

# Research on Elderly Apartment Interior Design Based on the Concept of Universal Design

Taking One Sample Room of Huichen Elderly Apartment in Beijing for an Example

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**Abstract**—The elderly apartment pension mode has extensive development perspective, and the elderly apartment interior design conforming to the old people's physical and mental characteristics is a key link to promote the mode. Huichen elderly apartment in Beijing acted as the research object in this paper which explored from the angle of universal design based on the analysis of the importance of universal design concept applied in elderly apartment interior design. The result showed that the interior design of Huichen elderly apartment in Beijing meets the basic principle of universal design, and the beneficial exploration in terms of universal design in Huichen elderly apartment was concluded in order to provide the elderly apartment interior design with the method guidance and the strategic reference.

**Keywords**—universal design; elderly apartment; interior design

## I. INTRODUCTION

With the increasingly serious population aging problem and the miniaturization development of family structure in China, How to properly solve the problem of the elderly endowment is becoming imminent. To meet the demand of the elderly increasingly rich material life and spiritual life, a new type of pension mode is coming into being, which is called as the elderly apartment pension mode. In this mode, the elderly can get comprehensive service, such as basic necessities of life, medical service, cultural education, sports, psychological counseling, assisted-living facility, legal advice and social participation etc.[1-2]. It's worth noting that the life quality of old people is greatly improved and the pension burden of their children is reduced in some degree and the possible conflict between the elderly and their children can be avoided in the elderly apartment pension mode. What's more, this mode is coinciding with the sustainable development of building a harmonious society for us. However, elderly apartment interior design meeting the old people's physical and mental characteristics just is the key link to improve the national acceptance for the elderly apartment pension and promote the elderly apartment pension mode, and at present, the research literature about the elderly apartment interior design is very rare.

## II. THE IMPORTANCE OF UNIVERSAL DESIGN APPLIED TO THE ELDERLY APARTMENT INTERIOR DESIGN

The concept of universal design was first put forward in the 1980s by the American designer Ronald L. Mace, which is the evolution of barrier-free design which was vogue in the 1980s. Compared with the barrier-free design designing "special treatment" of physiology or behavior for the disabled and retarded person, universal design is more emphasized to satisfy the use demands of all people, to pay more attention to the user's psychological content and emotion experience, advocating people, and to advocate the harmony and effective communication between people and design in the maximum allowable range [3-4]. Due to the elderly apartment users are oriented the old who have the individual differences between each other such age range, the operation flexibility etc., it is designing the elderly apartment interior based on the universal design concept that could meet potential and a wide range of the old. And due to the elderly apartment pension belongs to social endowment the elderly apartment interior design based on the universal design needs to less money than the indoor environment for special older people and the transformation of which is not easy to waste. Both the providers and the users of the elderly apartment pension services can save more money to realize the win-win. Furthermore, due to the users of the elderly apartment interior design based on the universal design are the whole older people and which is taken more psychological factors into account so that the special can accept more emotionally and be happy to use the elderly apartment [5-6]. Thus, universal design idea applied to the elderly apartment interior design is not only feasible, but also to play an important role in raising the quality of old people apartment interior design and to help to promote the rapid development of the elderly apartment pension business.

## III. THE PERFORMANCE OF UNIVERSAL DESIGN APPLIED IN THE SAMPLE ROOM IN HUICHEN ELDERLY APARTMENT IN BEIJING

With the help of Yanmin Zhou studio in Tsinghua University, we investigated the Huichen elderly apartment in Beijing and deeply analyzed the interior design of the sample room in Huichen elderly apartment. We tried to refine the performance of universal design applied in the sample room to

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provide some methodological guidance for the interior design in elderly apartment so that designers can design the interior environment and facilities to satisfy the physiological needs and spiritual needs of old people and to make the elderly apartment pension mode can be increasingly accepted by the national.

*A. Natural and Pure Decoration Materials*

Huichen elderly apartment in Beijing which is invested by Beijing Civil Affairs Bureau and was operated and managed by Beijing Huichen pension agency management co., LTD., covers an area of 8000 m<sup>2</sup> and has 105 rooms equipped with 248 beds. As shown in "Fig. 1", "Fig. 2" and "Fig. 3", the main decoration materials used in the elderly apartment are wood, fabric and marble. And the woods are mainly used for flooring, doors and furniture and the fabrics are mainly used for drape and active partition. As we know, the natural grain of wood and the mild texture of fabric make us involuntarily close to them that have nothing to do with our ages, so that they can best satisfy the demands of all kinds of the elderly. Furthermore, the marble is used on the wall in the washing space which is not only durable, but also is good for protecting environment and facilitating the elderly and nursing staff to clean. On the other hand, the tone of integral space created by the main decoration materials is filled with the natural color of furniture made for wood and the pure white color of wall paint which can be acceptable for all the elderly from both physical and psychological tendency. So from the perspective of universal design, this decoration materials used in the elderly apartment can remove the disorientation of the elderly living in the interior space and make the elderly prefer to live in the space.

*B. Intuitive and Clear Functional Division*

The living room area is about 20m<sup>2</sup> in Beijing Huichen elderly apartment. Taking one of the sample rooms for an example, we can find that the functional division of which is clear as shown in "Fig. 1", "Fig. 2" and "Fig. 3". The whole interior space is divided into two little space area which is living space area and washing space area by the solid wall. The furniture in the living space make the function of all furniture is mutually independent and closely related in together, which follows the set rule for general hotel furniture to effectively use the interior space and the furthest consider to satisfy the various functional demands of the elderly within the limited space, and which also follows one of the basic principles of universal design which is called "Fault Tolerance". On the other hand, We can find that two beds was set in the living space, the functional layout of which can not satisfy the requirement of two old persons to use, but also can avoid the problem of depression or loneliness because of the solitude of the elderly, so that this layout makes the interior space has the function of public communication space in a certain extent. What's more, the curtain around the bed is moveable, which makes the living space area divided into independent activity space taking one old person as a unit to ensure the certain space privacy for each other. And this layout is not only to satisfy the functional requirements of the elderly, but also to pay more attention to their psychological needs. Furthermore, the washing facilities are set according to the cross-type

planning to form the wide main passage with various facilities operating space. It is in this layout that not only the convenience of the action of the elderly is fully considered to eliminate the barrier formed by washing facilities, but also the facilities operating space for the elderly increased, which also follows one of the basic principle of universal design which is called "to provide enough space and size".



Fig. 1. Overall layout of the sample room space.



Fig. 2. Different perspective of living space area.



Fig. 3. Different perspective of washing space area.

### C. Concise and Considerate Interior Facilities

The perfect interior facilities in Beijing Huichen elderly apartment such as bed, desk, tea table, chairs, cabinet, TV, air conditioning, pager, bathroommaster, washstand and flush toilet etc., make the useable function of which more clear and reasonable. The corresponding arrangement of interior facilities is in everyone's daily routine with no redundant facilities to reflect the design thought of beauty of simple function. So the perfect interior facilities with reasonable arrangement in Beijing Huichen elderly apartment satisfy the demand of all the elderly for daily use, and bath the brief shapes of facilities and the fine detail designs show the humanist concern towards the elderly. As shown in "Fig. 4", the marginal parts of the furniture are dealt with fillet, which can ease the damage caused by knocking against the furniture during the elderly do activities in the interior space, and soft packing processing of chairs enhances the comfort for the elderly using them, and the wheels on bed legs can satisfy the demand of getting timely treatment when the elderly in emergency, and the moveable fence around the bed can ensure that the elderly will not fall on the ground when they turning their bodies sleeping on the bed and the fence can be folded again when they get up to avoid causing barriers for the actions. In addition, facilities operating space in washing space area is larger and can be shared each other to ensure roomy operating space for the elderly. As shown in "Fig. 5", both the L-shaped handrail of bathing facility and the U-shaped handrail around the washstand and flush toilet embody the warmth of people oriented design. So the common interior facilities are paid more attention in Beijing Huicheng elderly apartment, which makes the elderly living in such an environment just spend their common day without being specially discriminated, and make the elderly feel to be respected and cared.



Fig. 4. Facilities detail design in living space area.



Fig. 5. Facilities detail design in washing space area.

### IV. THE CONCLUSION OF RESEARCH ON ELDERLY APARTMENT INTERIOR DESIGN BASED ON THE CONCEPT OF UNIVERSAL DESIGN

The pace of China becoming an aging society is accelerating. According to a report in China Real Estate Business, the elderly more than 65 years old in mainland China accounts for 9.1% in the total population by 2011, and which more than 25% by 2050. Building the pension mode of satisfying the physical and mental needs of the elderly is imminent. So developing the mode of "the elderly apartment pension" can become the new breakthrough of old-age care boom and the elderly apartment interior design is one of the crucial link. American designer Ronald L. Mace and his colleagues concluded the seven basic principles of universal design, namely the principle of fair, the principle of elasticity, brief and intuitive, clear information, allowable error, the principle of save labor and the moderate scale and space, based on the design practice. The seven principles of universal design applied in the elderly apartment interior design can provide a good direction of design. We investigated the Huichen elderly apartment in Beijing and deeply analyzed the interior design of the sample room in Huichen elderly apartment. And we find that the interior design of the sample room in Huichen elderly apartment meets the basic principles of universal design and conclude its specific design strategies that choosing natural and pure environmental decoration materials as far as possible, and making the functional division intuitive and clear as much as possible, and choosing the facilities with brief shape and detail design as far as possible. To conclude, the beneficial explorations provide the methodological guidance for the elderly apartment interior design to create a warm harbor, which satisfy the physiological and psychological needs of the elderly. Therefore, we appeal to domestic colleagues work together to do more design practice of interior design based on the concept of universal design for the elderly apartment pension to truly make contributions to the development of the elderly apartment pension.

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