

Design Strategy and Method of the Rural Adaptive Aging Transformation under the Mode of Collective Elderly Care

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Abstract: In the context of the dual time of population aging and rural revitalization, “collective elderly care”, as a novel type of the elderly care, is being accepted by more and more elderly people. Moreover, it has become an innovative model of urban-rural integration and development. Because of its ample physical space, superior natural environment, as well as the leisurely and comfortable cultural atmosphere, the countryside has become a good carrier for “collective elderly care”. However, there are weak industries, outdated facilities and misplaced functions for rural areas, which is still a significant gap between the actual demands of the elderly care in the urban population. Therefore, the adaptive aging transformation of countryside is an inevitable choice for the revitalization of countryside under the “collective elderly care” model. Because its unique value and role in the great career of the rural revitalization, which is an effective way for design to empower the construction of countryside. In the paper, the collective elderly care model was analyzed and the main contradiction of current rural environment, was summarized. The targeted design strategies were proposed, and the design methods of adaptive aging transformation was discussed in five aspects - functional division, traffic organization, space optimization, improvement of facilities, and long-term management.

1. Introduction

With economic and social development, medical technology advancement, the average life expectancy has been lengthened, the degree of aging, social openness and mobility are deepening in China that leads, and the hollowing out of rural areas is becoming increasingly serious. The rural revitalization strategy provides novel ideas to realize the integrated development of urban and rural areas and solve the current elderly care problems.

Currently, there are three main models of elderly care in China: home-based elderly care, institutional elderly care and community-based elderly care. However, on account of some natural defects of family structure in China, the traditional home-based elderly care has significant empty-nested phenomenon that weaken the elderly care function. Institutional elderly care still suffers from insufficient supply of berths, expensive costs, substandard medical services, and neglect of the spiritual life of the elderly. While the overlarge scale of community elderly care, the insufficient service funding, and the imperfect facilities of the elderly care cannot fully meet the demands of the elderly.

As an emerging model of the elderly care, the model of “collective elderly care” is in line with the concept of active aging. With its unique natural landscape, social culture and historical heritage, the countryside has become the primary choice of collective elderly care for the urban seniors. While the urban seniors live and provide for the aged together in countryside, it means that the collective elderly care also introduces new population and social resources into the countryside, driving the economic development of the countryside, and then realizing the integrated development of urban and rural areas. However, the collective elderly care is still exploring without sufficient mature development in China, a series of the executive problems arisen by the collective elderly care, such as the adaptive aging transformation of the rural environment, have not to be solved yet.

2. Existing Problems

“Collective elderly care” in countryside refers to a model in which a certain number of urban elderly people with the same characteristics voluntarily come together as a group to meet their spiritual comfort needs and accompany each other to go to the countryside for aging. Because the main population of this model is as urban elderly, the type of activities they need contradict with the original rural environment in many aspects, such as use function, quality of life and cultural customs. While the contradiction is mainly caused by the different types of activities between the rural and urban elderly groups. (Table 1)

Table 1 Different Types Of Activities of the Rural Population and the Urban Elderly

Population	Active Time	Type of activity	Functional requirement
the rural seniors	Daytime	Farming, breeding, cottage industry	Production >
	Night	TV, chat, mahjong, card game, cottage industry	Living
the urban seniors	Daytime	Vegetables planting, climbing, walking, fitness, communication	Living >
	Night	TV, web surfing, walking, dancing, fitness, fishing, chess, playing cards, socializing	Production

Through the questionnaire survey, it was found that the original rural environment is closely related to the living habits and production requirements of the indigenous peoples. The rural people generally spend their time in the daytime, and their activities are mainly in farming, poultry breeding, cottage industry and other labor production activities, whose functional requirements of production on the environment are larger than living. It indicates that they have higher needs for convenience, lower needs for comfort and quality, and less cultural needs. However, for the urban seniors who “collective elderly care” in the countryside, they conduct their activities at the daytime and at night. During daytime, they are fond of hiking, fitness and experiential farming activities, while at night, they are keen on leisure and health activities such as walking, dancing, playing chess and singing, whose functional requirements of living are larger than production. The urban seniors in the countryside intend to enjoy the excellent natural environment as well as satisfy their multi-level spiritual needs and romantic living.

Although the demographic structure of the countryside has changed greatly, most of the young and middle-aged people are working beyond the countryside, and the elderly and children are mainly left in the countryside. However, the rural environment has not undergone corresponding changes, but it has been preserved in an original ecological state in current. Therefore, how to solve the contradiction between the different types of activities between the rural and urban elderly as well as the misalignment between the original environment of the countryside and the needs of the urban seniors is the core problem faced by the rural seniors group.

3. Problem Solving

3.1 Design Strategy

3.1.1 Leading by Culture with the Concept Beforehand

As the acceleration of urbanization and the continue upgrade of rural production and lifestyle in China, the rural population gradually moves to the cities or transforms to professional farmers which leads the rural culture is being lost. In this context, as a model and industry for rural development, rural adaptive aging transformation is conducive to solving the problems of rural revitalization and development, rural culture protection and inheritance by introducing modern industries and social resources to the countryside so as to improving the economic benefits of farmers and building a better future. In the process of adaptive aging transformation of the countryside, in order to avoid the problems of stereotyped and indiscriminate construction in numerous countryside, we must implement the concept of integrated development of urban and rural areas, promote the original beauty of the countryside as well as promote rural farming culture,

local culture, and local landscape characteristics, so it could meet the needs of the elder care from the urban seniors people maximally and they can integrate into the natural beauty and humanistic beauty of the countryside. In addition, it is also necessary to uphold the concept of sustainable development, actively develop green economic industries in rural areas to enhance the living environment of rural farmers, and promote the traditional culture of rural areas. Thereby, a beautiful rural area full of social vitality and harmonious coexistence between human beings and nature can be created.

3.1.2 Spatial Reconstruction and Functional Overlay

Due to the special nature of agricultural production and the lagging development of urban-rural duality, with features of the smaller rural space, single spatial function and backward infrastructure, most of countryside cannot meet the needs of modern interaction and life of urban elderly groups. In addition to protecting and repairing the traditional space, the transformed design of old village space can also endow the novel functions with the appropriate renovation and adjustment. Therefore, in order to maximize the value and role of rural space, the three functions of production, living and ecology need to be reorganized and optimized in the adaptive aging design of countryside under the model of collective elderly care.

In terms of production, the adaptive aging transformation of the countryside must also take into account the original production function and the development of the economic industry in the countryside. Moreover, under the premise of optimizing the overall function of the countryside, the novel products suitable for the local characteristics of the countryside should be appropriately implanted.

In terms of life, the urban elderly chose the way of collective elderly care in rural because they hope to be able to carry out life activities such as recreation and recuperation with like-minded family and friends in a place with a good natural environment and a healthy rural lifestyle. Therefore, the design of rural space should consider the elderly people's daily life and space needs, ensure that the space scale and auxiliary facilities are suitable for the elderly to use. Therefore, a safe, comfortable and convenient space environment for the elderly to live for the elderly can be created.

In terms of ecology, the adaptive aging transformation of the rural must respect and adapt to the local natural environment and topography, and make full use of natural elements and comprehensive transformation while protecting nature. Create a landscape in the rural space, let the space integrate into the nature, let the nature penetrate into the space, and achieve a realm of harmony between rural space and nature, so a unique rural natural scenery can be formed.

3.1.3 Facilities Improvement Empowered by Technology

Technology is an indispensable driving force for rural revitalization. In the process of rural adaptive aging transformation, we can integrate high-technology and intelligent technology into the construction and optimization of elderly care services and elderly care facilities, improve the elderly care services, so as to improve the intelligent level of rural elderly care such as the establishment of a senior information database system to understand all aspects information of the elderly, the establishment of an artificial intelligence home wisdom elderly care subsystem which can provide all-round systematic services to the elderly. The body data of elderly can be monitored and tracked their perform location by wearing the smart devices in real time, and transmit data to service personnel through sensors to facilitate immediate service and medical consultation. Combined with the strategic plan of rural revitalization, Combine the with technology with the local traditional culture to form an elderly care service model which is suitable for local characteristics, and then create a modern living and environment supported by science and technology for the urban seniors who come to have collective elderly care. The needs of the urban seniors for elderly care-related facilities are different from those of the rural population. We should consider the living habits and needs of the urban seniors, and combine the existing local basic conditions to improve some facilities suitable for the needs of the elderly, such as rest facilities, fitness facilities, service facilities and medical facilities.

3.1.4 Combination of Medical and Health Care with Appropriate Place and Age

The elderly commonly suffers from insomnia, hypertension, hyperglycemia and heart disease and other chronic diseases. To avoid further deterioration of their health problems, recreation and health care as well as physical examination are necessary for the elderly. Local medical security facilities should be set up at the levels of village, county and township, as well as 24-hour medical rescue support. Artificial intelligence devices should be used to monitor the elderly in real time for transmit health data to service centers, so that health problems of the elderly can be detected in a timely manner. Meanwhile, health promotion has to be done to raise the health care awareness of the elderly. In addition, it is also important to provide spiritual care services for the elderly with psychological problems. In addition to the necessary medical equipment and health check-up services, it needs to set up some convenient and suitable outdoor recreation and activity spaces for the elderly. The abundant surplus labor force in countryside can be used to improve medical services by training them in elderly medical care during building medical security facilities. It will not only improve the level of medical security in the countryside, but also improve the living standard of local villagers.

The group of elderly people chose collective elderly care will live together and have similar life experiences or interests. So, there will be more chances of interaction between the elderly people, while the social activities of the elderly people have the characteristics of group stability, mild personality and time seasonality. Therefore, according to different communication methods of different age groups, gender groups and interest groups, self-monitoring of certain diseases and emergency treatment training can be carried out to form a collective mutual assistance mechanism based on medical and nursing mutual assistance groups.

3.2 Design Method

3.2.1 Rationalization of Functional Partitioning

For the functional division on the mode of “collective elderly care”, it is necessary to combine the rural conditions with the migrant elderly population. From the perspectives of the local population and the migrant elderly population’s work and rest time, the activity characteristics and streamline organization, the planning of regional functions should be comprehensively considered on the “collective elderly care”. Firstly, since the elderly require a private and quiet living environment, the area should be set up with a certain degree of independence; secondly, in order to facilitate the living of the elderly, the most basic living function areas should be arranged centrally; thirdly, for the convalescence function of the elderly, the medical service facilities can be divided in the area near the natural resources; finally, considering that people selected collective elderly care have similar hobbies and social activities, it is necessary to appropriately increase various themes for social activity functional areas, such as pastoral labor functional areas, drama functional area and others.

3.2.2 Humanized Transportation Organization

As an important part of the aging-friendly construction with livability in rural areas, the adaptive aging transformation of public transportation should carry out the design concept centered on the aging groups. Firstly, the public transportation in countryside should be planned in detail. The serial number of bus run should be increased in the dense areas where the aging group lives so as to meet the travel needs of the elderly to the maximum extent. Also ensure that ambulances can reach the residential buildings of the elderly. Secondly, all transportation roads should meet the requirements of barrier-free use, ensuring the reasonable width and turning radius for wheelchair use, and the slope of the road should be relatively gentle to meet the usage habits and age characteristics of the elderly. Thirdly, in rural elderly care, people's main mode of transportation is walking. As for the elderly, there must be corresponding resting nodes along the walking route. The suitable nodes can be designed according to the scale of the living space, such as setting up seats and other facilities by the outdoor paths, and can be combined with the landscape to form a new scenery; finally, combined with their own cognitive mechanism and audiovisual level of the elderly, as well as the

information and communication technology, to provide them with detailed travel service guidance so as to ensure their travel safety.

3.2.3 Diversification of Space Creation

The main behaviors of the elderly in the “collective elderly care” mode include daily living, fitness and recreation, amusement and social communication, leisure and entertainment and others. The corresponding spatial demand are living space, recreation space, interaction space and rest space. The space planning is described below.

3.2.3.1 Living Space

People selected rural “collective elderly care” could pay more attention to the mutual companionship among friends and the comfort of living space, and the courtyard in traditional rural houses has obvious advantages in the spatial organization of building groups and the creation of spatial atmosphere, so the architectural layout of the courtyard can also be applied to the rural adaptive aging transformation of the Collective elderly care, which can improve the communication between the elderly in the group. The living space of courtyard buildings can be set up as semi-private and semi-open “small courtyard” areas, which not only meet the spatial intercommunication and mutual integration, but also respect the privacy of the elderly, and set up transitional areas such as courtyards and corridors outside the courtyard to form a multi-level spatial structure layout, so it can provide the diversified living patterns for the elderly to the maximum extent.

3.2.3.2 Recreation Space

The design of outdoor recreation space focuses on integrating the activity space with the natural environment and providing places suitable for the elderly to walk, play sports and socialize, such as field planting, forest hiking and retreat meditation. Various vegetation can also be used to improve the quality of public activity space and thus improve the healing effect, such as through the color, smell and touch of plants to provide a visual, olfactory and other sensory experience for the elderly. It can provide some help to the psychology and physiology of the elderly by creating a harmonious and natural spatial atmosphere.

3.2.3.3 Interaction Space

The interaction between the people selected collective elderly care is more frequent, but the communication and interaction of different groups of elderly people need different spaces, which can be divided into static indoor space, space in front of the house and outdoor activity space. For static indoor space, the barrier-free design and ergonomic design for the elderly can be used, such as the elimination of step height difference on the ground, the setting of railing and handrail assistance facilities in the indoor area and the adjustment of furniture scale. The space in front of the house is the neighborhood interaction space between the entrance of the house and the street, which can be designed with clever use of seats, paving, plants and other techniques. Outdoor public space is a more important space for interaction and should be considered, such as, increasing greenery to create a space under the trees that is conducive to the activities of the elderly; adding resting facilities to extend the distance for the elderly; transforming the useless space to meet the needs of the interaction activities of the neighbors and others.

3.2.3.4 Rest Space

As the physical function of the elderly declines, there are more frequency of rest in daily activities, so resting space should be set up as much as possible beside the street for the elderly to rest. Meanwhile, the various social interaction and entertainment activities can be brought. The rest space should be set up according to the principle of fatigue distance of the elderly, taking into account the sun, wind, lighting facilities and other conditions to meet the needs of the elderly to rest. The location can be chosen at the boundary between the front of the house and the road, at the intersection of streets and lanes, on both sides of the village road, public space and others.

3.2.4 Comprehensiveness of Infrastructure

3.2.4.1 Recreation and Entertainment Facilities (Playing Chess, Singing, Dancing and Others)

With the increase of age, all physical functions of the elderly continue to decline. Therefore, the adaptive aging transformation of rest facilities is especially important. For different spatial environments, it needs the rest facilities with different functions. For example, in the interaction space, linear seats can be set up to facilitate rest and communication among the elderly; in the rest space, round seats can be set up to meet the needs of the elderly for chess and leisure. The setting of rest facilities also needs to consider the climatic conditions of the countryside and the matching with native plants to facilitate shading in summer and light penetration in winter to meet the needs of different seasons.

3.2.4.2 Fitness and Recreation Facilities (Walking, Fitness, Boxing, Hiking and Others)

When the adaptive aging transformation was carrying out, the actual situation of the embracing elderly population should be fully considered, and equipment with high safety factor and able to help physical function rehabilitation should be set up to provide diversified exercise choices, while common fitness equipment is not entirely suitable for the elderly, so in the process of transformation, the combination of matching equipment should be considered to meet the more targeted needs of the elderly's daily leisure, physical training and rehabilitation training.

3.2.4.3 Cultural and Educational Facilities (Calligraphy, Painting, Flower Arrangement, Lectures and Others)

After the elderly retired from their jobs, their social roles had changed from social builders to social epicureans, plus the rapid change of social thought, the elderly is difficult to adapt. Therefore, the construction of cultural and educational facilities in countryside is particularly important. The construction of cultural and educational facilities should fully consider the distance, function type, service supporting situation, and facility operation method to meet the multifaceted needs of the elderly. For example, exclusive regional spaces for the elderly can be set up in libraries and cultural centers, and environmental conditions suitable for their use; public cultural organizations can provide professional guidance for the elderly, satisfy their pursuit of traditional culture and art, and cultivate a variety of interests for the elderly; colleges for the elderly can be set up to provide opportunities and venues for the elderly to study again, and even job opportunities for re-employment, so that the elderly can continue to shine in their favorite positions and further realize their life value; some horticulture, flower arranging and exhibition activities can be carried out in conjunction with the rural environment to enrich the lives of the elderly while promoting rural culture and beautifying the rural environment.

3.2.4.4 Medical Service Facilities

The perfection of rural services and medical facilities is the most important concern for urban elderly people in the countryside for collective elderly care, and many details should be considered in the design, such as full coverage of nighttime lighting facilities in the countryside, improvement of signage system and construction of barrier-free facilities. Meanwhile, we should improve the medical service system and set up hospitals, pharmacies, medical clinics, rehabilitation and physiotherapy services at different levels to meet the different medical needs of the elderly.

3.2.5 Long-Term Daily Management

The relevant laws and regulations for collective elderly care should be established and improved, clarify the power and responsibilities of each party in the collective elderly care in the relevant laws, and give clear provisions for some disputes that may occur in the collective elderly care, so the legal supervision of the village collective elderly care can be strengthened. In addition, the local government can introduce some preferential policies according to the specific situation to protect the material life of the elderly, strengthen the communication between local villagers and urban elderly, with the mutual learning and mutual help, and create a harmonious and beautiful rural

elderly care life.

4. Conclusion

The novel model of “collective elderly care” can make the traditional rural area come to life and solve the urban aging problem, which is one of the best paradigms of urban-rural integration development. The adaptive aging design of the village is the technical key that whether the old-age care model of “collective elderly care” can be truly implemented and rejuvenated in rural areas. This article explains the demand of collective elderly care and current problems of rural area, and then analyzes the methods of the rural adaptive aging transformation under the mode of collective elderly care from the perspective of life, production and ecology. To solve the problem of ‘collective elderly care’ fall into the ground in the rural area provides a design strategy and design method.

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