

Research on Spatial Design and Reconstruction Strategy of Aging Based on Visual Features

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Abstract. At present, our country is in the rapid development stage of aging, the pension problem has always been a problem that the whole society pays high attention to, how to create a high quality living environment for the old people becomes a new research topic. From the perspective of vision, combined with architectural design theory, geriatric psychology, color psychology and other theories, this paper explores the interior public space environment design of elderly buildings from the aspects of light, color, quality, humanity and other influencing factors. At the same time, it analyzes the living situation of the old apartment and the characteristics of the old people in our country. From the aspects of space environment, function layout and so on, this paper summarizes the renovation strategy of interior space of elderly apartment. It provides a new reference for the design of elderly apartments in China in the future, and combines the design of elderly service centers to enrich the design methods of indoor public space environment of elderly care buildings in China in the future, so as to improve the quality of life of the elderly.

Keywords: visual features; Elderly building; Visual function; indoor public space; Reconstruction strategy.

1. Introduction

The problem of population aging and pension in China has become a social hot spot. At present, China is the country with the largest aging population, and it shows the characteristics of fast, large scale, getting old before getting rich. According to relevant research reports, it is expected that by 2025, the population over 60 years old will reach 300 million [1], which is an aging country (Analysis of the current situation of China's Population Aging in 2017 and Forecast of its Development Trend). With the deepening of the aging process in China and the change of family concept, the elderly and children have more and more requirements for the choice of nursing environment, whether it is the choice of family care or social care [2]. Therefore, designers should optimize the building space environment to improve the quality of life of the elderly. At present, in the design of elderly care buildings in China, a large number of architects focus on the construction of hardware facilities, carry out barrier-free design and age-appropriate scale design in accordance with norms, and then ignore the creation of space environment, which is difficult to meet the physiological and psychological needs of the elderly. Based on the research, induction and summary of light, color, material, culture and other aspects, and combined with the project design of elderly care service center, this paper draws a design method to optimize indoor and outdoor space of elderly care buildings from the perspective of visual design [3]. Through visual design, it is the significance of the research to satisfy the elderly's psychological needs of security, belonging and self-worth, improve the openness, privacy and convenience of the space, and let the elderly enjoy their old age in a comfortable, safe and high-quality environment.

2. Visual physiological and psychological characteristics of the elderly

With the increase of age, the elderly's cornea, retina, lens, vitreous and other eye structures will produce functional disorders, resulting in visual impairment and eye diseases in the elderly, including presbyopia glaucoma, vitreous turbidity, etc. The main manifestations are the decreased sensitivity and perception of the eyes to light, the prolonged adaptation time to the change of light and dark



environment, and the decreased ability to compare and recognize things. The field of vision is reduced and the ability to focus is weakened [3].

Due to the decline in visual function, the perception of surrounding things has changed in the elderly, there is a decline in memory, can not see small patterns, text, and eyes are uncomfortable in a strong or dark environment. Poor recognition ability at night, unclear identification of the surrounding environment and other symptoms will cause psychological problems for the elderly [4]. The elderly will have a lack of security, personality becomes apathetic, depression, loss and other psychological changes, which is not conducive to the physical and mental health of the elderly

3. Influencing factors of visual design of indoor public space in elderly buildings

The public space inside the elderly care building mainly includes three types: traffic space, entertainment space and dining space. The traffic space is mainly hall, corridor, stairs, elevator and other daily walking space; The entertainment space mainly includes chess room, painting room and fitness room. Reading room, etc. : Three kinds of dining space, including restaurant and tea room, satisfy the daily action and emotional communication of the elderly, and let the elderly with different interests find the affirmation of self-value in the corresponding place and get rid of loneliness. From the visual point of view, to improve the quality of the interior space of the building, it can be improved from the following four aspects.

3.1 Optical environment design

First of all, a good light environment in the space has a direct help to the health of the elderly, and the ultraviolet rays in the sun can help the synthesis of vitamin D in the elderly, which has a positive effect on the treatment of calcium deficiency, disease and osteoporosis in the elderly. "1 Second, due to the decline of visual function of the elderly, the requirements for lighting in life will be higher [5]. Older people require higher standards of brightness, contrast and lighting uniformity than younger people, as well as the need to avoid glare. At the same time, the setting of lights can also play a warning and guidance role, and can also affect the psychological emotions of the elderly.

3.2 Color Design

Many studies have shown that color has a close relationship with people's mental and physical health, and color has symbolic characteristics, such as red on behalf of enthusiasm and blood and danger, can make people feel the atmosphere of joy, but also make people afraid. At present, many doctors also combine the characteristics of color with medicine, and the use of color therapy to treat mental illness has been widely recognized in the world. Therefore, the use of color is very important in the architectural design of the elderly, which directly affects the physical and mental health and emotional state of the elderly. Therefore, the comprehensive design should be based on the emotional attributes of color, the age stage of the elderly [5], the type of care and other factors. In consideration of safety, the physiological characteristics of the elderly should be combined in the design. The elderly have a low recognition of short-wave colors such as blue, green and purple, so the appearance of such colors should be avoided in the design Also, the use of irritating colors in a large area should be avoided, more warm and mild colors should be used, and less bright colors should be used as embellishing to maintain the vitality of the space.

3.3 Material Selection

Different materials will also bring people different emotional experience. In elderly buildings, due to physical and psychological needs, not only the physical properties of materials should be taken into account, but also the emotional connection between materials and people. Materials are divided into two types, one is a modern artificial material, the other is a simple and friendly natural material [6]. In the design, it is necessary to rationally use the characteristics of different materials, organically combine the two, and improve the quality of space.

3.4 Design of human environment

The so-called humanistic environment construction is to endow the space with the spirit of place. The spirit of place needs to be attached to the construction of space, and space provides a carrier for human activities. By taking human behavior as a way, space can stimulate spatial activity, make people have emotions for the objective material environment, and indirectly give space different spirit of place. For the elderly, a good place spirit can improve the communication and communication among the elderly, trigger memories and associations of the past [6], increase the topic of communication, can effectively transfer the bad emotions of the elderly, and reduce the loneliness caused by children's busy work and less time around.

4. Application of visual design in indoor public space of elderly buildings

Jinzhou Comprehensive Service Center for the Elderly covers an area of 19,200 m², with a total construction area of 36,920 m². The center is fully functional, beautiful and comfortable, highlighting The Times and forward-looking, with the basic conditions of modern equipment, intelligent management and star-level service. The center has a total of 256 rooms, which can accommodate 500 beds. The objects of acceptance are mainly government-funded veterans and self-funded elderly people, who can take care of themselves or provide assistance.

4.1 Traffic space design

4.1.1 Entrance hall

In terms of color selection, the entrance space as a whole chooses beige color, which visually gives people a warm, comfortable and comfortable feeling. In the cultural environment, the entrance hall is themed with maple leaves, creating a late autumn scene of frosty leaves and flowers in February, mountain roads, white clouds and people's homes. The artistic conception of sunset, maple leaf flowing Dan, mountain cloud brocade, such as shuo colored clouds, is to sing the beautiful life of the elderly in the pension center. The red color of maple leaves plays an embellishment role for the whole hall. A small amount of high-chroma color can improve the activity of the space. At the same time, red gives people a feeling of joy and makes people feel happy [6]. The grating with maple leaf as the background cleverly creates a semi-private communication space, the elderly can drink tea and chat behind the grating, but also to block the outside view. The use of large-area glass increases the lighting area, and the introduction of a large amount of natural light makes the entrance hall more sunny, and the elderly enjoy the sun here for a long time, which is beneficial to the health of the elderly. The entrance hall is empty on the first and second floors, which not only makes the space open, but also enables the elderly people on both sides to communicate visually and verbally (Figure 1).

4.1.2 Elevator hall and corridor

The design of the elevator hall considers the openness of the line of sight, avoiding the placement of many facilities to block the line of sight, and the open space will make the elderly feel comfortable. The top of the elevator is the Ming hall, the combination of natural lighting and artificial lighting, and the area of the glass window meets the lighting needs during the day. On the basis of meeting the illumination value of the hall corridor stipulated in the "Code for the Design of Elderly Care Facilities" (GB508672013), the local lighting is set in front of the elevator to increase the brightness of the door. Avoid accidents to the elderly. By changing the color of the ground material, the position of the elevator entrance [7] is positioned to guide the sight of the elderly (Figure 2). The design of the corridor takes into account the creation of the cultural environment. By hanging photos of working and living scenes in the 1950s and 1960s on the wall, the elderly can walk and look at memories while doing activities in the corridor, which is not monotonous, but also an incentive for the elderly to gather and communicate and increase the topic. In the corner treatment of the corridor, contrasting colors are used to distinguish the wall and the ground to prevent the elderly from colliding during walking. The handrail of the corridor is made into a light belt, and the location of the handrail can

still be seen when the corridor is dark, and it also indirectly becomes a guiding sign to guide the direction of the elderly and ensure the safety of the elderly when walking at night.



Figure 1 Effect of the hall



Figure 2 Effect of elevator hall

4.2 Entertainment space design

The main entertainment space in the service center includes chess and card room, book and painting room, fitness room and billiard room to provide a good space environment for the elderly's daily leisure activities, so that the elderly with different hobbies can find their own fun, to achieve "old people have their own support, old people have fun", to meet their inner emptiness.

Because the elderly are influenced by traditional Chinese culture and traditional customs, they are more fond of traditional Chinese patterns, colors and furniture styles. At the same time, the activities carried out by the elderly in these two places are static activities, which should create a quiet and warm atmosphere with cultural atmosphere. Therefore, the theme of Chinese style is adopted in the chess and card room and the painting room. In the use of facilities, traditional wooden tables and chairs with carved flowers are selected, which not only has a cultural atmosphere [8], but also gives people a mild feeling of wood material, without the cold feeling of metal. A one-to-one chandelier is set above the chess table and the calligraphy and painting table to increase local lighting to improve brightness, reduce visual fatigue of the elderly, and the chandelier is engraved with auspicious clouds and ancient grille patterns. There are grille decorations on the roof and walls, and Chinese ink paintings and antique ornaments are decorated in the room, further highlighting the cultural atmosphere. Green plants are used locally to enliven the space and purify the air (Figure 4, 5).



Figure 3 Effect diagram of chess and card room



Figure 4 Effect diagram of painting room

Relatively speaking, the billiard room does not have too strong Chinese atmosphere, but pays more attention to the active space and ensures the safety of the elderly in the process of playing. In the

design, a whole wall is selected to use bright colors with high saturation, and the circular pattern is decorated with rhythmic patterns to enhance the activity of the dynamic use of the space and arouse the desire of the elderly. The table tennis room and the fitness room use non-slip ground glue to avoid the elderly from falling down during exercise.

4.3 Dining Space

The dining space needs to create a warm dining environment, and the main design points are the use of color and lighting. In terms of color, warm, mild and bright colors should be used, and mild colors will not stimulate the psychology of the elderly and can promote the appetite of the elderly. Because the design of the restaurant should be integrated with the design of the entire service center, the beige color is chosen as the main color, and the material is used in the material, which is closer to nature, giving people a simple and friendly feeling. In terms of lighting, it is necessary to first meet the illumination value of 200lx stipulated in the "Code for Architectural Design of Elderly Care Facilities" ^[9] (GB50867-2013) of the public restaurant, and use small lined incandescent lamps to meet the lighting requirements; Secondly, strip lamps and close chandeliers are used to enrich the level of light in the space. The visible design of the dining room and kitchen increases the desire of the elderly to eat and enriches their dining style (Figure 5)



Figure 5 Restaurant rendering

4.4 Bath space

In the indoor space, the area where the elderly are most likely to encounter danger should be the bathing space. For example, the wet floor of the bathroom causes the elderly to fall down, and the elderly suddenly stand up after sitting for a long time in the toilet causes dizziness and other phenomena. In the design process of the apartment for the elderly, it is necessary to first strengthen the anti-slip treatment of the surface, at the same time reduce the height difference of the ground, set auxiliary handrails suitable for aging on both sides of the toilet and the appropriate position above the wash basin, and set alarm buttons convenient for the elderly ^[10], so as to avoid possible security risks caused by the bathroom space for the elderly. From the perspective of accessibility, leave enough nursing space for nursing staff to assist elderly people with poor physique or in need of assistance to go to the toilet and bathe, also install auxiliary handrails near the bathtub and shower, and leave enough nursing space for caregivers. A special storage platform is set up to facilitate the taking and placing of bath items.

5. Conclusion

This paper focuses on the visual design of indoor public space in elderly care buildings. Through the analysis of the visual characteristics of the elderly, combined with the influence factors of visual design, some suggestions are put forward for different use Spaces. In the design, follow the people-oriented design concept, combined with the nature of space use analysis design key points; In the construction of visual environment of public space such as transportation, entertainment and catering, the main purpose is to improve local lighting to meet the safety of use, excavate local characteristics and traditional cultural ideas to choose decorative styles favored by the elderly, and improve exchanges and communication among the elderly through humanistic environment. In the choice of color, the warm color system is mainly used to meet the psychological adjustment and psychological

soothing effect, and the easy recognition of color is used to provide visual guidance to the elderly in the space. Comprehensively improving the design level of elderly building in China, improving and optimizing the quality of living space of the elderly, will have a positive effect on solving the problem of elderly care in our country.

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