Pegem Journal of Education and Instruction, Vol. 14, No. 4 , 2024 (pp. 497-519)

RESEARCH ARTICLE

Helping to improve the facade of hospitals to improve the mood of clients*

Zahra Rayegan[1], Seyyedali Nouri[2]*, Mahnaz Mahmoudizarandi[3]

[1]-Ph.D. Candidate in Architecture, Department of Architecture , North Tehran Branch, Islamic Azad University, Tehran, Iran. Zara.rayegan@gmail.com

[2]- Assistant Professor, Department of Architecture , North Tehran Branch, Islamic Azad University, Tehran, Iran. 0000-0002-6290-668X, Sa_nouri@iau-tnb.ac.ir

[3] -Associate Professor, Department of Architecture , North Tehran Branch, Islamic Azad University, Tehran, Iran. 0000-0003-3623-1874, m_mahmoodi@iau-tnb.ac.ir

Abstract

Background: Hospitals are one of the most important service and public buildings, and considering the complexities of the mental state of their audience, considering and analyzing the mental states of the audience is one of the most important stages of designing such spaces. Paying attention to the healing effect of the environment and creating a pleasant and relaxing atmosphere is one of the necessities of treatment, while there are no written principles based on the components of the audience's perception for the design of hospital spaces, especially the entrance walls and facade, and there is a need to investigate this issue. It is completely visible. One of the most important of these sensory conditions is to gain the audience's sense of trust in hospitals, and since the audience's first encounter with architecture is the exterior of the building. The main purpose of this research is to identify the principles of composition of hospital facade components in order to strengthen the audience's sense of trust.

methods: In this regard, first, by using field studies, the compositional components of the facade were first collected, and then, by using interviews and two sets of questionnaires, the effectiveness of each component in gaining the trust of the audience was measured. Data analysis was done by comparing weighted averages and Friedman's non-parametric test using SPSS software.

results: In order to answer the main question, the findings of the research explained and prioritized the most important principles of composition of hospital facade components in order to strengthen the audience's sense of trust. Shape, balance and materials

Conclusion: The findings and statistical analysis confirmed the research hypothesis; This means that there is a correlation between the composition of the components of the hospital facade and creating a sense of trust in the audience, and by examining the perceptual characteristics and visual messages of each component, it is possible to increase the sense of trust in the audience.

Keywords: Composition, hospital view, sense of trust

*This article is an extract taken from the doctoral dissertation of “Zahra Raregan” entitled “Identifying the principles of composition of hospital facade components in order to strengthen the audience's sense of trust” which is Being comducted under the supervision of Dr. “Seyyedali Nouri” and advisement of Dr. “Mahnaz Mahmoudizarandi” Department of Architecture , North Tehran Branch, Islamic Azad University, Tehran, Iran.

* Corresponding author, Sa_nouri@iau-tnb.ac.ir

1. Introduction:

This chapter introduces and presents the research problem and the importance and necessity of addressing the principles of composition of hospital facade components in order to improve the sense of trust in the audience and pay attention to the psychology of perception and the selection of research goals and questions, and finally, based on the issues raised, the research hypothesis is defined

How to cite this article: Zahra Rayegan , Seyyedali Nouri *, Mahnaz Mahmoudizarandi. Helping to improve the facade of hospitals to improve the mood of clients*, Vol. 14, No. 4, 2024, 497-519

Source of support: Nil **Conflicts of Interest:** None. **DOI:** 10.48047/pegegog.14.04.43

Received: 12.10.2024

Accepted: 12.11.2024 **Published:** 01.12.2024

1.1. Statement of the problem

Building in all its aspects is related to the human mind. Building is the sensory perception of the landscape and the form of improvement 2012. Therefore, it is inevitable to pay attention to the perception of the audience and to study the psychology of perception in architecture. The application of psychology of perception in influencing the performance of architectural spaces in today's world is of particular importance. Because perception is a purposeful process and depends on the culture, attitude and value governing the thinking of the perceiver. Therefore, the process of perception always causes feeling and finally understanding the environment by knowing the environment (Mirzaei)2019. Considering the effectiveness of space in human psychological components, hospital architecture can be effective in improving patients and their psychological conditions. When patients enter the hospital, they are generally in a difficult situation mentally and are afraid, tense, distrustful or hopeless. Considering that the first image that the patient encounters when visiting the hospital is the facade of the building, paying attention to the effective factors in creating a sense of trust in the patient in the facade can have significant effects on the mental state of the audience. When this issue is analyzed based on the psychological principles of audience perception, it can define more practical results. Also, the constructive interaction between the patient and the environment and building patients' trust in the treatment environment can play an important role in advancing the treatment process. And the designers of therapeutic spaces can use the features of facade components to create a sense of trustworthiness.

1.2. The necessity and importance of conducting research

The society's attitude towards hospitals is associated with a sense of avoidance, fear and lack of trust, and many patients do not feel comfortable in these places, and this negative attitude can cause a delay in the patient's treatment process. Also, the characteristics and spatial organization of these places are such that the patient's recovery process is delayed or difficult, and paying attention to the healing effect of the environment and creating a pleasant and relaxing atmosphere is one of the necessities of treatment, while there are no

written principles based on the component. There is no audience perception for the design of hospital spaces, especially the entrance wall and facade, and the need to investigate this issue is clearly visible.

Considering the important and significant role of hospitals as a part of urban services and the significant area of these buildings in the urban context, paying attention to the external body and the main view of these places, in addition to affecting the sensory perception of patients and their companions, has a significant impact on the urban appearance and The society has a view on the field of medical services, and in addition to increasing the efficiency of treatment, a suitable physical structure affects the attraction of customers and the general popularity of hospitals.

1.3. Research objectives

Based on the explanations presented, the main goal of the research is to identify the principles of composition of hospital facade components in order to strengthen the audience's sense of trust based on the psychology of perception, and the secondary goals are:

- architectural solutions to strengthen the sense of trust in hospital contacts;
- Knowing the basics of the psychology of perception;
- Explaining the principles of facade composition.

1.4. Research questions

In line with the stated objectives, the main question of the research is:

How can the hospital facade help to improve the mood of the audience?

And the sub-questions are:

What should be the principles of composition of the components of the hospital facade in order to strengthen the audience's sense of trust based on the psychology of perception?
What are the architectural solutions to strengthen the sense of trust in hospital contacts?

1.5. Theory

1.6. Research variables:

The independent variable in this research is the principles of composition of facade components and the dependent variable is the sense of trust. Also, in this research, the hospital is considered as a spatial control variable and psychology of perception is also considered as a control variable.

2. Research literature / research innovation

Lots of research to study the impact and architecture has been carried out in medical environments and hospitals, and their results emphasize that the environment has positive effects on the behavioral and clinical results of patients, such as reducing stress, feeling safe, speeding up the treatment process, and environmental conditions can have negative effects on the recovery process of patients. to do On the other hand, the environment also affects the way employees work. Reviewing the literature related to the subject in this research shows that some of these studies have investigated the impact of the physical characteristics of hospitals on the quality of care services or the health of patients. Some others have offered solutions to improve this quality in the design stage and before that. Some researches have also

provided solutions to create a special feeling such as relaxation in patients, companions or employees of treatment spaces and hospitals.

A review of the literature related to the subject indicates that researches have been conducted on providing solutions to reduce fear, stress and anxiety; On the other hand, many researches have been done in order to define different emotions that have different compositions on humans. However, it has not been done about how to improve the sense of trustworthiness in hospitals, by the physical features of the space such as the facade, especially with regard to the perceptual features of the audience.

3. research background:

Based on the review of the background related to the subject, many researches have been conducted on the necessity of using environmental psychology topics in the design of treatment spaces and hospitals. For example, Matlabi has discussed the effects of the physical environment in reducing stress in patients in his article (Matlabi,2013) and in another research, he sought to identify effective factors in the design of healing environments (Motalabi, 2014). Some researches have addressed the relationship between physical characteristics and the impact of the environment on the mental health of patients (Daykln, 2008), (Ski, 2016), (Norsazlina, 2012), (Anderade, 2015), (Ghazali, 2017) or in more detail They have studied the effects of more limited factors such as color (Kolivand, 2015) or furniture (Zhou, 2021) on hospital design and patient treatment. Some researches have also analyzed different architectural approaches such as sustainable architecture and green architecture in the design of hospitals (Sudagar, 2015).

4. Research method

The research is applied, and the research method is qualitative and correlational, and the data collection is done in the form of documents and fieldwork.
In this way, the primary studies related to the literature related to the subject were collected and given using the documentary method the research requirements are collected using closed-ended questionnaires, video and observation, and after data collection, data analysis is performed using SPSS software, and qualitative data is converted into quantitative data.

4.1. Methods and tools of data collection

The methods of data collection in this research include documentary studies, field studies and interviews, questionnaires with video responses.
Based on this, firstly, the principles of facade composition based on different formal-physical theories were collected using documentary studies and interviews with experts, in the next step, the impact of each of these indicators in increasing the audience's sense of trust was determined by visual questionnaires with a Likert scale. The indicators that have the highest impact are identified.
These indicators determined in the stage of field studies were completed by using questionnaires with video response packages by the contacts, data collection in this section was completed by using in-depth organized interviews and the weights of the indicators by the SPSS software is

quantified and determined.

4.2. Statistical population, sampling method and sample size

The statistical samples are among the patients of the hospitals, and the sampling method will be random, and due to the unknown number of the statistical population, based on Cochran's formula, the sample size384 people are considered. Since the characteristics of the examinees' fields (gender and personality traits, visual knowledge and cultural factors) can be influential in visual preferences, the statistical population of the examinees is the audience of therapeutic spaces in cities with a population of over 1 million and 500 thousand people (big cities) including Tehran, Mashhad, Isfahan, Karaj and Shiraz were selected and due to the fact that the statistical population was one-sided, a simple probability sampling method was used. The samples were selected in equal numbers between male and female participants and people with artistic expertise and ordinary people. Data collection at this stage was done through the "selection preference test" using the "preference ranking method". Among the 384 people in the sample size, 192 men and 192 women, 65 specialists and 319 ordinary people were selected.

4.3. Preparing the initial questionnaire

The composition components of facade components were based on documentary studies and semi-structured in-depth interviews. At this stage, in order to summarize the data, we are looking for the components that have the greatest impact on creating a sense of trust in the hospitals' contacts.

To determine these components, an online questionnaire was set up to be completed by experts in the relevant field. In this questionnaire, the impact of each of the components in creating a sense of trust in the audience was compiled in the form of items in which attitudes were measured using a Likert scale. The respondent indicates his level of agreement with each of the items on a graded scale of one to five. Then the subject's answer to each of the items is valued numerically.

To measure the validity of the questionnaire, first, as a pilot, the initial designer of the questionnaire for10 experts were sent to reach a collective agreement for the detailed formulation of the items.

After the final formulation, the questionnaire was sent to experts online. The statistical population at this stage includes experts in the field of urban design and architecture, who specialize in facade design and design of therapeutic spaces, and the number of about100 people were estimated. Based on Cochran's formula with an error value of 0.05, the sample size is 79 people.

5. Discussion

5.1. Results of questionnaires

As mentioned, in order to determine the selected components, in an online questionnaire, experts were asked to rate the impact of time cycles on each indicator using a Likert scale and in a spectrum.5 points (1 is the least impact and 5 is the most impact) After weighting the items, the results are presented in the table below.

Table 5-1. the results extracted from the questionnaires

Row	Composition components of facade components	Total weight of the object	Weighted average of the object		Row	Composition components of facade components	Total weight of the object	Weighted average of the object
1	Rhythm and repetition	1413	17.88		15	Proportions	1209	15.30
2	Discipline	1398	17.69		16	Variety	1201	15.20
3	the balance	1384	17.51		17	The amount of full and empty	1201	15.20
4	material	1361	17.22		18	Age of crust	1195	15.30
5	Color	1348	17.06		19	Texture	1190	15.06
6	Opening rate	1343	17		20	symmetry	1190	15.06
7	Shape classification	1310	16.58		21	Move	1164	14.73
8	Decorations	1308	16.55		22	Gravity and gathering	1160	14.68
9	Visual coherence	1301	16.35		23	Lower left score	1143	14.46
10	Vegetation	1292	16.35		24	Hierarchy	1135	14.36
11	Contradiction and contrast	1273	16.11		25	Density	1135	14.36
12	transparency	1234	15.62		26	meaning	1116	14.12
13	Dimensions of the facade	1234	15.62		27	Skyline	1110	14.05
14	readability	1214	15.36		28	Design style	1101	13.93

Based on the presented results, the first quartile of the indicators, which have the highest weighted average, were selected as the components that have the greatest impact on creating a sense of trust in the audience, to be investigated in the field process of the research.

These seven indicators are: rhythm and repetition, order, balance, materials, color, amount of openings, shape classification.

5.2. Measuring the reliability of the questionnaire

Reliability of questionnaires at this stage using Cronbach's alpha method and by SPSS software was investigated. This method is used to calculate the internal consistency of measurement tools, including questionnaires. As can be seen in the output image of the software, the alpha value of 0.936 was obtained, which confirms the reliability of the questionnaire at an excellent level.

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	79	100.0
	Excluded[a]	0	.0
	Total	79	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.936	43

Equation 5.1. SPSS output for the alpha rate of questionnaires

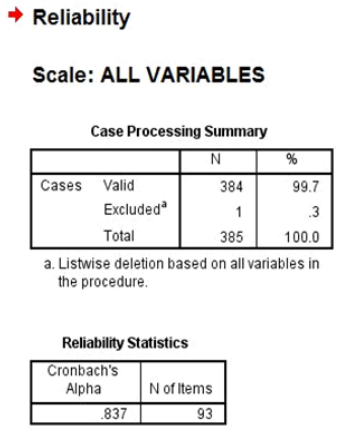
5.3. Interview and questionnaire in the second stage

Because of some of the words in the questionnaire needed explanations, we tried to fill them in the space of the questionnaire in the form of an informal interview. The main problem and obstacle in collecting data at this stage was the poor mental condition of the hospital contacts. Thus, they were hardly willing to cooperate and complete the questionnaires, and this issue made this stage of data collection more time consuming.

At this stage, the validity of the questionnaires using content analysis (consensus by10 experts) was done. Content validity is a type of validity that is usually used to check the components of a measurement tool. The validity of the content of a test is usually determined by people who are experts in the subject being studied. Therefore, the validity of the

content depends on the judgment of the judges.

Reliability of questionnaires also by SPSS software and Cronbach's alpha method were checked and as it is clear in the picture, the obtained alpha was 0.837.



Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	384	99.7
	Excluded[a]	1	.3
	Total	385	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.837	93

Figure 5.2. SPSS output for the alpha rate of the questionnaires of the second part.

5.4. Data discussion

Based on the process that was explained earlier (closed answer questionnaires completed by experts and weighted to the components that have the greatest impact on creating a sense of trust in the audience) and based on the results extracted from the questionnaires of the previous section, the first quarter of the components which had the highest weighted average were chosen as the selected indicators of the research.

These components are: rhythm and repetition, order, balance, materials, color, amount of openings, shape classification.

5.5. Data collection and analysis

At this stage consists of two categories of image questionnaires, the first of which includes selected components and the second of which includes images10 samples of hospital facades were distributed among the statistical population of the research in order to weigh the impact of each component in creating a sense of trust among the hospital audience. The findings from the questionnaires are shown in Tables 2-5, 5-3 and 5-4. Also, Pearson's correlation coefficient is used to measure the relationship between the components of the facade composition in the hospital and the level of trust in different age groups and in different genders separately in the audience. This numerical coefficient is between 1 and -1 and becomes zero if there is no relationship between two variables.

Table 5.2. Frequency and frequency percentage of examinees by gender and age group

Statistical index: gender	Abundance	Abundance %	Statistical index: age group	Abundance	Abundance %
male	192	50	young	128	33.1
female	192	50	Middle age	128	33.1
-	-	-	old	128	33.1
sum	384	100		384	99.2

Table 5.3. Pearson correlation coefficients to check the significant relationships between each component with gender and age group

Composition component of facade components	Pearson's correlation coefficient for gender variable	Pearson correlation coefficient for age category
Rhythm and repetition	-0.014	0.023
Discipline	-0.066	0.035
the balance	0.054-	0.030
material	-0.073	0.018
Color	0.015-	0.026
Opening rate	0.008-	0.022
Shape classification	-0.069	0.028

As the results of Tables 5-2 and 5-3 show, the correlation of the effect of the components of the composition of the facade in creating a sense of trust with the age group of the contacts is positive and has a very small value. Also, the correlation of the effect of the components of the composition of the facade in creating a sense of trust with the gender of the contacts is negative and has a very insignificant value. It is necessary to explain, the age classification is separated in this category in such a way that considering that the hospitals in question in this research are adult hospitals (and the discussion of children's hospitals is not considered due to the separateness of the type and specialty) the young age classification is (25-40 years), middle-aged (40-60) and elderly (over 50 years).

These results show that the components of age and gender do not have much effect on the effects of appearance components in creating a sense of trust.

Table 5.4. Quantitative results extracted from both questionnaires

Composition component of facade components	Overall weight	Weighted average	Rank based on Friedman test Degree of freedom (df): 6 Chi-square: 1073.934 Confidence interval (sig): 0.00
Rhythm and repetition	1449	3.77	5.01
Discipline	1318	3.43	3.92
the balance	1062	2.76	4.97
material	1051	2.73	1.79
Color	1353	3.52	4.23
Opening rate	1380	3.59	4.42
Shape classification	1312	3.41	3.66

In this section, images of 10 hospitals from across the country were presented, the audience was asked to rate the impact of each view on creating a sense of trust, and the researcher analyzed the characteristics of each desired component in each view (Table 5.5).

Table 5.5. Analysis of sample cases presented in the questionnaires

Hospital name	**picture**	**Visual components of facade composition**						
		Rhythm and repetition	**balance**	**color**	**Shape classification**	**Opening rate**	**discipline**	**material**
Imam Reza Kermanshah Hospital	pic 5-3	Repetition of square modulus and	*	Cold range bright spectru	Rectangular shapes	1 to 5	*	Synthetic and natural combination

		linear elements		m				
Jam Hospital	pic 5-4	Repetition of square modulus and linear elements	–	Cold to warm spectrum 3 to 1 Light to dark spectrum 2 to 1	Combination of rectangular and diagonal shapes	1 to 2	–	No porosity
Farhikhtegan Hospital, Tehran	pic 5-5	Repeating the module of 4 squares	*	Cold range bright spectrum	Rectangular shapes	1 to 3	*	matte
Noor Qom Heart Hospital	pic 5-6	Repetition of linear elements	*	Cold range Dark to light spectrum in the ratio of 1 to 2	Rectangular shapes	1 to 2	*	Synthetic and natural combination
Kian Hospital	pic 5-7	Repetition of linear elements	*		Rectangular shapes	1 to 3	*	No porosity
Mohammad Rasool Allah Hospital, Yazd	pic 5-8	Repetition of linear elements	–	Cold range Dark to light spectru	Rectangular shapes	1 to 4	–	Matte and transparent combination

				m in the ratio of 1 to 3				
Maragheh Hospital	pic 5-9	Repetition of linear elements	–	Cold range Dark to light spectrum in the ratio of 1 to 2	Rectangular shapes	1 to 3	–	artificial
Mehdi Clinic Hospital	pic 5-10	Repetition of linear elements	*	Cold range dark spectrum	Curved shapes	1 to 1	*	No porosity
Vali Asr Hospital in Tabriz	pic 5-11	Repetition of linear elements	*	Cold range Dark to light spectrum in the ratio of 1 to 2	Rectangular shapes	1 to 2	*	matte
Shariati Mega Hospital	pic5-12	Repetition of linear elements	–	Cold range dark spectrum	Combination of rectangular and diagonal shapes	1 to 1	*	Synthetic and natural combination

Figure 5.4. View of Jam Hospital

Figure 5.3. View of Imam Reza Kermanshah Hospital

Figure 5.6. View of Qom Noor Heart Hospital

Figure 5.5. Front view of Tehran Farhikhtegan Hospital

Figure 5.8. View of Mohammad Rasoolullah Hospital in Yazd

Figure 5.7. View of Kian Hospital

Figure 5.10. View of Mehdi Clinic Hospital

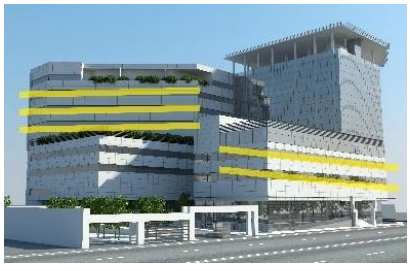


Figure 5.9. View of Maragheh Hospital

Figure 5.12. View of mega Hospital

Figure 5.11. View of Vali Asr Hospital in Tabriz

5.6. Analysis of each component based on the findings

Rhythm and repetition:

As presented in the tables, this component has the highest weighted average. (3.77) which shows that this component is the most effective component in creating a sense of trust among the audience in hospitals. Repetition here means uninterrupted sets of visually connected units. The results of interviews and questionnaires show that the presence of comprehensible rhythm and repetition in the composition of the facade of the building is accompanied by a feeling of emphasis, and this feeling of emphasis promotes the feeling of trust and confidence. It is in the viewer. The point that was mentioned in the interviews is the importance of the recurring rule; This means that if this rule causes complexity of the composition or has ambiguity for perception, it will cause distrust of the viewer**.**

Table 5.6. Results extracted from questionnaires for rhythm and repetition components

Component	The results of the questionnaires (in percent)		Analysis
Rhythm and repetition	Composition with rhythm and repetition	The composition lacks rhythm and repetition	The presence of rhythm and repetition in the composition increases the emphasis and the sense of stability and continuity of the data, which increases the sense of trust. According to the performance of the hospitals, such a repetition has required multiple openings in the facade, where the design of a suitable rule for the repeating rhythm is important.
	87 percent	13 percent	

Discipline:

The regularity of the composition here means that all components are used according to a single method and plan, and on the contrary, in irregular designs, the goal is to create unpredictable and amazing situations that cannot be limited to specific

rules or programs. did The images of the compositions presented to the audience in this section are categorized into two regular and irregular modes, which the audience found the regular compositions to be more effective in creating a sense of trust due to conveying the feeling of stillness, stability and especially predictability.

Table 5.7. The results extracted from the questionnaires for the order component

Component	The results of the questionnaires (in percent)		Analysis
discipline	Regular composition	Irregular composition	Predictability is the most important factor in creating a sense of trust in a regular composition.
	97 percent	3 percent	

The balance:

The most important physical and physiological factor affecting the senses is his need to maintain balance. He wants his feet to be more firmly on the ground and be sure that he maintains a balanced body position in any situation. Therefore, humans consciously or unconsciously in their visual evaluations pay more attention to the existence of balance than any other factor visually, and without the need for special expertise or a special calculation method, they can understand it with their instinctive feeling. The options presented in this section were balanced and unbalanced views, and the unbalanced compositions got a much higher preference score, which means that a balanced composition increases the feeling of trust in the space, and the pressure, instability and tension caused by the compositions Imbalance in the design of the facade can cause lack of trust and confidence of the audience upon entering

Table 5.8. The results extracted from the questionnaires for the balance component

componen t	Questionnaire results in percent		analysis
discipline	Regular composition	Irregular composition	Human's instinctive need for balance is to induce a feeling of stability and stability, and this perception of this stability through a balanced composition creates a feeling of trust.
	81 percent	19 percent	

material:

In the classification presented to the audience, this component was classified

into natural-artificial, porous-smooth and glossy-matte types. The results of questionnaires and interviews show that there are more natural materials such as stone and wood in the facade than synthetic materials (due to the sense of comfort and familiarity that natural materials have), less use of porous materials (which creates a sense of confusion and tension in the audience). And using more matte materials instead of shiny ones in the facade (because transparency is considered as a tension-causing stimulus), increases the sense of trust of the audience upon entering the hospital.

Table 5.9. The results extracted from the questionnaires for the components of materials and materials

component	Questionnaire results in percent					
material	natural	synthetic	porous	plain	matte	shiny
	76	24	17	83	76	24

Color:

Color is the most important visual element in terms of emotional and emotional load, so it has a special power in transmitting visual messages and can convey many meanings. In the classification presented to the audience, this component was classified into the following types (3-14). The results of the questionnaires and interviews show that the audience does not prefer the absolute use of cold colors in the facade, despite the calm feeling that this color spectrum instills in the audience. An absolute use of warm colors also increases the tension in them, and such tension-generating stimuli can reduce the feeling of trust in the audience. The range of cold and warm colors has the highest preference score among the audience with a ratio of 3 to 1. Regarding the use of light and dark colors, the absolute use of dark colors in the facade of the hospital increases fear, insecurity and sadness, and on the other hand, the absolute use of light colors is considered to be a stress-inducing stimulus upon arrival.

Table 5.10. Results extracted from the questionnaires for the color component.

component	Questionnaire results in percent						
color	warm colors	Cool colors	3 to 1 range of warm to cold colors	2 to 1 range of warm to cold colors	A range of warm and cold colors in equal measure	The spectrum of cold to warm colors is 3 to 1	Range of cold to warm colors 2 to 1
	2	6	7	8	22	38	17

	light colors	dark colors	The range of dark to light colors is 3 to 1	The range of dark to light colors is 2 to 1	A range of dark and light colors in equal measure	The spectrum of light to dark colors is 3 to 1	The spectrum of light to dark colors is 2 to 1
	6	3	8	6	28	43	6

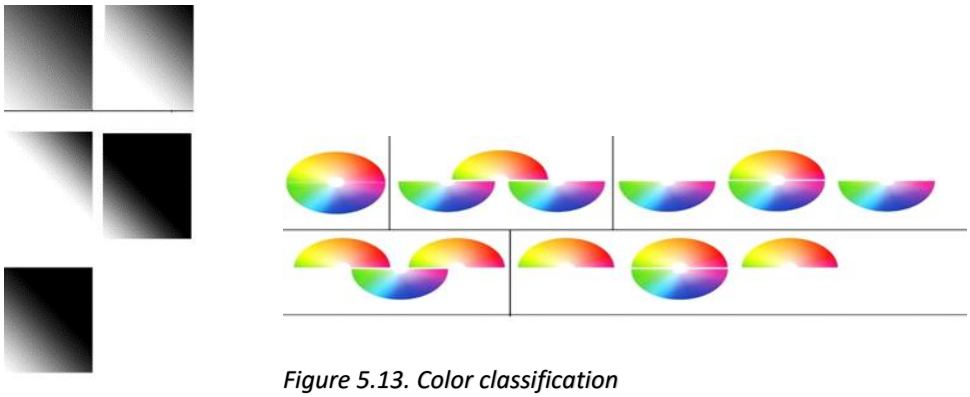


Figure 5.13. Color classification

Opening rate:

In the category presented to the audience, this component was categorized into the following types: ratio of opening to wall1 to 2, opening to wall ratio 1 to 3, opening to wall ratio 1 to 4 and opening to wall ratio 1 to 5 (Figure 7). The results of the questionnaires and interviews show that the presence of too many openings in the facade and its transparency gives the audience the impression upon entering that their privacy will be disturbed while staying in the environment, which reduces their sense of trust in the environment. Also, the excessive transparency of the facade causes more shine and as a result visual pressure. On the other hand, the rigidity of the facade and the lack of opening in it causes a feeling of suffocation, fear and insecurity in the audience. In this regard, most of the contacts prefer the opening rate to be 1 to 3 in the front of the hospital in order to increase the sense of trust in them.

Figure 5.14. Classification of the ratio of the opening to the wall in the facade in the first questionnaires

Table 5.11. The results extracted from the questionnaires for the component of the opening rate

component	Questionnaire results in percent			
Opening value	1 to 2 ratio	1 to 3 ratio	1 to 4 ratio	1 to 5 ratio
	28	38	24	10

Shape classification:

In the classification presented to the audience, according to the three main shapes of square, circle and triangle, this component was categorized into broken and diagonal shapes, rectangular and perpendicular shapes, and curved and curved shapes, which rectangular and perpendicular shapes, It has the highest preference score among the audience. The findings of this section show that curved and bent forms, due to creating a feeling of excitement, movement or even happiness, due to lack of familiarity with the functional nature of hospital spaces, create a feeling of lack of coordination and as a result lack of trust and confidence in the audience. Broken and diagonal shapes are also a stressful stimulus that induces the viewer to feel uneasy. The induction of these feelings to the audience is also due to the special characteristics that each of the main forms have, which are either due to their inherent form, or due to the physiological-psychological reaction of humans, or due to specific cultural interpretations. For example, the square of immobility, honesty and openness are attributed; The activity triangle evokes conflict and contraction, and the circle evokes movement and expression.

In a composition, each of the possible directions - horizontal, vertical, diagonal, circular or a combination of these - has its own expressive meaning. The horizontal direction indicates weight, distance and breadth. The vertical direction, the strongest opposite of the horizontal direction, implies the clarity of height and depth. The two vertical and horizontal directions together induce the effect of the surface, sense of balance, stability and strength and hardness of the material. When the horizontal and vertical directions cross each other, a strong emphasis is felt.

Diagonal directions create movement and draw human attention to the depth of composition.

Table 5.12. Results extracted from the questionnaires for the shape classification component

component	Questionnaire results in percent

Shape classification	Right-angled shape	Diagonal shapes	Diagonal shapes
	59	16	16

6- The final conclusion

Spending long hours in medical environments is usually a stressful experience for patients, visitors and staff. Any effort to reduce this tension is a positive result in the treatment process and it will increase the quality of these spaces.

Although the issue of health has been important for humans since long ago; But in the modern era and following the emergence of psychological problems resulting from the mechanical life and the boring physical environment, serious concerns have been formed in the field of health threats.

Visual components affect the emotions of the audience, and identifying, describing and examining these items can make it possible to evaluate the aesthetics of architectural facades and create the desired emotions in the audience. The architectural environment, its body and walls, especially the main facade of the building as the first encounter of the audience with the building, by influencing the behavior, actions, interactions of patients and their families as well as the staff who provide care, can affect people's health, reduce stress and Increase their confidence in the environment. By using the visual components that he uses in the design of the facade of the building, the designer can directly and indirectly affect the different mental states of the audience.

In this research, the relationship between the compositional components of facade design and creating a sense of trust in the audience was evaluated. In order to answer the main question, the findings of the research explained and prioritized the most important principles of composition of hospital facade components in order to strengthen the audience's sense of trust. So that at the beginning, the design component of hospital building facade composition was collected based on document studies and to summarize the data, the first quarter of the components was selected based on the average weight that experts in the field had scored on the impact of each component in increasing the trust of the audience in the hospitals. This component has been comprehensively analyzed in field surveys and its results have been presented based on users' opinions. The prioritization of each component based on the degree of impact in increasing the sense of trust in the audience is:

Rhythm and repetition, opening rate, color, order, shape classification, balance, materials and materials

It also confirmed the findings and statistical analysis of the research hypothesis; This means that there is a correlation between the composition of the components of the hospital facade and creating a sense of trust in the audience, and a meaningful relationship is established, and by examining the perceptual characteristics and visual messages of each component, it is possible to increase the sense of trust and confidence in the audience.

6-1- Proposed strategies

Table 6-1 presents the proposed strategies

based on the research findings that these strategies can be used in the design and planning of new spaces and by improving the status of existing spaces.

Table 6.1. Proposed strategies based on research findings.

Visual components	strategy	
Rhythm and repetition	Design and planning of new hospitals	Definition of a repeatable unit (module) that responds to the specific functional needs of the hospital and is proportional to the amount of openings required for the façade. Rhythm for repeating the units so that this rule has a specific order, is readable and easily understood by the hospital's anxious and confused contacts.
	Improving the status of existing hospitals	• The components of rhythm and repetition, at the beginning of the design, a precise definition should be proposed for it and it forms the main concept of the shape of the facade. Therefore, it is not possible to create such interference in the built facades. But if possible, covers can be used to emphasize the repetition of existing elements (without defining a new rhythm).
Discipline	Design and planning of new hospitals	• Using regular and visually legible compositions • Use predictable compositions • Avoiding the use of complex, unexpected compositions or inducing movement and dynamism in the view
	Improving the status of existing hospitals	Adding new plates or covers instead of irregular surfaces in the view Beautifying existing views with overlays
the balance	Design and planning of new hospitals	Designing balanced compositions without pressure in vertical and horizontal axes Avoiding creating an index element in the facade so that the eye is diverted towards it Avoid creating diagonal axes
	Improving the status of existing hospitals	Adding new levels or lines to the view if the levels are unbalanced Installation of new components in case of pressure in the view or the presence of visual mesh in its beginning parts to neutralize the existing visual pressure.
material	Design and planning of	More use of natural materials and as much as possible to bring canvas and in accordance with the climate

	new hospitals	Considering the arrangements and coverings necessary to increase the life of the materials Use of materials with low porosity
	Improving the status of existing hospitals	Covering shiny materials on the facade if there are many of these surfaces Use of alternative coatings to enhance the beautification of facade materials
Color	Design and planning of new hospitals	Using a range of warm and cold colors in a ratio of 3 to 1 in facade design Use of light and dark colors in a ratio of 3 to 1 in facade design Attention to the choice of colors and their resistance to environmental conditions
	Improving the status of existing hospitals	Covering and painting existing surfaces if possible with suggested colors
The amount of openings	Design and planning of new hospitals	Embedding opening proportions in the facade of the building in order to increase the transparency of the facade Necessary facilities for maintenance, washing and replacement of glass windows Use of glass with suitable material and in accordance with functional and climatic needs Considering suitable coatings for glass surfaces to control light and heat
	Improving the status of existing hospitals	Design of glass surfaces (semi-opening) as a substitute for some surfaces in case of lack of opening in the window Considering suitable coatings for glass surfaces to control light and heat
Shape classification	Design and planning of new hospitals	Use of 4-cornered forms with dominant vertical and horizontal axes General design and details of the overall concept based on square shapes
	Improving the status of existing hospitals	Adding shape details in the view in order to achieve the dominant square shape, if there are curved or diagonal shapes in the view

2-6- Recommendation for future research

Based on the research results, with interest Taking into account the architecture of hospital spaces and paying attention to physical factors such as color, balance, materials, etc., based on the aesthetic and functional principles of architecture, it is possible to design suitable spaces with spatial value in order to cure the stress and anxiety of the patients caused by being in the hospital. or is it a disease, reduce it and take steps to improve people's health, which is the most important goal of therapeutic environments. In other words, the design and architecture of hospitals is presented as a necessity in the treatment process. Also, based on such researches, a suitable model can be provided for the design of medical care based on high flexibility, security, intimacy and peace, which will guarantee the acceleration of the treatment process of patients and the improvement of the health of the society.

Research about the visual component preferences in the field of architecture, due to the difficulty of reducing the built environment to testable variables, are less noticed by the researchers of experimental aesthetics and environmental psychology. Experimental tests of aesthetics need to make suitable visual profiles and also describe these variables correctly. Structuring and summarizing shape diversity is a way to achieve these visual components. Investigating the effects of these components on each other and other visual components (such as color, shape and materials) in the facades of other architectural functions and their effects on creating different emotions in the audience can be the subject of future research.

7- References

- Improvement, Rehane. (2011). Perception in architecture, a case study of

European tourists' perception of Iranian-Islamic architecture in Isfahan city. Journal of Fine Arts, 17(3):41-48.

- Mirzaei, Arzoo, Shafizadeh Asdal... Naseri, Aynor (2019). An analysis of the key

factors in the visual quality of the walls of the residential buildings of the Qajar period in Tabriz. Journal of Land Geography, 18(69): 1-23.

- M Talabi, Qasim, Vojdanzadeh, Laden. (2012), Recognizing the effective factors

in creating healing environments, Safeh Magazine, No. 26

- Melabi, Qasim; Vajjanzadeh, Laden. (2013). The effect of the physical

environment of therapeutic spaces on reducing the stress of patients, a case study of a dental office - Journal of Fine Arts - Architecture and Urban Development 20(2): 35-46

- Kolivand, Pirhossein, Ishaqabadi, Arzoo, Kazemi, Hadi. (2015). Psychology of

color and its effect on hospital design and patient treatment, Shafai Khatam magazine, number 2

- Sudagar, Sharara, Mofakher, Farshad (2015). An analysis of the design

requirements of a green hospital with a sustainable architecture approach, Urban Management Journal, No. 45 Daykin Norma, Byrne Ellie, Soteriou Tony, O'Connor

Susan2008 Review: The impact of art, design and environment in mental healthcare: a systematic review of the literature, Journal of perspective in public health

- Myszkowski, N., Storme, M., & Zenasni, F. (2016). Order in Complexity: How Hans

Eysenck Brought Differential Psychology and Aesthetics Together. Personality and Individual Differences, 103, 156-162.

- NorsazlinaHaron, Siti, Hamida, Yusof, Talib, Anuar, (2012). Towards Healthcare

Service Quality: An Understanding of the Usability Concept in Healthcare Design. Social & behavior science, 42, 63-73.

- Cl_audia Campos Andrade, Ann Sloan Devlin, (2015). Stress reduction in the

hospital room: Applying Ulrich' s theory of supportive design, Journal of Environmental Psychology, 41, 125-134.

- Roslinda Ghazali, Mohamed Yusoff Abbas (2017). Paediatric Wards: Healing

environment assessment, Asian Journal of Environmen-Behaviour Studies, ajE-Bs, 2(3), Apr./Jun. (p.77-87).