



Healing Gardens: An Examination of the Relationship between Healing and the Natural Environment

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Abstract

The main purpose of this paper is to investigate the concept of healing gardens and to examine the relationship that exists between healing and the natural environment. In the first section of this article, different aspects of healing - spiritual healing, mental healing, emotional healing, social healing, and physical healing - are studied. Then, in the second section, different categories of healing environments - built environments, symbolic environments, social environments, and natural environments - will be considered. In the third section, focusing on the qualities of natural environments, how we can evaluate ways in which a garden might contribute to the healing process is discussed. In this part, the benefits of viewing a garden and of gardening, such as reducing stress and anger and fear, changing mood and improving feelings, and providing satisfaction, is explained. In the fourth section, therapeutic programs using natural stimuli such as horticultural therapy, color therapy, and aromatherapy are discussed. In the fifth section, besides a brief history of the development of healing gardens, the concepts of a healing garden, restorative garden, and therapeutic garden are compared. In the conclusion, the author makes some practical suggestions in terms of site planning and layout design to increase the efficiency of future healing gardens.

Keywords: Healing garden, healing environment, natural environment, gardening, horticultural therapy.

باغ‌های شفابخش: بررسی رابطه میان شفا و محیط طبیعی

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چکیده

این مقاله کنکاش در منابع علمی جهت ارائه تعریفی کامل از باغ‌های شفابخش به عنوان نوعی از محیط‌های طبیعی می‌باشد. در بخش نخست روش‌های مختلف شفا، شامل شفای معنوی، فکری (ذهنی)، احساسی، اجتماعی و جسمی مورد بررسی قرار می‌گیرد. سپس ضمن ارائه تعاریف مختلف از محیط شفابخش، انواع گوناگون آن شامل محیط مصنوع، نمادین، اجتماعی و طبیعی مورد بحث قرار خواهد گرفت. در بخش سوم مقاله تحقیقات عمده در مورد تأثیرات مشاهده مناظر طبیعی و باغبانی بر روی فرایند شفا در کاهش میزان اضطراب، ترس، عصبانیت و ایجاد حس رضایت و بهبودی روحی معرفی خواهند گردید. در ادامه با بررسی شیوه درمانی مربوط به محیط باغ شامل بو درمانی، رنگ درمانی و باغبانی درمانی، تاریخچه توسعه طراحی باغ‌ها در مراکز درمانی و تعاریف صاحب‌نظران از اصطلاحات باغ شفابخش، باغ درمانی و باغ تفریحی مورد بحث قرار می‌گیرد. در پایان، مؤلف پیشنهادات اجرایی خود را جهت طراحی یک باغ با خاصیت شفابخش در دو مقیاس سایت و ریزفضا، با توجه به تحقیقات انجام شده، ارائه می‌نماید.

کلیدواژه‌ها: محیط طبیعی، باغ درمانی، محیط شفابخش، باغ شفابخش، باغ تفریحی.

Introduction

With the rapid increase of healthcare facilities, an increasing emphasis is being put on the mental aspects of "healing". The need to reduce stress is becoming more and more a part of our contemporary, fast-paced lives. Additionally, nature, with its perceived healing properties, is seen progressively as a useful means in addressing medical needs. As a result, architects have been employing the concepts of nature as a healer to landscape designs in hospitals since the 18th century. The development of healing gardens, according to their unbelievable effect on the health of patients, is based on architects' understanding of the concept of healing and the qualities of nature. In this paper, attempts have been made to review relevant studies about the healing process and how natural environments can contribute to the healing. We will also discuss about the qualities of nature and benefits of greenery and different therapies using natural stimuli such as horticultural therapy, aromatherapy, and color therapy. Then we will assess different definitions of the healing gardens and give a brief history of the design of healing gardens, and in the end, the author gives suggestions for the design of contemporary healing gardens. It seems that more studies are needed to clarify the relationship between the design of healing gardens and healing of the patients.

What is "Healing"?

The word "heal" derives from an Anglo Saxon word "haelon," which means wholeness. Quinn (1997) believes that the reason that healing signifies "wholeness" is that "people are not collections and parts that need to be fixed, but whole bodymindspirits." The main difference between healing and curing is that curing is what allopathic mainstream medicine has to offer, whereas healing is what you bring to the encounter with disease. Healing is a multidimensional process which includes psychological and physical (biological) factors.

Psychological factors relate to spiritual, mental, emotional, and social needs. Gawain (1997) explains, "as we follow healing path, giving our attention to each of the levels as the need arises, all aspects gradually become more integrated with one another and it creates a balance and harmony in life". Thus will discuss the different levels of healing and how each can contribute to the healing process.

A. Spiritual Healing

The spiritual aspect of a being is the inner essence, the soul, and the part of the being that exists beyond time and space. It connects human beings with the universal source and the oneness of all life. Developing the awareness of the spiritual level gives people an experience of a feeling of "belonging" in the universe. The lack of connection to the spirit is the root of many of social and cultural ills as well as personal problems. The contact with the spiritual dimension gives people an expanded perspective on their lives as individuals in the society by developing spiritual awareness. One is able to find the inspiration, understanding, and strength that is needed to confront the difficulties and challenges of healing on other levels. Because of this strong belief in spiritual aspects, religious healing has been a common way of healing throughout the history.

B. Mental Healing

The mental aspect of human beings includes their intellect and ability to think and reason. All thoughts, attitudes, beliefs, and values which can cause confusion or bring profound understanding are different aspects of mentality. Developing the mental level allows one to think clearly, remain open-minded, yet discriminate intelligently. According to Gawain, the first step in any healing process is acknowledgement and acceptance of what is true in the moment. Nobody can be healed unless he accepts the existence of disease and all negative thoughts and beliefs which are part of the mind. Ornish (1993) believes that

the patient's own beliefs play an important role in the healing process, and healing process depends strongly on the doctor's belief upon the medicine and methods, which is using to heal the patient. Everything is based on a try to change the person's belief system and to make people aware of new possibilities. In this sense, the doctor's job, sometimes, is working on a person's religious or cultural belief system. Lown (1993), a psychologist, believes that some patients have been able to overcome their life-threatening illnesses by using the power of the mind such as laughter and positive thinking.

C. Emotional healing

Another level in the healing process is working on the emotional aspects of being. This aspect is the ability to experience life deeply to relate to another person and the world on a feeling level. This is the part of human beings which is always seeking meaningful contact and connection with others. Developing the emotional level gives people the opportunity to feel the full range of the human experience and find fulfillment in the relationship with people and the world. Rossi (1986) believes that positive attitudes and emotions can affect the biochemistry of the body, and can facilitate healing. Another researcher, Fox, believes that a synergy between patient and practitioner can help patient and practitioner to bring the resources. Candace Pert (1993) in an interview with Bill Moyers explains that moods and attitudes come from the realm of the mind and transform themselves into the physical realm through emotions. She adds that recent discoveries suggest that the surface of the monocyte, which is one of the prime cells in the immune system, is covered with receptors for peptides, the biochemicals of emotion.

D. Social Healing

In addition to mental, spiritual, and emotional aspects of healing, Dean Ornish (1993), a clinical professor

of medicine in an interview with Bill Moyers, adds another concept: psychosocial healing. He believes that psychosocial has to do with the context in which healing occurs. He adds, "an individual does not exist in isolation from everyone and everything else, but exists in the context of a community, family, workplace, religion, and so on".

E. Physical Healing

The physical aspect of human beings is their bodies, which includes the ability to survive and thrive in the material world. Developing the physical level of the being involves learning to take good care of the body and to enjoy it and to develop the skills to live comfortably and effectively in the world. Almost all researchers agree that healing body is only possible if the patients want to get well and if they coordinate their thoughts, spirituality, emotions, and social support in an effort to get better, and medicine, as a complementary, can act as only an effort to a physical cure. This relationship between Physical and psychological aspects of healing is described by Danely (1992), who believes that the "healing mechanism includes a series of chemical reactions in the patient's body, such as replacing cells, adjusting the blood pressure, turning hormone and immune system to respond to one's thoughts, feelings, and physical activities".

Healing Environments

Any discussion about healing gardens requires precise definitions for related terms such as healing and therapeutic environments. "Healing environments" are defined as environments which have achieved a healing sense of place. This definition is different from the common definitions for therapeutic environments. Environment refers to separate and identifiable settings which are not so readily therapeutic. The term "therapeutic gardens" has been used for two different environments:

1. Those in which therapy occurs and that encapsulate

therapeutic processes.

2. Those which make a direct contribution to the healing and therapeutic processes .

This definition for a therapeutic environment is different from the first one, which means an identifiable place where people go to receive therapy. According to Gesler (2003), healing environments could be divided into four categories: built, symbolic, social, and natural environments.

A. Built Environments

Environmental psychologists such as Bagly (1974), Halahan (1979), and Reizenstein (1982) who have worked on this subject believe that people's experiences from their surrounding affect their needs, emotions, and actions. In a similar study, Spencer (1986) suggested that building design has a direct affect on human behavior. Hospitals, as one kind of built environment, have been always used to enhance the healing process. Florance Nightingale was one of the first persons who claimed that the characteristics of hospitals such as low-ward density, circulation of fresh air, adequate light, good drainage, clean laundry rooms and kitchens, and accommodations for nursing staff, directly affect patients' therapy . Later studies about hospital design showed its huge influence on the health and therapy process.

B. Symbolic Environments

Contrast to natural and built environments, symbolic environments are neither tangible nor accessible to the five senses . Evans (1982) believes that symbolic mediators act between stimulus and response when a person reacts to an environment. Similarly, Meinig (1979) believes that people "regard all landscapes as symbolic, as expressions of cultural values, social behavior, and individual actions worked upon particular localities over a span of time" . Arthur Kleinman (1973) believes that "healing occurs along a symbolic pathway of words, feelings, values,

expectations, beliefs, and the like which connect events and forms with affective and psychological processes." These abstract symbol provide meaning to healing situations, for example, "rituals often contain symbolic language or actions that celebrate, maintain and renew one's world as well as deal with its danger".

C. Social Environments

Healing is a social activity which involves interactions among people who have different roles within the society. The history of some hospitals reveals the importance of the relationship between healer and healed, feelings of mutual respect and trust . The concept of "therapeutic community," which began during the World War II, was based on a good social relationship between people. It played an essential role in providing healing environments . The main idea behind the concept of the therapeutic community is that breaking down hierarchies and dimensions between patients and staff and developing full participation within a community atmosphere affect healing process.

D. Natural Environments

Natural environment is considered one of the most important sources of healing in the history. Nowadays, many people get away from routine life by spending time in nature to attain physical, mental, and spiritual healing. Studies by Marx (1968) and Williams (1973) show the restorative powers of rural life as opposed to stressful cities. In this paper, we will discuss the healing properties of gardens as one kind of natural environment.

How might a garden contribute to the healing process?

A. Benefits of Viewing Greenery

Qualities inherent in nature such as sunshine, clean air, natural water, and green vegetation, are generally considered to have a soothing effect on people.

Fredrick Law Olmsted, recognized as the father of landscape architecture, was the first known scholar that advocated the natural experience as an effective restorative measure for the body, soul, and mind . While some external benefits of greenery such as improving air quality¹, have been proven through several research studies, recent research has shown the significant impact of greenery on the levels of stress, fear, anger, and feelings.

1. Reducing Stress

Stress affects virtually every vital organ. In times of stress or perceived danger, the endocrine system goes into overdrive, stimulating the heart muscles and the nervous system. Typical reactions to stress are mental alertness, anxiety, stomach cramps, cold and sweaty palms, and rapid heartbeat According to psychologist Deepak Chopra, sensory input changes body chemistry within one one-hundredth of a second; therefore, being in a stressful environment automatically accelerates the aging process and promotes disease . Research studies done after 1973 showed that the presence of natural greenery in a scene has a high correlation with stress reduction . According to Stephen and Rachel Kaplan (1989), “vegetation serves as a shock absorber for the human sensory system. It provides an opportunity for rest from the constant mental alertness. Vegetation heals the wounds congested cities inflict on their residents” . Studies by Ulrich show that when people are exposed to plants, their blood pressure lowers, their muscles loosen, their heart rates slow down; and even the way the skin conducts electricity becomes more characteristic of positive states . In another study, Honeyman (1987) proved that the exclusion of vegetation in urban areas creates stress and other negative psychological responses.

2. Reducing Anger and Fear

In her thesis about vegetation and stress, Honeyman (1987) measured the levels of anger, fear, and positive

effects in three groups of people watching three groups of slides: countryside scenes, an urban area with vegetation scenes, and an urban area without vegetation scenes. Final measurements demonstrated that the levels of fear and anger were significantly lower in the countryside and urban area with vegetation groups, and positive affect was significantly lower in the “urban without vegetation” group .

3. Changing Mood and Improving Feelings

One of the positive properties of vegetation is its impact of mood changes in people with gardens. Various researchers such as Ulrich, Honeyman, Marcus, and Barnes, have tested the impact of plant life on emotion. In 1973, Ulrich (1973) interviewed several shoppers whose home locations gave them a choice between driving to a shopping center on an interstate highway or on another parkway with more scenery and landscaping. Most of the shoppers responded that they preferred the parkway in spite of its much longer driving time because of their opportunity to experience natural beauty. The results of another study by Ulrich (1984) showed that patients with vegetation view windows in hospitals recover earlier than patients in rooms with windows looking out at buildings. In her study, Honeyman (1987) concluded that the natural element of vegetation plays an important role in the psychological well-being of humans, the inclusion of vegetation in urban areas provides an important psychological benefit for the people experiencing it, and human psychological response is influenced considerably by the absence or presence of vegetation in urban context. In other research, Marcus and Barnes (1995) interviewed 36 patients in a garden located in a hospital to explore which specific characteristics of gardens helped patients feel better. According to the responses, flowers and colors, openness and views, seasonal change, and greenery were the most important factors in mood changes among patients.

B. Benefits of Gardening

According to *the Encyclopedia Britannica* (2003), gardening is the process of arranging land, plants, and objects for human use and enjoyment, usually with long and close-up views. It says that "gardening belongs both to art and to science. It is an artistic activity in that it deals with grouping of plants in harmonious or pleasing arrangements. It is scientific in its concern with the techniques of cultivating plants and producing satisfactory growth" (Britannica, 2003). One of the recommendations for improving the effect of gardens on the healing process is to have patients participate in "gardening." Through gardening, the patient is able to smell, taste, and touch nature, plants, and flowers. Gardening makes patients feel that they are a part of nature: they can connect their mind and soul with the spirit of garden and its elements .

1. Reducing Stress

In "some psychological benefits of gardening," Kaplan (1973) asserts that contact with nature increases self-confidence, self-esteem, state of relaxation, and stress reduction. In another study, he collected data from two major groups of gardeners: community gardeners and home gardeners. He found that for respondents, sustained scale of nature, such as aesthetic pleasure from plants and opportunities for relaxation, were much more beneficial than their tangible benefits, such as reduced food expenses within the household. In another study in 1979, Lewis explored the psychological benefits of being involved in community gardening .

2. Providing Satisfaction

A research study on "nature" and "life satisfaction" show that working in nature directly influences the levels of life satisfaction among people. In a project by Train (1974), the change in the individuals' life satisfaction was measured in the residents of a nursing home for the elderly, who were divided into a

gardening group, a discussion group, and a control group. Life satisfaction levels in each group were tested at the beginning of the project and eight weeks later. Results of the study showed that people who were involved with gardening and nature maintained the same level of satisfaction and self-esteem that they displayed at the beginning of the project. In contrast, those in the experienced significantly decreased levels of self-esteem.

3. Making an Spiritual Relationship with a Garden

Recent research has explored the effects of gardening on human life. One of the claims of some researchers, which has not been empirically proven, concerns the spiritual relationship between a gardener and a garden. In one of these studies, Kaza (1994) explored the role of trees in shaping one's environmental identity, concluding that establishing a spiritual relationship with trees increases healing among patients. Kaza adds that, according to Zen, direct engagement with trees unmediated by projections, memories, ideas, or other distancing mechanisms, can create a spiritual relationship with trees based on three concepts: nature, silence, and void. Through Buddhist training in mindfulness, one observes one's thoughts, emotions, and sense perceptions in detail to reduce reactivity and to develop the capacity for restraint. Thus, one can enter the realm of the tree with respect and attention . In his study of imagery in people/plant communication, Ottobre (1994) explains his gardening experience, through which a relationship between him and his plants developed. He believes that an image can be projected onto a plant, and the plant can reflect it back to the person. In this case, an information loop, a silent dialogue, a "romance" occurs between the person and the plant. Some ancient cultures and philosophies such as Zen, Shinto, and Sufism put great emphasis on this imagery relationship between human and plants, saying that "images have a great deal to do with people-plant relationships. Some of these images are conscious

and some are subconscious, but they all in turn affect people's lives” .

Therapy Programs Using Natural Stimuli

A. Horticultural Therapy

According to the *Encyclopedia Britannica* (2003), “horticulture is grounds laid ornamentally used as places of public entertainment, Branch of agriculture concerned with the cultivation of garden plants—generally fruits, vegetables, flowers, and ornamentals such as plants used for landscaping” (Britannica 2003). In horticultural therapy, plants are utilized as tools for an activity therapy to improve or expand a person's physical and/or mental well-being . Most of the studies on the benefits of gardening have been supportive to horticultural therapy. Although gardening has been common in many countries throughout history, the first serious research on horticultural therapy was done by Leonard Meager in 1699. His advice was “to spend time in the garden, either digging, setting out, or weeding--there is no better way to preserve your health.” In 1812, Benjamin Rush, a physician in Philadelphia, studied the medical benefits of working in garden for the patients with mental disabilities. That was the beginning of experimenting the horticultural therapy for thousands of patients. Since that time, horticultural therapy has been used in some medical centers in Europe such as those in Germany . By World War II, mental patients and their environments received special treatment in the form of horticultural therapy, defined as an active involvement with plant materials and gardening within a clinical program .

As we explained in the section “Benefits of Gardening,” some researchers such as Parsons, Kaplan, Lewis, Train, Kaza, Ottobre, Mooney, Craig, Aldous and Smith, Rice and Remy have proven the psychological, physical, and social benefits of gardening such as increased self-confidence, self-esteem, life satisfaction, and reducing stress on human beings. A study by Airhart, Willis, and Westrick has

shown that horticultural training can improve the self-image and degree of self-sufficiency of adolescent students with mental or physical disabilities . Epstein and Greenberger (1990) studied young people and older men and women participating in a gardening program. The results suggested that this gardening program was very beneficial for making friendships. It also showed that the presence of children seemed to revitalize the older individuals. In another study, Hoffman and Costro-Blanco (1988) showed that horticultural therapy sessions highly improves the in-class behavior of a four-year-old boy, enrolled in a special preschool program, who exhibited a variety of behavioral problems and depression. Lewis and Mattson (1988) experiment on 53 people aged 45 to 99, who were involved with horticultural, social and other activities, showed that participants' preference and frequency scores were greatest for horticultural activities. Several studies have shown the benefits of horticultural therapy on seniors. In one of them Mooney and Milstein (1994) demonstrated the improvement of PAMIE (Physical And Mental Impairment of Function Evaluation) and the MAS (Multi Focus Assessment Scale) in a group of forty seniors who received horticultural therapy for six months. In addition, gardening training can encourage disabled people to become active in society. For example, Relf and Dehart-Bennet (1990) revealed several ways in which businesses that employ persons with retardation can use horticultural therapy.

In another non-academic study by Craig (1994) on some blind people involved with learning gardening in a period of time, showed how most of these people got motivated to put gardening as one part of their daily time table. Jay Stone Rice, a California psychologist, believes that depressed patients who feel powerless to change their lives get in touch with the natural cycles of life when they are in contact with vegetation, which teaches them that there is always a new cycle, a rebirth, a life being renewed . Similarly, Elizabeth.Murray, a horticultural therapist

and gardener, believes that her recovery from cancer was a result of the impact of her garden. She says, "plants connect people to themselves, the earth, each other, even the universe itself. Plants are able to take frazzled minds and tattered spirits and to lift hearts and renew body, mind, and soul. They make people feel deeply calm and untroubled".

B. Color Therapy

Color therapy is another approach to healing that aims to stimulate the patients' inner resources to aid in the recovery of health. Treatment with color was probably first practiced by ancient Egyptians and later on adapted in ancient Greece, India, China, Central America by the Mayans, and North Americans by the native Americans. In the 20th century, the philosopher and educationalist, Rudolf Steiner (1861-1925) developed some theories of color therapy, which lately have been widely accepted. Although studies have demonstrated that colors have profound effects on the emotional and physical behavior of human beings, many of the theories are still scientifically unproven. Most of the studies in past few decades have focused on the ways that color can affect mood and express personality in interior design. In 1985, Penelope Hobhouse made a radical advance in Gertrude Jekyll's theories of color in the garden in her book, *Color in Your Garden*. After that an interest on color associations between plants has started. However, unfortunately, the concept of color as healing in the sense of being designed to ameliorate mood in the garden is rarely mentioned.

Rawlings (2001) believes, "the range of chronic and acute health issues treated by [color] therapists is extensive and improvement is claimed in such conditions are migraine, asthma, eczema, depression, lethargy, the common cold, high and low blood pressure, arthritis, rheumatism, and many mental and emotional problems." The way that colors can affect physical and psychological functions of the human body is related to the way that colors are translated

in the brain. The light energy that we receive converts colors into electrical impulses by red and cone cells. These electrical impulses travel down some one million nerve fibers leading from the retina to the optic nerve. Then the optic nerve conveys messages to the visual cortex in the brain for interpretation in terms of sight-color, relative lightness, and form. Some of these hormones impulses trigger the hypothalamus, which is a biological control center that regulates sleep, hunger, thirst, temperature, and other involuntary functions. It also influences glands in the brain, which affect the metabolism of the entire body.

C. Aromatherapy

According to the *Encyclopedia Britannica* (2003), aromatherapy is a kind of therapy which includes using essential oils and water-based colloids extracted from plant materials to promote physical, emotional, and spiritual health and balance. These oils are also called volatile oils or scents because they turn from liquid to gas at room temperature. Aromatherapy dates back over 6,000 years to ancient Egypt, China, and India. A medieval Persian physician Avicenna is credited with determining the methods for extracting essential oils from plants. In the 1930's, French chemist, Rene Maurice Gattefosse, discovered the benefits of lavender oil when it healed his hand without leaving scars. Gattefosse was the first person who used the term "aromatherapy" to describe the practice of using essential oils taken from plants, flowers, roots, and seeds in healing. After that, this method was widely used in healing French soldiers during World War II. From an aromatherapist point of view, the aromas of oils are not themselves therapeutic. It is the essence of oil and its chemical properties that give them their therapeutic value. Thus, Ernst defines "aromatherapy as the controlled use of plant essences for therapeutic purposes."

Unfortunately, a few studies have been done to prove positive effects of the aromatherapy in healing,

but many therapists believe that it can lead to positive responses and change patients' attitudes or moods. They believe that a universal reaction to certain essential oil scents evoke calm or joy, energize or relieve stress, or impact emotions in several ways . Most of the evidence about positive effects of the aromatherapy refers to its historical use. According to Sandra Buckle, although there is evidence of the positive effects of the aromatherapy and massage on sleep patterns (Asquith 1999) and anxiety , a systematic review by Cook and Ernst (2000) indicates that the effects are small. According to Buckle (2003), Asquith (1999) and Caelli et al. (2001) statically significant evidence show the efficiency of essential oils to fight against bacterial infections. Results of the studies done by Walsch and Wilson (1999) on severely disabled participants in an extended-day neurology unit indicated that patients' daily mood ratings were highest when they received aromatherapy and reflexology. The general questionnaire results suggest a positive reduction in reports of psychological distress by these patients. In another study by Komori, Tanida, Nomura, and Yokayama (1995), twelve depressed men were exposed to citrus fragrance in the air and compared with eight patients not exposed to the fragrance. Both groups were taking prescribed antidepressants. They reported that the dose of antidepressants in the experimental group was significantly reduced. Another study by Dunn (1995) shows that patients who were receiving aromatherapy reported significantly greater improvement in the mood and perceived level of anxiety.

The sense of smell and the memory it brings have rarely been part of the therapeutic interaction . However, during last decade, many studies have been done to examine a wide range of effects that odors have on human psychological process such as mood, memory, and cognition . Through some of these studies, it has been proven that odors are powerful memory stimulants, which can spontaneously sure emotion and auto geographical data . In another

study, Herz (1996) has proven that "olfaction and emotions are the same thing on an evolutionary basis with emotions just a kind of abstracted version of what olfaction tells an organism on a primitive level" . In some other studies, Herz (1995) and Cupchik (1992) and Engen (1973), have shown that how intimately smell, memory, and emotions are related and how fundamental odors are to our feeling . In addition, studies have shown that thinking about a scent can be as powerful as the scent itself . Martin (1996) provides indicators that aromas can play a positive role in healing process. A major weakness in most of the knowledge on aromatherapy is related to the clinical application of aromatherapy in relation to issues of dosage, methods, and therapeutic effects.

Healing Garden

A. What is a healing garden, restorative garden, and therapeutic garden?

According to *Encyclopedia Britannica*, a garden is a plot of ground where herbs, fruits, flowers, vegetables, or trees are cultivated. (Britannica 2003) "People cultivate gardens either to produce food or for aesthetic reasons- to create pleasant surroundings harmonizing flowers, shrubs, and trees within the landscape. Gardens in the second sense comprise plants, water, natural land formations, and architectural elements" (The Academic American Encyclopedia, 2002, 40).

Researchers have different definitions for a healing garden, a restorative garden, and a therapeutic garden. Ulrich (1986) believes that any garden acts as a healing garden. Eckerling (1996) defines the healing garden as "a garden in a healing setting designed to make people feel better." The goal of a healing garden is to make people feel safe, less stressed, more comfortable, and even invigorated. However, Marcus and Barnes (1999) believe that the healing garden is an outdoor or indoor garden space that is specifically designated as healing garden, a garden that heal. In the October 2001 issue of *Landscape Architecture*

Magazine, Clare Cooper Marcus identified seven essential components to creating gardens that heal. They are visibility, sense of security, physiological comfort, opportunities to make choice (seeking privacy or gathering for social support), engagement with nature, familiarity, and unambiguously positive design features. She believes that a garden could be called a healing garden if it possesses one or many of the above characteristics. Framed in this way, the definition is broad and inclusive. Kaufman and Gelarch-Springgs (1998) have limited their definition for healing garden, therapeutic garden, and restorative garden to just gardens in health care facilities.

B. The History of Healing Gardens

According to Warner, restorative gardens which acted as the reflection of individual emotions, cultural training, and social support, originated in Persia, Egypt, and the orient. The first restorative gardens in Europe started during the Middle Ages, when hospitals and monasteries ministering to the sick, the insane, and the infirm often incorporated an arcaded courtyard where residents could find the degree of shelter, sun, or shade on a human scale. During the 14th and 15th centuries, with plague and crop failure and waves of immigration into burgeoning cities, the role of monastic provision declined in medical care. With the decline of monasticism, the significance of restorative gardens declined, and consequently, open spaces attached to hospitals became accidents of local tradition. According to the historical texts in the 17th and in 18th centuries, the tradition of designing courtyards in hospitals in England, France, Italy, and Austria continued. During this time, outdoor spaces in hospitals started to emerge along with scientific medicine and Romanticism. The notion that infections were spread by noxious vapors spawned designs that paid attention to hygiene, fresh air, and cross-ventilation.

In the 18th and 19th centuries, a new wave of designing landscapes in psychiatric hospitals, whereby

gardening and farming became a part of therapeutic regimen, began. With the beginning of the 19th century, pavilion hospitals became the predominant form. In some hospitals, because of a strong belief in the healing benefit of fresh air and sunlight in the recovery process, hospital beds were wheeled out onto sun porches and roofs. Gradually, after World War I, garden work entered the arena in rehabilitation hospitals. In the 20th century with rapid advances in medical science and high-rise construction technology such as elevators, and higher demand for cost efficiency, landscapes in hospitals, balconies, and roofs were replaced by parking, tennis courts, and beautiful entrances. Later on, with higher rates of cancer and AIDS in U.S. cities, the therapeutic effect of the garden was re-discovered. Thus, designing gardens in healthcare facilities gradually became predominant, but none of these gardens were perceived as environments that might contribute to the restoration of health. However, land costs and pressure from insurance companies have resulted in fewer gardens in recent decades. Ignorance of the value of gardens in hospitals might be thought of as analogous to the forgotten psyche and spirit in the treatment of illness.

C. Design of Gardens in Healthcare Facilities

A typology of outdoor spaces that could be designated in health-care buildings was studied by Marcus and Barnes. In this study, the healing garden is differentiated from other kinds of hospital landscapes and gardens such as the landscape grounds, the landscaped setback, the front porch, the entry garden, the courtyard, the plaza, the roof terrace, the roof garden, the meditation garden, the viewing garden, and the walk-in garden. They have defined these spaces as follows:

1. "The landscape ground" is an open space which consists of a landscaped area at ground that forms an outdoor area between buildings.

2. "The landscaped setback" is an area in front of the main entrance to a medical center, usually comprised of lawns and trees.
 3. "The front porch"
 4. "The entry garden" is a landscaped area close to a hospital entrance with a green space with a green image that is designed and detailed for use, unlike "the landscaped setback."
 5. "The courtyard" is a space that forms the core of a building complex that is visible from the main entry. Some elements of this garden are trees for shade, flowers for color, water for relief, and movable seats.
 6. "The plaza" is a paved outdoor area that is furnished for use and hard-surfaced with trees, shrubs, and flowers without a green image.
 7. "The roof terrace" is an accessible outdoor area bounded on one side by a building that often forms a long narrow balcony to the building.
 8. "The roof garden" is an area on top of a hospital building that might be used by patients, staff, and visitors.
 9. "The meditation garden" is a small, very quiet, and enclosed space that is specifically labeled with a plaque as a meditation garden.
 10. "The viewing garden" is a small garden that cannot be entered but can be viewed from inside the building.
 11. "The walk-in garden" is a small space that can be entered from the waiting area or corridor from inside the building.
- a. Designers should note that they are designing a place that should have the ability of healing the spirit.
 - b. As healthcare facilities are high-stress environments for patients, the exterior environments should provide a contrast to the interior space in order to facilitate a sense of "getting away."
 - c. To increase the therapeutic benefits, an enclosure or separation from the world outside should be created. For example, the garden should be far away from noise pollution.
 - d. For minimal confusion, the layout should be readable for all users.
 - e. As orientation and way-finding are very important, they can be developed through the use of landscape features.
 - f. A sense of security, serenity, and safety-with defined seating areas, easily readable pathways, and clear designations should be created.
 - g. A balance between vertical and horizontal elements, and light and shadow should be created in the design.
 - h. The outdoor garden and its directions should be visible from the main entry.
 - i. Boundaryless edges will make people feel awestruck by the extraordinary landscape beyond the edges.
 - j. Pond in the garden and places in which patients can listen to the sound of the water could be very helpful.
 - k. A garden should be divided into areas with varying sizes and different amounts of privacy.
 - l. Places for social interactions are necessary within the garden. Also "private" places in the plan will create the opportunity for patients to process grief, sadness, confusion, and joy.
 - m. The interior and exterior should

Conclusion: Design Guidelines

Studies on healing gardens by Marcus and Barnes, and Delaney, recommend a series of goals and guidelines for improving the design quality :

A. Site Planning and Layout

- a. Designers should note that they are

complement each other. If one of them is private, places for interactions should be designed closer to it.

B. Detail Design

The design should provide the following:

- I. A contrast and harmony in texture, form, color, and arrangement of plant materials.
- II. Wide and smoothly paved surfaces for suitable mobility for patients.
- III. Night-time lighting for therapeutic benefits.
- IV. Seats with views of open spaces, so that the privacy of patients is guaranteed.
- V. Sculpture, wind chimes, aviary, or fish-ponds that provide patients with pleasant memories.

B. Planting Arrangements

- I. In selecting the types and the placement of plants, four criteria should be considered: the aesthetics and the medicinal qualities of plants and the cultural and medical needs of patients.
- II. In planting, a balance in the landscape design between the senses of smell, taste, and touch should be maintained.
- III. Symbolism, metaphor, and allusions based on color-therapy in the distribution of colors in the garden should be used.
- IV. A sense of seasonal change with flowering trees, shrubs, and perennials should be provided in the garden.

C. Users

- I. Since a wide range of users including patients, staff, and visitors, can use the space, a variety of outdoor spaces should be considered in the design.
- II. Garden should be easily accessible to all patients.
- III. Garden should be viewable for the new

people who are entering the hospital from the entrance.

- IV. Views from windows inside the building are very effective in shortening patients' stay in the hospital and creating a lower-cost pain medication.
- V. Balconies and roof terraces should be carefully designed, especially for patients with disabilities in mobility.
- VI. An opportunity to garden should be provided for patients.
- VII. Smoking and eating areas for staff should be considered.

Notes

1. Improving Air Quality: Several researchers have tried to explore the effect of plants on air quality. In one study Wood and Bruchett monitored the responses of the indoor plant to air pollution. During this study, they have measured levels of ascorbic acid, chlorophyll a and b, relative water content, and leaf extract H in three common indoor foliage plant species, to establish an air pollution tolerance index (APTI) for each. Referring to the dangers and risks of poor indoor air quality on health, particularly on the health of susceptible individuals, they concluded that a large number of interior foliage plants can be evaluated and ranked according to their potential ability to tolerate air pollutants and their actual responses to both controlled and ecological pollution levels Wood, R. A. B., Margaret D. (1994). Monitoring Indoor Plant Responses to Air Pollution. The Healing Dimensions of People-Plant Relations, Davis, University of California.

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