Chapter 17

HEALING ENVIRONMENTS DESIGN PROPERTIES AFFECTING PATIENTS PHYSIO-SOCIAL STATES

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1. BACKGROUND/ OBJECTIVES AND GOALS

The healing environments have a substantial role in the enrichment of patient and staff health, which connect with their users as behavioral settings (Yıldırım & Yalçın, 2016; La Vela, Etingen, Hill, & Miskevics, 2016; Bartley, Olmsted, & Haas, 2010; Pati, Harvey, & Cason, 2008; Douglas & Douglas, 2004; Butler, 2001). Healing environments are designed to provide physical well-being through science and technology, and since there exists an incontrovertible relationship between these two discipline, it also fosters psychological well-being by presenting innumerable emblematic signals (Andrade, Lima, Pereira, Fornara, & Bonaiuto, 2013; Connellan, Gaardboe, Damien Riggs, Due, Reinschmidt, & Mustillo, 2013; Glanz, Rimer, & Viswanath, 2008; Milburn, 2001; Fottler et al., 2000; Malkin, 1992).Thus, when designing healing environments, not only the physical requirements but also the mental and psychological demands should be taken into account to create a positively-stimulating effects (Bilge 2019, 2017; Ulrich, 2003; Parker & Coiera, 2000). Accordingly, to achieve hospitals' positive effects, such as contentment, peace, gratification, creativity, etc., on recipients (patients, staff, and visitors), supportive design should be applied that aims to establish mentally satisfactory spaces that the physical environment is strongly linked (Daft, 2001)

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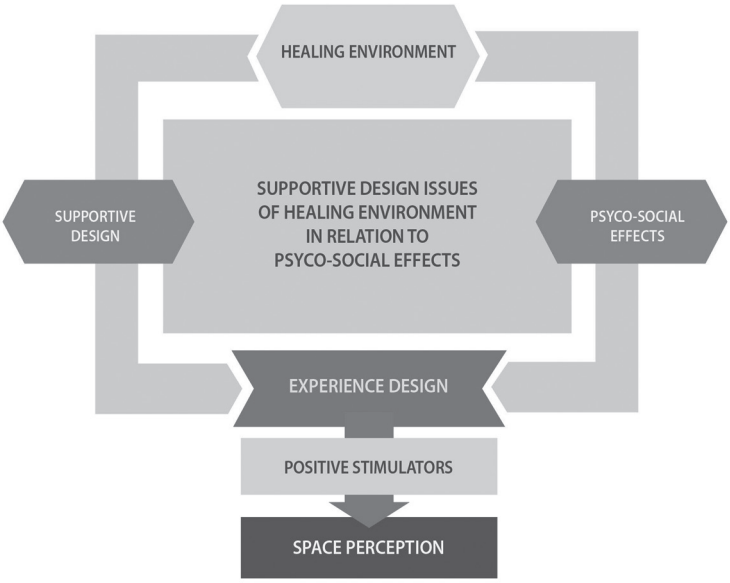

Fig. 1. Relations of Supportif Healing Environmental Design and Psycho-Social Effects.

In this regard, the method of utilizing the "experience design" in the healing environment provides contrubutions of wellness, essentially, is a holistic concept including the physical, environmental, social, psychological, and mental aspects of humans' life (Butler, 2001). In order to solve the design problems in the healing environment and to create suitable conditions started with the supportive design theory which is adopted and development by prominent researchers. Constructing this approach, the major theories that the healing environments have a substantial role in the enrichment of patients' wellbeing and also becomes necessary to assess because of its positive stimulation on patients' psychological state. These concepts and theories are assessed in the letter part.

2. CONTEMPORARY SUPPORTIVE DESIGN APPROACHES IN HEALING ENVIRONMENTS

Along with the medical improvements, some transformational affects the set-up of healing environment. Substantial approaches of healing environments come to the fore and reflecting (Sungur and Aytuğ, 2007) improvemnet patients' psychological state and focus of the healing environment. Many studies addresses many dimensions and determiners on this issue. Most comprehensive and contemporary ones are as follows;

The "Supportive Health Care Approach" by Ulrich states that the healing environment provides patients' positive stimulation to cope with stress and solve

problems (Ulrich, 1991, 1997, 1999). In such a way that supportive design should cover calming, stress-relieving and health-enhancing properties (Ulrich, 1991, 1997, 1999, Sloan, 2015). Supporting this approach, there are major theories that the healing environments have a substantial role in the enrichment of patient. Such as; the theory of Salutogenesis which is based on psychosocial situations in which the physical environment is a factor (Antonovsky, 1996; Dilani 2000, 2001). According to this theory, emotion and experience are directly related to the psychosocial status of the individual. The environmental stimuli affects the well-being of individuals. This model, called Antonovsky's salutogenesis, focuses on the capacity of environmental factors to strengthen individuals' wellbeing (Antonovsky 1991, 1997). The sense of competence, which is directly influenced by environmental factors, is presented as a determiner that improves the well-being, regardless of any patient. Unlike Antonovsky, Dilani's theory concentrates more on the ability of environmental designers to cope with stress (Dilani 2000, 2001, 2005). On the other hand, the study of 'Therapeutic architecture' describes the built environment as the patient-centered, evidence-based discipline which support ways of spatial elements that interact with individuals physically and psychologically by the environmental design (Chrysikou, 2014; Shepley, 2006; 2005).

The starting point of the methodology that Ulrich and Dilani used in their studies examining the effects of the physical environment on human psychology in healing environment is the experience design process deriven by the user (Dilani 2000, 2005; Ulrich 1984, 1991, 2003, 2004). According to McCullogh, experience design is a scientific analysis methodology based on the assumption that healing environments can have significant physical and psychological effects on users. It is emphasized that user experience influences design process in healing environment (McCullogh, 2010; Hamilton, 2003). According to Hamilton, in the simplest terms, experience design is defined as a process that directs environmental settings by combining theoritical and practical experiences (Hamilton 2003, 2005).

The Bio-Psycho-Social model of Engel (1980), diseases are the result of psychological, sociological and biological factors interacting with each other. In such a way that; illnesses and health are affected not only by physical, but also by social and psychological changes. The address Antonovsky's (1991) theory of integrality, it can be said that both of these models present the psychological and social status of the individual as the primary factor of disease outbreak. Accordingly, the basis of the patient-centered approach that comes to the forefront in healing environmental design is the necessity of meeting patients' social and psychological. These parameters also includes the environmental design of the hospitals.

In healing environmental designs, the patient-centered approach offers the option to choose during the treatment process of illnesses which is the primary reason for the antagonism and also providing a sense of control. According to Raybeck, individuals who feel that they have control over their conditions are developing sense of relaxation and belonging(Raybeck, 1991). According to Chrysikou and Shepley, who emphasize the same issue, the patients are able to express their point of view during the treatment process to improve patient wellbeing physically and psychologically (Chrysikou, 2014; Shepley, 2006, 2005). In addition, the patient-centered approach, which is also acknowledged in environmental psychology, supports the "feeling of control" (Birdsong and Leibrock, 1990; Sherer, 1993; Ulrich, 1992; In this context, one of the requirements of Ulrich's "Supportive Design Theory" is to provide individual feeling of control.

NHS (National Health System), patient-centered health care facilities should be designed to meet the healing requirements and to adapt innovations (NHS Estates, 1995). Another important factor in this context is the criteria of "orientation" in patient-centered healthcare environmental design. In such a way that; the typographic images should be readable, clarity of Signage systems and their hierarchical leveling which are the main conditions of orientation design in healthcare spaces. In addition, different colors and visual applications in the spaces that should be easily perceived and differentiated in terms of medical branches in the healthcare environment (Carpman and Grant, 2001, Morag, Heylighen and Pintelon, 2016, Peponis and Wineman, 2002) (Image 1).

Image 1. Typographic images in the hospitals' wayfinding design. (https://www.siloagency.com/en/case/hospital-wayfinding/)

Another important expectation is both indoor and outdoor of the healing environments that should be aesthetically pleasing and user friendly. So as to shorten the duration of treatment of patients; it is necessary to create a positive stimulating and to provide attention to the use of color, texture and light, which creates the effect of refreshment and relaxation in the environmental design (Ulrich 1993, 1995). Moreover, factors such as feelings of warmth, attachment or familiarity, cultural contect and informal feeling are among the prominent features of patient-centered design (Sungur and Aytuğ, 2007).

3. EXPERIENCE DESIGN IN HEALING ENVIRONMENTS

Healing Environments is a concept that deals with both dimensions; physically and conceptually. Conceptual design create a sensual experience between the user and the healing environment (Hillier, 1996) where many people meets their psycho-socially and physically requirements that plays a prominent role in the assessment of spatial perceptions (Image 2).

Image 2. An example of conceptual design application in a healing environment (https://www.siloagency.com/en/case/creating-a-healing-environment/).

Such as Ulrich's theory of supportive design, it is examined that the necessicity for the physical environment in the healthcare facilities is to have the physical content that reduces psychological stress (Ulrich 1991, 1993, 1995). According to Ulrich and many other researchers, the use of art works in health spaces have positive stimulating effects. (Ulrich 1984, 1993, 2003, Daykin et al., 2008, Suter and Baylin, 2007).

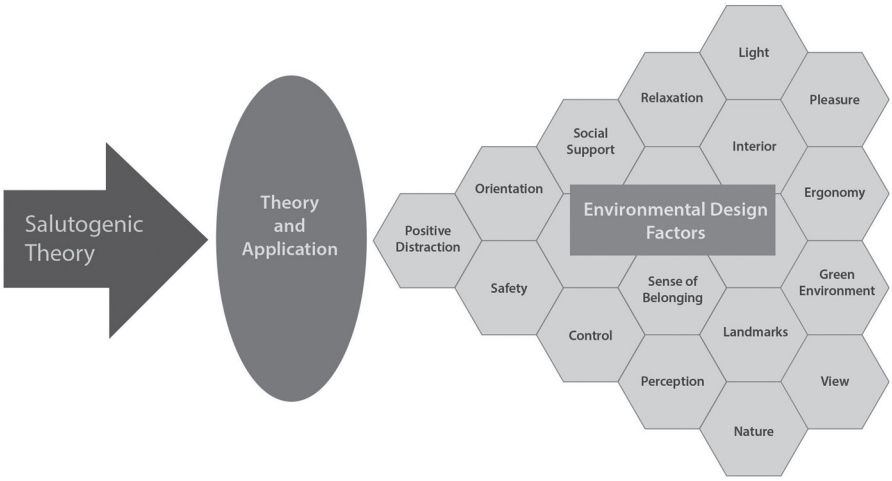

Fig. 2. Dilanis' (2000) Salutogenic 'Environmental Design' Theory

Main purpose of Salutogenic theory environmental design is to improve the quality of patients' wellbeing, not only physical but also psychological factors are covered. In other words, environmental design must support individuals in both directions (Güç, Gencel and Karadayı, 2013).

Figure 2 shows the environmental design factors in Dilani's Salutogen theory which expresses psychosocial supportive design under the heading of perception, orientation, landmarks, aesthetic elements, nature, positive stimulators, social support and more factors. Another Environmental design contribution is the social interaction between patients whom main problem is the lonelyness (Dilani, 2000). Studies show that, this interaction have positive effects on patients' health status (Lepore, Mata, Evans, 1993; Komarck, Manuck and Jennings, 1990).

Another factor of wellbeig in healing environment is the accesibility of nature. Providing access to gardens, windows, art works, photographs and illustrations of nature in the healing environments are positive stimulators by reducing patients' stress (Ulrich 1993; Dijkstra et al., 2008). In addition, photographic and illustrative design applications can also be used in the environments where natural accessibility is limited (Dilani, A. 2000, 2005) (Image 3).

Image 3. Design solutions for hospital interior spaces which provide access to nature. (http://www.healthcaredesignmagazine.com/architecture/childrens -hospital-design-grows/).

So, It is expected that the physical environment in health care spaces will have the potential to meet social and psychological needs such as aesthetic appearance, access to nature, as well as responding to the functional user needs. These criterias must be taken into consideration in the set-up of healing environmental design as a supportive manner of patient perception.

4. EFFECT OF THERAPAUTIC ENVIRONMENTAL DESIGN ON SPATIAL PERCEPTION

It is inevitable that the individuals are influenced by the social and physical environment. Resulting effects on humans life cycle expresses the importance of users' space perception (Hillier, 1996) as above mentioned before. In this context design considerations are even more prominent when the interaction between space and the user is so sensitive, such as health care environment (Power, 2015).

Considering the dynamic and complex structure of therapautic environmental design for the preservation of health in contemporary conditions, an adequate and clear healthcare venues should be covered to be *accessible* and readable spaces for everyone. It is necessary for individuals to have access to the interior (accessibility from outside) and to move freely within these spaces (interior accessibility) in order to use the hospital space effectively (Power, 2015).

On the other hand, the environmental syntax is an important determinant of how people think, feel and move in the physical space. Positive stimulators in this environment affect the users' spatial perception (Babin, Hardesty and Suter, 2003), their mood (Leather, Beale, Santos, Watts and Lee, 2003) and their behavior (Mattila and Wirtz, 2001). According to Lawton and Simon (1968) 'Environmental Docility' hypothesis, where individuals is less competent, the influences of environmental factors are more sensitive than regular once. Feeling more nervous and anxious, patients in the challenging conditions in hospitals will

therefore be easier to suffer from adverse environmental stimuli. This suggests that patients may also benefit from sedative, relaxing and other positive effects of positive physical environmental stimulators (Dijkstra and Karin 2009). From this same point of view Lawton and Nahemow's competence hypothesis also suggests that the environmental effects become more pronounced as the functional capacity (Lawton and Nahemow, 1973).

Harris et al. (2002) considered the physical environment in three dimensions like structural, interior spatial and atmospheric features. Structural features are relatively permanent features such as a hospital's spatial location, room size, and window placement. Interior spatial features are defined as less permanent or variable items such as furniture, colors and artwork. Atmosphere features include lighting, noise level, smell and temperature. Rice et al. (1980) defines; physical environment features are divided into subdivisions as purely stimulating or interacting objects. This distinction can be explained by the following example: when the works of art serve as stimulant objects and the patients are passively exposed (ie by sight), the patients become actively interested in.

4.1 Supportive Design Criterias' in Relation to the Healing Environment

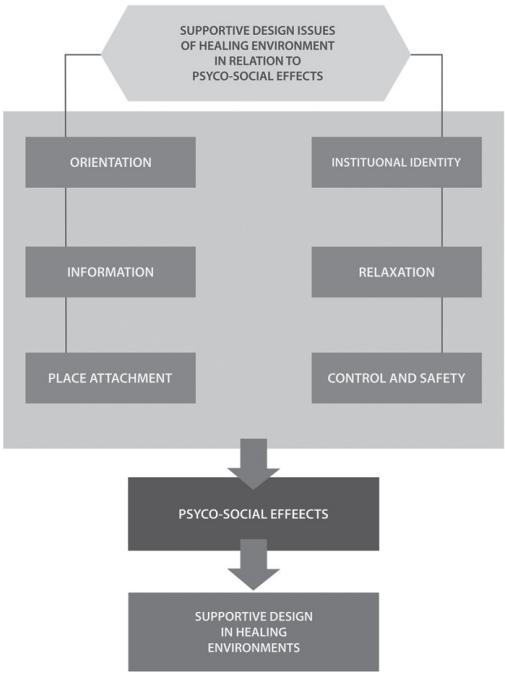

Fig. 3. Design Criterias' of Supportive Healing Environments in Relation to Psycho-Social Effects.

Arthur and Passini (1992) mentiones that, navigation have no directing effect. But spatial *orientation/wayfinding* have a psychologically supportive role for users. Generally, in hospitals with a very large and complex spatial structure, access to the target point on time becomes one of the most important functions by increasing patients' concerns, while designing the wrong orientation can lead to negative results on space experiences. For this reason, the referral effect of the hospital's environmental design is one of its prominent functions for improving the spatial experience.

The criteria of accessibility to *information* in the healing environmental design is vital part for the users to read and perceive the space correctly (Alpagut, 2005). Informative sources in the healing environment design maintain feeling of relief. In such a way as to the images in hospitals are readable; human scale, angle of view, information hierarchy should be considered. As well as their area and visual harmony are also important criterias in this visiual communication (Image 4).

Image 4. Environmental graphic design elements used for information in health places (http://envision.design/services/wayfinding-signage/).

Sense of place belonging/attachment is also a requirement for individuals who are constantly or temporarily experiencing Health Care Spaces. Sense belonging/place attacment is necessary to have a definition of place, positive perception and relaxation (Cross, 2001). According to Giuliani, Atmospheric requirements for place attchment depends on factors such as spatial experience, size, time duration, and users satisfaction. These connection with the users' surroundings enables them to feel familiar and regarded. Hence, place belonging in healing environment is a positive stimulator on patients' psychosocial state.

Many studies show that people who have more opportunity of feeling of *control* in their environment and are more likely to cope with stress. These individuals are less anxious and healthier than those who lack controls (Evans and Cohen, 1987; Ulrich, 1999). According to Sandier (1960) , the sense of security is the feeling of domination and control. This emotion is the source of the ego that tries to manipulate non-regular senses. Safety has been studied both in terms of sense

of control regarding physical and psychological aspects (Schweitzer, Gilpin and Framptons, 2004). So as to be observed that the safety measure mostly concerned with psychological effects in healing environment of space perception. (Andrade and Devlin, 2015).

CONCLUSION

The relationship between patient care and healing environment lead the study to view a deep inside within the perspective of supportive design theories and approaches. The contribution of the healing environment on patients pycho-social wellbeing is emphasized at many contemporary theories and models such as; 'Supportive Health Care Approach', 'Therapeutic architecture', 'Patient-Centered Healthcare Design', 'Bio-Psycho-Social' etc… regarding the relationship between patients' behavioral patterns, expectations and the way they utilize the space which atmosphere positively stimulates patients' experience and treatment.

Factors affecting healing environmental design where the patient-centered approach, improving environments, and therapeutic architecture concepts are prominant, needs of users to design environments that support the psycho-social wellbeing. For this purpose, user experience in healing environment is an important determinant directing patient space perception. User experience of spatial requirements should be examined in the most accurate way in healing environmental design process.

Investigations show that criterias' of *information, orientation, relaxation, and aesthetic sense of control and belonging are mainly* environmantal effects interacting with each other which constitute the behaviour setting in healing environment. It is assesed that these supportive design criterias' are important for patients' calming, stress-relieving and health-enhancing properties.

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