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## Decorative Motifs and Lighting Effects in Promoting Quality Health of Persian Bathhouse

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### Abstract

The hidden issues behind the body of Iranian architecture contain meanings, mysteries, and symbols. In the pathology of the bathroom, it should be noted that anti-physiological leisure in a mechanized, automated, and boring environment with no desire to stay in it, is the main problem that has prevailed in recent years. The aim of this article is to describe the relationship between the function of symbols of Iranian Architecture and the quality of health. This paper investigates 5 case studies namely the traditional bathhouse of Iran (TBI) from 5 cities with a particular approach to light and decorative motifs from the Ghajar and Safavid periods in Iran. The methodology used is the Delphi research with the Q factor analysis. Finally, the profile of the relations of ornaments in a healthy TBI is explained.

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Keywords: Quality of bathhouse; decorative motifs; lighting; healthy environment

### 1. Introduction

The hidden issues behind the body of Iranian architecture contain meanings, mysteries, and symbols. In other words, the ornaments of Persian architecture are defined in a world of symbols. The doctrine behind the creation of the traditional bathhouse of Iran (TBI) suggests that the patterns of healthy and healing designs must be extracted and expressed in a language that is comprehensible today. The role and function of the bathhouse are changing. New models of bathhouses can observe in pools, exercise clubs, spas, and massage parlors. Using bathhouses is the reality of everyday life; supporting continuity and paying attention to the quality are significant and necessary for making it comfortable in configuration and atmosphere. Its configuration has the characteristics of a home-like environment.

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How do the characteristics of a built environment adversely impact human health? Poor lighting, uncomfortable illumination, and decorations with an artificial sense of the bathroom makes it a boring environment. The existence of hazards influences our environmental condition and health. The sick building syndrome (SBS), industrial production, and some factors related to building and environment contribute to the increase in health disturbances and diseases (Health Environment and Building Design). The bathroom is offered instead of the "Bathhouse" in most cities. Visitors breathe "smoky air" instead of "fresh air". In the past, most people went to the Bathhouse once a week, and they were lively and healthy, but now, daily bathroom facility is offered instead of the weekly visit. Unfortunately, now the rate of health has decreased more than previously. "It has been far more concerned with the pathology of the environment than with the health criteria of the environmental design before the point of decision" (Shoshkes, Ellen.,Adler, Sy, 2009). Human ecology threatened with the 'dangers that man faces in the modern world.' In other words, a spatial organization with all the factors directly affects the holy branch of health as well as in disease. Lack of ability in the environment is boring and leads to depression and lesser social interaction. Lack of willingness to participate in a given space, lack of vitality, lack of affordance, cold atmosphere, and uncomfortable built environment are equally unappealing. In the pathology of the bathroom, it should be noted that anti-physiological leisure in a mechanized, automated, and boring environment with no desire to stay for a long time, is the main problem that has prevailed in recent years.

The recent rapid changes in therapies mean new necessities and initiatives introduced in supporting the need for flexibility in the design. It has to deal with the unavoidable qualitative changes in healthcare in the society and living standards to survive over time (Health Environment, Social Background, Quality of Life, and Wellbeing, Di Cicco, P40). A healing environment can simply describe as the overall environment (physical and non-physical) created to aid the recovery or healing process. Preliminary studies have conducted, and an interesting argument has emerged on how and what are the factors that contribute to the healthcare environment (Roslinda, G.,Yusoff Abbas, M, 2010).

The "complete wellbeing" of the user includes psychological and physical benefits, which are also the aim of a "healthy building". The well-being of society is the aim of a TBI and is necessary to consider. The environmental health authority should assess to see if the current practice of placing the health impact assessment under the purview of the Environmental Impact Assessment is still applicable (Shafie, 2013). The objective of this article is to describe the relationship between the function of symbols, motifs, natural light, and color of Iranian architecture and the quality of health in the TBI. Finally, it is the realization of a "healthy" built environment that takes into consideration the prevention of hazard risks related to health and environment.

## 2. Literature Review

### 2.1. Social health

A "healthy, balanced, and sustainable atmosphere" (Zufiaurre, B., Albertin, A.,Belletich, O., 2014) is the most pressing issue in social health. The abundance of public bathhouses in ancient Iranian cities indicate to the approach to healthy is the most important issue. Also, the issue of cleanliness needs to be addressed as advocated in the Islamic faith. These structures, however, are not mere washing places. These are places where people can also spend their leisure time conversing, exchanging views, resting, and even praying. They are a place where friends can meet and where daily problems of life can resolve. Beyond bodily cleanliness, they also provide spiritual refreshment. Optimizing the relationship between the individual and the environment through the Bathroom environment also improves the relation between the society and the environment through the Bathhouse environment. Intangible social therapy observed in the environment including entertainment with a friendly atmosphere, home-like convenience, and a place for conversation (Ganjnameh, 2008).

The work of the Peckham Health Center has shown that health is not brought about by drugs, vitamins, or by developing muscles in the body. It is the result of an active life in an environment rich in various opportunities for mental and physical development with free and friendly social intercourse. Healthy people do not want to organize, but they do want opportunities to do things together (J.Tyrwhitt, 1985). It is a convergence between a long epidemiological tradition that examines the inter-relationships between disease agents, characteristics of the host, and the broader socio-cultural and environmental context. The current interest in the promotion of health and a safer environment recommends a modification of how we live in and relate to the social world and nature (Shoshkes, Ellen.,Adler, Sy., 2009).

## 2.2. Mental health

*Ravan* is the psychological aspect of human beings, which is more important than *Jesm* in designing any building. Therefore, a dwelling should be built considering its psychological impacts on the human brain and the nervous system. Based on the concept of psychosomatic diseases, any form, pattern or element that negatively affects the *Ravan*, will lead to health problems for the inhabitants. Psychology considers and deals with the psychological effects of forms, patterns, spatial organizations, color, light, and plant motifs (Goodarzi, Ali.,Fazeli, Hengameh, 2014).

## 2.3. The quality of Life

“Equation conveys two primary meanings. The first is an imprecise sense of harmonious or aesthetically pleasing proportionality and balance; such that it reflects beauty or perfection, which links between a human being and architectural design” (Mahdavineja, M., Mansoori, S, 2011).

Energy flow extends from the surface of the human body to energy centers of the body, and the body absorbs fresh energy and expels the used up energies (Leadbeater, 1972). Sometimes, energy flows move from the human body to the built environment and vice versa. Some places have positive energies to carry the “*Ravan*” placed at the center of the brain then the *Ravan* absorbs them, distributes, and energizes the whole physical body. It is important to know that “without energy, the body would die.” The energy centers control and handle the proper functioning of the whole physical body and its different parts and organs (Powell, 2005; Sui, 2006; Sui, 2009). It is necessary that more human properties in healthcare need to find a new balance between modern attitudes and traditional principles of medicine. It must be conscious of the advantages of prevention rather than cure. In order to improve the quality of life, the new strategy for prevention is to increase the return on the holistic and multifunctional approach.

## 2.4. Ornament in TBI

The *Bineh* or *Sar-Bineh* is the largest and the most ornate area of a bathhouse; it is a large, elaborately decorated hall with a large dome and a central pool. The central area of the *Bineh* surrounded by platforms or alcoves where visitors can sit and rest. The floor of these areas is higher than that of the *Bineh*'s central area, and it usually has a shallower ceiling. Thus, it forms comfortable, secluded areas with a commanding view of the central area. To reach the floor, one has to climb several stairs and rinse one's feet in shallow pools provided on the platforms to assure the cleanliness of the individual areas. The uniform lighting of the *Bineh* also adds to the impact of this decoration, while pools with water spouts further enhance the restful atmosphere of this field by their brilliant colors and rustling sounds. The *Garm-Khaneh*, however, often consists of a smaller and simpler area with corners for sitting and washing. The hot water *Khazineh*, the cold *Chaleh-Hose*, as well as other fields for more private bathing, adjoin the *Garm-Khaneh*. The *Garm-Khaneh* houses several large and small pools and lit through light apertures in its ceiling. The water used must not be from an expropriated source; clean areas have to separate from the impure ones, and the clean water has to be meticulously kept apart (Ganjnameh, 2008).

## 3. Methodology

This paper investigates 5 case studies of TBI from 5 cities (as described further in Section 3.1 and demonstrated in Table 1) with particular emphasis on light and decorative motifs from the Ghajar and Safavid periods. The healthy approach needs to be analyzed, decrypted of the intrinsic properties, and healthy principles of how it affects the TBI will be extracted. The research method will scrutinize and measure how the ornaments influence unhealthy and healthy minds. Using the Delphi method in the SPSS software version 22, reliability and validity assessment of the research data will be performed. Evaluation and Survey analysis of the data obtained from the quantity measurements will be carried out by the Q factor analysis. Dimensions analysis among components of the case studies (samples), components of the buildings, and the correlation between the factors will be performed. Finally, the profile relations and process profiling of the ornaments in a healthy TBI will be drawn, and the final effective factors will be explained. Modifying factors having aesthetic proportions are the independent variables that possibly affect the health and quality of life in the mental and physical aspects of the direct factor that is the dependent variable. Moreover, quality and health that mediate the indirect factor is the mediating variable; evaluation of fitness, indirect qualitative



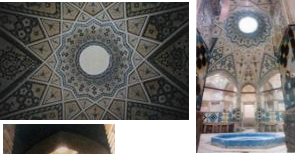


measures, and indirect relations between those parameters will be performed. A healthy profile of the built environment will be determined.

3.1. The number of case studies (samples)

The five bathhouses (case study) have a different approach to ornaments and use various colors in different climatic conditions. Samples with specific characters were selected as listed below:

- Sarbineh 4 Fasl Arak: Full of color ornaments and decorative motifs (seven colors);
- Garmkhaneh women Esfahan: Pure and unique ornaments via Saroj and light in particular;
- Sarbineh Soltan MirAhmad Kashan: Moderate ornaments with brick and tile;
- Garmkhaneh Nobar Tabriz: Original ornaments with red bricks; unique and extraordinary ornaments in the TBI; and Sarbineh Ganjalikhan Kerman: Majestic simplicity; spiritual lights with integrity and purity.

Table 1. Chosen bathhouse for coding. Source: Author

No	Title of Bathroom	City	Document
1	4 season	ARAK	
2	women	ESFAHAN	
3	Soltan MirAhmad	KASHAN	
4	Nobar	Tabriz	
5	Ganjalikhan	Kerman	

Interviews with samples performed among six experts including architectural professors, professional restorers, and psychological professors. Semi-structured interviews performed with 6 of the best professors who are experts in the area of the traditional bathhouse of Iran.

Then, the concepts of the interviews were categorized into four groups (Component: all of the concepts that the experts pointed out classified into four components): 1. Beauty; 2. The quality of the environment; 3. The idea of psychological perception of space; and 4. Social component.

After that, a table of the specification was crystallized from the relations between the categorized concepts and the components. Accordingly, a questionnaire with 90 questions was prepared and filled up by 20 Ph.D. students consisting of architecture graduates and professional architects.

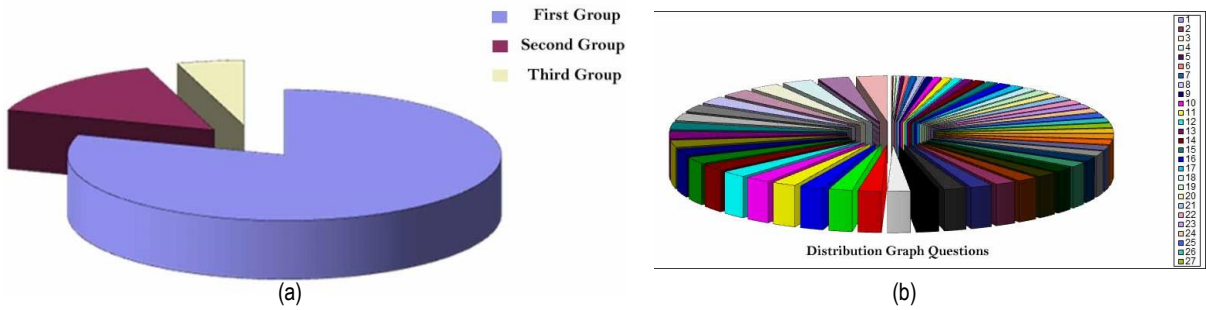


Fig. 1. (a) Distribution graph unanimously participant; (b) Distribution graph questions

The samples' adequacy was measured using the Kaiser-Meyer-Olkin (KMO) and Bartlett's Tests, and the result were 0.94. Therefore, these samples are sufficient for this paper.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.946
Bartlett is Test of Sphericity	Approx. Chi-Square	1723.851
	df	190
	Sig.	.000

Fig. 2. KMO and Bartlett's Test for Measure of Sampling Adequacy

Then, all the data were entered into the SPSS software, and the Q-analysis factor performed. The classification of a conceptual vision of the relation between concepts and categories created. Due to the classification of the Q-analysis factor, the statistical society was classified into three groups of 80%, 15%, and finally, 5% of the total.

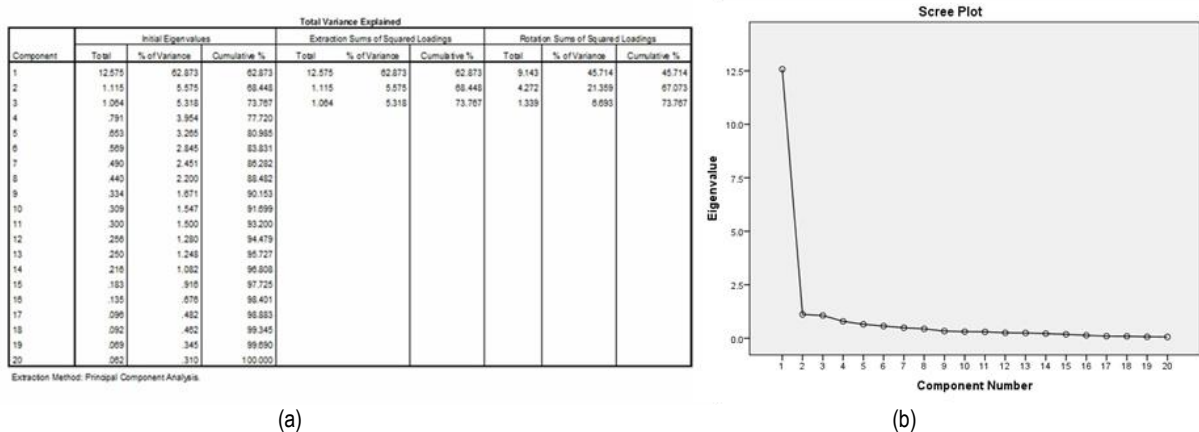


Fig. 3. (a) Total variance explained; (b) The relation between component number & eigenvalue

Table 2. Extraction method: principal component analysis. Rotation method: Varimax with Kaiser Normalization

Rotated Component Matrix			
	Component		
	1	2	3
var007	.861	.299	.035
var001	.853	.423	.034
var008	.852	.010	.074
var004	.809	.396	.083
var016	.809	.446	.213
var020	.804	.312	.134
var015	.781	.506	.034
var002	.775	.406	-.034
var011	.728	.340	.079
var012	.700	.445	-.011
var006	.646	.363	.351
var017	.629	.534	.198
var010	.623	.178	.246
var005	.621	.468	.018
var014	.564	.460	.266
var003	.558	.315	.053
var018	.163	.919	.088
var019	.399	.794	.027
var009	.598	.598	.177
var013	.062	.063	.957

Component Transformation Matrix			
Component	1	2	3
1	.837	.527	.147
2	-.467	.547	.695
3	.285	-.651	.704

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.a

a. Rotation converged in 5 iterations.

## 4. Findings

### 4.1. Hypocaust

The sunlight passes through the hypocaust and enters the inner part of the bathroom space. There is a central pool in the middle of the Sarbineh and Garmkhaneh, which has many meanings from several perspectives. In this paper, it is considered very healthy, healing, and therapeutic. Sunlight originates from the holy fire, so it has a hot and dry temperate and water in the center of the pool is cold and wet. Therefore, the atmosphere between the hypocaust and the pool is moderate, and the equilibrium causes a moderation. All of the therapy places and TMI's lead physical and mental parts to an equilibrium, which means being healthy and moving toward healing. In other words, hypocausts have a mediating role in observing the invisible cosmic energies, allowing fresh air inside and removing dirty air in the physical aspect, and eliminating the material properties and temporal detachment in the spiritual dimension. It is important to improve the human mode towards moving in the direction of positive energy flow. Moreover, the hypocaust of bathhouses has a mystically and secret function with a sense of suspending space.

The relaxing and balancing influence of four-temperates in one place on the mental and physical parts of a human has a healing factor with intermediate variables such as healthy properties of intrinsic design proportion. The features of the built environment of the hypocaust have with the human scale and the presence of the light on the water.

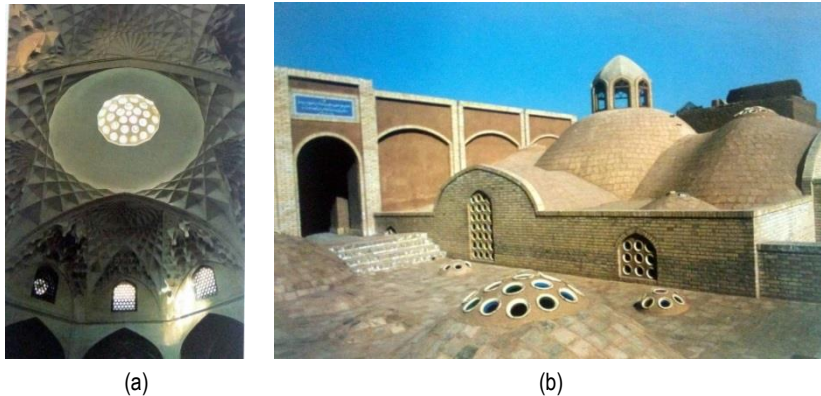


Fig. 4. (a) Indoor of Hypocaust; (b) Outdoor of Hypocaust

Ornamental features and symbolic figures in the inner decoration have symbolic and therapeutic functions that related to the water element. It observed that the invisible cosmic energies have equilibrium features in the role of healthy healing. Hypocausts have a mediating role since the invisible cosmic energies allow the material properties and temporal detachment, fresh air, and sunlight inside and remove the dirty air. Moreover, they have a mystical and secret function that creates a sense of space suspension. This suspension places a human in a spiritual atmosphere, and it removes the material properties of the earth. In this way, it accompanies the human with a sense of suspension and a natural positive energy flow.

Moreover, it strives to produce comfortable environments such as having a massage in a relaxing atmosphere and friendly behaviour settings for leisure time for the prevention of disease, and for health and healing.

According to Shoshkes, the ecological perspective recognizes the dynamic inter-relationship between individuals in social and physical environments (Shoshkes, Ellen.,Adler, Sy, 2009).

#### 4.2. Result of the first group (80% of the total)

- 93% of the first group of participants confirmed the relation between mental health and a guided look towards the light, wide and generous space, and the relation between beauty and the light of the hypocaust.
- 87% of the first group of participants emphasized the relation between beauty and order of surface ceiling, creativity in the use of color and light and a pleasant environment. Moreover, they pointed out the relation between quality of the environment and the Gestalt approach, coordination between structure and ornament.
- In the first group, 81% of the total said that there is a meaningful relation between mental health and the feeling of lightness and convenience. Relaxation and spiritual presence of light are as well as the relation between beauty and originality of the motifs and decoration, an organization of motifs, light, color, and structure. Moreover, the relation between quality of the environment and playing with the light has been mentioned.
- 75% of the first group of participants pointed out the quality of environment and unity between ornament and spatial structure, liveliness, and height of a ceiling. Moreover, the relation between social health and unity in diversity, colors, and motifs has been indicated. Also, they mentioned the relation between beauty and partial and total congruence.
- 68% of the first group of participants pointed out the relation between social health and friendly atmosphere, as well as the relation between mental health and the combination of light and material. They also indicated the relation between quality of environment and light, simplicity, and purity of space. They also mentioned the relation between mental health and security.

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#### 4.3. Result of the second group (15% of the total)

- Firstly, 100% of the second group of participants confirmed the relation between mental health and a feeling of lightness, convenience, fun and enjoyable, and light. Moreover, the second group of participants emphasized the relation between beauty and the congruence of structure and ornament as well as the relation between social health and friendly environment.
- Secondly, they approved the relation between quality of life at the bathhouse and a combination between light and material.
- Thirdly, they mentioned the relation between beauty and originality of motifs and brick ornament, and order and creativity in the colour and motifs.
- Fourthly, the second group pointed out the relation between mental health and the guided look toward the light, beauty and the emphasis on rhythm and pivot points. Moreover, they emphasized on social health and contrasting colours and magnificent space.

Finally, all of the participants of this group indicated the relation between beauty and presence of sunlight and ornament without diversity of colours. They also confirmed the relation between quality of life and playing with sunlight in the bathhouse, high ceiling and using the contrast of colours between ground, wall, and ceiling. Moreover, in this part, they emphasized the relation between mental health and a welcoming, wide, and generous space.



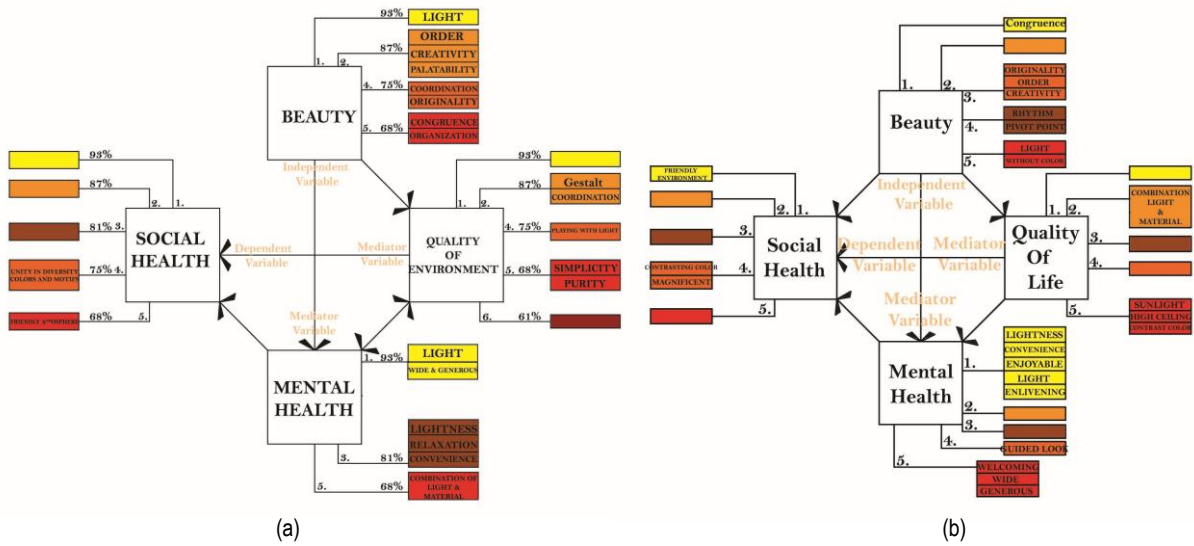


Fig. 5. (a) Profile of the first group; (b) Profile of the second group

In this paper, TBI is not only considered regarding visual beauty but also through the application of physical, mental, and social health aspects and the investigation of colors, motifs, and decoration on the quality of life in the environment. The TBI strives to produce comfortable environments for the prevention of mental problems with a high level of social interaction with fun times, intangible prevention, and healing. In other words, intangible social sustainability has a common meaning with intangible healing and a therapeutic place. The presence of sunlight with full-spectrum light healing figures and pictures develop health and prevent diseases. It is necessary to not only present but also to reuse and update the traditional therapeutic principles. In TBI, particular components of design focus on optimizing the relationship between the individual and environment. To promote contact with a great social group and socially-friendly interactions, in Sarbineh and Garmkhaneh, there is a social human scale. Therefore, they have many ornaments, motif decorations, and ceiling heights.

On the other hand, in “Miandar”, “Khazineh”, “Khalvat” and “Chalehooze”, we observe individual human scales. There is a suitable, private place for hygiene and individual cleaning without motifs, decorations and ornament promotions, and an empowered architectural space for healing purposes.

## 5. Conclusion

By revealing the meanings of the ornaments' symbols used in the construction, the environment can promote the quality of the environmental life. On the other hand, the definition of "property of decorative motifs" in TBI is comparable with the definition of the "quality of the bathhouse" in the mind of the Iranian artist. In other words, an embroidered body of the bathhouse with the picture of the Iranian gardens, geometric motifs, and timeless symbols is a part of the anonymous qualities. The compatibility of drawing, light, and color among most of the TBI will recall the "feeling of being in Paradise" among the users.

Not only are psychological benefits provided by the effect of natural light (NL), decorative and painting motifs but social health also improves more and more in the friendly and lovely atmosphere. It is the key to discovering a new function for the bathhouse.

The investigation concluded that the first group indicated that natural light (NL) affects the beauty and mental health more than motifs, decorations, and colors. 81% believed that physical and cognitive features have a meaningful relationship with beauty and the quality of the environment. Also, 81% believed that feeling and perception of space have an effect on mental health. Therefore, in this paper, beauty is known as the independent variable, and the quality of the environment and mental health is the mediator variable. Finally, social health is the dependent variable.

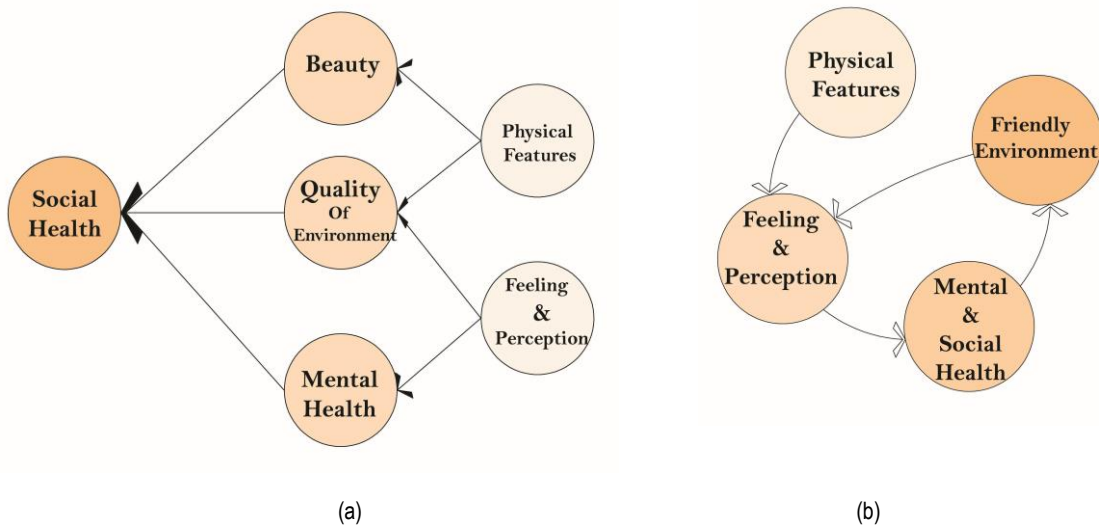


Fig. 6. (a) Profile of the first group; (b) Profile of the second group

In the second group, an advanced attitude was found on this issue. Firstly, they found that the physical features of the TBI such as the decorative motifs and natural light influence the human feelings and perception about physiology and psychology. Then, these perceptions are distributed and scattered in the society, and the society beliefs crystalize. Finally, mental and social health leads to a friendly atmosphere in the TBI, and with the repeated use of the TBI, the legibility of the TBI becomes better, and there is a friendlier environment for users and the environment of TBI. As it showed in second profile, friendly environment has affected in mental perceptions; and in this profile like a rotation cycle, it continues. Therefore legibility and friendly atmosphere become better and more.

## 6. Further Research

- To investigate the association between these findings and the modeling of a healthy TBI; and
- To compare the effectiveness of the TBI and similar Turkish and Roman bathhouses about the current issue.

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