

Psychologically supportive healing environment for sustainability in healthcare facilities: A case study



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ABSTRACT

The design and construction of healthcare facilities are some of the significant foundations for the survival and healthy living of a happy society. In terms of the sustainable quality aspect in healthcare facilities, the structural safety and functional efficiency were primarily analyzed. In the further development, it turned into the healing healthcare centers together with the inclusion of aesthetic and cultural values as well as psychological and physical needs of individuals. With such developments, the concept of psychosocially supporting design has come into prominence through improving as a connection to nature, social support enhancement, stimulating design features, complexity, and coherence factors. Our article analyses the subject based on the indoor space planning elements for user's psychological positive experience upon defining the factors with their spatial characteristics in consideration with the study regarding a conceptual model of the supportive healing environment. A hospital project, which is in the pre-design phase and still under development in the Near East University, was analyzed as the case study under this study.

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1. Introduction

Upon the assessment and control of sustainable hospital designs based on the healthcare buildings certificate program criteria such as DGNB, LEED, BREEMS, and GREEN STAR, the sustainable hospitals have become the subject of discussion regarding the ways of creating a healing environment and their contributions on the recovery of patients. Pursuant to the previous studies, patients recovered faster with feeling safe in the healthcare facilities designed and organized with the concept of psychosocially supporting design (Güner, 2018).

In this study, the subject matter is analyzed from the perspective of a psychologically supportive healing environment for sustainability. With the existing physical, aesthetic, and cultural values and psychological needs of users, it is imperative to design healthcare buildings by considering the studies on healing environments. The studies showed that the establishment of gathering, art, and live music spaces as social spaces in hospitals, and

the creation of flora in such places with the reflections of nature and natural light, i.e. water, artificial waterfall have brought healing effects on patients.

This study is concentrated on a hospital design, which is under development at the Faculty of Architecture, Near East University. Spatial arrangement is considered as the impact point in the spatial use features.

As a dynamic organism, healthcare facilities are formed in a way that is always open for constant change of life within and spatial improvement. Where the social life within the healthcare facilities is well analyzed and organized, and a sustainable healing environment is created, such facilities bring positive healing effects on patients and users. This matter is still a problem domain with various ongoing studies.

The elements of a sustainable healing environment should be taken into consideration during the architectural design phase.

In England, a healthcare facility can be hypothetically analyzed under the researches on NHS in AEDET (the Achieving Excellence Design Evaluation Toolkit) within the framework of healing environment (AEDET can be used in some of the situations as "at various stages during the design of healthcare buildings.") (Ruddock and Aouad, 2009).

Considering the case study designed about the healing environment, this article explains how the

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arrangements and their locations can be places with interior planning with social, art, and exhibition areas. The design is described with elaborated explanations on the project indicating natural features such as artificial waterfall, aquarium, and courtyard.

Through its studies, NHS aims to enhance the health and welfare effects of such interior schemes at the healthcare facilities in consideration of the positive impact of art programs in staff and patient environment. The prominent subjects in the related studies of NHS are music, visual arts, embracing nature, and accessibility elements.

Pursuant to NHS patient satisfaction survey, a well-designed environment improves the clinical outcomes of patients, and consequently reduces the personnel and medical expenditures of hospital administration (Ruddock and Aouad, 2009).

The healing environment features are considered to improve the healing effect among patients where such features are included in hospital design.

Noise, temperature, and interior-exterior landscape all have significant and positive effects on patients and users where placed in a controlled environment (live music, natural lighting, indoor garden, scenery, etc.). Additionally, the areas such as spots for waiting, meeting, and cafeteria furnished with aesthetic and comfortable ergonomic furniture also promote various positive social behaviors among patients.

The theoretical approaches in the design of healthcare facilities also account for the cultural and spatial ideas of society.

Patients staying in the rooms with a view are observed to require not so many painkillers when compared with other patients. For the patients undergoing chemotherapy, visual arts reduce their depression levels while live music helps to relieve their anxiety levels.

According to National Health Services in the UK, healthcare buildings should be planned and designed for the provision of quality service to patients and their relatives. The spatial design should help to calm down and relieve the patient by eliminating the concerns of patients and their relatives, which means that the design concept should be patient-oriented (Erenoğlu and Aytuğ, 2007).

Since designers do not look at their designs from the patient perspective, they may sometimes create buildings that arouse negative feelings in patients (Erenoğlu and Aytuğ, 2007).

In the UK, a number of research conducted by the National Health Service (NHS) on the healing environment with regard to the innovative designs concluded the importance of hospital designs, even the projects that have not been yet implemented (Ruddock and Aouad, 2009).

Thus, the category "Sociocultural and functional quality" that DGNB considered in its assessment tool, and the similar one "Social, cultural and perceptual aspects" that the International SBTool considers, positively influence the concerns of spaces design quality in the architectural design phase. This fact

promotes the consideration of the patients' and users' welfare in this type of buildings.

It is within this context that one can speak about Eco-humanism. Eco-humanism in architecture is about having an equal concern for human and ecological wellbeing, and by its nature, it touches on many uncomfortable truths (Verderber, 2010; Castro et al., 2013).

The challenge now is to translate this unprecedented opportunity into action.

The main concerns of the space design are the humans' needs. So, the use of rating systems specifically for the hospital buildings becomes essential to include in the design phase, beyond the importance of historic preservation, and systems of interrelated hierarchies comprised of personal, institutional, and societal constructs (Rokeach, 1979).

Abraham Maslow is the founder of humanistic psychology. Therefore, the humanistic approach by Abraham Maslow, which is the hierarchy system of human needs, becomes important for users. The psychological needs and safety needs as the first two levels in the hierarchy of human needs by Maslow are in the group of basic needs. The next group of human needs is the psychological and self-fulfillment needs that show social and psychological characteristics such as belongingness, esteem, and self-actualization, which are personal preferences. As people progress up the pyramid, needs become increasingly psychological and social. Soon, the need for belonging, friendship, and intimacy becomes important.

Fig. 1 shows the creation of sustainable healing environment spaces through the humanistic approach of Maslow and the comfort, health, and happiness factors of sustainable healthcare spaces.

2. Psychosocially supportive design

Dilani (2009) explained that the aim of the psychosocially supportive design is to stimulate the mind to create pleasure, creativity, satisfaction, and enjoyment. There is an important relationship between an individual's sense of coherence and the characteristics of the physical environment. Nowadays, when health is defined, salutogenic perspective is more applied rather than pathogenic perspective. The holistic viewpoint enhances multiple dimensions of health, including physical, psychological, emotional, spiritual, and social treatment. A designer must consider psychosocially supportive design for hospital design with an understanding of patient's various statuses. A hospital must be planned with good design elements and support user's positive experiences. It can optimize health-promoting environmental effects. Having positive experiences can give comfort to patients and promote their health. A healing environment can be accomplished by psychosocially supportive design which promotes a sustainable environment. Sustainability environment would bring the quality of life, and it will eventually

enhance healing environment” (Dilani, 2009; An and Lee, 2010).

There have been crucial developments in the sustainability of healthcare facilities regarding the healing environment characteristics. Other than providing medical treatments, healthcare facilities should be considered as a changing social organism. The main aim of this study is to organize the main

functions of hospitals on the site plan based on the admission, diagnosis, treatment, and medical care of patients in consideration of the healing environment of healthcare services. Moreover, the planning of spaces as healthcare facilities based on the healing environment features has positive psycho-social effects on patients.

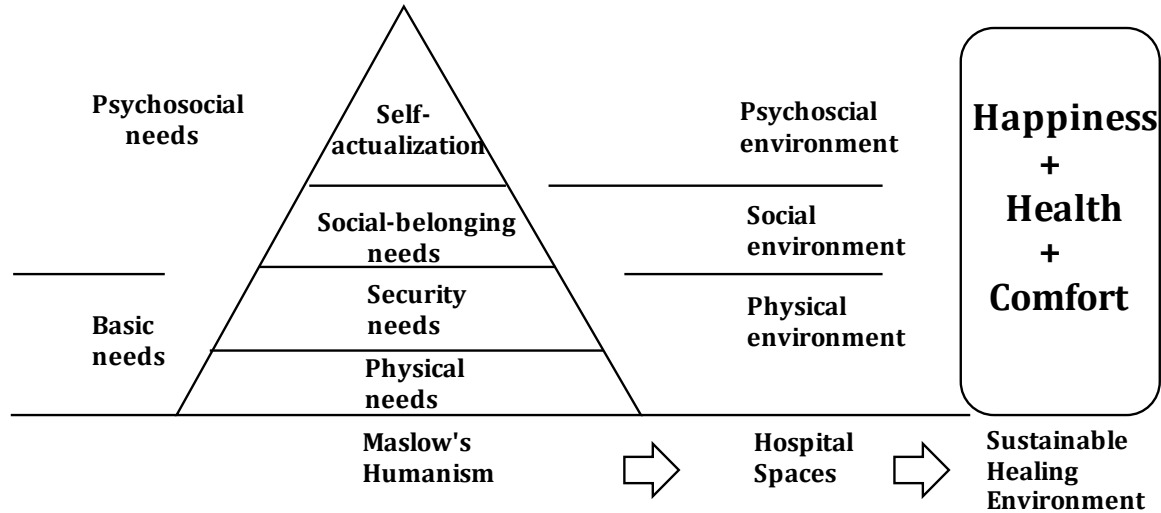


Fig. 1: Psychosocial supporting design idea (Cherry, 2020; An and Lee, 2010)

The related studies focus on the sustainability of healthcare facilities and their associated interaction between the design and users. This study signifies the supplementary design of hospitals from the psycho-social perspective and psycho-social views of users, which is the psychological relation (An and Lee, 2010).

3. Conceptual framework of healing environment attributes

As earlier stated, a very important feature of healing attributes is its ability to have a positive influence on patients physically, socially, and psychologically. This research is centered on four distinct variable or factors summarized from the work of Dilani (2009) and Ulrich et al. (1991), enhancement of social support, stimulating design features, flexibility, and coherence, and connection to nature, focusing on the hierarchy of the above-mentioned attributes according to their relevance in the application and outcomes as shown in Fig. 2 (Dilani, 2009; Ulrich et al., 1991).

The healing environment of healthcare buildings was analyzed by their 4 main attributes and each of them was given in Fig. 2 upon their spatial classification by their actions and functions (Uwajeh and Ezennia, 2019). Similarly, Table 1 provides a much-elaborated scheme as indoor space planning elements for user’s psychosocial positive experience together with spatial characteristics and its healing effects on the users (An and Lee, 2010).

From the perspective of sustainability, the well-organization of social programs in the design of

healthcare facilities by the administration is vital for the healing environment. In terms of design, the availability of recreation, waiting, meeting areas and yards opening to nature have all positive physical, chemical, biological, and ecological effects. Additionally, this has healing and positive features on the designed environment from the cultural, social, economic aspects (An and Lee, 2010).

Dilani (2009) stated that the aim of the psychosocial supportive design is to introduce the feelings of pleasure, creativity, satisfaction, and affection.

From the holistic perspective, the healing environment features have supplementary positive psycho-social, physical, psychological, emotional, moral, and social effects in the treatment of patients, which the designers should consider in the project development phase. The creation of environments with well-organized design elements providing psycho-social positive environmental effects to the users and patients gives patients the feeling of relief while helping them to get better.

As given in Table 1, An and Lee (2010) grouped the design elements that may affect the user’s psychological feelings in a positive way as NA=Nature, WL=Windows, and Lighting, CL=Color, LS=Land mark and Symbol, SM=Sound and Music, AT=Art and Atmosphere, RC=Rest and Crowding, SV=Social and Service. Consequently, the features of indoor space planning elements for user’s psychosocial positive experience are explained in terms of being explained as comfort, safety, convenience, sociality, territory, privacy, accessibility, dynamic, energetic, eco-friendly, and interaction.

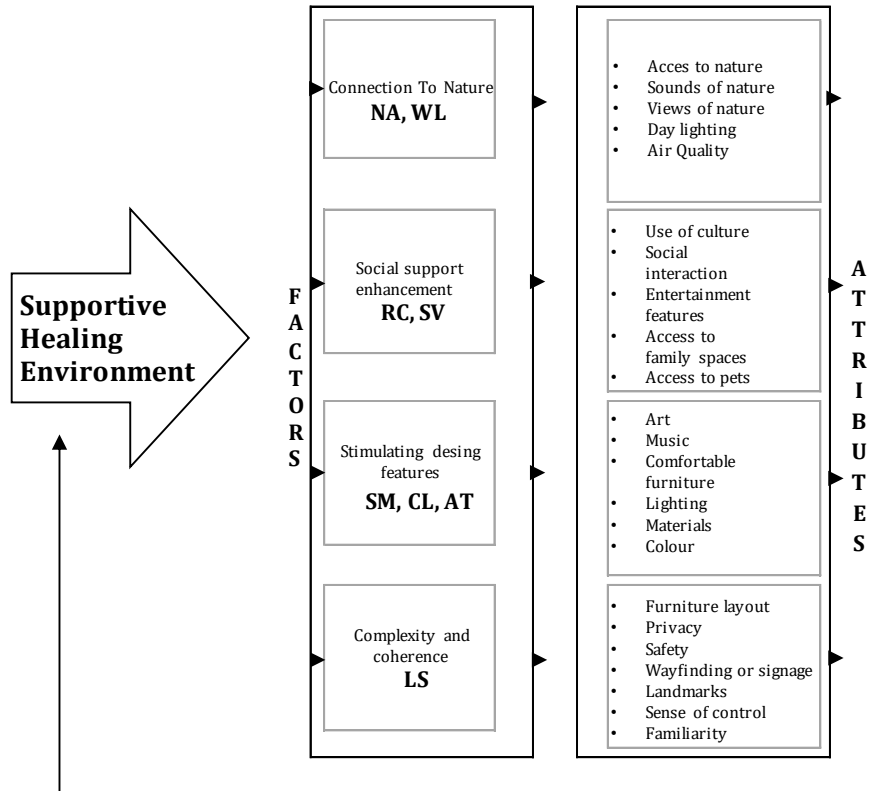


Fig. 2: A conceptual model of supportive healing environment with the four attributes from theories of Dilani (2009) and Ulrich et al. (1991) (Uwajeh and Ezennia, 2019)

Table 1: Indoor space planning elements for user’s psychosocial positive experience (An and Lee, 2010)

		Comfort	Safety	Convenience	Sociality	Territory	Privacy	Accessibility	Dynamic	Energetic	Eco-friendly	Interaction
NA	1 Roof garden	•			•	•		•			•	•
	2 Indoor gardens	•	•	•	•	•		•		•	•	•
	3 Aquarium	•			•	•			•	•	•	•
	4 Fountain, waterfall				•	•			•	•	•	•
WL	5 Atrium	•							•	•	•	•
	6 Indirectness	•			•					•	•	•
	7 Pastel colors	•				•	•	•	•	•	•	•
CL	8 Various color fabric and-synthetic leather	•			•	•			•	•	•	•
	9 Color therapy	•							•	•	•	•
	10 Complementary colors- schemes					•	•			•	•	•
LS	11 Similar color schemes					•	•			•	•	•
	12 The LED display showing art activities and locations									•	•	•
SM	13 Sound absorption panels	•	•	•			•					
	14 Concert Area				•				•	•	•	
AT	15 Patterns like leaves or petals-on the floor		•	•	•	•		•	•	•	•	•
	16 Art galleries	•			•			•	•	•	•	•
RC	17 Art walls	•			•			•	•	•	•	•
	18 Wide windows	•		•	•	•	•	•	•	•	•	•
	19 Advanced cafe atmospheres	•	•	•	•	•	•	•	•	•	•	•
	20 Extension of area per bed	•	•	•		•	•	•		•		
SV	21 Minimize copper	•	•	•		•	•	•				
	22 One-stop service	•		•		•					•	
	23 Health Promotion Centre - as- an independent space	•	•	•	•	•	•				•	
	24 Various cultural events	•		•	•			•	•	•		•

NA=Nature, WL=Windows, and Lighting, CL=Color, LS=Landmark and Symbol, SM=Sound and Music, AT=Art and Atmosphere, RC= Rest and Crowding, SV= Social and Service

4. A case 4: Study project evaluation

We would like to elaborate on the psycho-social analysis and evaluation of our ongoing hospital

project. Table 2 provides the characteristics of this project associated with the psychologically supportive design factors.

Table 2: Psychosocially supportive design: A case study project

Connection to Nature		Social Support Enhancement		Stimulating Design Features			Complexity and Coherence
NA	WL	RC	SV	SM	CL	AT	LS
Atrium	Atrium	Wide window of ward lounge	One-stop service	Concert area	Pastel colors	Art wall	Land-mark
Aquarium	Indirectness		Corporate Health Promotion Center	Sound absorption panels	Various colors	Art gallery (corridor)	Symbol
Roof garden	Courtyard	Advanced cafe atmosphere				Fabric and synthetic leather	
Fountain wall		Minimize copper	Various cultural events				
Indoor garden						Color therapy	
Courtyard		Extension of area per bed					

NA=Nature, WL=Windows and Lighting, CL=Color, LS=Landmark and Symbol, SM=Sound and Music, AT=Art and Atmosphere, RC=Rest and Crowding, SV=Social and Service

In correlation with the conceptual model (Uwajeh and Ezennia, 2019) developed as regards to the supportive healing environment theories by Dilani (2009) and Ulrich et al. (1991); the main subjects of our evaluation is on the analysis of supportive healing environment under the spatial adjustment criteria by An and Lee (2010) upon elaborating on the case study.

Given in Table 1, the indoor space planning elements for using spaces by an organized in 24 function group allows making a detailed assessment in the way of controlling the effects on users even in project development phase.

Pursuant to the theoretical initiative given under Fig. 2 as a conceptual model of supportive healing

environment with the four attributed by Uwajeh and Ezennia (2019) our study analyses the ongoing hospital design project with subtropical climate courtyard.

Figs. 3 and 4 present the site plan, ground floor plan, and section of the hospital design.

5. Project assessment by supportive healing environment characteristics

The analysis of design with site plan, ground floor plan, and section is given in Fig. 3 and Fig. 4, respectively.

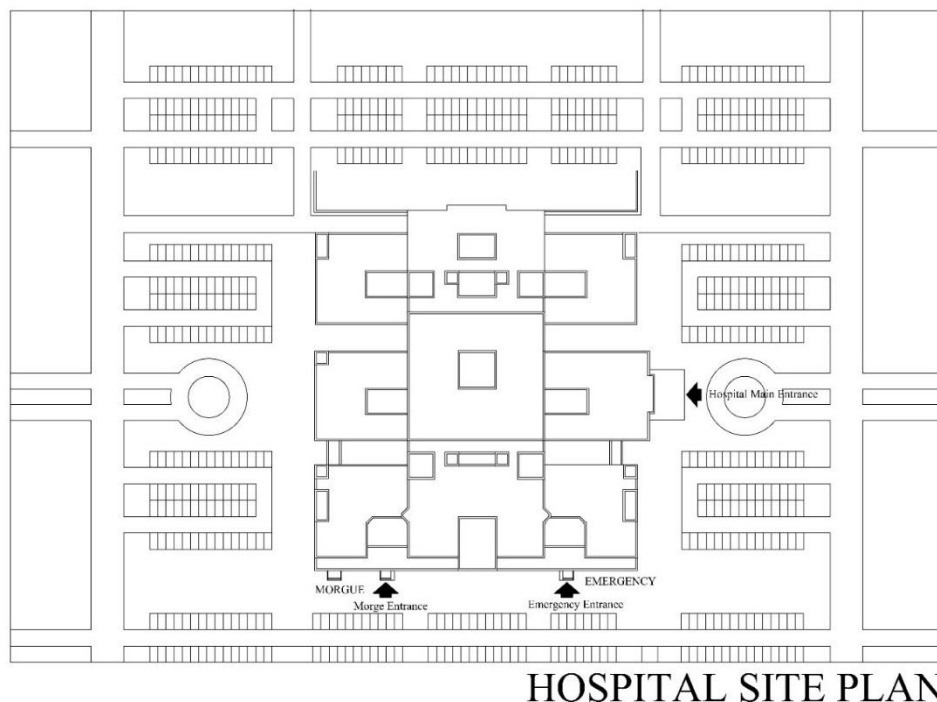


Fig. 3: An unimplemented hospital design project site plan

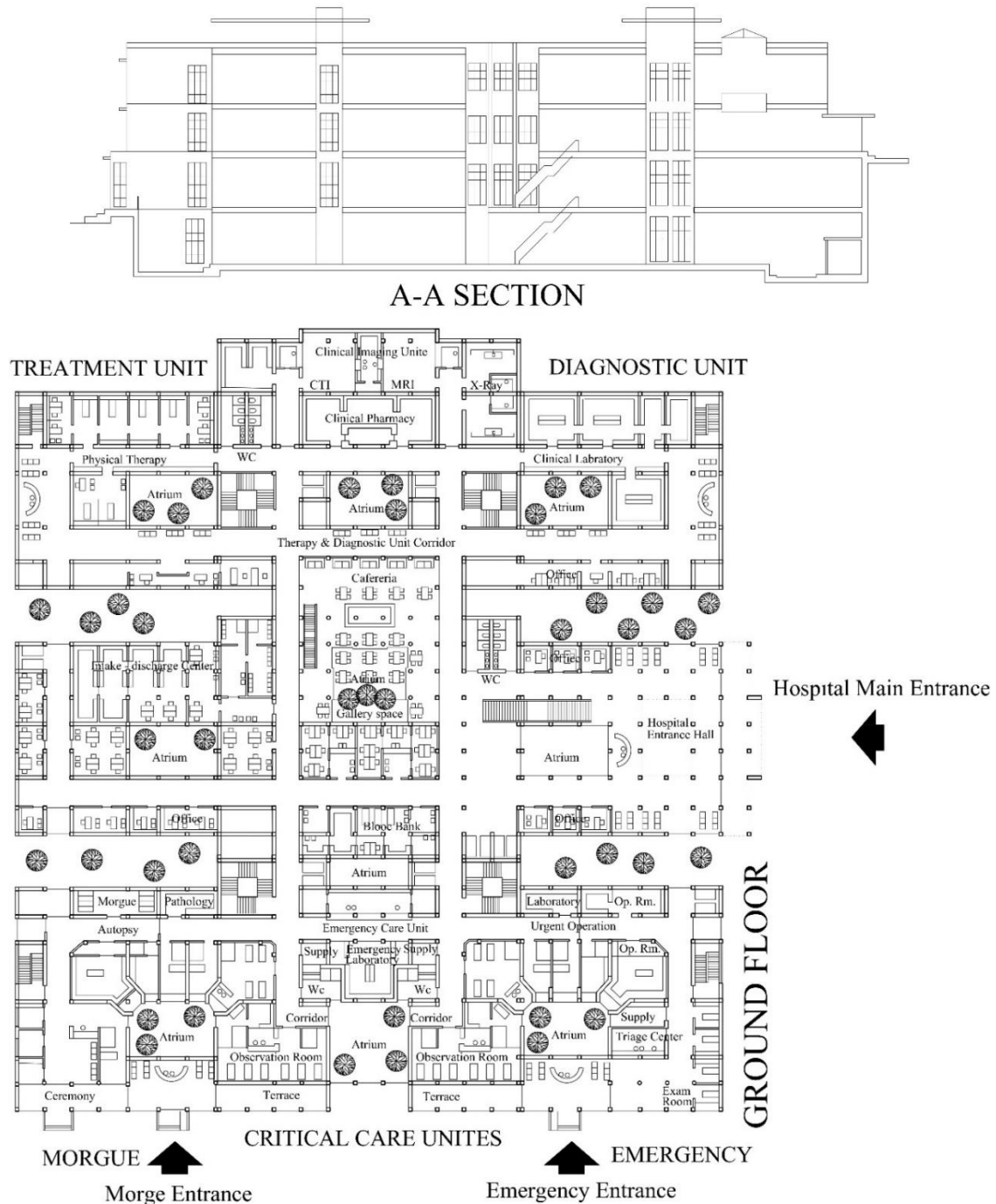


Fig. 4: An unimplemented hospital design project section and ground floor plans

This project is evaluated in accordance with the conceptual model of supportive healing environment with the four attributes from theories of Dilani (2009) and Ulrich et al. (1991) that given in Fig. 2 (Uwajeh and Ezennia, 2019).

The factors on the evaluation of the project as a supportive healing environment are as follows:

- A. Connection to Nature: NA=Nature, WL=Windows, and Lighting,
- B. Social Support Enhancement: RC=Rest and Crowding, SV= Social and Service
- C. Stimulating Design Features: SM=Sound and Music, AT=Art and Atmosphere
- D. Complexity and Coherence: LS=Landmark and Symbol

The proposed project is analyzed in accordance with the functionality information by A given in Table 1 since it is parallel with the supportive healing environment attributed by Uwajeh and Ezennia (2019) given in Fig. 2.

In terms of project design features, the site plan of ground floor and 1st floor have the same plan geometry with the spatial functions that can fulfill all definitions regarding the supportive healing environment per indoor space planning elements for the user's psychosocial positive experience.

The assessment and control of the ongoing proposed project from the perspective of a supportive healing environment are listed as follows:

A. Connection to nature:

NA=Nature

- Roof garden: 2 on the terrace.
- Indoor garden: 4 in the courtyard area.
- Aquarium: At the atrium in the reception area of the entrance.
- Fountain and waterfall: 4 in the courtyard and 3 at the atrium. There is also a waterfall at the big atrium facing the cafeteria.

WL=Windows and Lighting

- Atrium: 9 at the atrium, 4 at the courtyard.
- Indirectness: There is already daylight coming from the existing atrium and courtyard.

Also, all outside-facing spaces and indoor spaces get daylight.

B. Social support enhancement:

RC=Rest and Crowding

- Wide window: Bed units and all of the windows are wide.
- Advanced cafe atmosphere: 2-story cafeteria facing the big courtyard at the center of the hospital.
- Extension of area per bed: Sufficient spaces left for bed units ensuring user comfort and additional area use in two bedrooms.
- Minimize copper: Limited use of copper around the building and courtyards due to the hazardous effects of copper.

SV=Social and Service

- One-stop service: At the entrance lobby.
- Health Promotion Centre-as an independent space: With the one-day care service.
- Various cultural events: A range of cultural activities are organized by hospital administration at the cafeteria atrium and entrance lobby.

C. Stimulating design features:

SM=Sound and Music

- Sound absorption panels: Sound absorption panels and plants at concert area and atrium.
- Concert area: Live music at the big atrium by the cafeteria.

CL= Color

- Pastel colors: Windowpanes within the cafeteria, courtyard, and atrium were foreseen in pastel color.
- Various color fabric and synthetic leather: Used on sitting units like sofas and chairs in cafeteria and lobby areas.

- Color therapy: Calming, non-contrast, light sequential colors used generally in social areas.
- Complementary color schemes: Used in the related complementary color areas.
- Similar color schemes: Distinctive color used in hospital main departments based on their functions.

AT=Art and Atmosphere

- Patterns like leaves or petals on the floor: Mainly on the courtyard and nature-facing space floors.
- Art gallery: Two-level art galleries around the atrium behind the lobby of the hospital main entrance.
- Art wall: Corridors stretching from the art gallery area from the diagnosis and treatment areas.

D. Complexity and coherence:

LS=Landmark and Symbol

- The LED display showing art activities and locations: Signs at the areas close to cafeteria and hospital main entrance.

The assessment and analysis of this project design as a functional example in terms of its spatial adjustment for healing environment based on the details given under [Table 1](#) by an allow the control of psychosocially supporting design features.

Upon the construction of this and other similar project designs as buildings, the users may share their views on the spaces together with positive-negative aspects as POE (Post-Operative Evaluation).

There are several spatial standards required in spatial adjustments of hospital design in terms of a supportive healing environment. Regarding such users, it would be appropriate to add healing environment features into the sustainability criteria like DGNB in the project design phase. The evaluation and control of architectural designs within such adjustments would allow specific and up-to-date healing environment adjustments.

Within this framework, the inclusion of supportive healing environment evaluation criteria in healthcare building executions into the certificate schemes would be deemed as appropriate. The features to be added are as follows ([An and Lee, 2010](#)):

- Connection to nature (NA, WL): Hospital design has to be planned with nature elements (plant, water, air, and light) into indoor space carefully. Hospital design has to be concerned with illumination properly.
- Social support enhancement (RC, SV): Hospital design has to be considered crowding as cafe spaces, social services, and various cultural events and organizations.
- Stimulating design features (SM, AT): Hospital design has to be planned with artworks to stimulate the user's emotion. Hospital design must be promoted cultural events like art, music,

etc. Hospital design has to be colored properly. Coloring is a good method to improve the psychosocially supportive design for the hospital.

D. Complexity and coherence (LS): Hospital design has to be installed symbolic landmark.

6. Conclusion

Considering the supportive healing environment evaluation criteria, such design principles shall be considered by the hospital designers, which would ensure psychosocially supporting design idea criteria in hospital designs between space and individuals in terms of sustainability.

Other than the improvement of the physical environment for the functionality and comfort in the space, the psychosocial environment should also be organized for user satisfaction. The appropriate adjustment of hospital design in accordance with the healing environment would also bring a positive contribution to the good spirit of patient recovery.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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