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ABSTRACT

The research was conducted to study the reality of therapeutic gardens at psychological hospitals in Sulaimani city- Iraq. The study included two hospitals; Soz for women (SW) and Shaheed Salah for men (SSM). It was carried out during the period from April 15, 2019 to February 15, 2021. The results showed the buildings and spaces for both hospitals were not qualified for mental diseases. These structures were not originally created for such establishments. Both hospitals have areas designated as gardens, but they were not used rightly. Area in SW was exploited to construct gardens, while so-called garden in SSM was not used. Each of which, did not achieve the goals and purposes of which they were founded. Moreover, the hospitals scarcely interested in recreational activities at these areas. However, based on psychiatrists and doctors in both hospitals, patients needed the activities. Some activities such as sports, artistic, and social activities were provided by the SW inside internal halls. Strong responses by patients to similar activities were noticed. Such actions were less occurred in SSM. The research reached several recommendations to develop a proposed design for the gardens at both hospitals. The recommendations were based on the international standards and environment for such places.

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INTRODUCTION

Psychiatric hospitals, also known as psychological health units or social health units, are hospitals or areas focusing on treatment of mental illnesses. These included schizophrenia, bipolar disorder, and major miserable disorder. Psychiatric hospitals differ widely in their size and classifying, the essential healing part. In these hospitals is a therapeutic garden which is an outdoor garden space that has been specifically designed to meet the mental, psychological, social, and physical requirements of patients and staff (1).

Horticulture has been used to soothe senses in Mesopotamia since 2000 BC. About 500 BC, Persians started making gardens that collective beauty, scent, music (flowing water), and freshening temperatures to satisfy senses. Since at least the nineteenth century, the therapeutic benefits of peaceful garden settings have been recognized in the United States. In 1812, Dr. Rush published Medical Inquiries and observations into mental diseases. It was declared that one of the things that

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distinguished those male patients who improved from their mania from those who did not involve in garden activities was "digging in a garden." (2). The hospital grounds contained landscape-shaded walks through grassy meadows based on these observations. Agricultural and garden activities were regularly integrated into both public and private psychiatric facilities in the United States. (3).

A healing garden is defined differently by different researchers. Any garden, according to Ulrich (4), can be a healing garden. "A garden in a healing setting designed to make people feel better," Eckerling (5) defines the healing garden. A healing garden aims to make people feel safe, less stressed, more relaxed, and even energized. The healing garden, according to Marcus and Marni (6), is an outdoor or indoor garden space that is specifically designated as a healing garden, or a garden that heals. Clare Cooper Marcus identified seven necessary foundation or principles for creating healing gardens in the October 2001 issue of Landscape Architecture Magazine. Visibility, a sense of safety, physiological comfort, interaction with nature, and familiarity are among them. (7)

Furthermore, research studies were done after 1973 showed that the existence of natural greenery in a scene has a high association with stress reduction (8), (4). According to Kaplan and Kaplan (9), vegetation assists as a shock absorber for the human sensory system, and it provides an opportunity for rest from the constant mental alertness. Vegetation heals the wounds congested cities inflict on their residents. Studies show that when people are exposed to plants, their blood pressure lowers, their muscles loosen, their heart rates slow down. In a study was conducted in an American hospital, it was noted that 95% of the doctors, 79% of the nurses, and 72% of the administrative staff said that the therapeutic gardens had a positive impact on reducing the psychological state of hospital patients. In addition, 100% of doctors and 84% of nurses believed a garden would help the patients to recover (10). In another study, inside a neurological hospital, when patients went out to the hospital gardens, they noticed more relaxation and calmness of patients by 79% (4). In another study on designing therapeutic gardens, it was noticed that 74% of patients and staff in the hospital prefer to enjoy watching and sitting inside gardens with trees, shrubs, and various plants compared to other activities inside their gardens. (11)

Healing gardens are effective if they contain the following elements

1 :Accessibility to the garden is an important and basic requirement, even if the gardens are attractively designed, as users need to feel that they can easily reach through the entrances and corridors, as well as they can deduce the way and wander from one place to another. The garden must be visibly in terms of its location in relation to its surroundings, as the visibility of entry and exit to the gardens plays a major role in the effectiveness of its function, and this in turn relieves tension and pressure, increases patient satisfaction, provides comfort, and reduces the time required for treatment

2 :Social assistance users frequently prefer spatially enclosed settings that allow them to socialize. It's critical to plan for small groups as well as large groups on occasion (such as those associated with hospital-initiated programs and large extended family visits). All considerations for social support, however, should not preclude access to privacy (which undermines patient control).

3 :Exercise and physical movement designs that allow mild exercise. Areas that allow for stress-relieving physical activities and play should be included for patients.

:4 Having access to nature and other enjoyable diversions plants that are medicinal or edible, as well as those that engage all of the senses and encourage wildlife, are often good choices for the design's plant palette. Poisonous, thorny plants, as well as those that attract large numbers of unwanted insects (such as bees), should be avoided in gardens used by children and the mentally ill (12). (13) ,(

5 :Feeling in command patients/residents must be aware of the presence of a garden, be able to find it quickly, and be able to access and use the space actively or passively. It should also have areas for privacy that are not visible through the windows. A variety of different types of spaces can help the users make decisions. Users' feelings of control can also be enhanced by involving them in the garden's design.

6: Research shows that people who are supported socially are usually less stressed and they have better health status than people who are more socially isolated. Researches also show that patients

and staffs prefers natural, spatially enclosed settings for active socializing but on the contrary they prefer natural, spatially open settings for more passive activities such as sitting and viewing scenery or watching the other people.

7 :Users of healing gardens need to feel quiet and be able to hear the sounds of birds, the sounds of the wind, or the sounds emanating from water sources, and they do not want to hear inappropriate mechanical sounds such as those emitted by air conditioners or traffic in the streets, and therefore it is necessary at the planning stage to choose places for the healing gardens is far from traffic, parking lots, airstrips and other sources of noise. As well as planting trees whose leaves move easily and make sounds even in light winds to create patterns of color, shade, light and movement, providing a relaxing and meditative experience as well as masking some urban noise.

8 :Healing Gardens should be designed based on when (i.e. what time and in what weather conditions) by whom (which groups) and how they are currently used (eg for a lunch break, exercise or social communication) and also on how their future use will be shaped To maintain interest and interaction throughout the year, for example, it must be studied to see how it is used in different seasons, and then designed by using different seasonal flowers, colors, and weather (14). Accordingly, the garden must include elements that can be changed, moved, removed or added while ensuring that the garden remains flexible for more than one activity.

9 :An essential component of positive healing and a healing environment is the presence of green spaces. In general, exposure to nature can have a hugely beneficial effect on people's emotional state." The more a place evokes an image of a rich green garden, the more it will be used and appreciated as a healing place exponentially (15). Therefore green materials should dominate garden design. This reduces artificial components to a minimum so that trees, shrubs and flowers make up about 70% of the garden and 30% for driveways and squares. At the same time, green surface have an important role in the recovery process, as they reduce pollution and reduce noise, as they have the ability to absorb sound waves as well as absorb toxic emissions, encourage sports and improve the quality of life.

A therapeutic garden is designed for use as a component of a treatment program such as occupational therapy, physical therapy, or horticultural therapy programs which may include both horticultural and non-horticultural activities and can be considered as a subcategory of a healing garden These activities are very helpful in treatment of patients, stress reduction of staff and patients, increase in outcome of hospitals, increase in work efficiency and reducing cost of treatment. Therapeutic gardens are mainly designed for patients suffering from mental illnesses like autism, dementia, Alzheimer's disease; etc .

Therapeutic gardens are classified into two types, according to the American Society for Horticultural Therapy. A: horticultural therapy garden is a type of therapeutic garden; it is designed to accommodate client treatment goals, but it is designed to support primarily horticultural activities. A horticultural therapy garden is also designed in such a manner that the clients themselves are able to take care of plant material in the garden. B: restoration or meditation garden may be a public or private garden that is not necessarily associated with a healthcare setting. This type of garden employs the restorative value of nature to provide an environment conducive to mental repose, stress-reduction, emotional recovery, and the enhancement of mental and physical energy. The design of a restorative garden focuses on the psychological, physical, and social needs of the users.(16)

A therapeutic garden's design processes (design standards) are as follows: A- understanding user groups and their needs. It is critical to understand the user groups before beginning the design process. The people who will use the healing garden should be prioritized when designing a healing garden (17). There are three distinctive groups of users of both indoor and outdoor hospital spaces – patients, employees and visitors, each having its own requirements and patterns of use. First and foremost is the patient group which consists of various categories depending on type of patients' disabilities, their length of stay and physical and psychological needs. Specific demands of each subgroup greatly determine the choices made in the outdoor environment. Employees, varying from the medical to administrative and supporting staff, are a critical group of users since they spend

every working day within the hospital environment. Visitors as the third user group are also in need of positive distractions while spending time with their family members or friends.(10)

B-Hospital's site is certainly one of the most significant generators of its form in many aspects. Numerous analyses and investigations need to be undertaken by the design team with the aim of truly understanding its advantages, disadvantages and potentials. In an ideal case, optimal distribution of the total site area of a hospital complex should be the following: 30% for the buildings, 15% for internal communication routes and parking, 50% for vacant area (25-30% in case of hospitals with a limited capacity for future growth) out of which 10% is reserved for recreational areas (18). Several factors must be considered when determining appropriate locations for various types of outdoor areas, including environmental factors (e.g., orientation, insolation, wind exposure, views); distance from distractions (e.g., urban noise, parking lots, mechanical systems); physical configuration of the complex; internal traffic system and its access points; and specific needs of different user groups.(15)

C-When setting up the design principles, it is essential to base them on the premise that the hospital outdoor spaces need to accommodate various types of activities and experiences which are in close relation to the users' particular needs, such as create opportunities for movement and exercise; also choice between social interaction and solitude; and provide both direct and indirect contacts with nature and other positive distractions .(15)

D: The key element of a positive healing and therapeutic environment is the presence of greenery. Stress levels among patients have been shown to decrease when they contact with nature, the green spaces, or the gardens, the beneficial effects identified are threefold: they encourage the practice of physical activity and social contacts through indirect effects, and contribute, through a direct effect, to restoring physiological and psychological capabilities A selection of plant material for hospital outdoor spaces should be carefully made in order to associate certain users' needs, particularly patients' requirements .(19)

E: The outdoor hospital areas should be visible from patients' rooms, interior public spaces and corridors, for both security and medical purposes. View out is also psychologically therapeutic, since it reduces feeling of isolation and claustrophobia by providing a constant contact with the outside world. It may also add patient's interest to the surrounding environment .

F: Minimize ambiguity: Complex or mysterious settings that provide a challenge might be of interest to the healthy, but research shows show that abstract design may be contraindicated for patients who are ill or undergoing stress. For this reason, the use of abstract art may be unsuitable, and design should focus on clearly identifiable elements .(14)

Research Objective :

1. Study the state of the gardens in psychiatric hospitals in Sulaimani to find availability of therapeutic gardens and their maintenance.
2. Taking the opinions of doctors and specialists in these hospitals to find solutions for designing therapeutic gardens.
3. Suitable designs are placed for the gardens according to the needs of patients and international standards in this regard to suit the environment of the site.

Case Study :

The research was conducted in two hospitals for mental illnesses within Sulaimani-city. They are Soz Women's Hospital (SW) and Shaheed Salah Mohandes Men's Hospital (SSM), during the periods from April 15, 2019, to February 15, 2021. Three methods were used for data collection, namely personal observation, analysis of architectural designs, and interviews with officials and doctors in both hospitals.

General description of research samples

1 -Soz women's mental hospital: It is a hospital for the women with mental and psychiatric diseases, which was constructed in 2009, and it is located in the western part of the city center (longitudes (45° 23' 20" E), latitudes (35° 31' 0" N), and Elevation 800 m). The total area is 11500 m² (4.6 hectares), 2700 m² of which is allocated for gardens which includes 23% of the total area of the hospital. The hospital is built on a low hill with a flat surface and the sides have a slight slope.

The site is distinguished by the absence of surrounding residential houses or other buildings, accommodating about 50 - 55 patients (Fig. 1) .

2 -Shaheed Salah Mohandes men's mental hospital: It is a hospital for men with mental and psychiatric diseases, which was constructed in 2014, and accommodates about 150 patients. Also, it is situated in the east side of the city center (longitudes (45° 28' 20" E), latitudes (35° 30' 0" N), and Elevation 750 m). Its area is 10400 m² and the area allocated for gardens is 2600 m², which includes 25% of the total area of the hospital. The hospital is built on a low hill with a flat surface and the sides have a slight slope. The site is distinguished by the absence of surrounding residential houses or other buildings, (Fig. 2).

Data collection

Accurate information about the study samples was obtained through several visits to the two sample sites. The data were collected depending on three methods, which included personal observation, personal interviews with officials, and analysis of architectural plans.

Personal observation: personal observation proved to be a highly useful and sometimes indispensable tool here. At both hospitals patient interview processes might not be successful. Patients at that facility were not capable of engaging in long conversations, and might not be willing to engage in conversation at all (K. Hines 2009). The sample locations were visited many times in order to study reality of the garden parts and take the observations, which were :

- The location of the gardens in the hospital.
- Sunny spots for both growing and user's activities.
- Garden areas, open spaces, green areas, and areas for entertainment activities.
- Garden design style
- Irrigation system and water sources.
- Direction of the local wind and its power should be examined, if wind shields are needed, and what are the best ways to reduce wind's power .
- Type of agricultural soil.
- Road structures and pathways.
- Components of the site are valuable or not.
- The most important problems that were observed during visits to those parks.

Table (1): Personal interviews questions

| | |
|---|---|
| 1 | Their conceptualization of the space, in other words, what is the purpose of the space, who should use it, and how should it look? |
| 2 | The subject matter experts were asked to describe key concerns or problems related to creating the garden? |
| 3 | Is there already a garden constructed? Is there any building in it? How is the connection between buildings and its surroundings? |
| 4 | What kind of feelings do they have when they are in garden? |
| 5 | What improvements would you make in a new garden compared with the current one? |
| 6 | What are activities should be available in the garden? |
| 7 | Where is the preferred location for activities? |
| 8 | What are the characteristics of planting design that can most usefully be applied to therapeutic gardens for dementia patients? |
| 9 | Do you prefer a place for producing vegetables and fruits in the garden? Establishment of an edible garden for horticultural therapy and greenhouses for winter activities? |

Personal interviews: The Information were collected from specialists, managers, psychological supervisors, and educators in both hospitals, as well as officials in those parks who provided us with very useful information, since interviewing can be used as an intentional conversation to gather

specific information (20). In consideration of covering all necessary topics, a semi structured interview was selected which is a scheduled activity with open-ended discussion. The interview was chosen to gain direct answers from the respondents and follow-up questions. It was a semi-structural interview with an open question and answer to give them the maximum opportunity to tell their own ideas (21). The three of the informants were general director Mr. Pshtiwan Ali and psychological supervisor Mr.Aram Ali at Shaheed Salah Mohandes (SSM) mental hospital and Mr. Dilshad general director of Soz women's (SW) mental hospital, before the interviews observation of the site was done to get to know the place and get the picture of the garden for a better discussion during interviews. All interviews were face-to-face and were conducted at both hospitals.

Analysis of the architecture plans: Some designs and plans for those hospitals and their gardens, which were obtained from the health directorate in Sulaimani city have been analyzed.

Environmental factors of study site: Environmental factors included climate and soil.

Climate factors

1- Precipitation: The region is characterized by the abundance of precipitation during the seasons of October until the middle of May. Precipitation in this region is mostly rain, and the average rate of it reaches 700 mm/year. However, there are days of snow in months during December until February, and a few cases in the shape of the hail in March, April, and May. The total evaporation in the city is about 1400 mm/year.

2- Temperature: Sulaimani city is characterized by the presence of large differences between temperature degrees along the year. So, the temperature is rising from the beginning of May and reaching its maximum during July, and then it will take down. While, it recorded the highest degree 49.1°C during July, but the lowest -5.5°C recorded during January, meanwhile the average annual temperature is 21.5°C (Table 2).

3-Humidity: The relative humidity is variable during the months of the year. It may reach the highest during the winter months (95%), while the lowest percentage occurs during July and August (18.2%), also the average annual is 51.1 % (Table 2).

4-Winds: The most important wind that should be taken into account is northern and northwestern winds, which are the prevailing winds in the region. It is dry hot and carrying dust in the summer, especially during day hours, but it looks cold and dry in the winter.

5- Solar radiation: It determines the thermal environment in the earth and the main source of energy that moves the air masses in the atmosphere. In December (9.85 hours), longest appearance time of the sun was in June (12.80 hours), and the shortest brightness is in December and January (3.20 hours) (Table 2).

Soil characteristics

1-Topography

Soz women's hospital: Due to the hospital's location on the hill, the terrain of the open spaces around the hospital is somewhat flat, but the edges of the hill have an average slope of up to 5%, and this requires making terraces when constructing gardens in it.

Shaheed Salah men's hospital: The hospital is also located above the hill, the topography of the land and the open spaces around the hospital are somewhat flat, but the edges of the hill have an average slope of 5%, and this requires making terraces when constructing gardens in it.

2-Soil analysis: Several samples were taken from different sites and depths of the site soil in both hospitals for physical and chemical analysis in the Soil Department - Sulaimani University. Table (3) showed soil analysis of Soz hospital, and table (4) showed soil analysis of Shaheed Salah Mohandes hospital.

Table (2): Climate data for Sulaimani city for the periods (2001-2019)

| Climate factors | Units | Maximum degree | Minimum degree | Average degree |
|-------------------|-------|--------------------|-------------------|----------------|
| Precipitations | Mm | 1081.4 (2018-2019) | 408.3 (2007-2008) | 700 |
| Temperatures | °C | 49.1 (July) | -5.5 (January) | 21.5 |
| Relative humidity | % | 95% (winter) | 18.2% (August) | 51.1 % |
| Winds | Km/ H | 7.1 | 0 | 3.1 |
| Solar radiation | Hour | 12.80 | 3.20 | 8.0 |

Table (3): Soz women's hospital site soil analysis

| Soil depth (cm) | pH degree | soil texture (g/kg) | | | soil type | CaCo3 (g/kg) | EC (m/ds) | Organic matter (g/kg) |
|-----------------|-----------|---------------------|-------|-------|-----------|--------------|-----------|-----------------------|
| | | Sand | Silt | Clay | | | | |
| 0 - 12.5 | 7.5 | 380.5 | 176.7 | 352.9 | clay | 179.5 | 1.55 | 8.21 |
| 12.5 – 40 | 7.6 | 480.3 | 133.4 | 386.3 | clay | 189.7 | 1.40 | 6.56 |
| 40 – 55 | 7.7 | 443.0 | 100.0 | 443.0 | Clay | 205.0 | 1.44 | 3.85 |
| 55 – 80 | 7.8 | 447.0 | 100.0 | 453.0 | Clay | 210.8 | 1.30 | 2.96 |
| 80 – 120 | 7.8 | 447.0 | 657.0 | 472.0 | clay | 228.0 | 1.44 | 2.35 |

Table (4): Shaheed Salah men's hospital site soil analysis

| Soil depth (cm) | pH degree | Soil texture (g/kg) | | | soil type | CaCo3 (g/kg) | EC (m/ds) | Organic matter (g/kg) |
|-----------------|-----------|---------------------|-------|-------|-----------|--------------|-----------|-----------------------|
| | | Sand | Silt | Clay | | | | |
| 0 - 12.5 | 7.7 | 480.3 | 166.8 | 352.9 | Clay | 169.5 | 1.65 | 6.45 |
| 12.5 – 40 | 7.8 | 480.3 | 133.4 | 386.3 | Clay | 179.7 | 1.50 | 5.63 |
| 40 – 55 | 7.9 | 457.0 | 110.0 | 453.0 | Clay | 205.4 | 1.54 | 3.65 |
| 55 – 80 | 7.9 | 447.0 | 100.0 | 453.0 | Clay | 220.8 | 1.40 | 2.96 |
| 80 – 120 | 8.0 | 447.0 | 687.0 | 486.3 | Clay | 228.2 | 1.54 | 2.15 |

RESULTS AND DISCUSSION

1-Personal observation

Soz women's mental hospital

1. The hospital building was an administrative and marketing building of the Tasluja cement factory, which was converted into a hospital. It consists of two floors, and it is large and suitable for a hospital, close to the cement factory, located on a hill of medium height, not surrounded by other buildings (Fig. 1).
2. The building is surrounded by good areas of gardens, designed appropriately to sit, rest, and roam in them (fig. 3). The areas contain lawn areas with various shade trees, windbreaks, and various ornamental shrubs. The parts of the gardens are also linked by wide walkways on which seats are placed in suitable numbers (Fig. 4).
3. There are also large unexploited areas around the hospital, especially the slopes of the hill and the part of plantation in the form of pine forests.
4. The presence of a multi-purpose sports area completely fenced and covered with tartan, which is used for exercises and various sport events, and used by patients under the supervision of the health training staff (Fig. 5).
5. The hospital also contains a concrete yard for gathering, sunbathing, and other activities for patients during the fall and spring days. In addition, the presence of a garage dedicated to parking the administrative, health staff, and visitors to the hospital.
6. Inside the hospital, there are various halls and activities for patients, such as the library hall with books and different courses (Fig. 6). Additionally, reading and sitting areas, assembly hall, social events and other events (Fig. 7), continuing education hall, cinema hall, sports and

indoor games hall, drawing and handicraft hall (Fig. 8), tennis room, music room(Fig. 9), a barber room, the make-up and beauty room. Besides, a family room is intended for patients to sit with their families at the time of visits during the winter season, and finally the dining room.

Shaheed Salah Mohandes men's mental hospital

1. The hospital is located on low-rise and medium-sized hill (Fig.10), and there are no other buildings adjacent to it, (Fig. 2). On the eastern side, the slope was treated by making terraces, and the middle building is located and surrounded by areas designated for gardens and unused (Fig. 11).
2. The hospital building was not originally designed as a treatment hospital for psychiatric and mental diseases. It consists of one floor and is not attached to any other annexes such as the sports arena, the hall of meetings, the cinema, and celebrations. Moreover, there are no private gardens for patients, except a simple and small garden at the entrance to the hospital (Fig. 12).
3. After the hospital was completed, some ornamental trees were planted around the hospital borders as windbreaks, but due to neglect and lack of service, most of them were died and a few of these trees remained (Fig. 13).
4. Due to the importance of gardens in mental and neurological hospitals, despite having sufficient area for construction of gardens in the hospital, they were not exploited for this purpose.
5. Through visits inside the hospital, halls or specialized areas were not observed for conducting internal activities, such as painting, handicrafts, sports, cinema, and others.
6. The garden in the hospital does not contain the physical components such as seating benches and other amenities. Also, the modern irrigation system such as drip and sprinkler irrigation was not applied, as well as the soil of the site is not fertile and not suitable for growing most other plants (Fig. 14).

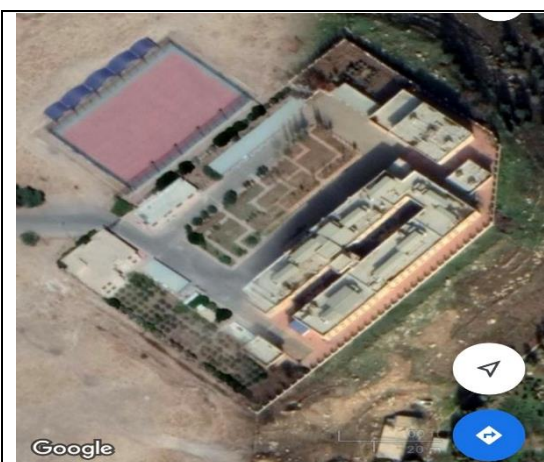


Fig. (1): Soz women's Google map view



Fig. (2): Shaheed Salah Mohandes Google map view



Fig. (3): Soz women's garden view



Fig. (4): Soz women's garden plants



Fig. (5): Soz women's multi-purpose sports arena



Fig. (6): Soz women's library hall



Fig. (7): Soz women's social events hall

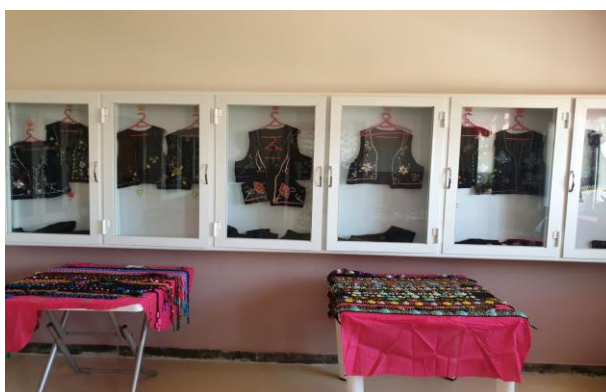


Fig. (8): Soz women's handicraft hall

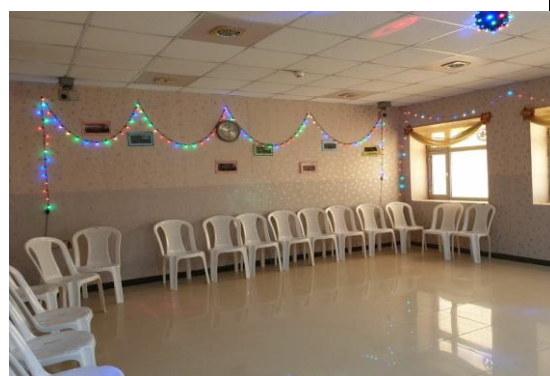


Fig. (9): Soz women's music room



Fig. (11): Shaheed Salah Mohandes located in low-rise hill



Fig. (11): Shaheed Salah Mohandes view unused areas



Fig. (12): A small garden at the entrance of Shaheed Salah hospital



Fig. (13): Shaheed Salah Mohandes hospital borders as windbreaks, but due to neglect and lack of service.

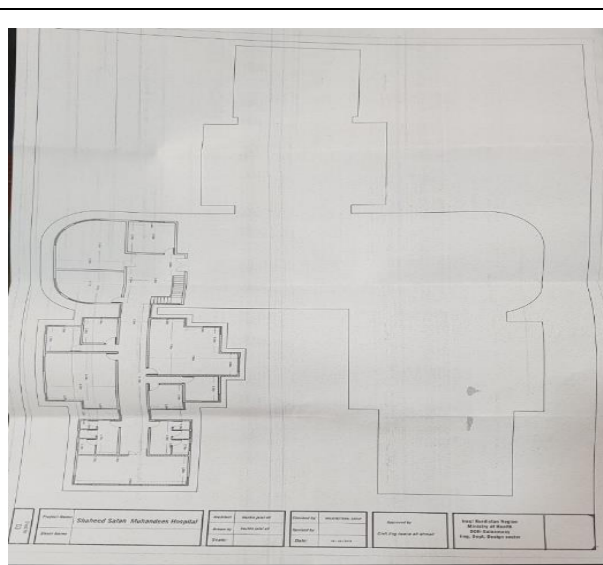


Fig. (14): The site park view Shaheed Salah Mohandes

2-Personal interviews

Soz women's mental hospital

The concerned persons in the hospital emphasized the vital roles of gardens and their environment in reducing stress and calming the souls of patients via sitting, walking, and picnicking inside the gardens. Besides, employing patients inside the gardens by planting flowers and serving garden plants are important for soothing the patients. Concomitantly, repliers drew attention to doing other activities and exercises in the sports field, in addition to the presence of many other activities that patients conduct on a regular daily or weekly basis. Generally, the hospital had great effects on improving the mood of patients and activating their ideas as a result of activities (Fig. 9). Most noticeable ones were art and entertainment, which made them forget their worries, hastened the improvement of their illness, and returned them to their families. These results have been confirmed by many other research and studies (6), (22).

Shaheed Salah men's mental hospital

The hospital lacked garden spaces along with the lack of various recreational, educational and professional activities that were available in the Soz Women's Hospital. This condition negatively affected the psyche of the hospital patients. In contrast, a positively improvement in patients' behavior was noticed by the staff during monthly recreational outing to Azadi Park inside the city, which urged the medical staff to provide gardens for the patients around the hospital. They even supported the existence of a glass or plastic house to operate patients with the production of various flowers and vegetables, in addition to all the activities that presented in Soz hospital (Table 1).

3-Analysis of the architecture plans

Through visits to the General Directorate of Health of Sulaimani Governorate-Engineering Department to obtain plans and architectural designs for these two hospitals, did not obtain any plans for Soz hospital because it was not built as a hospital, but rather was an administrative building for a factory. As for Shaheed Salah Hospital, only a preliminary map of the hospital building and its open space was obtained, but there was no planning or design for gardens and their components (Fig. 13). This is evidence of the lacking interest in gardens in the two hospitals.

Recreational and therapeutic needs for patients and hospital staff in garden designs:

Before starting a design process, it is significant to know the user groups of gardens and their needs. In designing a healing garden, the attention should be paid on the people who are going to use the garden. Based on several sources devoted to this aspect and through personal interviews with the managers and therapists, and psychologists in both hospitals, as well as personal observations in the two sites, the needs can be summarized as follows:

- Benches for sitting and resting in the gardens.
- Corridors and pedestrians for walking and roaming purposes.
- A place for a picnic and eating for patients at the appropriate times and several times during months.
- A multi-purpose sports court for daily exercises and multiple sports.
- Glass or plastic houses to grow various types of vegetables, ornamental plants, and flowers.
- Establishment of an orchard or field for growing several types of fruits or vegetables by patients, and to produce food for a hospital kitchen.
- Attempting to occupy patients in many appropriate agricultural jobs.
- The presence of a hall for several purposes such as painting, handicrafts, meetings, parties and events, cinema, indoor gymnasium, or for other purposes in which patients to play and spend their leisure times.

CONCLUSIONS

From the results of the study, we conclude the following:

1. Therapeutic gardens are considered essential in hospitals, and they are an integral part of the treatment process in many types of hospitals, especially in neurological and psychiatric hospitals. In the opposite manner, interesting in therapeutic gardens were not found in both hospitals, despite having of sufficient areas of land for this purpose.
2. Therapeutic garden parts are important place for many activities. However, we did not notice those activities in Shaheed Salah men's Hospital at all, and we followed a few therapeutic activities in Soz women's Hospital, but most of them took place inside the internal halls.
3. The most important criteria for choosing places, spaces, and activities for therapeutic gardens in hospitals are the type of hospital, the needs of patients and staff, environmental factors, and site characteristics. However, we did not observe the application of any of these criteria in both hospitals.

RECOMMENDATIONS

Through the results and conclusions, the study reached several recommendations, which are:

1. Recommending the establishment of therapeutic gardens in all hospitals according to their specializations, follow standards and scientific studies in terms of their area, components, therapeutic, and recreational activities.
2. When a garden is designed in psychiatric hospitals, the needs of patients, medical and administrative staff, as well as environmental factors on the site must be taken into account.
3. Recommending further studies on therapeutic gardens in other types of hospitals.

Suggested designs for mental hospital gardens:

To develop garden designs for both hospitals, the two sites were visited several times to collect information and take data about the sites, which included:

1. Site survey.
2. Determine the dimensions.
3. The actual area allocated to the gardens.

4. Determine location and elevation directions.
5. Study the natural ingredients present in the sites.
6. Water source and quantity.
7. Soil test.
8. Gathering environmental information about the site.

Based on the results, conclusions and recommendations of this study and based on international standards in this regard and the needs of patients and hospital staff, taking into account the environmental factors of the site as well as the opinions of psychological experts and specialists in this field, an alternative design for the gardens of both hospitals was proposed and developed. It appears in figure (15) for the gardens of Soz Hospital and figure (16) for the gardens of Shaheed Salah men's Hospital and the two designs are somewhat similar in terms of recreational activities and patients' needs, with some minor differences, which depends on the topography of the land, the available survey and the gender of patients. The two designs are characterized by the presence of windbreaks around the hospital site with the planting of shady trees with fallen leaves in the corners of the garden and around the sitting places and along the movement corridors for abundant shade, as well as the presence of grass yards, flower gardens, fountains and places to sit and rest and picnic for patients, in addition to the presence of fruit orchards and greenhouses for the production of ornamental plants and various vegetables, for patients to work in to spend time and entertain themselves, in addition to the presence of a multi-purpose sports court, this is one of the most important features and components of the two designs of the two hospital gardens.

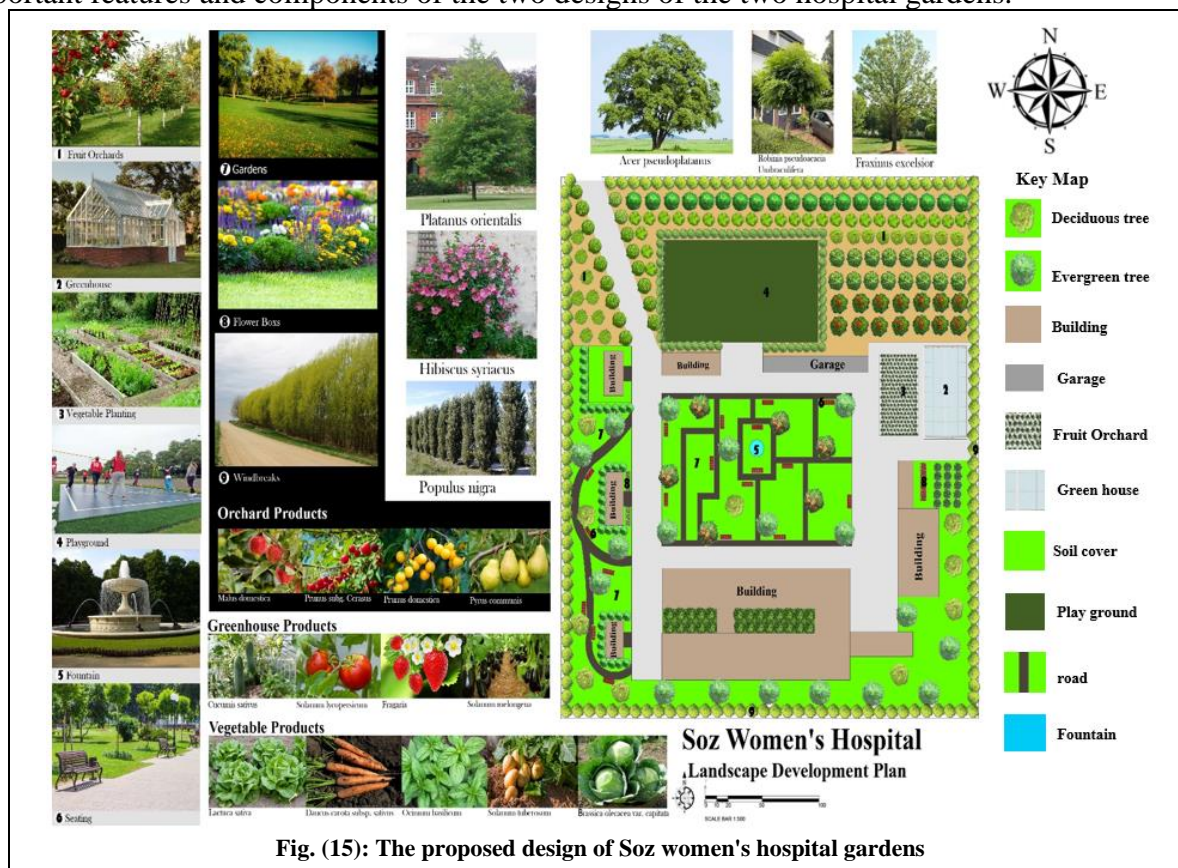


Fig. (15): The proposed design of Soz women's hospital gardens

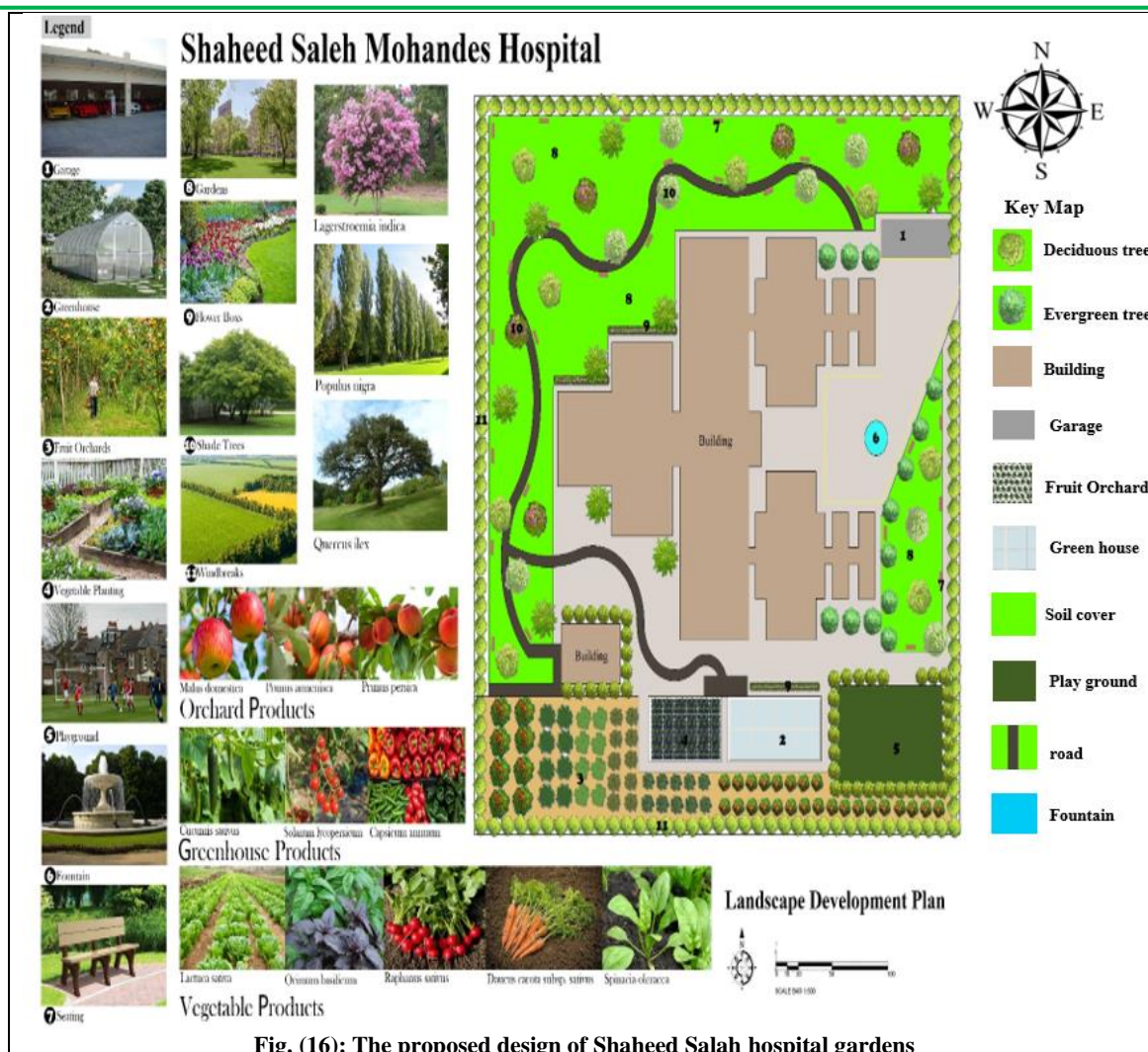


Fig. (16): The proposed design of Shaheed Salah hospital gardens

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الحدائق العلاجية في مستشفيات الأعصاب بين الواقع والمطلوب - دراسة حالة في مدينة السليمانية

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الخلاصة

اجرى البحث لدراسة واقع الحدائق العلاجية في المستشفيات الأعصاب في مدينة السليمانية - العراق. شملت الدراسة مستشفيات: سوز للنساء و الشهيد صلاح للرجال. خلال الفترة من 15 أبريل 2019 إلى 15 فبراير 2021. أظهرت النتائج أن المباني والمساحات في كلا المستشفيات غير مؤهلة للأمراض العقلية. لم يتم إنشاء هذه الهياكل في الأصل لمثل هذه المؤسسات. فكلا المستشفيات فيهما مناطق مخصصة للحدائق، لكن لم يتم استخدامها بشكل صحيح. تم استغلال المنطقة في الجنوب الغربي لمستشفى سوز للنساء لإنشاء الحدائق و لم يتم استخدام المساحات المخصصة لإنشاء الحدائق في مستشفى شهيد صلاح للرجال. كل منها لم تحقق الأهداف والمقاصد التي أسست من أجلها. علاوة على ذلك، قلما تهتم المستشفيات بالأنشطة الترفيهية في هذه المناطق. ومع ذلك، بناءً على الأطباء النفسيين والأطباء في كلا المستشفيات ، يحتاج المرضى إلى الأنشطة. تم توفير بعض الأنشطة مثل الأنشطة الرياضية والفنية والاجتماعية من قبل مستشفى سوز للنساء داخل القاعات الداخلية. لوحظت استجابات قوية من قبل المرضى لأنشطة مماثلة. مثل هذه الإجراءات كانت أقل وجوداً في مستشفى الشهيد صلاح للرجال وصل البحث إلى عدة توصيات لتطوير تصميم مقترح للحدائق في كلا المستشفيات. وقد استندت التوصيات إلى المعايير الدولية والبيئية لمثل هذه الأماكن.

الكلمات المفتاحية:

تصميم حديقة علاجية،
مستشفيات الأعصاب، مستشفى
سوز للأمراض العقلية للنساء،
مستشفى الشهيد صلاح للرجال.