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EFFECTS OF ENVIRONMENTAL GRAPHIC DESIGN ISSUES AS A SUPPORTIVE SOURCE OF HOSPITAL SPATIAL PERCEPTION [1]

ÇEVRESEL GRAFİK TASARIMININ DESTEKLEYİCİ BİR UNSUR OLARAK HASTANELERDE MEKAN ALGISI ÜZERİNDEKİ ETKİSİ

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Öz: Amaç: Hastalara güven ve memnuniyet sağlayabilen, tedaviyi destekleyici yaklaşıma sahip hasta odaklı sağlık mekânı tasarımları mekân-hasta/doktor/sağlık personelinin açısından değerlendirilecektir. Bu nedenle, hastalara güven ve memnuniyet duygusu veren hasta odaklı sağlık mekânı tasarımları- tedaviye destekleyici bir yaklaşımla birlikte-tasarımın hastalar üzerindeki etkilerini ve deneyimlerine örnek teşkil eden bu çalışmada sağlık iç mekanlarında çevresel grafik tasarım elemanları (fotoğraflar, illustratif, tipografik ve piktogramlar), kullanıcıların oryantasyonları, bilgilendirmeleri ve mekân algıları gibi mekânsal deneyimini şekillendiren faktörler olarak ortaya çıkmaktadır. Bu çalışmada, bu tasarım unsurlarının sağlık alanlarındaki kullanıcı algısı üzerindeki etkileri araştırılmış ve hastane mekanlarında çevresel grafik tasarım unsurlarının belirlenmesinde ve aktif olarak etkileşimde rol oynayan tasarım kriterleri ele alınmıştır. Yukarıda sözü edilen gerçeklere dayanarak, bu araştırma hem mekân tasarımı hem de çevresel grafik tasarım bağlamında sağlık alanlarındaki grafiklere katkıda bulunmayı amaçlamaktadır. **Yöntem**: Araştırma mekânı olarak çevresel grafik tasarım elemanları açısından değerlendirilmeye elverişli üç adet hastane belirlenmiştir. Bu hastanelerdeki elemanlar fotoğraflanarak mekanları sürekli veya geçici olarak deneyimleyen kullanıcı grupları üzerinde (hasta, doktor, sağlık personeli) anket uygulanmıştır. **Bulgular ve Sonuç:** Elde edilen istatistiksel verilere göre araştırma yapılan hastane mekanlarındaki tasarım elemanlarının beklenen etkileri sağlayamadığı gösterilmiştir. Sonuç olarak, hastane mekanlarında destekleyici tasarım anlayışına sahip çevresel grafik tasarım uygulamaları bütünsel bir dile sahip olmalıdır ve bu tasarım anlayışı ancak mimarlar, iç mekân tasarımcıları, grafik tasarımcılar ve endüstriyel tasarımcıların iş birliğiyle sağlanabilir.

Anahtar Kelimeler: Sağlık Mekanı, İç Mekân Tasarımı, Görsel Kimlik

Abstract: Aim: Increased awareness of creating design solutions that can meet the social and psychological needs of patients in healthcare spaces highlights research on the psychology of place-patient/ doctors/healthcare staff. Therefore, patient-oriented health space designs that provide a sense of trust and satisfaction to patients – along with a supportive approach to their treatment – are the points of departure in this study, while understanding the effects and experiences of design on patients. Environmental graphic design elements (photographs, illustrations, typography, and pictograms) in the interiors of hospitals emerge as the factors that shape the patient's spatial experience, such as orientation, information, and perception of a space. In this study, the effects of such design elements on user perception in health spaces were investigated, and these design criteria that play a role in determining and actively interacting with the environmental graphic design elements in hospital spaces are encountered. Based on the above-mentioned facts, this research aims to contribute to the graphics in health spaces in the context of environmental graphic design, with experience covering both fields. **Method:** Three hospitals, which are sufficient in terms of environmental graphic design elements and have differences between them, were determined as the research places. The elements in these hospitals were photographed and surveyed on user groups (patients, doctors, health personnel) who experienced the places continuously or temporarily. **Results and Conclusion:** It was demonstrated by statistical data that the elements in the investigated places could not provide the expected effects as a whole. As a result, environmental graphic design applications that have a supportive design understanding in hospital spaces should have a holistic language, and that design understanding can only be demonstrated with the cooperation of architects, interior designers, graphic designers, and industrial designers.

Keywords: Healthcare Spaces, Interior Design, Visual Identity

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INTRODUCTION

There is increasing international awareness among health managers and medical professionals about creating functional environments with patient-centered supportive features that can help patients cope with stressful situations caused by diseases. The key factor that motivates the need for awareness of healthcare design is that it has been scientifically proven that environmental characteristics directly affect patient health outcomes (Ulrich, 1992:20; Alfonsi, Capolongo, & Buffoli, 2014:137; Andrade, Lima, Pereira, Fornara, & Bonaiuto, 2013:122-121; Schreuder, Lebesque, & Bottenheft, 2016:87; La Vela, Etingen, Hill, & Miskevics, 2016:31). Roger Ulrich's "supporting design theory" and Alan Dilani's "psychosocial support theory" suggested that environmental design influence the spatial experiences of users, such as patients, visitors, and health personnel in health spaces, and their psychological needs and environmental perception (Ulrich, 1991:97; Dilani, 2001:31-32). Based on the healing properties of the design mentioned in these two theories, environmental graphic design elements in health spaces are examined in terms of design principles and subsequently, their positive effects are revealed (Ulrich 1991:97,1992:21, 2003:117).

THEORETICAL BACKGROUND

Awareness of environmental design can meet the social and psychological needs of the improvement in health spaces; it directs research towards the design of patient-oriented health spaces with supportive design approaches that can evoke feelings such as satisfaction, relaxation, trust, and control among patients and health personnel (Alfonsi, Capolongo, & Buffoli, 2014:137; Marberry, 2006:40; Sloan, 2015:41). The main concern of Ulrich, who pioneered the research in this field, is that space design has the potential to cope with stress and solve problems (Ulrich 1991:97, 1999:27). Supportive design theory begins with the elimination of environmental factors that cause stress and have a direct negative impact on results. However, supportive design is expected to create a calming environment for patients, reduce stress, and build up healing restoration (Ulrich 1991:98, 1999:29; Sloan, 2015:40-41).

Alan Dilani, founder of the International Academy for Design and Health, presents the notion in his psychosocial supportive design theory that diseases are caused by psychosocial conditions, which are also influenced by the physical environment (Dilani, 2001: 31:, 2005:17-18). As stated in this theory, emotions and experience are directly related to the psychosocial status of the individual. According to Aaron Antonovsky (1996:11), whose

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studies form the basis of Dilani's theories, environmental stimuli affect the well-being of individuals. This model, which Antonovsky (1996:11, 1997:19) calls "salutogenesis," focuses on the capacity of environmental factors that strengthen patients' health. Antonovsky explains the sense of coherence with the theory and the power to maintain health by fighting pathogens. A holistic approach of this model, which is also directly influenced by environmental factors, is presented as a condition that supports patients' well-being. Unlike Antonovsky, Dilani's theory has focused more on the ability of environmental design elements to cope with stress (Dilani, 2001:32, 2005:19). The common point of Ulrich, Dilani, and Antonovsky's work is the fact that the physical environment is a factor that affects patients' psychological state (Ulrich, 1991:98, 1993:74; Dilani, 2001:36, 2005:18-19; Antonovsky, 1991:113, 1996:11-12).

Furthermore, the concept of "Therapeutic architecture," which is discussed in detail in Chrysikou and Shepley's research, advocates the necessity of a patient-oriented approach and experiential data in healthcare spaces. Environmental factors that interact with patients physiologically and psychologically reveal important design issues for healing environments (Chrysikou, 2014:54; Shepley, 2005:313, 2006:265-267). In hospital settings, the effects of environmental graphic design elements as positive stimuli that directly affect patients' perception of space is an important issue to be addressed (Suter & Baylin, 2005:32; Ulrich, 1993:76). Environmental graphic design elements (photographs, illustrations, pictograms, and typographies) in health spaces contain factors that can provide a sense of confidence and satisfaction in patients' experience of the space and can support the treatment approach (Andrade et al., 2013:122; Devlin & Arneill, 2003:665; Ulrich, 2003:38, 2204:21-23,2008:61). The use of environmental graphic design elements in accordance with the orientation and information functions in hospital spaces is another contribution to the space experience (Morag, Heylighen, & Pintelon, 2016:243; Hashim, Alkaabi, & Bharwani, 2014:503-504). In addition, many studies show that visuals used in healthcare facilities affect patients' psychology and treatment process (Bilge 2019:397, 2017:36; Connellan et al., 2013:127; Glanz, Rimer, & Viswanath, 2008:169; Fottler, Ford, Roberts, & Ford, 2000:91; Malkin, 1991:27,1992:56). So, there are some studies showing that visual design elements used in healthcare environments affect patient psychology and treatment process. This notion is substantiated by the fact that healthcare users are psychologically more sensitive and their perception of space is more affected by environmental stimulation (Dijkstra & Karin, 2009:82). For this reason, it is important

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to investigate the effects of environmental graphic design elements in healthcare environments on spatial experience.

There are very few studies on the design of environmental graphic design elements in health spaces. Studies on environmental graphic design elements in healthcare spaces that meet the requirements Ulrich (1991:98, 1993:75, 1999:29) proposes in supportive design theory are mostly focused on the impact of nature paintings and abstract artworks on patients. In Salutogenic Design Theory, Dilani (2005:18-19) included visual elements and artworks under the title of environmental design elements. Environmental graphic design elements in health spaces are classified as environmental stimuli in the works of Ulrich, Dilani, and Antonovsky. In this study, graphic design elements in hospitals, which are described as environmental stimuli, were examined under the titles of typography, pictogram, photography, and illustration in spatial context.

While typography and pictograms in health spaces are handled in the category of orientation under environmental graphic design, studies on their psychological reflections are insufficient. Similarly, studies investigating the psychosocial effects of illustrations and photographs in health spaces are insufficient. The study aimed to contribute to the mentioned areas.

HYPOTHESES DEVELOPMENT

In this research, how visual images (pictograms, photographs, illustrations, and typography) – which are encountered within the environmental graphic design elements in health spaces, as suggested by Ulrich's "supportive health service approach" and Dilani's psychosocial supportive theory – affect the perception of space, psycho-social needs, and sense of integrity will be examined (Graphic 1).

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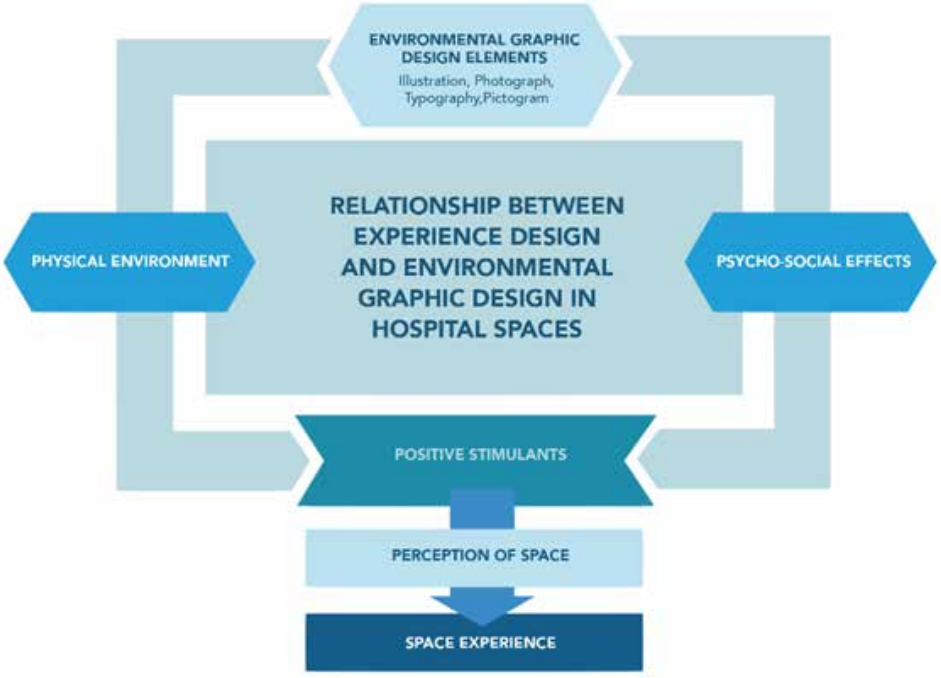

Graphic 1. Hospital Spaces/Environmental Graphic Design" Concepts And Relations

In healthcare spaces, the supportive design approach has been a topic that has long been discussed in the literature (Ulrich, 1984:420-421, 1991:102). Patient experience design is considered important in terms of improving environments and patient-oriented approach concepts. In addition, studies on the intersection of environmental graphic design and experience design in health spaces are insufficient. Therefore, the focus of this study is to examine the effects of experience design and environmental graphic design on users in health spaces. For this purpose, the perceptions and experience data of the users in three different hospital spaces, determined after the literature review, will be searched in the context of information, orientation, aesthetics, trust, relaxation, and space belonging; the results will be discussed within the framework of the design criteria obtained from the literature. will be introduced which criteria should be taken into consideration in order to positively increase the experience of space graphic design elements.

RESEARCH QUESTIONS

How do environmental graphic design elements (typography, illustrations, photographs, and pictograms) in health spaces affect users' perception of space? What is the

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contribution of these effects to the experience of space?

Sub-problems

- Which criterion is important in proposing environmental graphic design elements in hospital spaces?
- What is the contribution of information, comfort, guidance, control, aesthetics, space belonging, and security criteria to the environmental graphic design process in the literature?
- What is the relationship between patients' experience design and environmental graphic design in hospital spaces?

HYPOTHESES

H1: The effect of space belonging to photographs, typography, and pictograms in the hospital space is expected to be greater in physicians than in patients.

H2: The relaxing effect of photographs and illustrations in hospital spaces is higher in doctors than in patients.

H3: The effect of illustrative elements in the hospital spaces is expected to be higher in Private Güven Çayyolu Health Campus than in Medicana and TOBB ETU Hospital.

METHOD

This study has been shaped by the results of observational and survey studies conducted to support the design criteria of the visuals within the scope of environmental graphic design in health sites determined by a literature review. The results aimed to determine the effects of environmental graphic design elements in health spaces in the context of experience design. Among the many health sites examined in the study, three hospitals were identified, with sufficient visual elements for the study and differences between them in terms of environmental visual identity design. Observational studies were conducted in these hospital spaces, where research permission was obtained before the survey application. Surveys were created in line with the data obtained from the observation of the environmental graphic design of the spaces. In the first part of the survey, questions about obtaining demographic information (gender, age, education level, reason for being in hospital place) of hospital users are included. In the second part, the assessment of environmental graphic design elements in hospitals according to design criteria is classified under four titles: "typography," "pictogram," "illustration," and "photography."

The environmental graphic design elements of the three hospitals where the research was conducted were evaluated in the sub-compo-

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nents: "orientation," "informative," "space belonging," "institutional identity," "trust," "order," "comfort," and "aesthetics," and were determined as a result of a literature review. The questionnaires were conducted on three groups of users: patients, medical staff, and doctors. In the last part of the survey, users' perceptions of space were measured with variables of design criteria. IBM's SPSS Statistics program was used to evaluate the study data.

Selection of the Subjects

Observational studies were carried out in hospitals in Ankara by taking into account spatial design and graphic design information for the survey to be conducted within the scope of the study. In these spaces, it was noted that there were sufficient visual elements within the scope of the environmental graphic design that could be used in the study and that there were enough differences for comparisons. Medicana Hospital, Güven Çayyolu Health Campus, and TOBB ETU Hospital were among the places investigated and were considered important in terms of the relationship between space design and graphic design. For this reason, these hospitals were chosen as research environments.

Environmental Setting

The visuals in the hospitals, which are designated as research sites, were grouped under the specified headings.

Analyses of Typography

Figure 1. Samples of Typographic Elements in Hospital Spaces Examined

Typographic elements within the scope of environmental graphic design elements in hospitals are mostly located on plates placed for orientation and information purposes. Considering the placements and purposes of usage within the space, whether the typographic elements were easy to read and understandable from a sufficient distance was examined. Legibility is important for space users to feel comfortable and safe. The ability to move alone, follow directions, and obtain information are factors that enhance the space experience of the hospital user.

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Analyses of Photographic Images

Figure 2. Samples of Photographic Elements in the Hospital Spaces Examined

Photographic elements in the hospital can be seen in poster designs, where health-related information and services provided in the hospital are explained. The logo of the hospital can be seen in the lower part of some posters. This detail has been examined as an effect that increases the institutional impact. In some posters, elements of nature (flowers, trees) were used, while in others, images containing human photographs related to the information provided were supported by typography.

Analysis of Pictograms

Figure 3. Samples of Pictograms in the Examined Hospital Spaces

Pictograms are often used in health facilities to indicate toilets, stairs, and cleaning areas. In addition to space identification, they have also been used to inform users of vehicles meant for certain functions (such as an elevator for a stretcher). The pictograms in the space are designed with the same color palette that is often used in other environmental graphic design elements.

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Analysis of Illustrative Images

Figure 4. Samples of Illustrations in Hospital Spaces Examined

Illustrative images in hospitals are found in corridors, patient waiting areas, and patient examination areas throughout the interior. In addition to natural elements, human figures are used in illustrative images. In some sections, images were selected according to the section. For example, visuals with female figures were preferred in the obstetrics clinic while children's pictures were used in the pediatric department.

Design of the Questionnaire

The survey consists of six parts. In the first part, in addition to demographic information such as gender, age, and education level, the reason for hospital admission is asked because of the effect on participants of the process of experiencing the health facility. Likert type scale was used in this study. The second part consists of four sub-sections for the evaluation of visual elements in terms of the perception and function of space created by individuals. In this section, illustrations, typography, pictograms, and photographic visuals are presented, and the participants are expected to make an evaluation according to the design criteria. Separate questionnaires were prepared for visuals belonging to each hospital and participants were asked to make an evaluation between 1 (positive) and 5 (negative) (Table 2).

Evaluate the above illustrative images according to the design criteria given below:

Please rate it from 1 (positive) to 5(negative).

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Table 2. Survey Question Structure Sample for Evaluating Visual Images in Terms of Space Perception and Function of Design

The effect of illustrative visuals	1	2	3	4	5
Layout					
Information					
Aesthetics					
Relaxation					
Orientation					
Confidence					
Institutional Perception					
Space Belonging					

The same likert scale system was used for all four (illustrations, typography, pictograms, and photographic visuals) analysis groups, but the images were selected and prepared in environmental graphic design elements experienced in that hospital**.**

The third and final part of the study evaluates the health environment in terms of the perception of the place. For this purpose, the impressions created by users in the hospitals were evaluated with the answers provided on scales presented in the questionnaire.

The questionnaire has been prepared based on the criteria of health space design, which are formed by matching the independent variables: information, orientation, aesthetics, confidence, institutional identity, layout, relaxation, and space belonging, with the visual elements that make up the environmental graphic design of the health space. Space belonging is a symbolic relationship shaped by the loading of cultural values and emotional meanings by people to a specific space and it affects behaviors by communicating through images, symbols and metaphors in the space (Astorino, 2003). At this point, it is necessary to determine how the content of the message conveyed through visual images contributes to the healing process. The layout effect included in the criteria refers to the space order. With this criterion, it is aimed to measure the movement and orientation capabilities of the users in the hospital space. Information elements in healthcare settings are environmental graphic design elements that provide the necessary information about the environment of the users. These have an important place in the correct reading and perception of the space (Ulrich, 2003). Informing elements

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help users by organizing and simplifying complex data to a level that can be easily perceived, so informing has been determined as an important criterion. Supporting hints in the form of sub-headings about the design criteria were given to the people participating in the questionnaire during the application to make them more understandable and make sure that the purpose of the survey can be understood with the pre-interview.

Evaluation of the Data

In this study, environmental graphic design elements in health spaces were evaluated by people who experienced health spaces. The survey was conducted with 103 participants, including patients, doctors, and health personnel. According to the demographic information in the first part of the survey, 57% of the participants are women and 43% are men. 1% of the people participating in the study are primary education, 4% secondary education, 14% associate degree, 45% bachelor's degree, 37% master's or doctorate graduates. In this study, 40% of the participants have 1-5 years, 22% 6-10 years and 38% 11 years and more professional experience. 19% of the participants are 18-25, 25% 26-35, 36-45% 36-45, 17% 46-55 and 3% 56 years and older. 27% of the participants are health personnel, 45% are patients and 28% are doctors. In order to test the reliability of this study, the collected data were analyzed with the SPSS program. In this study, a pre-test was performed and the Cronbach's Alpha value was found to be 0.88 to measure the reliability of the study; the questionnaire was reliable (Table 3).

Case Processing Summary
Reliability Statistics

Cronbach's Alpha	N of Items
,888	53

		N	%
Cases	Valid	103	100,0
	Excluded a	0	,0
	Total	103	100,0

a. Listwise deletion based on all variables in the procedure.

Table 3. Value of Cronbach's Alfa

RESULTS

Evaluation of the Effects of Environmental Graphic Design Elements in Hospital Spaces on Space Experience within the Scope of User Group Subcomponents

The data referring to the environmental graphic design elements in the hospitals where the research was carried out was measured on space users and were evaluated statistically; a general table was prepared (Table 4).

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Table 4. Evaluating the Effects of Environmental Graphic Design Elements in the Hospital Spaces on the Space Experience Within the Scope of User Group Subcomponents

	Illustration			Photograph			Typography			Pictogram		
	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.
Criteria	*Average(SD)*											
Layout effect	1,95(0,84)	2,41(0,86)	2,28(0,97)	2,39(1,18)	2,24(0,83)	2,03(0,57)	1,95(0,98)	2,2(0,77)	2,07(0,81)	2,28(1,22)	2,13(0,83)	1,92(1,08)
Information	4,15(1,05)	4,00(1,10)	3,46(1,13)	2,39(1,13)	2,48(0,91)	2,39(1,13)	1,65(0,87)	2,17(0,84)	1,64(0,73)	1,39(0,77)	1,93(1,03)	1,82(0,94)
Aesthetic	2,30(1,20)	2,86(1,05)	2,46(1,20)	2,84(1,13)	2,51(0,73)	2,71(1,11)	2,78(1,17)	2,58(0,56)	2,78(1,17)	2,95(0,95)	2,86(0,87)	2,78(0,91)
Relaxation	2,89(1,13)	3,20(0,86)	3,00(1,08)	3,63(1,10)	2,96(0,77)	3,03(1,20)	3,19(0,93)	2,96(0,94)	2,85(1,11)	3,5(0,98)	2,72(0,84)	3,10(1,06)
Orientation	3,54(1,31)	3,72(1,16)	2,89(1,31)	3,82(1,03)	3,51(0,73)	3,57(1,16)	2,02(1,04)	2,27(0,70)	2,07(0,85)	2,21(1,29)	2,27(0,95)	1,89(0,95)
Confidence	3,13(1,06)	3,17(1,10)	3,07(1,01)	3,63(1,10)	3,44(0,78)	3,39(1,10)	3,02(0,99)	3,03(0,94)	3,07(1,15)	3,50(1,04)	3,06(0,92)	3,10(1,03)
Institutional perception	3,89(1,12)	3,58(0,90)	3,28(1,21)	2,93(1,35)	2,89(0,93)	2,46(1,17)	2,95(1,26)	2,62(0,77)	3,07(1,35)	3,23(1,43)	3,03(1,01)	3,32(1,38)
Space belonging	3,36(1,14)	3,58(0,86)	3,42(1,10)	3,13(1,25)	3,03(0,82)	2,96(0,99)	2,30(0,89)	2,65(0,89)	2,25(0,65)	2,52(1,37)	2,65(1,14)	2,35(1,06)

The values in the tables prepared show the statistical average numerical values (Average (SD)) of the answers given by each user group to evaluate each design criterion. According to the questionnaire scale, number 1 was numerically considered equivalent to the highest positive answer. Therefore, the criteria close to this value and above the average value were considered statistically imported and significant.

Based on this table, the layout and aesthetic effects of illustrations among environmental graphic design elements, which have an impact on the users' space experience, were found to be more important in hospital spaces. When the data are analyzed according to the subgroups of user groups, the order, aesthetic perception, and orientation of the illustrations are important for the health personnel. Order and aesthetic perception are important in the illustrations for patients and doctors. According to the data, these two are important design criteria for illustrations in healthcare spaces. The fact that these effects are common to all three user groups shows that the layout and aesthetic effects of the illustrations are independent of the experience of the hospital space.

The effects of order, information, aesthetics, and institutional perception on the spatial experience of the users were found to be positive according to the statistical data of the photographs. The user group with the highest order effect of photographic elements is the health personnel. The informational impact of typography, which is one of the elements of environmental graphic design, was evaluated by all users as the most effective criterion. In addition, the effects of typography on order, aesthetics, orientation, and space belonging

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were found to be important on the experience of space. Informative effect of pictograms on all user groups, especially patients, was found to be significant in hospitals. According to the data in Table 4, it is observed that orientation, order, aesthetics, and space belonging effects are important for pictograms in health spaces. When examined by user groups, the informative effect of the pictograms is greater on patients. Order and orientation were found to be most influential by health personnel.

When the findings presented in Table 4 are evaluated in general, pictograms and typography are the visual elements in design criteria that are most effective among all the environmental graphic design elements in the researched hospitals. Illustrations and photographs give the healthcare users a first-class impression. For typography and pictograms, the information effect is prevalent.

Evaluation of the Effects of Environmental Graphic Design Elements in Hospital Spaces on Spatial Experience within the Scope of Hospitals and User Group Subcomponents

Evaluation of Illustrative Elements

Table 5. Evaluating the Effects of Illustrative Visuals on Space Experience According to Hospitals and User Groups

	Güven Hospital			Medicana Hospital			Tobb Etü Hospital		
	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.
Effects of illustrations	*Average(SD)*								
Layout effect	1,53(0,74)	2,60(0,84)	2,70(1,05)	2,12(0,95)	2,09(0,83)	1,70(0,82)	2,20(0,67)	2,62(0,91)	2,50(0,75)
Information	4,20(0,94)	4,50(0,70)	2,80(1,22)	3,93(1,34)	3,45(1,12)	4,00(0,94)	4,33(0,81)	4,12(1,12)	3,62(0,91)
Aesthetic	2,06 (1,16)	3,00(1,05)	2,50(1,43)	2,56(1,20)	2,63(1,12)	2,00(0,94)	2,26(1,27)	3,00(1,06)	3,00(1,06)
Relaxation	2,40(1,24)	3,20(1,03)	3,00(1,24)	3,50(1,03)	3,09(0,83)	3,20(1,22)	2,73(0,88)	3,37(0,74)	2,75(0,70)
Orientation	2,73(1,33)	4,10(1,28)	2,20(1,39)	3,68(1,35)	3,45(1,12)	3,00(1,33)	4,20(0,77)	3,62(1,06)	3,62(0,74)
Confidence	2,60(1,05)	3,30(1,05)	2,80(1,13)	3,43(0,89)	2,90(1,04)	3,30(1,05)	3,33(1,11)	3,37(1,30)	3,12(0,83)
Institutional perception	4,06(1,16)	3,50(0,84)	3,00(1,41)	3,87(1,08)	3,81(0,87)	4,00(1,05)	3,73(1,16)	3,37(1,06)	2,75(0,70)
Space belonging	3,20(1,37)	3,60(1,07)	3,40(1,42)	3,68(1,01)	3,72(0,78)	3,80(0,91)	3,20(1,01)	3,37(0,74)	3,00(0,75)

According to the statistical evaluations in Table 5, the layout effect of the illustrations is important in all three hospitals, but the layout effect of the illustrations at Medicana Hospital was considered the highest. The layout effect of the illustrations at Güven Hospital has

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an impact on the spatial experience of all user groups, especially patients. Based on the observations made before the research, it can be said that the illustrations in Güven and Medicana hospitals have the same design language for each space, and as a result of this design approach, the illustrations have increased the order effect in the health space. The aesthetics, relaxation, orientation, and confidence effects of the illustrations at Güven Hospital were found to be significant. The information effect of the illustrations at Güven Hospital was evaluated as positive by the health personnel only.

Evaluation of Pictograms

Table 6. Evaluating the Effects of Pictograms on Space Experience According to Hospitals

	Güven Hospital			Medicana Hospital			Tobb Etü Hospital		
	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.
Effects of pictograms	*Average(SD)*								
Layout effect	3,13(1,12)	2,20(1,03)	2,30(1,41)	1,93(1,28)	2,09(0,53)	1,40(0,69)	1,80(0,77)	2,12(0,99)	2,12(0,83)
Information	1,06(0,25)	1,70(0,94)	2,10(0,99)	1,50(1,03)	1,81(0,87)	1,40(0,96)	1,60(0,73)	2,37(1,30)	2,00(0,75)
Aesthetic	2,86(0,91)	2,80(0,91)	3,00(0,94)	3,25(0,93)	2,45(0,68)	2,60(0,84)	2,73(1,03)	3,50(0,75)	2,75(1,03)
Relaxation	3,60(1,05)	3,00(0,81)	3,40(1,17)	3,81(1,04)	2,36(0,92)	3,40(0,96)	3,06(0,70)	2,87(0,64)	2,37(0,74)
Orientation	1,73(1,22)	1,90(0,99)	2,40(0,96)	2,50(1,36)	2,36(0,80)	1,20(0,41)	2,40(1,24)	2,62(1,06)	2,12(0,99)
Confidence	3,93(0,88)	3,60(0,96)	3,50(0,95)	3,31(1,25)	2,72(0,90)	3,20(1,03)	3,25(0,88)	2,87(0,64)	2,37(0,74)
Institutional perception	4,06(1,45)	3,50(0,84)	3,10(1,19)	3,87(1,14)	3,36(0,80)	4,60(0,69)	1,73(0,70)	2,00(0,75)	2,00(0,75)
Space belonging	2,60(1,45)	1,90(1,10)	2,30(1,05)	2,75(1,48)	3,09(0,83)	2,20(1,13)	2,20(1,20)	3,00(1,19)	2,62(1,06)

Among the three health venues, the institutional perception felt by the pictograms at TOBB ETU Hospital is the highest. It can be said that the pictograms at this hospital increase the institutional perception of users because they are used in environmental graphic design elements together with the logo of the hospital. The use of the logo is also high in other environmental graphic design elements within the space. Similarly, typography in TOBB ETU Hospital has a high institutional perception effect since it is frequently used in information design. These values support the view that the repetition mentioned in the literature increases the identity of the place.

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Evaluation of Typography

Table 7. Evaluation the Effects of Typography on the Experience of the Place According to Hospitals

	Güven Hospital			Medicana Hospital			Tobb Etü Hospital		
	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.
Effects of typography	*Average(SD)*								
Layout effect	**1,46(0,74)**	**2,30(0,94)**	**2,30(0,82)**	**1,93(1,06)**	**2,09(0,83)**	**1,60(0,69)**	**2,46(0,91)**	**2,25(0,46)**	**2,37(0,74)**
Information	**1,13(0,35)**	**1,90(0,99)**	**1,90(0,73)**	**1,95(1,12)**	**2,10(0,70)**	**1,10(0,31)**	**1,86(0,74)**	**2,62(0,74)**	**2,00(0,75)**
Aesthetic	**1,66(0,48)**	**2,20(0,63)**	**2,50(0,84)**	**3,18(0,98)**	**2,81(0,40)**	**3,10(0,99)**	**3,46(1,06)**	**2,75(0,46)**	**2,75(0,70)**
Relaxation	**3,06(0,70)**	**3,10(1,10)**	**2,80(0,78)**	**3,00(1,09)**	**2,81(0,98)**	**3,00(1,49)**	**3,53(0,91)**	**3,00(0,75)**	**2,75(1,03)**
Orientation	**1,60(0,91)**	**2,30(1,05)**	**2,10(1,19)**	**2,06(0,92)**	**2,18(0,40)**	**2,00(0,81)**	**2,40(1,18)**	**2,37(0,51)**	**2,12(0,35)**
Confidence	**2,46(0,83)**	**2,90(1,10)**	**3,00(1,15)**	**3,31(1,01)**	**3,00(1,00)**	**3,40(1,42)**	**3,26(0,96)**	**3,25(0,70)**	**2,75(0,70)**
Institutional perception	**3,40(1,12)**	**2,30(0,67)**	**2,60(1,34)**	**3,12(1,40)**	**3,09(0,83)**	**4,30(0,82)**	**2,33(1,04)**	**2,37(0,51)**	**2,12(0,64)**
Space belonging	**1,86(0,74)**	**2,40(1,07)**	**2,10(0,31)**	**2,62(1,02)**	**2,63(0,80)**	**2,20(0,78)**	**2,40(0,73)**	**3,00(0,75)**	**2,50(0,75)**

The perception of space, order, orientation, and readability criteria were found to be the second most important for typographic images. The relief value of typography was found to be ineffective in all three hospitals (mean 3.00). When users are examined by reason of hospitalization, the informative effect of typography is more positive for health personnel and patients than doctors. For patients and physicians, the effect of order after the informative effect is also a significant criterion. The effect of order was considered most important by patients.

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Evaluation of Photographic Elements

Table 8. Evaluation of the Effects of Photographs on the Experience of the Place According to Hospitals

	Güven Hospital			Medicana Hospital			Tobb Etü Hospital		
	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.	Patient	Doctor	Health.per.
Effects of photographs	*Average(SD)*								
Layout effect	**1,60(0,73)**	**2,10(0,56)**	**2,30(0,67)**	**2,43(1,09)**	**1,81(0,60)**	**1,70(0,48)**	**3,13(1,18)**	**3,00(0,92)**	**2,12(0,35)**
Information	**2,20(1,14)**	**3,00(0,94)**	**3,10(1,19)**	**2,50(0,96)**	**1,82(0,75)**	**1,70(0,82)**	**2,46(0,91)**	**2,75(0,46)**	**2,37(0,91)**
Aesthetic	**2,40(1,12)**	**2,70(0,94)**	**3,00(1,49)**	**3,68(1,19)**	**3,09(0,70)**	**3,50(1,17)**	**3,33(0,97)**	**3,12(0,47)**	**2,50(0,53)**
Relaxation	**3,86(1,12)**	**2,70(0,94)**	**3,00(1,49)**	**3,68(1,19)**	**3,09(0,70)**	**3,50(1,17)**	**3,33(0,97)**	**3,12(0,47)**	**2,50(0,53)**
Orientation	**3,53(1,06)**	**3,50(0,52)**	**3,10(1,10)**	**4,18(0,91)**	**3,72(0,78)**	**4,40(1,07)**	**3,73(1,09)**	**3,25(0,88)**	**3,12(0,83)**
Confidence	**4,00(0,92)**	**3,20(0,78)**	**3,20(1,22)**	**3,50(1,41)**	**3,63(0,92)**	**4,20(0,63)**	**3,40(0,82)**	**3,50(0,53)**	**2,62(0,74)**
Institutional perception	**4,00(1,06)**	**3,40(0,69)**	**3,30(0,82)**	**2,43(1,31)**	**2,36(0,92)**	**1,70(1,33)**	**2,40(1,05)**	**3,00(0,92)**	**2,37(0,51)**
Space belonging	**3,20(1,13)**	**2,50(0,70)**	**3,20(1,13)**	**3,50(1,21)**	**3,45(0,82)**	**3,00(1,05)**	**3,33(1,23)**	**3,12(0,64)**	**2,62(0,74)**

In terms of user groups, the layout effect of the photographs was found to be most favorable by the medical staff at Medicana Hospital. Order and informative effects are equally important for patients, while order impact is more important for doctors and medical staff.

EVALUATIONS

The layout and aesthetic effects of the illustrations among the environmental graphic design elements examined in the scope of the research were high in all research spaces. These criteria were found to be important for patients, physicians, and health personnel. When the effects of illustrations are examined according to user groups, order, aesthetics, and orientation effects are more important for health personnel, while order and aesthetic effects are evaluated by patients and doctors as an important criterion. The common order and aesthetic effects in all three user groups reveal that these effects are independent of the experience of the hospital space.

When the effects of pictograms in hospital spaces were examined, the information effect was found to be significant in all three places. Among the three hospitals, the information and orientation effects of pictograms in Güven Hospital were found to be highest. The institutional perception of the pictograms

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in TOBB ETU Hospital is the highest. The use of pictograms at TOBB ETU Hospital, with frequently repeated logos in the general environmental graphic design of the hospital, increased the institutional perception of users. According to these data, it can be deduced that repetition in the identity of the place increases the institutional perception.

Pictograms are the elements that provide the fastest information transfer among environmental graphic design elements and appeal to the widest audience. Given the time it takes to experience the hospital space, the informative effect of the pictograms is more important for patients, who are unfamiliar with the space and need information about the space more quickly. Research data also support this situation. When the pictograms were examined with the independent variables of the user groups, the information criterion was found to be most important by the patients.

The informational impact of typography from environmental graphic design elements in healthcare environments has been evaluated as an important criterion by all user groups. Typographical elements in hospitals are often found in the entrance, floor information boards, and orientation designs. Therefore, the information criterion of typography comes to the forefront. The information and order criteria of the typography at Güven Hospital were evaluated as the most positive. When typographic designs in this hospital space are examined in terms of font size, thickness, background-foreground color relationship, placement in the space, and suitability to human scale, it can be said that it has the most accurate design among all hospitals. This difference also increased the information and order effects of typography. According to the data in this section, information and layout are important design criteria for typography.

Finally, the layout and information criteria of the photographs examined are the most important design criteria among the user groups. The information effect provided by Medicana hospital, where photographic elements were used in posters providing information on health issues, was found to be more accurate than the other two hospitals. The layout effect of the photographs in Güven Hospital, which is generally supported by the same figures and typographic elements, is more accurate. When the photos in the health sites were evaluated in the independent variables of the user groups, the order effect was found to be most favorable by the health personnel. Order and informative effects are equally important for patients, while order and informative effects are most important for doctors and medical staff.

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CONCLUSION

How the physical environment affects the experience of the users (patients, doctors, health personnel, and visitors) and causes significant changes to the psychological status of the users is a subject that has been studied in the past (Ulrich, 1984:420-421, 1991:98, 1993:74, 2003:38; Dilani, 2001:31-32, 2005:20-21).

In health settings where a patient-oriented approach, healing environments, and therapeutic architecture are at the forefront, it is necessary to design environments that support users psychosocially. For this purpose, the use of the space experience data of the users in order to determine the user needs in the most accurate way has become important in design processes. Environmental graphic design elements, which are an important part of the physical environment of the hospital space, should also be designed in such a way that this data becomes integrated. This design process should be carried out by a team of architects, interior designers, industrial designers, and graphic designers, considering the user needs and requirements.

Environmental graphic design of health spaces is created by using the main visual images such as photography, illustration, typography, and pictograms on vertical and horizontal planes forming the space. The aim of environmental graphic design should be to meet the functional requirements such as orientation and information in the space, to add aesthetic value to the space and to bring the users feelings of trust, relaxation, control, and space belonging to the highest level. The subject of this study is to evaluate the effects of spatial photographs, illustrations, typography, and pictograms on the spatial experience.

The *information, orientation, spatial attachment, trust, control, order, relaxation, calming,* and ***aesthetic*** value-added criteria determined as a result of the research have an effect on the totality of the environmental graphic design elements that constitute the spatial identity of the hospitals.

In the last part of the survey, the evaluations of the perception of space in terms of the criteria mentioned by the user were measured. The results of the evaluation were examined with typography, pictogram, photograph, and illustration subheadings of each of the effects of environmental graphic design elements and in connection with the conclusions drawn from the previous sections.

Based on the observations made in these hospitals before the survey, it can be said that there are differences between the spaces in terms of environmental graphic design and health service understanding. When the results were evaluated in terms of environmental graphic design elements, it was observed

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that the effects of spatial identity progressed in the same direction with the positive effects of visual elements. According to Kutlu (2015:40), visual images such as photographs, illustrations, typography, and pictograms in the health space constitute the visual identity of the space. In this respect, in parallel with the findings in the second part of the survey, it can be said that the positive effects of environmental graphic design elements on the experience of the space have a positive effect on the perception of space.

According to the findings obtained from the research, the order and aesthetics of illustrations, informational order of pictograms, order and orientation of typography, information and readability of typography, and order and informational criteria of photographs were found to be the most important design criteria affecting the users' experience in the spaces. As emphasized in the study, environmental graphic design elements in hospitals need to have a number of psychological supporting effects in order to create a good experience design. It was demonstrated by statistical data that the elements in the investigated places could not provide the expected effects as a whole. As a result, environmental graphic design applications that have a supportive design understanding in hospital spaces should have a holistic language, and that design understanding can only be demonstrated with the cooperation of architects, interior designers, graphic designers, and industrial designers. Continuity is also expected to be ensured in subsequent changes in the space.

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