

2014

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(8), 2014 [2336-2342]

Study on the satisfaction degree of barrier-free facilities of the elderly in the urban residential outdoor environment: Case of hangzhou

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ABSTRACT

With the trends of home-based care and increasing population aging, to build barrier-free facilities in the residential outdoor environment is significantly important to improve the life quality of the elderly, make old people enjoy themselves and build high quality outdoor activity space for the elderly in the residential districts. This paper takes Hangzhou residential districts as the research object, uses typical sampling methods, selects 12 residential districts including high-grade commercial housing, general commercial housing and affordable housing and then discusses the satisfaction degree and related problems of barrier-free facilities in the residential outdoor environment from the perspective of the elderly through questionnaires and interviews so as to meet the psychological and behaviour demands of the elderly for barrier-free facilities in the residential outdoor environment and provide reference for the sustainable development of the residential outdoor environment.

KEYWORDS

The elderly; Urban residential districts; Outdoor environment; Barrier-free facilities; Satisfaction degree; Sustainable development; Hangzhou.



INTRODUCTION

Barrier-free design is a new view proposed by the United Nations in 1974. It emphasizes that the planning of all the public space environment and all building facilities and equipment related to the residence of human must fully consider the usage requirements of the handicapped with different degrees of physical disability as well as the elderly with decreasing normal performance and then equip with the equipment that can meet the service function so as to build a modern life environment that can provide human with care, safety, convenience and comfort^[1-3]. In recent years, the barrier-free construction in China has represented a quick and standardized trend in the construction of urban roads and large public buildings and also has achieved good results^[4,5]. But because of the late start and the weak public consciousness, there are still many places to be improved in the design and construction of barrier-free facilities in the residential outdoor environment. The residential district, as the major living space of the elderly, and especially the aging of population and the China's special national condition "home-based care" have urgent requirements for the construction and perfectness of the barrier-free environment in the residential districts, which confirms the construction of an barrier-free environment should be paid more attention to realize more development.

As an important symbol of social progress and civilization, to build up a barrier-free environment has become a common topic in the world^[6]. Barrier-free facilities refer to the facilities that are constructed to support the whole construction project and ensure the disabled, the elderly, children and other people with limited physical abilities to live, work, travel and use independently, safely and conveniently, including ramps, curb ramps and the sidewalks for the blind; warning signals, hint sound and indicating device; low appliance, special parking space, special auditorium and safety rails; barrier-free toilets and toilet seats; barrier-free marks; barrier-free vertical elevators, lifting tables and other lifting device; as well as other facilities easy to be used for the disabled, the elderly, children and people with limited physical abilities. Under the conditions of more serious aging of population and home-based care, this paper takes Hangzhou as an example and discusses the satisfaction degree and the related problems of the barrier-free facilities in urban residential outdoor environment from the perspective of the elderly^[7-9], which has important practical significance for the building of a harmonious residential environment, the satisfaction of the psychological and behaviour demands of the elderly for the barrier-free facilities in residential outdoor environment, the improvement of the elderly life quality as well as the promotion of the physical and mental health of the elderly.

OVERVIEW OF STUDY AREA AND RESEARCH METHODS

Overview of study area

The aging of population in Zhejiang Province has the following characteristics: an immense population base, quick development, old aging, many "empty-nesters" and the phenomenon of "getting old before getting rich". And the aging of population puts forward new requirements for the industrial structure and social services. As the provincial capital of Zhejiang Province, Hangzhou city inevitably becomes the typical representative of aging in Zhejiang Province. Hangzhou is not only one of the first batch of state-level historical and cultural cities, but also the international tourist city. As one of the seven ancient capitals of China, Hangzhou has been praised as "the Paradise on Earth" for its beautiful sceneries and rich output of various products. As early as the Yuan Dynasty, Hangzhou was said as the most beautiful and magnificent city in the world by the Italian traveler Marco Polo. In 1994, Hangzhou was named as "National Garden City". In recent years, Hangzhou has paid great attention to the consolidation of national garden city and firmly established the idea of achieving harmonious development between human and nature. It bases itself on the profound historical culture and the unique

natural landscape resources and takes the urban greening as the major content of improving environment, upgrading the city grade, building a habitable city and providing services for people.

To set up a city brand of “To Live in Hangzhou” and build Hangzhou as the most suitable city for living is one of the urban development strategy goals of Hangzhou municipal party committee and the municipal government. Today, “To Live in Hangzhou” has become one of the well-known urban development strategies and goals that are paid great attention by the government. As a typical aging city and the brand city of “To Live in Hangzhou”, the study on the satisfaction degree of the barrier-free facilities of the urban residential outdoor environment in Hangzhou from the perspective of the elderly has important significance and representativeness.

Research methods

Selection of typical residential districts

In this paper, it takes the residential districts in Hangzhou as the research object, adopts typical sampling method and selects the following three types of housing for research, including high-grade commercial housing, general commercial housing and affordable housing. And the residential districts are listed as follows:

High-grade commercial housing districts: Osmanthus Flowers Town, Yijing Garden, Lake Garden and Langui Garden. General commercial housing districts: Wulian New Village, the 5th District of Chaohui, the 8th District of Chaohui and Gudang District. Affordable housing districts: North Garden, East New Park, Watery Town and Hanmo Xianglin.

Selection of investigation time and weather

Investigations were mainly conducted when it is clear or cloudy. In this weather, there are more people resting in the residential districts, which is helpful for the development of the investigation. Furthermore, select 1-2 weekdays and an offday to make the result more representative.

Transformation of the satisfaction degree

TABLE 1 : The transformed score list of satisfaction degree

| Satisfaction degree | Transformed scores |
|----------------------------|--------------------|
| <i>Very satisfied</i> | 100 |
| <i>Basically satisfied</i> | 80 |
| <i>General satisfied</i> | 60 |
| <i>Dissatisfied</i> | 40 |
| <i>Rather dissatisfied</i> | 20 |

Research methods

This study combines questionnaires and interviews^[7-11]. Questionnaires: This method is to make a fill-in-the-blank questionnaire survey on the barrier-free facilities of the urban residential outdoor environment to the elderly users. In order to eliminate the errors or ambiguity, before formally distributing the questionnaire to a large range of respondents, a small range of respondents should be selected to fill in the questionnaire so as to find problems and correct them. More than 10 questionnaires can be handed out to the respondents with different professions and genders around the interviewers to find the problems and ambiguity that are difficult to be found by the designers of the questionnaire. The final questionnaire will be modified and determined after two trials. Through the trial survey, it can inspect and adjust the rationality, scientificity and simplicity of the questionnaire. Interviews: This method is to make open interviews with questionnaires. First ask the elderly to answer the questions listed on the questionnaire and then ask some open questions (that are not mentioned on the

questionnaire) so as to provide supplements for the questionnaire survey and collect recommendations on improvement and optimization.

From 2009 to 2011, the research group conducted questionnaire surveys and interviews to the elderly in the investigated districts by using the cluster random sampling method. No less than 30 questionnaires were distributed to each district. 380 questionnaires were distributed in total and 278 questionnaires were received, including 257 valid questionnaires. Then Excel and DPS software were used to make frequency analyses and satisfaction researches on each option.

The content of survey samples includes the gender, age, occupation, residence, education level, profession, job titles and annual household income of respondents. This large sample group has a diversity of demographic characteristics, which has certain representativeness and universality. So, the results of the survey have high reliability.

RESULTS

Satisfaction evaluation result of high-grade commercial housing districts

In the high-grade commercial housing districts, as for the satisfactory proportion of the barrier-free facilities of residential outdoor environment, people who are very satisfied with the barrier-free facilities account for 7.53%, people who are basically satisfied with the barrier-free facilities account for 41.94%, people who are satisfied with the barrier-free facilities account for 47.31%, people who are dissatisfied with the barrier-free facilities account for 3.23%, people who are rather dissatisfied with the barrier-free facilities account for 0.00%, and the overall average score of the satisfaction evaluation is 70.8 points. Osmanthus Flowers Town has the highest gratification degree, and the Yijing Garden has the lowest satisfaction degree.

Satisfaction evaluation result of general commercial housing districts

In the general commercial housing districts, as for the satisfactory proportion of the barrier-free facilities of residential outdoor environment, people who are very satisfied with the barrier-free facilities account for 7.07%, people who are basically satisfied with the barrier-free facilities account for 54.55%, people who are satisfied with the barrier-free facilities account for 35.35%, people who are dissatisfied with the barrier-free facilities account for 2.02%, people who are rather dissatisfied with the barrier-free facilities account for 1.01%, and the overall average score of the satisfaction evaluation is 72.9 points. Wulian New Village has the highest gratification degree, and the Gudang District has the lowest satisfaction degree.

Satisfaction evaluation result of affordable housing districts

In the affordable housing districts, as for the satisfactory proportion of the barrier-free facilities of residential outdoor environment, people who are very satisfied with the barrier-free facilities account for 0.00%, people who are basically satisfied with the barrier-free facilities account for 26.09%, people who are satisfied with the barrier-free facilities account for 65.22%, people who are dissatisfied with the barrier-free facilities account for 8.70%, people who are rather dissatisfied with the barrier-free facilities account for 0.00%, and the overall average score of the satisfaction evaluation is 62.8 points. Hanmo Xianglin has the highest gratification degree, and the East New Park has the lowest satisfaction degree.

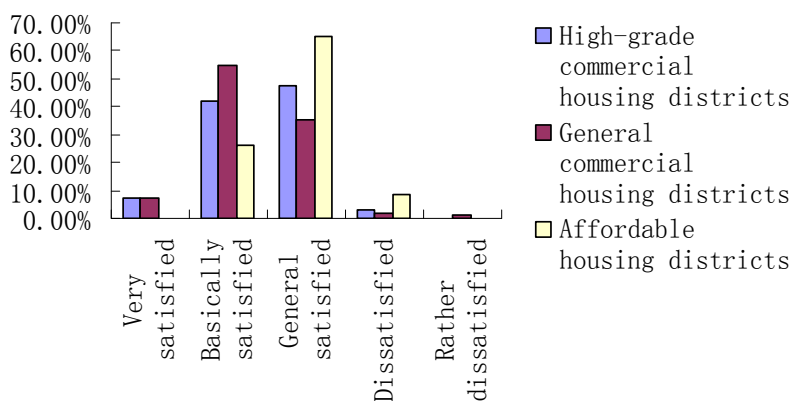


Figure 1 : Evaluation of the satisfaction degree of the barrier-free facilities

Comparison of the average satisfaction degree of different types of districts

Different types of residential districts have some differences in the satisfaction degree of the residential outdoor environment. All in all, the satisfaction degree of high-grade commercial housing districts is relatively high, that of the general commercial housing districts is medium, and that of the affordable housing districts is relatively low. Although the satisfaction degree of the barrier-free facilities of the three types of the residential outdoor environment differs greatly, some types of districts are with relatively high degree of satisfaction. However, in a word, among all the investigated residential districts, there is no residential district with 90 points or more of satisfaction. It means that the construction and management of the barrier-free facilities in the residential outdoor environment is far from the satisfied needs of the elderly and there are still many problems that need to be optimized and improved.

DISCUSSION

Although the barrier-free design of the residential outdoor environment in Chinese cities has realized great development and achieved significant achievements under the condition of a late start and a low starting point, the design, construction and management of the barrier-free facilities in China are still not perfect enough. There is still a big gap between our country with developed countries, so we need to make further optimization. Fully considering the physical and psychological needs of the elderly, improving the consciousness of barrier-free design in residential outdoor environment, designing high quality barrier-free facilities with safety, comfort, accessibility and identity and making scientific, reasonable and standardized operation and sustainable management is the one of the difficult and important points of the design, construction and management of residential outdoor environment.

Lack of barrier-free design consciousness

The elderly are a special group. Because the recession of the physiological function and the physical changes of structure of the elderly affect the space use abilities of the elderly, the environment that can be used by normal people might not be easy to be used by the elderly. To meet the special physiological and psychological feelings of the elderly, it requires designers to study their daily demands from their ergonomics, praxiology, psychology and the physiological and psychological needs and then take these study data as an important design basis. However, in the actual design and construction projects, the special needs of the elderly are often neglected or simply processed. Even a part of people think the elderly are the people who have already retired from social labour and social value creation, they also think the young with healthy and strong body are the leading power of this society, so the environment construction and facilities setting should first satisfy the needs of most people; Some people also think the requirements of barrier-free design are rather complex and special,

which is contradicted with the use and beauty pursuit of normal people, so we should give up the barrier-free design. The elderly are not only a special group but also an important group. Under the background of population aging and home-based care, only if we pay attention to the special demands of the elderly for the barrier-free facilities of the residential outdoor environment from thought and action, a high quality and harmonious residential outdoor environment can be constructed.

Lack of barrier-free design consciousness

The safety of barrier-free design is to ensure there is no dangerous materials or dangerous situation in the environment facilities. Because of the recession of body as well as the imperfection of physical and psychological function, the elderly usually have lower perception and reaction abilities to risks. Therefore, the common facilities for young people and healthy people may not be safe for the elderly vulnerable group. The applicability of barrier-free design is to make the environment facilities be easy to be used by the elderly so as to realize barrier-free in use. Compared with young people and healthy people, many old people have some defects in their body function, which make them cannot meet their needs through their own efforts in the real environment. Therefore, while designing the details of the barrier-free facilities in the environment, designers should give full consideration to the special induction and demands of the elderly in the sense of sight, hearing, touch, etc. However, although many residential outdoor environment have equipped with barrier-free design, there are many detail problems on the design, which causes the elderly cannot use the barrier-free facilities safely and comfortably enough. Detail design is the necessary guarantee of the design and construction of excellent barrier-free facilities in residential outdoor environment, so we must attach importance to the detail design of the barrier-free facilities in residential outdoor environment.

Imperfectness of the barrier-free facilities supervisory system

Many residential districts put more attention to the construction of barrier-free facilities rather than their management. So many finished barrier-free facilities are equivalent to semi-finished products. Some of them are even used as parking places, thus becoming the tool of some businessmen to make money. The elderly often encounter “artificial barriers”, even dangerous “artificial traps”. The imperfectness of the barrier-free facilities supervisory system mainly shows in the following aspects: (1) The construction responsibilities and obligations of the barrier-free facilities are not clear, especially in some residential outdoor environment that should construct barrier-free facilities in accordance with the provisions, to reduce or reduce the construction cost, there are some construction units failing to follow the provisions or specifications while constructing barrier-free facilities; (2) As for the issue how to construct barrier-free facilities or gradually transform the finished barrier-free facilities that don't conform to the relevant provisions and standards, there are many problems like subjects of liability are unclear, the question who will pay for the reconstruction is unclear, offering excuses or disputing to escape from the responsibilities, etc; (3) The management of the each construction link of barrier-free facilities should be strengthened. Because of the loose management, many design units fail to follow the specifications while designing barrier-free facilities or design nonstandard barrier-free facilities, and many construction units fail to follow the design documents and standards while constructing barrier-free facilities or put unqualified or unchecked barrier-free facilities into use; At the same time, many barrier-free facilities construction are lack of standardization, system, coherence and integrity; (5) The maintenance and management responsibility of the barrier-free facilities is not clear. Some of the barrier-free facilities in the residential outdoor environment haven't been maintained and managed normally, thus causing the barrier-free facilities can't be used normally; Some of the finished barrier-free facilities are not open for use; And many barrier-free facilities have been destroyed, illegally occupied or used for other purposes.

The perfectness of the barrier-free facilities supervision system in the residential outdoor environment needs the unremitting efforts of the government, design units, residential property

management departments and the broad masses. To actively understand the population aging condition in China, develop optimization strategies and perfect the “barrier-free” and “humanized” construction of the aging society with laws and regulations will not only be helpful to give a comfortable later life for the elderly, but also be conducive to the sustainable development of the residential outdoor environment.

CONCLUSIONS

China has entered an aging society. In the future decades, the aging of population will continually aggravate. In the background of home-based care and the aging of population, the residential outdoor environment and housing are equally important for the elderly. Therefore, to improve the life quality of the elderly, make the elderly enjoy themselves and build high quality residential outdoor activity spaces for the elderly is especially important. However, the recent barrier-free facilities in the residential outdoor environment can't adapt to the aging of population, so the overall satisfaction degree of the elderly is not high. Because of the weak consciousness of the barrier-free facilities in the residential outdoor environment in the society, the weak consciousness of the design, construction and maintenance of the barrier-free facilities has become a big obstacle for the construction of barrier-free facilities. At present, the barrier-free construction and management work in the residential outdoor environment still can't keep up with the development of economic society and the needs of urbanization construction, which far from satisfies most of the elderly. To focus on the elderly and pay attention to the safe, comfortable and beautiful outdoor barrier-free facilities of this special social group according to their physiological and psychological characteristics will have great significance for the improvement of the life quality of the elderly and the sustainable development of the residential outdoor environment.

ACKNOWLEDGMENTS

This work is supported by the National Science Foundation of China (No.51208467); the Welfare Technological Application Research project of Science and Technology Agency of Zhejiang Province (No.2012C33004); the funds project under the Ministry of Education of the PRC for young people who are devoted to the researches of humanities and social sciences (No.11YJCZH193); the Philosophy and Social Science Planning Subjects of Zhejiang Province (No.12JCWH08YB).

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