

Research on Barrier Free Interior Design from the Perspective of Ergonomics

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Abstract: “Home” is a place full of warmth and love, and a haven for comfort. A family living in their own house is the simplest and most insipid happiness, and for their own “home” interior design, in addition to considering the simplicity of interior space design, but also into more “human”, in order to really feel at ease. Ergonomics is a new interior design concept in recent years, which emphasizes the integration of “human” and things. In recent years, we have been advocating “humanization”. No matter what industry, we pay more and more attention to people-oriented, advocating humanized working and living environment. Interior design, as a subject closely related to human living environment, also gives more and more attention. In particular, the disabled, the elderly, the injured, pregnant women, children and other vulnerable groups should be paid more attention because of their special physiological needs. Based on the investigation and analysis of the basic situation and the main obstacles of the vulnerable groups in China, and the investigation and analysis of the relevant design, this paper explores and studies the interior environment design methods suitable for the vulnerable groups.

1. Introduction

In modern society, we are not unfamiliar with the word “decoration”. Generally speaking, it is interior design and transformation. It mainly refers to the formation of a comfortable, healthy, natural and safe space environment through the decoration and adjustment of the indoor environment according to personal aesthetic requirements, and gives a distinct meaning in the spiritual level. With the progress of the times, people's living standards are further improved, interior design is facing higher and higher requirements of beauty, health, environmental protection and comfort, and interior design has been extended to all aspects of life, such as residence, store, office, hotel, hospital, school, library and so on, which are closely related to people^[1]. With the improvement of the level of science and technology, the imagination of people is endless, so ergonomics also came into being, and the proportion of interior design is more and more, so it also attracts more and more attention.

2. Barrier Free Design

Barrier free design, as a method of using ergonomics to achieve reasonable planning of space and facilitate daily activities, can make everyone's desire to live independently come true.

Ergonomics, as an important basis for studying the applicability of human body in life, work and other activities, is an indispensable part in the process of barrier free interior design. Although barrier free design in China started late and from a low starting point, it has made remarkable achievements^[2]. The main roads, main commercial streets, squares and hospitals in most cities have adopted barrier free design, and the barrier free facilities in urban residential areas have also started. Some cities have also built a number of high-level barrier free facilities, such as the blind botanical garden in Nanjing, the wildlife park in Dalian, the terracotta warriors and Horses Museum in Xi'an, which have had a certain impact in the world^[3]. However, barrier free design has not attracted our enough attention, and there is a big gap in popularization. There are still some universities, banks, courts, etc. without barrier free design consideration, barrier free design has become a blind spot.

3. An Analysis of the Barriers of Vulnerable Groups

In order to get the method of barrier free design, we must first understand the obstacles faced by vulnerable groups. Only in this way can we get twice the result with half the effort. Vulnerable groups mainly include: the disabled, the elderly, the injured, pregnant women, children, etc. Analysis of life obstacles of the disabled: some equipment and equipment caused by physical disability are not convenient or can not be used; the equipment (such as wheelchair, crutch, etc.) that the disabled rely on when they move is inconvenient to space and the process of action; the special requirements for the height of facilities in the process of life of the disabled, etc. Analysis of the life obstacles of the elderly: the elderly generally move slowly; they are not easy to accept and adapt to some new and difficult equipment; their vision is poor, etc. Analysis of life obstacles of injured patients: the obstacles of some injured patients are the same as those of the disabled people mentioned above; they are prone to fatigue, etc^[4]. Analysis of life disorder of pregnant women: inconvenience caused by physiological and physical differences; easy to fatigue, etc. Analysis of children's life disorder: inconvenient factors caused by the difference between height and adults; memory disorder; risk of equipment or facilities to children, etc.

4. Summary and Refinement of Barrier Free Design Method

① Interior design should conform to the physiological and psychological characteristics of vulnerable groups. In addition to the necessary design to facilitate life action, we should pay more attention to the mental health of this group, and try to avoid the generation of frustration and inferiority in the process of using it. ② Reduce the height difference of the ground, widen the passageway to facilitate walking, and set a gentle ramp to create conditions for wheelchair access. Blind roads should be set up in public places. ③ The indoor floor should be made of anti-skid materials to avoid slipping and other accidents. According to the need, anti-skid ceramic tile, wood floor, plastic floor, rubber floor or carpet can be used. ④ The toilet should be equipped with convenient toilet for the elderly and the disabled, and auxiliary handles should be installed on both sides of the toilet to help the elderly and the disabled leave the toilet. The color of sanitary ware should be white to facilitate the identification and use of the visually disabled and the elderly. ⑤ The wash basin should be wall hung or platform basin type, and the lower clearance height should not be less than 600mm^[5]. The main consideration is to leave space for the disabled to extend their knees. The cold and hot water faucets of the wash basin should adopt the photoelectric control induction type automatic faucet, or the lever type and press type faucet. This is mainly due to the poor grip strength and slow movement of the disabled and the elderly. ⑥ Bathtubs in living rooms and hotels should not be too high, but should be padded higher^[6]. Handrails should be installed in bathtubs, and the bottom of bathtubs should be antiskid to ensure safety. ⑦ Indoor activity routes

must be unobstructed. Facilities causing walking obstacles shall not be placed or installed on pedestrian passageways and blind roads. In order to avoid bumping, it is not necessary to set signs and other obstacles within the range of human height. ⑧ The height of indoor furniture and facilities should consider the needs of different vulnerable groups, especially the needs of the disabled and children in wheelchairs^[7]. ⑨ In order to facilitate the identification of amblyopia group, indoor font should be neat, clear, moderate size and strong contrast. ⑩ Facilities and equipment should avoid the complexity of operation as far as possible to facilitate the use of the elderly and the disabled. Vulnerable groups are prone to fatigue. In order to facilitate their rest, the rest area should be properly designed and arranged in public places^[8]. Under the condition of suitable for vulnerable groups, we should pay attention to the public use and integration of vulnerable groups and normal groups, and increase the scope of application.

5. Conclusion

The interior design with ergonomics as the focus has a subtle effect on people's life. It can show people's different inner feelings such as happiness, anger, sadness and happiness. The house is not only the residence, but also the strong embodiment of the residents' emotion and thought. Through the interior design of ergonomics, the heavy mind can be reduced and released, and the mood can be calm in a relaxed and comfortable environment, which highlights the coordination and unity of human, machine and environment, and can actively create a more safe and reasonable interior space for people. Because of their own physiological and psychological characteristics and the lack of consideration of the whole social environment system, the vulnerable groups' free behavior is restricted. The humanized consideration of barrier free interior design is to eliminate the obstacles caused by physical inconvenience to the maximum extent, and try to meet the needs of the groups most likely to use the place. At the same time, it also encourages the use of other groups, and ensures that the activities between groups do not affect each other, so that the disabled, the elderly, the injured, pregnant women and children can enjoy the fun of life Especially for the needs of special groups such as mothers, infants and the disabled, we should also give consideration and care in the design and construction of public space, so that they can share the achievements of modern scientific and technological civilization. Only by taking into account the internal needs of human beings and designing the interaction and management on the various elements of urban space, space performance characteristics, space aesthetic significance and other aspects, can the urban public space achieve the morphological characteristics and aesthetic artistic conception of isomorphism with human needs. The brewing, planning, construction, design, use, maintenance and transformation of public space should be people-oriented, so as to maximize the realization of human concern. Therefore, in this sense, humanized design is the requirement of design essence and the return of design origin. How to ensure the convenience of vulnerable people's life and guide interior design to a healthy and healthy development will be a very difficult work. But we believe that as long as we continue to work in the right direction, our living environment will be more and more beautiful!

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