

# Analyzing Home Environment Design for the Elderly from the Perspective of Design Psychology

Lin Zhu \*

International College, Dhurakij Pundit University, Thailand

\* Corresponding author Email: lin.zhu@dpu.ac.th

---

**Abstract:** With declining birth rates and extended overall lifespans worldwide, many countries are experiencing population aging. China, has the fastest aging population globally, making the care and support of the elderly a critical concern for the future. In this context, aging in place is the preferred choice for many elderly individuals, and the design of home environments plays a direct role in their physical and psychological well-being. This article, with a focus on healthy aging, addresses the psychological needs and issues commonly encountered by the elderly in their home lives. It employs the principles and methods of design psychology to analyze and research the design of home environments for the elderly. The article proposes key design considerations for improving elderly home environments beyond meeting functional requirements related to aging in place, with the aim of creating more conducive environments for elderly care and placing genuine attention on the psychological well-being of the elderly.

**Keywords:** Design Psychology; Elderly; Home Design.

---

## 1. Introduction

According to data, by the end of 2020, the population of elderly individuals aged 60 and above in China had reached nearly 250 million [1]. China's aging population issue continues to escalate, primarily due to long-standing birth control policies and improvements in healthcare, resulting in increased average life expectancy and decreased birth rates. The rapid growth in the elderly population and the rising proportion of elderly individuals signify the need for more resources and services to meet the demands of the elderly. The government has implemented a series of policy measures to address the challenges in elderly care, medical insurance, and the labor market while also improving the social security system to cater to the needs of the elderly population. The nation has emphasized the development of home-based elderly care services and the promotion of elderly-friendly communities to ensure that the elderly can enjoy their later years. Currently, the living spaces of elderly individuals in China, both their existing homes and potential new residences, are typically in ordinary mainstream communities and home environments. Therefore, this article, in exploring the future development of elderly community home environment design, aims to address the genuine needs of elderly individuals. It seeks to fulfill the psychological, emotional, and spiritual needs of the elderly in their daily lives, in addition to meeting functional requirements. Efforts are made to address or alleviate the various psychological issues that are inevitably encountered in old age. This design approach follows the principle of human-centric design to create a more comfortable and reassuring home environment for the elderly.

## 2. Analysis of Home Environment Design for Elderly People from the Perspective of Design Psychology

### 2.1. Overview of Design Psychology

Design psychology is an interdisciplinary field that studies

how human perception, cognition, emotions, and behavior interact with design and environments. It explores people's responses to products, spaces, interfaces, and other design elements to assist designers in creating more attractive, functional, and user-friendly solutions [2]. By delving into human needs, preferences, and psychological processes, design psychology offers valuable insights into optimizing user experiences across various design domains. Design psychology employs various research methods, including observation, user testing, surveys, eye-tracking, interviews, physiological measurements, prototype testing, emotion analysis, and virtual reality, to gain a deeper understanding of how humans interact with design and environments and how to enhance and optimize user experiences [3]. These methods help designers and researchers better comprehend user needs, preferences, and behaviors, enabling them to create more appealing and functional design solutions. From the perspective of design psychology, analyzing the design of home environments for the elderly involves designers considering the behavior, inner thoughts, suggestions, and potential psychological experiences of the elderly in their home life. Combining their design knowledge and thinking, designers should thoroughly research and consider factors that affect psychology within the space, aiming to create a home environment that promotes relaxation, enjoyment, and peace of mind for the elderly, ultimately striving for holistic physical and mental well-being.

### 2.2. Psychological and Emotional Characteristics of the Elderly

The psychological and emotional characteristics of the elderly are influenced by various factors, including physiological, social, and psychological aspects. They may experience feelings of loneliness, a reassessment of self-identity, variations in life satisfaction, emotions related to loss and grief, physical health issues, and declines in intellectual and cognitive abilities. Current surveys indicate that many elderly individuals face challenges such as low psychological security, a sense of loss, low self-esteem, loneliness,

emptiness, as well as conditions like geriatric anxiety and geriatric depression. Firstly, as various aspects of their physical health noticeably deteriorate with age, elderly individuals may struggle to perceive changes in their external environment and their adaptability to the environment weakens, leading to reduced psychological security. In response to these psychological changes, it is essential in-home environment design to consider comforting designs as well as measures to safeguard the health of the elderly. Secondly, the intensity and duration of emotions are difficult to control for those in old age, leading to rapid or slow emotional shifts and causing tension, anxiety, and suspicion in changing environments, potentially resulting in geriatric anxiety. Thirdly, many elderly individuals experience the syndrome of retirement adjustment, marked by declines in memory and thinking abilities, which can lead to feelings of loss and low self-esteem. Fourthly, empty nest syndrome leads to increased social needs for elderly individuals, who seek belonging and respect. When these psychological expectations are not met, it can intensify feelings of loneliness and emptiness, increasing the likelihood of geriatric depression. These issues, if persistent, can have a detrimental impact on the mental and physical well-being of the elderly. Therefore, addressing the psychological and emotional characteristics of the elderly in home environment design is imperative from the perspective of design psychology.

### **2.3. Home Environment Design Based on the Psychological Needs of the Elderly**

#### **2.3.1. Home Arrangement and Space Scale Design**

Based on the psychological needs of the elderly, for the design of the elderly home environment, the author believes that in addition to meeting basic functional requirements, emphasis should be placed on comfort, safety, and accessibility. In terms of home arrangement, it is advisable to use bright, natural lighting, simplify furniture placement to enhance spatial flow, and ensure easy-to-clean surfaces. Regarding spatial scale, considerations should be made for the mobility of the elderly, ensuring spacious walkways, uncrowded furniture layouts, and providing ample space for possible mobility aids. These design elements contribute to creating a warm, comfortable, and easily manageable home environment that caters to the psychological needs of the elderly.

#### **2.3.2. Home Color and Style Decor Design**

Based on the psychological needs of the elderly, home environment design should focus on gentle colors and functional styles. The use of colors in the environment provides more intuitive experiences for the elderly, and different functional spaces should use different color combinations. When choosing colors, it is essential to consider the hue, brightness, and saturation of each color. Using warm-toned colors in the living spaces of elderly homes can alleviate feelings of loneliness and depression. High-saturation colors are suitable for active areas like the living room and dining room, while low-saturation colors work well in quiet areas like bedrooms and study rooms. This approach helps regulate the mood and state of the elderly for different activities while maintaining an overall cohesion and unity in the design. In addition to careful color selection, it is essential to ensure the familiarity of the space, which is a common psychological requirement for the elderly. Familiar items in the home can provide a sense of comfort and nostalgia. Emotionally, older items can better counteract

external negative influences. Since the adaptability of the elderly is relatively weak, it is crucial to maintain a familiar environment as much as possible, creating comfort and a sense of belonging. Through these designs, a pleasant, warm, and highly functional home environment can be created for the elderly, meeting their psychological needs.

#### **2.3.3. Home Safety and Accessibility Facilities Design for the Elderly**

Designing Home Environments for the Elderly Based on Their Psychological Needs: Safety and Accessibility Considerations When designing home environments for the elderly based on their psychological needs, a paramount focus should be placed on safety and accessibility. First and foremost, it is crucial to ensure that there are no tripping hazards within the home, such as exposed wires or clutter. Selecting non-slip materials for flooring, particularly in areas like bathrooms and kitchens, is advisable. Installing grab bars, handrails, and ramps within the home facilitates easier mobility and use of facilities for the elderly. Doorways should be wide enough to accommodate wheelchairs or mobility aids. Facilities in the bathroom and kitchen should be designed with the needs of the elderly in mind, including easily reachable controls, switches, and handles. Additionally, safety features like smoke detectors and emergency call systems are essential to ensure the safety of the elderly within their homes. These designs collectively create a safe, accessible home environment that enhances the comfort and quality of life for the elderly, fostering a sense of security and independence in their living spaces.

#### **2.3.4. Designing for Other Care Details in Home Environments for the Elderly**

In addition to the considerations mentioned above, factors such as good ventilation, air quality, temperature control, and noise management are crucial when designing home environments for the elderly. Details such as indoor temperature, room illumination, furniture materials, and various small decorative items all require careful attention. A space that offers suitable lighting and temperature, along with materials that exude a sense of warmth, can significantly enhance the comfort of elderly residents in their homes. Elderly individuals often have a desire for social interaction and a heightened need for privacy within their living spaces. Creating spaces and settings that facilitate neighborhood interaction, such as establishing card-playing areas in the living room or designing semi-private balconies, can increase the elderly's sense of joy and reduce loneliness. Bedroom design should prioritize soundproofing and privacy to ensure a quiet and stable sleeping environment for the elderly. In this regard, designers should leverage their comprehensive design expertise, applying design principles and methodological principles while considering the diverse habits and preferences of the elderly, striving for a holistic and harmonious home environment. These detail-oriented designs aim to create a safe, comfortable, convenient, and inviting home environment that meets the daily needs of the elderly, ultimately enhancing their quality of life and overall well-being.

## **3. Current Status of Elderly Home Environment Design**

At present, there is a growing focus and innovation in both domestic and international contexts regarding the design of home environments for the elderly. Internationally, many

countries are actively researching and implementing the construction of elderly-friendly housing and communities, emphasizing the integration of barrier-free facilities, smart home technologies, social interaction, and psychological well-being [4]. In China, in the face of the severe challenges posed by an aging population, the government has adopted proactive and effective measures. In 2017, the State Council General Office issued 'Opinions of the State Council General Office on Formulating and Implementing Elderly Care Service Projects,' which emphasized the efforts to develop home-based elderly care services, promote elderly-friendly communities, and ensure that seniors can enjoy their later years with happiness [5]. With the increasing aging population, there is also a growing recognition of the importance of designing home environments for the elderly. Designers and real estate developers are beginning to listen to the needs of the elderly and provide residences and communities that are better suited to them. Additionally, the government has formulated relevant policies to promote the development of elderly-friendly housing and communities. As elderly individuals may experience physical fatigue more easily and spend an increasing amount of time at home during retirement, they often have different physiological needs and changing perspectives. Combining these with various personality traits and psychological processes can lead to different psychological activities. Designers should consider these diverse psychological activities when creating home environments for the elderly.

Currently, there are many potential discomfort factors in the homes of elderly people in China. Elderly individuals often experience or exacerbate negative psychological and emotional states such as loneliness, emptiness, anxiety, and depression due to the impact of poorly designed living spaces. For instance, there are situations where the color schemes and styles in shared living spaces with their children are unsuitable for the elderly. Designers may not have taken into consideration the overall sensory experience of the elderly person's bedroom. Design should not merely focus on individual aesthetics and artistic elements or blindly pursue conformity with the overall environment; instead, it should be based on the needs of the users. In comparison to younger individuals, the elderly tend to seek stability and tranquility in their living spaces. Moreover, their moods are more easily influenced by their environment. Prolonged exposure to spaces with strongly contrasting color combinations can continuously stimulate the eyes of the elderly and lead to increased anxiety and restlessness, which is detrimental to their sleep patterns. As shown in Figure 1, the vibrant color scheme and design are less conducive to the sleep of the elderly. In contrast, the natural wood color combination in Figure 2 is more suitable for the aesthetic preferences of the elderly. A bedroom characterized by a simple, yet warm spatial arrangement is an optimal choice for alleviating insomnia in the elderly, as it provides a more comfortable and reassuring sleeping environment.



Figure 1. Bedroom Space that Disrupts Elderly Sleep

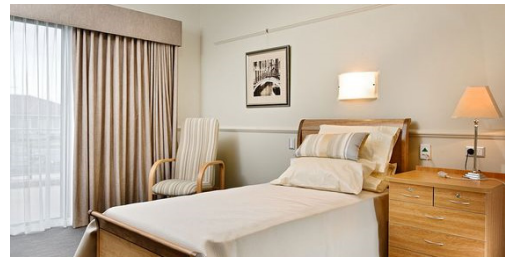


Figure 2. Bedroom Space Conducive to Elderly Sleep

In the design of furniture layout and space planning, there may also be issues such as an excessive number of furniture items or the selection of furniture with inappropriate dimensions, leading to a visually crowded space and inconvenience due to restricted movement (see Figure 3), which can easily cause irritability and frustration in the elderly. Additionally, an irrational use of corners that makes space appear empty (see Figure 4) can intensify feelings of loneliness and emptiness among the elderly. These common issues hidden in current home designs can subtly impact the psychological and even physical health of the elderly. Interior designers should pay particular attention to these aspects in the design of environments for the elderly."



Figure 3. Overly Crowded Living Room Space Design



Figure 4. Overly Spacious Living Room Space Design

## 4. Conclusion

Incorporating the impact of the environment on the psychological well-being of the elderly is a crucial consideration for designers in their future design directions and an essential factor in constructing elderly-friendly living environments. Designers should genuinely prioritize the psychological health of the elderly, thoroughly analyze their emotional and psychological needs, and intelligently integrate the principles and methods of design psychology into the design of elderly home environments. This integration aims to achieve holistic physical and psychological well-being, thereby making efforts to enhance the elderly's happiness and contentment in their homes. Future designs for elderly home environments should focus on the following aspects: First, integrating smart technology to provide a more convenient living experience, including automation, healthcare monitoring, and emergency call systems. Second, emphasizing social interaction and psychological well-being by creating an environment that encourages elderly individuals to interact with family and the community,

alongside providing peaceful spaces to alleviate loneliness. Additionally, strengthening accessibility features and safety measures to ensure the safety and comfort of the elderly, such as non-slip flooring, handrails, and appropriately designed facilities. Finally, personalized customization that considers individual differences among the elderly, offering diverse design choices to meet their respective needs and preferences, promoting extended periods of independent living. These aspects will become pivotal focuses in the future of elderly home environment design. It is hoped that further research and applications stemming from this article will provide guidance and recommendations for the improvement of elderly home environments in China.

## References

- [1] State Council General Office. "Opinions of the State Council General Office on Formulating and Implementing Elderly Care Service Projects." June 16, 2017, [Online] Available: [https://www.gov.cn/xinwen/2017-06/16/content\\_5203124.htm](https://www.gov.cn/xinwen/2017-06/16/content_5203124.htm).
- [2] Tian.Y, Zhang.B, Design Psychology, Publishing House of Electronics Industry, Beijing,2020.
- [3] Liu.S, Tan.Y, Research Methods and Research Design in Design Psychology, Decorations, Vol.3,2020, No4, p.15-30.
- [4] World Health Organization. Dementia. Geneva, Switzerland: World Health Organization; 2020. URL: <https://www.who.int/news-room/fact-sheets/detail/dementia>.
- [5] R.Victor, Residential Environment Design in the Aging Era: Innovative Practices for Assisted Living Facilities. Architecture & Building Press, Beijing, China 2019.
- [6] Abegaz, T. (2014). Design With Emotion: Improving Web Search Experience for Older Adults (All dissertations). Available online at: [https://tigerprints.clemson.edu/all\\_dissertations/1439](https://tigerprints.clemson.edu/all_dissertations/1439).
- [7] Bartels, S. J., and Naslund, J. A. (2013). The underside of the silver tsunami--older adults and mental health care. *N. Engl. J. Med.* 368, 493–496.
- [8] Balta-Ozkan, N., Davidson, R., Bicket, M., and Whitmarsh, L. (2013). Social barriers to the adoption of smart homes. *Energy Policy* 63, 363–374.
- [9] Barbosa, J. A., Araújo, C., Mateus, R., and Bragança, L. (2016). Smart interior Design of buildings and its relationship to land use. *Archit. Eng. Des. Manag.* 12, 97–106.
- [10] Demiris, G. (2008). Smart homes and ambient assisted living in an aging society. *Methods Inf. Med.* 47, 56–57.
- [11] Deen, M. J. (2015). Information and communications technologies for elderly ubiquitous healthcare in a smart home. *Pers. Ubiquit. Comput.* 19, 573–599.
- [12] Cho, M. E., Oh, Y. J., and Kim, M. J. (2018). Development of a health smart home model for the elderly. *J. Korea. Hous. Assoc.* 29, 81–90.
- [13] Cimperman, M., Makovec Brenèiè, M., and Trkman, P. (2016). Analyzing older users' home telehealth services acceptance behavior—applying an extended UTAUT model. *Int. J. Med. Inf.* 90, 22–31.
- [14] Abu-Bader S., Rogers A., Barusch A. S. (2002). Predictors of life satisfaction in frail elderly. *Journal of Gerontological Social Work*, 38(3), 3-17.
- [15] Crabtree, A., and Rodden, T. (2004). Domestic routines and Design for the home. *Comput. Support. Cooperat. Work* 13, 191–220.
- [16] Dannefer D. (2003). Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences*, 58, S327-S337.
- [17] Giummarra M. J., Haralambous B., Moore K., Nankervis J. (2007). The concept of health in older age: Views of older people and health professionals. *Australian Health Review*, 31, 642-650.
- [18] Lee YS, Lim YJ, Hwang JH, Yoon HG: Pre-evaluation of users on flexible elderly housing alternative: *J Korea Inst Interior Design* 2012;21(1):248–258.
- [19] Dilani A: Design & Health IV: Future Trends in Healthcare Design. Stockholm, International Academy for Design and Health, 2006.
- [20] Dilani A: Design & Health III: Health Promotion through Environmental Design. Stockholm, International Academy for Design and Health, 2006.
- [21] Atchley RC: Continuity and Adaptation in Aging: Creating Positive Experiences. Baltimore, MD, The Johns Hopkins University Press, 1999.
- [22] Carp FM, Carp A: A complementary/congruence model of well-being or mental health for the community elderly: in Altman I, et al. (eds): *Elderly People and the Environment*, New York, Plenum Press, 1984.
- [23] Valins M: *Housing for Elderly People: A Guide for Architects, Interior Designers and their Clients*. New York, Van Nostrand Reinhold Co., 1988.