



Research on the Design of Dementia Rehabilitation Garden Based on Five Senses Therapy

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Abstract. At present, the aging population in our country is increasing rapidly, but at present, in the rehabilitation garden design method lacks attention. In this paper, five senses therapy is applied to the rehabilitation garden, and combined with the physical and mental behavior characteristics of the elderly with dementia, the combination of various sensory stimulation therapy in the rehabilitation garden is proposed, so as to improve the utilization rate of the rehabilitation garden for the elderly with dementia, delay the development of the disease and improve the healing benefit of the rehabilitation garden.

Keywords: dementia elderly care institution; rehabilitation garden; five senses therapy.

1 Introduction

According to the seventh national census, by the end of 2022, the population aged 60 and above accounted for 19.8 percent of the total population, and data from the National Health Commission shows that the proportion will exceed 30 percent around 2035[1]. In the past 10 years, the level of empty nest of elderly families in all provinces has increased, and the elderly living alone empty nest elderly have reached 7.72 million[2]. There is a high probability of dementia among the elderly, and the huge pressure of family care makes more and more elderly people with dementia stay in nursing institutions for care. At present, the domestic care space for the elderly with dementia is still in the initial stage of development, and the construction level of rehabilitation gardens for the elderly with dementia is low, which is difficult to meet the care needs of the elderly with dementia.

At present, the treatment of dementia mainly includes drug therapy and non-drug therapy. Although drug treatment can alleviate the disease to a certain extent, the use of drugs increases as the disease worsens. And this trend can lead to a range of adverse effects, such as drowsiness, constipation, and stiff limbs. Therefore, the effect of drug treatment can bring negative effects. Non-drug therapy is different from drug therapy in that it focuses treatment on the interaction of the elderly with dementia, the spatial environment and the caregiver. At present, non-drug treatments through environmental

therapy include rehabilitation garden, art therapy, aromatherapy, multi-sensory stimulation, music therapy, light environment therapy, etc. Compared with other non-drug treatments, rehabilitation garden can be treated in real space environment, and relevant studies have found that the healing effect of severe dementia elderly people in rehabilitation garden is more obvious than that of non-drug treatment in indoor[3]. Therefore, focusing on rehabilitation gardens in the spatial environment of elderly people with dementia can achieve more long-term and effective results.

The five-sense therapy refers to creating more suitable environmental stimuli for the elderly with dementia through the five sensory stimuli of vision, smell, hearing, touch and taste, reducing the stimuli that are not helpful to the elderly with dementia in space, and obtaining more abundant and appropriate feelings. Rehabilitation gardens based on the five senses are often used in practical cases abroad, such as Sedgwood Rehabilitation Garden, to design different targeted healing gardens for elderly people at different stages of dementia, providing them with multi-level sensory stimulation, expanding the range of activities, increasing natural breath, and delaying the deterioration of the elderly's condition.

2 Pathological characteristics of dementia elderly

The rehabilitation garden designed for the elderly with dementia needs to be considered from the physiological, psychological and behavioral aspects of the elderly with dementia at different stages according to the pathological characteristics of the elderly, so as to provide healing effects for the elderly with dementia.

2.1 Physiological characteristics of elderly people with dementia

With the increase of the age of the elderly, the functions of all parts of the body will produce degenerative changes, and the range of physical functions, brain functions and cognitive functions of the elderly with dementia is much greater than that of the ordinary elderly, so the normal elderly and the elderly with dementia have fundamental differences in physiological characteristics, especially in the nervous system. Elderly dementia patients with different physical conditions, causes of disease and different living environments have different disease course development, which also determines that elderly dementia patients at different stages have different perception ability and space needs for rehabilitation gardens.

Elderly people with dementia can be divided into mild, moderate and severe stages according to the severity of dementia, and the development time of each elderly person with dementia from mild to severe is not the same. Elderly people with mild dementia will gradually show memory disorder, but they are more familiar with long-term memory. After going out, their ability to analyze things declines, and they are prone to get lost, but they can still live independently without the assistance of others. The course of disease is generally 1-3 years. The elderly with moderate dementia had severe memory decline in the long term and the short term. Mood swings, there will be suspicious, angry, wandering and other behaviors. Social skills decline, in life began to need

assistance from others, the course of disease for 2 to 10 years; The elderly with severe dementia have severe loss of memory, calculation ability, judgment ability, aphasia, agnosia, practice and other behaviors, and their life is completely dependent on the care of nursing staff, and the course of disease is 8 to 12 years[4][5].

2.2 Psychological characteristics of elderly people with dementia

When dementia has a serious impact on all aspects of physical functioning in the elderly, they still have emotional experiences. When designing the dementia environment, it is necessary to understand the psychological characteristics of the elderly at different stages of dementia. The elderly with dementia at all stages will generally show common psychological characteristics such as delusion and hallucination, and corresponding designs need to be made in the space according to the specific performance. For example, when the elderly with mild to moderate dementia have delusional symptoms, decorative paintings, music, and social activities in the space can be used to divert attention, so that the emotions of the elderly can be alleviated and their psychological disorders can be alleviated[6].

2.3 Behavioral characteristics of elderly people with dementia

With the deepening of dementia, elderly people with dementia will have various problem behaviors. Due to the different backgrounds, personalities and ways of care of elderly people with dementia, abnormal behaviors are also different. The elderly with dementia gradually begin to blur the concept of time, and have the problem of chaotic sleep cycle. They often walk noisily at night, sleep during the day, and lead a life of black and white. I often suddenly don't know where I am and forget what I have to do. Often appears in a path of wandering behavior.

3 Design strategy of five senses therapy

Five senses therapy refers to the human brain through the senses to obtain information about the surrounding environment, and then prompt the brain to secrete corresponding chemicals to regulate the body's immune system, affecting people's cognition, memory and emotion to a certain extent. The five senses therapy consists of vision therapy, hearing therapy, touch therapy, olfactory therapy and taste therapy. The application of five senses therapy in the rehabilitation garden of the elderly with dementia can effectively improve the physical function of the elderly with dementia, so as to delay the development of the course of dementia[7].

3.1 Visual sensory stimulation

The vision of the elderly with dementia decreases with age, and they will face a certain degree of visual obstacles, such as difficulty in color discrimination and perception. Plants are the main color renderers in the healing garden. Therefore, plants of different

heights and colors with ornamental value should be selected for collocation in the landscape environment to stimulate the visual perception of the elderly with dementia, enhance the sense of space use, and constantly attract the elderly to swim in the garden to enjoy flowers. In the process of finding the way, the elderly can use different varieties of plants instead of institutional signs to help find the way. In the design process, it is necessary to strengthen the elderly with dementia's understanding of the season by observing the changes of plant flowering and plant growth, and exercise the elderly with dementia's sense of time and memory. According to the common memory of The Times, cultural background and regional characteristics of the elderly with dementia, some devices with memory elements can be set up in the rehabilitation garden, such as the station sign, the corner of the old street, the mailbox, the water wheel and other components that can cause the elderly to start recalling. It can make the elderly feel warm and familiar, stimulate the elderly to use the brain nerves, and help the elderly to locate.

3.2 Olfactory sensory stimulation

Plants have bactericidal and bactericidal, refreshing, calming and other effects, different effects of aromatic plants can stimulate people's respiratory center, so that the brain supply sufficient oxygen, so that people maintain a long time vigorous[8]. Some scholars believe that the dull and low stimulation level of the space environment will lead to the elderly with dementia to produce boredom, escape, anxiety and other emotions, and through the carefully designed aromatherapy that triggers the elderly's fragrance memory can improve the mental and physical enjoyment of the elderly with dementia, effectively improving the comfort and utilization rate of the institution.

The West Wind New Capital Apartment for the elderly in Osaka, Japan, is one of the typical cases of the use of five senses therapy. Planting large areas of purple lavender and yellow rose plants in the central area can improve the emotional state of the elderly, eliminate anxiety and tension, help the elderly relax, and improve their physical health[9].

A study conducted by an Alzheimer's care unit in Taiwan showed that white noise such as the sound of the ocean, rain, wind and tap water can intervene in the production of anxiety in elderly people with dementia. Some scholars believe that soundscape in nature, such as the sound of running water, the sound of insects and birds, and the sound of wind blowing leaves, can alleviate the occurrence of stress emotions in the elderly at various stages, and have the psychological ability to soothe uneasy emotions. In the era of continuous changes in modern technology, multimedia equipment can not only complete the sound required for landscape, but also supplement the sound that is difficult to create, such as the music loved by the elderly with dementia. Familiar sounds or appropriate musical levels are a positive stimulus to maintain cognitive function and coordination in elderly people with dementia. Clinical studies have found that patients with dementia can retain their memory in music for a longer time, so music therapy is often used in the dementia care space. In the sound design of the rehabilitation garden, natural sound is the main feature. Tree species with lush branches and leaves can be set in each area to create the effect of wind blowing leaves. Water features can also be

added. In terms of noise control, the outside sound can be blocked into the rehabilitation garden through plants in the edge space of the institution[4].

3.3 Auditory sensory stimulation

A study conducted by an Alzheimer's care unit in Taiwan showed that white noise such as the sound of the ocean, rain, wind and tap water can intervene in the production of anxiety in elderly people with dementia[10]. Some scholars believe that soundscape in nature, such as the sound of running water, the sound of insects and birds, and the sound of wind blowing leaves, can alleviate the occurrence of stress emotions in the elderly at various stages, soothe the psychology of uneasy emotions, and maintain a happy mood. In the era of changing modern technology, digital music devices can be set up not only to complete the sound required for landscape, but also to supplement the sound that is difficult to create, such as the music loved by the elderly with dementia[11]. Familiar sounds or an appropriate level of music is a positive stimulus that can divert attention and regulate emotions, thereby controlling restlessness caused by psychological stress, stimulating positive emotional interaction, and maintaining cognitive function and coordination of the elderly with dementia[12]. Clinical studies have found that patients with dementia can retain their memory in music for a longer time, so music therapy is often used in the dementia care space. In the sound design of the rehabilitation garden, natural sound is the main feature. Tree species with lush branches and leaves can be set in each area to create the effect of wind blowing leaves. Water features can also be added. In terms of noise control, the outside sound can be blocked into the rehabilitation garden through plants in the edge space of the institution[13].

3.4 Tactile sensory stimulation

Clinical studies have shown that the nerve endings of the human body organs are gathered in the feet and hands, and through the selection of plants with different textures, the tactile senses of the elderly with dementia can be stimulated and a pleasant physiological response can be generated. When the elderly with dementia water flowers and plant in the garden, it also has a certain therapeutic effect on the elderly's body and mind. In the design of rehabilitation garden, some rich and optional Spaces should be arranged, such as some movable tables and chairs, which can meet the mobility of the elderly and other elderly people to carry out small social activities flexibly; For example, the operable gardening small corner, vertical greening of different heights, adjustable hanging flower baskets, using the smell, color, shape and other characteristics of the plant, can provide smell, vision, touch and other all-round multi-sensory stimulation for the elderly with dementia. This behavior is conducive to easing the time barrier and anxiety of the elderly, and improving the sense of acquisition and experience of the elderly. At the same time, gardening activities also achieve the role of exercise.

Considering people with different physical conditions in the height design of the device, the lower level of the flower basket device is suitable for elderly people in wheelchairs to operate, while the higher level of the flower basket device can help nor-

mal elderly people to carry out gardening operations and help elderly people in wheelchairs to stand up, and simply exercise their lower limbs on the ground through appropriate environmental pressure to achieve tactile stimulation. According to the standing posture of normal elderly people, the touching height of the plant device design is 850mm~1650mm; Depending on the sitting position of the elderly in the wheelchair, the plant device is designed with a touchable height of 650mm to 1000mm[14].

3.5 Sensory stimulation of taste

Taste stimulation can be through planting melons, fruits and vegetables in the garden to provide practical fruits for the elderly, for the elderly in each unit to pick and taste, through tasting to produce different taste experience. In the space design, vegetable plots or vegetable ponds can be reserved to encourage the elderly to plant by themselves. The older generation has a deep memory of wild berry plants, such as raspberry, mulberry, grapefruit, pipa, cherry, etc., which can make the elderly recall the past, regulate the body and exercise the brain memory.

4 Conclusions

As people age, they become less and less sensitive to their surroundings, and their ability to adjust through the environment deteriorates. Unreasonable environmental factors in the building or rehabilitation garden will form stressors, which will bring various pressures to the elderly with dementia, resulting in emotional disorders and even physiological and psychological diseases. Reasonable environmental factors can help or guide them to better adapt to the place and improve the ability of daily life. At present, the use of rehabilitation gardens in nursing institutions is not ideal, there are problems such as maintenance difficulties, poor care for patients, and so on, and they do not play the due effect. The vision, touch, taste, smell and hearing of the five senses therapy are combined to make each sensory stimulation produce different healing stimulation for the elderly with dementia, and delay the process of dementia under the comprehensive effect. Therefore, the use effect of rehabilitation garden is improved in order to provide reference for the design and construction of rehabilitation environment for the elderly with dementia.

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