Research on Intelligent Interior Space Design under Home Care Mode

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Abstract: With the advent of the aging society, the innovation of home care model and facility design have attracted increasing attention. Smart interior design, big data and IoT technology application aims to provide a more convenient, comfortable and safe living environment for the elderly through the integration of intelligent technology as a new design concept. This paper first expounds the design idea of the intelligent indoor environment, and the intelligent lighting, temperature control, emergency response and other aspects are discussed in detail. It analyzes how the intelligent indoor design can effectively improve the quality of life and safety of the elderly, smart interior design, with its outstanding performance and forward-looking concept, enables smart systems to quickly activate emergency response mechanisms and health monitoring, bringing new changes to the home life of the elderly. It improves the quality of life for the elderly, and makes them feel the warmth and care brought by technology.

Keywords: Home Care Mode; Elderly Care Facilities; Smart Equipment; Interior Design; Elderly People

1. Introduction

The aging of the population in Chinese society is becoming more and more serious, and the pension problem has become a very prominent livelihood problem. In order to cope with this livelihood problem, the Chinese government has put forward a project and construction implementation plan to actively deal with the aging population in the 14th Five-Year Plan, aiming to meet the needs of the elderly by improving the home-based care model [1-3].

We will not only pay attention to the basic living needs of the elderly, but also pay attention to improving their quality of life, so as to realize the high-quality pension model of "the old are supported, the old are supported and happy".

In the process of home care model, the aging-suitable transformation is a key link. Aging-appropriate transformation refers to the necessary transformation of the living environment of the elderly, so as to adapt to the physical and psychological characteristics of the elderly and ensure their living safety and comfort. This transformation should be on the basis of security, comfort as the premise, aims to improve the quality of life of the elderly, transformation should ensure the safety of the elderly living environment, improve the living comfort, meet the personalized needs of the elderly, consider long-term use, for sustainability, to ensure that the renovation scheme can meet the actual needs of the elderly, the design of pension facilities increasingly attention [4-7].

Intelligent interior design takes science and technology as the means, through intelligent and humanized design, to provide the elderly with a more comfortable, convenient and safe living environment. This design concept combines advanced technology with human needs, aiming to improve the comfort and convenience of the indoor environment, and to meet the pursuit of high-quality life of users. Compared with traditional design, intelligent interior design pays more attention to the application of technology and the personalized needs of users and realizes the transformation from a single function to a diversified and intelligent function. Under the guidance of this design concept, the designer put the needs of users in the core position. They start from the

elderly's living habits, health status, psychological needs and other aspects, tailored indoor environment more in line with their actual needs. At the same time, intelligent interior design makes full use of the Internet of Things and artificial intelligence to integrate the indoor environment, equipment and services intelligently, so as to bring users a more convenient, comfortable and safe life experience [8-10].

2. Smart Interior Design Features

The core concept of smart interior design is to combine modern technology with the interior layout to create a beautiful, practical, comfortable and intelligent living and working environment. This design concept emphasizes the following key points: 1. People-oriented: Intelligent interior design always puts people's needs in the first place, and improves the comfort, convenience and safety of living and working through scientific and technological means. Consider the users' health, safety, comfort and personalized needs during the design.2. Intelligent: Using the Internet of Things (IoT), artificial intelligence (AI), automatic control and other technologies to realize the intelligent interconnection and automatic management of home devices. For example, the intelligent lighting system can automatically adjust the brightness according to the indoor light, and the temperature control system can automatically adjust the indoor temperature according to the indoor and outdoor temperature.3. Sustainability: Smart interior design focuses on environmental protection and energy saving, using green building materials, energy saving equipment and renewable energy to reduce the impact on the environment and reduce the resource consumption of users.4. Personalized customization: Through data analysis and user feedback, intelligent interior design can provide personalized solutions to meet the specific needs and preferences of different users.5. Flexibility and scalability: Consider future technology developments and changes in user needs, reserve room for upgrade at the design time, and ensure that the system can be updated as the technology advances.6. Safety: Pay attention to the safety of living and working environment and improve the efficiency of emergency handling through monitoring and emergency response system.7.

Convenience: Simplify daily operations and improve life and work efficiency with smart devices, such as voice control or mobile applications, to operate home devices. The field not only focuses on current technology applications but also explores future trends to ensure forward-looking and adaptable to future change.

Through the intelligent lighting system, the indoor light is automatically adjusted according to the time, brightness and other factors, providing a comfortable visual environment for the elderly. The intelligent temperature control system can adjust the temperature and humidity of the room, and automatic air conditioning, heating and other equipment can adjust to keep the room dry. Artificial intelligence technology provides more intelligent services for intelligent interior decoration design. For example, the elderly can easily control the smart housekeeper, query information, and communicate with the society. The smart health monitoring system is to monitor the health status of the elderly with heart rate and blood pressure in real time, and find abnormalities in time, which can urge treatment. In short, the core concept of intelligent interior decoration design is to take user needs as the center, maximize the use of the Internet of Things, artificial intelligence and other cutting-edge technologies, create a more intelligent and humanized indoor environment, and improve the quality of life and safety of users.

3. Example of Intelligent Interior Design in Pension Facilities

The smart temperature control system is an important application of smart interior design in elderly care facilities, integrating advanced temperature sensors, efficient and energy-saving air conditioning and heating equipment, and integrating artificial intelligence and big data technology to achieve automatic adjustment and personalized setting of indoor temperature. The core of the smart temperature control system lies in its intelligent and personalized design concept, which can provide the most comfortable temperature environment for the elderly according to different environments and needs. First of all, the intelligent temperature control system can sense the indoor temperature in real time, and intelligently adjust the indoor temperature

according to the activity state and body temperature of the elderly. This means that the system can provide the most suitable temperature environment to them no matter what they are doing.

As a shining gem in modern smart interior design, the importance of smart lighting systems is particularly prominent in elderly care facilities. This system provides an unprecedented lighting solution for elderly care facilities with cutting-edge sensor technology, efficient network communication, and precise intelligent algorithms, achieving an efficient, convenient, and extremely comfortable lighting experience. The intelligent lighting system has demonstrated its excellent adaptive ability. The system can not only perceive the current time, but also accurately judge the indoor lighting intensity, and even carefully consider the real-time changes in indoor activities. Based on these meticulous perceptions, the system can automatically and accurately adjust the brightness, color temperature, and uniformity of the lights, ensuring that the lighting environment inside the elderly care facilities is always maintained in the most suitable state. This automatic adjustment function not only meets the visual comfort needs of the elderly, but also invisibly protects their health and avoids potential health hazards caused by improper lighting. The smart lighting system also has the function of simulating natural light, which is even more icing on the cake. Today, as elderly people increasingly value a healthy quality of life, the simulated natural light function of the system brings a lighting experience similar to outdoor lighting to elderly care facilities. This kind of light is not only soft and comfortable, but also can regulate the biological clock of the elderly, helping them maintain good sleep habits. This care for details fully reflects the practical application value of smart lighting systems in elderly care facilities.

Emergency response system is an important safety measure for home care, which aims to provide timely and effective rescue services for the elderly. The system integrates emergency call buttons, temperature difference detectors, smoke alarms, and other equipment to ensure that older people can be helped quickly in an emergency. First, the emergency call button is one of the core components of

the emergency response system. The emergency response system for home-based elderly care is an intelligent system designed specifically for the elderly, aiming to provide quick response and assistance in emergency situations for elderly people who are taking care of themselves at home. In China, with the intensification of population aging, the emergency response system for home-based elderly care is receiving increasing attention. The government and various sectors of society are actively promoting the development and improvement of emergency call equipment, monitoring systems, service platforms, community linkage mechanisms, health management systems, and information management systems. These buttons are usually placed in places accessible to the elderly (such as bedside, bathroom, etc.) to ensure that they can be pressed quickly to send a distress signal in an emergency. After pressing the button, the system will immediately send an alarm message to the manager and automatically call the emergency call to quickly start the rescue process. Secondly, the fall detector is another important component of the emergency response system. The device monitors the movement status of the elderly in real time with built-in sensors and algorithms. When falling behavior is detected, the system will automatically trigger an alarm and notify the management personnel so that they can quickly rescue. This real-time monitoring function greatly improves the safety level of the elderly. (Figure 1)
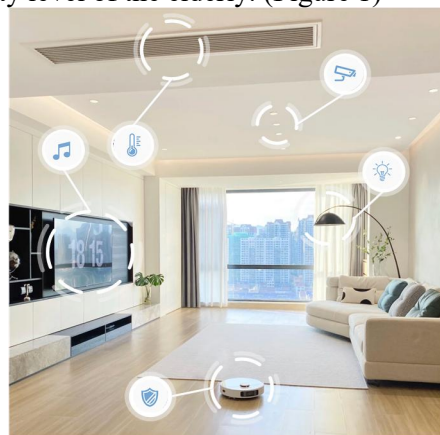

Figure 1. Examples of Intelligent Interior Design

4. Analysis of Life Quality and Safety Improved by Intelligent Interior Design

Smart interior design has significant

advantages over traditional designs, especially in improving quality of life and safety. Traditional designs are often limited to spatial layout, color combinations, and furniture choices. While it can also create a beautiful and comfortable environment, it appears inadequate in dealing with the diversity and complexity of modern life. The intelligent design is to integrate the scientific and technological elements into the interior design, which makes the interior design more intelligent, personalized and humanized, and greatly improves the quality of life and safety. First of all, intelligent design uses advanced technologies such as the Internet of Things, big data and artificial intelligence to provide residents with a more convenient and comfortable living environment for them. The smart home system can remotely control household appliances, realizing one-button control, voice control and other operation modes, so that residents can enjoy the smart life experience without leaving home.

intelligent design can also provide personalized services according to residents' personal preferences and needs, such as automatic adjustment of indoor temperature and humidity, lighting brightness, etc., so that residents can feel more comfort and care. Secondly, intelligent design plays an important role in improving the safety of elderly care facilities. Although traditional pension institutions can also provide basic pension services, they are often insufficient when dealing with possible unexpected situations of the elderly. Intelligent design is to achieve comprehensive care of the elderly through the use of advanced technology. The intelligent monitoring system can monitor the activities of the elderly in real time, find abnormal situations in time, and issue an alarm to ensure the safety of the elderly. The smart door lock system can automatically identify and manage people entering and leaving, prevent criminals from entering the pension facilities, and ensure the safety of life and property of the elderly. The emergency response system can quickly start the rescue process when the elderly encounter an emergency, contact the medical staff and their family members in time, and provide timely and effective assistance for the elderly.

Through the introduction of intelligent control system, intelligent interior design realizes the remote control and automatic management of home equipment. Residents can control lighting, air conditioning, curtains and other equipment at home anytime and anywhere through smart devices such as mobile phones and tablets to achieve one-click operation. This convenient lifestyle not only improves the comfort of living, but also saves time and effort. Smart interior design pays attention to personalized customization, according to the needs and preferences of residents, tailor-made exclusive home environment. By adjusting the home color, material, layout and other factors, to create a both aesthetic and comfortable living space. This personalized design allows residents to enjoy a good life while also feeling respect and care.

Smart interior design advocates the concept of energy conservation and environmental protection and reduces energy consumption through the use of energy-saving lamps, efficient air conditioning and other equipment. At the same time, smart interior design also pays attention to the selection of green building materials to reduce environmental pollution. This green and environmentally friendly lifestyle is not only good for the health of residents, but also helps to protect the planet.

Smart interior design is equipped with a security monitoring system, through the installation of cameras, smoke detectors and other equipment, real-time monitoring of the safety of the living space. Once an abnormal situation is found, the system will immediately issue an alarm and notify the residents to ensure the safety of living. In addition, smart interior design can also realize remote monitoring, so that residents can know the situation at home anytime and anywhere.

Smart interior design pays attention to the construction of intelligent security system and improves the security performance of living space by adopting high-tech means such as password lock and fingerprint recognition. At the same time, smart interior design can also realize intelligent alarm, intelligent lighting and other functions to provide a full range of security for residents. This multi-protection security system allows residents to enjoy a comfortable life without having to worry about safety.

By collecting and analyzing data information of living space, smart interior design can predict and warn potential security risks. For

example, through the analysis of indoor temperature, humidity and other data, it can predict the failure risk of household appliances. Through the analysis of household electricity consumption, it can predict the safety risks such as circuit overload. This early warning system based on data analysis can detect and deal with potential security problems in time to ensure the safety and stability of the living space. Smart interior design can greatly improve the quality of life and safety. With the continuous progress of science and technology and the improvement of people's living standards, smart interior design will become an important trend of future home design.

5. Conclusion

The application of smart interior design in elderly care facilities not only provides a more convenient, comfortable and safe living environment for the elderly, but also can significantly improve their quality of life and safety. Through the application of smart technology, smart lighting system, smart temperature control system, emergency response system and barrier-free design, the daily life of the elderly becomes more relaxed and comfortable, while also being able to deal with emergencies and ensure their own safety. The application of these technologies makes the management and service of elderly care facilities more efficient and meets the various needs of the elderly. In conclusion, the application of smart interior design in elderly care facilities is of great value and significance. With the continuous progress of technology and the deepening of its application, smart interior design will bring more innovations and breakthroughs to the elderly care industry in the future and create a better living environment for the elderly.

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