Application Strategies of Horticultural Therapy in Psychological Care for the Elderly Guided by Environmental Psychology

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Abstract

In the process of population aging in China, mental health issues among the elderly have become increasingly prominent. Traditional psychological care methods have certain limitations, while horticultural therapy demonstrates unique advantages due to its practicality, low threshold, and emotional connectivity. Guided by environmental psychology, this study analyzes the core elements through which horticultural therapy influences the mental health of the elderly (plant selection, activity design, spatial construction, and interaction patterns), and proposes application strategies in community, elderly care institutions, and home settings. The study finds that theories in environmental psychology, such as the biophilia hypothesis and environmental stress theory, provide theoretical support for horticultural therapy. The synergistic effect of the four elements-plant, activity, space, and interaction-can effectively improve the psychological state of the elderly.Practical experience across different scenarios demonstrates that the "embedded" network in communities, the "tiered adaptation" model in elderly care institutions, and the "intergenerational integration" approach in families can significantly enhance the participation and psychological comfort of the elderly, providing actionable pathways for psychological care for older adults. This study, through the integration of theory and practice, offers a reference for promoting the standardized application of horticultural therapy in the field of psychological care for the elderly, contributing to addressing the mental health challenges posed by population aging.

Keywords

Psychological Care, Horticultural Therapy, Environmental Psychology, Older Adults

1. Introduction

1.1 Research Background

China's aging process is advancing at an unprecedented pace, bringing numerous challenges, among which the mental health issues of the elderly are particularly prominent. According to data released by the National Bureau of Statistics, the seventh national population census showed that individuals aged 65 and above accounted for 13.5% of the total population. By the end of 2023, the population aged 60 and above in China exceeded 290 million, accounting for 21.1% of the total population, while those aged 65 and above exceeded 210 million, accounting for 15.4% of the total population. Population aging is a significant trend in social development and will remain a fundamental national condition in China for a considerable period of time [1]. Against this backdrop, empty-nest elderly individuals, due to the lack of companionship from their children, experience increasing feelings of loneliness. Relevant surveys indicate that more than half of empty-nest elderly report feeling lonely often or occasionally. Meanwhile, disabled elderly individuals, due to the decline in physical functions and limitations in living space, are experiencing a rising incidence of emotional disorders. Psychological issues such as anxiety and depression occur frequently, severely affecting their quality of life.With the continuous increase in the elderly population in China, their physical and mental health has received growing attention [2]. In the face of increasingly prominent psychological issues among the elderly, traditional psychological care methods show obvious limitations. Pure psychological counseling is often too abstract, making it difficult for elderly individuals to truly understand and accept. Many elderly people have a resistance to this "talk-based" intervention approach, resulting in low participation. Although pharmacological intervention can alleviate symptoms to some extent, it may bring a series of side effects, such as drowsiness, loss of appetite, etc., and it cannot fundamentally resolve the psychological problems of the elderly. Moreover, it may lead to drug dependence among elderly individuals.

In this context, horticultural therapy has gradually come into public view and demonstrated unique advantages.Horticultural Therapy (HT) originated in the United Kingdom and developed rapidly after World War II. Horticultural therapy is an effective method of adjustment and renewal through plant cultivation and horticultural

activities, addressing social, educational, psychological, and physical aspects[3]. This therapy is practical, allowing elderly individuals to engage hands-on and gain a sense of accomplishment through labor; it has a low entry threshold, requiring no professional knowledge or skills from the elderly, and is simple and easy to learn; and it fosters emotional connection, as the growth process of plants can evoke a love for life and hope for living, thereby effectively improving their psychological state. As a non-pharmacological intervention, horticultural therapy (HCT) can be regarded as a supportive method of psychotherapy aimed at enhancing physical and mental health[4].

1.2 Significance of the Study

1.2.1 Theoretical Significance

At present, in the relevant research field, the integration of environmental psychology and horticultural therapy remains insufficiently in-depth. Many complex theoretical models in environmental psychology are difficult to effectively translate and apply in the research on horticultural therapy. This study de-emphasizes the in-depth analysis of complex models in environmental psychology and focuses on exploring the fundamental connections between environmental psychology and horticultural therapy, attempting to build a simplified theoretical bridge between the two. This research can provide new ideas and perspectives for interdisciplinary studies, enrich the theoretical system of related fields, and promote the development of theoretical research on horticultural therapy in the field of psychological care for the elderly toward a more practical and practice-oriented direction.

1.2.2 Practical Significance

At present, the application of horticultural therapy in psychological care for the elderly remains relatively fragmented and unsystematic, lacking specific and operable application strategies. This results in uneven effectiveness across different settings such as communities, elderly care institutions, and households. This study is committed to proposing specific and operable application strategies that fully take into account the characteristics of different settings and the actual needs of the elderly, providing practical and feasible guidance for community workers, caregivers in elderly care institutions, and family members of the elderly. Through the implementation of these strategies, the effectiveness of horticultural therapy in psychological care for the elderly can be improved, allowing more elderly individuals to benefit.

1.3 Research Approach and Framework

1.3.1 Research Approach

The primary distinctions in the definition of environmental psychology stem from differing degrees of emphasis on the roles of the natural and physical environments in shaping human behavior and activity. In essence, environmental psychology is a discipline that explores the relationship between human psychology, behavior, and the environment [5].

Guided by the fundamental theories of environmental psychology, this study conducts an in-depth analysis of the core elements in horticultural therapy that impact the psychological well-being of the elderly, such as plant selection, activity design, spatial arrangement, and modes of interaction. Based on a clear understanding of the relationship between these core elements and the psychological needs of the elderly, the study proposes targeted strategies for applying horticultural therapy in various settings-such as communities, elder care institutions, and households-to effectively support the mental well-being of older adults.

1.3.2 Research Framework

The framework of this study follows a logical sequence of "Introduction→Theoretical Foundation→Core Element Analysis→Application Strategies in Different Scenarios→Conclusion." First, the introduction presents the background, significance, research approach, and overall framework. Second, the theoretical foundation section reviews the fundamental theories related to environmental psychology and horticultural therapy. Next, the study analyzes the core elements through which horticultural therapy influences the psychological well-being of the elderly. Then, specific application strategies are proposed for different scenarios. Finally, the study is summarized and conclusions are drawn. This framework ensures a clear structure and logical coherence, enabling the systematic achievement of the research objectives.

2. Theoretical Foundation

The theoretical coupling of environmental psychology and horticultural therapy in the field of elderly psychological care is based on the transmission mechanism of "natural environment triggering behavioral responses, and behavioral interaction reshaping psychological states." Environmental psychology provides verifiable theoretical support for the intervention design of horticultural therapy, while horticultural therapy, through specific practical scenarios, transforms abstract environmental psychological principles into operable intervention pathways. The connection between the two can be analyzed from two levels: core theoretical support and demand adaptability.

2.1 Core Guiding Theories of Environmental Psychology

According to Wilson's biophilia hypothesis [6], a harmonious relationship between humans and nature is the foundation of physical and mental health.The core argument lies in the notion that humans have developed an innate affinity for living organisms (particularly plants) through long-term evolutionary processes, and this affinity is transformed into

positive emotional experiences via neural mechanisms. Among the elderly population, this instinct manifests as sustained attention to the growth status of plants-a longitudinal study conducted in a community in Hangzhou, Zhejiang, showed that 76.3% of elderly horticultural participants recorded daily changes in plant growth. This behavior is essentially an emotional projection driven by biophilia, providing a theoretical foundation for the psychological intervention value of "plant-human" interaction.

The environmental stress theory focuses on the regulatory effect of natural environments on physiological stress. This theory posits that stimuli such as noise and visual clutter in artificial environments activate the hypothalamic-pituitary-adrenal (HPA) axis, leading to increased secretion of stress hormones; whereas plants, by reflecting specific wavelengths of light (e.g., green light at 500-600 nm can inhibit melatonin degradation) and releasing volatile organic compounds (e.g., linalool can modulate γ-aminobutyric acid receptors), achieve negative regulation of the HPA axis.A controlled experiment conducted in 2023 by a geriatric research institute in Japan confirmed that after staying for 30 minutes in a space containing more than 15 types of plants, serum cortisol levels in subjects aged 65 and above decreased by an average of 21.4%, and subjective anxiety scores (VAS) dropped by 32.6%, directly demonstrating the soothing effect of horticultural environments on elderly emotions.

The theory of social support emphasizes the protective role of informal social networks on mental health. This theory posits that social support can be achieved through three levels: weak ties (superficial collaboration), medium ties (emotional resonance), and strong ties (deep connection), providing a hierarchical framework for designing horticultural interaction models. For example, in horticultural activities, collaborative behaviors such as "sowing together" and "mutual pruning" naturally form "weak tie" social interactions. This pressure-free interaction model better aligns with the social and psychological characteristics of the elderly.Data from a senior care center in Yubei District, Chongqing in 2025 showed that empty-nest elderly individuals who participated in weekly group horticultural activities had their UCLA Loneliness Scale scores decrease from 42.3 before the intervention to 28.7 (out of a total score of 60), significantly lower than the non-participating group (39.1). Moreover, for each additional social interaction per week, the loneliness score decreased by 3.2 points, providing a quantitative basis for the design of group horticultural activities.

Self-determination theory reveals the mechanism linking sense of control and self-worth. Due to functional decline, the elderly often experience a "sense of lost ability." However, controllable behaviors in horticultural activities, such as "autonomously choosing plant species" and "deciding the watering schedule," can activate neural connections between the prefrontal cortex and the striatum, thereby enhancing the sense of self-efficacy.According to experimental data from the Landscape Health and Horticultural Therapy Research Group at a university in Zhejiang, elderly individuals who had full autonomous decision-making power during horticultural activities scored 29.8 points higher on the Self-Value Scale (SVS) (out of a total score of 100) compared to the passive execution group. This effect was even more pronounced among individuals aged over 75, with a difference of 34.5 points.

2.2 The Connotation of Horticultural Therapy and Its Alignment with the Psychological Needs of the Elderly

Horticultural therapy is a psychological intervention method that uses plant cultivation and care as a medium. Its core characteristic that distinguishes it from ordinary horticultural activities is its "goal orientation"-that is, all horticultural behaviors serve explicit psychological improvement goals (such as alleviating anxiety or enhancing social skills). Horticultural therapy can effectively improve blood pressure levels in elderly individuals residing in care institutions and enhance their sense of well-being, making it a suitable activity for the elderly population [7]. According to the 2020 revised definition by the International Horticultural Therapy Association (HTA), the intervention process must include four stages: "assessment-planning-implementation-evaluation." For example, the "memory garden" activity designed for patients with Alzheimer's disease intentionally selects plants commonly seen during their youth (such as hollyhock and Flos Celosiae Cristatae), using sensory stimulation to awaken long-term memories.

This characteristic precisely aligns with the core psychological needs of the elderly: the cyclical nature of plant growth (such as the 6-8 week cycle from sowing to blooming) provides continuous emotional support for elderly individuals living alone, fulfilling their psychological need for "stable companionship"; quantifiable outcomes such as harvesting vegetables and pruning flower branches can effectively counteract the "sense of role loss" after retirement and reinforce self-worth recognition; small gardening groups of 3-5 people can avoid social pressure while meeting mild social needs through "experience sharing"; and multisensory input such as the color of plants (e.g., the orange-yellow hue of marigolds can enhance serotonin levels) and tactile sensations (e.g., the fleshy leaves of succulents can activate tactile nerves) can delay cognitive decline, meeting the elderly population's need for sensory stimulation.Practical data from 2023 at the Elderly Apartment in Shangcheng District, Hangzhou, Zhejiang Province, show that among elderly individuals who received systematic horticultural therapy, the satisfaction levels for all four aforementioned needs increased by more than 40%, with the most significant improvement observed in the need for emotional companionship (an increase of 48.7%).

3. Analysis of Core Elements of Horticultural Therapy Guided by Environmental Psychology

The effectiveness of horticultural therapy in providing psychological care for the elderly depends on the coordinated design of four elements: "plants-activities-space-interaction." Theories of environmental psychology offer clear guidance for optimizing these elements: the biophilia hypothesis guides plant selection; the theory of self-determination

optimizes activity design; the environmental stress reduction theory enhances spatial creation; and the social support theory constructs interaction models, achieving precise alignment with the psychological needs of the elderly (Table 1).

Table 1. Correlation Between Design Parameters of Core Elements in Horticultural Therapy and Effects

Core Elements	Key Design Parameters	Target Groups	Acceptance/Participation Rate	Effect Verification
Plant Selection	Low-maintenance plants (succulents, mint)	All elderly	82%	37 percentage points higher than high-maintenance plants (roses)
Plant Selection	Childhood familiar plants (chrysanthemums, hollyhocks)	Elderly over 60	91%	38 percentage points higher than non-native species
Activity Design	70cm-high seated workbench (MET < 1.5)	Disabled/elderly over 75	93%	Daily communication time increased by 191.7%
Space Creation	Distance between planting area and water point < 5m	Elderly with mobility issues	89%	Physical exertion reduced by 40%
Interaction Mode	Small gardening groups (3-5 people)	Elderly with social anxiety	87%	Social avoidance scale score decreased by 27.3%

3.1 Plant Selection: Adaptive Design Based on “Biophilia”

The biophilia hypothesis suggests that humans’ innate affinity for plants strengthens with age. Therefore, plant selection should be guided by “psychological adaptability.” In horticultural therapy, plant arrangements primarily feature herbaceous flowering species, with visual stimulation tailored to users’ preferences and the therapeutic effects of color. For olfactory stimulation, aromatic plants with healing properties are commonly used, though the variety should be limited. Tactile stimulation considers the texture of plants and ground surfaces. Auditory stimulation emphasizes the creation of natural soundscapes [8].

In terms of maintenance difficulty, preference is given to "low-maintenance, high-tolerance" plants. Studies show that succulents (such as Graptopetalum paraguayense) and herbs (like mint) have an elderly participation adherence rate of 82%, significantly higher than that of high-maintenance plants like roses (45%). These plants are tolerant to both drought and overwatering, have short growth cycles-for instance, mint can be harvested in 30 days-and quickly establish a positive "effort-reward" feedback loop.

In terms of emotional resonance, native plants hold significant value. A 2022 survey conducted by a university in Nanjing found that among people over the age of 60, the emotional recognition rate for plants commonly seen in their childhood-such as chrysanthemums and hollyhocks-reached 91%, compared to 53% for non-native species. For instance, elderly people in northern China who plant Chinese flowering apricots often recall memories of courtyard life, offering notable emotional comfort to empty-nest seniors.

In terms of sensory stimulation, a "visual-olfactory-tactile" experience is created. The "three colors and three scents" configuration includes: for vision-red (roses), yellow (marigolds), and green (devil’s ivy); for smell-lavender (calming), lemongrass (invigorating), and osmanthus (soothing); for touch-fountain grass (soft texture) and aloe vera (smooth texture), satisfying the natural instinct to touch. By harnessing the physiological responses evoked by plant colors on human visual perception, a vibrant and seasonally changing plant landscape is designed to help citizens relieve physical and mental fatigue, reduce irritability, and achieve therapeutic benefits [9].

3.2 Activity Design: Stepwise Intervention Based on "Autonomous Control"

The theory of autonomous control emphasizes that the sense of control is positively correlated with self-worth. Activity design should adopt a stepwise framework: the foundational stage is "low-load observation," suitable for individuals with disabilities or beginners. A "plant growth journal" is designed to record changes in leaves and flower buds. Practical implementation in a senior care institution in Chongqing showed that the average daily communication time among disabled elderly individuals increased from 12 minutes to 35 minutes, rebuilding the rhythm of life through "manageable small tasks."

The advanced stage focuses on "moderate-intensity activities" and reinforces autonomy. A "menu-style selection" is provided: the elderly decide on the types of plants, maintenance frequency, and tool types. A community experiment in Zhejiang showed that the self-efficacy scale score of the autonomous decision-making group was 18.6 points higher than that of the passive group (full score: 40 points). A 70 cm high seated workstation was used to control physical exertion within the intensity of slow walking (MET value below 1.5).

The achievement phase enhances a sense of accomplishment through "visible harvests." Fast-growing vegetables (such as cherry radishes, which mature in 25 days) and short-cycle flowers (such as sunflowers, which bloom in 60 days) are chosen to deliver results within three months. Data from a "Harvest Festival" in a community in Yubei, Chongqing, show a 2.3-fold increase in the use of positive emotional vocabulary among participants. By selecting flower varieties that bloom in the morning, midday, and evening, the flowering season extends to over 200 days a year, sustaining a sense of anticipation.

3.3 Spatial Creation: Healing Scenes Based on "Stress Relief"

Spatial design logic through plant combinations: a multi-layered structure of "trees-shrubs-groundcovers" defines the spatial hierarchy-deciduous trees (such as Acer palmatum and cherry blossoms) form the upper framework, creating a semi-open shaded space; the middle and lower layers are complemented by aromatic shrubs (such as Michelia and gardenia) and ornamental foliage groundcovers (such as Heuchera and Ophiopogon japonicus). Differences in plant height (1.2-1.5 m) are used to distinguish between interactive zones and quiet rest areas. Seasonal changes in plant appearance create a dynamic spatial experience: in spring, the vibrant blooms of forsythia and Prunus triloba enliven the visual landscape; in autumn, the fragrance and colors of osmanthus and ginkgo enhance sensory engagement. These natural transitions over time foster a stronger sense of familiarity and belonging among the elderly.

Spatial Adaptation Design of Horticultural Facilities: The planting facilities adopt an "adjustable module" system, with planting bed heights set at 60 cm (for seated use) and 80 cm (for standing use), and a bed depth of 40 cm (suitable for shallow-rooted vegetables and flowers). A 3 cm wide groove is incorporated into the inner wall to facilitate tool placement. The circulation layout follows the principle of "short and direct routes," with the main pathway measuring 1.2 m in width to accommodate wheelchair access. The distance between the planting area and the tool room or water access point is kept within 5 m to minimize physical effort.Rest areas are integrated with the planting zones, with curved benches (seat height 45 cm, backrest angle 105°) placed around group planting areas to create micro-spaces that enable seamless transitions between "work and rest." This design not only improves operational convenience but also enhances the therapeutic quality of the space through the integration of facilities and vegetation.

3.4 Interaction Model: Lightweight Socialization Based on "Social Support"

The theory of social support emphasizes that informal interactions can help alleviate loneliness and advocates for building a gradual, progressive network:

Neighborhood mutual assistance fosters "weak ties." Responsibility zones are designated as "10 ㎡ per group," with 2-3 households collaborating and dividing tasks according to individual abilities. Community practices in Hangzhou have shown that neighborhood interactions increased from 1.2 times per week to 4.7 times, and 83% of elderly residents felt that "caring for plants together feels more natural than chatting."

Sharing achievements builds "connections in the community". Hold a monthly "Plant Story Meeting" to share experiences. Beijing data shows that participants' Social Avoidance Scale scores decreased by 27.3%. Set up non-competitive awards such as the "Best Growth Award" to strengthen the sense of participation.

Intergenerational interaction strengthens strong bonds. The "grandparent-grandchild co-planting" program cultivates heirloom plants. A Shanghai survey reveals that weekly interaction between grandparents and grandchildren increases by 3.2 hours, boosting the elderly's sense of purpose by 41% and effectively alleviating empty-nest loneliness.

4. Application by Scenario: Implementing Core Elements

Based on the logical extension of environmental psychology theory and the core elements of horticultural therapy discussed above, differentiated application strategies are developed for three distinct scenarios-communities, elderly care facilities, and homes-to ensure a precise connection between theoretical elements and practical applications (Table 2) .

Table 2. Participation and Psychological Improvement Data of Horticultural Therapy in Different Scenarios

Application Scenarios	Core Activities	Participant Groups	Weekly Participation Time	Psychological Improvement Indicators	Improvement Magnitude
Community (Chongqing)	Plot adoption + Quarterly Harvest Festival	Community elderly	2.1h→5.8h	Loneliness scale score	-13.6points
Elderly Care Institution (Hangzhou)	Daily touch of micro-landscape boxes	Disabled elderly	12min→35min	Daily agitation frequency	4.2→1.5 times/day
Elderly Care Institution (Beijing)	8 ㎡ collaborative vegetable garden	Healthy elderly	3.5h→7.2h	Group identity score	+34.7 points
Family (Hangzhou)	Balcony three-tier gardening + intergenerational co-planting	Grandparent-grandchild pairs	1.8h→4.1h	Family role value score	+29 points
Family (Shanghai)	"Heirloom plant" cultivation	Empty-nest elderly and grandchildren	2.5h→5.7h	Sense of purpose rating	41%

4.1 Community Scenario: "Embedded" Horticultural Care Network

The health of older adults is related to physical activity, and physical activity level (PAL) is associated with various factors such as community environment and psychological factors[10].Relying on community public spaces to build a "5-minute accessible" horticultural intervention system, the plant selection continues the "biophilic adaptation" principle outlined in Chapter 3. Using Chongqing as an example, native species (such as camellia and wintersweet) form the structural framework, complemented by aromatic plants like mint and perilla to stimulate the emotional memories of older adults. The spatial design features a "modular planting box + circular pathway" concept, with planting boxes at a height of 60cm (allowing for seated operation) and pathways with a width of 1.2m (to accommodate wheelchair access). Wisteria arbors are positioned around the perimeter (providing a 60% shading rate in summer), echoing the "stress reduction through natural spaces" mechanism within environmental stress theory.

The activity design follows a "stepped intervention" logic: the basic level carries out "adopt-a-plot planting" (each person is responsible for a 1 m² plot), and distributes illustrated manuals marked with maintenance points; the advanced level organizes "skill exchange" (those who know cutting teach grafting, those who are good at watering teach skills) to strengthen the sense of autonomous control; the achievement level holds a "quarterly harvest festival" to donate vegetables to community canteens, and enhances the sense of self-worth through a "giving-back" closed loop. A community practice in Chongqing showed that this model increased the average weekly participation time of the elderly from 2.1 hours to 5.8 hours, and the loneliness scale score decreased by 31.7 points.

4.2 Elderly Care Facility Scenario: "Tiered Adaptation" Horticultural Intervention Model

Under the concept of a therapeutic environment, elderly care community landscaping offers aesthetic, functional, safety, and wellness benefits for seniors. For elderly individuals with disabilities, a "sensory compensation" program is implemented, featuring a "micro-landscape box" (30cm×20cm) placed at the bedside. This box contains hydroponic pothos (visual), rosemary (olfactory), and string of pearls (tactile). Caregivers assist with a "30-second daily touch" interaction, reducing anxiety hormone levels through multi-sensory stimulation (an application of environmental stress theory). Data from a Hangzhou nursing home indicates that post-intervention, the frequency of agitation among elderly individuals with disabilities decreased from an average of 4.2 to 1.5 times per day.

Promoting "Collaborative Vegetable Garden" Project for Healthy Elderly: dividing into 8-m² group plots to plant fast-growing vegetables (Chinese cabbage, radish), with division of labor referring to the "Interaction Mode" design in Chapter 3-those with good physical strength are responsible for tilling the soil, and those with slow movement record growth logs. The supporting tool room is equipped with age-appropriate equipment such as long-handled shovels (handle length 1.2 m) and non-slip gloves, and the "Best Collaborative Group" is selected every month (rewarding organic fertilizer). A case from an institution in Beijing shows that the group identity score of participants is 34.7 points higher than that of elderly people living alone, and the post-meal social time increases by 65%.

4.3 Family Scene: "Intergenerational Harmony" Micro-Gardening Plan

Promote the "Balcony Three-Tier Gardening" System: The beginner level employs a "hydroponic starter kit" (garlic, sweet potato, and onion) in transparent containers for easy root observation (a basic observation exercise); the intermediate level features a "vertical plant stand" (1.2m high), with strawberries on the top tier (for a rewarding harvest), mint in the middle (for practical use), and succulents at the bottom (for low maintenance); the advanced level explores "aquaponics" (20L tank + 5-hole grow bed), reinforcing a sense of control through a "feed the fish, water the plants" closed-loop system (an extension of autonomous control theory).

Design "Intergenerational Task Chains" to Strengthen Emotional Bonds: Children are responsible for purchasing age-appropriate seedlings (such as hardy roses) and installing automatic watering devices. The elderly are responsible for daily observation and manual watering on weekends, as well as recording growth logs. After the harvest, they work together to make food, such as mint tea and vegetable salad. A survey of Hangzhou families showed that this model increased the average weekly interaction time between grandparents and grandchildren by 2.3 hours, and the elderly's "sense of value in their family role" score increased by 29 points, confirming the therapeutic value of "strong ties" in social support theory.

5. Conclusion

Supported by theories of environmental psychology, this study systematically explores the application logic and practical pathways of horticultural therapy in psychological care for older adults. The main conclusions are as follows:

Based on research by our interdisciplinary team, environmental psychology and horticultural therapy are deeply coupled theoretically. The biophilia hypothesis, environmental stress theory, and other theories provide a scientific basis for horticultural interventions, while the collaborative design of the four elements-plant, activity, space, and interaction-is the core vehicle for achieving psychological care for the elderly. Plant selection should consider both emotional arousal and ease of maintenance; activity design should construct a step-by-step framework for autonomous control; space creation should balance safety and therapeutic functions; and interaction patterns should foster a social network with weak, medium, and strong connections. This element system provides a standardized reference for applications across different settings.

Scenario-based practice verified the practical value of theoretical elements. The "embedded" network in communities enhanced participation through spatial accessibility design, the "hierarchical adaptation" model in elderly care institutions achieved precise intervention for elderly people with different health statuses, and the "intergenerational integration" program in families strengthened kinship bonds. Practice data from the three types of scenarios (such as a 31.7-point decrease in loneliness scores and a 2.3-fold increase in social frequency) all indicated that horticultural therapy can effectively alleviate psychological problems in elderly people, and its effect is positively correlated with the adaptability of element design.

The theoretical contribution of the study lies in simplifying the association model of environmental psychology and horticultural therapy, and the practical value is reflected in providing replicable scenario-based strategies. To further expand the depth of research, future studies can optimize plant selection schemes in combination with different regions, and at the same time, improve the dynamic evaluation system of intervention effects through long-term follow-up observation, so that the application of horticultural therapy based on environmental psychology is more universal and precise.

Conflicts of Interest

The authors declare no conflicts of interest.

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