Research on Residential Building Design for the Elderly in the Aging Society

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Abstract. In the late 1990s, China has entered an aging society. In recent years, with the rapid development of economy and society, the speed of population of the aging is accelerating. The elderly are the wealth of the country. We should start with details to ensure the normal life and needs of the elderly. To study the problems related to the residential building design for the elderly, we must first make clear the related problems of the elderly, and then improve from the actual design process, and finally improve the quality of life and living of the elderly. This thesis focuses on the design of residential buildings for the elderly in the context of an aging society. Proceeding from the actual problems of the elderly, discussing the physical and psychological problems, the author analyses the problems in the design process and the principles to be followed, and finally proposes measures to improve the design level. It is hoped that the waste paper will further promote the development of residential building design for the elderly in the aging society.

1 Introduction

With a series of changes both in physical shape and function, the elderly needs for social care. Food, clothing, housing, and transportation is the most closely related to the elderly’s daily life which need to be continuously improved. This paper is based on the problem of aging society, analyzes the problems of residential building design for the elderly in detail. It is hoped to further promote the development of residential building design for the elderly in the context of an aging society.

2 Briefly describe the related issues of the elderly in China under the background of population aging

The country's two-child policy has been implemented aiming at the rapid aging of the population and the large number of middle-aged and elderly people in the society. The existence of the number of middle-aged and elderly people has caused that China society develope slow and a trend of containment has emerged. The pace of social renewal has slowed. So there must be a new force to innovate and promote. The elderly are the wealth of the country, and we should work from their specific living aspects to ensure the normal life needs of the elderly. To study the residential building design of the elderly, we must first clarify the relevant issues of the elderly:

2.1 Development Trend of China’s Population Aging

According to relevant data, as early as the late 1990s, China's aging trend has been quite fast. And after nearly two decades, things have become even worse and acute. According to the National Bureau of Statistics data, at present there are 134 million people over 60 years old in China, accounting for 10.8% of the total population. According to the prediction of the population aging process in the 21st century, with the census data of our country, China has entered the second stage of population aging in advance, that is, the stage of rapid population aging. In addition, the National Bureau of Statistics predicts that by 2025, there will be as many as 185 million people aged 65 and over, and by 2050, there will be 284 million people aged 65 and over. Data show that the problem of aging in China is very serious. It develops rapidly and it is not easy to manage.

2.2 Physiological characteristics of the elderly

It is generally believed that after the age of 40, the morphology and function of the body gradually appear aging. Generally, 45 to 65 years are considered to be senesence, and 65 years and older are considered to be senile. The elderly have undergone a series of changes both in body shape and function. These changes in physiological characteristics are not only reflected in the appearance of the elderly as described above, but also reflected in changes in cells, tissues and organs within the human body and various functional systems of the
The elderly have frequent diseases and their physiological conditions are not optimistic.

2.3 Mental needs and behavioral characteristics of the elderly

Due to the decline of brain physiological functions, the elderly show a decrease in mental energy, and show a passive, shrinking and slow impression in life. This is not negative, but an active self-protection. Using the life energy in the most effective survival activities is an adaptive change. Older people often experience physical discomfort due to reduced physiological function and high incidence of chronic diseases, and so they are prone to depression and loneliness. While, the emotions of the elderly are inherent, strong, and long-lasting because the intensity of the negative emotion experience does not decrease with age. Due to their rationality, the elderly often weaken their emotional responses through cognitive regulation. However, older people's emotional experience caused by negative stress events is much longer lasting than younger and middle-aged people.

3 Relevant situation of elderly residential buildings

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3.1 Housing Construction of Foreign Seniors

Capitalist countries, represented by advanced western countries, have made sound guarantees for the elderly. Whether it is from the most basic food, clothing, housing, to actual medical consumption, the elderly have received practical help and preferential treatment. The building fully reflects the necessary principles of humane care and practicality. No matter which type is, the design of elderly housing reflects the necessary principles of practicality, health, security and protection.

3.2 Relevant situation of elderly residential buildings in China

What has been admitted is that most of the reasons for the gap in the design of elderly homes at home and abroad are due to differences in social concepts and living habits. In China, restricted by traditional way of thinking, the society has not given the necessary understanding and attention to the design of elderly homes, and has not realize the difference in the requirements of the living environment after old age. Although the Chinese government has begun to improve the actual living environment of the elderly under the background of population aging, the actual effect is not satisfactory. The reasons are various, including economic factors, social factors, and personal factors, etc.

4 Four common living forms for the elderly in China

4.1 Living alone

In China, living alone in the elderly is a common way. Elderly people are separated from their children and live alone for various reasons. Old people living alone are generally physically strong and have high self-care ability. The family relationship in this way is relatively simple, and there would not be serious intergenerational interference. The residential building of the elderly living alone is relatively simple, but as time goes by, the elderly will have the necessary sense of dependence on the residential building, and also need family’s support and care.

4.2 Cohabitation

Cohabitation refers to the common living pattern in which the elderly live with their children and relatives. This method is of great benefit to the physical and mental health of the elderly and their later life. However, due to the unsatisfied situation, family interpersonal relationships may become complicated, and there are issues such as differences in living habits and concepts between generations. Older residential buildings in the co-living mode may require a large enough area, and at the same time, continuous innovation and improvement are needed. This is because young people's ideas and life concepts are constantly improving. At the same time, under the influence of the market economy wave, the pressure of survival and the frequent flow of population have restricted the development of residential buildings for the elderly under the common living form.

4.3 Adjacent residence

Adjacent residence means that the elderly and their children and relatives do not live under the same roof, and the two residences are not far away. Under this type of residence, the elderly and children can maintain their relative independent life while taking care of each other. From the perspective of actual development, adjacent living is the most common and extensive living mode, and under this living mode, the residential buildings of the elderly show certain traditions and supporting characteristics.
4.4 Concentrated residence
Concentrated residence means that multiple elderly people of similar age live together in an elderly group service institution represented by a nursing home, which has a high social security system and infrastructure supporting facilities. Since China has just entered an aging society, the number of elderly service institutions is small, and the good facilities have high fees and low service levels, which has led to the lack of centralized living form of the elderly in China.

5 Problems Existing in the Design of Residential Buildings for the Elderly in the Aging Society
In China, the issue of aging has received widespread attention from society. In the past ten years, the design of residential buildings for the elderly is also in the ascendant. In general, the design of residential buildings for the elderly in China is still in the early stage of development. There are many problems that hinder the actual development and need to be continuously improved.

5.1 Ignoring the actual needs and requirements of the elderly
Judging from the current situation, most of the elderly live in dwellings they have lived in the first half of their lives, mostly ordinary residences. It is understandable that the elderly have a serious feeling attached to the old. In the process of designing elderly buildings, the problem of ignoring people's actual needs is widespread, making the design separated from reality, blindly pursued freshness and fashion, and lost the main fundamental purpose of the building. The design of residential housing for the elderly should fully moderate the physical and psychological needs of the elderly as a whole. This is the most basic criterion for residential design, but currently the most severely lost.

5.2 Lack of necessary supporting facility designs
The necessary infrastructure and supporting facilities are lacking and there are many unsafe factors in the community where the elderly live, which need to be paid attention by the relevant departments: (1) the space in the community is limited and the necessary equipment and venues such as fitness are insufficient. (2) The lack of living facilities in the community. The necessary hospitals and supermarkets should be equipped for the community to reduce the occurrence of unsafe problems and to provide the elderly with the most basic protection. (3) The environment in the community is not suitable for the elderly because the inconvenience of public transportation, and the large number of private vehicles are all defects in the early design.

5.3 Residential design is single and lacks multifunctional facilities
Most of the elderly live in dwellings that they have lived in the first half of their lives. Most of them are ordinary houses with a single structure only meeting daily life. In the current era, the residential design of the elderly must have the multifunctional characters. The elderly are old and physical frail, and their ability to take care of themselves decreases. Therefore, we should focus the design of multi-function: (1) timely warning function. The elderly are frail and ill, and it is necessary to establish the necessary residential early warning function to prevent problems before they occur. (2) necessary auxiliary functions. Including health and medical treatment, physiotherapy, etc. (3) daily life functions. Elderly people’s legs and feet are not flexible enough, and they need to make a communication way with the outside world.

5.4 Short of humanity and weak economic foundations in the overall planning
The residential design of the elderly lacks a humanized theme and does not truly reflect the main purpose of care. In addition, China's economic foundation is weak and its development is uneven. The society cannot provide sufficient elderly care facilities, so that a large number of elderly people, especially those in rural areas, have a quite poor living condition due to lack of adequate pension funds for the elderly.

6 Principles for the design of elderly residential buildings in the context of an aging society

6.1 Humanization
Whether it is the residential home design for the elderly, or the related design in any other field, it should follow the principle of humanized design. The characteristics of humanized design should be reflected in the residential buildings of the elderly who may be frail and sick. Take the concrete staircases as an example. The stairs should be slightly slower than normal, and the spacing should be increased. The purpose is to meet the living characteristics of the elderly.

6.2 Practical
The design of residential buildings for the elderly should give an expression of the practicality principle. The elderly live most of the time in their homes, so the architecture is closely related to the daily life. In terms of specific architectural planning, the low floors are preference to normal heights. The effective configuration of internal wiring and the like should meet the both physiological and living needs of the elderly.
6.3 Health

In the design of residential buildings for the elderly, the principles of health should be fully considered. The various raw materials such as paint and wood required for construction should meet the relevant national regulations, with the most fundamental starting point not to harm the health of the elderly.

6.4 Benefits

The design of related projects and specific practical operations should be based on the principle of efficiency. This is because the elderly are not people with rich economic resources. Practical projects based on the principles of economical efficiency and energy saving should be carried out.

6.5 Security

Security is the most fundamental and important principle in the design process. Inside and outside the community where elderly people live must be strictly controlled and planned to avoid the occurrence of safety problems. In addition, necessary living facilities should be equipped inside and outside the community to eliminate potential safety hazards as much as possible.

7 Perfect Measures for Architectural Design of Residential Buildings for the Elderly in the Ageing Society

7.1 Knowing well the actual needs

The basic design is to serve people. In order to design the most complete residential building for the elderly, the actual needs of the elderly should be known well and the most basic data should be held: (1) conduct research in the elderly group, and master the first hand information. (2) Conduct necessary research various living modes of the elderly and grasp their needs.

7.2 Respecting tradition and combining reality

On the basis of respecting China's traditional culture and family customs, consideration should be given to providing diversified forms of elderly living. The elderly living model, which consists of mainly home-based care for the aged and depends on community services and continuous improvement of the social pension system from one point to the whole area, is suitable for China's national conditions. That is the best choice for the elderly. It is necessary to follow the tradition and combine the actual needs of each elderly person in order to design according to their aptitude to meet the needs of different customers.

7.3 Establish and improve the social security system and relevant normative regulations

We will improve the old-age security system in China so that the elderly will still enjoy corresponding welfare guarantees after retirement. At the same time, the state provides certain support to the families supporting elderly people. We will continue to improve elderly facilities and use the network to expand service targets and develop social pension network system. Change the current single centralized management model, implement flexible and diverse development and management methods, so that more elderly people could choose and adjust according to the situation.

8 Conclusion

This thesis focuses on the design of residential buildings for the elderly in the context of an aging society. Starting from the actual problems of the elderly, it discusses the physical and psychological problems, analyzes the problems in the actual design process, and proposes the principles to be followed. Finally, the author puts forward specific measures to improve the design level and hopes that this paper will further promote the development of residential building design for the elderly in the context of an aging society.

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