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Space Optimization Design of Institutional Facilities for the Elderly under the Mode of Combination of Medical Treatment and Endowment

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Abstract: With the acceleration of the aging process of the social population, the space of institutional facilities for the elderly under the mode of combination of medical treatment and endowment has become the main direction of the development of medical institutions. Therefore, the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment is researched in this paper. In the process of research, it mainly aims at the requirements of the elderly in physiology, psychology, adaptability and behavioral characteristics, upholds the principles of safety, convenience, diversity, communication and naturalness, and optimizes the outdoor space and indoor space, so as to provide useful reference for the development of facilities for the elderly at the level of health treatment and endowment.

Keywords: Medical treatment and endowment; Institution; Support the elderly; Optimization

1. Introduction

With the acceleration of the global population aging process, China has already entered the aging society. According to incomplete statistics, by the middle of this century, the aging population of China is expected to be close to 500 million. Therefore, "support the elderly" has become one of the biggest problems faced by the society at present. The continuous development of population aging has a great impact on many factors such as China's social culture and economic development [1]. In order to solve this problem, China has put forward the mode of combining medical treatment and endowment in the Several Opinions of the State Council on Accelerating the Aged Care Service Industry and Several Opinions of the State Council on Promoting the Development of Health Service Industry, which combines medical and health resources with institutions for the elderly to provide safe and secure institutions for the elderly. The mode of "combination of medical care and maintenance" mainly realizes the cross-border combination of medical institutions and institutions for the elderly, and realizes the mutual integration of their functions [2]. On the basis of meeting the needs of daily life and leisure and entertainment of the elderly, it is supplemented by various medical services such as daily disease treatment, emergency treatment of sudden diseases, rehabilitation and health care, and psychological counseling, so as to solve the contradiction of medical treatment in the long-term care of the elderly institutions, and form a new service mode for the elderly. Therefore, the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment is researched. Based on the analysis of the current situation of the institutions for the elderly in China, combined with the physiological and psychological characteristics of the elderly, the functions, operation structure and design principles of the buildings for different elderly groups are optimized and upgraded [3].

2. The External Space Optimization Design of Institutional Facilities for the Elderly under the Mode of Combination of Medical Treatment and Endowment

As a vulnerable group, with the growth of age, the physiological function of the elderly has deteriorated to varying degrees, and the ability to adapt to the new environment has also declined. Therefore, if the elderly are in the indoor environment for a long time, the quality of indoor environment will directly affect the mood of the elderly[4]. Therefore, the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment needs to consider the air quality problem, artificial lighting problem, thermal environment and other aspects to provide a comfortable space environment for the elderly. At the same time, considering the psychological space needs of the elderly, there are strong requirements for privacy, belonging, security, comfort and neighborhood in the

optimization process. Therefore, it is required to have the characteristics of flexible spatial organization, diversity of spatial residence and permeability of spatial perception. In the optimization process, based on the spatial demand analysis of the adaptability of the elderly, it is necessary to achieve outdoor space indoorization, indoor space outdoorization and transition space integration, while ensuring the principles of safety, convenience, diversity, communication and naturalness.

2.1. External space layout optimization

In the process of optimizing and designing the space of institutional facilities under the mode of combination of medical care and nursing, the space of external facilities is mainly divided into two parts: dynamic space and static space. The static space optimization provides activities space for the elderly, such as gardening space, health walkway, outdoor rest space; the dynamic space optimization provides swimming pool, rehabilitation activity space, fitness space for the elderly. In order to reflect the functional difference between static space and dynamic space, green belts are used to separate the junctions and they play a transitional role. Considering the connection between space and indoor space in facilities for the elderly, factors such as sunshine and strong wind should be avoided in the design so as to enhance the psychological security and visual permeability of the elderly. In the optimization of external space layout, courtyard and indoor layout schematic diagram, courtyard and outdoor layout schematic diagram, as shown in Figure 1 and Figure 2:

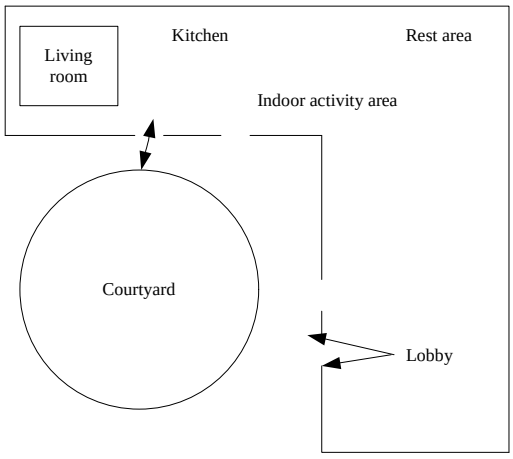

Figure 1. The courtyard and indoor layout schematic diagram

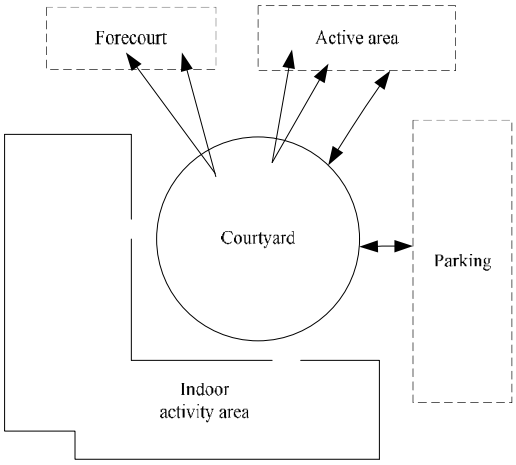

Figure 2. The courtyard and outdoor layout schematic diagram

2.2. Road design optimization

Considering the physiological characteristics of the elderly, in the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment, the road structure should be based on the platform and no steps. At the same time, anti-skid design of the original ground should be carried out to reduce the probability of accidents of the elderly in sports. In road optimization, the medical trails and jogging venues are mainly based on the combination of rest space and sports trails to ensure that the elderly can rest at any time after exercise[5]. Considering some elderly people with inconvenience in movement, the road surface is widened to facilitate wheelchair access. The courtyard rest area and pedestrian passage is divided to avoid interference. At the same time, the pedestrian and vehicle routes in the facilities for the elderly should be planned more reasonably to avoid the danger caused by poor routes. Series connection design is adopted for different outdoor functional spaces to enable the elderly to actively participate in group activities through facilities. Between the walkway and activity square, a intersection line should be designed to create opportunities for some elderly people who do not actively participate in group activities, so that the elderly can participate spontaneously. At the same time, a circular outdoor walk has been designed to enable the walking routes of the elderly can form a network system, providing them with outdoor travel routes, so that the elderly can fully enjoy the happiness brought by the outdoor scenery.

3. The Internal Space Optimization Design of Institutional Facilities for the Elderly under the Mode of Combination of Medical Treatment and Endowment

For the elderly, the spatial structure of the facilities can bring different life experiences to them [6]. In the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment, the design optimization is mainly aimed at the living space, activity space and medical care space. The spatial organization relationship of the old-age facilities is shown in Figure 3:

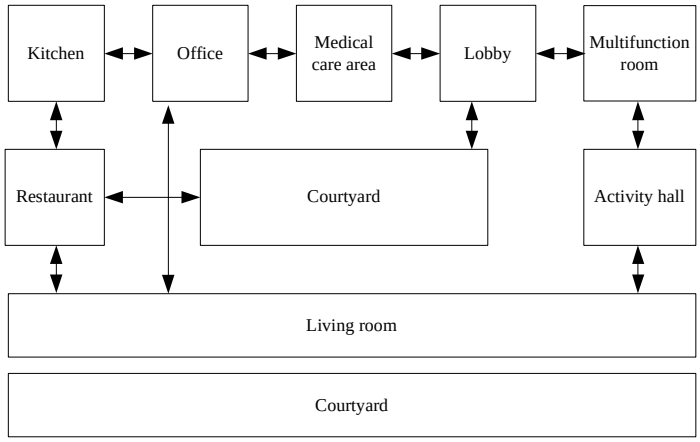

Figure 3. The spatial organization relationship of the old-age facilities

3.1. Design optimization of living space

The elderly have gradually increased their requirements for the quality of living facilities, and the privacy requirements for their living spaces are getting higher and higher. At present, single room, double room, suite, economic three-person room and four-person room are the main types of living room in the facilities for the elderly, among which double room and single room are more common. At present, with the improvement of the quality of life, living facilities for the elderly are mainly single rooms [7]. Therefore, in the design optimization of the living space of the single room, considering the physiological needs of the elderly, the rest room can only provide toilets and hand-washing pools, and the shower can be set in the public shower bathroom to facilitate nursing work. Considering that the elderly often wash their hands, the original hand-washing pools in rest rooms are placed outside the rest rooms, which is convenient for the elderly to use. At the same time, in view of local differences, the elderly in the north region prefer to the place facing south, so their living rooms can be equipped with inclined windows facing east, which can lead sunshine into the north-facing houses, and increase the comfort of living and the interest of building facades.

3.2. Optimization of public activity space

For indoor public activity space, multi-level design is adopted to meet the needs of different elderly people through spatial layout, forming a variety of forms of

communication space, thereby reducing the loneliness of the elderly. In the first floor space, because it is close to the main entrance, the area is relatively large, so it can be used as a public activity space; the second floor can be used as a dining space, or rehabilitation activity space and other space [8]. In the small courtyard, rehabilitation machines are placed along the windows to increase the self-confidence of the elderly in life. For the public space in the facilities for the elderly, the mode of external operation can be considered. While increasing the operating income, people outside the old-age facilities can enter the public activity space to interact with the elderly, which can increase the overall space vitality.

3.3. Design optimization of medical rehabilitation space

Combined with the local regional culture and climate characteristics, considering the psychological characteristics of the elderly, the medical rehabilitation space adopts the concise and generous modern design style with regular shape. Different from the previous closed space design, the optimized space mainly consists of large area of transparent glass, giving the elderly a delicate and quiet medical atmosphere. Because the elderly have a stronger ability to recognize the color with longer wavelength, the overall space of it uses yellow-brown real stone paint, and partially matches wood-colored aluminum alloy material, to make the whole more intimate. The design of transparent glass enables the whole to have a high permeability in the line of sight, at the same time, it makes it easier for the nursing staff to observe the situation of the elderly.

4. Conclusion

With the acceleration of the aging process of the social population, the demand for the space of institutional facilities for the elderly under the mode of combination of medical treatment and endowment is also increasing. Therefore, according to the physiological, psychological, adaptive and behavioral characteristics of the elderly, the space design of facilities for the elderly is optimized, so that the facilities can effectively improve the quality of life of the elderly, while meeting the aging trend. In the space optimization design of institutional facilities for the elderly under the mode of combination of medical treatment and endowment, the principles of safety, convenience, diversity, communication and naturalness should be taken to optimize the outdoor and indoor space in the facilities, so as to improve the facilities under the mode of combination of medical treatment and endowment. The optimization design of the facilities for the elderly can improve the quality of life of the elderly, and provide useful reference for the development of facilities for the elderly at the level of health treatment and endowment.

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