

Research on Intelligent Product Design under the Community Elderly Mutual Aid Model

Yueli Li*, Fuqiong Gao, Kaixuan Song, Ziyi Wang

School of Design, Xi'an Technological University, Xi'an, Shaanxi, China

**Corresponding Author.*

Abstract: Community elderly care mutual aid mobilizes the resources of the elderly through elderly mutual aid and partnership companionship, which is an innovation and remedy to the current community elderly care service. This paper takes the elderly living alone as the research object, and researches and discusses the design of community elderly care products under the concept of intelligent elderly care. Through literature analysis and questionnaire survey, we summarize the psychological and health needs and problems of the elderly in the process of living, and use service design methodology to study the mutual help contacts in the user journey diagram of the elderly, and use big data and the Internet to build a four-way correlation between the elderly, products, family members, and third-party companies. The intelligent terminal products are used to detect the physical health of the users, establish the connection between various types of people and the platform through online data transmission, and form a multi-party linkage health management mode to provide the elderly with a safe, efficient, and convenient intelligent service system. Users through the terminal product release life mutual aid demand, reach mutual aid through the time bank system cumulative timing to complete the transaction behavior between users, encourage more elderly people to help each other, and continue to expand the social participation of the elderly service, save human resources, save the expenditure of the social elderly service.

Keywords: Community Aging; Mutual Aid Model; Elderly Living Alone; Health Management; Smart Services

1. Introduction

At present, China is in a rapidly aging

society, and old-age pensioners are facing great challenges. With the change of China's family structure, the family size is getting smaller and smaller, and the support guarantee that the family can bring to the elderly living alone is getting weaker and weaker. The traditional way of old-age care is gradually changing to a diversified old-age care model, with community old-age care and mutual aid old-age care gradually taking the lead, and the provision of diversified and intelligent old-age care services will become a major trend in the development of old-age care in the future. In the case of the elderly service system is not yet perfect, how to meet the diversified needs of the elderly in old age life, physical health, psychological accompaniment, etc., and how to make the elderly active and give full play to the value of their own old age, has become the most concerned issue.

2. Analysis of the Community Elderly Mutual Aid Model

2.1 Mutual Aid Model under Community Care

Community care for the elderly is a method of integrating traditional family care for the elderly with modern community services, drawing on the advantages of both traditional family and community care for the elderly; the main advantage of this mode of care for the elderly is that, when changes occur in the elderly's physical condition and ability to take care of themselves, the elderly will still be able to live in their own familiar natural environment and will be able to receive a specialized home care system from the community, hospitals and other service agencies. With the deepening of the aging of the country, the demand for community-based elderly care services has

increased significantly. Vigorously developing community-based elderly care services and developing traditional family-based elderly care into a new type of home-based elderly care based on the community provides an opportunity to explore a new model of elderly care. [1]

As an innovative model for the elderly, mutual aid for the elderly is a voluntary and active model for the elderly, which takes the enhancement of the vitality of the elderly's survival as the first requirement for the elderly, and alleviates the problem of emotional loneliness of more or even elderly people by helping each other and warming up with the elderly in a group and alleviating the problem of the ageing of the elderly community to a certain extent. By integrating some of the advantages of community aging, mutual aid aging injects a new form into the existing aging mode, and to a certain extent meets the aging needs of the elderly in terms of health, wisdom, and psychology. Based on the concept of intelligent aging, community aging provides the elderly with safe, efficient, and convenient home-based intelligent aging services, and provides an intelligent management service system for the community aging services of the whole society with people-oriented services.

2.2 Current Situation of Community-Based Mutual Aid Models for the Elderly at Home and Abroad

From the data research found that there have been many practical cases of community mutual aid for the elderly in foreign countries. For example, Liu Shengli of Ningbo University mentioned the "Capitol Hill Village" model of the United States in the product design for mutual care for urban empty-nesters, which is self-organized by elderly residents of the Capitol Hill community, with membership management, members pay dues and accept donations for mutual care among members; the "multigenerational living" and "apartment sharing" models of Germany, with "multigenerational living" meaning that the German government advocates different age groups to live together in apartments. The German models of "multi-generational living" and "apartment

sharing" are mentioned. "Multi-generational living" means that the German government advocates that elderly people of different age groups should live in the same community, so as to realize mutual assistance in old age. [2] There are also many new achievements of mutual aid in old age, such as the "Happy Mutual Aid Home" mentioned in the article on the development trend of mutual aid in old age in China under the background of aging, which is the origin of China's mutual aid in old age, and which creatively puts forward the mutual aid mode of "collective construction of the home, centralized living, self-protection, mutual aid service", and at the same time, creates a "Feixiang At the same time, it has created the brand culture of "Handicrafts for the Elderly in Feixiang Happiness Home", in which the elderly living in the mutual aid home give full play to their remaining heat by doing handicrafts, realizing a sense of dependence and joy in old age. [3] There are also the "old partner" model in Shanghai and the "time bank" model in Guangzhou. During the national conference on the construction of a social service system for the elderly, many mutual-help elderly care activities were vigorously promoted, and mutual-help elderly care is in full swing throughout the country. However, in most of China's cities and rural areas, the mutual care model has only been able to mobilize a very small number of elderly people to participate in voluntary self-support. [4]

At present, although most of China's mutual-help models for the elderly are government-led and are carried out in a top-down manner, there is a serious lack of laws, regulations and institutionalization related thereto; for example, there is still no "law on volunteerism" in our country. At the same time, we need to strengthen the construction of integrity system, set clearer service standards, effective assessment of service quality, accurate registration and archiving of service time, to provide evidence for the future "service time savings" of the successive services, to ensure that service providers enjoy the corresponding service resources. [5] China's community pension although has been through the rapid development of society in

recent years and has long been the beginning of the scale, but is still also facing the existence of a number of social problems, including the community pension infrastructure supporting the construction of a relative lack of medical and health services such as supporting facilities are relatively single and simple, the community management is chaotic. The basic needs of the elderly for preventive health care and medical services cannot be met, and many of the existing community nursing homes are too small for the elderly, with fewer staff members to provide health and companion services for the elderly, and a lack of experience in emergency response to accidental injuries, disease outbreaks, and other emergencies, so that the injured elderly are not able to carry out some of the daily necessary psychological life, nursing care services, and mental health monitoring in time. The work of community management staff is often complicated, and the lack of proper management wastes many human resources.

3. Characteristic Needs and Problem Solving Strategies of Elderly Living Alone

3.1 Characteristics of Elderly People Living Alone

The group of older persons living alone in this paper is not limited to the place of residence, but refers to the group of older persons aged 60 years and over who, for various reasons, lack the companionship of a family member and live alone in the home, in an institution or in a community setting. Two distinctive features of older persons living alone are their vulnerability to disease and their lack of spiritual and cultural life. The living safety and mental state of the elderly living alone are related to the effectiveness of the policy objectives of the elderly living at home, and the goal of the ageing-friendly design of the daily necessities for the elderly living alone is to ensure that the elderly living alone can monitor their health and appease their psychology, and that they can gain a sense of dignity and fulfillment in their lives, so as to optimize the social support system for the elderly living alone. [6]

3.2 Needs of the Elderly Living Alone

The elderly living alone have poorer economic conditions and inadequate social and medical security, and as they get older, they develop various kinds of physical and mental health problems; in terms of their ability to take care of themselves in daily life, the difference between the elderly living alone and those who do not is not obvious, but in terms of their mental state, the difference between the elderly living alone and those who do not is more pronounced. A literature survey found that the five major needs of elderly people living alone are: most of them suffer from chronic diseases and have difficulty in seeing a doctor, lack of spiritual life, no one to take care of them, weak social adaptability, and a high demand for living difficulties.

Through the questionnaire survey, it was found that the proportion of elderly living alone suffering from chronic diseases was large. In order to clearly reflect the relationship between physical health status and chronic diseases, the author analyzed and summarized the categories of common chronic diseases suffered by the surveyed elderly living alone, and listed the diseases suffered by the elderly living alone by rank, hypertension, heart disease, arthritis and cataracts are more than ten percent, respectively, ranked in the first four, accounting for more than two thirds of the total, which indicates that these types of chronic diseases are the most important diseases affecting the health status of the elderly living alone. This shows that these chronic diseases are the most important diseases affecting the health of the elderly living alone. Of these four types of diseases, the first two are more dangerous and must be taken care of at all times, affecting their ability to take care of themselves in their daily lives to a great extent; the latter two tend to have an indirect effect on their ability to take care of themselves in their daily lives by affecting their physical mobility.

The mental health of most elderly people living alone is poor. Whether they live alone in urban areas or in rural areas, there is still a lack of spiritual, cultural and sports activities; only a small proportion of the elderly living alone in urban areas are able

to take part in community-organized cultural and sports activities for the elderly, while the elderly living alone in rural areas basically do not take part in cultural and sports activities, and their mental and psychological well-being is relatively empty. The social adaptability of the elderly living alone is not strong. Household chores are the daily activities of many elderly people living alone, followed closely by outdoor recreational activities; a few elderly people living alone nourish their bodies and minds by planting flowers and raising birds, reading books and newspapers, and playing cards, but the vast majority of elderly people living alone do not participate in social activities organized by the community or other institutions.

Therefore, it is particularly important to promote the high-quality development of elderly services in the context of the aging of society, the key to which is to continuously meet the increasingly diversified needs of the elderly in terms of life care, spiritual recreation and psychological comfort; secondly, it is required that the existing elderly services be closely integrated with medical services, so as to provide different levels of services in accordance with the state of health of the elderly. [7]

3.3 Product Functional Design Strategies to Address the Needs of the Elderly Living Alone

In order to solve the mutual aid needs of the elderly living alone as described above, community mutual aid intelligent products for the elderly need to take the three major functions of physical health monitoring, psychological mutual aid accompaniment and mutual aid in life needs as the main design direction, and develop the design around how to realize real mutual aid through terminal products. By utilizing offline intelligent terminal products, the elderly, products, systems, children, and third-party companies can be linked together to bring the elderly a better experience through human-computer interaction and system interaction, and encourage the elderly living alone to face life correctly and actively help others. The offline smart terminal needs to design three

systems, the first is the health detection area, in the terminal product with the function of monitoring daily blood sugar, blood pressure, heart rate and other data instruments. The second is the design of the mutual aid system module, with ancillary products to accompany the table and chair to use the terminal, to achieve the time bank timing function. The third is the cloud data storage and transmission function, the equipment by reserving the elderly detection of health data and head of household information data, uploaded to the APP database, children and third-party administrators can browse and manage.

4 Research on Intelligent Terminal Product Design for Community Elderly Mutual Aid Mode

4.1 Study of Users Living Alone in the Elderly

With the information from the offline interviews with the elderly living alone, we used the "user profile" tool to set up two typical elderly living alone in the community and analyzed their details, personality, daily activities, and choice of elderly products.

Solitary Elderly 1: Female, 61 years old, living in Xi'an, retired, hobbies include playing chess and erhu, in good health, widowed, with children out of the country, past medical history of lumbar disc herniation. Character description: Healthy and able to take care of himself in daily life, but the lack of children's companionship has a certain impact on his mental health, resulting in a lack of joy and confidence in life. Daily activities: In addition to eating and sleeping at home, they are generally idle, in a variety of busy, happy to help neighbors, dedication to themselves, running around in recreational activities and community activities. Product selection basis: can solve their own needs, cost-effective, can provide emotional value for themselves. Simple appearance, clear function, simple operation.

Solitary Elderly 2: Male, 78 years old, living in Xi'an, retired, hobbies chess, flowers, poor health, marital status widowed, children are in the field, has a past medical history of high blood pressure.

synergize with each other to jointly build a comprehensive and efficient home-based community elderly service process. [10] From the touchpoints of the user journey map above, design an intelligent service system for the community-based mutual care information exchange for the elderly living alone, and produce a blueprint for the product mutual aid system service. (Figure 2)

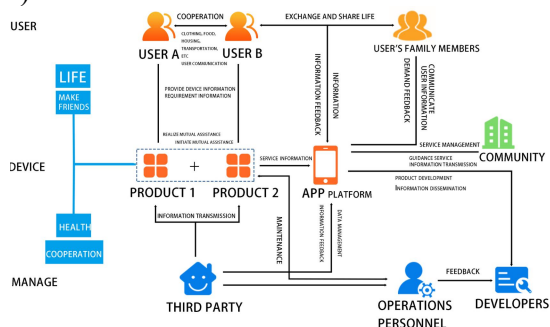


Figure 2. Service Blueprint

From the elderly encountered difficulties and needs to use the product process records: the elderly from the beginning of the day to use the terminal products to measure blood pressure and blood glucose and other health data, the terminal synchronization data uploaded to the cloud, the app end user elderly family and community can view the data in a timely manner, if there is an abnormality can be reminded of the early warning. Elderly people who encounter life problems can release their needs through the terminal, and other users can view the demand information through the terminal and choose to help. Mutual aid can be accomplished through product 2 or other forms, and the terminal records the mutual aid time to complete the transaction behavior. If there is any problem in the mutual help process, the terminal can be managed and adjusted through user feedback.

4.4 Community Mutual Aid Elderly Intelligent Terminal Product Design Practice

Based on the above research and analysis, the "Enjoy" smart terminal is a community elderly mutual aid product based on the concept of intelligent aging, with three major functions of health monitoring, mutual aid timing, and cloud data, which

enables the elderly to detect their health at any time and any place through the terminal, release information on their needs, and receive information on their needs and mutual aid information, so as to provide the elderly with safe, efficient, and convenient intelligent services, efficient and convenient intelligent services for the elderly. (Figure 3)



Figure 3. Enjoy Smart Terminal

The terminal product has three major functions: health monitoring, mutual help timing, and cloud data. Terminal health detection is divided into non-invasive blood glucose monitoring area, blood pressure detection area, temperature area, by clicking on the screen health module, fast and accurate measurement of blood glucose, blood oxygen, blood pressure, electrocardiogram, heart rate, temperature, cloud link data uploaded to the back-end management terminal, real-time query data information, when necessary, but also can be online early warning to family members, the community, the doctor to remind. Mutual aid module is the elderly through the use of the terminal information platform to release their own needs information, waiting for others to accept help, the use of the terminal supporting the companion table and chairs or other mutual aid behavior to achieve mutual aid, and through the equipment to record mutual aid time, using the concept of time banking, to help mutual aid crowd to obtain benefits.

The appearance of the smart terminal product adopts a square sleek streamline, simple shape, and the structure adopts the use of fresh and literary seamless knitted fabric, which enhances the affinity and sense of home. Selection of milder low brightness hues, white, blue, orange, gray-based color scheme, visually more affinity. In the low brightness contrast choose to use low mid-tone blue and orange

contrast, color display effect is more stable, simple, more suitable for the elderly.

5. Conclusion

With the aging problem becoming more and more serious, the problem of the elderly is becoming more and more prominent, and the elderly service system needs to be further optimized. Mutual support for the elderly meets the diversified needs of the elderly in terms of their living needs, culture and entertainment, and psychological accompaniment, and makes their old age life richer and more valuable. The main purpose of this research is to study and analyze the current situation of the development of community mutual support for the elderly, through research and analysis of the characteristics and needs of the elderly living alone, to build a service system for community mutual support for the elderly and to design intelligent terminal products for a healthy life according to the user profiles and pain points of the elderly living alone. As a new type of elderly care model, the intelligent terminal products researched in this project can realize the "digitalization", "intelligence" and "sharing" of community elderly care, and establish a service system that can give full play to the abilities and needs of contemporary elderly people. An information network platform that can give full play to the ability and creativity of the current generation of elderly people, and show the healthy and sunny mentality of the current generation of elderly people, showing the sunset style of the current generation of elderly people's life, and realizing the "value of old age". While bringing convenience to the elderly, it will also enable them to give better play to their spare time and live more comfortably and happily in their twilight years, thus truly realizing value, and thus contributing to the optimization of the elderly service system and the improvement of the relevant elderly policy.

References

- [1] Lin Lixue. Research on the Problems and Countermeasures of Smart Community Elderly Model. Residence, 2021, (11):184-185.
- [2] LIU Shengli, WANG Xiaochun. Product design for mutual care of urban empty-nesters. Design, 2021, 34(01):148-150.
- [3] Yi Dongli. Characteristics and Relevance of Mutual Elderly Care Model in the New Era. Journal of Hunan Institute of Science and Technology, 2019, 40(12):64-65.
- [4] Xia Lihua, Long Liliang, Yin Yiqing, et al. SWOT analysis of rural home care model in Luoshan County, Henan Province. Occupation and Health, 2015, 31(09):1199-1201+1204.
- [5] Gan Mantang, Lou Xiaoxiao, Liu Zaoxiu. The Practice Mode and Promotion Mechanism of Mutual Elderly Care Concept. Journal of Chongqing University of Commerce and Industry (Social Science Edition), 2014, 31(04):78-85.
- [6] Xu Haohui, Qin Bin, Li Jie. Research and practice on the design of companion equipment for the elderly living alone. Design, 2024, 37(16):118-120.
- [7] Zhang Beihang. Research on the service demand and countermeasures for the elderly in medical and nursing care institutions in Tangshan City. North China University of Science and Technology, 2023.
- [8] Gao Ying. Research on the innovation path of experience value in service design. New Art, 2019, 40(04):92-96.
- [9] Liu Heshan, Dong Xue, Fan Zhijun, et al. Research on the design of intelligent home care service system. Packaging Engineering, 2020, 41(08):36-42.
- [10] Zhao Man, Xing Yiqing. Research on the development of home-based community elderly care service empowered by artificial intelligence and its ecosystem optimization strategy. Social Security Research, 2024, (02):16-25.