Nile Journal of Architecture &Civil Engineering

Journal Webpage: https://njace.journals.ekb.eg

Volume 2, June. 2023

The Role of Architectural Design in Solving Problems of Addiction Treatment and Rehabilitation Centres

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Abstract

Addiction treatment centres play a critical role in helping individuals to overcome substance abuse and to achieve a long-term recovery. However, these centres often face numerous challenges that can impact in the effectiveness of treatment programs and the overall well-being of patients. This paper explores the role of architectural design in solving problems faced by addiction treatment centres, aiming to enhance the therapeutic environment and to improve treatment outcomes. The present study analyzes the components of physical spaces in drug rehabilitation centres by using a theoretical and analytical approach, and descriptive-analytical method. The research aim is studying of interaction and relationship between patients, design elements and requirements, which significantly influence on patients in drug rehabilitation centres and the physical spaces defined by a range of aesthetic signs in its surrounding. Also, it shows how to apply these requirements in the design process. By considering the unique needs of patients and implementing though design strategies, centres can create spaces that able to heal, promote recovery, and enhance the overall well-being of individuals seeking treatment for addiction. There is a need to improve the physical environment of patients using aesthetic structures, such as enhancing of environment and spaces (indoors, outdoors).

Key words: Drug Rehabilitation Center, design elements, Environment.

1-Introduction

Drug addiction is one of the biggest social problems facing societies nowadays. Therefore, most countries seek to rehabilitate drug addicts in order to benefit from them as productive members of society. It should be working on an appropriate built environment. One of the architect's top priorities is user needs. Especially in specialized facilities, such as addiction treatment centres where the user stays for a long time to be rehabilitated and reintegrated into society. Addiction centres in Egypt have not yet kept pace with medical development to provide comfort and luxury within these institutions. Although medicine has determined that addiction is not a mental illness. Standards and recommendations for the design of drug addiction centres are not specifically designed for that type. This influences patients' perception through the implementation of the therapeutic structure. The importance of this research is convincing decision makers to consider the human dimension in design.

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2- Research problem

The research problem is to determine the role of architectural design in helping to fill the needs in spaces of addiction treatment centres in Egypt. That will be achieved by making them suitable to the human dimension and thus helping to solve a social problem that threatens society through analyzing some international examples and identifying the design principles that related to addiction treatment centres.

3-Method

The present study analyzes the components of physical spaces in drug rehabilitation centres using a theoretical and analytical approach, descriptive-analytical method, and data studies.

4- Cases of study

Some international examples of different architectural approaches to designing addiction treatment centres are used in the analysis as following;

4.1-Sister Margaret Smith Addictions Treatment Centre

That example is selected for obtaining the Golden LEED Project Award Environmentally supportive architectural design.

4.2-Groot-Klimmendaal rehabilitation center

The building is located in the heart of the forest, which gives it a distinct connection to nature, and at the same time it is not far from the city. The building was designed by architect Koen van Velsen, a distinguished architect who has won several awards.

4.3-Al Amal psychiatric hospital

The hospital was designed with a special focus on both natural and artificial light, to emphasize the importance of light's ability to heal.

5-Analysis of case studies

5.1- Sister Margaret Smith Addictions Treatment Centre

Architect: Kuch Stephenson Gibson Malo
Location : in Ottawa - the capital of the Canada
Area: 15849 square meters (figure 1).

Figure 1: Courtyard of Sister Margaret Smith Addictions Treatment Centre

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The center provides residential and non-residential services (figure 2) to treat alcohol, drug and gambling addicts, in addition to eating disorders. The accommodation rooms are also individual. Available activities include a games hall, a space for worship, a multi-purpose hall, and large gardens. The building was placed as part of the care complex, as the model increases ease of access to activities and led to achieving a real mark in respecting the environment. In short, this building embodies the philosophy that a healthy building environment can be an essential element in the therapeutic process.

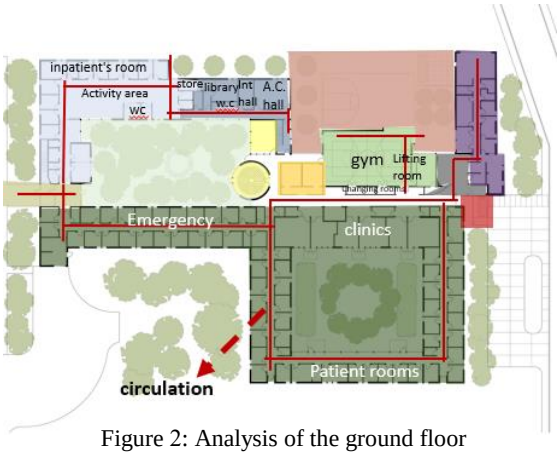

Figure 2: Analysis of the ground floor

The project embodied five main design strategies

1- Wide glass areas to provide natural light
2- Construct a building that respects the natural environment
3- Rationalizing water use through design
4- Reducing energy use
5 - Sustainable vision

Void analysis	space	total Area	Detail space	Area	N
	The main entrance	20	Emergency	434	-
	the residential entrance	42	clinic	240	-
	administration	320	Patient rooms	771	-
	the recovery hall	280	inpatient's room	196	1
	spiritual rooms	97	activity	230	4
	Gym	310	w.c	28	1
	the laundry room	62	library	28	2
	the school	195	internet hall	26	1
	a residential section (youth living)	511	store	63	1
	a residential courtyard	645	w.c	9	1
	a treatment courtyard,	2040	gym	290	2
	an activities courtyard	533	a lifting room	48	1
			store	7	1
			changing rooms	24	1
					2

Table 1: case voids area

5.2- Groot-Klimmendaal Rehabilitation Centre

Architect: Koen van Velsen
Location : in a forest outside Arnhem, the Netherlands (figure 3).
Area: 14000 square meters

Figure 3: The building's direct connection with nature in the forest

-Description

The three-storey building is made of brown anodized aluminum (figure 4, 5, 6, 7).

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Figure 4: Analysis of the ground floor

Figure 5: Analysis of the first floor

Figure 6: Analysis of the second floor

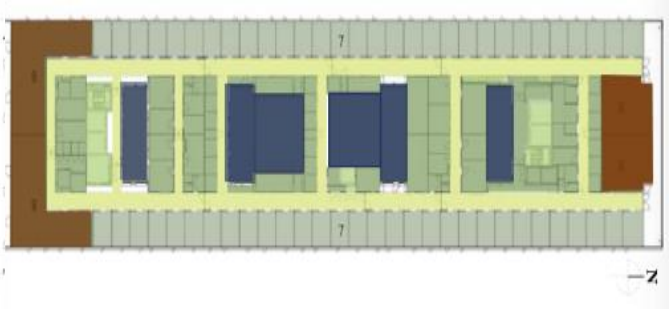

Figure 7: Analysis of the third floor

The design aims to change the stereotype of rehabilitation centres by creating a welcoming and comfortable environment for its users. The building is clad in brown aluminum panels, despite its size. Al is low profile to blend in with its surroundings. Secondly, the center's design emphasizes nature's healing capabilities. This project was a Mis van de Rohe Prize nominee in 2011.

--Activities such as the gymnasium, swimming pool and theater (table 2, 3) were placed on the ground floor in order to open them to members of the local community. This philosophy is due to the patient feeling integrated again, where there is no isolation and is compatible with the environment.

The building has large glass surface providing sunlight everywhere and visual continuity. It is also designed with energy-saving mechanical and electrical installations to emphasize the concept of sustainable design.

Void analysis	space	Area
	The main entrance	15
	gym	290.54
	a swimming pool	295.96
	a theater	247.24
	horizontal circulation elements (corridors) stairs and elevators	152.19
	administration and technical rooms	326.19
	a fitness center	232.91
	a space	400.31

Table 2: Voids area for (0-1) floor

Void analysis	space		Void analysis	space	Area
	Sports hall	70/room		Corridors	
	patio (courtyard)	45/room		stairs and elevators	152.19
	corridors, stairs and elevators	152.19		administration	548
	clinics			double height	
	administration	1238.2		patients' rooms	1709.61
	double height	450.8		Ronald's house	393.57
	living rooms	100/room			
	patients' rooms	15/room			

Table 3: Voids area for (2-3-4) floor

The project embodied main design strategies

1- Natural lighting
2- Visual continuity
3- Contact with nature

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5.3- Al Amal Psychiatric Hospital

Architect: KMD ARCHITECTURE
Location: Dubai United Arab Emirates.
Area: 36600 square meters

Figure 9: Interaction of the building with surrounding environment.

Analysis:

KMD provided a program and design services for this prototype psychiatric facility, which required a unique design and aesthetic response to ensure its therapeutic mission in the community effectively accomplished.

The overall agglomerated appearance of the hospital is an oasis or village surrounded by lush vegetation (figure 9). Al-Amal Complex for Behavioral Health has 272 beds for patients ranging in age from adolescents to the elderly. Acute, forensic, and detox levels are available (figure 10, 11, table 4).

Figure 10: Analysis of the ground floor

The project embodied main design strategies:

The hospital was designed with a particular focus on both natural and artificial light, emphasizing the importance of light's ability to heal. The hospital has glass panels and interior courtyards that allow plenty of natural light. Retracted ceilings and internal glazing allow light to penetrate deeper into the structure. Furthermore, chromotherapy is used throughout the facility to soothe re-coverage, support sleep, eliminate depression and maintain a natural circadian rhythm for staff and patients.

Figure 10: Analysis of the first floor

Table 4: Voids area for (1-2) floor

Void analysis	space	Area	Void analysis	space	Area
	Fire hose			Fire hose,	
	multi-use hall	85.83		drug abuse rehabilitation rooms,	278.15
	living rooms, administration and staff,	111.4 286.48		gymnasium, corridors,	70.24
	corridors			administration and staff	444
	elevators	23.46		rooms,	
	courtyards			clinics,	147.87
	mothers and children's rooms	176		technical rooms	130.12
	clinics	532			
	technical rooms	83.87			
	workshops	48.15			
	family visiting hall	29.30			

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5.4-Comparison Between analyzed Cases (Table 5)

Table 5: Comparison between studied cases of addiction treatment centers

	Case study 1	Case study 2	Case study 3
Area	15849 m2	14000 m2	36600 m2
location	Suburbs	outside the city	outside the city
Illness	addiction	addiction	mixed
no. of bed	40	60	272
Residence style	Rooms	Rooms	Rooms and suites
Women's Residence	separate	separate	separate
Treatment Stages	Rehabilitation	Rehabilitation	Rehabilitation
Isolation Rooms	0	0	0
Main Design Strategies	1- Wide glass areas to provide natural light 2- Construct a building that respects the natural environment 3- Rationalizing water use through design 4- Reducing energy use 5 - Sustainable vision	1- Natural lighting 2- Visual continuity 3- Contact with nature	1-natural and artificial light, emphasizing the importance of light's ability to heal. The hospital has glass panels 2-interior courtyards that allow plenty of natural light. 3-Retracted ceilings and internal glazing allow light to penetrate deeper into the structure.

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6-Result and Discussion

6.1- Physical Components of Patient Satisfaction in Drug Rehabilitation Centres

Patients in drug rehabilitation centres respond to a series of physical components and accept them as a treatment incentive and persistence in the drug rehabilitation environment. These factors are related to the environment and elements within the environment**.**

6.1.1- Color and Light

The structure of the built environment includes the most important components which are color and light that has been done in each case.

In general, color and brightness can affect patients and their response to the environment. It also helps the improvement of patients and the total experience of patients, staffs, and visitors. Appropriate color and brightness are powerful tools for finding the path. The artworks on the walls are suitable to regulate the nervous system and carry out the tasks. The effect of cold and warm colors and brightness are broad issues.

6.1.2-The use of Light

Light is essential for the internal clock of humans. Human has been equipped with certain rhythms such as body temperature during his evolutionary process that help him for communication and inform him of the time outside. The lack of contact with the outside may lead to fatigue, insomnia and seasonal depression.

This magnificent glass ‘treatment’ where the sun is always there brings the residents closer to nature. The purpose of this method is to guide the continuity between the exterior and interior design through glass and innovative height. But the important thing is that the residents do not have the sense of confinement and being away from the world outside. The clear view of the restaurant shows the warm feelings of meals on days with hall windows to manipulate the surrounding forest and welcoming the environment.

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6.1.3-Natural Environment and Green Space

One of the components of satisfaction with drug rehabilitation centres is their natural environment. Studying the effects of nature on human soul with scientific methods has started too late. In the past 30 years, many theories about how to increase the welfare and the quality of life of people with their presence in nature have been offered by natural and social scientists14. Herbalism has been considered since the late 1800s and many of the health centres have used it as a means to improve the lives of patients. Plants in the interior space also reduce stress and help the promotion of recovery. Apart from the fact that having plants in pots in every room makes the hospital environment away from the dry place, using Atrium in the central parts of hospitals helps the entrance of natural daylight and can also create an appropriate waiting area**.**

6.1.4- Materials

Materials are the language and decoration of buildings and physical environment. In fact, the visual language is the emotion and expression of construction materials. Thus, paying attention to the company and semantic relationship of them is one of the important issues. The use of natural materials in buildings establishes a harmonious relationship between the visual power of human and his feelings. In assessing a building not only the building itself but also the surrounding environment is important. Terence r.lee empirically proved that the method of perception was very personal and differed from person to another. An international forum in one of his research in 1974 concluded that in general the environment with the radius of 400 meters or a five minute walk affects the perceptions20. As mentioned, the materials are the visual aspect of the building and have direct psychological effects on people. Thus, the addict person needs to see relaxing and peaceful elements in his/her environment due to the nervous problems and disorders and the appropriate and natural materials (such as the use of wood, stone, brick) in the building as decorative elements can affect the mental health of people and enhance their satisfaction.

6.2- Design requirements

Some of the most important design standards for treatment Centres:

- ***The number of patients in the nursing****:* unit should not exceed 30 patients in stable cases, and 20 patients in critical cases.
- ***Single accommodation rooms*****:** The area of the residence room must not be less than 12 square meters.
- ***Double accommodation rooms:*** The area of a room should not be less than 9 square meters for each patient.

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- ***Isolation rooms:*** The area of the isolation room shall not be less than 15 m^2. The height of the room is not less than 2.75 m, attached to a bathroom with certain rules and regulations.
- ***Living room:*** The living room area is calculated according to the number of patients to be accommodated in it and their functional and mobility requirements. The area of the person in the living room is 2.25 m^2. The living room area for the ward is 45 m^2.
- ***Dining room:*** The area allocated to each patient should not be less than 1.85 m2.
- ***Examination room:*** The area of the examination room is not less than 12 m2.
- ***Group therapy:*** Allowing for the meeting of about 10 to 12 people sitting together in a circle. The area allocated for this room should not be less than 20 m2.

7- Conclusion

From the above, the success of designing treatment centres increases recovery rate, and the success of the treatment process are the most important. The data for this design are as follows:

- It is important to note that the architecture is not a cure from the beginning, but can be useful significantly as a part of the treatment through the establishment of spaces.
- Natural and built environments have physical and mental aspects Different therapeutic environments have effects Featured on mental health and psychological behavior And physical balance.
- An addiction rehab center needs to be A successful therapeutic community has a large area, large enough to contain the spaces mentioned previously.
- The design of behavioral bases should fit the patients.
- Activating the concept of support in design elements reduces nervous tension and increases patient reassurance.
- The creation of defining inviting and easily readable paths and directions to become more relaxed.
- We conclude from the analysis of the examples that the treatment stages take place in 4 stages:
  - STEP 1: The comprehensive evaluation and first examination stage.
  - STEP 2: Expulsion of toxins from the body.
  - STEP 3: Rehabilitation stage and psychological and treatment.
  - STEP 4: External follow-up stage.

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8-Recommendations

In light of the previous results, the research suggests:

- Exploitation of occupational therapy by Egyptian therapeutic institutions treatment as a means of income from company's investments.
- Therapeutic Centres should have a full exploitation of the nature and provide an environment that create attraction and stimulate sensory of patients.
- Establishing a treatment center in a new area outside the city limits, such as New Alamein City, as the city is located within Egypt's strategic plan, which is scheduled to establish an integrated medical complex. It is also affiliated with Matrouh Governorate, which ranks as the fourth in Egypt's addiction statistics, with a rate of 19%, according to the National Center for Research and Housing.
- Use appropriate colors in the center proposed to be established, as they have an effective and accurate impact on human life.

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