

Design of Mood Disorder Treatment Clinic with Biophilic Approach to Improving the Treatment Quality

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ABSTRACT

Mental illness can be divided into different categories, with mood disorders being the most common. Accordingly, this cultural-therapeutic clinic was established to provide a blissful and cordial atmosphere for the medical, psychological, and emotional treatment of people with mood disorders. Today, doctors worldwide prescribe various medications to treat mental illness, sometimes leading to backfire and other psychological problems for patients. Many of the psychological problems of human beings arise from distancing themselves from nature and being trapped in the world of modernity and modern machines. Research has shown that a return to and direct contact with nature improves a person's mental state. Therefore, a biophilic approach based on the philosophy of biophilia was adopted and getting back to nature in the design of this clinic. In this way, dependence on psychiatric drugs can be reduced, and patients' treatment process improved. The second chapter of this project addresses in detail the biophilic architecture and its components. The third chapter presents the results of using these components in the design and its effect on the human psyche. It is expected that a dedicated and standard psychiatric hospital will be established soon to address the existing shortcomings and meet the needs of the mentally ill in their province.

Keywords: Treatment Clinic, Mental Disorder, Biophilic, Treatment.

Introduction

The mentally ill are considered part of human society and should have the same citizenship rights as others. However, today's vulnerable segment of society is unfortunately neglected so that the required and appropriate spaces are not constructed. Many domestic issues (including social, economic, and cultural) have led to the emergence of numerous mental disorders, including mood disorders and depression as the most common type belonging to the category of functional disorders. People with these disorders may be severely depressed, happy, or fluctuating, or fluctuate between the two. There are several ways to treat mental illness. In the meantime, the effective role of architecture and nature in improving treatment quality has been neglected. According to studies by psychologists and sociologists, the use of nature can greatly help solve mental disorder treatment problems. Nature plays an important role in improving the mental disorder treatment process and functional design similar to medical centers. Thus, the mood disorder

treatment clinic was designed with a biophilic approach. Therefore, the performance of medical centers can be improved by combining architectural design and nature (Babapour, 2014).

Today, there is not much difference between hospitals and treatment centers for mental disorders, in terms of function and spatial organization, with public hospitals. On the other hand, they have the least connection with nature. Nevertheless, establishing a deep connection with nature can facilitate the improvement of the quality of treatment. Also, cities do not pay much attention to the environment. This indifference to the environment gradually leads to the destruction of nature and the depletion of natural resources. In light of the foregoing, a new and innovative design approach is taken to conserve natural resources. This leads to a deeper connection between man and nature. As mentioned earlier, the human-nature relationship facilitates the design process and improves the performance of the building. This is because the human-nature relationship leads to increased intelligence, peace of mind, physical-mental health, etc. This is important because it is one of the most important design factors. A mood disorder and depression treatment clinic are an environment in which patient comfort is paramount. One of the strengths of this project is that the performance of the clinic has been doubled by adopting a biophilic recollection approach. In addition to this strength, natural energy conservation is also addressed.

Unfortunately, modern technology and engineering advances have led people to believe that nature cannot limit them and that they can even overtake them and go beyond them. This dangerous illusion has led to the emergence of a certain kind of architecture with extremely dense buildings, reduced and collapsed natural environments, and people isolated from natural systems and processes. It has also contributed to the emergence of numerous mental disorders in urban communities. The purpose of biophilic design is to bridge the gap between modern architecture and the human need to connect with the natural world. From one point of view, biophilic design is the recognition of the innate human need to communicate with nature along with sustainability and global design strategies to create environments that can enhance the quality of life (Stewart, J.).

In biophilic design, design and construction are based on nature in mind. It does not state that buildings should be green with grass and vegetation or that the use of trees and shrubs should enhance their simplicity, attractiveness, and beauty. Instead, it goes beyond our scope, something about the place attached to humanity in nature and attached to the natural world in human society. In such an atmosphere, valuable confrontation, respect, and communication can arise at all levels and emerge in the form of norms. (Claret, Stephen). In light of the above, this study seeks to answer the question, "How can the quality of treatment be improved by applying biophilic design components to a psychiatric clinic?"

Mental Disorder Treatment Clinic

Spatial design is important, although the design of medical centers is doubly important. This can be attributed to the use of various special medical equipment in these centers for the treatment and care of patients, as well as numerous health considerations. Also, the design process of such centers can be even more complicated due to the myriad psychological considerations of the space for the mental states of patients and their companions. It increases in importance when it comes to the specific space of the mentally ill. To design a psychotherapy clinic, it is necessary to gather comprehensive information on the stages of recovery and care of the mentally ill. The family also plays an important role in the patient's recovery. Due to the increasing symptoms of mental disorders in Iran compared to other countries, designing an appropriate and efficient environment for treating and improving mental state is necessary. Architecture plays a significant and influential role in this healing process. Unfortunately, most psychiatric clinics and hospitals in Iran today suffer from a lack of standards and criteria for designing a suitable architecture and space for the mentally ill. Therefore, it is vital to design a special space that can meet the needs of this sensitive segment of society and allow them to improve and treat. In designing a psychiatric clinic, various goals are pursued, including establishing a relationship and constructing appropriate spaces to facilitate patient care and supervision and create an invigorating atmosphere for patients. This helps them achieve inner peace. On the other hand, patients' sense of security and confidence accelerates the improvement of patients' physical and mental condition.

Examples of creating the right environment for a psychiatric clinic

Factors influencing the creation of a suitable environment for patients and staff are:

- 1) Natural light
- 2) Artificial light
- 3) Prevent undesirable noises
- 4) Color and architectural space

Biophilic and biophilic design

Despite urban development and distance from nature, a growing aspect of scientific knowledge increasingly shows that most of our innate tendencies toward dependence on nature continue to significantly impact health, function, and physical and mental health. However, limited data points are available, and research is poor, often methodologically. Extensive findings in a wide range of sectors, including work, education, health, recreation, housing, and society, support that communication with nature still profoundly impacts human beings, fitness, and quality of life. For example, numerous studies on health care have shown that exposure to nature can reduce stress and blood pressure, relieve pain, improve illness, accelerate recovery, and increase employee morale and performance, leading to fewer conflicts between patients and staff (Nikoukar, 2016).

Biophilic design primarily seeks to maintain the efficiency, performance, and flexibility of natural systems over time. Construction and construction of large buildings inevitably lead to changes in natural structures. In addition, all biological organisms transform the natural environment during the habitat process. A question arises here, "Are there any environmental changes?" An environment can be considered constructive and flexible if it has the following characteristics: levels of biodiversity, biomass, cycling, nutrients, hydrological regulation, decomposition, pollination, and other services provided by a natural ecosystem. Biophilic design can change the environmental conditions of a building or landscape in the short term, while it must support a strong and sustainable natural community in the long run. If used successfully, biophilic design can bring physical (including increased physical fitness, reduced blood pressure, increased comfort, satisfaction, reduced unpleasant symptoms, improved health), and mental (including increased satisfaction and motivation). Reduced anxiety, problem-solving ability, and creativity), and multiple behaviors. Changes in positive attitudes include coping skills and dominance, more attention and focus, better social interaction, and less hostility and aggression (Ibid).

Green elements are known as gold, especially in today's natural life. The construction of a green building covers the environmental and human health benefits. The green elements of the building contribute somehow through the evaporation and filtering of airborne dust to improve environmental conditions. These positive effects include: reduction in roof temperature, environmental improvement, rainwater conservation, an increase in green life span, summer cooling, and winter heating effects, better impact on the urban island, energy costs decrease, runoff and wastewater reduction, better protection against UV radiation (Jafari and Yousefi, 2017).

The most important things that have positive effects on biophilic design

- 1) Physical and mental health
- 2) Creativity, Attention, and Learning
- 3) Satisfaction with the environment
- 4) Productivity and creativity at work, job satisfaction,
- 5) Neighborhood relations and interaction and travel in cities
- 6) Creating peace of mind and reducing stress
- 7) Appreciate and understand the value and importance of nature (Sharifi and Azar Pira, 2015).

Application of biophilic design:

The practice of biophilic design includes the use of different designs according to the mentioned principles. Depending on the terms and conditions of the project, including the use of buildings and landmarks, the size of the project, different economic, logistical, regulatory, and also the damage caused to culture and the environment, the choice of designed applications inevitably differs. As we have pointed out, effective biophilic design factors must respect the principles mentioned. Above all, the biophilic design should never occur singly or individually. However, the design must create interrelationships and generate the overall result of a complete environment (Nazemi and Ghasemi, 2016).

Three types of relations with nature are demonstrated in biophilic design, including:

- 1) Direct experience of nature,
- 2) Indirect experience of nature
- 3) Experience space and place.

Rules, applications, and goals of biophilic design

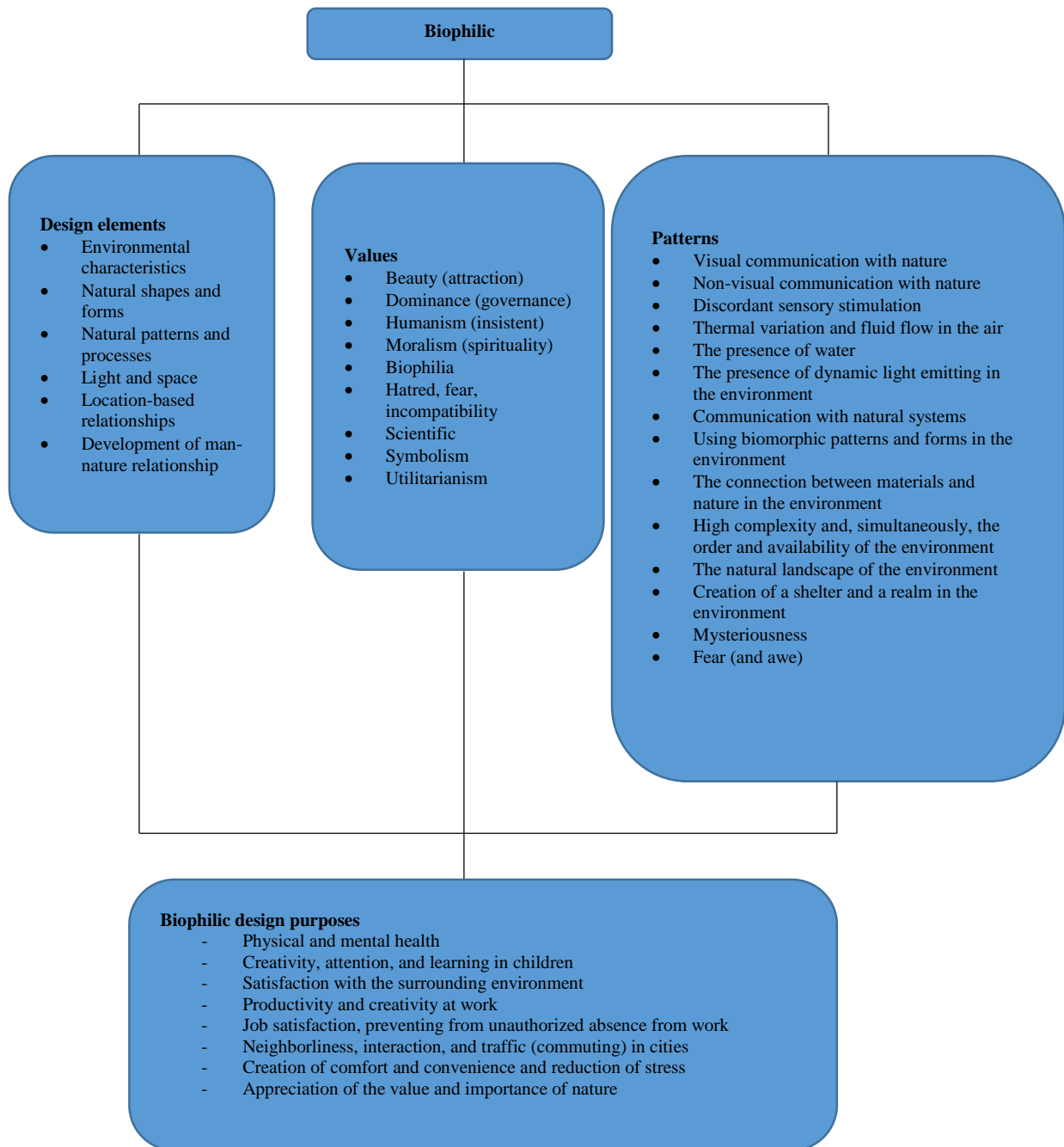


Figure 1: Summary of biophilic design (Source: Author)

Principles in biophilic design from the perspective of environmental psychology

1) Social interactions:

Comfortable and accessible places to meet people and their families in and out of the building should be used to ensure casual and friendly contact between the circulation system and the building (Clart, 2015).

2) Territory, the meaning of being together (collective sense derived from culture):

Places for different rituals, arts and crafts originating from culture and identity, a sense of unity, and a place to be.

3) Calm and refresh the spirit:

Quiet areas with low sensory stimuli, nature, lovely landscapes, outdoor seating, and sideways with spectacular and appealing landscapes.

4) Sensory variability:

Access to light, sunspots indoors, changes in color, pattern, texture, and natural ventilation

5) Exercise:

Indoor gymnastics, outdoor cycling, and walking, outdoor steps to enhance nature and walking, fun and spectacular views

6) Sense of equality:

Design the rooms so that air conditioning and adaptation are so divided that all the building's residents, visitors, or other users are concerned with the health, well-being, and comfort.

7) Acoustic level is in harmony with nature:

The use of the adjustable windows allowing positive communication with the external sounds, the use of acoustic material in areas in which industrial noise and disturbing instruments are produced, allow an energizing human voice to be heard.

8) Fun and beautiful scenery:

Natural and environmentally friendly design, complex designs, reduced monolithic conditions, and greater use of organic forms and shapes

9) Using the biophilic design, particularly for children, the elderly, and those with disabilities, in all buildings. It is vital to observe natural landscapes for the calming and value of children. Elderly and handicapped people also feel relaxed and comfortable by looking at natural landscapes and reduce their restoration time (Pir Mahmoudi and Miraj Firoozi, 2016).

The effects of biophilic design on the healing process of mentally ill patients

Perhaps the most historical, usual, and effective biophilic design method is creating architecture on a small scale. This approach calls for less intervention in the common forms and structure of current architecture while making nature most vivid with neighboring humans at its closest distance and for the longest time. This method can have positive physiological effects, such as air cleaning by plants, two-fold psychological effects including positive educational impacts on children when plants are grown and taken care of, and calming effects of care for adults. This approach includes visual components, pots and gardens, ponds, streams, and natural light, using skylights and windows, etc. Other biophilic components in which audible greens approach, such as using ponds, water running, maintaining songbirds, or using sounds like bells in nature, can. The tactile symptoms of this approach include moisture creation, air treatment, and fresh air or oxygen injection, air conditioning system wind, and other similar cases. Biophilic motifs can also be attributed to taxidermy, keeping birds in cages, or keeping pets.

Due to the important role that nature plays in the soul and body, the development of healthcare centers, such as hospitals and medical clinics, can be efficient with biophilic components. If a person is in a place and space away from nature, he feels imprisoned in it, and he wants to go out and get to the natural environment and give new life. If the patient is hospitalized away from nature in a hospital or clinic, the patient diaries remove the space and environment, thus creating additional stress and without inner peace for the patient. But, when the hospital or clinic has a biophilic approach, with the proper use of biophilic components when the patient is hospitalized in the face of an architectural space mixed with the green nature, he is not alienated and will have a long time to stay here.

Effective components of biophilic design on the recovery process of patients

Outlook (Season Ability):

- 1) Light in the field of view (windows and walls are bright)
- 2) Ability to go to a farther point for better visibility
- 3) The horizon of the image of the sky (sun, mountains, and clouds)
- 4) Landscape corridors

Shelter (feeling protected):

- 1) Tent pattern (short roof and a similar view of tree branches above)
- 2) Water (inside the building or there is a view from inside the building)
- 3) Low light or reflective surfaces (reminiscent of clean water)
- 4) Running water (reminiscent of cleanliness and the presence of oxygen in water)
- 5) Symbolic forms of water

Biodiversity:

- 1) Variety of plants inside and outside the building (tall trees, plants, and flowers)
- 2) Windows designed to see nature
- 3) Outdoor nature with dense plants and animals

Sensitivity:

- 1) Changes in ambient color, temperature, airflow, texture, and light over time and different spaces
- 2) Natural rhythms and processes (natural ventilation and lighting)

Imitation of nature (mimesis)

- 1) Design inspired by nature
- 2) Use patterns, forms, and natural textures
- 3) Fractal roles

The feeling of vitality:

- 1) The use of decoration, natural materials, decorations, artifacts, and spaces with the main aim of creating a sense of joy, surprise, and entertainment.

Attraction:

- 1) Complexities that can be discovered by people
- 2) The richness of information that encourages exploration
- 3) Curved surfaces that gradually open up exponentially

Criteria for planning and designing a psychiatric clinic

Location of the clinic

The clinic should be as far removed as possible from noise and air pollution. While the location is selected to be away from traffic, public transport should be readily accessible to the covered people. At least 80 meters from the main road, railway, and 40 meters from the street should be the first hospital building (www.file.qums.ac.ir).

Clinic area

The clinic base should be equal to or greater than 75 m²/bed. This number is more than 150 m² per bed if extensively constructed (building this type of hospital is not common and affordable today). It would be enough around 75 m²/bed for a multi-story (vertical) clinic to be constructed (Ibid).

Characteristics of the structure of the mentally ill

A hundred years ago, Florence Nightingale stressed that the right climate is an important part of the mental disorder recovery. Today hospital designers and building managers work hard to create the right place for patients. The designers of inpatient/surgical ward designs must pay particular attention to creating an adequate patient environment. The management policies of patient stations by hospital boards, nursing management, and nursing teams play an important role in building an appropriate patient environment after implementing the inpatient/surgical ward plan at operation. Objects that are considered to create the appropriate environment for patients during the planning and implementation of hospital/operation services:

- Natural light, scenery, and natural ventilation
- Artificial light

- Temperature, humidity, and ventilation
- Safety
- Favorable and undesirable sounds
- Patient comfort and safety facilities
- The color of the architectural space
- Suitable facilities for the disabled
- Baths and toilets (Ibid)
- Natural light, scenery, and natural ventilation in the hospital environment

The window plays a vital role in meeting patients' needs in hospital areas for natural light, natural landscape, and natural ventilation.

Positive and undesirable sounds in patients' hospital environment

Design and equip a closed environment that achieves the best conditions to hear the desired sound and avoid the undesired sound. Unwanted noise prevention in hospitalized wards is particularly important. Any unpleasant sound will annoy patients and may adversely affect their recovery. However, a good voice has a positive effect on the recovery of the patient (Ibid).

1) Unpleasant sound

Some suggestions for looking or getting an appointment for inpatient/surgical outpatient clinics are as follows:

- Location of the clinic building
- External shell of the clinic building
- Cooling, heating, and air evacuation systems in inpatient wards
- Sound from music, radio, and television in multi-bed rooms
- The sound caused by the health system in the hospital ward
- Location of health services in the hospital ward
- A space in which function produces sound
- Sound reflection and suitable joinery materials
- Regulations of the nursing management system in preventing annoying noise in the ward (Ibid).

Exterior shells of the hospital building

Isolation of the external shell and double-glazed windows are very useful in addition to energy-saving to prevent undesirable noise from penetrating (Ibid).

Cooling, heating, and air evacuation systems in inpatient wards

If fan coils are used in hospital rooms, fan coils should be mounted and used as much as possible. A special valve must be designed to provide the fan spiral for the built-in fan. If the fan coil needs to be placed on the earth, it should be located away from the patient's bed. Air inlet, air outlet, valves, and pipelines should be designed and operated in accordance with the standard to ensure that your voice is in the allowed range (Ibid).

Audio systems

- 1) Sound from music, radio, and television in multi-bed rooms

The sounds are heard by telephone when music is played, or there is a radio or a TV in a multi-bed room.

- 2) The sound caused by the paging system in the hospital wards.

Only at the nursing station should the sound of paging be heard and voice control.

Insulation inside the walls and doors with special equipment to generate sound is recommended (e.g., dirty room, cleaning room, water supply, ventilation room, etc.).

- 4) Sound reflection and joinery materials

Materials such as stone should be prevented from being used in walls and floors, which reflect the sound in patient rooms or ward corridors. Kinetic flooring is both infection controlled and sound absorption superior to stone. In the ceilings should be used materials with high sound absorption properties. Caregiving regulations in the care centers can prevent noise and unwanted noise in the inpatient/surgical wards.

Effects of light and color on patients' recovery

The biological importance of the light and the impact of sunshine in recovery are a matter that is overlooked. Also, special lights are required during long hospital stays to carry out proper metabolic and circulatory

functions. Those who plan such environments should be conscious of light's biological effects. Sudden light exposure stimulates the adrenal glands. In these cases, the rotation of day and night can be inspired and produce similar natural light. Check also the beam lights and their material and details on the ceiling and bar. The installation of heating and cooling devices and the features of shock absorbers in different medical devices and fittings on different walls and storage boxes are all internal details that are closely linked to architectural design and even the building. Measures to reduce additional noise in the hospital environment and ventilation systems, etc., should be taken beforehand in consultation with the interior designer. Therefore, we see how important it is for every design to be aware of the impacts of space, light, and color in the social life of human health. These effects can improve health and can lead to depression, lethargy, and somnolence. Inner architects can utilize this awareness to improve recovery and make access to inner peace easier. Work on the walls to govern the nervous system is desirable to accomplish the task. The warm, cold, and luminous colors are broad topics. High contrast, for example, causes headaches and stress in the eye. The result of interior design is enhanced awareness, confusion, distraction, a sensation of transit, cultural connection, sadness, and joy. A major issue is a knowledge and the connection between new color theory and architectural form. Color and its medical impacts are an important part of the research study of an interior architect (Ibid).

Methodology

The biophilic theory was first studied in this study. The data were then collected and employed in summary. This research took place based on one of the factors that affect the quality of medical clinics, namely creating a deep link with nature and the conditions for the proper use of nature. The descriptive nature is analytic and practical because of the efficacy of the results in the structure. The data collection was done by desk research method, books and articles examined, and the theoretical foundations of resources and the Internet, including articles and case studies, were also completed.

The methods in descriptive and inferential statistics were used to test the research hypotheses. Mean, median, mode, standard deviation, and bar charts are used in the descriptive statistics section.

Design context studies and design process

Geographical studies

Kermanshah province is located in western Iran is with an area of 24434.25 km. This is the 18th province in terms of area and is approximately 1.45 percent of the entire country's area. The province of Kermanshah is between 33°C and 42 minutes to 35°C and 17 minutes north and 45°C latitudes, 24 to 48°C and 6 minutes east of Greenwich Meridian. Its altitude is an average of 1200 meters higher. This province's political borders are adjacent to the northern province of Kurdistan, the southern province of Lorestan and Ilam, the eastern province of Hamedan, and western Iraq. It has a border with Iraq of more than 330 kilometers.

Climatic studies

One of the factors that affect architectural design in all regions is its climate. The way the climate is used can create appropriate or inappropriate living and working conditions. The inhabitants of this land have long considered proper use of the climate in buildings construction. The climate design is considered to be an appropriate option for creating a good living and activities environment in the current situation as air pollution increases. To that end, it is important for the design of a technology park to recognize climate factors. Cold and temperate areas with cold winters, mild and droughty summers are situated in Kermanshah City. The climate conditions in the various regions of the city have relatively similar and favorable conditions because of the special topographic situation.

One of the region's climate indicators is its temperature, which has similar and favorable conditions in various latitudes (in the city) and various seasons.

The results of the study of climate factors in Kermanshah are as follows:

- 1) The city's lowest point is 1.400 meters above sea level, with the highest point being the Paraw Mount at approximately 3.357 meters. High above sea level, therefore, caused cold weather in winter and mild in summer.
- 2) In the mountainous area, the town of Kermanshah is located. Therefore, there is no substantial difference in Solar radiation parameters in the latitude between its northern and southernmost points.
- 3) The Mediterranean climate of this city is 438 mm, the mean annual precipitation. Frozen days are 104 days and average rainy days are 77 days a year. There are 13 days for snowy days, while 2906 hours for sunny times.
- (4) The prevailing winds are from west to east throughout the year and from southwest to northwest in winter in autumn. The winds of winter are the calmest. The average temperature per year is 13.4°C.
- 5) It seems to be a matter of priority for the use of climate parameters with prevailing winds, which are generally desirable and blowing in spring, winter, and autumn. To avoid the cold in autumn, winter, and early spring months, maximum sunlight must be employed.
- 6) The building's optimal orientation will be on the south-east frontier in Kermanshah's climate. The western light can be used in parts of the offices or meeting rooms.

Site location

The local location chosen for the project is a territory situated on the east side of the Kuhestan Park, which is on the northern part of the city in Kermanshah province - Kermanshah. Important applications near this location are Imam Hossein Hospital, Imam Reza Hospital, Zagros Medical Hospital, Jamshid Hotel, Eastern Park, and the Mosque of the Prophet (Figure 2).



Figure 2: Selected site (Source: Google Maps)

Reasons for choosing the site:

- 1) Severe mental health center shortages in the province of Kermanshah, particularly in this field
- 2) Easy access to Imam Hossein (AS), Imam Reza Hospital (AS), and Zagros Hospital, among others.
- 3) Have a good look and wait.
- 4) proximity to the city's main artery that increases the covered area
- 5) The appropriate design approach environment Appropriate (biophilic)
- 6) Environment suitable for the design of the project (improving the treatment of the mentally ill)
- 7) Calm and refreshing noise pollution atmosphere
- 8) Local attractions near the site, including the amusement park and the Taq-e Bostan historical monuments
- 9) Green space around the site and mountain Taq-e Bostan, which functions as an efficient natural filter.
- 10) Access to the area of application (approximately 20,000 square meters)
- 11) The sunlight on the south side is the highest in the year; in summer, vertical, and in winter, the prevailing winds move to the west and northwest.

Site analysis

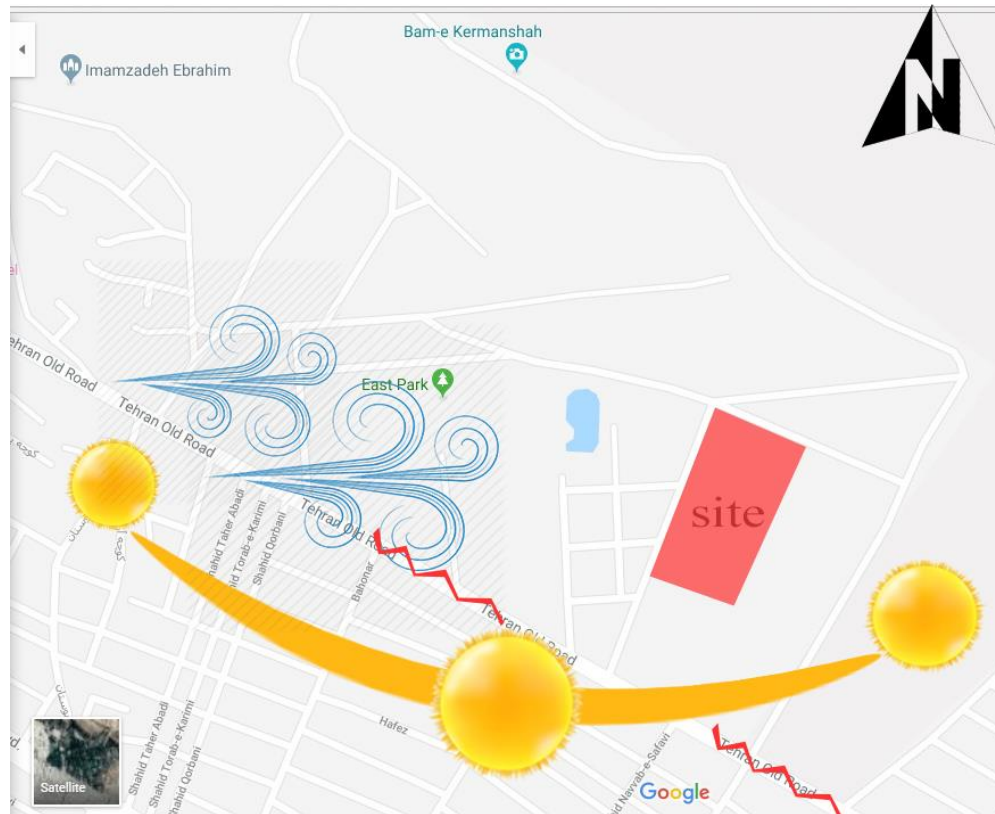


Figure 3: Site Analysis (Source: Author)

Design ideas

- 1) Modeling brain neuron elongated form and curve
- 2) The application in the design of soft and curved lines (from a psychological point of view, soft lines induce a sense of calm and broken lines to induce a sense of confusion)
- 3) use in concept design of biophilic components
- 4) Wide and broad void design for maximum natural light usage
- 5) Divide the different space areas to achieve a regular, complex space complex
- 6) Design large and big openings for equalizing the space for mentally ill people both inside and outside
- 7) Creation of long lines of horizontal (psychologically evokes a sense of calm and stillness)

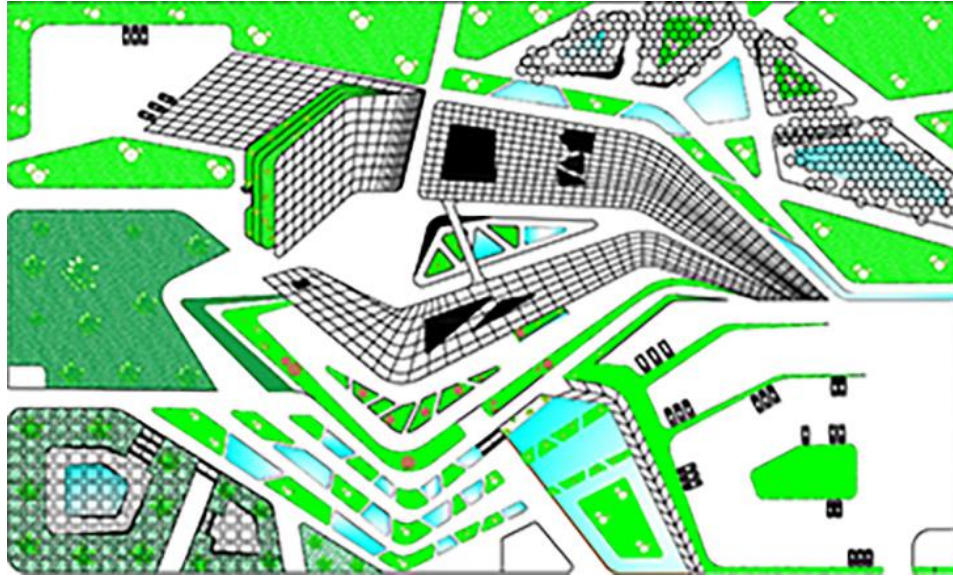


Figure 4: Site plan



Figure 5: Render

Conclusion:

Modern and mechanical life has created many problems for people in large and densely populated cities. Mental illness is one of these major problems. A person who has mental health is sensitive and needs to be looked after and treated. Today, as cities expand and the population grows, there is less room for mental illness to be maintained and tolerated. Thus, it is crucial that this segment of society is creating a unique and suitable environment to be best looked after and go through the recovery and return to society.

A mental disorder is a syndrome or behavioral or psychological pattern of medical importance, accompanied by discomfort, disability, or an increase in the risk of pain, death, suffering, incapacity or loss of liberty, or the symptoms of pain or painful symptoms, or of an important function.

Today there is little difference in terms of function and spatial organization between hospitals and mental disorder treatment centers with public hospitals. They have the least link with nature, on the other hand. However, it can help enhance the quality of the treatment by establishing a close connection to nature. Cities also pay little attention to the environment.

This environmental indifference is gradually resulting in nature's destruction and natural resources' depletion. In view of the above, a new and innovative approach to natural resource conservation is adopted. This leads to a deeper link between nature and man.

Besides protecting nature, Biophilic Baroque design creates specific, environmental-oriented laws on physical planning and urban design. These include green roofs, bird-friendly houses, green streets, green forests, forestry, urban green spaces, etc., which are also very beautiful, to name a few. For example, the use of natural light in the building, which has several advantages, is one of the biophilic orientation architecture patterns. First of all, this decreases economic costs, as artificial light is less required if the light used in the building is more natural. On the one hand, it also has a major health effect because, as we know, vitamin D is absorbed by sunlight. The deficiency of this vitamin leads to a disease partially removed by biophilic design.

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