

Architecture for Healing and Rehabilitation

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Abstract

There was a time when mental illnesses were dismissed as being non-existent- when the concept of health was linked primarily with the physical functioning of one's body. Today, there is significant acknowledgment of the healing and rehabilitative needs of the mentally ill. In addition, existing research on environmental psychology has shed light on the power of the environment to influence the activity as well as the psychological well-being of the person experiencing the space. That said, given the diverse and complex nature of the topic, the role of architecture in assisting healing and rehabilitation among the psychologically disturbed is yet to be explored in depth. Research on design considerations for the improvement of the mental state of individuals is in its infancy. This study investigates the architectural and spatial design considerations to be undertaken to leverage the power of architecture in the healing and rehabilitation of those experiencing different forms of anxiety disorders.

Keywords

Post Traumatic Stress Disorder (PTSD), Trauma-Informed Design, Evidence-Based Design (EBD), Gender-Based Violence (GBV), Healing Garden, Creative Stimulation.

1. Introduction

To design a successful user experience, many architects and designers have emphasized the significance of considering all five senses during the design process. Many techniques have been introduced to help those who are physically challenged, but little is being done to help those who feel helpless and confined because of mental diseases or traumatic events. The spaces that we experience have a direct influence on how we feel. While a dark and narrow alley would make us feel restricted and anxious, an open space with greens makes us feel enthusiastic and content. This simple example suggests that the power of the built environment in influencing emotions as well as behaviors of the occupants is quite considerable. At a time when mental health illnesses are increasing significantly, it makes sense to try and leverage the power of design and architecture to facilitate healing and rehabilitation, especially for people who are vulnerable to mental health conditions. While the study in this area is limited, the existing academic papers on this topic suggest that architecture's role in healing and rehabilitation is quite promising. This paper is an attempt to summarize the existing state of knowledge

about rehabilitative architecture; it explores the various architectural and space design considerations to be undertaken for the creation of rehabilitative and healing spaces. The concept of architectural determinism holds that the built environment influences the viewer's behavior within a designated space [1]. This suggests that architecture has a direct influence on the emotions of the perceiver. However, the little existing research that draws associations between the built environment and the perceiver's well-being relies on a small pool of participants. This generalization is somewhat inappropriate. Besides, the power of the built environment on human psychology is not addressed to its full potential. This gap in existing research as well as interest in the topic made the topic "Architecture for Healing and Rehabilitation" appropriate for selection.

2. Objectives

- To investigate the architectural and spatial design considerations for a rehabilitative and healing space.
- To identify the design elements that either trigger or relax people experiencing different

kinds of anxiety disorders.

- To explore the role of recreational spaces and activities in promoting the healing and rehabilitation of patients.
- To understand the role of healing gardens and therapeutic landscaping elements in promoting positive experiences among the residents in a rehabilitative facility.

3. Methodology

The methodology of the research includes two primary steps- literature review and case study. Through the literature review, the existing knowledge on the subject as well as the research gaps are identified. Then, appropriate case studies are selected based on the gaps identified. The case study is intended to provide a clearer picture of the relationship between architecture and healing in the local context.

4. Literature Review

4.1 Design Elements and Their Influence on Participants diagnosed with PTSD

With an increase in the global prevalence of mental illnesses as well as the awareness of the impact of the built environment on holistic health, the significance of designing spaces for better mental health is ever increasing. However, while the role of therapists and psychologists in rehabilitating individuals after trauma or other mental illnesses has been identified, the constructive role of rehabilitative spaces has often been downplayed. The concept of Evidence-based design (EBD) is currently being explored by experts to establish relationships between design and architectural elements and consequences such as efficiency and safety in ensuring better decision-making during the design process [2]. The scope of EBD, however, is significantly limited to the creation of safe and efficient spaces, what patients and families are looking for is a holistic healing experience [2]. Architects and designers are trying to address this gap while exploring the associations between healing and the built environment. Among the very few scholarly articles that explore the concept of trauma-informed design is one titled “Investigating Architectural and Space Design Considerations for Post-Traumatic Stress Disorder (PTSD) Patients”.

In their research paper, Khanade and colleagues (2018) explore the concept of trauma-informed design, elucidating the architectural considerations to be made when designing for PTSD (Post Traumatic Stress Disorder) patients. The researchers conducted semi-structured interviews with five combat veterans (gender: male and mean age 39.2) diagnosed with PTSD to identify their expectations and experiences with physical indoor as well as outdoor spaces [3]. A thematic analysis of the interviews conducted allowed the researchers to identify certain design elements as harming the patients and others having a positive impact. The findings of the experiment have been tabulated below (Table 1).

Design Element	Effect on the Patients
Blind Spot	Triggered
Narrow Pathways	Triggered
Sharp Corners	Triggered
Furniture Clutter	Triggered
Open Spaces with Situational Awareness	Relaxed
Interaction Spaces	Relaxed
Increased Privacy in Living Areas	Relaxed
Familiarity in Layout	Relaxed
Access to Several Exit Points	Relaxed

Table 1: Design Elements and Effect on the Patients

While the limited number of participants in the mentioned research deems the established guidelines inadequate in terms of appropriation for generalization, the research does establish the groundwork for trauma-informed design. Additionally, the enthusiastic participation of the PTSD-diagnosed veterans emphasizes the need to explore the concept of rehabilitative architecture, not just for study but for implementation in design at a time when mental health illnesses are proliferating at a much higher rate.

4.2 Recreational Spaces and their Role in Healing and Rehabilitation

In a research paper published in The Journal of Psychosocial Rehabilitation and Mental Health, Jagannathan and colleagues (2021) inspect the effectiveness of recreation as a rehabilitative procedure, particularly for those individuals who have

been diagnosed with one or more mental health disorders. The researchers conducted semi-structured surveys among eleven patients (63 % male and 37% female; mean age of 34.45 years) in Psychiatric Rehabilitation Services who had been participating in recreational activities (both online and offline) and conducted a thematic analysis of the interviews [4]. The participants of the research had been diagnosed with a variety of mental health disorders- four participants with schizophrenia, four with Intellectual Disabilities, two with Bipolar Affective Disorder (BPAD), and one with the combination of BPAD and cerebral palsy and the use of recreational activities as a rehabilitation method for these individuals provided important insight to effective rehabilitation [4]. Recreational activities were conducted every Saturday for one hour via online or offline mediums. Some of the activities conducted online were identifying the difference between two images, identifying the odd one out, dancing, singing, gathering household objects with a particular color, etc and some activities conducted offline were musical chairs, bowling, etc [4]. The participants were allowed to choose the activities that they wanted to participate in and were expected to provide reviews on their experiences. The researchers also analyzed the qualitative feedback that the participants had provided with or without the assistance of a helper, in the form of written records in hospital files [4]. The research revealed that the participants experienced the different perks of attending recreation sessions like meaningful engagement in activities, opportunities for socialization, the experience of positive emotions, etc., and the participation in these activities, in turn, corresponded to an increase in ease of rehabilitation [4]. Whether the activities were conducted online or offline did not make much of a difference, they demonstrated a direct correlation with improvement in the mental state of the participants. By the end of the paper, the researchers strongly establish that participation in recreational activities has a positive influence on mental health patients who experience enhanced mental capabilities as well as better psychological well-being through regular participation.

The findings established by Jagannathan, and colleagues indicate the need for an architecture that caters to the recreational needs of individuals, for those with and without mental health illness diagnoses. While recreation has been looked upon as a privilege, it can be a necessary antidote for people

with mental illnesses.

In her TedTalk, Sternberg (2014) claims that places can positively influence healing. As someone who experienced the healing power of spaces herself after spending some time in Greece after her arthritis diagnosis, Sternberg seemed hell-bound on demonstrating to the world why we need to be more careful about how we design hospitals and rehabilitative spaces. Sternberg identifies factors such as crowding, noise, too little or too much light, foul smell, mazes, etc in design and architecture that can have a negative effect on a person's healing journey within a place. Further, Sternberg points out how research has identified a direct correlation between images and odor exposure and the subject's mood. A 1984 study conducted by Roger Ulrich revealed that patients recovering from gall bladder surgeries, who had a view of a grove of trees outside of their hospital windows healed a day sooner, needed less medication, and had fewer negative nurses' notes in comparison to those who had the view of a brick wall [5]. Likewise, views of nature provide shots of endorphins, corresponding to an elevation in the perceiver's mood [5]. On the other hand, odors are chemicals that affect brain function- induce slow-wave sleep in animals [5]. These findings reinforce the claim that spaces can go much beyond making people happy- they can proactively help them heal, not, physically, mentally as well as emotionally.

4.3 Participation in Recreational Activities for Improved Mental Health

There are two distinct ways in which individuals can engage with the outdoors to improve their mental health- by encountering the natural environment (witnessing nature and activities taking place in it) and by interacting with elements within the natural environment (interacting with animals or nature, for instance, through horticulture) [6]. Further, nature-based interventions have been studied extensively for the rehabilitation and empowerment of individuals in institutions such as care homes, prisons, and mental health facilities [6]. The different nature-based interventions identified are green-care (gardening, farming animals, tree-hugging, etc) and blue-space interventions (activities such as fishing, canoeing, etc in surrounding water bodies) [6]. The existence of research in this field suggests that there has been an increasing inclination toward the use of structured and deliberate use of the outdoors for its

healing benefits. However, there is little evidence on how strongly outdoor contact can impact mental well-being and for how long. The existing research employs qualitative methods for analysis and has not been validated by triangulation. David and colleagues (2020) demonstrate an effort to provide a quantitative analysis of the mental-health impacts of a disadvantaged group's engagement in a unique recreational activity- a community-based sustainable building project.

Davies and colleagues (2020) explore the relationship between participation in sustainable building projects and a subsequent decrease in self-reported mental health illnesses such as anxiety and depression. In the experiment, individuals with poor mental health and social connections, belonging to disadvantaged groups, worked in groups of six to twelve, in a community-based sustainable construction project each full day for an eight-week period in which they used materials such as lime render, straw, cob, timber, etc and were taught traditional construction techniques [6]. Self-report data were collected before and after the experiment to conduct quantitative as well as qualitative analyses [6]. The study was divided into two different parts- in the first study, 93 participants had never participated in any kind of employment, training, or educational activity (68 male, 20 females, and 5 not disclosed; average age: 19 years) [6]. In the second study, 55 participants were either long-term unemployed, diagnosed with longstanding depression, or seeking asylum (40 male, 15 female, and mean age: 36 years) [6]. The analysis of the self-report data collected before and after the intervention revealed that 53% of the individuals with reported anxiety demonstrated reliable improvement and 58% of those with reported depression did the same [6]. The study suggested that participating in small-scale sustainable outdoor construction projects led to improvement in the mental health status of individuals who otherwise continued to struggle with poor mental health and social connections.

4.4 Healing Garden & Therapeutic Landscaping Elements

Ulrich's Theory of Supportive Garden Design provides the premise for deciding the main dimensions for designing an effective healing garden- (1) a sense of control and privacy, (2) views of nature and other positive distractions, (3) opportunities for physical movement, and (4) settings that facilitate

social interaction [7]. Stigsdotter and Grahn (2002) provide an interesting perspective whereby they state that healing gardens and therapeutic landscape elements affect individuals differently, depending on their life situation and their mental power. The writers highlight that an effective healing garden must be designed with the realization that different visitors have different types of involvement, which is a direct consequence of their differences in mental power. Grahn has devised a pyramid (see Figure 1) that illustrates the need for environments with smaller demands at the top (for individuals with higher mental power) and higher demands at the bottom (for individuals with lower mental power) [8].

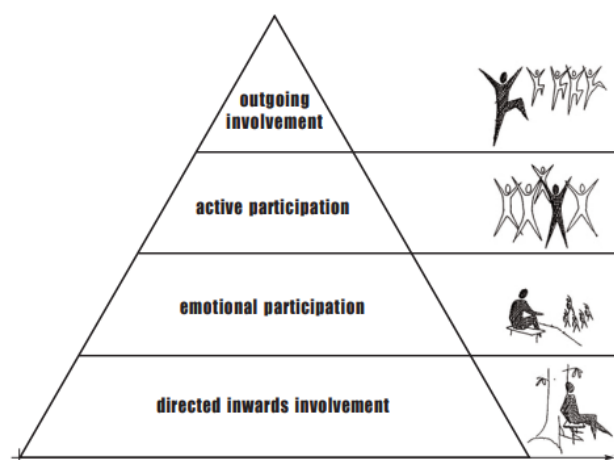


Figure 1: Level/ Type of Involvement Depending on the Individual's Mental Power. Source: Stigsdotter & Grahn (2002)

4.5 The Association of Green Spaces with Mental Well-Being

In their systematic review, Zhang and colleagues (2020) identify enhanced resilience and mental health as the most prominent benefits of accessibility to green spaces. According to the review, the beneficial association between green spaces and decreased risk of depression and anxiety was evident, across socio-economic and demographic variables [9]. Both direct experiences with green spaces and participation in physical activities in the natural outdoor environment have demonstrated a direct association with decreased fatigue, negative emotions, and lower psychological distress [9]. The research by Zhang and colleagues (2020) also emphasizes that green space can serve multiple purposes, such as mixing learning, working, leisure, and entertainment and that it is something that future designer should consider.

Barton & Rogerson (2017) go one step further in elucidating the application of green spaces in designing structured therapeutic interventions for particularly vulnerable groups such as at-risk adolescents, those with dementia or mental illness, probationers, and stressed employees [10]. Wilderness therapy, social and therapeutic gardening, aided environmental conservation, care farming, ecotherapy, nature-based arts and crafts, and animal-assisted treatments are all examples of therapeutic interventions that leverage the healing power of nature and green spaces [10]. Barton and Rogerson suggest that the positive influence of nature on individuals with self-esteem or behavioral issues stems from the ability of wilderness greenspaces to serve as “vehicles for reflection” [10]. Not just in rehabilitation centers and hospitals but in temples and monasteries, visitors benefit from the inclusion of green spaces in landscaping design (See Figure 2).



Figure 2: Evora Monastery in Portugal. Source: Barton & Rogerson (2017)

The association between green spaces and mental well-being serves as a guiding factor for architects and designers who are willing to harness the full ability of spaces to have positive cognitive effects on the mental

health of those inhabiting or experiencing distinct spaces.

4.6 Spaces for Creative Stimulation and Mental Health

According to Stahl (2008), in a single day, the average human has 60,000 intrusive thoughts and creative activities can help focus the mind; such activities have been compared to meditation because of their relaxing effects on the brain and body. Spaces that allow room for creative stimulation, thus, ensure a positive consequence on the mental health of the participants. Dr. Cathy Malchiodi, a psychologist and art therapist, cited numerous research in 2015 that showed that being creative can boost positive emotions, lower depressive symptoms, reduce stress, reduce anxiety, and even improve immune system function [11]. Spending time on creative goals during the day relates to higher activated positive affect (PA) on that day, according to a 2016 study published in *The Journal of Positive Psychology* [11]. Further, studies demonstrate that venues for creative interaction can help people with dementia reconnect with their personalities and sharpen their senses, as well as minimize depression and isolation [12]. The secret to the positive stimulation in holistic human health is the release of natural antidepressants called endorphins, serotonin, and dopamine when an individual is engaged in any creative activity [11].

As pointed out by Brenner, (2019) the brain behaves similarly during creative activities to how it reacts in the time of yoga and mindfulness exercises and meditation, all of which are meant to help you find peace, quiet, and happiness by obstructing outside stimuli. There is evidence that participating in artistic activities, whether as an observer of others’ creative endeavors or as an initiator of one’s own creative endeavors, can improve one’s sentiments, emotional states, and other psychological states as well as have a significant impact on key physiological parameters [13]. Thus, spaces that allow engagement in creative behaviors such as coloring, painting, creating models, etc enhance mental health, physical health, and brain function. Such activities in a constructive space calm nerves, improve mood, and even decrease one’s heart rate.

4.7 Architecture and Healing Constructs

Healing is a considerably more challenging outcome to quantify than regaining health. Healing is a lengthy process that hardly ever results from a single intervention [2]. There are eight different components of healing as identified by internal, interpersonal, behavioral, external, psychological, self-efficacy, social and functional (See Figure 3).

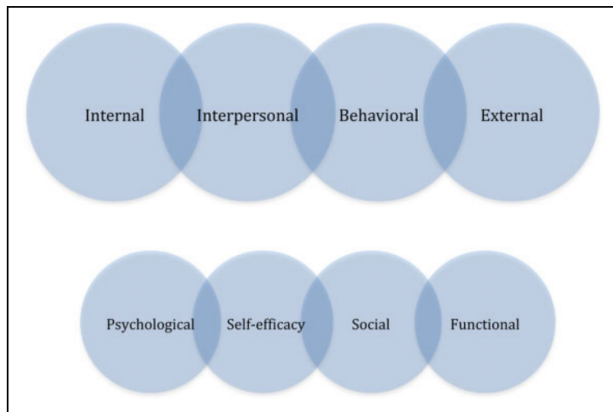


Figure 3: The Domain of Healing Spaces. Source: DuBose, et al. (2018)

DuBose and colleagues, (2018) while exploring the power of environmental design in positively influencing healing and wellness, discuss the positive role of environmental variables such as “homelike environment, access to views and nature, light, noise control, barrier-free environment, and room layout” in improving social, functional, and psychological constructs associated with healing [2]. While the architectural elements used in design can directly influence healing, another significant aspect to be considered during design is that architecture determines human behavior that has a direct influence on the healing experiences of those experiencing the space (see Figure 4) [2]. While the built environment itself might not correspond to healing, it can enable participation in emotions and behaviors that assist healing; for instance, the space can activate emotional as well as physical responses such as joy, happiness, and relaxation, while enhancing functionality and individual control which are prerequisites for healing [2]. As pointed out by Schroeder and colleagues, physical environments which influence social interactions, like those with peers and family, and physical settings, determine how social relationships and interactions are experienced [14]. For instance, a space can guide individuals to engage in making subtle conversations with other trauma survivors,

providing them strength and facilitating their healing process.

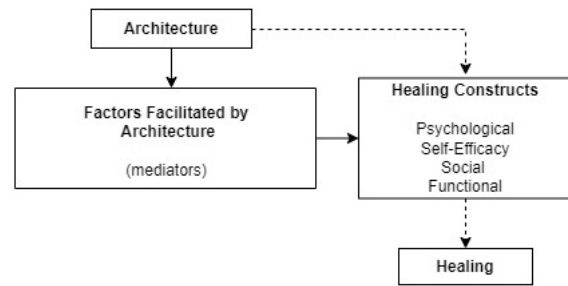


Figure 4: Schematic Representation of how Architecture Influences Healing. Source: DuBose, et al. (2018)

4.8 The Concept of Trauma-Informed Design

The concept of trauma-informed care stems from the concept of acknowledging the widespread impact of trauma and delivering care in a way that promotes healing while avoiding re-traumatization. The cornerstones of trauma-informed care include safety, trustworthiness, and transparency, as well as peer support, cooperation, mutuality, empowerment, voice, and choice, as well as cultural, historical, and gender equality [14]. Through careful consideration of each of these grounding principles, the concept of trauma-informed care can be implemented to reduce vulnerability and assist healing of the victims. Researchers have established a direct relationship between certain architectural elements and their influence on the mental health of the occupants. For instance, depression is linked to a lack of personal outdoor access, a lack of green space, and poor walkability [14]. Likewise, increased congestion, industrial use, and facilities for toxic chemicals correspond directly to anxiety and recommendation of anxiolytics [14]. Increased noise pollution in the neighborhood, exposure to artificial light, and proximity to traffic are factors that induce stress among adolescents; however, the introduction of greenspaces can buffer such destructive effects [14]. Certain design characteristics in buildings such as the use of bars and wires in windows, police cameras, etc may elicit feelings of danger; on the other hand, Murals created by the community may help to build communal cohesion [14]. Likewise, greenspace is linked to less psychological discomfort, less rage, and fewer psychiatric drug prescriptions [14]. These findings provide guidelines on how architects and designers should integrate elements of

trauma-informed to transition from designing efficient and safe spaces to spaces that promote holistic healing and well-being.

4.9 Inference

The research conducted reinforces the idea that a positive built environment can have a rehabilitative influence on those that are experiencing the space; spaces and activities conducted within these spaces can allow the rehabilitation of people who suffer from different forms of anxiety issues. Existing research highlights the role of architectural design elements as well as nature in positively influencing the people who need rehabilitation. For instance, participants showed that they felt more relaxed in wide spaces that raised their situational awareness, unlike when they experienced design aspects such as blind spots, limited passageways, sharp curves, and others that often startled them. Other factors that helped design "healing" spaces were: plenty of open spaces for interaction, increased privacy in living areas and retreats, absence of blind spots, familiarity with the layout, lack of furniture clutter, facilitation of peer interaction, and access to multiple exit points, and so on. In increasing social, functional, and psychological dimensions linked with recovery, variables including the homelike setting, accessibility to views and nature, light, noise management, barrier-free environment, and room arrangement. While the built environment may not always directly correspond to healing, it can facilitate the expression of emotions and behaviors that promote healing. For example, the space can elicit emotional as well as physical responses such as joy, happiness, and relaxation, while also improving the functionality and individual control, all of which are necessary for healing. These inferences, however, have been drawn from international case studies and their relevance in the national context remains largely unexplored. So, this gap in the national context is to be explored through a national case study. The central objective of the case study is to determine the healing and rehabilitative quality of one of the rehabilitation centers existing in Kathmandu and to analyze how effectively it was soliciting stress-relieving effects through design, architecture and landscaping elements.

4.10 Framework for Case Study

Main objective	Specific objective	Research Variables	questions/Data sources
- To investigate the architectural and spatial design considerations for a rehabilitative and healing space	- To identify the design elements that either trigger or relax people experiencing different kinds of anxiety disorders.	-Blind Spots	-Observation + Drawing Study + Questionnaire
		-Narrow Pathways	-Observation + Drawing Study + Questionnaire
		-Sharp Corners	-Observation + Drawing Study + Questionnaire
		-Dark Alleyways	-Observation + Questionnaire
		-Cluttered Furniture	-Observation + Questionnaire
		-Noise Pollution	-Observation + Interviews + Questionnaire
		-Poor Walkability	-Observation + Drawing Study + Questionnaire
		-Use of Bars/ Wires in Windows	-Observation + Questionnaire
		-Surveillance Cameras	-Observation + Questionnaire
		-Privacy in Retreat/ Living Areas	-Observation + Drawing Study -Questionnaire -Observation + Drawing Study + Questionnaire
-Personal Outdoor Access -Open/ Interaction Spaces -Access to Several Exit Points -Familiarity in Layout -Access to Views of Nature -Art Works			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
			-Observation + Questionnaire
-To explore the role of recreational spaces and activities in promoting the healing and rehabilitation of patients.		-Spaces for Recreation	-Observation + Questionnaire
		-Recreational Activities (Singing, Dancing, Creating Artwork, etc.)	-Observation + Questionnaire
		-Socialization Activities	-Observation + Questionnaire
		-Interaction with elements in the natural environment (gardening, farming, tree-hugging, etc.)	-Observation + Questionnaire
		-Meditation, Mindfulness, and Yoga Activities	-Observation + Questionnaire
-To understand the role of healing gardens and therapeutic landscaping elements in promoting positive experiences among the patients.		-A sense of control and privacy	-Observation + Questionnaire
		-Views of nature and other positive distractions	-Observation + Questionnaire
		-Opportunities for physical movement	-Observation + Questionnaire
		-Settings that facilitate social interaction.	-Observation + Questionnaire
			-Observation + Questionnaire

5. Case Study

5.1 Background of the Organization

Casa Nepal is a residential rehabilitation center for female Gender Based Violence survivors and their children. Survivors who have experienced gender-based violence (GBV) are referred to Casa Nepal by the Nepali Police, Women and Children Offices, GBV Watch groups, and other NGOs that advocate women's rights. Casa Nepal offers comprehensive case management that is personalized and focused on the needs of each survivor. Some of

the crucial services that survivors receive in the safe home include psycho- social counseling, medical care, legal counseling, various therapies, and skill development training. The physical, mental, and emotional state of women who come to Casa Nepal, seeking shelter varies from one woman to another but it is given that the shelter deals with some of the most sensitive cases of violence survivors. Social exclusion, psychological anguish, mental diseases, anxiety and mood disorders, and substance abuse are among the issues that gender-based violence frequently causes. The significance of psychosocial support for GBV survivors and their children is therefore paramount.

5.2 Method of Case Study

The primary purpose of the case study was to conduct a visual survey to identify the presence or absence of the key design elements noted in the literature review. In addition to the visual survey, the questionnaire method was used to realize the effects of each of the design and architectural elements on the residents of the complex, at the specified time. The sample consisted of a total of six participants, (females; Age-21-45 years) all of whom had stayed at the complex for over two months. The questionnaire featured a total of twenty-five questions (excluding their age) which required them to rate how the architectural and design elements made them feel or would make them feel. Based on the analysis of their responses, the general effect on the residents was noted. The ratings have been tabulated alongside (Table 2, Table 3 and Table 4):

5.2.1 Ratings Based on Framework Established: Design Elements

Variable	Present- "X" / Absent- ""	Effect on the Survivors
Blind Spots		Positive, relaxed.
Narrow Pathways		Positive, relaxed.
Sharp Corners	X	Negative; triggered.
Dark Alleyways		Positive, relaxed.
Cluttered Furniture		Positive, relaxed.
Noise Pollution		Positive, relaxed.
Poor Walkability		Positive, relaxed.
Use of Bars/ Wires in Windows	X	Negative; triggered.
Surveillance Cameras	X	Somewhat triggered.
Privacy in Retreat/ Living Areas	X	Positive, relaxed.
Personal Outdoor Access		Somewhat constricted.
Open/ Interaction Spaces	X	Positive, relaxed.
Access to Several Exit Points		Negative, trapped
Familiarity in Layout	X	Positive, relaxed.
Access to Views of Nature	X	Positive, relaxed.
Art Works	X	Positive, relaxed.

Table 2 Design Elements and Effect on Survivors

5.2.2 Ratings Based on Framework Established: Recreational Spaces and Activities

Variable	Present- "X" / Absent ""	Effect on the Survivors
Space for Recreation (Play Area for Children)	X	Positive, relaxed.
Spaces for Meditation, Mindfulness, and Yoga Activities	X	Positive, relaxed.
Recreational Activities (Singing, Dancing, Creating Artwork, etc.)	X	Positive, relaxed.
Socialization Activities	X	Positive, relaxed.
Interaction with elements in the natural environment (gardening, farming, tree-hugging, etc.)	X	Positive, relaxed.

Table 3 Recreational Spaces, Activities and Effect on Survivors

5.2.3 Ratings Based on Framework Established: Healing Garden and Therapeutic Landscaping Elements

Variable	Present- "X" / Absent ""	Effect on the Patient
A sense of control and privacy		Somewhat triggered.
Views of nature and other positive distractions	X	Positive, relaxed.
Opportunities for physical movement	X	Positive, relaxed.
Settings that facilitate social interaction.	X	Positive, relaxed.

Table 4 Healing Garden, Therapeutic Landscaping Elements and Effect on the Patients

5.3 Lessons Learnt from Case Study

Casa Nepal is one of the very few women’s centers in Nepal designed by taking into consideration the different architectural elements and their influence on the road to the mental recovery of the survivors. Unlike other adaptive reuse women’s centers that focus primarily on catering to the physical need for shelter, Casa Nepal demonstrates the careful incorporation of design elements, recreational spaces and activities, and healing garden and therapeutic landscaping elements to ease the mental and emotional scar of the survivors. That said, there are some aspects of healing and rehabilitative architecture that are lacking in the case study conducted. The use of barbed wires in windows, surveillance cameras, the absence of a sense of privacy and control in living areas, etc. are some of the design considerations that made the survivors within the shelter uncomfortable and anxious.

6. Conclusion and RECOMMENDATION

6.1 Conclusion

This study attempted to engage in research linked to architectural and space design considerations outside the traditional realm of rehabilitative and healing architecture. The research was able to identify various design elements that either trigger or relax people experiencing psychological programs. It also identified the positive roles of recreational spaces, activities, healing gardens, and therapeutic landscaping elements within a rehabilitative facility. Although the analysis and final design interventions shown here do not result in any built work, the study's future expansion might enable the construction of therapeutic spaces that could then be used for rehabilitation and healing. It could also enable the effective evaluation of the existing rehabilitation centers within and outside Nepal. A good approach would ultimately result in a better in-vivo therapeutic paradigm by explicitly reducing symptoms in patients suffering from various forms of anxiety disorders.

6.2 Limitations

The first limitation was the inability to interact with patients with moderate to severe psychological conditions; research was based on interviews obtained from patients with mild psychological conditions only. Diverse patients' accounts of their experiences with positive as well as negative architectural and landscape design elements would have provided a detailed and rich quality to the data collected via second and third-hand sources. However, since most patients with psychological distress belong to a vulnerable population, engagement or research studies could not be conducted for their well-being. The time allotted for this project (about four months) limited this study's ability to do research outside the conventional field of rehabilitative and healing architecture. It takes a lot of time and effort to wade through extensive research and consult specialists to completely comprehend a complex topic like healing, which, unlike physical health, cannot be measured through direct measures. Because of time limitations, there was increased reliance on literature already published on the topic. Only one case study (with a limited number of participants (6)) nested within the regional context could be done. In terms of the scope of the study itself, the complexity associated with the concept of healing is yet another limitation. One must

understand that healing can be aided or hindered by built settings, but it is ultimately a profoundly human process impacted by individual attributes and social relationships.

6.3 Recommendations

This project begins to fill a gap in research exploring the use of architectural and spatial design elements as therapeutic tools in rehabilitative care. While this study offers a broad perspective on the topic of "rehabilitation and healing," more research could help narrow the overall methodology and findings down to suit the rehabilitative and healing needs of patients with varying levels of psychological distress. For instance, groups with low and high psychological distresses might react differently to the same architectural and space design elements and they might have significantly different needs in terms of design suited for rehabilitation and healing.

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