



ASSESSMENT OF THERAPEUTIC IMPACTS OF ADAPTABLE RECREATIONAL SPACES IN ORTHOPAEDIC HOSPITALS DESIGN: A LITERATURE REVIEW

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ABSTRACT

Healthcare facilities and their surrounding outdoor spaces forms part of an everyday landscape especially for inpatients. As such the trend now is to have hospital environments that brings patients close to nature so as to enhance their recovery. Accordingly, orthopaedic patients are mostly required to stay long during recovery, to enable persons with physical limitations acquire or maintain skills that will allow them to function optimally with the least amount of assistance and participate as fully as possible in the society. The aim of this research therefore, is to assess the therapeutic impact of recreational spaces that are amenable in a hospital setting. Reviewing literatures was considered as the most appropriate approach for this study. The criteria for inclusion of literatures was relevance of research work to the study with regards to the therapeutic impacts of recreation spaces with focus on literatures range from 1998 to 2018. Publications were further stratified into themes concerning the physical environment in healthcare settings and in doing so forty-two articles were determined to be eligible for evidence analysis. The research found five key components of therapeutic healing in hospital design spaces namely; aquatic features, physio therapy, and natural-view, music and noise. Consequently, the research brings to fore the design features that can accommodate recreational spaces to be gardens, courtyards, water bodies, indoor gym, seating areas, and walkways. This paper thus recommends that it is possible to integrate therapeutic features in the design of orthopaedic hospitals.

Keywords: *Aqua-therapy, Healing garden, Positive distraction, Stress reduction, Therapeutic spaces*

INTRODUCTION

Healthcare facilities and their surrounding outdoor spaces are some of the largest and most complex of all public institutions, because of the various activities carried out within this setting.

Moreover, it is spatially detached from the urban fabric in people's mind and entered sole in the case of an emergence or only when the need arises. However, to soften this public perception it is important to introduce a different design

approach from the usual norm by implementing new content (Adams, 2008). The increasing interest in research studies all over the world on the benefits of physical surrounds as it affects health and well-being is based on the realization that good indoor and outdoor design do not only procreate functional efficiency, but also strengthen health processes (Dilani, 2001; Rashid and Zimring 2008). Similar research remarks that patients who viewed trees had shorter post-operative stays, took fewer pain relief drugs, and had a favourable response about their outcomes in medical notes when compared to those exposed to view a brick wall (Altimier, 2004). There is therefore, need for a patient-centred architectural design of healthcare facilities among landscape architects and other service providers (Reiling, 2006). It requires healthcare architects/designers making an effort to shape and reshape the healing environment, addressing patients' needs to provide satisfying healing experience and achieve desired outcomes of perceived service quality. (Gutteling *et al*, 2008).

Overview of Therapeutic Landscape.

The idea of healing spaces dates back to the ancient Greek era, when temples dedicated to gods served as places where people afflicted with infirmities go to, hopeful of having dreams that will reveal the cures of their ailment. The *Epidaurus* sanctuary built for the god *Asclepius* is one of such examples (Ananth, 2008). However, the notion of "therapeutic landscape" was introduced first by medical geographers, referring to places that poses noteworthy natural or artificial features capable of enhancing wellbeing and health (Velarde, Fry. and

Tveit, 2007). For centuries, ideas have evolved about the positive effects the natural surroundings, wild nature as well as enclosed gardens can have on man's health and well-being by spending time in it (Gerlach-Spriggs *et al.*, 1998; Cooper Marcus & Barnes, 1999). According to Ulrich (1984), the first report about the measurable effects of nature's influence on health was recorded and published in 1984. Sequel to that, other scholars have attested to the benefit derived from such environment. Every garden is said to have a healing effect even if it is not present in its design intentions (Ji, 2010; Dargan *et al.*, 2007; Marcus and Barnes, 1999). However, the 20th century witnessed a lot of technological advancement both in the field of medicine and building construction. By the turn of new millennium, the recognition of possible restorative benefits of nature had started to disappear as the emphasis of hospital design shifted towards increasing staff's efficiency and away from creating a therapeutic environment. Thus, hospitals erected during the Modern movement resemble high-rise office buildings, with large parking lots that replaced traditional gardens (Dejana *et al.*, 2010).

RESEARCH METHOD

In view of assessing the role of therapeutic recreational spaces in the hospital setting, and its impacts on patients, visitors and staffs' wellbeing. Reviewing literatures was considered the appropriate method in determining the spaces that can create a supportive healing environment for occupants. The criteria for inclusion of literatures was relevance of research work to the study with regards to the title and abstract context, date of publication, from the year

1998 to 2018 which is twenty years. Publications were further stratified into themes concerning the physical environment in healthcare settings. The results from searching several electronic databases using keywords and combinations such as horticultural, physio, aquatic and auditory therapy, healing garden, healing environment,

stress reduction, positive distraction. However, news items, monographs, duplicates, encyclopaedia articles, non-English publication and editorials were excluded from the materials used in this review.

CLASSIFICATION OF THE HEALING ENVIRONMENT

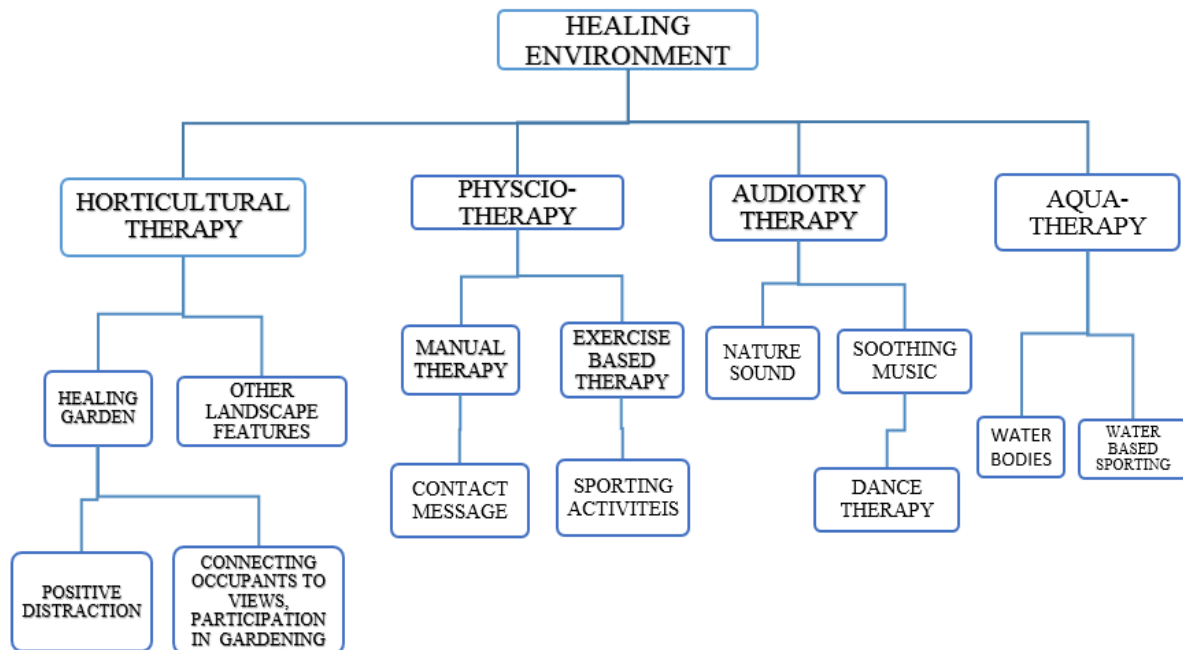


Fig 1: Types of therapies that constitute a healing environment based on studies reviewed. Source: Iyendo, 2016.

Healing environment as shown in figure 1, The four types of healing environment each is subdivided into the passive and the active recreation. From the left horticultural therapy is subdivided into healing garden involving passive (seating within the garden) and active (participation in gardening) which is intended to connect occupants to the natural views. Secondly, Physio-therapy consist of manual exercise such as body messages carried out in spa and active

participation in exercises that may be land or water based. Auditory Therapy involves the use of sound as an element intended to bring relaxation to patients and for active use such as dance therapy. Aquatic-therapies are water-based interventions that helps person with limitations because of the unique characteristics of water which includes buoyancy, osmolality, its temperature, viscosity and hydrostatic pressure.

Table 1. Showing summary of analysed literatures, Key findings/result and recommendation

AUTHOR/YEAR	COUNTRY	RESULTS AND FINDINGS	RECOMMENTIONS
<p><u>LANDSCAPE ENVIROMENT</u> Ulrich, (1999). Whitehouse et al., (2001), Dijkstra, et al. (2006). Ulrich, R. Craig, Z. (2004), Kaplan and Berman (2010), Cooper, M. and Sachs (2013).</p>	<p>- Chicago, United States of America Twente, Netherlands -Michigan, United States of America -Ann Abor, United States of America. New Zealand.</p>	<ul style="list-style-type: none"> • Reduce staff stress and fatigue. • Increase effectiveness in delivering care. • Improve patient safety. • Reduce stress and improve clinical outcomes. • Reduce patient length of stay 	<ul style="list-style-type: none"> • Provide views of nature and other positive distractions. • Provide single-bed rooms in almost all situations • Incorporate fountains, ponds and water features in the courtyard and other spaces. Design ward layouts and nurses stations to reduce staff walking and fatigue.
<p><u>AUDITORY THERAPY</u> Daniel, E. (2016), Parker, D.A (2008), Schneider, et al., (2007) Alfredo, R, et al. (2013). Garred, R. (2006). Strzemecka, J. (2013)</p>	<p>-United Kingdom -Berlin, Germany. -United States of America -Barcelona, Spain - Biala Podlaska, Poland</p>	<p>4.0 Soothing music decreased anxiety depression, blood pressure, and relieve pain. 7. Improve mobility in stroke patients. significant improvements in social functioning and general health. I. Ocean sounds improve postoperative patient sleep. I. Reduce stress correlated outcomes.</p>	<p>I. Introduce background sounds, music, ocean waves, rain showers. K. Low noise level through the use of sound absorbing building materialse zoning is critical in location of recovery rooms. K. storage areas, staff lounges and utility rooms should be located away from patient rooms</p>
<p><u>AQUATIC THERAPY</u> Taglietti et al. 2018 Broach &Dattilo, (2003) Haff, G. et al. (2008) Burgdorf & Panksepp, (2006).</p>	<p>Vila, Brazil. -Alabama, United States of America -United Kingdom Ohio, united state</p>	<p>I. Extended positive emotions, decreases in blood pressure. I. Social fun. I. Keep weight off joints and muscles. 7. increased range of motion and flexibility. 7. improves metabolism and calorie burning of weight.</p>	<p>I. Provide artificial water views; Ponds and fountains. I. In cooperate pools for aerobic exercise. I. Provide water safety equipment.</p>

<p><u>PHYSIO-THERAPY</u> Farida, <i>et al.</i> (2013) Abd El-Kader, (2013). Buckworth & Dishman, (2002). Smyth, Zawadski, & Gerin, (2013).</p>	<p>-Kano, Northwest Nigeria. Egypt - United Kingdom -United Kingdom</p>	<ul style="list-style-type: none"> • Increases the range of motion. • Promotes a better healing environment for patients. • Increases mobility and general wellbeing. • Relief from physical symptoms, illness or trauma 	<p>6.0 Provide Courts such as basketball, football, volley ball, badminton, table tennis. 6.1 Indoor Gym Facility. 6.2 Simple access to wheelchairs, walkers and props.</p>
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Benefit of viewing landscape and other natural elements

From Table 1, the benefits of viewing landscape and gardens in healthcare settings are highlighted in the third column. More also, a research carried out by Ulrich (1999), in which four hospital gardens were evaluated in San Francisco, a team of experts used a combination of behavioural observation and interview methods. The results showed that, after spending time outside, 79% of the patients felt "more relaxed and calmer", 25% sensed "refreshed and stronger", 22% were "able to think and cope" and only 5% did not feel any particular change. These indicates that visual exposure to plants and other nature lasting few minutes can foster considerable restoration or recovery from stress. It is important to emphasize that broadly parallel findings have been obtained when stressed patients in healthcare settings have been visually exposed to nature major findings from several research (Ulrich, 1999; Whitehouse et al, 2001; Ulrich, R. and Craig, Z., 2004; Farida, 2013) suggesting that there are positive effects in viewing natural scenes they include but not limited to restoration from stress, Increase effectiveness in delivering care among hospital staffs, and improves medical outcomes.

Design recommendation for location of green spaces and natural spaces

Restorative garden locations are very important and should be well planned from conceptual stage. These gardens customarily are the highlights of healing centres and nursing homes outdoor (Gerlach-Spriggs, et al. 2014). The garden nurseries are helpful for push alleviation, easing physical side effects (Marcus, 2017). Franklin (2013), contends that Stress levels among patients appears to diminish when they are within the sight of plants, blossoms, and water. In the Child and Adolescent Mental Health Unit at Great Ormond Street Hospital, developing vegetables have helpful incentive for youngsters with dietary issues (Mitrione and Larson, 2017). Courtyards are the focal and regularly utilized spaces in a healing facility building complex. They have a tendency to be utilized more by patients and guests, if they are easily visible and spacious enough to counteract stuffing. Courtyard features may include landscaped tree-shaded areas, water features, flowerbeds and moveable seats; due to privacy and security as well as aesthetics, they may be fenced.

Benefits of benefits of physio-therapy on patient

The second role of Table 1 summarizes the impact of exercise therapies on clinical outcomes. It is usually aimed towards reclamation of normal musculoskeletal capacity, to diminish pain and beneath the site of damage caused by sicknesses or wounds through neuro revised instruction. Fortunately, enjoyable exercise activity has also been associated with emotional well-being (Buckworth and Dishman, 2002). However, Henderson as cited in Michael et al, (2017) opines that the loss of mobility further decreases self-esteem to carry out recreational activities. Chronic stress is experienced when a person is faced with repeated or ongoing exposure to acute stressors (Smyth, Zawadski, and Gerin, 2013).

Design recommendation for Physiotherapy

The location, size and type of spaces provided for exercise therapy will determine the nature of exercise that will take place within. Special attention ought to be given to the space requirement for equipment, wall and floor finish specifications. The design should provide easy access and independence, as well as stress reducing structural elements such as walking paths, alongside indoor gym for patients to encourage exercise, and play areas for children. Outside zones,

which are normally cleared and outfitted, ought to enable simple access to wheelchairs, walkers, active ball courts such as basketball, football, volley ball, badminton, table tennis also encourage exercise.

Benefits of aquatic-therapy

Many people suffering from disabling conditions, such as Multiple Sclerosis (MS) find it difficult to partake in land-based physical activities due to their physical impairment (Broach and Dattilo, 2003; Broach, 2004). Nevertheless, aquatic therapy provides an ideal solution in which individuals enjoy enhanced freedom to roam, better independence, reduced body temperature, less stress on the muscles, lower relative energy consumption, limits the fear of falling (Broach, 2004). Aquatic therapy (AT) facilitate positive emotions thus, contributing to adherence to the activity (Broach&Dattilo,2003) as well as improved health and longevity (Seligman, 2002). Carruthers and Hood (2004) contend that while water provides an ideal environment for enjoyable activity the most recent review about the use of aquatic exercise for the management of knee and hip osteoarthritis showed that it can be effective at the end of treatment with a small effect on pain, function, and quality of life (Hochberg *et al* 2012: & Bartels *et al*, 2016).



Fig 2: Group of women receiving routine exercise instruction in a pool.
Source: *Everyday Health*, 2011.

Design recommendation for Aqua-Therapy

Water bodies such as Fountains, should be incorporated in or around courtyards and entrances to provide pleasant scenes and ornamentation. Ponds and pools are small bodies of still water that should also be used in the gardens or parks. They allow for swimming, paddling and support of plants that cannot grow on plain soil. They are used for an aesthetic and also increase humidity of an area. Cascades are alternative way water can be used in an hospital setting. This consist of falling water from a high level which may be maintained in its natural state known as water fall or artificially influenced to attain the best effect. It causes cooling also and add natural beauty to the environment.

CONCLUSION

To sum up, this systematic review of literature, which involved studies evaluating amenable recreational spaces in hospitals, findings indicates that, viewing certain types of nature and garden scenes for longer periods not only helps to calm patients, but can also foster improvement in clinical outcomes. Hence

designers of the built environment ought to put into consideration how best to integrate landscapes features, the location, size and type of spaces required for each particular therapy as it varies, as this will determine the nature of activity that will take place within. Special attention should be given to the space requirement for equipment, wall and floor finish specifications not neglecting hospital protocols and guidelines. The design should provide easy access and independence, as well as stress reducing structural elements such as walking ways in gardens, fountains, pools, courtyards, alongside indoor gym for patients to encourage exercise, and also play areas for children. it is therefore concluded that the aforementioned design considerations are not just necessary but also important in creating a supportive patient-centred architectural design of healthcare facilities for orthopaedic patients.

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