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Healing landscape: How healing parameters in different special organization could affect user's mental health?

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Abstract

Studies on the relationship between landscape and health show that the inherent attraction of humans to nature and presence in these spaces causes mental peace and improves mental and physical health. Thus, the therapeutic landscape approach could be useful in healing. Healing landscapes reduce stress and improve people's mental health. So, applying healing design parameters in open urban landscapes strengthens the quality and livability of urban space and enhances the tendency to make optimal use of nature. The study was carried out in urban parks and the Persian Garden. The therapeutic landscape approach with emphasized on differences between these two cases did use. This study aims to evaluate the parameters affecting the quality of the healing landscape in two urban landscapes with different spatial structures (Persian Garden and Urban Park) in Iran. Therefore, landscape healing quality factors collected and classified in emotional, cognitive, behavioral, and social effects. The research method consists of both quantitative and qualitative techniques. Data collected through questionnaires, interviews, and field observation. Results indicate that the cognitive parameters in the Persian Garden and the behavioral and social parameters in the urban park affected the healing quality of these landscapes. Geometric design pattern, visual communication, using water, and vegetation increase connection with nature; additionally, psychological safety through night lighting and clarity of the space can be efficient in promoting the healing of the environment. In social and behavioral parameters, quality of public spaces, appropriate furniture, legibility, and a variety of activities are valuable in the quality of healing.

Keywords
Healing landscape, Persian garden, Spatial organization, Urban park.

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1. Introduction

Stress and neurological crises, which are rooted in environmental factors, are the source of many diseases and their resulting damage in the form of illness, aggression, crime, and other social harm (Altman, 1975, p.179; Nili, 2013, 66). The results of recent research in the field of environmental psychology, concerning environmental science and perception, suggest that responding to human needs such as relaxation, thinking and contemplating, and self-improvement can reduce stress, mental and physical health of the individual, and promote community. So the proper presence of nature in one's life can also reduce many psychological, physical, and social pressures (Kabiri & Balilan, 2015, p.5). The use of healing landscapes is a way to reduce stress and nervous tension and create peace, regain strength or restore health (Divandari et al., 2016, p.26; Abdollahi et al., 2015, p.26).

In natural settings can be provided by places such as urban green spaces, parks, and gardens in cities where opportunities for contact with nature are available (Pazhuhanfar et al., 2018, p.79). Iran has a valuable cultural and natural heritage called the Persian Garden, which has healing landscapes. As described the Persian garden, Pop writes: "A Persian Garden is a place of inner peace and comfort as well as contemplation and reflection. It is a place to purify the tired soul of a human, to make the human psyche fresh and smooth. Undoubtedly the impact of such gardens cannot be ignored" (Pop, 2009; Divandari & Emamian, 2016, p.21).

From the Qajar era, the tradition of designing the Persian garden has changed, and in the design of some green spaces, they have created surfaces with curved and symmetrical lines. In the image of Europeans, such spaces called parks. The scientific definition of a park, it is a public and urban space that seeks to provide healthy air and improve the environment and the need to create a natural and healthy place to spend leisure time with the idea of returning to nature in cities (Sultanzadeh, 2003, p.91). Although garden and park are different, these are relevant in most of the features now, so the link between these two kinds is crucial for enhancing performance in such spaces (Nabizadeh et al., 2018, p.96).

It seems that the performance of healing parameters in parks and gardens (with different spatial structure) is different, and the healing characteristics of the urban landscape in Persian gardens and urban parks are different. Therefore, the theoretical foundations of this research are based on the writings of "Gessler" landscapes with a therapeutic approach (healing perspectives) (Gesler, 1992). Then the performance of parameters affecting the healing quality of the landscape evaluated in 4 parts: emotional, cognitive, behavioral, and social in Persian garden and urban park. To investigate this hypothesis, the research seeks to answer the following questions.

1. Are there differentiating healing indicators in the different landscape spatial structure?

2. How does the spatial structure pattern of the landscape (Persian Garden and Urban Park) affect the healing performance of the urban landscape?

3. Which healing indicators affect the best in the garden and which in the park?

2. Literature review

Human communication through the five senses provides an opportunity to experience the environment. Healing landscapes, regulated senses purposefully. The healing landscapes awaken the Human senses and eventually balance the five senses (Nili et al., 2013, p.68). Clare Cooper, stark, and Marni Barnes (1999), in their book, "Healing Gardens: Therapeutic Benefits and Design Recommendations" discovered, the primary history of healing gardens (Fairchild, 2011, p.13). On the other hand, many studies have focused on healing and its influencing factors, including theoretical research. Each of the studies considers factors affecting healing, which summarized in Table 1. As far as we know, there are no studies on the parameters differences performance in two types of landscape structure.

Table 1. *Research background research on healing landscapes.*

Research fellow / Healing indicators	Mac Dowell, 1998	Stark, 2013	Stigsdotter, 2005	Ushorticultura litherapy association, 1995	Nili et al, 2012	Abdullahi et al, 2015	Shahrad, 2012	vappa, 2002	Sadler, 2007	Kaplan, 1995	Mumtaz, 2017	Ulrich, 1999	Cooper Marcus & Barnes, 1999-2007
Preserving the spiritual space character		√	√					√					
Provide relief from stress:ful environment/ psychological comfort		√	√	√				√	√	√			√
Sense of control - accessibility				√			√				√	√	√
Displaying life cycle		√	√					√					
Privacy-Self-awareness			√					√			√	√	√
Social support			√	√			√				√	√	√
Distribution of different plant species		√	√		√	√					√	√	√
Minimizing ambiguity		√	√	√	√	√		√			√		
Familiarity/ provide memorable features				√									√
Provide positive distractions		√				√	√					√	√
Encourage physical exercise and movement					√	√	√				√	√	√
Emphasis on nature (Rock, wood, wind, sound, etc.)	√												√
Use the healing power of Water	√	√	√		√								√
The use of art and increasing the spirit of the place	√												
Offer different types of activities				√			√						√
Encourage wildlife in the environment	√	√	√					√					√
Creative use of color and light	√												√
Inviting Input for Visitors	√							√					
Create a sense of respect and support for nature		√	√										
Stimulating and using the senses		√	√	√			√	√					√
Spatial variation					√	√			√	√			
Fascination of place									√	√			
Compatibility - understanding different social group users and their needs				√					√	√			√
Minimize undesirable ambient noise					√								

3. Theoretical framework

3.1. Healing and healing landscapes

According to the World Health Organization, seventy percent of human physical illnesses caused by stress and neurological crises (Shahcheraghi, 2010, p.33). Mental health in today's stressful world is a move that can be achieved by urban planners and environmental designers. Healing involves a broad field that does not certainly refer to treatment. Preferably, it applies to a general process of healing that considers the human mind and body together. According to Marcus and Barnes's (1995) theory, healing is the liberation of physical symptoms, illness, and trauma. It is one of the factors for nervous pressure reduction, which increased human comfort (Nili, et al., 2013, p.39; Fairchild, 2011, p.13). Landscape spatial organization can make people feel relaxed. Gardens and landscapes called healing landscapes designed to improve people's mental health and create a pleasant feeling. (Polat, et al., 2017, p.37). "The healing garden has existed for medieval patients as part of the healing landscape. The goal of the healing garden designers is to create an environment for soul awareness, strengthening the human body, and conclusively the recovery of the body and the mind's intrinsic power. When healing is not possible, communication with nature can bring out mental relaxation for a person. This concept peaked in the 1700 decade in the Romanticism era" says Spriggs. (Spriggs et al., 1998; Ramyar, 2011, p.81). The healing landscape concept first introduced by geographic health researchers to define a place for health and wellness. The "healing perspective" term used to achieve physical, mental, and intellectual health (Velarde et al., 2007; Jiang, 2014). Since the relation of a healing garden with human, it can stimulate the senses and relieves stress. Continued presence in such places can arouse the patient's mental and physical well-being (Momtaz, 2017; Shahcheraghi, 2010, p.259). Healing is a feature that promotes mental health, relieves stress, and increases recovery. And have been used for landscapes that improve comfort and preserve human health (Williams, 1999). A healing garden "... Used as a tool for treatment: as places to relieve pain, to help the patient struggle for orientation and balance. This is a place that calms and

relaxes and thus encourages the body to think about recovering themselves" (Spriggs et al., 1998, p.7; Anderson, 2011, p.54).

3.2. Persian garden as a healing landscape

The impact of healing gardens on visitor health stems from the experiences of the garden and its content (Abdollah et al., 2015, p.330). The Persian Garden Becomes an Entity by Creating a Place through the Relationship between Environment and Human (Khoshouie, Alborzi, 2010. P.406). According to the studies done in the Florence Charter, the constituting characteristics of the Persian garden classified into two categories, natural elements (plant, water, field form) and artificial elements (main building, porch, wall, and garden accessories). While identifying and describing these parameters, they evaluate the effect of these parameters on the individual's health in the two types of urban and suburban gardens of the Qajar era (Nili et al., 2014, p.171). The initial structure of Persian gardens based on a geometrical quadripartite division with a pavilion in its intersection. The general idea of this formation based on the pre-Islamic Iranian division of the earth into four quarters, which may have been inspired by the geometrical motifs of Mesopotamia and Sindh Valley civilizations (Massoudi, 2009; Farahani, et al., 2016, p.3). Persian gardens have the most significant roles in the Iranian landscape, formed by the climate, culture, politics, security conditions, and other features. These factors have affected the Persian garden's appearance. Water use in a variety of forms such as fountains, springs, and so on. The sound of water draws people's attention away from the stressful environment and will have a direct impact on the human psyche. Water's symbolic meanings such as life, radiance, cleanliness, light, immobility, and movement create a great feeling and improves mental comfort in the garden (Khoshouie & Alborzi, 2010, p.412; Göker, 2017, p.661). Throughout history, the Persian garden has tried to create a quiet place by stimulating the five senses. The place to presence of man in space in this world (Khoshouie, Alborzi, 2010, p.406). Involving the five senses of humans, organic products, and herbal remedies; the healing role could consider for gardens (Khalilnezhad, & Tobias, 2016, p.13). In the Persian garden, plants located for various purposes such as shading, usefulness, and ornamentation of the garden (Mahmoudi Nejad et al., 2006, p.74; Khoshouie & Alborzi, 2010, p.412). Persian gardens consider as healing gardens or health landscapes because plants with fruit or edible plants are one of the principles in designing healing gardens (Nikbakht, 2004). Plants and flowers were not only planted for the sake of beauty and fragrance, but also they used as part of a healthy diet and in perfume making (Ruggles, 2008; Khalilnezhad, & Tobias, 2016, p.11). Apparently, as well as in terms of architecture and urban planning, parks have seen in Iran since the Qajar era. The term "park" has been coming into the Persian language from the French one, so it seems that it is one of the Qajar monarch's achievements from their frequent trips to France. Since then, Park as one of the modern civilization sign has taken place in Iran's urban development plans (Nabizadeh et al., 2017, p.96)

3.3. Introducing landscape healing parameters and indicators

This concept incorporates all areas related to environmental design. In environmental psychology and landscape architecture, there are different views on how healing gardens work. According to Ulriuch's (1991) studies, the healing effects of the natural environment are due to the revival of emotional centers in the limbic brain system and Humans are comfortable in the natural environment (Ulriuch, 1991) so at the beginning the emotional aspect of the healing landscape are important. After that desirable communication between humans and the natural landscape is the basis of the cognitive healing process. This process seeks people to behave in the environment. The cognitive function requires high energy, and the brain may be affected by high pressure. This theory indicates that man has different kinds of attention; self-conscious and unconscious (Kaplan, 1989). Nature is a set of features and elements that draws one's unconscious attention. New fac-

tors are discovered without bothering humans (Hartig et al., 1991). Nature can balance one's ability and control over oneself (Lwarsson, 1997). And affect one's response that relates to the behavioral aspect of the healing landscape. Bill Moyers adds social healing to landscape healing criteria. He believes that under no circumstances can one be separated from everything and everyone (Moyers, 1995; Nili et al., 2013, p.169). According to the definitions provided by theorists and what mentions above, Figure 1 shows the resulting indicators in four categories: emotional, cognitive, behavioral, and social. This figure shows the theoretical framework of the present study.

There have been numerous studies on the healing landscapes that each has provided criteria and Parameters. In the following, we will offer the healing landscape indicators of each parameter specified in most researches.

Emotional parameters of healing landscapes are such as:

- Provide positive distractions: Nature draws human attention or fascinates people. This directed fascination which is controlled by the operating system, makes human relax and causes negative thoughts to replace with positive ones (van den burg, 2010)
- Stimulate and use of five senses: Sound, sight, and smell in the environment are external stimuli that are directly identified by the conscious mind (cooper Marcus & Barnes, 1999, p.88 ; Shahrad, 2012, p.10). Smooth and favorable landscapes quickly arouse one's emotions and imply effective in relieving one's stress (Nili et al., 2014, p.171).
- Encourage wildlife: Animals and birds are directly attracted to garden plants. The birdsong, and along with the sound of the wind among the trees, create a beautiful melody in the garden (Jafarnia et al., 2006). This nature orchestra sweeps away the daily stress and tension (Sad, 2003).
- Prevalence of green materials: Green planets effect on reducing the psychological fatigue of the residents. Green planets effect on reducing the psychological fatigue of the residents. (Emami et al., 2018, p.70).

Cognitive parameters of healing landscapes:

- Privacy: Researches indicate that people prefer natural, spatially open areas for passive activities like as; sitting, thinking, and watch the landscape, nature, or other people (Pouya, 2017, p.150). Therefore in locations where cultural and ethnic groups, favor visiting in large, extended family groups, sub-space needs implemented the privacy of those who wish to, be alone do not intrude upon (Cooper Marcus & Barnes, 1995).
- Psychological comfort: Mental health is a mental state characterized by health and emotional well-being, lack of anxiety and disturbing life symptoms, and the capacity to build a satisfying relationship with others and to compare with the stresses and inconsistencies of life (Waist, 2001, p.39). Mental peace achieved in different ways. Studies show that exposure to natural elements designed to be effective in relieving stress and reducing mental fatigue (Matsuoka & Sullivan, 2011). Environmental features can help to enhance mental health by providing a higher level of social support experience. (Brown et al., 2009; Mehrabi, 2010, p.35).
- Minimize instruction and ambiguity: People need a degree of sophistication and mystery that will provide them with challenging opportunities. Amounts of complexity create a sense of worthlessness and ordinariness of space. (Kaplan & Kaplan, 1982). However, numerous studies show that abstraction in design does not well tolerated by persons who are ill or stressed. Identifiable features and garden elements incorporated into the design. Abstract art in the facility and garden has been often unsuitable (Mitrione & Larson, 2007, p.3).

Behavioral parameters of healing landscapes:

- Sense of control: Sense of control is an individual's perception of his or her own ability to have power over

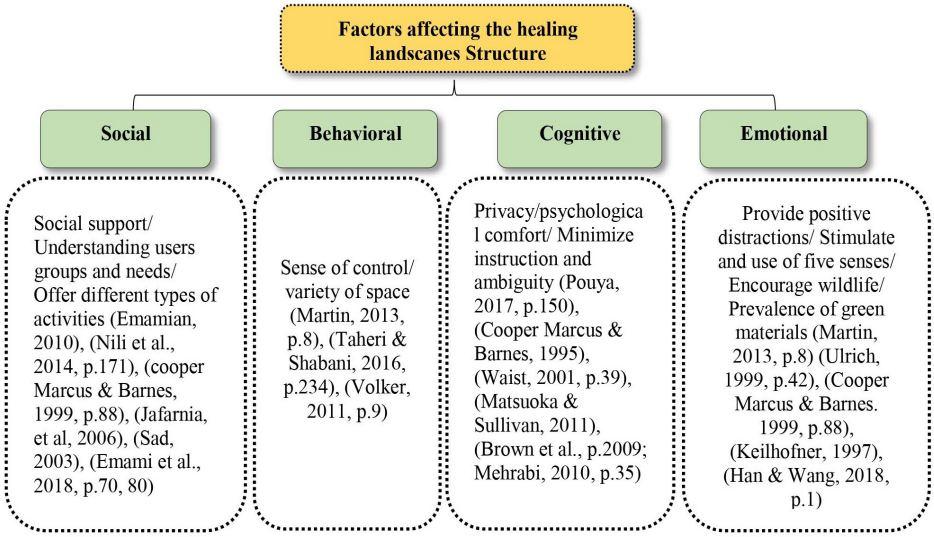

Figure 1. *The conceptual model of research.*

what they do (Martin, 2013, p.8). People with a sense of control experience less stress, and the ability to cope with it, and are healthier than those with less control (Taheri & Shabani, 2016, p.234).

- Variety of Space: The variety of spaces gives the audience a variety of experiences, and creates a variety of landscapes to see, hear, smell, and touch all of the natural elements that enhance a certain kind of positive emotions and reduce stress (Volker, 2011, p.9).
- Social support: Social support is the perceived emotional help individuals receive through interacting with other people (Martin, 2013, p.8). People who receive a higher level of social support are usually less stressed and have better health than those who are more isolated (Ulrich, 1999, p.42-43; cooper Marcus & Barnes, 1999).

Social parameters of healing landscapes:

- Understanding users groups and needs: Understanding how people see their surrounding environments and how they react to it is one of the most crucial factors of therapeutic design, in another word, what individuals observe, and how they interpret (Cooper Marcus & Barnes. 1999, p.88).
- Offer different types of activities: Men are at heart, an active creature and activity are healthful in it. If he has a chance to use his body and mind in the pursuit of pleasurable and meaningful occupations, he feels rewarded (Keilhofner, 1997). Physical activity and relationship with nature are promoting both physical and psychological health and well- being (Han & Wang, 2018, p.1).

4. Research method

The present study is applied research. The methodology of this study is analytical, and the descriptive data have been collected by the use of researcher-made questionnaires, in addition to field observations and interviews with space audiences.

For investigating the characteristics of spatial Structure in Persian garden and urban Park and Assessing the differences in the performance of healing parameters in these two cases, qualitative analysis and T-test used respectively. Then Comparison of healing parameters and characteristics in Persian garden and urban Park Was shown with the Mann-Whitney U test. Qualitative evaluation of the effectiveness of the healing landscape in cases evaluated by Interview.

The results of the interviews have also examined the environmental factors affecting the healing of two samples of Persian garden and urban park with two different organizational patterns the survey developed in two descriptive and multiple-choice sections. Descrip-

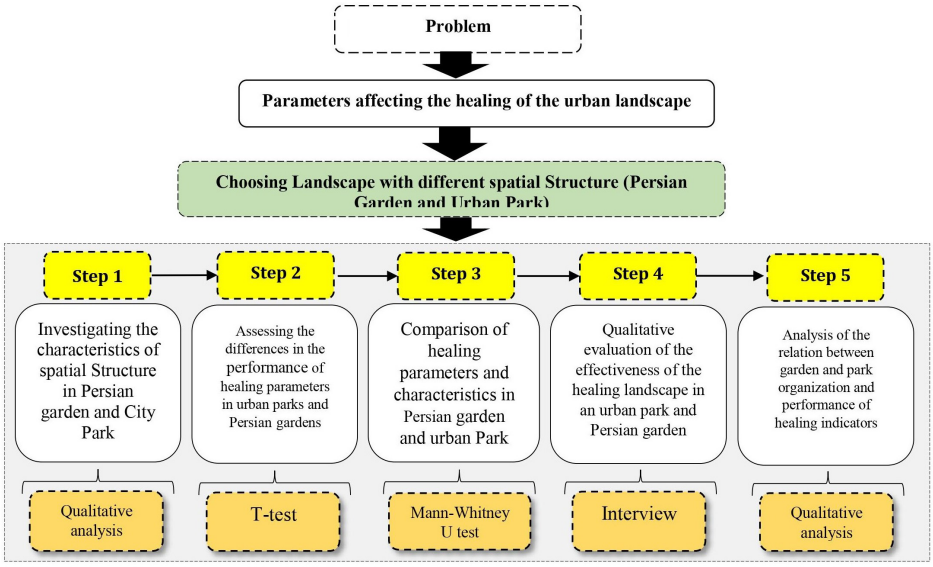

Figure 2. *Research process.*

tive questions mainly interviewed, and multiple-choice asked on a five-point Likert scale. The statistic sample was the users of Eram Garden and Azadi Park in Shiraz, Iran. A total of 80 questionnaires completed in Eram garden and 128 in Azadi Park. The content validity of the questions confirmed by experts and its reliability assessed by Cronbach's alpha test (alpha coefficient 0.91). According to Cronbach's alpha, the correlation between the items is high and the research model considered to be desirable. Together with all these methods, the relationship between garden and park organization and performance of healing indicators in them analyzed.

5. Results and discussion

5.1. Step 1: Investigating the characteristics of spatial structure in persian garden and city park

Urban parks have environmental benefits, such as air and water filtration and the reduction of urban heat islands. Urban green spaces also encourage physical activity and social integration by providing spaces for urban residents (Jeon & Hong, 2015: 100). Urban planners emphasize that landscapes play an important role in providing social and psychological benefits to urban residents (Cheung & Jim, 2019, p.2). Urban parks and green spaces widely used to help human well-being and quality of life (Chiesura, 2004). Parks founded on various scales and spatial structures (geometric, organic, combination of both, etc.) in modern cities. Azadi Park built on 22 hectares of land in Shiraz opened in 1966. This park has an urban function and its unique privilege obtained in multiple functions including recreational, social, and educational activities. Azadi Park has an almost organic and coherent form that enhances its functional diversity and appeal. The extent of the landscapes and the dominance of the natural space make the presence of nature perceptible (Moradian et al., 2019, p.119). It is a place for citizens and also travelers and have various functions as physical, functional, and semantic. Various areas such as the religious-cultural Complex, Library, Playgrounds, Sports Facilities, Café, artificial Lake, Green Spaces, Birdhouse, Various Elements, etc. also attract people of all ages and genders.

The geometric structure of the Persian garden formed in two main ways, one is to create three parallel extensions along with the garden and the other is to consider two main axes perpendicular to each other and, then divide the garden into squares that have regular divisions (Shahcheraghi, 2010, p.43). The general pattern of most Persian gardens consists of a rectangular space with four intersections with streams and routes. In addition to the influence of Persian beliefs, the most common irrigation system known as a factor in

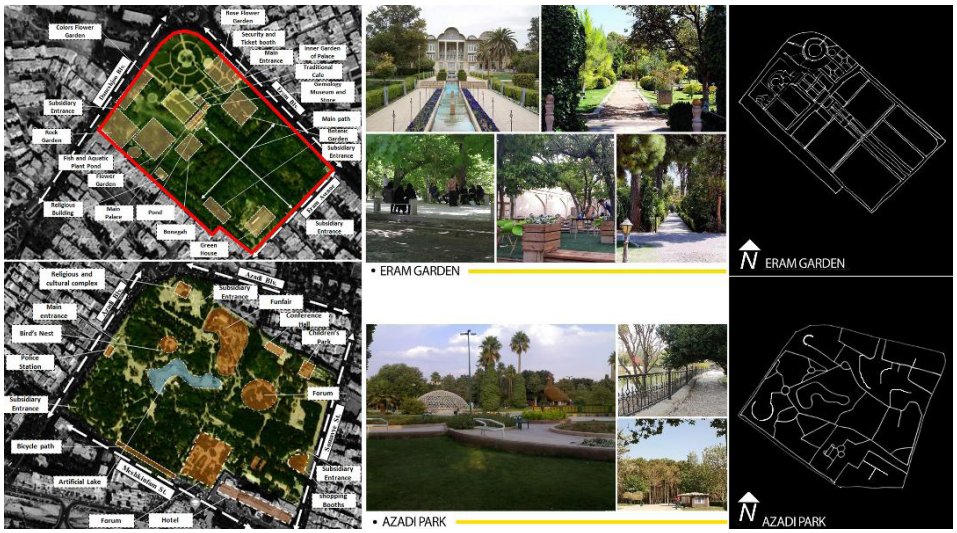

Figure 3. *From left to right -the space structure and area of Azadi Park and Eram Garden in Shiraz.*

forming the geometric structure of the garden (Naghizadeh, 2013; Mahmoudi Farahani et al., 2016, p.3). The Persian Garden is a space that, by combining architectural and natural structures such as water and plants, embodies a dreamy and imaginative meaning (Shahcheraghi, 2010, p.41).

The Persian garden has elements such as a pavilion, row of trees, plots, and water. The Eram garden, from the Seljuq era, was erected at the request of Atabak gharcheh, the Fars governor in the sixth century (Aryanpour, 1365, p.308). This quadrangular garden with an area of 110380 square meters, defined by a row of trees on its periphery, and it has a major longitudinal axis in the structure by the row of tall trees. It has the fountain, and the middle ponds as well as the kiosks and buildings on it (Alai, 2009, p.8). The emergence of water in a variety of forms: Across a row of Cypress, an atmospheric passage through the main pond and large pool (Nili et al., 2013, p.34). It now used as a botanical garden. This garden consists of spaces, including a gem museum (in the middle of the garden), a traditional café, and photography and handcraft booth, a fish pond (attached to the main Eram garden area), sitting areas, walkways with shade trees and more. Figure 2 shows the area of both sites.

According to the presented analyzes, it seems that the existence of spatial hierarchy, the geometric, and symmetrical pattern of the Persian garden is one of the factors to minimize ambiguity. The geometric pattern in the Persian garden brings balance, symmetry, and simplicity; it also makes it possible to walk in the garden without confusion and feel more relaxed. The location of the pavilion on the main axis and in front of the fountain has led to a better understanding of the environment and the positive experiences of the audience in Eram Garden. It also works as a sign on the path, helps people finding direction, and can reduce ambiguity. Figure 3 shows the area and spatial organization of the Eram Garden (as an example of the Persian Garden pattern) and Azadi Park (as an example of an urban park). These two samples selected with different regular and organic geometric organizations to identify the healing qualities of the landscape.

5.2. Step 2: Assessing the differences in the performance of healing parameters in urban parks and Persian gardens

To examine the hypothesis the Kolmogorov-Smirnov test used to determine whether the data distribution was normal. According to table 2, the decision criterion (sig) for all indicators is (0.000). In other words, the distribution of this sample is normal. Therefore, an independent T-test used to investigate this hypothesis.

Based on the above test and sig (2), which is at a significance level of less than 0.05, it claimed that with a 95% confidence, there is a meaningful difference between the performance of

healing parameters among Azadi Park and Eram Garden. And the parameters of Eram Garden were more effective than Azadi Park. Therefore, this garden has been able to get closer to its healing role.

5.3. Step 3: Comparison of healing parameters and characteristics in Persian garden and City Park

Effect differences of landscape healing parameters in Azadi Park and Eram Garden verified by an independent T-test. The different performances of various parameters in the Persian garden and urban park examined. For this purpose, the Kolmogorov-Smirnov test used to determine whether the distribution of data in the four behavioral, cognitive, emotional, and social parameters as normal. According to this test, the decision criterion (sig) for all indicators is more than (0.05). By accepting the null hypothesis, there is no reason to reject "the sample has a normal distribution" in other words, the distribution of this sample is normal. Therefore, an independent T-test used to investigate this hypothesis. According to Table 3, considering the gap between the average difference in the garden and park, the performance of cognitive parameters in the garden and the function of social and behavioral parameters in the park was better. There was no significant difference in the performance of emotional parameters, so these act similarly in the healing quality of the Persian garden and urban park.

To examine the healing indicators in the three social, behavioral, and cognitive parameters, the Kolmogorov-Smirnov test used to determine each indicator data normality distribution. Due to the abnormality of the distribution of data related to the indicators, the Mann-Whitney U test used to investigate the second hypothesis of the research. To measure the influence of each healing parameters between the park and garden, the average rank of each parameter used in two sites. According to Table 4, the average rank of the cognitive parameters, and all its

Table 2. *T-test for two independent groups in the park and garden.*

T-test for Equality of Means							Levene's Test for Equality of Variances		parameters
95% Confidence Interval of the Difference		Std. Error Difference	Mean Difference	Sig. (2-tailed)	df	T	Sig	F	
upper	lower								
-0/00546	-/041518	0/10681	-/020336	0/04	202/053	-1/904	0/001	12/353	Healing Landscape

Table 3. *Independent T test.*

T-test for Equality of Means							Levene's Test for Equality of Variances		parameters
95% Confidence Interval of the Difference		Std. Error Difference	Mean Difference	Sig. (2-tailed)	df	T	Sig	F	
upper	lower								
1/08406	0/79355	0/17878	-43/881	0/016	192/641	-2/454	0/017	5/864	Behavioral
-0/23626	-0/76248	0/13268	-0/49937	0/000	202/142	-3/764	0/001	12/900	Cognitive
1/02473	0/30997	0/18024	0/66735	0/000	204/112	3/703	0/129	2/347	Social
0/10585	-0/34547	-0/11381	-0/11981	0/295	204/112	-1/053	0/586	0/299	Emotional

Table 4. *Average of healing factors in garden and park.*

Sum of Ranks	Mean Rank	Site	Healing indicators	Healing parameters
6900.48	53.91	Azadi Park	Social support	**Social**
4332.00	54.15	Eram Garden		
7663.36	59.87	Azadi Park	Understanding users groups and needs	
4019.20	50.24	Eram Garden		
7845.12	61.29	Azadi Park	Offer different types of activities	
3343.20	41.79	Eram Garden		
6933.76	54.17	Azadi Park	Sense of control	**Behavioral**
4296.80	53.71	Eram Garden		
6312.96	49.32	Azadi Park	variety of space	
4947.20	61.84	Eram Garden		
5907.20	46.15	Azadi Park	Privacy	**Cognitive**
5372.00	67.15	Eram Garden		
5785.60	45.20	Azadi Park	psychological comfort	
5372.20	67.19	Eram Garden		
6635.52	51.84	Azadi Park	Minimize instruction and ambiguity	
5408.80	67.61	Eram Garden		

Table 5. *Mann-Whitney Test of healing parameters in garden and park.*

Sig.	Z	Wilcoxon W	Mann-Whitney U	Indicators	parameters
0.03	-2.132	3304.500	1026.500	variety of space	Behavioral
0.940	-0.0 75	2.148E3	1130.500	Sense of control	
0.005	-2.945	3.474E3	996.000	Minimize instruction and ambiguity	Cognitive
0.000	-3.593	2.984E3	772.000	psychological comfort	
0.001	-3.457	3.092E3	814.000	Privacy	
0.001	-3.211	1.672E3	851.000	Offer different types of activities	Social
0.002	-3.006	3.408E5	1130.500	Understanding users groups and needs	
0.969	-0.039	3.612E3	1.334E3	Social support	

Table 6. *Interview with users of garden and park.*

Healing Parameters	Healing Indicators	Environmental Parameters	Eram Garden	Azadi Park
Social	Social Support	Quality Of Collective Spaces		•
			•	
		Quality Of Furniture Arrangement		•
		Quality Of Night Lighting	•	
	Considering Social Groups And Their Needs	Accessibility	•	•
		Facilities And Services And Functional Diversity		•
		Variety Of Activity	•	
	Different Activities	Gender Domination	•	
		Active Experience Of Nature	•	
		Access Facilities		•
		Variety Of Activities		•
		Quality Of Collective Space		•
		Variety Of Uses	•	
		Visual Communication	•	
Cognitive	Privacy	Territorial Segregation (Semi-Public And Public)	•	
			•	
		Visual Communication	•	
	Mental Peace	Lighting Quality Visual Communication	•	
		Physical And Psychological Supervision And Safety	•	
		Preserve Environment Privacy	•	
		Green Materials	•	•
	Minimize Ambiguity	Use Signs And Guides, Proper Navigation, Legibility	•	
		Coherence and Integration	•	•
		Using Different Materials		•
		Associating Meanings And Emphasizing Collective Memory		•
		Spatial Hierarchy And Symmetry	•	
		Clarity Of Space In One's Mind	•	
Behavioral	Sense Of Control	Proper Location Of Entrances		•
		Variety Of Access Routes (Permeability)		•
		Visual Connection With Different Points	•	
		Use Guides And Signs	•	
		Diversity And Flexibility	•	
	Variety Of Space	Variety Of Green Materials	•	
		Diversity Of Forms (Design)		•
		Uses Centralization	•	

related indicators in Eram Garden is higher than its value in Azadi Park. Eram Garden's cognitive parameters increase its healing quality. In contrast, the average rank of social and behavioral parameters in Azadi Park reported more. Regarding the research hypothesis about the difference of the healing parameters in the Persian Garden and the urban park, according to Table 6, the Persian garden has a more select performance in the cognitive indicators than the Azadi Park.

According to Table 5, the indicators of each parameter are at a significant level of less than 0.05. There is a notable difference between parameters indicator (except the sense of control and social support) in Azadi Park and Eram Garden.

5.4. Step 4: Qualitative evaluation of the effectiveness of the healing landscape in an urban park and Persian garden

After examining the effect of healing parameters and parameters on two case studies, the causes of differences in their performance in the garden and park investigated. The analysis of healing in gardens and parks as part of the city's landscape depends considerably on space users. So in the second stage of the survey, the semi-constructed interview technique used to extract the positive and negative factors affecting the quality of each of the healing characteristics. For this purpose, 30 garden and park visitors randomly selected. To create two-way dialogue between the researcher and the interviewee, we asked questions about the reason to be in the place, expectations from this environment, and positive and negative characteristics from their point of view. So the role of the researcher in gathering information minimized. After conducting the interviews and based on the content of questions, the approved parameters of the interviewer extracted. Table 6 shows the classification of environmental parameters based on the modality and performance of each parameter. As can be seen in this table, the parameters of healing (social, cognitive, and behavioral) have differences in two samples studied, and Eram Garden has more environmental parameters to increase healing in individuals.

- The social parameter of healing in design parameters such as the quality of collective spaces in both samples is appropriate, but the lighting at night needs improvement in Azadi Park. Accessibility is proper in both garden and park examples, but due to the public and urban space of the park, the variety of services needs to be more. On the other hand, in Eram Garden, due to the diversity of green materials, there is a chance for an active nature experience. Visual communication in Eram Garden is also more effective in healing since the regular spatial organization, and the line of sight created.
- In the cognitive parameter, psychological safety and preserving privacy in Eram Garden has led to mental peace for people. The use of guides and signs and legibility has also been efficient in minimizing ambiguity in the healing of the Eram Garden. On the other hand, due to the symmetry and the spatial sequence of the Eram Garden, the integrity of the environment is more elevated, so by creating clarity in people's minds, it will help reduce spatial ambiguity and then promote peace in the individual.
- In the behavioral parameter, the variety of pathways in Azadi Park provides the opportunity of experiencing space. It has improved people's sense of control over their surroundings. In the Eram garden, the sense of control more enhanced by signs and visual connection.

5.5. Step 5: Analysis of the relation between garden and park organization and performance of healing indicators

- Eram Garden has a regular geometry and fence specific spaces. The quality of lighting and visual communication with different places, physical and psychological supervision and safety, territorial segregation, preserve environmental privacy, has led to higher mental peace and privacy gained by individuals. The legibility of space, its coherence and integration, spatial hierarchy, symmetry, and clarity of space in one's mind (by minimizing ambiguity in the environment) also improve cognitive healing. The use of guides and signs enhances the diversity and flexibility of the space, along with the variety of vegetation, the focus of the uses, and the sense of control. The quality of public space, night lighting, accessibility, gender dominance and diversity of activity, and active experience nature are among the items that, with emphasis on social support, provide a platform for various activities among different social groups in Eram Garden.

- The regular geometry in the environment increases the legibility of the space, and due to a much perception of the environment, it raises people's peace of mind.

- Azadi Park has an organic and non-linear organization. It creates more complexity in the audience's mind and increases ambiguity. But more spatial diversity and the lack of defined spaces and the flexibility of most spaces have enhanced the sense of control in the area. On the other hand, the proper location of the entrance, the variety of the access route (permeability), and the diversity of Forms strengthened the social aspect of the healing landscape of the park. The quality of the collective space and quality of furniture arrangement, facilities, and functional diversity provide a sense of social support and the place for various activities toward the majority, which affects social healing. The greatest cognitive healing impact in park landscape is related to the existence of green vegetation, the use of different materials, spatial coherence, Associating Meanings, And emphasizing Collective Memory in space.

According to the mentioned factors, in general, the following strategies can be used to strengthen the healing qualities of the cityscape:

-Familiarity with space and its memory could create a sense of calm in the audience of a space. The scent is a trait that affects a person's subconscious and, while recalling memories, triggers a reaction to space, and creates positive feelings and peace in the person. Besides, the presence and appearance of water in various forms could also enhance the sense of peace in the audience.

- The privacy gained in a space increases with a regular organization and more mental peace.

- Organic and curved patterns reduce space legibility due to the complexity of the environment and cause more ambiguity and reduce peace of mind.

- Spatial and functional differences provided a great platform for various activities that allow the audience to hold different alternatives, so it increases the sense of control.

- Spatial diversity can attract population and increase social interactions.

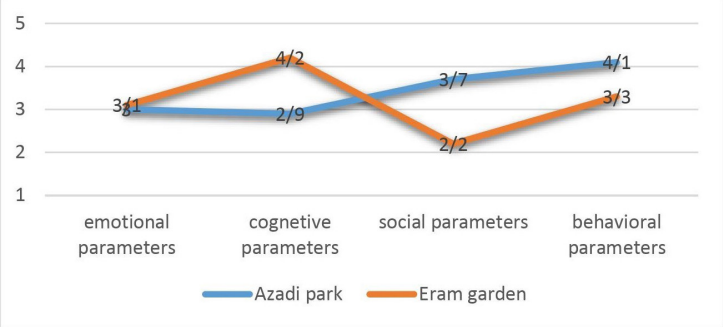

Figure 4. *Compare between healing parameters in Persian garden and urban park.*

6. Conclusion

The beneficial effects of nature on human mental health, as well as the need for human nature to feel close to nature, have made the design of green spaces in today's cities an effective way to promote mental health. The healing perspective, through communication with the human senses through various senses, heals, and reduces daily stress.

The green space designed in Shiraz as a Persian garden and an urban park, so it is essential to study the criteria for landscaping in these two types of spatial organization, to provide solutions to improve the healing effect of the city's green landscape. As a kind of landscape architecture, the Persian garden is one of the most well-known gardening styles in the world, which has played an essential role in designing urban green space in geographical states. Parks, as a natural environment in the heart of cities, also play a significant role in creating a proper relationship between citizens and the natural environment.

Mental peace of the individual is expressed in various ways by the criteria of a healing perspective, and their effects revealed in the form of emotional, cognitive, behavioral, and social healing. All senses are active in the process of perceiving the environment, so they pay attention to all aspects of space and visual, perceptual, and functional categories. so it is necessary to define design details of elements (decorations, variety of materials, colors, etc.) along with the generalities of space (continuity, Confinement, etc.) In general, the performance of Eram Garden is better in terms of cognitive healing than Azadi Park, and in contrast to Azadi Park, it has a better performance in behavioral and social healing indicators.

However, the majority believes that they feel more relaxed in the Eram Garden, which confirms the undeniable value of cognitive parameters in the healing of landscapes. Therefore, using the regular pattern of designing the Persian garden as a healing perspective has been very efficient in the cognitive part.

Also, creating Perspective and Visual Communication, using Water in different shapes, and Variety of Vegetation increases Nature Communication. On the other hand, creating psychological safety through night lighting and routing and clarity of space can be design items that are effective in raising the quality of the healing environment. In the social and behavioral part, which has some purposes in common, enhancing the quality of collective areas, proper furniture, legibility, and variety of activities in the space can be efficient in the quality of healing.

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