

HEALING ENVIRONMENT: SENSES, NATURE, AND PSYCHOLOGY PRINCIPLES IN HEALTHCARE BUILDINGS

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ABSTRACT

Healthcare Buildings are a group of buildings with various health support functions. Nowadays, Healthcare Buildings are not only limited to hospitals and physical treatment, but also mental health and addiction treatment such as Addiction Treatment Centers to Healing Centers that focus on psychological treatment. To support a faster healing process through the patient's psychology while seeking medical treatment, a Healing Environment approach is needed. This paper aims to find out how the theory, application, and impact of the Healing Environment approach with its three main principles, namely nature, senses, and psychology in the patient's healing process. This paper is prepared by referring to literature studies and analyzing selected case studies by making scientific arguments. The discussion in this paper will be divided into two (2) main sections. The first part will discuss the theory of Healing Environment that focuses on the principles of Healing Environment, and the second part is the analysis of Healthcare Buildings case studies that use these principles.

Keywords: *Healing Environment, Healthcare Buildings, Nature, Senses, Psychology.*

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1. INTRODUCTION

Health is a very important and fundamental thing for an individual. The rapid development of the health sector has caused researchers to make various improvements and innovations involving design and the environment in the planning of healthcare buildings. Healthcare buildings are buildings that used for various health service functions, such as hospitals, healing/wellness centers, addiction centers, nursing homes, spa centers, and so on. These buildings have been designed with various approaches with the main goal of supporting the patient's recovery process. One approach that is commonly used in Healthcare Buildings is the Healing Environment approach. Healing Environment is a physical environment that is carefully designed to support the recovery and well-being of individuals which includes several factors such as space design, natural lighting, natural access, temperature regulation and other aspects that create a positive environment to accelerate the recovery process (Ratodi etc.,2024). Healing Environment not only focuses on physical healing, but also looks deeper into a person's emotional, mental and social state which is resolved through the design of the surrounding



environment. Therefore, a design approach is needed that can create an environment that is safe, comfortable, and can help the healing process.

The concept of Healing Environment evolved from the Ancient Egyptian civilization beginning with the Temple of Imhotep that used natural scenery, spirituality, and design that stimulated the senses, with the main focus of patient well-being, which is still relevant to the design of modern healthcare environments. In the 20th century, the healing environment approach became more dominant, where health professionals realized how important psychological and emotional conditions are in supporting their healing process. Ulrich's research in 1992 suggests that the environment in healthcare facilities has a major influence on the quality of the healing process that takes place in them. In 2004, he explained that in addition to the necessary aspects of human psychology and the five senses in supporting the healing of patients. Other research shows that access to green spaces such as parks can reduce stress levels, which affect sleep quality, and accelerate healing. This research became the basis for applying natural elements in the design of healthcare buildings. Today, the Healing Environment approach is an integrated concept with healthcare and environmental design, which goes beyond physical design to create an environment that supports the psychological well-being of individuals.

2. RESEARCH METHODS

The method used in this research is descriptive analysis which is used to get a theory of something that really happened which is proven by a literature review to support the theory presented. The theory and data are analyzed qualitatively based on scientific thinking and argumentation.

3. RESULTS AND DISCUSSION

Healing Environment Theory

Healing Environment is the concept of forming a care environment that integrates the physical and psychological aspects of patients in it which aims to accelerate the healing process (J. L. Beggs, 2009). Healing Environment is an integral concept in the world of health and environmental design that is able to create a physical environment that supports the physical, emotional, psychological healing process of individuals. Healing environment is a therapeutic environment design that combines natural, sensory and psychological elements (Murphy, 2008). According to Knecht (2010), Healing Environment is a supportive physical and cultural environment that nurtures the physical, intellectual, social, and spiritual well-being of patients, their families and administrators, and coworkers, supporting the healing and recovery process, as well as to cope with the stress of illness, treatment, medical visits and recovery

Based on these theories, Healing Environment not only aims for physical healing, but also to the psychological aspects and well-being of individuals to create a positive environment. A positive environment is believed to stimulate more positive feelings, higher motivation, and lower stress levels. This concept is based on the understanding of research results in the book *Health and Human Behavior*, where in the healing process of patients, environmental factors play a 40% of role when compared to other factors (Kaplan, 1993).



In its development, there are several theories that underlie the concept of Healing Environment. These theories explain the impact of the environment on the healing process. This theory continues to evolve and be refined along with the times, especially in the fields of health, design, architecture, and the environment.

1) Stress Reduction Theory

The stress reduction theory was discovered by S. Ulrich, whose theory focuses on the stress levels that can be reduced by the physical environment. In one of his studies, "View Through A Window May Influence Recovery From Surgery" in 1984, Ulrich explained how the natural scenery that patients see from indoors can reduce stress levels and speed up the healing process. In this study, there are several important things in the context of design that can be concluded, including

a. Nature as a reducer

These aspects of nature include natural light, natural air circulation, green areas and natural views. Patients who had access to natural scenery through their inpatient room windows tended to have a shorter hospital stay than those who did not have access to natural scenery from their inpatient room.

b. Biophilic design

Biophilic design is a design concept that emphasizes the integration of natural elements in the designed building or environment. This design is made to mimic the natural setting so as to create a sense of connection between the design, the individual, and the surrounding environment.

2) Social Connection Theory

This theory was proposed by Julianne Holt-Lunstad, who emphasized the importance of social connection in one's health. In this research, it was found that social connection is essential in physical and mental health and recovery. This theory has had a good impact in the fields of health and psychology, by prioritizing social connections and interactions in the healing process over the imposition of social isolation. The healing environment approach is closely related to this theory, where positive social connections have a significant impact on patient recovery. Patients' stress levels can decrease because they feel connected to others, which results in better mental health and positive feelings. In the context of architecture and environmental design, the healing environment approach through social connection theory is expected to create a space that is able to facilitate good social interaction between patients, medical personnel, and families so that patients can feel connected and receive mental support.

These two theories play an important role in the development of the healing environment concept, which includes the main principles of the healing environment, namely senses, nature, and psychology.

Principle of Healing Environment

1) Senses

In this principle, the design should stimulate the five human senses through smell, sight, texture, and sound.



a. Scent through the sense of smell

a) Theory

Certain scents can affect how a person feels, promote relaxation, reduce stress, and improve quality of life. In the journal "The Effects of Peppermint on Exercise Performance", scents such as peppermint or eucalyptus can aid muscle relaxation, stimulate deep breathing, and improve focus. Lavender scents are also believed to be calming.

b) Design Implications

The application of this principle in design can be in the form of an aromatic flower garden, where there are lavender paths along the garden walkway while around the seating area jasmine and chamomile can be planted to provide a calm atmosphere.

b. Color through the sense of sight

a) Theory

The senses through color play a role in mood swings, and a person's physiological responses. Color is used to create spaces that support mental health and physical recovery. Generally, health care buildings use neutral colors such as white and beige that build a comfortable atmosphere. In addition to these colors there are several more colors that can create a positive space. In "Interventions to reduce short-wavelength ("blue") light exposure at night and their effects on sleep: A systematic review and meta-analysis", exposure to blue light, especially at night, can inhibit the production of melatonin, a hormone that induces drowsiness and helps the body enter a natural sleep rhythm, which is important for regulating the sleep cycle.

b) Design Implications

Recovery rooms can use pastel blue or light green to create a calm atmosphere. While rooms can use neutral colors such as beige.

c. Texture through the sense of touch

a) Theory

The design requires the use of materials with comfortable and natural textures, such as wood, natural stone, or surfaces with smooth textures that provide a sense of touch, to improve the patient's sense of touch.

b) Design Implications

Spaces can use different floor textures, either between fellow indoor areas, or transitioning to outdoor areas. Generally, the indoor floor can use a non-rough wood texture, and the outdoor area can use a rough stone texture. This also applies to the wall area, which can be given access or a play of textures and materials.

d. Sound through the sense of hearing

a) Theory

In the book *Healing Environment Combining Health and Architecture for Healthier Living* (2024), natural sounds such as the sound of running water and wind can stimulate feelings of relaxation and improve sleep. In addition to utilizing sounds from nature, it can also be helped with the help of music and good acoustic design.



b) Design Implications

The design can be in the form of pools created in certain areas of healthcare buildings, where the sound of the water can be heard up to the patient rooms, for example outdoor pools where the sound can be heard through the inpatient room openings. This also applies to wind noise. Meanwhile, music from the device can also be another option when the sound of the pool water cannot reach the patient's room.

2) Nature

In this principle, nature acts as a provider of positive impact and energy on a person's psyche which is considered to be able to provide a feeling of relaxation and comfort to both the body and mind. This principle includes many aspects such as natural lighting, natural ventilation, natural scenery and natural access

a. Natural lighting

a) Theory

In one of Roger S. Ulrich's theories, he provides an idea of the impact of daylighting on an individual's physical and mental well-being, where daylighting is believed to reduce stress levels, improve mood, and regulate circadian rhythms related to the release of hormones that play a role in the process.

b) Design Implications

Comfortable daylighting can be applied to the design through sufficient window openings by taking into account the orientation of the building and the selection of materials such as glass walls, transparent facades, or window glass that minimizes light reflection.

b. Ventilation

a) Theory

According to Santamouris (2001) in the book *Building Ventilation: The State of the Art*, he explains that natural ventilation is essential for improving indoor air quality and achieving thermal comfort. Natural ventilation can control indoor air pollution because the air is always changing so that the occupants' health is better maintained.

b) Design Implications

The design implication can be natural ventilation where air flows through the space through openings on two opposite sides of the room, driven by differences in wind pressure and temperature, so that thermal comfort can be achieved

c. Nature views and access

a) Theory

There is a need for natural areas such as gardens that can be seen from the windows of the room which can give patients a sense of connection with the surrounding nature and provide a sense of calm.

b) Design Implications

Design implications can include gardens, play areas, sitting areas, fish ponds and warm water pools. Generally, garden areas are filled with flowers that have a calming scent such as lavender. Garden paths are also created by placing flowers along the path. The garden area can also be utilized as an area for light exercise

and relaxing. Meanwhile, the pond with the sound of water is believed to create a calming feel through the sonic effect of falling water, making it suitable for relaxation and meditation. Natural stones can also be placed around the pond to add a natural feel.

3) Psychology

This principle is a combination of the principles of nature and the senses, both of which produce a psychological impact on patients that supports the healing process. In addition, in the context of physical facilities, gathering spaces should be provided for social activities to foster social interaction, as well as experts such as psychologists.

Case study of Healing Environment application in Healthcare Buildings

Nowadays, there are many healthcare buildings that use the concept and approach of healing environment. Each building has its own way of processing this concept to be applied to its building design.

1) Raga Svara Wellness Center

Raga Svara Wellness Center is a healing center located in Rajko, India, which focuses on the philosophical, aesthetic, therapeutic, and ecological well-being of oneself and its relationship with the surrounding environment. Raga Svara's logo "Pause" means that people who enter this building can pause, reflect, and release the body to synergize with nature, so this building prioritizes the use of the surrounding nature as a healing container.



Figure 1. Raga Svara Wellness Center

Source: ArchDaily

The building brings together the linearity of the site, the existing mature trees, the placement of large canopies, the farmland, and the natural site. The building is made to relate to the outside landscape, where some side walls are made with large openings to enjoy the view of lush vegetation, while the roof is simply made of exposed horizontal concrete slabs. Incoming light can be maximized and a calm and natural atmosphere can be enjoyed by the senses.



Figure 2. Raga Svara Wellness Center exterior

Source: ArchDaily

The reception area seems to provide a view that stretches from the ground to the roof. The roof is covered with hanging vines that act as a green curtain upon entering the lobby to give a good first impression.



Figure 3. Raga Svara Wellness Center reception lobby

Source: ArchDaily

Giant trees are also found around the swimming pool, library, restaurant and meeting rooms. The library is located right under the banyan tree. The ceiling of the pool area is symmetrically perforated and has granite stairs.

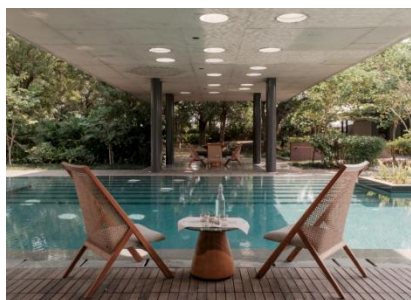


Figure 4. Raga Svara Wellness Center pool area

Source: ArchDaily

In the yoga area, glass openings are made with large dimensions to maximize natural lighting and take advantage of the surrounding visuals, which are also applied to the guest rooms. The building also utilizes many natural materials such as natural

stone, and the use of solid wood and rattan that dominates the furniture inside which gives a natural impression.



Figure 5. Raga Svara Wellness yoga and bedroom area

Source: ArchDaily

There are winding paths amidst the lush landscape that connect the building to the natural surroundings. There are also plenty of spots to rest or just relax. In one of the outdoor areas, there is an amphitheater covered with grass that can be used as a meditation spot that is in direct contact with nature.

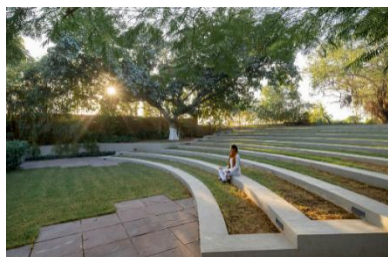


Figure 6. Raga Svara Wellness yoga outdoor meditation area

Source: ArchDaily

2) Mayo Clinic Cancer Treatment Center, Arizona

Mayo clinic is a cancer treatment center that has implemented the principles of healing environment well. The most striking principle is the utilization of natural light by large window openings that allow sunlight to enter the room, which can improve the mood of



Figure 7. Mayo Clinic Arizona

Source : mayoclinic.org

The interior of the room is also well designed, using neutral colors such as beige, combined with blue which is believed to give a feeling of relaxation. The windows are made with large enough dimensions to provide access to the outside view for patients



Figure 8. Mayo Clinic room
Source : dunhameng.com

The cancer treatment center also has a patient-accessible therapy garden, which provides ample green space with park benches, so that patients can take a break while looking at the surrounding scenery or doing small exercises that can support the healing process.



Figure 9. Mayo Clinic park
Source : mayo.edu

3) Soham Wellness Center

Soham Wellness Center is a fitness facility located in Bali, Indonesia that facilitates activities such as gym, yoga, aerobics, and reflexology. This building has applied the principle of healing environment where, in some rooms, it uses natural lighting through large glass windows, such as in the pilates room and gym.

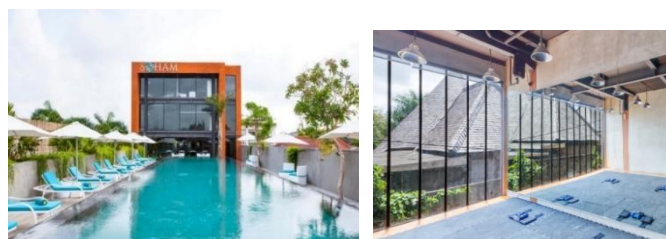


Figure 10. Soham Wellness Center
Source : mayo.edu

In private rooms such as the women's spa, natural light is maximized by the use of glass blocks, so that light can still enter the room without disturbing the privacy of the users in it.



Figure 11. Soham Wellness Center spa room

Source : mayo.edu

On the wall of the wellness room, right behind the jacuzzi, there is an accent wall made of artificial fish arranged to form an art pattern. The accent wall, which is a work of art, is then responded to by the senses of sight, the eyes, and then affects the psychology of its users. This wall accent also stimulates the ability of the sense of touch through its three-dimensional shape. This wall accent is also found in other rooms such as the reflexology room and spa.



Figure 12. Soham Wellness Center wellness area

Source : mayo.edu

Soham wellness center also provides an outdoor swimming pool with vegetation around the pool that brings a natural feel to visitors and provides a relaxing feeling. The pool is also equipped with benches so that visitors can relax and enjoy the atmosphere of the pool.



Figure 13. Soham Wellness Center pool area

Source : mayo.edu

4) Amati Spa Wellnes Center

Amati Spa Wellness Center is a healing center in Ubud, Bali, that offers fitness facilities such as sauna, spa, jaccuzi, swimming pool, and healthy restaurant. There is a lot of vegetation on the outside and inside of the building to bring a natural atmosphere and a sense of comfort.



Figure 14. Amati Spa Wellness Center

Source: Google

Natural lighting is maximized with openings and the use of *glassblock* in private rooms such as spa rooms so that natural light can still enter without disturbing the privacy inside.



Figure 15. Amati Spa Wellness Center spa room

Source: Google

The interior of the room is dominated by beige and warm colors with warm white lighting to create a comfortable atmosphere. The sauna area is made with natural wood materials and equipped with aroma therapy to stimulate the sense of smell and build a atmosphere.



Figure 16. Amati Spa Wellness Center sauna room

Source: Google

In the *whirlpool* area, small rocks are placed around the pool which serves to increase the feeling of relaxation and can be felt by the sense of touch. There is also a fish pond with vegetation around it that creates a microclimate in the building and affects the air conditioning so that the air becomes cooler.



Figure 17. Amati Spa Wellness Center whirlpool area

Source: Google



Figure 18. Amati Spa Wellness Center fish pool area

Source: Google

In the outdoor area, there is a flower garden and fish pond located near the healthy restaurant that can be accessed by visitors. The visuals of the flower garden can be well responded to by the sense of sight, while the aroma of the flowers is responded to by the sense of smell, adding to the visitors' feeling of relaxation.



Figure 19. Amati Spa Wellness Center flower garden

Source: Google

5) Naman Pure Spa

Naman Pure Spa is a two-storey building with the main activity function of treatment and wellness. On the ground floor there is an open space landscape surrounded by a tranquil lotus pond. On the second floor are treatment rooms plus a large exhibition space. The building is kept cool by the use of lush vegetation. The building has facilities for fitness and relaxation activities, such as a yoga area gym room, jacuzzi, cabana, library, spa room, rinse room, male and female lockers.



Figure 20. Naman Pure Spa
Source: ArchDaily

This building applies a vertical and horizontal cross ventilation system, namely with openings that are designed to face but on the other side of the opening is in the upper position so that air circulation can move optimally in the building so as to create a sense of relaxation and comfort because of the cool air.

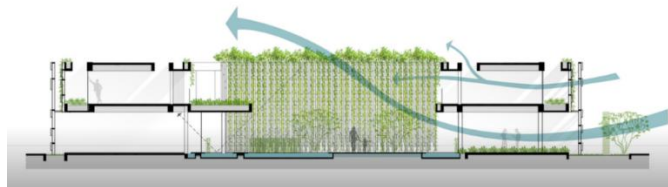


Figure 21. Cross ventilation in Naman Pure Spa
Source: ArchDaily

Hanging vegetation and passive shading devices in the form of shading are found in the corridor and lobby space which functions as a barrier to direct sunlight.

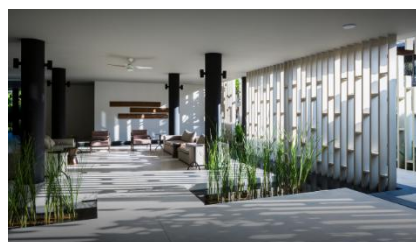


Figure 22. Corridor shading in Naman Pure Spa
Source: ArchDaily

This building uses natural lighting in its spaces, including the Spa room, where the use of glass on the outer wall of the spa room allows light to enter and become a source of natural lighting for the room and visitors can see the natural scenery that comes from the vegetation around the building.



Figure 23. Naman Pure Spa, spa room
Source: ArchDaily

One part of the space is made open by applying waterscape elements in the form of a low-level pool to provide psychological tranquility, as well as acting as a sensory stimulator by touching the pool water, looking around the pool, and hearing the splash of pool water that comes into contact with the hand.

4. CONCLUSION

Healing environment is a design concept approach where the physical environment is well designed to support the recovery and well-being of individuals which includes several factors such as sensory, natural, and psychological. The role of these three factors can be achieved through good space design, natural lighting, natural access, temperature regulation and other aspects that create a positive environment to accelerate the recovery process. This design approach has been widely developed and applied to healthcare buildings. The indoor space as a place where patients spend more time must be well organized so as to help accelerate the healing process through good patient psychology and not be burdened by being in the space of a hospital or other healthcare buildings. In addition, the concept of healing environment is also applied to the outdoor area as a supporting area for patient recovery. The outdoor area can be designed by utilizing plants that have direct functions and efficacy on the patient's mood. Outdoor areas such as parks can also provide physical benefits to patients, such as giving patients the option to simply walk around the park and enjoy the view. With the advent of this design approach and the development of the concept, planners and architects have helped patients to heal faster.

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