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The Design Principles of Therapeutic Gardens

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Abstract

Throughout history, it is known that people have used nature for various purposes in order to find health. Nowadays, many scientists are studying the effects of natural and regulated environment on human health and healing. It has been proven through research that some special landscape arrangements encourage people to be more comfortable and better. The gardens designed and applied to make people feel better in the psychologically and physiologically are called therapy gardens. These gardens offer healing, instructive and self-improving activities based on elements such as plants, land and nature to the individual who do not feel well physically and psychologically and to the urban people. In this study; the design criteria of therapy gardens for disabled children, elderly people and patients have been determined.

Keywords: Landscape Design, Landscape Perception, Plant Therapy, Therapeutic Gardens

INTRODUCTION

The use of the natural environment has varied through the centuries and reflected each culture's beliefs and values. Historically, people have always used nature as a powerful healing source and as a resource for recovery (Adevi & Lieberg, 2012). Natural outdoor areas and natural elements such as forests, parks, trees and gardens are known to provide opportunities to enhance public health and well-being (Nilsson, Sangster, & Konijnendijk, 2011).

Nature, the green landscape, sunlight and fresh air were from the latter 17th century until the middle of the 20th century an essential component of the healing process in various hospital settings, such as sanatorium parks (Söderback, Söderström, & Schälander, 2004). From approximately 1950 to 1990, the therapeutic value of access to nature all but disappeared from hospitals in most western countries. High-rise hospitals built in the International Style resembled corporate office buildings; air conditioning replaced natural ventilation; outdoor terraces and balconies

disappeared; nature succumbed to cars and parking lots; and indoor settings designed for efficiency were often institutional and stressful for patients, visitors, and staff (Marcus, 2007; R. S. Ulrich, 1991).

Since the mid-1980s, research has indicated that gardens, parks and areas with natural greenery have beneficial effects on human health, well-being and capacity. Following Roger Ulrich (1984) discovery of the relationship between views of nature and reduced use of pain medications and quicker recovery among surgery patients, theory and research have explored the healing qualities of the natural environment. Stays in natural environments and gardens offer positive stimulation of emotional, cognitive and physical functions (Kaplan & Kaplan, 1989). The presence of natural greenery in a scene has a high correlation with stress reduction (Chapman, Hazen, & Noell-Waggoner, 2007; Detweiler et al., 2012; Marcus & Barnes, 1995; Souter-Brown, 2015) (Figure 1). The structured, empirical knowledge that exists has accumulated slowly, developed by research groups in disciplines as diverse as environmental psychology, landscape architecture, forestry and epidemiology.

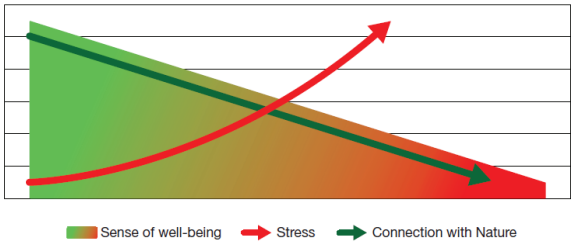

Figure 1. Nature connection as it affects stress and quality of life (Souter-Brown, 2015)

Gardens and gardening activity may offer a key site of comfort and a vital opportunity for individuals' mental, physical and spiritual renewal (Ivarsson & Grahn, 2010; Milligan, Gatrell, & Bingley, 2004). Some of the most common names for different nature settings are: restorative gardens or landscapes, healing gardens, therapeutic gardens or landscapes, sensory gardens, mediation gardens and restoration gardens, care farms, community gardens, urban green therapeutic spaces (Relf, 2005; Stigsdotter et al., 2011). In the existing literature, authors have used an array of terms to refer to the therapeutic segment of landscape architecture. Spaces are often referred to as healing gardens, healing landscapes, or therapeutic gardens. Frequently, these words and phrases are used interchangeably (Pouya & Demirel, 2015).

In a purposefully therapeutic garden, the well-being of a wide variety of people with diverse abilities and special needs is stimulated within a flourishing garden environment (Kavanagh, 1995). Therapeutic gardens achieve comfort and support clinical objectives by playing on the attributes of plants and gardens that meet needs for special protective and preventative measures. Therapeutic gardens are especially healthful environments providing safe and comfortable settings for people (Kavanagh, 1995). Rehabilitation using gardening and other creative activities in a therapeutic garden has been found to have positive health effects on people with stress-related ill health, myocardial infarctions, mental chronic illness, and dementia. Creative activities such as crafts have been shown to promote experiences of,

for example, engagement and improved self-image in people with chronic fatigue syndrome (Eriksson, Westerberg, & Jonsson, 2011).

A growing awareness of the power that outdoor experiences in garden landscapes can have in the healing process has been accompanied recently by the increasingly frequent construction of therapeutic gardens in clinics, hospitals, and residential care centers (Kavanagh, 1995). Hundreds of therapeutic gardens have been created, from the nineties on, especially in USA and Canada, but also in Europe (especially in Holland and Belgium) and Italy (some of them have been shown in the conference), some are dedicated to special illness or disability (Alzheimer gardens, gardens for HIV affected people, gardens for blind people or disabled on wheels-chairs, ...), other simply for the patients of an hospital or other sanitary structures (Ghersi, 2007).

Today, therapeutic landscape design is a growing facet of landscape architecture. "A restorative garden is intended by its planners to evoke rhythms that energize the body, inform the spirit, and ultimately enhance the recuperative powers inherent in an infirm body or mind" (Anderson, 2011).

These gardens offer healing, instructive and self-improving activities based on elements such as plants, land and nature to the individual who do not feel well physically and psychologically and to the urban people. In this study; the design criteria of therapy gardens for mental and physical handicapped children, elderly people, patients and stressed urban people have been determined.

What is The Therapeutic Garden?

The attempts by experts in the field to introduce nature into healthcare settings have been variously described as contemplative gardens, restorative gardens, healing gardens, and therapeutic gardens (Hebert, 2003). The use of the word healing in the case of a 'healing garden' encompasses these definitions to a certain extent, but instead of stressing the idea that they can cure a person, the benefits are related more to the alleviation of stress and the abilities of the space to soothe, to calm, to rejuvenate or to restore one's mental and emotional health. A main role of the space is to provide sanctuary, to allow for meditation or to evoke other qualities desired by the garden user (Vapaa, 2002). According to Roger S. Ulrich, "a healing garden refers to a variety of garden features that have in common a consistent tendency to foster restoration from stress and have other positive influences on patients, visitors, and staff or caregivers" (Hebert, 2003).

A therapeutic garden offers a locality where the patients and their healers might achieve the objectives of therapeutic process. The garden offers localities in order to breathe fresh air, to feel the warmth of solar beams etc. The variety of vegetation offers alternation of colours depending on the seasons and the various perfumes (Georgi & Anthopoulos, 2005). Healing garden is a term more frequently applied to a garden at a healthcare facility that is intended for use by staff, visitors and clients at their discretion, rather than as a part of a treatment plan (Relf, 2005). A therapeutic landscape, according to Gesler (1996), is characterized by being where "physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing" (Ivarsson & Grahn, 2010). Therapeutic garden describes a garden that is used as part of a treatment programme by various members of the medical staff. For example, it may include walkways and steps or grassed raised beds to use as outdoor exercise mats designed with the Physical Therapist (PT) as an outdoor PT room (Relf, 2005).

Therapeutic Garden Design

In designing a healing garden, the landscape architect then has two goals in mind. The first goal is the process of healing and the second goal is to design an outdoor environment that will support this process (Hebert, 2003). Garden and landscape designers who develop a coherent image of the users of their gardens as people with more or less of these deficits and abilities, will design better therapeutic gardens (Zeisel, 2007). For this reason, it is important for the landscape architect to take a patient-centered approach to design. Spatial considerations, the use and control of materials, all decisions made by the designer should enhance the therapeutic process and support relief from stress, promote a sense of well-being, and provide a distraction from symptoms (Hebert, 2003). Healing gardens should be restorative and helpful to participants for improving their well-being. In designing healing gardens, it is extremely decisive to understand the user groups and intention of the garden (Shahrad, 2013). Some of the most famous examples of therapeutic gardens created by Landscape Architects are the result of a team work: the Landscape Architect assumes the role of mediation, translating the expressed (by doctors, assistants or patients) needs of the therapy into the design (Ghersi, 2007). Ongoing rehabilitation veterans Combat Stress Garden, Leatherhead, England. Special benches are designed to reduce the fear of being hidden under bombs. The immovable water feature provides the reflex and provides the plant reflex and sky (Marcus & Sachs, 2014) (Figure 2).

Figure 2. Nature connection as it affects stress and quality of life (Souter-Brown, 2015)

Since, not all gardens have healing, they should have special characteristics in order to be called a therapeutic garden. Therapeutic gardens should provide a feeling of security and safety. By being fenced off and safe, they could offer psychological peace and space for relaxation. Garden, by showing life with lively components such as trees, flowers, bushes may give the feeling of security and hope to the visitors. It is important that the garden has different rooms with different characters. "Healing garden must be able to communicate with the visitors on many levels through sight, smell, hearing etc.". Designers should offer different thing to awaken participant's senses. They can be varied as listening to running water, touching stones, tasting

berries or smelling flowers (Shahrad, 2013).

Basic design elements in a healing garden will support the users to both spend time alone or to socialize, to leisurely or more vigorously walk, and to enjoy the warmth of the sun or the shelter of the shade. A restorative garden should be a place of order that alters moods and improves the visitors' sense of well-being. In these settings, the patients' direct connection with the physical and natural environment provides healing (Anderson, 2011). The common management and design factors exhibited in these landscapes were identified to include 1) scheduled events and programmed activities and features; 2) features modified to improve accessibility to plants and gardening techniques; 3) well-defined perimeters; 4) a profusion of plants and people–plant interactions; 5) essentially benign and supportive conditions; 6) universal design for completely accessible plant dominated features, details, and spaces; and 7) recognizable pacemaking. Each of these characteristics is predicated on its setting in a vigorous plant-dominated landscape (Kavanagh, 1995).

Therapeutic Gardens for Patients

Therapeutic garden design principles for patients are listed below (Georgi & Anthopoulos, 2005; Marcus, 2007; Marcus & Barnes, 1995; R. Ulrich, 1999; Yücel, 2013):

•Where there is sufficient room, divide the space so that there are sub-areas of varying size and levels of privacy. Some users come alone and seek a space in which to sit that is comfortably private, while others may desire distraction and social interaction.

•The interior and exterior spaces should complement each other. If patients near an outdoor space have private rooms, exterior areas for social interaction and observation should be a priority. Visibility of a garden space from inside for staff monitoring of patients is especially critical for long-term care facilities.

•Gardens may be designed and set up attractively, but people need to be aware that they exist, that they are easily accessible through entrances and paths and useable regardless of people's Hospital Outdoor age or disability, and that they facilitate certain activities.

•Paths must be wide enough for two wheelchairs to pass (minimum of 180 cm); they should be smooth and wide enough for a patient on a bed or gurney to be wheeled into the garden; paving joints should be narrow enough so as not to catch a cane, the wheels of a walker or an IV-pole.

•Fixed seating with backs for sitting in comfort is especially important for garden users who may be physically weak. A sense of control in the garden can be enhanced by getting users involved in its design and different types of spaces and layouts can enable them to make their own choices. For example, chairs can be moved, selecting the degree of sun and shade, as well as determining the size of the seating cluster.

•As hospital patients are often sensitive to temperature options such as sunny and shady areas should be provided. Existence vegetation that will ensure in the users of space shade in summer, sunlight at the wintry months, alternation of shade and sunlight, privacy, reduction of wind and quietness.

•In a setting such as a hospital, known to elevate symptoms of stress, it is essential that art, sculpture and other human-made design elements be unambiguously positive in their message. For example; a classic case of the "wrong" kind of art occurred in a US hospital where abstract figures of birds in a courtyard were viewed with dislike and fear by cancer patients in adjacent wards, and eventually had to be removed.

•Patients often feel both physically and psychologically vulnerable in hospitals, and a feeling of security should be provided. This includes sufficient lighting and public telephones in isolated areas so people can call for help, and other facilities and design elements in the garden that make them feel safe.

•If a garden is to have therapeutic value in a medical setting, it needs to be quiet. In addition to providing an external focus, sound can create a psychological screen (white noise) that serves the restoration process. People using the garden need to feel a sense of calm, and to be able to hear birdsong, wind chimes, or the sounds of a fountain.

•Lush, colorful planting that is varied and eye-catching so as to suggest the image of a garden. For a garden to provide maximum therapeutic benefits, it needs to have a plentiful supply of plant materials, some with distinctive seasonal changes; leaves or grass which move with the slightest breeze; subtleties of color, texture, and leaf shape especially where frail people may move slowly looking down or where people may sit for long periods in one setting.

•Plants may be experienced unconsciously as metaphors. Trees can provide metaphors of solidity, strength and permanence; perennials of persistence and renewal; annuals of growth, budding, blooming, seeding, decay, death and transformation.

•For all users of the garden, including the partially sighted, scented and brightly coloured flowers and leaves provide an attractive sensory experience. The olfactory sense is closely associated with memories and feelings, so scents can suddenly stimulate memories and responses, aiding those with memory loss. Sensory stimulation is particularly important for the visually impaired and for patients with reduced cognitive function, and this can be assisted by plants that are colorful throughout the year, are scented (e.g. Lavandula spp. and Echinacea spp.), and have tactile qualities (e.g. Festuca caesia).

•Quality maintenance contributes to the health of the plants, which in turn provides the maximum therapeutic benefit. Shrubs should be trimmed to emphasize their natural form, so the space looks well cared for and sends the implied message that patients are also well cared for. Appropriate plant selection, with special attention given to cultural requirements and correct placement in the garden, is one of the essential elements of a therapeutic garden environment, as dying and unhealthy plants have a negative psychological impact on those observing them.

•A healing garden should also provide views to the sky and changing cloud formations; pools that reflect the sky or trees and that can attract wildlife, reminding those in ill-health that life goes on; elements that feature the sight and sound of moving water; and where possible, views to the horizon or to "borrowed" landscape.

•Features to attract birds — such as a fountain or birdbath, a bird feeder, trees appropriate for roosting or nesting — stimulate the senses and help to lift people's spirits. Plant species that attract butterflies call attention to the ephemeral, serving as a gentle reminder of the preciousness of life.

Therapeutic Gardens for Disabled Children

Children of many different types may benefit from a healing garden, whether they are recovering from an operation, working through the turmoil of a traumatic experience, coming to grips with a terminal illness, or living with a permanent or profound mental or physical impairment. The term habilitation rather than rehabilitation is used to refer to the treatment of those with disabilities. It is important to focus on the child's potential (Hebert, 2003).

Several types of therapies are used in treatment of children. Examples of these are Play Therapy, Horticultural Therapy, Animal Therapy, Nature as Therapy, and Sensory Integration. Any one or a combination of these may be incorporated into a healing garden designed for children. Often the professionals who care for the child form an interdisciplinary team. The Landscape Architect should meet with, and temporarily become part of this team to learn how to design an environment that will support these therapies and meet the needs of those who will use this garden. The design principles of therapy gardens for children with disabilities are listed below (Hebert, 2003; Marcus & Sachs, 2014).

•Spaces should be designed to allow for alone time, one on-one work with a therapist, small group work, and large group work. Use spatial arrangement to create a private space (a "Corner of the World") where the child can take a "sensory break" and get away from the demands of the world.

•A number of opportunities could be provided in a therapeutic garden to develop gross motor skills or large muscle groups. Challenges can be created through activities that require balance. Children can climb on stumps, boulders, nets, ladders, or more that offer differing degrees of challenge. Equipment that requires coordination and judgement, such as horizontal ladders, stepping logs, and tunnels, might be incorporated into the therapeutic garden.

•Provide opportunities for the child to experience nature. Rocks, a decaying log, bushes, and branches of trees all provide habitats for wildlife (lizards, earthworms, bugs, spiders, lady bugs, doodle bugs and beetles, honey bees, frogs, snails, butterflies, birds, and squirrels). Choose plants for seasonal variety such as leaf color and flower, fruit and nut production and for their ability to attract wildlife. Water features, bird houses, bird baths, and bird feeders all encourage wildlife to visit and stay.

•Due to the acute or hypersensitive nature of their sensory systems, care should be taken to provide visual relief from the glare of the sun. Patios, porches, vine-covered arbors, trellises, gazebos, shade trees and other methods could be used to create spaces with filtered sun, dappled shade, and to reduce the effect of the bright rays of the sun.

•The therapeutic garden must be accessible to all children. Wheelchair ramps, smooth surfaces, planters and tables at wheelchair height are all examples of barrier-free design. A variety of surfaces (brick, concrete, slate, bark, pea gravel, sand, grass, asphalt, and others) could be used to indicate transition from one space to another.

•Furniture should be chosen for durability, ease of care, function, safety, and design intent. It should be lightweight, moveable, and multi-purpose.

•Because the needs of the children change as they learn and grow and because the needs of the special educator/ therapist change as new ideas and therapies are discovered, the therapeutic garden should allow for flexibility. Physical elements that can be changed and moved around should be included in the garden. Play leaders could be trained to handle flexible space management. Addition or removal of special equipment could make the space flexible for more than one activity. Modular systems and lightweight mobile equipment (water tables, sand tables, collapsible tables, inflatables, lawn furniture, watering cans, hoses, buckets, pulleys, ropes, hammocks, tree swings, natural objects, garden accessories) are all methods of supporting flexibility.

•Use vegetation and other elements for screening to reduce or eliminate excessive visual or auditory stimuli. Mask unwanted sounds with the soothing sounds of water. Use design elements to keep distractions to a minimum.

•Provide places to experience the sun, shade, wind, and rain.

•Provide opportunities for planting and harvesting.

•Choose plants for the therapeutic garden carefully and place them strategically. Avoid poisonous plants, plants with points or thorns, plants with sticky sap, and plants whose seeds are spread by the wind as these often aggravate sinus and allergy conditions.

•Consider elements that are activated by the sun or weather, such as wind chimes, hanging crystals, features that cast recognizable colors or shadows on the ground, or rain chains.

•Avoid art elements that are likely to have no meaning to children.

•If there are play features, these should be spread out so that children who are cautious, shy, or have a disability can find some element that engages them. A central, integrated play feature that is actively used can be frightening to such children.

•Provide elements that would be intriguing and distracting for a sick child, such as elements of whimsy or surprise, a gazing ball, a sundial, or sculpted animal figures half-hidden in the planting.

•Design pathways and include elements that may entice a child recovering from surgery or a temporary disability to ambulate in the garden, giving them a sense of autonomy. These might include a path leading to a secret hiding place or to a special feature; crawl spaces, bridges, diverse terrain; a play space that requires climbing into; a grassy hill to climb up and roll down.

•Provide plenty of seating in private places of refuge and quiet for worried or bereaved parents, sick children, stressed staff, and adolescent patients who may feel self-conscious about hair loss due from cancer treatment or about being in a wheelchair.

•Provide a glider swing that accommodates a stroller or wheelchair.

Therapeutic Gardens for Elderly

The design principles of therapy gardens for elderly are listed below (Marcus & Sachs, 2014; Zeisel, 2007).

•The outdoor space must have the look of a domestic garden in terms of scale, details, and planting.

•Provide a simple, clear garden layout viewable from the garden entry, preferably with a simple looped, circular, or figure-eight pathway system.

•Provide appropriate destination points, such as a gazebo, arbor, pavilion, or summer house that has ample seating and is large enough to be used for social events or programmed activities organized by the staff. Depending on

the local climate, this space should ideally be supplied with lighting, heat lamps, and/or fans to extend outdoor use in cooler or hotter seasons. Screening against insects may also be necessary.

•Provide plenty of choice —in seating, pathway routes, views, destinations, and the like. This is important for any healing garden, but especially for those catering to the elderly in a residential environment where there may not be many choices indoors and where they may not have many opportunities (or the energy) to seek choice in the wider community.

•Provide garden spaces both at the back of the building and in the front. The latter are particularly popular as people like to watch for the person delivering mail or the car bringing a visitor. The front garden should be viewable from the main lobby so that people sitting there can feel secure, and just off to the side of the building entrance so those coming and going do not have to run the gauntlet of people sitting in the garden.

•The culture and attitudes of the residents toward nature and the outdoors, as well their image of what a garden is, must be sensitively addressed. For example, low-income Londoners who may have left a garden at home with a small lawn, roses, and space for vegetables are not going to relate easily to an area of white gravel, blue urns, and a symmetrical Persian motif.

•Ensure that the garden is attractive, well maintained, and rich with amenities, to encourage family members to visit more often and take their relative outdoors.

•Allow for views out to the wider landscape so that residents can feel a sense of belonging to a broader community.

•Provide an area specifically designed for gardening (raised beds, tool shed, various large containers, access to water) that can allow older people to draw on past skills.

•If there is enough space, include a simple recreational amenity such as a putting green, shuffleboard court, or croquet lawn with nearby storage area for equipment. Th is will be used by the residents and also by visiting families, including older children.

•Ensure that at any garden entry there is a patio/ transition space to the outdoors. Elderly people adjust to changes in temperature and light less easily than younger people, hence this space should be adequately sheltered, and it should provide sufficient shade so that people can adjust to brighter outdoor lighting. Skylights or higher-intensity lights just inside can balance the bright light outside for people reentering the building.

•The entry patio to a back garden should be large enough to accommodate several people in wheelchairs, together with tables and chairs suitable for eating outside, and for programmed group activities such as barbecues, ice cream socials, and birthday parties.

•Since older people tend to lose muscle mass, they find it difficult to get up from a seated position. Seat height should be higher than usual (44–46 cm), with a maximum seat depth of 48 cm, arm height of 60–62 cm and arms projecting forward from the seat to provide extra support when standing up. With a bench serving several people there should be armrests.

•Emphasize plants with flowers or foliage in saturated colors such as red, yellow, or orange, since colors in the blue/ lavender range tend to be perceived as grey when older people develop cataracts.

•Emphasize intricate planting with varieties of color and texture at or below eye level, since some older people walk in a semi stooped posture.

•Provide some interesting planting to touch or smell at the height of someone using a wheelchair.

•Include a range of scented plants that can be enjoyed throughout the year. Smell is one of the last senses to fade, and smelling certain plants, or pinching their leaves, can evoke powerful memories. The attractive experience of scents indoors suggests that some plants with evening fragrance should be planted close to entries or windows.

•Research which species of plants have special sacred or cultural significance for the group that makes up the majority of the residents.

•Mature trees (or those that will mature in a relatively short time) can provide a symbolic sense of longevity. Indeed, research has shown that people live longer when in environments populated with trees.

•The easier it is for residents to get outside to a safe therapeutic garden by themselves, and the easier it is for them to find their way back inside, the more they will use the garden on their own. By “easier” I mean both cognitive as well as physical ease. The simplest way to guarantee that this happens is to make the door itself a visual landmark. A bright color can do this; a typical doorway shape can work as we.

CONCLUSION

We tend to take our health for granted, until compromised in some way. Poor mental or physical health, as a result of illness, injury or congenital condition can make it more difficult to access education, employment and the community in which we live. In discussions with disabled people we find little talk of disability from a physical perspective, but a great concern for and about disabling environments. Healing gardens are, by their nature, enabling environments (Souter-Brown, 2015).

Therapeutic Landscape Design is more specific and relates to a particular aspect of a disease or healing process. The therapeutic landscape would be designed to produce a given effect and measurable outcome upon a disease or health problem for a given patient and/or group of patients. It can be thought of as similar to a medication taken for a specific disease or illness.

Today, therapeutic garden design and applications is rapidly increasing. In particular, it is necessary to accelerate these studies in developing countries. In the last decade, urban landscape studies in Turkey have shown a rapid increase in terms of quality and quantity. Therefore, people living comfort is improved significantly from the physical and psychological aspects. However, there is still a need for more specific areas such as therapeutic landscapes. Therapeutic garden practices in public should be increased. This paper provides a evaluation of the various methods available for testing the efficacy of measures for preventing expansion due to alkali-silica reaction (ASR) in concrete containing deleteriously reactive aggregate.

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