

Review Article

Healing Gardens- A Review of Design Guidelines

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Abstract

Through speedy growth of cities due to modernization and urbanization, inhabitation have headed for selecting the cities to live in their surroundings over rural areas that led to dense urban areas, a weak infrastructure and reduction of nature areas. This has occurred without considering psychological, physical and social state of design of public space and buildings properly (Gehl 2010). Moreover, modern life-style has furnished various alternatives such as computers, internet, mobile and other modern-day digital gadgets which are led the people to feel stress to fulfill all of the demands of a social lifestyles. Hence, diseases related to stress are becoming one of the major health problems that human are suffering from it all over the world (Van den Berg et al., 2007). Many prevailing researches on human health suggest that connection between human health and access to nature leads to lessen stress, reduces mental fatigue, promotes human health and wellbeing. Therefore, the paper aims to define the principle of healing garden through the theoretical analysis of the core studies of healing gardens. Additionally, the extent of user satisfaction and their perceptions about the elements of design that should be found in the gardens. The results of the paper have shown that healing gardens in the hospitals have significant benefits as reducing stress and promoting psychological recovery for patients

Keywords: Healing Gardens- Healthcare- design principles- Hard landscape- Elements of design.

1. Introduction

Over the past 20 years, there has been renewed interest in the role of healing gardens and health. However, ancient civilizations were aware of the importance of natural environments for health. The use of healing gardens as a healing area can be traced back to early Asian, Greek and Roman cultures.

Presently, some hospitals and health care institutions are interested in the existence of healing gardens and landscapes as an important part of healing. This has been neglected over the years, especially with the rapid growth of medical technology and economic pressure (Bell, 2004).

2. Healing gardens

Many architectural design research has been discussed to deal with relationships in natural environments designed for health and healing. As landscape architecture increasingly addresses the link between garden design and healing health, it has led to confusion over the various expressions used for the concept.

2.1 History of Gardens in Healthcare

Historians have kept track of the utilization of gardens as restorative places back to Persia, Greek, Egypt, and

the Orient, and have observed that the presence of these gardens has persisted until today in these cultures fig. (1) (Gierlack, et al, 1998).



Fig. 1. The temples for the god Asclepius (god of healing)

Healing gardens were also found as an integral part of medieval hospitals in monastic societies in Europe (Cooper Marcus, et al., 1999).

The existence of these gardens was based on the idea that incorporating herbs and plants in the garden herbs and plants in the garden.

With religious prayer could lead to human healing (Cooper, Marcus and Barnes, 1999).

Although it is almost impossible to determine the source of the healing gardens in Europe, it is assumed that healing gardens were generally established in the

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field of health care for the poor, sick and disabled between the 10th and 14th centuries (Gerlak-Spriggs *et al.*, 1998).

By the end of the 1980s and the beginning of the 1990s, there had been a decline in the concept throughout the world. The connection between healing and nature was gradually replaced by advanced treatment techniques until the concept of nature was completely lost and healed. Beginning in 1990, the idea of healing gardens gained renewed interest and began to emerge in the field of medical and sustainable landscapes researches (Faba, 2002).

Today, healing Gardens are gaining popularity due to stress-related diseases resulting from the harsh living conditions and environmental problems that humans suffer from all over the world.

2.2. Defining Healing Gardens

Healing garden is the place to reduce stress to the user by using a variety of natural elements with a specific design in the garden, which helps restore the mental and physical state (Faba, 2002).

Stark (2004) had a vision, that healing garden as a miniature of the larger world, where every feature of the garden is to represent the greatest advantage in the scene. he argued that through this healing modeling it must be able to "stimulate the senses, improve the immune response, and promote the relaxation of physical and emotional illnesses The healing garden is a sacred place keeper, users can reach higher levels of spiritual strength by having a simple presence In space "(Stark, 2004).

The American Horticultural Therapy Association definition of Healing garden is a place that helps patients to recover rapidly, through horticultural therapy programs. The concept of healing gardens in the hospitals : As an a special external environment related to the hospital which is designed to provide particular therapeutic benefits.

2.3. Types of Healing Gardens

There are two types of healing gardens as follows:

The first type is a therapeutic garden in hospital and a healthcare centre. Based on the most healing researches , the positive results of hospital recovery are related to the patient's time with nature and his presences in green spaces of a special nature. (Hopper, 2007; Faba, 2002; and Marcus and Barnes, 1999). The second type is a private garden that considered as the best type of meditation garden with healing impact due to The user has his own space with the most healing benefits of a garden (Vapaa, 2002).

The paper targets the healing gardens in the hospitals to reach the most important elements and features that must be available in the design of healing gardens as a tool to help the architects during the design process.

3. Healing gardens design criteria for hospitals

Well-designed hospital garden provides pleasant view, lessen stress and improve therapeutic results through, enhancing the social support , providing the privacy, and providing opportunities for getting rid of stressful therapeutic conditions (Ulrich, 1999; Cooper-Marcus, *et al.*, 1995).

Depending on patients' views ,the healing garden should be designed taking into consideration physical needs and psychological state (Stigsdotter, *et al.*, 2002).

When designing a garden for a hospital , the main focus should be on location, accessibility, patients' needs and priorities. Moreover, the garden should have opportunities for mobility and exercise, provide a different choices between friendly and personal spaces, and facilitate useful distraction through direct or indirect connection with nature (Stigsdotter, *et al.*, 2003).

3.1 Design principles of healing garden

Many health care institutions around the world have begun to integrate therapeutic landscape design with hospital and health care buildings. The healing gardens have therapeutic benefits, including stress relief, relief of physical symptoms, and improved overall well-being for both patients and healthcare staff. (Sima POUYA, *et al.*, 2015) .

When creating a garden for a health care facility, the main focus should be on the site, accessibility, patients' preferences, and various design elements which suit the health and psychological state of patients and users of the garden (Epstein,2006).

The healing garden should offer multiple opportunities to encourage the practice of various activities and mobility, through the diversity of spaces between social and individual spaces that support the interaction of Patients with nature in direct or indirect ways (Marcos *et al.*, 1999).

Well designed healing gardens should include some basic principles related to the psychological state of the Patients as follows (Sherman *et al.*, 2005):

Enhance control feelings: Users should be aware that there is a garden, easy access and use. The Patients should feel free to choose between the different and various areas. The design of healing gardens should include special areas that cannot be seen from overlooking windows to achieve privacy and a sense of isolation for those who want to . All or some of the five senses can be chosen as focal stimuli in the garden's construction which promote Cognitive performances and enhance control feelings , (vapaa,2002)

A prevalence of green materials and areas: Patients' sense of well-being is promoted by the soft landscape, so the green materials should be dominating in the garden design also, reducing the hardscape to the lowest level so that trees, shrubs and flowers should form about 70% of the garden, with 30% in the corridors and squares Variety of spaces. as shown in fig. (2) (Franklin, 2012).



Fig 2 .landscape and hardscape in Dora Efthim Healing Garden

Encourage exercise: The designs should provide ease of access and a sense of independence, as well as relieve the feeling of stress by providing structural elements such as walking paths for patients to encourage exercise and play areas for children patients in fig. (3) (Seversen *et al.*, 2013).

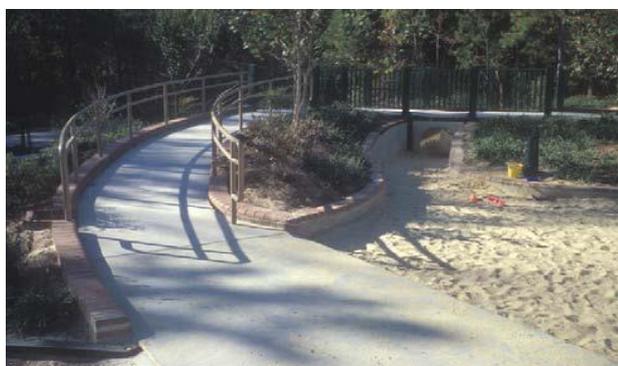


Fig. 3 . ramp over a sand play area becomes a feature in itself in this universally designed children’s play area

Social support: Communication with other patients and family members in the garden enhances the emotional state of the patients (Branan & Fest, 1997; Ulrich, 1999). Social support can be facilitated by the design of a healing garden that encourages conversations and social networks between groups of patients and visitors .Fig. 4 (Ulrich, 1999).



Fig. 4 . There are private areas where people can be alone in the garden

Minimize intrusions: Healing garden should be designed to reduce negative factors such as urban noise, smoke and artificial lighting, for the benefit of natural lighting The gardens must contain a variety of strongly scented flowers with bright colors that satisfy different senses for patients and (although strongly scented flowers and other scents should be avoided for chemotherapy patients) (Franklin,2012), and also *Access to privacy* refers to an individual’s ability to find spaces of solitude in the garden.

Access to Nature refers to environmental and natural features that help to relieve stress for patients and users through their restorative influence Natural deviations such as green spaces, flowers, water, and sunlight are believed to strengthen the restorative effect of garden users, promote psychological recovery and improve The therapeutic results of patients. (Ulrich, 1999).



Fig. 5. Natural distractions such as plants, flowers and water features decrease stress levels.

3.2. Hard landscape design

3.2.1. Gateways and entrances

Gateways and entrances should be designed to welcome patients and users when they arrive. This can be achieved through colorful and interesting plants and also, the work of arts can be organized the primary access focuses and makes a feeling of place. (Shackell, *et al.* ,2012). The comfortable and varied seats should be considered between fixed and mobile In addition, utilization of guide signs should be found in the garden to guide them to find their way around the site.(Main, , *et al.*,2010).

3.2.2 Paths

Direct paths is one of essential elements In the healing garden additionally, paths should be avoided right-angled corners , slopes of the designed paths should not exceed 30.5cm of rise for a length of 6m and cross slopes should not exceed 30.5cm of rise for a length of

15.24m. Where the slope does exceed 1/20, there should be a support railing to preclude slipping.

The surfaces of paths should be firm and smooth (Queensland Health,1999).

The principle circulation routes should be plainly shown, by giving effortlessly comprehended names to the primary path or having colored lines along the path or using lighting along the path to designate the main paths; (NHS Estates, 2005).

3.2.3. Children's gardens

Children often have tension and stress from the treatment in hospitals ,So, there must be separate spaces where they can move freely as they need or want (Nord, *et al.*, 2009). Creative play areas should be available to improve cognitive performance. Additionally, the availability of many spaces play areas provide to children the freedom to choose and encourage them to move which lead to improve therapeutic results (Verderber, *et al.*, 2006)

3.2.4. Art

Artworks form as a part of the healing environment, which reduce the stress and improve the creative abilities of patients . artworks could be incorporated to fit with specific spaces into the garden. On other side , utilizing from artworks to create an engaging focal point for the garden and positive message, but without use complex or abstract forms which caused confusion for patients

3.2.5. Water

Hearing the sound of running water in fountains , the reflection of the sun on it or seeing the fish in the lake has a positive effect on the patient (Verderber, *et al.* , 2006), Moreover, the sound of running water helps to reduce external noise from space and creates sensory focal points for garden spaces that attracts all ages and abilities

3.2.6. Site furniture

This term refers to free-standing elements such as seats, litter bins, lighting and signs, which should be selected carefully to suite the psychological state of users.

Seating: should be accessible where people would really need to utilize it, ordinarily shaded and confronted towards an attractive scene. It should be Comfortable and movable. (Main, *et al.* ,2010).

Signage: fitting, agreeable and inviting signs are an unquestionable requirement. Site signage ought to show, in addition to other things, directional or one-way activity, confinements, stopping, conveyances, understanding passage focuses, doors to offices, et cetera (Epstein, *et al.* ,2006). Material signs ought to be settled at a stature of 150cm (120cm for children)

(Stephen and *et al.* ,2006). Other sensible indicators, for example, capable of being heard water, highlights and wind rings may likewise be utilized to help route finding for the outwardly disabled in the garden.

Lighting: The main role of lighting is to improve wellbeing, help avoid accidental falls, and enhance the sense of safety. The lighting should be placed in the changing levels of corridors , slopes and stairs in the garden, in addition to the appropriate lighting in different areas in the garden to support the sense of safety and give an aesthetic look to the patient through his room (Marcus, *et al.* ,1995)

3.3. Planting design

Native plants with varied densities should be utilized in healing gardens which attract butterflies , stimulate the patients' senses with their colors and sounds and raise patients' spirits (Shackell *et al.*,2012). Seasonally changing flowering trees and plants conduct a comforting consciousness of life's cycles (Marcus, Clare,1999).Large trees provide shade in summer and shelter in winter Moreover help to improve the local climate and lessen the air temperature. In gardens for children or patients shouldn't contain thorny plants and also, plants that drop fruit or leaves that might comprise a hazard . Moreover, Low shrubs and dense, dark greening walls ,that conceal the view ,should not be planted close to paths ,instead, these areas should be planted by varied wild flowers and shrubs to promote the sensory aspects of nature (Shackell *et al.*,2012).

4. Need to explore the principles of Healing Garden

Presenting the core objective of healing gardens principles adopted of a number of design guidelines which aims to maximize the ability of healing gardens to meet the psychological and functional goals of the program through three phases:

The first stage is to present specific healing garden design features that potentially facilitate each of the five key outline standards of recuperating the garden proposed by the Theory of Healing Gardens. The second stage is an analytical study on the extent of the effect of gardens on the stress state of patients. The third stage is to present the principles of healing garden through the basis of theoretical analysis of the core studies in the field of healing gardens and the extent of user satisfaction and their perceptions of the elements of design that should be available in the gardens.

4.1 healing garden design features

Tables below presents specific healing garden design features that potentially facilitate each of the above five key design elements suggested by the Theory of Healing Gardens, These design features have been compiled based on seven major theoretical and practical researches. Selected studies are :

Cooper Marcus and Barnes (1995, 1999), McDowell and Clark-McDowell (1998), Mitrione and Larson (2007), Naderi and Smith (2008), Ulrich (1999) Cochrane, T.G.(2010) and Tseng, W.C., Chang, W.C., & Yi, K.J. (2014).

Table 1. Enhance feelings of control

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione, et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
easily visible from the entry.							4
provide an inviting entrance.							2
easy to see from hallways in the hospital.							3
Maps are to be had at unique places inside the health facility							1
signage							4
The doors are easy to use.							2
The paving of pathways is smooth.							3
Navigating across the lawn is simple.							5
provide ease in getting around for users in wheelchairs.							6
provide an expansion of seating arrangement choices.							5
comfortable seats							5
sunny and shaded areas.							4
Avoid glare from light concrete							4
entering the garden without having to use stairs or ramps.							1
Variety of walking routes.							3
variety of choices in gardens' spaces.							3
unique perspectives of surroundings to choose from inside the garden.							3
fountain							2
restroom near the garden							1

Based on Table 1, the most common elements suggested by the literature were Variety of walking routes in the garden, easy to see from hallways in the hospital, The paving of pathways is smooth, different views of scenery to choose from in the garden, variety of choices in spaces within the garden and provide sunny and shaded area. According to the result, designers should Provide ease in getting around for users in wheelchairs, Navigating across the lawn is simple, an expansion of seating arrangement choices and comfortable seats.

Table 2 Access to Nature

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione, et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
personal areas in which patient can be alone							4

plants with a variety of colors.							5
spots of bright colors in the plants.							4
plants are pleasant to touch.							2
The vegetation is planted densely.							3
The vegetation is the major portion of the garden.							4
The vegetation are appealing.							1
The plants have a nice fragrance.							1
variety of types of plant life the garden.							2
the choice of flowers fits this location/metropolis properly.							2
Provide a few local plant							1
Some plants attract butterflies.							4

As shown from Table 2, the factors that most mentioned with the aid of the seven guides were The lawn has flora with a spread of colors., vegetation (timber, shrubs, and plants) is the primary portion of the garden., designers ought to choose vivid colorings inside the plant life that trade coloration with the seasons and some plant life inside the lawn entice butterflies. a précis, garden layout need to have plenty of flowers mainly with awesome species, methods which could provide privacy.

Table 3 Social support

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione, et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
provide areas for conversations in small groups.							5
Plenty of seating available							3
movable seating.							3
central space for gathering							1
table for coffee or food							2
Comfortable Chairs							3

Referring to Table 3, 4 sub-elements in this category achieved a minimum of 3 number of hits which included areas in the garden for conversations in small groups, Plenty of seating available, movable seating and Comfortable Chairs

Table 4 Minimize Intrusions

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione, et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
personal areas in which patient can be alone							4

some personal seating regions hidden with the aid of vegetation private places.										2
a sense of enclosure from the outside the world.										3
a sense of enclosure from the hospital environment										2
the scale of the garden is big sufficient to keep away from noise										4
privacy from on-looking patient rooms.										2

As proven from table 4, the elements that maximum noted were personal areas where in humans can be alone, there may be a sense of enclosure from the outside global and the size of the garden is big enough to avoid noise.

Table 5 Encourage exercise

Design Feature Item	Design Published Recommendations						Total
	Cooper, et al.	McDowell et al.	Mitrione et al.	Naderi, et al.	Ulrich	Cochrane, T.G	
provide areas that encourage exercise through walking.							6
diverse sorts of taking walks paths.							1
narrow and curving walking paths							3
Play area for children							3
region for gardening and therapy							1
Places for exercise and workout							1

In table 5. the most common factors counseled through the literature have been provide regions that encourage exercising thru strolling, narrow and curving strolling paths for slowly on foot and meandering and Play place for children.

4.2 Analysis of users' Responses

The strategy for proceeding users' interviews(patient-staff and families of patients) in children's cancer hospital were semi-organized users' interviews occurred between the hours of 10:00 am and 5:00 pm. The researcher asked and interviewed with fifty. Each meeting kept going no longer than ten minutes. the interviews were directed independently to have a firsthand comprehension of requirements and to ensure data integrity. The participants' responses were analyzed in terms of their perceptions of satisfaction with the indicators for healing gardens Table 6. And their perceptions of the design elements that must be available in the gardens and their impact on the psychological state of them Table (7).

Table 6 Essential Objectives of a Healing Garden for Different User Groups

Objectives of a healing garden	Patients	Staff	Families of Patients
Stress reducing features			
Sense of control			
Physical movement and exercise			
Opportunities for social support			
Spaces for significant associations with friends and family			

Table 7 Design Elements in Relation to Goals of the Healing Garden

Objectives of a healing garden	Patients	Staff	Families of Patients
Stress reducing features	Waterfall birds pond Varyity of plants.	waterfall birds Varyity of plants.	Varyity of plants.
Sense of control	easily visible from the entry.	N/A	N/A
Physical movement and exercise	paths	paths	N/A
Opportunities for social support	Plenty of seating Resting points	resting points	paths benches/ resting points
Interaction with friends and family	none cited	N/A	paths

4.3 Discussions

The most discussed design recommendations (things which were specified more than 3 times) from the reviewed literature and users' interviews can be abridged as takes after.

A-Seating

While choosing furniture for patients, the physical delicacy of the patients must be considered. healing garden ought to have a lot of seating with various forms, for example, those with arms and backs and furthermore seating which are moveable. Other than that, the patients lean toward zones with overhead shade which enabled them to remain outside with protection from the hot sun.

B-Pavement Material

Patients regularly feel powerless. Along these lines, a garden space should be safe. Material of the asphalt must be non-slide and non-glare with indeed, even and smooth surface which will be simple for wheelchair clients to move around. Handrail ought to be given along some walkway.

C-Activities

Give open air exercises, for example, healing garden has been appeared to have positive advantages to

patients . Other than that, horticultural treatment is considered as a therapeutic system which may enhance memory, consideration, feeling of obligation and social association. Moreover, greenery enclosures can give regions for amusement and exercise purposes, places for social exercises and furthermore play area for children which are helpful for physical and emotional wellness of the patients.

D-Location of the Garden

The open air plant needs some feeling of walled in area and the non attendance of feeling that usres are in a "fishbowl" or being gazed at. Along these lines, the area and introduction of the garden are significant, for example, the garden ought to be close to the principle entrance and furthermore unmistakable from fundamental indoor zone.

E-Access to Nature

Many research had discovered the significance of medical advantages for the patients , for example, enhanced mind-set , diminished worry and stress by having contact with nature. In this way, a very much outlined garden ought to give components that could urge the patients access to nature, for example, a differing blend and wildflowers to attract birds and butterflies

Conclusions

the architects must Focus on integrating all key elements of healing garden and users' desire that create a quiet environment which reduce stress and promote patients health. It needs special attention in the design and continual emphasis by the hospital.

The following list is an important elements which must be included in the design:

- 1) Climate-controlled areas (i.e., misters to cool and heated floor to produce warmth)
- 2) Strolling ways and exploring trails
- 3) Improve the stream to take into consideration however much connection as could be expected.
- 4) Play area to take into consideration patients' and children' delight.
- 5) Open area to take into consideration different exercises .
- 6) Contemplation region for thought and reflection.
- 7) A few water highlights.
- 8) Different seating choices with the greater part in the one to three seating range.
- 9) Friendly/commonplace components (i.e., winged animal feeders, recognizable plants and scents).

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