

Application of Intelligent Bathroom Products in Aging Society

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Abstract

In line with the application status of intelligent bathroom products in an aging society, this thesis focus on the analysis of the concept of intelligent elderly bathroom facilities and fundamental needs of an aging society, thus to draw a conclusion about the characteristics of the elderly, the basic content of intelligent bathroom facilities. This thesis also proposed the basic principle of design for the intelligent bathroom products, thus to promote the application of intelligent bathroom products in the aging society.

Keywords

Intelligent bathroom products; Aging society; Application analysis.

1. Introduction

1.1. Development status of aging society in China

It is as early as the initial stage of this century that the number of elderly population in China has reached 88.11 million. With the constant acceleration of aging in this country, the elderly population has witnessed a drastic growth. After a period of rapid growth in the early 2000s, the population of the elderly is still growing at a rapid rate of 3% per year. In the year of 2020, the number of people over 65 reached 174 million, accounting for over 12 percent of the population.

1.2. The concept of the bathroom facilities for the elderly

The raging development as well as the application of modern science and technology have witnessed the intelligence turning into an indispensable part of modern life, such as intelligent building, intelligent water system, and intelligent home. It is safe for us to draw the conclusion that intelligent products are equipped with more functions compared with traditional products, which can even replace manpower to complete some specific functions. In addition, given intelligent products enjoy a certain degree of intelligence, they can meet the basic needs of people.

1.4 Basic features of intelligent bathroom facilities for the elderly.

2. The analysis of the characteristics of the elderly in bathroom activities

2.1. Physical characteristics

From the perspective of bathroom activities, the physiological factors that impose negative impacts on the elderly to engage in bathroom activities can be roughly separated into two aspects, namely, motor function and sensory function. On one hand, in terms of motor function, the degeneration of muscles and bones is expected to mitigate the flexibility of activities of the elderly, which means that the dominant force of the body is sometimes expected to be out of their own control. In such case, it is easy for the elderly to feel powerless in the bathroom activity, where mostly they need to rely on auxiliary facilities to complete those activities. On the other hand, in terms of sensory function, against the backdrop of the deterioration of sight, hearing, and smell, the ability of the body's different senses to transmit signals to the central system decreases, which will contribute to the fact that the elderly tend to be not sensitive to temperature.

2.2. Psychological characteristics

Taking into the consideration the influence of age, the psychological state of the elderly also presents certain changes, including the following aspects. First is the safety needs. The elderly are longing for adequate security to prevent themselves from danger and injury. Second is the social needs. The elderly always hope to get noticed by others, otherwise they will feel lonely. Third is the needs to be respected. The elderly crave respect from others, while to achieve respect, the premise is to accomplish certain things independently. Fourth is the self-actualization needs. As the highest pursuit of life, self-actualization need also represents the level of self-value, which is of paramount importance for achieving goals in life.

2.3. Behavioral characteristics

After stepping into the old age stage, the aging of the body is expected to impose a direct impact on one's behavior characteristics. With prominent dull actions with a slow reaction speed, the elderly witness weaker coordination ability of the movement in comparison with before. In addition, the elderly are prone to get exhausted and generate the feeling of fatigue. Last but not least, given the sharp decline in the physical function of the elderly, their resistance will also gradually weaken. In such case, they have to attach great importance to seasonal changes and diseases brought by climate change, where the elderly will cast their eyes on and fully leverage preventive measures in advance.

3. Basic contents of intelligent bathroom facilities in aging society

3.1. The characteristics of bathroom facilities for the elderly are dependent by the use environment

To embark on the research on the bathroom facilities for the elderly, it is of great significance to on one hand give priority to the product, on the other hand attach great importance to the interpersonal relationship between the elderly and bathroom products. During the design process, any link should never be isolated, and the designers are responsible for taking comprehensive consideration about bathroom facilities, thus to have better understanding on the integral connection of bathroom facilities under the specific bathroom environment. In addition, when embarking on the design of bathroom, what should never be overlooked is grooming needs, storage of sanitary equipment and configuration of laundry equipment. Hence, the relationship between the internal facilities and the space of the bathroom should to be properly addressed and coordinated. In case of any unreasonable design, the designers should correct or improve in terms of the relationship between the facilities and the space ^[1].

It is universally acknowledge that all kinds of facilities in bathroom space are the main basis for the measurement of the space, during which process people's behavior and activities in this space should also be taken into consideration. The area of bathroom includes basic area and expand area. Basic area refers to the space for meeting the basic physiology function. In the actual process of bathroom space design, it is the responsibility for the designers to coordinate the scale relationship between the space area and the overall indoor area, coordinate the proportion of each indoor space, and avoid any contradiction in space using. It is worth to point out that from the perspective of the physiological, psychological and behavioral demands of the elderly, it is wise for the design of bathroom space for the elderly to take full consideration of the coordination of scale relations [2].

3.2. The analysis of the functional characteristics of the bathroom facilities for the elderly

With the continuous development of social economy, people's life style and ideology have witnessed great transformation, together with dramatic increase of their acceptance of novel things. In addition, the functional positioning of bathroom has also been improved from meeting the fundamental physiological needs to providing comfortable experience in bathroom. As an essential use space in people's daily life, bathroom space is expected to change with the improvement of social environment, use demand and living standard. During this process, changes will be witnessed in the original bathroom function, which are expected to engage in three directions, namely, basic function, auxiliary function and extension function. The colour of bathroom is made of a variety of factors such as product that defend bath by metope, ground and lamplight. In accordance with the research and analysis of elderly consumers, most of them prefer bathroom to be a warm color, as the warm colors are expected to create a comfortable and soft feeling^[3]. In addition, bathroom facilities generally emphasize the use of white and warm colors, which is expected to create a comfortable displacement space for the elderly. Such spatial color collocation can on one hand expand the whole bathroom environment visually, on the other hand further satisfy the visual needs of the elderly. [4]

4. Basic contents of intelligent bathroom facilities in aging society

4.1. Intelligence of operational factors

It is safe for us to come to the conclusion that bathroom, to some extent, is the best representative of the activity space that can show human care. Operation factor is a major factor that can never be ignored in the design process of bathroom facilities. Hence, the operational design of bathroom facilities is required to remain commitment to the basic principle of people-oriented. Designer should take into consideration the physiological, psychological and behavioral needs of the elderly. Hence, the application of intelligent operating factors in the design is conducive to on one hand mitigating the impact of physiological inconvenience on the elderly, on the other hand meet the basic needs of the elderly who are expected to use bathroom facilities alone, thus to satisfy their psychological needs. The basic principles of the design of intelligent bathroom facilities for the elderly mainly are as follow.

Manual flush button should be installed on the side of the bathroom for preventing the failure of automatic flush function after power failure; The bathroom should be equipped with wireless remote control, with prominent illustrations or instruction to ensure that the elderly can flexibly operate in accordance with their personal needs; The bathroom seat should be equipped with the function of heating, which is conducive for the elderly to adjust the temperature in line with seasonal changes, thus to prevent the impacts brought by seasonal changes on their urination; The bathroom should also be equipped with a soft lighting function, thus to further facilitate the elderly to go the bathroom independently at night. With various intelligent operations, it is expected that the elderly can complete bathroom activities independently. In such case, we can

provide convenience for the elderly while showing full respect to their privacy, together with their psychological needs well satisfied [5].

4.2. The intelligence of 3R bathroom culture

3R bathroom culture is a new requirement of modern bathroom activities, which includes relaxation, recognition and recovery. Under the influence of traditional ideas, bathroom space in China has only receives little attention, and what required is to satisfy the fundamental sanitary needs. With the influence of modern design concepts, the design of bathroom space has given increasing priorities to customization, comfortable, safe and pleasant experience. Therefore, in the process of designing intelligent bathroom facilities for the elderly, it is of paramount importance to apply 3R intelligent bathroom culture and take into consideration both the physiological and psychological needs of the elderly to a full extent. For instance, the bluetooth speaker can be installed in the shower, which allows the elderly to answer the phone and play music when bathing. LED light emitting design can be installed at the faucet, which allows the elderly to recognize the water temperature in accordance with the LED screen when using. From an all-around perspective, 3R bathroom culture enjoys practical significance for the study of convenient, comfortable and safe bathroom environment for the elderly.

5. Conclusion

All in all, since the world is stepping into the aging society, we have witnessed the increasing demand of intelligent bathroom facility products among the elderly these days, which also expands the overall market of intelligent bathroom facility products. As for the practical design process of bathroom facility products, it is of significant importance for designers to fully leverage intelligent technology in line with the actual needs of the elderly, as well as respect their physiological, psychological and behavioral characteristics. Only in this way can the designers manage to work out intelligent bathroom facility products that meet the characteristics and actual needs of the elderly, contributing to their bathroom activities in a safe and independent way.

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