Humanities and Social Sciences Letters
2025 Vol. 13, No. 2, pp. 471-484
ISSN(e): 2312-4318
ISSN(p): 2312-5659
DOI: 10.18488/73.v13i2.4175
© 2025 Conscientia Beam. All Rights Reserved.

Healing gardens and their impact on rehabilitation: Integrating humane design in Nanning City general hospitals' outdoor environments

XiaoXin Huang[1]
Nurhayati Abdul Malek[2+]
Mohd Zahid Mohd Salleh[3]
Yuan Jun[4]

[1]*Centre for Postgraduate Studies, College of Built Environment, Universiti Teknologi Mara (UiTM), 40450 Shah Alam, Selangor, Malaysia.*
[1]*Email: 2022814342@student.uitm.edu.my*
[2,3,4]*Department of Landscape Architecture, School of Town Planning and Landscape Architecture, College of Built Environment, Universiti Teknologi Mara (UiTM), Puncak Alam Campus, 42300 Selangor, Malaysia.*
[2]*Email: nurhayati8203@uitm.edu.m*
[3]*Email: mzahid@uitm.edu.m*
[4]*Email: yuanju760124@gmail.com*

(+ Corresponding author)

Article History
Received: 3 December 2024
Revised: 10 March 2025
Accepted: 24 March 2025
Published: 16 April 2025

Keywords
Healing gardens
Hospital environments
Humane design
Nanning city
Patient rehabilitation
Therapeutic landscapes.

ABSTRACT

The study examines the effects of healing gardens on patients, healthcare professionals, and tourists in general hospitals in Nanning City, emphasizing humane design and outdoor environments. A survey of 400 participants, including physicians, patients, and tourists from Trinidad and Tobago was conducted to assess their perceptions of the benefits of healing gardens. The study measured the impact on anxiety reduction, sociability, physiological activity levels and mood enhancement with data analyzed using independent samples t-tests and analysis of variance (ANOVA). Findings indicate significant reductions in anxiety levels for both patients and hospital personnel with patients experiencing more pronounced improvements. However, no significant differences were observed between the two groups in terms of physical activity levels and mood enhancement. Patients highlighted the garden's role as an important social space suggesting a positive influence on recovery and reinforcing the necessity of healing gardens for patient rehabilitation. The study underscores the importance of accessible and well-designed outdoor spaces in healthcare environments, contributing to holistic well-being and informing potential improvements in garden design to better serve diverse user groups.

Contribution/Originality: This study highlights the therapeutic benefits of healing gardens in hospitals, demonstrating their role in reducing anxiety and enhancing social interactions. It underscores the need for well-designed outdoor spaces in healthcare settings and offers insights for improved garden designs catering to diverse users.

1. INTRODUCTION

Healing gardens, also known as therapeutic places have emerged as critical elements of architectural features of contemporary facility environments, specifically in buildings such as hospitals. These gardens are meticulously designed outdoor spaces that integrate natural elements to promote healing, alleviate stress, and enhance overall well-being among patients, visitors, and healthcare staff (Nieberler-Walker, Desha, Bosman, Roiko, & Caldera, 2023). The growing interest in healing gardens is not merely a trend; it reflects a deeper understanding of the intrinsic relationship between nature and health which is founded on historical practices and validated by contemporary research.

Historically, the therapeutic benefits of nature have been recognized for centuries. Various cultures have employed the healing power of nature in their medicinal practices from ancient Greek gardens dedicated to healing

© 2025 Conscientia Beam. All Rights Reserved.

deities to the Zen gardens of Japan designed for meditation and tranquillity (d'Erm, 2024; Lestari & Favurita, 2024; Marques, McIntosh, & Kershaw, 2021; Zhu & Sarah, 2024). However, in modern society, the relationship between humans and nature has been increasingly strained due to urbanization and the fast-paced nature of contemporary life. The increasing prevalence of mental health challenges, exacerbated by factors such as environmental stressors, social isolation, and lifestyle changes underscores the urgent need for therapeutic spaces within healthcare settings (Jamal, 2023; Trojanowska & Matuszewska, 2024).

Research consistently highlights the psychological and physiological benefits of exposure to natural environments. Studies demonstrate that patients who interact with healing gardens experience a wide range of benefits, including reduced anxiety levels, improved mood and enhanced overall satisfaction with their healthcare experiences (Huang & Yuan, 2024; Kim, Ryu, & Seo, 2024; Wood, Polley, Barton, & Wicks, 2022; Yang et al., 2022).

The significance of healing gardens extends beyond individual patient benefits. These gardens foster social interactions and support networks among patients, families, and healthcare providers. According to Jeffs (2024) stress levels are reduced and job satisfaction rises when employees are exposed to concepts of green space. The development of healing gardens can enhance an individual's experience at the facilities, making them quickly represent the objectives of paradisiacal treatment (Kim et al., 2024; Singh, Sabahat, & Qamrudiin, 2021).

According to this point of view, applying compassionate design concepts in hospitalized environments is becoming increasingly important. According to Naderi and Shin (2008) humane design emphasizes the individual, namely how individuals feel and how they are affected by their surroundings, ultimately resulting in the individual experiencing both physical and psychological comfort (Wolf-Meyer, 2023). This includes aspects such as the ease of access, the capacity to touch or feel something and the variety of plant kinds that horticulturists would advise that have the potential to be valuable to several people. These elements can be found in the case of healing gardens.

This study will investigate the effects of healing gardens in the context of rehabilitation activities given in general hospitals within Nanning City, as well as the function that humane landscape design plays in such gardens as a tool for improving the experience that patients have. This research aims to provide practical guidance on hospital landscaping that considers the therapeutic imperatives of garden designs. This will be accomplished by categorizing best practices for healing gardens based on a review of current studies and case data.

It was also observed that the concept of a healing garden requires applying more than one field to be fully appreciated. Typically, psychology, landscaping, and environmentalism are required fields. Some psychological theories are linked with the concepts of healing gardens and mental health improvement. An example of this would be the attention restoration theory which states that merely spending time in nature can help people feel refreshed, which in turn can assist them in overcoming attention fatigue and emotional worn-out. This hypothesis serves as a reminder of the necessity of designing settings that allow patients to escape other stresses associated with hospitalization and connect with nature to enhance their experience.

On the other hand, landscape architecture's role in creating healing gardens cannot be overstated. According to Trojanowska and Matuszewska (2024) a community with outdoor characteristics such as walking routes, areas for sitting, and other plant assortments is more likely to be active, maintain social relationships, and feel refreshed. According to Huang and Yuan (2024) the design of these devices is also significant in improving their utilization and rehabilitation because they need to be situated in a suitable location and be easy to navigate for hospital patients, including youngsters and those who use wheelchairs.

Healing gardens are an essential intervention in the context of healthcare settings and the human experience. They offer a wide range of good effects that extend beyond the scope of the medical approach. Consequently, incorporating nature into these constructions results in these gardens improving patients' health, increasing the rates, and encouraging everyone. Undoubtedly, healing gardens will remain relevant and important; hence, additional research and financial resources should be allocated because the accessibility to excellent healthcare is shifting to focus on numerous dimensions of the individual. As a result, this research aims to expand upon the existing body of literature by determining the most effective way healing gardens can be established and made available in the general hospitals surrounding Nanning City.

1.1. Objectives of the Study

The research objectives of the study are as follows:

1. To examine the various types of healing gardens and their applications in rehabilitation.
2. To assess humane design principles to influence patients' healing processes and enhance the conditions for hospital staff and visitors.
3. The current study aims to evaluate the general and specific needs and preferences of patients, staff, and visitors at Nanning City General Hospitals concerning humane landscape design interventions.
4. To investigate methods for integrating healing gardens effectively within a hospital in Nanning to enhance their beneficial impacts on health consumers' treatment.

1.2. Research Questions

The current study intends to answer the following research questions:

© 2025 Conscientia Beam. All Rights Reserved.

1. What are the different types of healing gardens and how is each type applicable in rehabilitation?
2. Which humane design principles influence patients' healing processes and enhance the conditions for hospital staff and visitors?
3. What are the general and specific needs and preferences of patients, staff, and visitors at Nanning City general hospitals concerning humane landscape design interventions?
4. What different methods are there to integrate healing gardens effectively within a hospital in Nanning to enhance their beneficial impacts on health consumers' treatment?

1.3. Significance of the Study

The following aspects add to the significance of the study:

Healing gardens may provide holistic treatment because they reduce stress, improve mental health and rehabilitation patients. Green spaces improve stress reduction, employee morale and tourists' experiences. This research could guide the hospital architects and administrators to practically design methods. Similarly, this study fills a literature gap and offers local insights by studying healing gardens in the sociocultural and infrastructural setting of Nanning City. This research also contributes theoretically as well as realistically about how healthcare experiences could be improved.

1.4. Contribution of the Study

This study contributes to healthcare design by analyzing the impact of healing gardens in Chinese hospitals. Outdoor environments positively influence various user groups, and specific demographics' degree of garden utilization dictates the perceived advantages. This research demonstrates that healing gardens in urban hospitals can facilitate recovery, diminish patients' anxiety, and provide opportunities for social engagement. These results imply that change ought to include "humanistic and natural motifs' in their structures to give a round reintegration plan with a physiological in addition to a psycho-emotional objective.

2. LITERATURE REVIEW

Significant attention has been directed towards healthcare, landscape architecture, and environmental psychology concerning therapeutic environments and healing gardens. Marques et al. (2021) Identified that various unique characteristics of these gardens positively influence psychological and physiological health, thereby underscoring the significance of the environment for well-being. Healing gardens benefit therapeutic care aspects associated with stagnation in patient improvement during healthcare recidivism, particularly in chronic illnesses, mental health issues, or recovery (Huang & Yuan, 2024; Kim et al., 2024).

Literature has described various potential uses of nature in the field of treatment. Research indicates that exposure to natural environments can significantly enhance patients' mental health. Previous studies have demonstrated a relationship between restorative environments as indicated by patient's emotions, and their mood which is influenced by exposure to nature and the prevalence of stress, anxiety, and depression (Guo, Zhou, Lai, & Yao, 2023; Nieberler-Walker et al., 2023). According to Singh (2023) surgical patients viewing the greenery outside their window experienced reduced stress levels and utilized less analgesia. This also demonstrated that these patients consumed less pain medication. This study emphasized the significance of views and the ability to structure the appreciation of nature in a therapeutic context, underscoring the need for additional research in therapeutic geography.

The attention restoration theory, developed by Kaplan and Kaplan (1989) offers a psychological framework to elucidate the restoration concept. The ART model posits that natural environments facilitate cognitive restoration, requiring less attentional resources from individuals and allowing for greater focus on the environment. The incorporation of plants in healthcare facilities warrants consideration. The spaces exhibit considerable effort in aesthetic design and facilitate restorative activities, including walking and gardening (Marques et al., 2021; Trojanowska & Matuszewska, 2024).

A significant amount of research supports the psychological benefits associated with healing gardens. A meta-analysis conducted by Murroni et al. (2021) found comparable results in their meta-analysis, which aimed to show the beneficial benefits of therapeutic gardens on the psychological-somatic condition of dementia patients.

Patient records indicated that interacting with plants or observing related activities reduced feelings of unhappiness, agitation, and disorientation. The research concludes that constructing gardens for individuals with special needs is effective and should incorporate essential environmental elements. Sensory gardens are included as they engage multiple senses, facilitating motor activity.

Literature indicates a strong correlation between the establishment of healing gardens and improved physical health compared to the absence of such gardens. Thus, Huang and Yuan (2024) established that using green spaces for exercise aids in the recovery and rehabilitation of patients by promoting increased activity levels. Individuals who engage with healing gardens exhibit increased activity levels, establish positive objectives, and enhance self-efficacy mechanisms commonly observed in patients (Guo et al., 2023).

Research indicates that individuals engaged in gardening demonstrate improved muscle strength and enhanced energy levels. Kim et al. (2024) found that older participants who engaged in structured gardening sessions

© 2025 Conscientia Beam. All Rights Reserved.

exhibited significantly higher gardening maintenance parameters related to movement and overall well-being compared to the control group. According to the study's findings, creating therapeutic gardens intended explicitly for physical activity is a pressing requirement. These gardens should have paved pathways, raised beds, and paved terraces for group workouts.

There is evidence that healing gardens can help people recover more quickly with medical procedures or therapy for diseases. Marques et al. (2021) and Nieberler-Walker et al. (2023) found that a view or windows to the outside was related to shorter hospital stays and a decreased chance of postoperative problems. This was supported by the results of the aforementioned research. According to the findings of Murroni et al. (2021) patients who were admitted for surgical procedures and had access to healing gardens enjoyed a more rapid recovery and reported lower levels of pain when compared to patients who did not have access to such gardens. This finding demonstrates the significance of incorporating gardens into the hospital system which may enhance overall patient outcomes and, more critically, facilitate the early improvement of individual patient results.

Culturally appropriate healing gardens represent a valid and effective practice grounded in the understanding that design elements play a crucial role in the functionality of these spaces. Huang and Yuan (2024) and Kim et al. (2024) argued that the theoretical framework of therapeutic geography must incorporate sensory participation, usability, and sociability as essential components. Korean healing gardens enhance therapeutic utility by engaging the five conventional senses, including unique plant aromas, tactile elements, and soothing sounds (Singh et al., 2021).

It is essential to consider the application of various sensory cues to enhance the emotional connection with users and visitors in evaluating the concept and implementation of healing gardens. Sensory gardens featuring flowers, herbs, and plants that engage the senses of sight, smell, and touch can benefit emotional and cognitive states (Trojanowska & Matuszewska, 2024). Research conducted by Murroni et al. (2021) indicates that gardens featuring aromatic herbs and flowers can evoke positive emotions and promote relaxation, particularly in patients with dementia or other types of memory impairment.

Research indicates a positive relationship between the architectural design of healing gardens and the utilization of horticultural healing environments. In garden design, it is essential to prioritize patient safety, comfort, and fitness to ensure inclusivity. The design and structures of the garden must facilitate accessibility for patients who use wheelchairs (Jeffs, 2024). Considering existing disabilities in the building is integral to the design of landscaping areas to enhance accessibility. The elements comprise broad paths, railings, and benches, facilitating prolonged patient engagement with the open space. Research indicates that patients are likely to utilize plots, suggesting that these individuals may experience increased physical activity and improved mental health relative to a control group. Two structured gardening programs implemented for students resulted in enhanced stroke mobility and overall physical health relative to a control group. This research highlights the necessity for establishing healing gardens that incorporate pathways for movement such as walkways, garden benches, raised planting beds, and spaces designated for communal activities.

Healing gardens may assist patients in recuperating from surgical procedures or illnesses facilitating a more effective recovery process. Marques et al. (2021) and Nieberler-Walker et al. (2023) studies suggest a relationship between natural home environments, the duration of recovery, and the overall incidence of postoperative complications. Murroni et al. (2021) have conducted research in Auckland to demonstrate that patients who utilized healing gardens post-surgery experienced faster recovery and reduced pain compared to those who did not have access to such environments. This research highlights the importance of integrating healing gardens into hospital settings to improve patient recovery outcomes as demonstrated in the following sections.

The concept behind the development of the gardens is the primary aspect that determines their effectiveness. Recently, Huang and Yuan (2024) and Kim et al. (2024) emphasized the significance of sensory engagement, accessibility, and social connections in developing therapeutic landscapes. Singh et al. (2021) assert that these gardens should be created to engage the majority or all of the sensory organs of the intended individuals. Specifically, it should have elements like smell selections, various textures and noise options to enhance the therapeutic effect.

Integrating diverse sensory stimuli into healing gardens is essential for enhancing user involvement. The comprehensive research by Trojanowska and Matuszewska (2024) indicates that sensory gardens characterized by fragrant flowers, vibrant colours and diverse physical stimuli effectively improve mood and cognitive function among participants. Murroni et al. (2021) suggested that aromatic herbs and flowers elicit happy feelings and may benefit individuals with dementia or other cognitive diseases as gardens contribute to a favourable atmosphere.

Traditional and advanced healing gardens are significantly related in terms of design. According Jeffs (2024) gardens must be designed to accommodate the demands of patients with diverse physical limitations to ensure their safe navigation around the gardens. The establishment of wide pathways, handrails, and seating areas not only facilitates mobility for individuals with disabilities but also encourages them to venture outdoors more frequently. Numerous studies by Guo et al. (2023) and Huang and Yuan (2024) indicate that although healing gardens for patients represent a significant financial investment to enhance offerings, they positively influence customers' physical activity and mental well-being.

© 2025 Conscientia Beam. All Rights Reserved.

According to Marques et al. (2021) healing gardens can be a venue for direct contact between patients, family members, and healthcare personnel. This feature of healing gardens, advocated by Jeffs (2024) emphasizes loneliness, a sentiment many patients are likely to encounter upon hospital admission. The study by Kim et al. (2024) indicates that gardens featuring seating and gathering spaces positively influence users' social relationships and foster trust with healthcare personnel.

A literature review of quantitative and qualitative research and case narratives provides insights into prior studies of healing gardens. Murroni et al. (2021) conducted a study on healing gardens in children's hospitals, demonstrating that green areas alleviated anxiety and enhanced the mood of patients. Meanwhile, Singh et al. (2021) observed a favorable reduction in clients' anxiety levels when comparing baseline and post-test results, attributing this change to patients' satisfaction and engagement with healing gardens.

Another instance is the research on implementing a therapeutic garden and garden-themed activities within a rehabilitation centre for stroke patients. Nieberler-Walker et al. (2023) observed that patients who engaged in gardening as a therapeutic intervention exhibited superior rehabilitation outcomes compared to those participating in conventional therapeutic exercises. This emphasis encompassed the priority established on experiential learning and outdoor activities as fundamental components of rehabilitation.

Furthermore, Kim et al. (2024) conducted a systematic study to investigate the experiences associated with healing gardens by assessing their efficacy in various contexts and the range of related topics. The medical review highlighted the therapeutic significance of healing gardens emphasizing that they enhance the emotional and psychological well-being of patients and staff while fostering improved social connections among them. These findings necessitate further investigation into the concept and implementation of healing gardens, patients' physical and psychological health and the methods by which these beneficial alterations to patients' experiences might be maintained. A literature review is given in Table 1.

Table 1. Literature review matrix.

Authors	Year	Purpose of the study	Key findings	Implications for design	Target population, respondents, and sample size
Kaplan and Kaplan (1989)	1989	To propose attention restoration theory (ART).	Natural environments facilitate cognitive recovery and enhance focus.	Design environments that allow for restorative experiences.	General population: N=200 (Various surveys)
Murroni et al. (2021)	2021	To evaluate therapeutic gardens for dementia patients.	Therapeutic gardens reduce agitation and improve mood among dementia patients.	Design sensory gardens to stimulate engagement for dementia patients.	Dementia patients: N=30 (Interviews and observations)
Guo et al. (2023)	2023	To identify essential landscape elements in healing gardens.	Specific landscape elements are crucial for creating effective healing spaces in hospitals.	Incorporate elements such as water features, varied plantings, and seating areas for social interaction.	Hospital staff and patients: N=100 (Surveys)
Huang and Yuan (2024)	2023	To review the role of smells capes in healing gardens.	Smells capes enhance health and well-being, particularly for older adults.	Integrate aromatic plants and sensory experiences in garden designs.	Older adults: N=50 (Focus groups and interviews)
Kim et al. (2024)	2024	To analyze stress reduction through gardening activities.	Structured gardening activities lead to significant decreases in stress among elderly participants.	Promote gardening as a therapeutic activity in healing gardens.	Elderly participants: N=60 (Structured program over 12 weeks)
Marques et al. (2021)	2021	To explore therapeutic landscapes as a catalyst for health.	Outdoor spaces facilitate rehabilitative healing and foster community	Design gardens that encourage community interaction and provide accessible	General population; N=150 (Surveys and case studies)

© 2025 Conscientia Beam. All Rights Reserved.

Authors	Year	Purpose of the study	Key findings	Implications for design	Target population, respondents, and sample size
			support.	spaces for various user needs.	
Nieberler-Walker et al. (2023)	2023	To provide a working definition of therapeutic hospital gardens.	Therapeutic gardens enhance emotional well-being and social interaction in hospital settings.	Establish clear design guidelines that incorporate evidence-based practices for healing gardens.	Healthcare professionals: N=40 (Interviews and surveys)
Singh et al. (2021)	2023	To assess the restorative environment in hospitals through design.	Healing gardens significantly improve patient satisfaction and reduce anxiety levels.	Focus on sensory engagement and natural aesthetics in hospital gardens.	Patients in healthcare settings: N=80 (Mixed methods)
Dushkova and Ignatieva (2020)	2020	To analyze urban environmental health concerning healing gardens.	Healing gardens can improve access to green spaces and mitigate mental health issues in urban populations.	Integrate healing gardens into urban planning to enhance community well-being.	Urban populations: N=200 (Surveys)
Murroni et al. (2021)	2021	To evaluate the impact of therapeutic gardens in children's hospitals.	Children engaging with gardens showed reduced anxiety and improved overall satisfaction with their hospital experience.	Design child-friendly therapeutic spaces that encourage play and exploration.	Pediatric patients: N=50 (Surveys and observations)
Jeffs (2024)	2024	To investigate the role of gardens in hospital design.	Gardens are associated with reduced stress and improved staff morale.	Incorporate gardens into the architectural design of hospitals to enhance the working environment for healthcare staff.	Hospital staff: N=60 (Interviews)
Kim et al. (2024)	2024	To assess the effectiveness of gardening programs in rehabilitation.	Gardening programs improve physical health outcomes in elderly patients undergoing rehabilitation.	Develop structured gardening programs within healing gardens to support rehabilitation efforts.	Elderly rehabilitation patients: N=40 (Quantitative and qualitative analysis)
Ouf, Makram, and Abdel Razek (2021)	2021	To examine landscape design principles in healthcare settings.	Effective landscape design significantly enhances patient satisfaction and reduces stress levels.	Apply evidence-based design principles to create healing environments in hospitals.	General healthcare staff: N=70 (Interviews and surveys)
Huang and Yuan (2024)	2023	To review the implications of smells capes in healthcare gardens.	Smells capes enhance therapeutic benefits, particularly for older adults with cognitive impairments.	Integrate fragrant plants into healing gardens to stimulate positive emotional responses.	Older adults with dementia: N=30 (Focus groups)
Wi and Samad	2022	To evaluate the	Biophilic design	Prioritize biophilic elements in garden design to	

© 2025 Conscientia Beam. All Rights Reserved.

Authors	Year	Purpose of the study	Key findings	Implications for design	Target population, respondents, and sample size
(2022)		impact of biophilic design in hospital gardens.	principles significantly contribute to improved patient health outcomes and emotional well-being.	foster connections with nature.	
Marques et al. (2021)	2021	To investigate therapeutic landscapes as a means for social equity.	Therapeutic landscapes can bridge gaps in healthcare access and promote social cohesion.	Design inclusive gardens that are accessible to diverse populations and encourage community engagement.	
Lee and Maheswaran (2011)	2011	To assess the relationship between green spaces and health.	Access to green spaces is linked to improved physical, mental, and social health outcomes in urban populations.	Advocate for the inclusion of green spaces in healthcare planning and policy.	
Gesler (1992)	1992	To define therapeutic landscapes and their relationship to health.	Therapeutic landscapes are characterized by their ability to promote healing by integrating social, cultural, and environmental elements.	Design gardens that reflect the cultural and social needs of the community to enhance therapeutic effectiveness.	
Kaplan and Kaplan (1989)	1989	To explore the cognitive effects of nature on humans.	Natural environments facilitate the restoration of attention and promote mental well-being.	Incorporate diverse natural elements in healthcare environments to enhance cognitive restoration.	

3. DATA AND METHODOLOGY

This section outlines the study design utilized, the participants engaged, the data collection techniques, and the analytical methodologies applied to assess the impact of healing gardens on rehabilitation activities at general hospitals in Nanning City.

3.1. Research Design

This research employed descriptive (survey) and case study methodologies. It also emphasizes the social environment and all metrics associated with the perceived advantages of healing gardens as intricate and multifaceted as patients' connections and psychological and physiological conditions.

3.2. Participants

The study participants included hospital workers, patients, and tourists who utilized the healing gardens in general hospitals located in Nanning City. Table 2 presents the sample size of 400 persons which is distributed into three categories.

Table 2. The number of participants in three categories.

Participants	Numbers
Patients	200
Hospital staff	100
Visitors	100

© 2025 Conscientia Beam. All Rights Reserved.

Participants were selected using a stratified random sampling technique to ensure representation from each group, thus enhancing the generalizability of the findings.

3.3. Data Collection

Data were collected using a structured questionnaire to assess various constructs related to the perceived benefits of healing gardens. The questionnaire included the following sections:

3.4. Research Instrument: Questionnaire's Structure

The questionnaire focused on the benefits of healing gardens and included demographic information. Participants' level of agreement on the following statements about the perceived benefits of healing gardens was measured using the five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree).

1. Using the healing garden helps me feel less anxious.
2. I feel more physically active after spending time in the garden.
3. The garden provides a good space for socializing with other patients and visitors.
4. I feel my mood improves when I spend time in the garden.
5. Access to the healing garden contributes positively to my overall well-being.
6. The healing garden enhances my recovery experience.
7. I prefer spending time in the healing garden compared to indoor areas of the hospital.
8. The garden's design (e.g., plants, pathways and seating) positively impacts my experience.

The questionnaires were distributed physically in hospital settings and digitally through hospital communication channels to facilitate participation.

3.5. Data Analysis

The data collected from the questionnaires were analyzed by using the following techniques: Descriptive statistics (means, standard deviations, and frequencies) were employed to summarize demographic information and the overall responses to the questionnaire items. T-tests and ANOVA were applied to compare the means of perceived benefits across different groups (patients, staff and visitors) and determine if any significant differences exist based on demographic factors.

3.6. Ethical Considerations

This study adhered to ethical guidelines as the research involved human participants. Informed consents were obtained from all participants ensuring they were fully aware of the study's purpose and their right to withdraw at any time without penalty. Confidentiality was maintained by anonymizing participant responses and by storing data securely.

4. RESULTS

4.1. Demographic Profile of the Respondents

The sample shows a gender-balanced representation of the respondents, i.e., including 45% male and 55% female respondents. Regarding age, most respondents were aged between 30 and 39 years (37.5%) followed by the younger group of 18 and 29 years (25%) highlighting a mix of working-age adults and younger individuals. The respondents had diverse educational qualifications with the majority having secondary (35%) or college/university education (30%) with respect to their educational background. A large majority of the respondents was married (62.5%), hence aligning with typical demographics in healthcare studies. Table 3 shows a brief demographic profile of the respondents.

Table 3. Demographic profile of the respondents.

Variables	Category	Percentage (%)
Gender	Male	45
	Female	55
Age group (years)	18 to 29	25
	30 to39	37.5
	40 to 49	25
	50 and above	12.5
Educational level	Primary	20
	Secondary	35
	College and university	30
	Postgraduate	15
Marital status	Single	30
	Married	62.5
	Divorced and widowed	7.5

© 2025 Conscientia Beam. All Rights Reserved.

The total number of participants in the study was 400. Nearly 39% of respondents were healthcare professionals (hospital staff) who provided insights into the effectiveness and utility of healing gardens from a staff perspective. Respondent patients represented 29.8% of the sample indicating that just under 30% of the respondents were individuals currently receiving treatment or rehabilitation which is crucial for assessing the direct impact of healing gardens on patient recovery and well-being. Around 31% of respondents were family members or friends of patients who could provide valuable feedback on their experiences with the healing gardens from a visitor's standpoint. Figure 1 illustrates the distribution of the participants in the study.

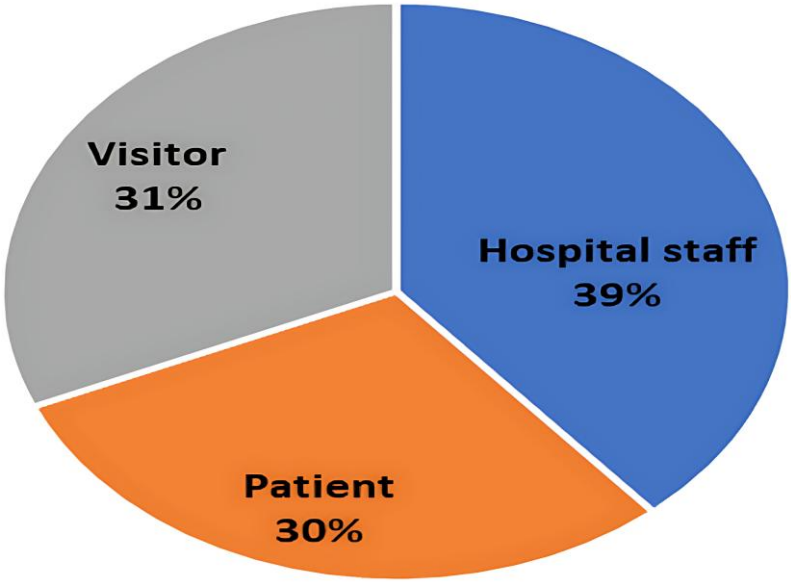

Figure 1. Participants of the study.

Respondents were also classified according to their frequency of healing garden use. Figure 2 illustrates the garden use frequency of the participants in the study. Nearly 25% of participants reported using the healing garden daily. Participants (26.8%) indicated they use the garden weekly. Participants (24.0%) reported using the garden monthly. Moreover, 24.5% of respondents stated they use the garden rarely.

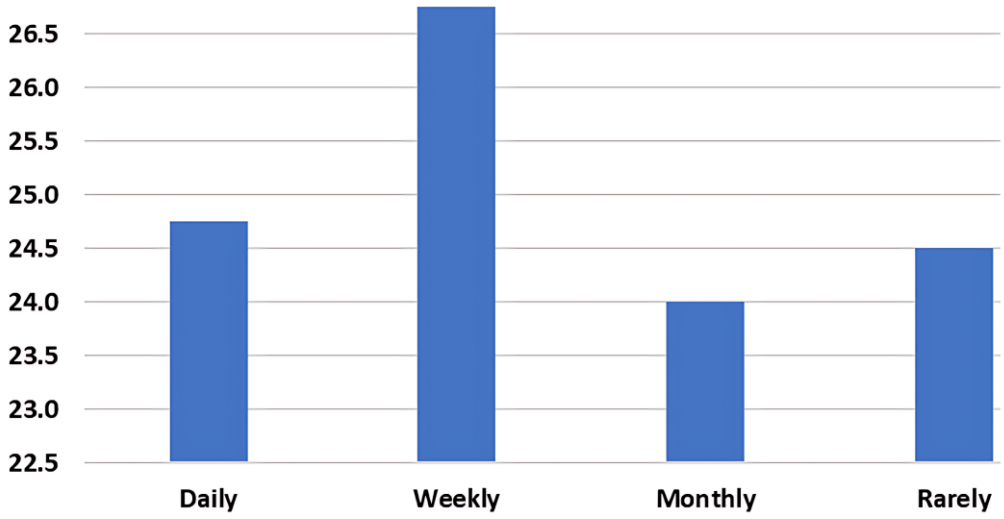

Figure 2. Participants by garden use frequency.

4.2. Comparing Hospital Staff and Patients Regarding Their Perceptions of Various Benefits Associated with Healing Gardens

Table 4 presents group statistics for eight measures of healing gardens' perceived benefits. The average score indicates patients feel significantly less anxious after using the healing garden than hospital staff. The lower mean for hospital staff suggests they may experience less anxiety reduction from garden usage than patients. Both groups report relatively similar levels of physical activity enhancement from the garden with patients slightly higher. The close means indicate that both groups perceive the garden as a means to increase physical activity.

© 2025 Conscientia Beam. All Rights Reserved.

Table 4. T-test (Group statistics).

Group statistics					
Healing gardens' impact	**Participants**	**N**	**Mean**	**Std. deviation**	**Std. error mean**
Feel less anxious.	Hospital staff	155	2.69	1.408	0.113
	Patient	119	3.39	1.373	0.126
Feel more physically active.	Hospital staff	155	3.04	1.376	0.111
	Patient	119	3.10	1.520	0.139
Good space for socializing.	Hospital staff	155	2.99	1.432	0.115
	Patient	119	3.25	1.397	0.128
Mood improvement.	Hospital staff	155	2.97	1.501	0.121
	Patient	119	2.97	1.417	0.130
Positive contribution.	Hospital staff	155	3.08	1.426	0.115
	Patient	119	3.04	1.458	0.134
Enhances recovery.	Hospital staff	155	3.12	1.461	0.117
	Patient	119	3.20	1.430	0.131
Preference outdoor.	Hospital staff	155	3.20	1.398	0.112
	Patient	119	2.92	1.447	0.133
Design impact.	Hospital staff	155	2.77	1.430	0.115
	Patient	119	2.74	1.405	0.129

Patients perceive the healing garden as a better space for socializing than hospital staff. The higher mean for patients suggests they may use the garden more for social interactions, which could enhance their overall experience. Both groups have identical means indicating no significant difference in the perceived mood improvement when using the healing garden. This suggests that the garden's effect on mood is consistent across both participants.

There is a slight difference in perceptions of the garden's positive contribution to overall well-being with hospital staff reporting slightly higher mean scores. However, the difference may not be statistically significant. Patients perceive a slightly higher contribution of the garden to their recovery process than hospital staff indicating that the garden might be more effective from the patients' perspectives. Hospital staff have a higher preference for outdoor spaces than patients, suggesting that staff may find greater value in the garden environment than patients. Both groups reported low scores on the perceived impact of garden design with staff slightly higher. This may indicate that while the garden is appreciated, there may be room for improvement in its design aspects.

Since the significance values for Levene's test were all greater than 0.05, it could be concluded that the assumption of equal variances holds for all measures allowing us to interpret the t-test results accordingly. After using the garden, the patients felt significantly less anxious than the hospital staff. No significant difference was observed in perceived physical activity between the groups. Table 5 shows the independent samples t-test for equality of means.

Table 5. Independent samples t-test for equality of means.

Healing gardens' impact	T-value	df	Sig. (2-tailed)	Mean difference	Std. error difference
Feel less anxious.	-4.151	272	0.000	-0.705	0.170
Feel more physically active.	-0.354	272	0.724	-0.062	0.176
Good space for socializing.	-1.534	272	0.126	-0.265	0.173
Mood improvement.	-0.039	272	0.969	-0.007	0.179
Positive contribution.	0.202	272	0.840	0.035	0.175
Enhances recovery.	-0.448	272	0.654	-0.079	0.176
Preference outdoor.	1.642	272	0.102	0.284	0.173
Design impact.	0.201	272	0.841	0.035	0.173

There was no difference in mood improvement perceptions in both groups. Similarly, there was no significant difference between the groups' perceived positive contributions to the garden and the perceptions of recovery enhancement. No significant preference difference for outdoor spaces was there between the groups. The groups have no significant difference in perceptions of garden design impact.

4.3. Comparing Patients and Visitors Regarding Their Perceptions of Various Benefits Associated with Healing Gardens

Table 6 summarizes the group statistics for two participant roles—patients and visitors regarding their perceptions of the benefits of healing gardens. Patients reported a higher mean score in feeling less anxious compared to visitors. This suggests that patients find the healing garden more effective in alleviating anxiety, indicating a more robust perceived benefit. There were significant differences in perceptions between patients and

© 2025 Conscientia Beam. All Rights Reserved.

visitors across several constructs. Patients reported feeling less anxious, perceived the garden as an excellent social space and believed it enhanced recovery more than visitors.

Table 6. T-test (Group statistics)

Healing gardens' impact	Participant	N	Mean	Std. deviation	Std. error mean
Feel less anxious.	Patient	119	3.39	1.373	0.126
	Visitor	126	2.81	1.413	0.126
Feel more physically active.	Patient	119	3.10	1.520	0.139
	Visitor	126	3.03	1.420	0.126
Good space for socializing.	Patient	119	3.25	1.397	0.128
	Visitor	126	3.08	1.446	0.129
Mood improvement	Patient	119	2.97	1.417	0.130
	Visitor	126	3.17	1.351	0.120
Positive contribution	Patient	119	3.04	1.458	0.134
	Visitor	126	3.09	1.442	0.128
Enhances recovery	Patient	119	3.20	1.430	0.131
	Visitor	126	2.99	1.428	0.127
Preference outdoor	Patient	119	2.92	1.447	0.133
	Visitor	126	3.22	1.379	0.123
Design impact	Patient	119	2.74	1.405	0.129
	Visitor	126	3.08	1.532	0.136

Table 7 presents the independent samples t-test for equality of means. Visitors reported better mood improvement, a stronger preference for outdoor spaces and a higher perceived impact of the garden design. The results suggest that while both groups appreciate the healing gardens, their experiences and perceptions differ, potentially informing targeted garden design and usage enhancements to maximize benefits for both patients and visitors.

Table 7. Independent samples t-test for equality of means.

Healing gardens' impact	T-value	df	Sig. (2-tailed)	Mean difference	Std. error difference
Feel less anxious.	3.287	243	0.001	0.585	0.178
Feel more physically active.	0.368	243	0.713	0.069	0.188
Good space for socializing.	0.950	243	0.343	0.173	0.182
Mood improvement	-1.130	243	0.260	-0.200	0.177
Positive contribution	-0.244	243	0.807	-0.045	0.185
Enhances recovery	1.148	243	0.252	0.210	0.183
Preference outdoor	-1.696	243	0.091	-0.306	0.181
Design impact	-1.807	243	0.072	-0.340	0.188

The only statistically significant difference was found in the feeling less anxious measure where patients reported significantly more anxiety reduction from using the healing garden than visitors ($p < 0.01$). No statistically significant differences were found between the groups for the other constructs, including physical activity, socialization, mood improvement, positive contributions, recovery enhancement, preference for outdoor spaces, and design impact. This suggests that while both groups appreciate the healing garden, their experiences are similar.

4.4. Perceived Benefits of Healing Gardens among Participants: An Analysis of Variance

Table 8 presents the outcomes for various additional variables associated with the perceived advantages of healing gardens, as reported by participants, including patients, visitors, and hospital staff. The Analysis of Variance (ANOVA) results indicate a significant difference in the perceived reduction of anxiety among participant roles ($p < 0.001$). This indicates that at least one group experiences reduced anxiety when utilizing the healing gardens, while the other groups do not or vice versa.

The uniformity in individuals' perceptions of the garden as a favourable social space suggests that all examined groups shared similar views. On the other hand, there was no discernible difference between the groups regarding improvement in mood. The perceptions of the beneficial contributions that the garden makes to well-being were not significantly different from one another concerning the garden. It was also shown that there were no significant variations between the groups regarding how they perceived the enhancement of recovery. It was found that there was no significant variation in preferences for outside spaces. It was discovered that there were no significant variations between the groups regarding how they perceived the impact of garden design.

© 2025 Conscientia Beam. All Rights Reserved.

Table 8. Analysis of variance.

Categories	ANOVA	Sum of squares	df	Mean square	F	Sig.
Feel less anxious.	Between groups	36.436	2	18.218	9.308	0.000
	Within groups	777.001	397	1.957		
	Total	813.438	399			
Feel more physically active.	Between groups	0.359	2	0.180	0.087	0.916
	Within groups	816.431	397	2.057		
	Total	816.790	399			
Good space for socializing.	Between groups	4.772	2	2.386	1.173	0.311
	Within groups	807.618	397	2.034		
	Total	812.390	399			
Mood improvement	Between groups	3.588	2	1.794	0.877	0.417
	Within groups	811.922	397	2.045		
	Total	815.510	399			
Positive contribution	Between groups	0.139	2	0.070	0.034	0.967
	Within groups	823.901	397	2.075		
	Total	824.040	399			
Enhances recovery	Between groups	2.767	2	1.384	0.666	0.514
	Within groups	824.823	397	2.078		
	Total	827.590	399			
Preference outdoor	Between groups	7.260	2	3.630	1.834	0.161
	Within groups	785.737	397	1.979		
	Total	792.998	399			
Design impact	Between groups	8.933	2	4.466	2.108	0.123
	Within groups	841.227	397	2.119		
	Total	850.160	399			

5. DISCUSSION

The findings of the study show that participants have different benefits that they associate with healing gardens, and these benefits fit nicely into the therapeutic landscape's literature. The patients stated that the gardens made them feel less anxious. Singh et al. (2021) found that healing gardens are a great way to lower anxiety in medical environments. Kaplan and Kaplan (1989) emphasized cognitive recovery stimulated in nature which may explain why patients felt anxiety reduced more. Such spaces as highlighted by Jeffs (2024) greatly reduce stress, improving the lot of hospital staff. These findings indicate that healing gardens provide a universal benefit to mental well-being based on heightened emotional vulnerability during hospitalization; patients experience a more powerful anxiety lowering effect.

Results revealed that the garden is perceived as a better space for socializing than the staff or the visitors. Similarly, Marques et al. (2021) stressed therapeutic landscapes in promoting community interactions. A similar finding was made by Guo et al. (2023) highlighting the need to integrate design pieces such as seating areas for participation in social interaction. The patients and the staff of the hospital reported practically similar perceptions of the mood improvement. Moreover, patients' perceptions of the enhancement of recovery which slightly lean towards the patients' side, conform to the idea that green spaces increase health outcomes in urban settings (Dushkova & Ignatieva, 2020). Lastly, recovery benefits in healing gardens could be further enhanced with structured activities that were suggested by Kim et al. (2024).

Findings showed little perceived benefits of the garden's design impact consistent with Ouf et al. (2021) who stress the importance of evidence-based landscape design to enhance patient satisfaction. Interestingly, staff have a stronger preference outside than patients. Biophilic design principles may be able to span such gaps by yielding spaces that meet diverse preference while allowing for a connection to nature, as proposed by Wi and Samad (2022). Addressing the shortcomings of perceived design impact in the system as suggested by Guo et al. (2023) can be brought about by incorporating diverse landscape elements as they describe, and sensory stimuli as they are conveyed by Huang and Yuan (2024). In addition to this, structured gardening activities (Kim et al., 2024) can be utilized to accomplish this objective of increasing physical activity while surveying recovery results.

6. CONCLUSION

The study presents the role of healing gardens in transforming patients' as well as staff and visitors' quality of life in healthcare settings. These spaces are found to have a dramatic effect on reducing anxiety, improving mood and enhancing social interaction with patients reporting the greatest benefits in recovery and social and emotional well-being. The results support existing literature, including the *attention restoration theory* with its cognitive and emotional restorative effects associated with natural environments. The study also cites areas for improvement,

© 2025 Conscientia Beam. All Rights Reserved.

including by including more inclusive and evidence-based design features to ensure the gardens' therapeutic benefits are optimized. Sensory elements, structured activities and biophilic design principles can satisfy a variety of needs, generate stronger connections with nature. Results from this research validate the need for healing gardens to be integrated within healthcare infrastructure as not mere decor but rather part of the infrastructure of care. By resolving design and accessibility problems, healing gardens can be more useful as spaces to strengthen holistic health, social bonds and environmental connections in healthcare settings.

7. POLICY IMPLICATIONS

The findings of this study have several important policy implications:

As essential therapeutic spaces, healing gardens should be mandated in policymaking to be included in healthcare facilities. The goals of patient care centers must have their role in decreasing anxiety, improving mood and promoting recovery. Evidence-based design principals should be adopted by healthcare administrators and planners to maximize the therapeutic benefits of healing gardens. Healing gardens should be designed to be accessible for a broad spectrum of user groups. Policies should direct the creation of these accessible gardens. It will also encourage equitable healthcare access. Healing gardens should be recognized as an integral part of workplace wellness initiatives for healthcare staff to reduce stress and enhance morale. Healing gardens should be incorporated within larger public spaces where they can boost community health and social cohesion through urban development policies. The long-term effectiveness and sustainability of healing gardens require that government or healthcare institutions allocate specific budgets for the creation and upkeep of these oases from nature.

7.1. Limitations of the Study

The study was restricted to a particular population, primarily drawn from a single institution or a large city, making generalization difficult to studies from other contexts or regions. The design of this study was cross-sectional which provides a snap shot of perceptions at a point in time. Understanding the long-term benefits of healing gardens would be better achieved longitudinally.

Although the study shows a range of perceived benefits, it does not undertake an in-depth consideration of particular types of garden design elements that appear likely to be influential (e.g., layout, plant type, sensory element etc). These limitations should be addressed in future research so that findings are more robust and to gain a more complete understanding of the many benefits of healing gardens.

7.2. Directions for Future Studies

Over time, healing gardens may improve patient outcomes, including physical rehabilitation, psychological changes, and social reintegration. Comparable studies across cultures and regions would explain how cultural variation affects hospital healing gardens. Examining garden layout, plant choices, sensory components, and seating can improve designs for user preferences and therapeutic needs. Healing gardens may benefit from digital guided meditations, natural soundtracks, and interactive displays. Investigation of these technologies may be valuable. Researching pediatric and geriatric healing garden requirements and experiences may improve design for these at-risk populations.

Funding: This study received no specific financial support.
Institutional Review Board Statement: The Ethical Committee of the Universiti Teknologi Mara, Malaysia has granted approval for this study on 13 May, 2024 (Ref. No. REC/05/2024 (PG/MR/199)).
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

REFERENCES

d'Erm, D. P. (2024). Green and blue health: The benefits of nature experience on overall health. *Hegel, N° 2*(2), 195-208.

Dushkova, D., & Ignatieva, M. (2020). New trends in urban environmental health research: From geography of diseases to therapeutic landscapes and healing gardens. *Geography, Environment, Sustainability, 13*(1), 159-171. https://doi.org/10.24057/2071-9388-2019-99

Gesler, W. M. (1992). Therapeutic landscapes: medical issues in light of the new cultural geography. *Social Science & Medicine, 34*(7), 735-746. https://doi.org/10.1016/0277-9536(92)90360-3

Guo, H., Zhou, W., Lai, W., & Yao, L. (2023). What landscape elements are needed for hospital healing spaces? Evidence from an empirical study of 10 compact hospitals. *Frontiers in Public Health, 11*, 1243582. https://doi.org/10.3389/fpubh.2023.1243582

Huang, Y., & Yuan, X. (2024). Smellscape as a healing factor in institutional gardens to enhance health and well-being for older people with dementia: A scoping review. *Journal of Clinical Nursing, 33*(2), 454-468.

© 2025 Conscientia Beam. All Rights Reserved.

Jamal, A. (2023). Embracing nature's therapeutic potential: Herbal medicine. *International Journal of Multidisciplinary Sciences and Arts*, *2*(3), 117-126. https://doi.org/10.47709/ijmdsa.v2i1.2620

Jeffs, C. (2024). The garden hospital: Reinventing the healthcare landscape using principles of gardens and sustainability to Create a Visual Guidebook for Human Design.

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York: Cambridge University Press.

Kim, S.-H., Ryu, B.-Y., & Seo, J.-B. (2024). Stress Control in Elderly through Healing Garden Activities.

Lee, A. C., & Maheswaran, R. (2011). The health benefits of urban green spaces: A review of the evidence. *Journal of Public Health*, *33*(2), 212-222. https://doi.org/10.1093/pubmed/fdq068

Lestari, M. W., & Favurita, A. L. (2024). Healing garden as a green open space in hospital. *International Islamic Medical Journal*, *6*(1), 25-35. https://doi.org/10.33086/iimj.v6i1.6054

Marques, B., McIntosh, J., & Kershaw, C. (2021). Therapeutic environments as a catalyst for health, well-being and social equity. *Landscape Research*, *46*(6), 766-781. https://doi.org/10.1080/01426397.2021.1906851

Murroni, V., Cavalli, R., Basso, A., Borella, E., Meneghetti, C., Melendugno, A., & Pazzaglia, F. (2021). Effectiveness of therapeutic gardens for people with dementia: A systematic review. *International Journal of Environmental Research and Public Health*, *18*(18), 9595. https://doi.org/10.3390/ijerph18189595

Naderi, J. R., & Shin, W.-H. (2008). Humane design for hospital landscapes: A case study in landscape architecture of a healing garden for nurses. *HERD: Health Environments Research & Design Journal*, *2*(1), 82-119. https://doi.org/10.1177/193758670800200112

Nieberler-Walker, K., Desha, C., Bosman, C., Roiko, A., & Caldera, S. (2023). Therapeutic hospital gardens: Literature review and working definition. *HERD: Health Environments Research & Design Journal*, *16*(4), 260-295. https://doi.org/10.1177/19375867231187154

Ouf, T. A., Makram, A., & Abdel Razek, S. A. (2021). *Design indicators based on nature and social interactions to enhance wellness for patients in healthcare facilities*. Paper presented at the Advanced Studies in Efficient Environmental Design and City Planning.

Singh, I. (2023). Restorative Environment and Well Being in a Hospital through Landscape Design.

Singh, S., Sabahat, M., & Qamrudiin, J. (2021). The impact of architecture in the process of healing & well-being. *International Journal for Research in Applied Science & Engineering Technology*, *9*(3), 202-222.

Trojanowska, M., & Matuszewska, J. (2024). The Importance of Landscape Design in Hospital Settings–Results of a Pilot Study in Poland.

Wi, C. T., & Samad, M. H. A. (2022). Integration of landscapes in healthcare facilities to heal users'body-mind health. *Malaysian Journal of Sustainable Environment*, *9*(1), 267-284.

Wolf-Meyer, M. (2023). Human-centred design, disability and bioethics. *Medical Humanities*, *49*(3), 334-339. https://doi.org/10.1136/medhum-2022-012391

Wood, C. J., Polley, M., Barton, J. L., & Wicks, C. L. (2022). Therapeutic community gardening as a green social prescription for mental ill-health: Impact, barriers, and facilitators from the perspective of multiple stakeholders. *International Journal of Environmental Research and Public Health*, *19*(20), 13612. https://doi.org/10.3390/ijerph192013612

Yang, Y., Ro, E., Lee, T. J., An, B. C., Hong, K. P., Yun, H. J., . . . Choi, K. H. (2022). The multi-sites trial on the effects of therapeutic gardening on mental health and well-being. *International Journal of Environmental Research and Public Health*, *19*(13), 8046. https://doi.org/10.3390/ijerph19138046

Zhu, L., & Sarah, J. S. (2024). History and evolution of the healing gardens: Investigating the building-nature relationship in the healthcare setting. *SSM - Qualitative Research in Health*, *6*, 100450. https://doi.org/10.1016/j.ssmqr.2024.100450

Views and opinions expressed in this article are the views and opinions of the author(s), Humanities and Social Sciences Letters shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.

© 2025 Conscientia Beam. All Rights Reserved.