

## Therapeutic Gardens in Healthcare : A Review

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### ABSTRACT

Therapeutic garden is gaining popularity as non-pharmacological approach in modern health-care system. It is a type of healing garden mainly used as physical therapy or horticultural therapy programmes which may include both horticultural and non-horticultural activities. These activities are very helpful in treatment of patients, stress reduction of staff and patients, increase in outcome of hospitals, increase in work efficiency and reducing cost of treatment. Therapeutic gardens are mainly designed for patients suffering from mental illnesses like autism, dementia, Alzheimer's disease, etc. In this article, an effort has been made to present an empirical literature on the use of therapeutic gardens in healthcare setting.

**Key words :** Therapeutic garden, horticultural therapy, healing garden, healthcare

### INTRODUCTION

Globally, public health has become a major concern due to changing lifestyle. Presently approximately 350 million people are suffering from depression worldwide (WHO, 2016) and this trend is likely to increase as most of the population is residing in cities (Seto *et al.*, 2012) having concrete jungle. As a result of this trend, improving health of urban populations has become a challenge. India has made great progress in plant food production and emerged as one of the top food producers in the world (Panghal *et al.* 2007, 2009). There are plenty of evidences that green environment provides considerable human health benefits. The historic record of use of horticultural plants for mood refresher dates back 2000 BC in Mesopotamia (Jellicoe and Jellicoe, 1975). During 500 BC, Persians build gardens to delight all the senses by including colourful and fragrant flowers in the garden. In the 1940s, U. S. government established veteran hospital to cure wounded servicemen by introducing flowers and horticultural activities in the hospital (Relf, 2006). Council for Therapy and Rehabilitation through Horticulture has been established in 1973 at the National Arboretum and USDA National Agricultural Library and this again was renamed as American Horticultural Therapy Association in 1988.

Previous studies have shown that there is escalating understanding about the use of gardening activities in hospital outdoor setting for the patients benefit (Clatworthy *et al.*, 2013; Genter *et al.*, 2015). Numerous reports have confirmed that green environment increases psychological well-being, reduces stress, anxiety and depression (Gonzalez *et*

*al.*, 2010; Wood *et al.*, 2016). Because of these benefits from green environments, in recent year many hospitals in the US started using gardens and horticultural activities in patient treatment programmes. Numerous terminologies have been given to these treatment programmes such as garden therapy, therapeutic horticulture and therapeutic gardening. Similarly, gardens planned to support human well-being have been termed as therapeutic gardens, healing gardens and restorative gardens. However, there is slight difference in these gardens.

### Therapeutic Gardens

It has become an integral element of physical and horticultural therapy. This type of garden meets the needs of a particular user or patient and may include both horticultural and non-horticultural activities (Fig. 1, Anonymous, 2012). Therapeutic garden is less determined on curing in a spiritual context and more determined on ameliorating a disease. Different types of therapeutic gardens include Alzheimer's gardens, senior community gardens, cancer gardens and enabling gardens.

### Horticultural Therapy Gardens

This type of garden focuses on the healing effects of horticultural activities (Gonzalez *et al.*, 2011). These gardens consist of raised bed having media and also include flexible and light weighted equipment so that patient can easily do horticultural activities like sowing, weeding and raking. It is easy and comfortable to wheel chair patient to touch and sense the anti stress and medicinal plants in the raised bed.

## Restorative Gardens or Meditation Garden

This type of garden provides restorative value of greenery and nature for stress-reduction and the enhancement of physical and mental energy. The principal elements of a meditation garden focus on the social, physical and psychological needs of the users (Anonymous, 2012).

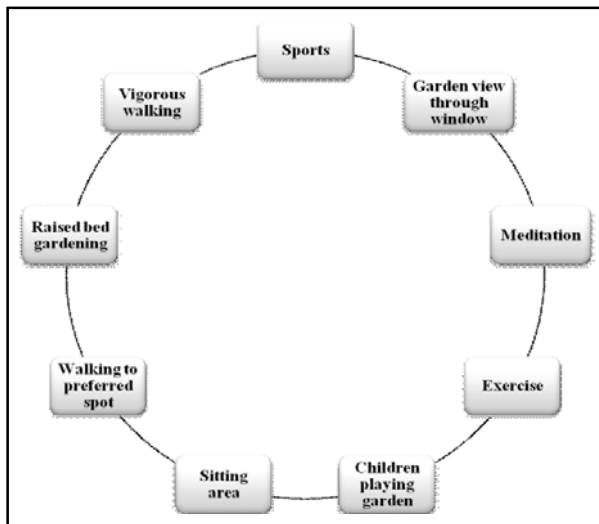


Fig. 1. Potential activities performed in a therapeutic garden.

## Benefits of Therapeutic Gardens

The therapeutic gardens centered on giving mental relief, improvement of bodily signs and enhancement in the overall well-being of patients as well as healthcare staff (Ulrich, 1999). Many studies have shown that therapeutic gardens of all types can provide the benefits. Various categories of the patients can be benefited from therapeutic gardens : Physically and cognitively impaired, Veteran seniors, HIV, Physical therapy, Neurological, Spinal injury, Alzheimer, Dementia, Autistic children, etc.

Researchers have recommended that nature and plant encounters are emphatically connected with physical (Chang and Chen, 2005), psychological (Kaplan, 2001), emotional (Adachi *et al.*, 2000) and cognitive health (Wood *et al.*, 2016) of human. Also, seeing nature of plant is connected to pain relief, fewer requirements of analgesics and quick recuperation from surgery (Park and Mattson, 2009). Zeisel *et al.* (2003) reported the potential of natural environment for recovering the health and behaviour of Alzheimer's patients. Similarly, Edwards *et al.* (2012) demonstrated the positive impact of visiting therapeutic garden for improvement of health of people suffering from

dementia. Rodiek (2002) contemplated the impact of an outdoor garden on mood and stress in aged people and found that cortisol was altogether lower in the garden condition compared to indoor settings which indicated that presence of garden decreased the anxiety level in elderly people. Similarly, less pain and anxiety were recorded from burn patients undergoing dressing when they watched a video of natural scenes combined with music as compared to other patients (Miller *et al.*, 1992). Jiang (2014) reported that horticultural therapy was successful in diminishing the levels of tension and depression in people with mental sickness. Hospital indoor environment can be enhanced by including indoor plants. Many studies have revealed that indoor plants improved indoor air quality by absorbing indoor pollutants and air-borne micro-organisms (Darlington *et al.*, 2001; Wood *et al.*, 2002; Smitha and Thaneshwari, 2018). Bengtsson and Patrik (2014) reported that notwithstanding, enhancing mood and mitigating stress, existence of therapeutic garden, indoor and outdoor gardens, plants and window views of garden can considerably increase satisfaction, boost patient, staff as well as family satisfaction.

## Benefits of Healthcare Gardens for Staff

It has been known for a considerable length of time that medicinal services occupations, for example, nursing are distressing on the grounds that they regularly include over-burden from work requests, absence of control or expert over choices and worry from pivoting shifts (Sharma *et al.*, 2014; Dagget *et al.*, 2016). These conditions have in numerous areas brought down lower work fulfilment, expanded truancy and turnover, added to deficiencies of qualified staff, expanded suppliers' working expenses and disintegrated the nature of care that patients receive (Yada *et al.*, 2017). The significance of hospital gardens for employees enables positive escape from working load and job pressure, simultaneously brings staff satisfaction with the workplace (Brodady *et al.*, 2003).

## Reduction of Cost in Healthcare Facility

In all the public and private hospitals, healthcare manager has pressure of cost reduction without compromising the quality. There are number of evidences that report cost-effectiveness of gardens (Ulrich, 1999, 2002).

## Elements and Principles of Therapeutic Gardening

“Therapeutic garden” is more particular, can be considered like a prescription taken for a particular ailment or sickness. In the book “The Sanctuary Garden” by McDowell Forrest and Clark-McDowell (1998) it has been stated that the success to a therapeutic garden is to honour and celebrate human relationship with nature and soul, not just plants. They have suggested various elements like special entrance, water, colour, garden features and plants for therapeutic gardens. Successful therapeutic gardens include the following principles (Fig. 2) :

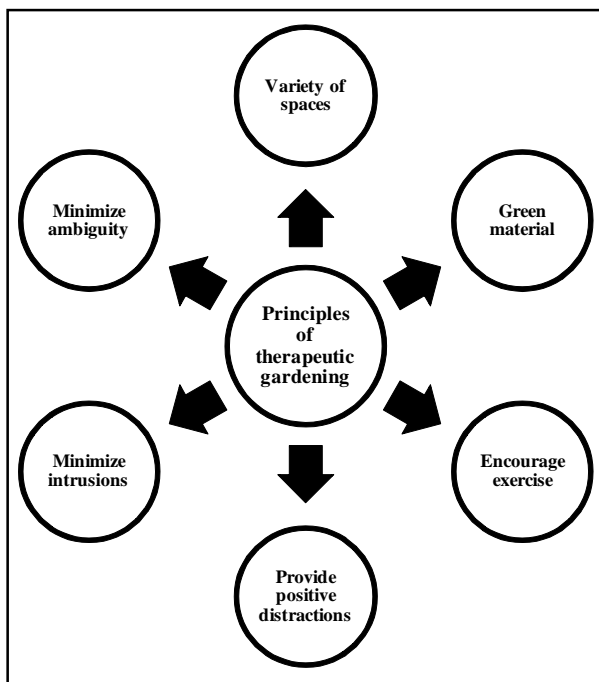


Fig. 2. Principles of therapeutic garden.

### Planting Material for Therapeutic Gardens

“Therapeutic garden” is more precise and relates to a particular aspect of an ailment or therapeutic process. Softscape is crucial element of any healing garden which will determine its therapeutic effects. Flowers like rose, marigold, chrysanthemum and periwinkle are good source of antioxidants and possess pharmacological activity hence their consumption contributes towards improved health and lowers the risk of various diseases (Kumari and Adarsh, 2016; Kumari *et al.*, 2017a; Kumari *et al.*, 2017b). Calixto *et al.* (1998) reported the potential therapeutic benefit of plants belonging to genus *Phyllanthus* in the management of hepatitis B and nefrolitiase. Ashraf *et al.* (2010) isolated eight *Artemisia* species which were widely used by the local people of northern Pakistan

as traditional therapeutics. These species include *A. dubia*, *A. absinthium*, *A. japonica*, *A. maritima*, *A. brevifolia*, *A. moorcroftiana*, *A. vulgaris* and *A. roxburghiana*.

In therapeutic gardens, we can use fragrant plants for pleasing the sense of smell to relax and evoke the patients. *Lavendula officinalis*, *Rosa damascene*, *Mathiolaincana*, *Centaurea cyanus*, *Tuberosa hybrida*, *Lonicera japonica*, *Hiptagebenghalensis*, *Solanum jasminoides*, *Trachelospermum jasminoides*, *Quisqualis indica*, *Tecomajasm inoides*, *Abelia x grandiflora*, *Gardenia jasminoides*, *Cestrum diurnum*, *Murraya exotica*, *Jasminum sambac*, *Cestrum nocturnum*, *Fragaria xananassa* and *Thymus vulgaris* are some of the fragrant plants which can be used in therapeutic gardens.

Plants can be utilized for upgrading the feeling of sound to calm the nerves. Examples are *Bambusa bamboo*, *Peltophorum ferruginium*, *Magnolia grandiflora*, *Platan usorientalis*, *Musa paradisiaca* and *Lavendula officinalis* (attract buzzing bees).

Anti-stress herbs : *Lavandula officinalis*, *Ocimum sanctum*, *Valeriana officinalis*, *Passiflora sp.*, *Rosemarinus officinalis*, *Melissa officinalis*, *Matricari arecutita*, *Piper methysticum*. Plant with a higher phytoncide emission : *Pinus oxberghii*, *Quercus spp.* However, many ornamental plants have toxic and irritant impact on individuals due to release of poisonous latex or sap like *Euphorbia*, presence of fine hairs on leaves like comfrey or stinging weeds or development of noxious berries bearing thistles or sting. Such plants need to be maintained a strategic distance from the garden and should be replaced with some alternative plants (Table 1).

## CONCLUSION

Beautiful blossoms and foliage plants could be a complementary medication for patients. Moreover, plants give significant remedial contact, particularly for patients spending quite a bit of their time indoor while recuperating from agonizing surgery. This review paper furnishes solid confirmation that presence of plants is straightforwardly helpful to patients’ well-being. This non-pharmacological complementary approach enhances prosperity and obviously financially savvy to patients, as well as to medical coverage organizations by decreasing the expenses of hospitalization and medication utilization. Medicinal services experts and doctor’s facility overseers need to think about the utilization of ornamental plants to upgrade healing environment for

Table 1. Alternate plants used in place of toxic, thorny and irritant plant for dementia specific therapeutic garden patients (Kim Grove, 2012)

Popular toxic plants	Type of toxicity	Non-toxic alternatives
<i>Hyacinthoides non-scripta</i>	Poisonous	<i>Fritillaria</i> sp.; <i>Ixiolirion tataricum</i> ; <i>Anemone</i> sp.
<i>Helleborus niger</i>	Poisonous, Skin irritant	<i>Crocus sieberi</i> ; <i>Epimedium</i> sp.; <i>Trillium grandiflorum</i>
<i>Narcissus</i> sp.	Poisonous, Skin irritant	<i>Crocus sieberi</i> ; <i>Fritillaria</i>
<i>Daphne odorata</i>	Poisonous, Skin irritant	<i>Mahonia japonica</i> ; <i>Jasmine nudiflorum</i> ; <i>Chimonanthus praecox</i>
<i>Chaenomeles x superba</i>	Thorny	<i>Ribessanguineum</i>
<i>Digitalis</i> sp.	Poisonous	<i>Alcearosea</i> ; <i>Gauralindheimeri</i>
<i>Ilex aquifolium</i>	Poisonous, Thorny, Skin irritant	<i>Cotoneaster salicifolus</i> ; <i>Sarcococca confusa</i>
<i>Iris</i> sp.	Skin irritant	<i>Hemerocallis fulva</i> ; <i>Crococsmia x crocosmiiflora</i>
<i>Delphinium</i> sp.	Poisonous	<i>Althea rosea</i> ; <i>Verbascum</i> sp.
<i>Nicotiana glauca</i>	Poisonous	<i>Antirrhinum majus</i> ; <i>Fuchsia</i> sp.
<i>Lupinus</i> sp.	Poisonous	<i>Althea rosea</i> ; <i>Verbascum</i> sp.

patients. Henceforth, it can be concluded from this review that healing value of therapeutic gardens is a complementary technique of medicine.

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