should consider the smart elderly care industry as a new economic growth point for an aging society, transforming the pressure of population aging into a driving force for economic growth[4]. Therefore, this article provides a deep and concrete understanding of the willingness and influencing factors of various age groups, based on which efforts can be made on the supply side to better meet people's multi-level and diversified elderly care needs, and continuously promote the development of China's smart elderly care industry.

3 Survey and Analysis of the Demand for Smart Elderly Care in Chongqing

3.1 Survey content

In the Chongqing region, investigate the opinions and suggestions of young and elderly people in various districts and counties of Chongqing on smart elderly care:

a. Investigate the current status and satisfaction of elderly care methods;

b. Understand people's current understanding, channels of understanding, and acceptance of smart elderly care;

c. Understand people's current and future demand for smart elderly care services, as well as the degree of demand for different smart elderly care service products. Conduct multidimensional analysis based on the opinions and suggestions of different age groups, in order to provide a better intelligent elderly care model and meet people's needs for elderly care.

3.2 Survey methods

3.2.1 Stratified sampling

This survey mainly adopts α Reliability coefficient method analysis, using SPSS statistical analysis software. Firstly, use stratified sampling method to stratify the population. Chongqing is divided into the main city and various districts and counties. The main urban areas are Yuzhong District, Jiangbei District, Nan'an District, Jiulongpo District, Shapingba District, Dadukou District, Beibei District, Yuebei District, and Banan District. Except for the main city, all districts and counties, including Fuling District, Kaizhou District, Liangping District, Wanzhou District, Hechuan District, Qianjiang District, Yongchuan District, Nanchuan District, Bishan District, Tongliang District, etc., were surveyed in 38 administrative districts and counties (autonomous counties) under the jurisdiction of the entire Chongqing city. Therefore, the overall area will be divided into two layers. The first layer is the main city, and the second layer is each district and county. As of the end of 2020, the total permanent population of the main urban area was 10.344 million, accounting for 32.27% of the city's population. The total permanent population of each district and county was 21.71 million, accounting for 67.73% of the city's population.

3.2.2 Three stage unequal probability sampling

Firstly, considering multiple practical factors such as overall financial, material, and human resources at each level, it is decided to select 2 primary sampling units from the first layer. Based on the proportion between each layer, 6 sampling units are selected from the second layer. Conduct independent three-stage sampling within each of the two separate layers.

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Table 1. Sample Weights of Primary Sampling Units at Each Layer

<table>
<thead>
<tr>
<th>Layer</th>
<th>Administrative district</th>
<th>Population proportion</th>
<th>Number of streets</th>
<th>Number of Street Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>First layer sampling unit</td>
<td>Yuzhong District</td>
<td>0.3151</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Yubei District</td>
<td>0.2500</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Second layer sampling unit</td>
<td>Dianjiang County</td>
<td>0.6849</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Jiangjin District</td>
<td></td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Shizhu County</td>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Wanzhou District</td>
<td></td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Yongchuan District</td>
<td></td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Yunyang County</td>
<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>1.0000</td>
<td>62</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Specifically, simple random sampling is used in the primary sampling units at each level. All streets in each administrative district are listed in EXCEL, disordered, and encoded. Using EXCEL, a random number table consisting of 0-9 ten numbers is generated, and the sampling starts from the 4th row and 7th column. (4, 7) is set as the starting point, and the required number of samples is sequentially read to the right to extract each time. On the second floor, due to the number of streets in each administrative district being less than 10, we chose the lottery method for sampling.

The third stage is to select respondents from the sampled streets. In order to obtain sufficient samples within a limited time, we adopt a systematic sampling method and conduct pedestrian surveys within each street. During the implementation process, we formulated the following survey rules: first, search for surrounding residential communities centered around the street office, and then set fixed questionnaire distribution points centered around the residential communities within the jurisdiction of the street. Every five minutes, stop a passing pedestrian and invite them to fill out a survey questionnaire. If the respondent refuses to investigate, invite the pedestrian closest to them to fill out the questionnaire; Change the location for distributing survey questionnaires every two hours.

3.2.3 Sample confirmation

According to the data from the 7th National Population Census, the total population of Chongqing is 32054200. Using Chongqing as the sampling box, formula 1 is used to calculate the sample size. The maximum variance obtained through SPSS calculation is S2=0.25, with a relative error limit of 9.5% and a confidence level of 99%. The initial sample size is calculated as:

\[ n = \frac{Nz^2 \cdot s^2}{N \cdot d^2} + \frac{4z^2 \cdot s^2}{N} = 384. \]  

(1)

3.3 Survey results

From the analysis of the cognitive situation of smart elderly care, it can be concluded that the respondents have a general understanding of smart elderly care, but the vast majority of respondents who are not familiar with smart elderly care services are willing to learn about smart elderly care services. And the respondents all believe that smart elderly care services can be widely promoted in the future.

Compared to older people, their willingness to learn about intelligent elderly care is relatively low, and their acceptance of new things is relatively low.

A significant difference in cultural level also has a significant impact on the willingness to understand smart elderly care. The higher the cultural level, the higher the acceptance of smart elderly care among the population.

Do the respondents currently have elderly people in their families? The respondents with only one elderly person in their family will pay more attention to their understanding of smart elderly care.

The analysis of the demand for smart elderly care in different age groups shows that the 25-34 year old population has a greater demand for online services, door-to-door services, and supporting services in nursing homes. The population aged 45 to 59 has a high demand for offline service platform points. Overall, there is the greatest demand for door-to-door service platforms among all age groups. People of different ages have the greatest demand for personalized health management intelligent products and Internet plus care services, which are more than 75%, followed by telemedicine. The demand for family elderly care beds is the highest among people of different age groups, with elderly people aged 60 and above having the highest demand for family elderly care beds.

From the analysis of the influencing factors of satisfaction with smart elderly care, it can be concluded that young respondents have a high overall satisfaction evaluation of smart elderly care in Chongqing.

The degree of emphasis on smart elderly care among Chongqing residents has a significant impact on their satisfaction with smart elderly care, especially in terms of entertainment. The willingness of Chongqing residents to accept intelligent elderly care health products or services for package planning, the cost of accepting intelligent elderly care, and whether Chongqing residents believe that the smart elderly care platform will launch promotions and point exchange activities have a significant impact on their satisfaction with intelligent elderly care, indicating that people have a high demand for intelligent elderly care services and high expectations.

4 Problem Analysis

4.1 The public has a shallow understanding of smart elderly care

From the analysis of the cognitive situation of smart elderly care, it can be concluded that the respondents
have a general understanding of smart elderly care, but the vast majority of respondents who are not familiar with smart elderly care services are willing to learn about smart elderly care services. And the respondents all believe that smart elderly care services can be widely promoted in the future. Analyzing the reasons for this, the development of smart elderly care has a relatively short history. It is understood that the main channels for smart elderly care services are the internet, including community science popularization, news broadcasting, government propaganda, etc., which are mostly guided by policies. The brand effect of enterprises in the industry has not yet emerged. At the same time, products related to smart elderly care are still in the development and small-scale verification stage, such as visual display of elderly data platforms, smart home devices, emergency alarm calls, and routine alarm calls, but have not been widely applied, which limits society's understanding of smart elderly care related products.

4.2 There is a high demand for smart elderly care products and services, while the market supply is limited

According to research data, there is a strong demand for smart elderly care products, especially for rehabilitation assistive devices such as smart wheelchairs and hearing aids, elderly care monitoring products such as emergency calls, indoor and outdoor positioning, sleep detectors, and digital Chinese medicine intelligent products such as traditional Chinese medicine diagnosis and treatment data collection and health status identification Health management intelligent products (such as wearable devices for detecting blood pressure and blood sugar). However, due to issues of timeliness and price, these smart elderly care products cannot be widely used. Secondly, the demand of people of different ages for personalized health management intelligent products and Internet plus care services is more than 75%, followed by telemedicine. The demand for family elderly care beds is also high among different age groups, with elderly people aged 60 and above having the highest demand for family elderly care beds. Chongqing residents have a high demand for door-to-door service platforms and community designated services, but their satisfaction with community designated services is only 23%, and their satisfaction with offline service platform points is 39%. The reason for this is that the service scope of door-to-door service platforms involving smart elderly care products in Chongqing is currently limited, and there are not many offline smart elderly care product care experience stores. Experimental verification has only been conducted in a few communities, and the effectiveness and sustainability of the model need further testing.

4.3 Lack of professional and intelligent elderly care service talents

Currently, smart elderly care products generally involve information data processing and equipment operation, requiring high professional and technical level of talents. At present, there is a high overlap between practitioners and domestic workers in smart elderly care service institutions, and there is an extreme lack of professional personnel in medicine, nutrition, psychology, and other fields related to smart elderly care, which cannot provide support and guarantee for smart elderly care services. The new generation of talents entering the smart elderly care industry, due to the constraints of traditional social concepts, have low internal industry self-identity and social status, forming a bottleneck in the human resources of smart elderly care. Due to the late start of the smart elderly care industry, information technology is not mature enough in integrating and processing relevant data, making it difficult to efficiently convert the collected data into information, increasing the difficulty of related elderly care services and management. Therefore, the application level of this highly intelligent data feedback method is relatively low, and the level of daily monitoring data mining and timely processing of elderly care services needs to be improved[5].

4.4 Strong service limitations, lack of humanized measures and spiritual care

The current elderly population is not a group of "elderly people", on the contrary, they have diverse and multi-level service needs from clothing, food, housing, transportation to medical care and entertainment. At present, community services place more emphasis on traditional household services such as "indoor cleaning" and "indoor maintenance", while lacking targeted services such as medical care, spiritual entertainment, and psychological comfort. According to survey data, 82% of elderly people expect social and entertainment products and services. Another 41% of the elderly show a strong willingness to work again.

5 Suggestions

5.1 Conduct baseline research to enhance awareness of smart elderly care among all age groups

Deepen the awareness of smart elderly care among the younger generation through internet health education. Make full use of Internet plus health science popularization, promote online popularization of health knowledge, strengthen data retrieval, science popularization, health education and other information services. The middle-aged group is in the transitional stage between youth and elderly, with good acceptance ability and high and multifaceted demand for smart elderly care services. Establish and improve smart elderly care scenarios to enhance the experience of offline platform services and community designated services for middle-aged and elderly groups. For the services of smart elderly care restaurants, we will further improve various services such as "care, food, and housing", fully absorb and mobilize market forces,
innovate and improve the services of smart elderly care restaurants, and meet the needs of various age groups for smart elderly care restaurants[5].

5.2 Encourage innovative research and development of diverse entities in the smart elderly care industry

According to this survey, there is a significant demand for services such as Internet+nursing services, remote medical services, personalized health management, and Internet+health consulting in smart elderly care services. The innovation of the smart elderly care industry relies on the joint participation of multiple entities. Firstly, local governments should take responsibility and actively guide the innovation of various market entities, creating a good atmosphere for innovation and entrepreneurship in the elderly care service industry through policies, systems, and laws; Secondly, third-party elderly care service enterprises should fully recognize that in a relatively free market environment, only by continuously innovating in technological means and management methods can they improve the quality of elderly care services, reduce service costs, and reap the industry dividends of smart elderly care[6]; In addition, research institutions, think tanks, social organizations, etc. should also actively take responsibility in the innovation of the smart elderly care industry, provide governance support for the technological innovation of smart elderly care, actively carry out industry university research cooperation, and compensate for the limitations of single research and development of enterprises by optimizing the organization. In short, Chongqing should encourage and support enterprises to increase investment in smart elderly care technology innovation, promote the application and innovation of modern information technology in the field of elderly care services, and enhance the technological content of smart elderly care services.

5.3 Strengthen the construction of smart elderly care professional talent team and enhance professional skills

Encourage universities to adjust their talent cultivation system according to changes in social needs, cultivate composite talents who not only understand professional skills in geriatric medicine, nursing psychology, nutrition, but also understand data analysis and statistics, as well as professional and technical talents and composite talents who meet the needs of smart elderly care models. Establish a comprehensive vocational education and training system for elderly care service personnel[7], and help them improve their professional literacy and skills by adding courses related to elderly health, internet technology, and strengthening skill training guidance.

5.4 Demand-oriented, improve soft supporting facilities such as community support and health services

In terms of soft services, it is necessary to strengthen medical care services based on the needs of the elderly, such as health monitoring, seeking medical advice, and obtaining medication. At the same time, on the basis of promoting daily care services such as meal assistance, bathing assistance, and accompanying travel, timely introduction of psychological counseling, companionship, and other leisure and social services will comprehensively improve the quality of service for the elderly and enrich their spiritual and cultural life. Considering the current gap in elderly care services, it is necessary to promptly cultivate and introduce diverse and professional market entities to intervene in elderly care services.

6 Conclusion

In the context of active aging, Chongqing needs to vigorously develop smart elderly care, enhance the awareness of smart elderly care among people of all ages, strengthen the cultivation of professional skills, and increase community spiritual care smart elderly care projects.

References