

Optimising Environmental Health Renewal in Neighbourhoods Based on Traditional Chinese Concepts of Wellness

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Abstract

In the context of the Healthy China 2030 Action Strategy and the post epidemic era, planning scholars have focused on the exploration of the path between traditional health culture and urban neighbourhood renovation and renewal, in order to soundly promote the construction of the planning discipline system. This paper takes the idea of "four-dimensional health" of traditional health culture as the main skeleton, and builds a theoretical system of neighbourhood environmental health from four aspects of neighbourhood environmental planning: spatial layout, traffic and travel, public facilities, and living environment. Dongba Township in Chaoyang District, Beijing is selected as an empirical case for field study, and based on GIS data, we analyse the impacts of people's vitality, facilities and green coverage on health, and then explore the environmental renewal strategies for Dongba Township in combination with the neighbourhood planning dimensions derived from the "four dimensions of wellness". Finally, we propose a universal neighbourhood environmental health regeneration strategy based on the traditional concept of wellness, which will provide new perspectives and breakthroughs for the future of healthy urban planning and other industries.

Keywords: traditional health concepts, health culture, neighbourhood environment, healthy neighbourhoods, regeneration strategies

1. Introduction

The way of health maintenance is both a means or method for Chinese people to take care of their bodies, defend themselves against diseases and prolong their lives, as well as an embodiment of a Chinese concept of life. In this paper, we will revive the traditional concept of health maintenance, take the background of health demand in the post epidemic situation, intervene in the environmental health ideas in the concept of health maintenance in the construction of healthy environment in the neighbourhood, explore the new paradigm of scientific health maintenance with prevention as the basis and maintenance as the root, fill the lack of cultural functions in the neighbourhood, disseminate the traditional Chinese culture of health maintenance, and provide a unique perspective for the construction of a healthy city for research and reference.

2. Neighbourhood Environmental Health Theory System Construction

2.1 Construction of "Four-Dimensional Permaculture" Street Environment Elements

"Four-dimensional health care" is also known as "four-dimensional health care of human meridians". This paper starts from the four dimensions of "unity of heaven and man", "smooth meridians", "form and spirit", and "full of qi and blood", corresponds to the four elements of the neighbourhood environment, namely, spatial layout, road traffic, service facilities, and architectural landscape, and regards the overall neighbourhood space as the normal operation of the human organism, explores the correlation between the two, and jointly establishes the layout environment of "unity of heaven and man", the traffic environment of "smooth meridians", the "form and spirit" and "both" service environment, "qi and blood" living environment, together constitute the main skeleton of the neighbourhood environment health theory system under the influence of health culture.

2.2 The Relevance of the "Four Dimensions of Health" Theory to the Health of the Population

Numerous studies have shown that the factors affecting residents' health are complex and varied. In order to illustrate more clearly the relationship between the "Four Dimensions of Wellness" theory in terms of neighbourhood planning dimensions and residents' health, the following block diagram has been constructed to provide an explanatory illustration (Figure 1).

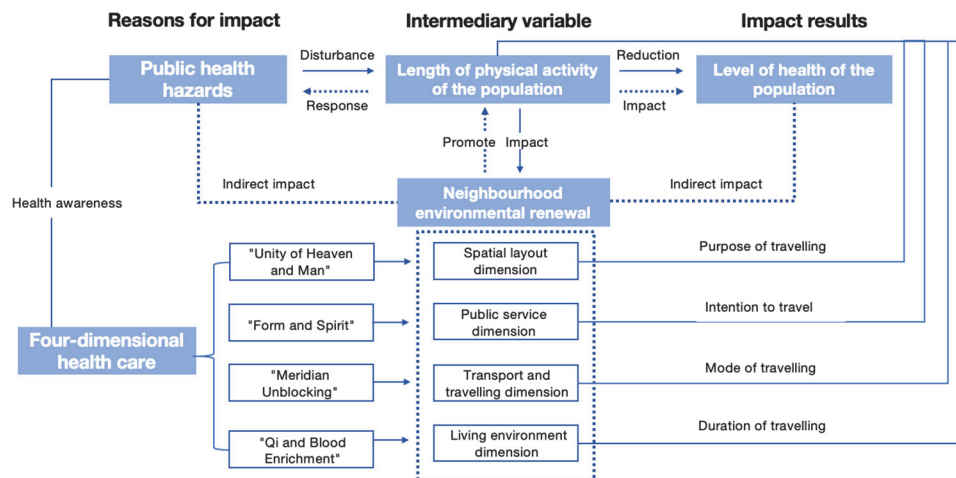


Figure 1. Relationship between the Four Dimensions of Health Theory and the Health of the Population

Source: Self-drawn by the author

The proposal of "four-dimensional wellness" caters to the current demand for health and wellness, and improves the neighbourhood environment in four aspects, namely, diversity of public service facilities, accessibility of traffic and travel, comfort of the living environment, and rationality of the layout space, respectively. It has an indirect impact on both public health hazard events and residents' health, reducing the risk of disease and improving residents' health.

3. Principles and methods

3.1 Main Principles: Integration, Relevance, Foresight

In the process of constructing the theoretical system of "four-dimensional health care" and neighbourhood environmental health, this paper follows the principle of scientific integration, the principle of thematic relevance and the principle of functional foresight. The principle of scientific integration focuses on the scientific nature of the theory and the logic of overall thinking in the construction process; the principle of thematic relevance is based on the fact that all dimensions of the system are related to residents' health and the neighbourhood environment, and that all dimensions are in line with the needs of the current national situation; and the principle of functional foresight emphasizes that in the post epidemic era, more attention should be paid to the dynamic regulation of and emergency response to the needs of neighbourhood functions and activities.

3.2 Construction Method: Data Collation and Empirical Research

In this paper, the progress of research on health is collated from academic literature, policy information, and domestic and international conferences, reflecting the increased attention to environmental health by the state, academia, and even the public (Table 1).

Table 1. A collated map of 23 years of research hotspots related to healthy cities (partial)

Frequency of occurrence	Frequency	Centrality
city	32	0.27
Built environment	20	0.31
health	17	0.26
Physical activity	17	0.14
impact	15	0.19
exposure	11	0.11
Air pollution	10	0.12
Urban planning	9	0.05
Public health	9	0.05
design	8	0.07
Ecosystem services	8	0.06

benefits	7	0.05
space	6	0.01
urbanhealth	6	0.02
associations	6	0.05

Source: Self-drawn by the author

Under the theoretical foundation, the empirical research method is used as the core means to explore the environmental optimisation strategies applicable to actual cases by combining the neighbourhood environmental problems and the "four-dimensional healthy neighbourhood planning dimensions" discussed in the previous section, and then to propose a universal optimisation strategy by combining the traditional concepts of health and wellness.

4. A Study on the Renewal Strategy of Healthy Environment in Dongba Township Neighbourhood of Chaoyang District

4.1 Basic Regional Overview

4.1.1 Status of Neighbourhood Development

Dongba Township is located in the north-eastern part of Chaoyang District, closely connected to the fifth ring road of Beijing. It is located at the intersection of the functional core area of the capital, the city's sub-centre and the international airport (Figure 2). According to the announcement of the seventh population census of Beijing, the resident population of Dongba area reaches 124,163, which fully demonstrates its population aggregation and prosperous development (People's Government of Chaoyang District, Beijing. 2023). The study in this paper gathers in the southern part of Dongba Township, and the specific study area extends from the Dam River in the north to the administrative boundary of Dongba in the south, from the Fifth Ring Road in the west to the Second Airport Expressway in the east (Figure 3).

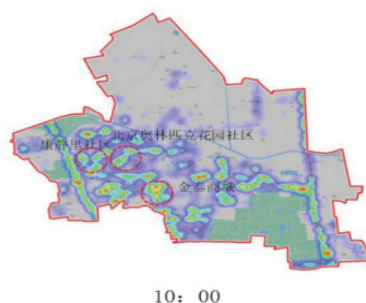


Figure 2. Geographic location of Dongba Township, Chaoyang District, Beijing, China

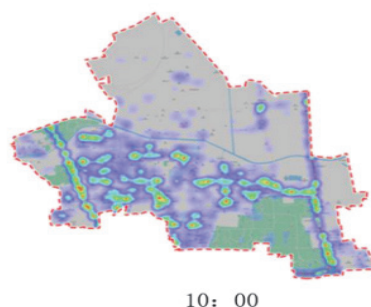


Figure 3. Schematic of the study area of Dongba Township

Source: Self-drawn by the author

4.1.2 Neighbourhood Environmental Problem Profiling

After on-site research in the study area, heat map analysis, grid analysis and coverage analysis have led to the conclusion that the environmental problems in the neighbourhood are mainly concentrated in the three aspects of poor spatial vitality in the neighbourhood, insufficient small and micro green open spaces, and uneven distribution of the supply of public service facilities, which will provide important references for the subsequent targeted strategies.

(1) Poor spatial vitality of neighbourhoods

The study intercepted the heat maps of crowd activities at the same time on weekdays and rest days respectively, and judged from the large purple area in the maps that the overall spatial vitality of the Dongba community was poor, and residents' activities were mainly concentrated within the community. Compared with weekdays, the degree of gathering on rest days increased significantly, but still mainly within the community (Figures 4).



Figure 4. Heat map of 10:00 on weekdays and days off for residents of East Dam

Source: Self-drawn by the author

(2) Insufficient open space in small micro green spaces

There is a lack of micro-green spaces and parks for recreational breaks in the vicinity of the Dongba community, and the more established parks are the large Dongba Country Park and the strip-shaped Dam River Park. Analysed in terms of the 500m buffer zone (Figure 5), it can be seen that neighbourhoods in the central part of the area have low green space coverage and insufficient accessibility.

(3) Uneven distribution of public service provision

The number of education facilities is "more in the west and less in the east", with less in the southwestern region (Figure 6); the coverage of large general hospitals is incomplete in terms of medical service facilities, which needs to be strengthened in terms of both business scale and medical level, and the number of small specialist clinics is insufficient; there is a gap of recreational facilities in the central region, and the coverage of green parks is relatively low; in terms of transport stations, the coverage of public transport stations is sufficient, and the coverage of the metro stations and their number do not reach the standard of "15-minute living circle".

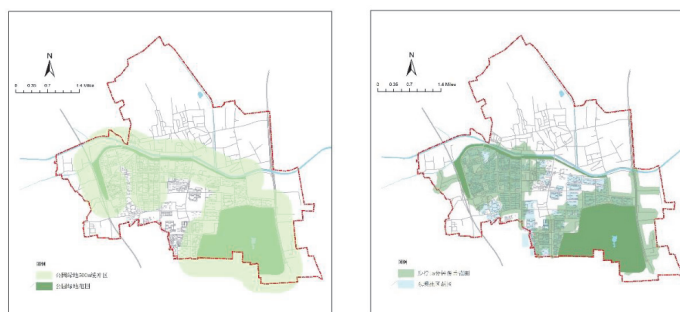


Figure 5. Open Space Recreation Facilities Buffer and Grid Analysis Map

Source: Self-drawn by the author

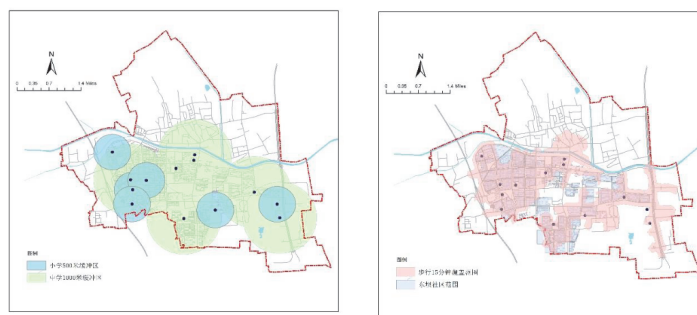


Figure 6. East Dam Educational Facility Buffer and Grid Analysis Map

Source: Self-drawn by the author

5. Strategies for Optimising The Dongba Neighbourhood Environment Under the "Four Dimensions of Wellness".

Based on the "four-dimensional health" neighbourhood environmental health theory system constructed above, and according to the existing neighbourhood environmental problems in the Dongba area, the Dongba neighbourhood environmental regeneration strategy will be explored from four perspectives, namely the optimization of healthy spatial layout, the optimization of traffic and mobility, the optimization of facilities and services, and the optimization of living environments.

5.1 Optimisation of The Spatial Distribution of Health

5.1.1 Progressive Development: Grid-based Management Model for Neighbourhood Units

Complex management of the vertical level of the urban spatial environment is a synergistic management model of three spatial levels, from the overall coordination of the macro-city, to the implementation of community units, to the concrete implementation of neighbourhood planning (Figure 7). Therefore, the existing neighbourhood is divided into smaller community units to meet the daily needs of the residents (Figure 8). Underground garage entrances and exits are constructed at the boundary of the district, and the internal roads in Area A and Area B are built into an ecological slow-moving greenway network system, creating a symbiotic environment of man and nature in the neighbourhood units.

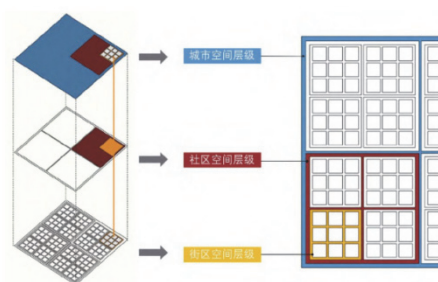


Figure 7. Synergistic management model diagram for three spatial hierarchies

Source: Wang, Yun-Xian & Mao, Key-Yuan(2024)

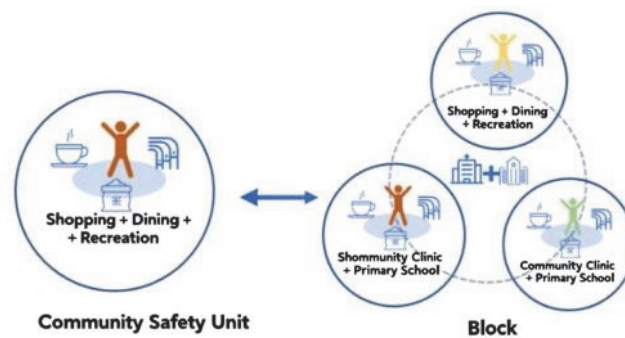


Figure 8. Schematic diagram of the community safety unit

Source: Self-drawn by the author

5.1.2 Boundary Space Remodelling: White Space for Dual-Use Functions of Level and Emergency

The strategic white space of neighbourhood boundary space is particularly important in the context of the era of high-quality development of towns and cities and fine governance of land space (CHA Le, LI Yuanyu, et al.). Activate the low utility land at the boundary of the neighbourhood to achieve flat and urgent dual-use. The natural combination of green space and white space can be used for residents' daily activities and close proximity to nature, and can be used as an evacuation site and a place for the transmission of materials in case of emergencies (Figure 9).

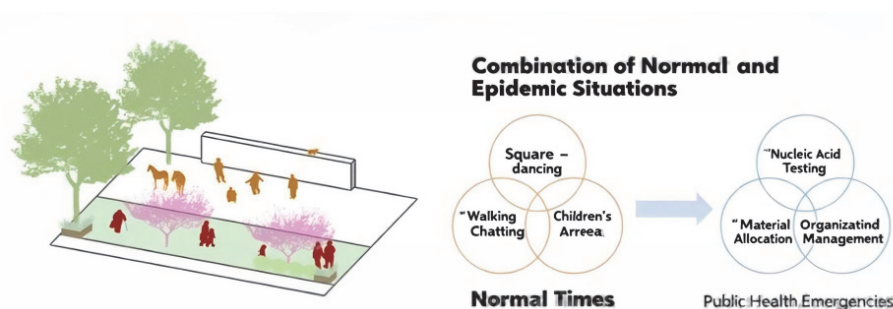


Figure 9. Schematic diagram of functional conversion of low utility land

Source: Self-drawn by the author

5.2 Optimisation of Health Transport Trips

5.2.1 Road Stitch Improvement: Building Open Shared Roads

Shaping open and shared neighbourhood road environments and creating "fast commute, slow recreation" travel patterns. Distinguish between residential and living service functions, and create grey space next to buildings in the living service area to provide residents with independent outdoor open space. Through the traditional "meridian" concept, the interface should be opened up, and the traffic function should be weakened through landscaping, signage, seating and flowerbeds. The roads adjacent to the office and residential areas are widened to ensure traffic flow and efficiency, and street trees are used as noise barriers to mitigate noise pollution and ensure a healthy and sustainable traffic environment (Figure 10).

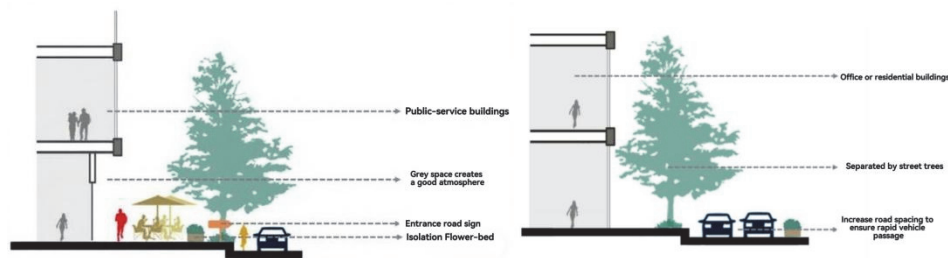


Figure 10. Schematic road design for service and residential areas

Source: Self-drawn by the author

5.2.2 Multi-Connections And Interchanges: Building A Transport Micro-Circulation System

The vehicles on the road are the blood flowing in the veins, and the sewed-up neighbourhood roads are the veins responsible for blood transport, and the combination of the two together revitalises the urban transport system. Through the construction of a symbiotic circulation system of man and nature, city and environment, we promote the optimisation of the "point-to-point" connection of slow-moving transport, rail transport and regular transport. Neighbouring neighbourhoods are linked to form an integrated, multi-level transport network layout, forming a micro-circulation bus system (Figure 11). It meets the travelling needs of the disadvantaged groups and promotes the frequency of their outings, while at the same time driving the development of neighbouring parks and commercial projects (Liu Mengyao, 2024).

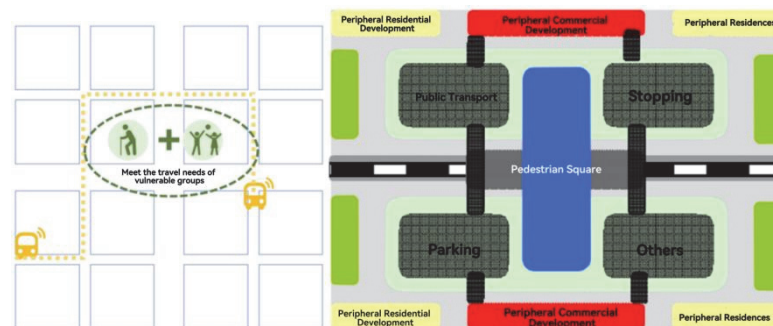


Figure 11. Schematic layout of the transport micro-circulation system and station connections

Source: Self-drawn by the author

5.2.2 Optimisation of Health Facilities and Environment

(1) Low variety of service facilities: upgrading the mix of public service facilities in neighbourhoods

Improving health facilities and upgrading the mix of public service facilities in neighbourhoods are key to building a livable and healthy city. Fitness facilities need to be comprehensively upgraded with an emphasis on safety and environmental protection. At the same time, health education and knowledge promotion should be strengthened to guide residents to develop healthy habits. In addition, environmental hygiene should be improved and hygiene management in public places should be strengthened to prevent the spread of diseases.

(2) Creating social micro-spaces: creating a "cluster + interconnection" model to enhance community vitality

The Dongba area has a lot of unused land, especially the under-utilised street corners close to residential areas. Different types of public spaces are constructed on a block-by-block basis, and through the dynamic change of resident groups, people are guided to change from "external bystanders" to "internal users" through visual communication, perception and empathetic interactions with internal groups, forming a chain-type sharing structure. The sparse density and distance of the tree pools and seats in the micro-space promote the interaction between individuals, stimulate the participation of onlookers, and promote the mobility and scale expansion of the members among the groups.(Figure 12).

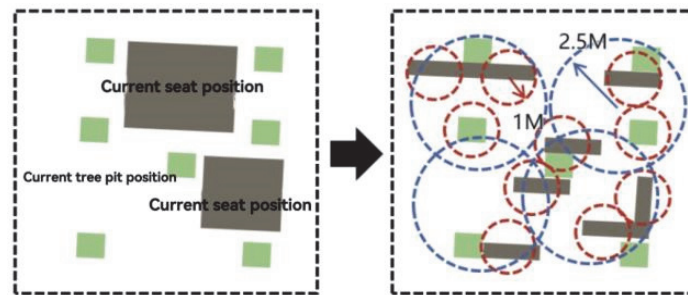


Figure 12. Pocket Park Seating Arrangement Schematic

Source: Self-drawn by the author

6. Strategies for Optimising Neighbourhood Health Environments Under the Traditional View of Wellness

Taking into account the differences in culture, facilities and other environmental substrates of each neighbourhood, it is proposed that the strategy should focus on universality and hierarchy. Therefore, this paper takes the three traditional health care concepts of "Cosmic View", "Balance View" and "Dynamic and Static View" as the general orientation of the strategy, takes the middle view of the "Four Dimensions of Health Care" as the theoretical basis, and puts forward the universal practice strategy from the micro perspective of the block.

6.1 Cosmology: The Way of Nature, Constructing A Place of Symbiosis

The cosmic concept of "unity of man and heaven" places human health activities in the macro-environment, focusing on the symbiotic relationship between man and nature, man and society. Based on the "natural way", this paper puts forward the two strategies of "boundary nature" and "ecological nature". "Boundary Nature" aims to establish a natural dialogue between the neighbourhood and the outside world or inside the neighbourhood, softening the boundary through site elevation and greening, and promoting residents' spontaneous activities; "Ecological Nature" aims to emphasize the relationship between the neighbourhood's living environment and the park's green space and the neighbourhood's stock of land, and to build a natural, ecological and humane relationship between the neighbourhood and society. The "Ecological Nature" aims to emphasise the naturalisation, ecology and humanisation of the neighbourhood's living environment with the park's green space and the surrounding land stock. In addition, increasing the green coverage rate, while improving the quality of the environment, improves the frequency of residents' activities, strengthens their body metabolism and functionality, reduces the incidence of chronic diseases, and creates a place for living and healing where human beings and nature live in harmony and symbiosis.

6.2 Balanced View: Reconciling Yin And Yang in Pursuit of A Steady State of Supply and Demand

The concept of balance, "internal and external harmony, yin and yang secret", is interpreted in the Five Elements doctrine as the homeostatic equilibrium of the human physiological system, which is regulated by five substances, each of which is indispensable and cannot be imbalanced. In neighbourhood environmental health planning, the quantity, quality and distribution of public service facilities in a neighbourhood are usually measured by their ability to meet the multiple needs of nearby residents in their daily lives and in emergency situations (Ding, L. K., 2022). In order to avoid the emergence of the "border depression effect", a "three-regulation" approach is proposed to constrain the imbalance in the layout of public service facilities. Firstly, additional facilities should be installed according to local conditions to fill the supply gap; secondly, service facilities should be adapted to the population density of the neighbourhood, and upgraded by classification and grading, and adjusted in terms of quantity and aesthetics; and thirdly, service facilities should be coordinated with residents' psychology and behaviour to create a user-friendly facility system (Liu, H., 2023).

6.3 Dynamic and Static View: Weaving Multiple Spaces Inside and Out

"Combination of movement and static, form and spirit" emphasises the respective health effects of movement and static, which can be differentiated from the functional perspective as "movement" and "static mind". This paper proposes that "movement" is the "visible road space planning", and "stillness" is the "invisible spiritual and cultural dissemination". In the planning of "movement", road connectivity and carrying capacity are strengthened, fitness trails and running tracks are used to link public service buildings and facility spaces, and rich activity spaces such as Zen gardens, staking areas and martial arts lecture halls are created to enhance the continuity and composite

degree of walking tours. In addition, the density of the road network will be increased, a micro-circulation bus system will be advocated to shorten the time of transferring and connecting, and the slow-moving system will be perfected, combining the road network with a comfortable and beautiful environment. The "quiet" planning focuses on the promotion of health and wellness culture, through changes in the materials and styles of the walkways, and the integration of intelligent interactive technology, to stimulate the spatial vitality of the neighbourhood, and to promote the active health of the residents.

7. Conclusions

Neighbourhood planning is traditionally more concerned with the "external" transformation and enhancement of material space elements, while neighbourhood renewal based on the concept of traditional health culture pays more attention to the "internal" health needs of residents. Through a healthy environment, the spatial perception of urban neighbourhoods is enhanced, and residents' outdoor activities and exchanges are promoted, forming an environment in which human beings and nature coexist harmoniously. In the future, it is necessary to further improve the mechanism and research methodology of neighbourhoods under the concept of wellness, strengthen the guidance of the behavioural characteristics of neighbourhood activists, increase the green coverage and healing function, ensure the comfort and safety of the residential environment, set up a social space for neighbours to communicate with each other, enjoy the body and mind, and improve the health of residents, so as to promote the effective dissemination of the culture of wellness and the development of a healthy city stock.

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