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Original Research Article

Landscape Architecture Factors for a Reduction of Depressive Symptoms in Women with an Interdisciplinary Point of View of Experts*

Elnaz Abbasian[1], Mohsen Faizi**[2], Asghar Mohammadmoradi[3]

1. Ph.D. Candidate of architecture, Iran University of science and Technology, Tehran, Iran.
2. Professor of Landscape Architecture, Iran University of science and Technology, Tehran, Iran.
3. Professor of Architecture, Iran University of science and Technology, Tehran, Iran.

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Abstract

Problem statement: Current cities with their physical and spatial components have hidden the disease symptoms in their parts and the landscape architecture as the health cycle of cities creates mental health there. Rapid growth of depression symptoms, especially in women, has made it necessary to identify the therapeutic methods, the effectiveness level of landscape component, finding a common pattern in the urban context and proper urban areas in the current situation to fully utilize the potential of metropolitan areas in favor of women. It is expected that by ever-increasing growth of mental illnesses such as depression, in a metropolitan city like Tehran, it is required to conduct studies on mind, spaces in cities will be ready to improve mental health and reduce women `s depression.

Research objective: Tehran with gardens which are the main parts of city public places, welcome people , having health factors, are considered as health micro climates and can be applied as improving factors of environment in treatment duration to reduce mental illnesses specially women`s depression. The purpose is introducing the architecture landscape components in gardens for the aim of women`s health. to use such buildings in treatment space specially mental health.

Research method: To respond to the research queries, the researcher starts collecting the documents of relevant research and petitioning the psychoanalysts, psychiatrists and environment designers` views with the help of interview and questionnaire processed, data connections were analyzed with non-parametric *Kruskal–Wallis test*.

Conclusion: The current study of regular geometry in motion routes and elements, allocating 1/3 of the area to water presence and considering its hierarchy, average plant density with accurate plantation in terms of height, variety of species, lighting similar to natural light, public lighting organizing and created shadows, green and yellow in a regular array of floor and natural material will be main elements to improve the space for women`s depression.

Keywords: *Depression, Women, Experts` Opinions, Landscape Architecture Components.*

* This article is extracted from Elnaz Abbasian's Ph.D. thesis entitled "Short-Term Effects of Landscape Architectural Components on Depression Symptoms in Women aged 18 to 45 with the benefit of cognitive science" which is done under supervision of Dr. Mohsen Faizi and Dr. Asghar Mahmodamadi and advisement of Dr. Abbas Erfanian Omidvar and Dr. Reza Khosrow Abadi at the Faculty of Architecture in Iran University of Science and Technology, and the Research Institute of Cognitive Sciences and Research Center of Shahid Beheshti University.

** Corresponding author: mfaizi@iust.ac.ir, +989121231148

Introduction

Landscape as a spirit of urban atmosphere keeps community members in a good state of mind in addition to acting as an atmosphere framework for health-promoting activities in the physical, mental, and social realms. Relevant health and urban life studies consider the psychological disorders, especially depression, at the top of modern urban diseases (Fu, 2018, 1-9). This disorder as the third disease in Iran (Nazari, Hermeshi, Mashayekhi, Valizadeh, Falahati, 2001, 24) and the third in the world will affect a large population of cities by 2030 (WHO, 2011, 2012, 2016; NIMH, 2016). Urbanization growth, interactions of people and city during a day (Helbich, 2018, 132), stressors such as job demands, busy and polluted environments, levels of violence and a lack of social support will cause tension and endanger citizens' mental health (Helgason, Daly, 1988; AHRQ, 2017). The attention of people such as Kaplan in 1990, Frumkin in 2002 and Saltogenic theory (Antonovsky, 1991), the dynamic environment factors for mental health and the hopelessness theory (Abramson, Alloy, Hankin, Haeffel, MacCoon, Gibb, 2002, 278),human aspects in design, urban space architecture (Musa & Rusli, 2017, 3). Revival by nature in the context of Kaplan's health (Kaplan, 1983, 1989, 2001, 289) with focusing on direct attention and renewal theory of care in 1995 (Ministry of Social Affairs & Health, 2006, 131) reveals the importance of urban elements effectiveness on health. Meanwhile, landscape architecture is known as the city health chain to reduce symptoms of mental illnesses, especially depression. For this purpose, cross-sectional studies related to human needs, component recognition and the amount of their affection on citizens must be conducted (ibid, 68). A suitable model will be designed by professionals in this field appropriate with the climate.

This article results from the second phase of a Ph.D. dissertation which is searching to find environmental components of landscape architecture, recovering women depressive symptoms. The results of the study attributed to the research in this field accurate with Tehran psychologist's opinions done in the experiment of 300 women who had used gardens. Following this section, building an environment in virtual reality and doing a 21- day experiment on women with moderate depression based on some criteria. In the first stage, landscape architecture components affecting mental health have been extracted by content analysis method. As the impact level of each environmental component depends on other factors such as climate and cultural characteristics, this study by posing some questions such as the relationship between landscape and mental health in studies and influential architecture components on mental health to reduce depression symptoms of women in Tehran from the experts` points of view of other majors and answering the elements and landscape architecture environmental components on reducing women `s depression by structural analysis method have provided universal opinions in the experts ` points of view are representing the model of landscape architecture components in urban space for better exploitation , they identify landscape potentials of the city to reduce depression symptoms of citizens specially women. The open and close interviews and questionnaires were used in two parts, then Kruskal-Wallis method was used to analyze the components to approach the purposes of the study.

Depression Symptoms and the relevance with the City

Depression is a disease in which the patient feels grief and hopeless for a long time. body, mood and thoughts are involved and change the normal function of a person. (Baum, Fleming & Singer, 1985; Farr, Dietz, Williams, Gibbs & Tregear, 2011). One out of three people experiences depression in a period of his life. The degrees of depression are divided into mild, moderate, and severe and its symptoms are insomnia, feeling grief, lack of concentration while thinking, motion declineh and lack of necessary energy, etc. (Doornbos, Zandee, Timmermans, Moes, DeGroot, DeMaagd-Rodriguez, Scholman, Zietse, Heitsch & Quis, 2012; Oxman, Sengupta, 2001, 3; Lee, Choi, Bang, Kim, Song & Lee, 2017; Monajemi, 2015; Sadeghi & Yousef, 2014) (Fig. 1).

Moderate depression is the next phase of mild depression and its symptoms are more severe in comparison with the mild one. The symptoms of moderate depression are very severe which make the atmosphere of home or workplace problematic (Lee, 2017, 5-11).

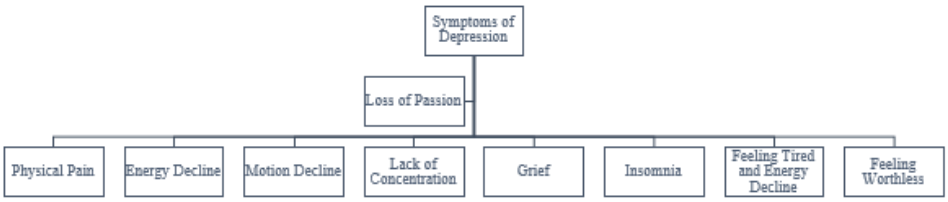

Fig. 1. Symptoms of Depression. Source: Oxman, 2002,1.

Based on the definition of The World Health Organization, health is defined by physical, spiritual, mental, and social dimensions (Ahmadi, 2006, 7; Motallebi & Vojdanazadeh, 2011, 37). Mental illnesses can cause physical ailments . Depression causes certain physical symptoms like heart and lung diseases, weight loss or gain weight, change of heartbeat (Gehl, 2013), blood pressure, brain structure and cortisol changes (Lee & Maheswaran, 2011, 212; Connellan, Gaardboe, Riggs & Mustillo, 2013; VanDenBerg, Hartig & Staats, 2007; Pagliaccio, Luby, Bogdan, Agrawal, Gaffrey, Belden, Botteron, 2015). Hence, by Organizing the biological elements we can reduce depression symptoms.

Women, Depression, and Future Generation

In previous studies, there was a significant relationship between the duration of depression period and brain structure changes in volume, brain thickness and function; Also, women may transfer depression affections to the future generations by defining their maternal role. (Gopalan, Glance, Valpe, Joseph, Shenai, 2018,114; Mayberg, Lozano, Voon, McNeely, Seminowicz, 2005; Liuc, liu, Wang, Zhang, lil, 2017; Lemogne, Basard, Mayberg, Volle, Bergouignan, Lehéricy, 2009). Studies have shown 13. 1 to 75. 3 percent of depression prevalence in women and 7. 6 to 67 percent in men. These findings suggest that women are more vulnerable (1. 1 to 1. 7 times) to depression than men (Monajemi, 2015; Montazeri, Mousavi, Omidvari, Tavousi, Hashemi & Rostami, 2013, 567; Kardan, Gozdyra, Misic, Moola, Palmer, Paus, Marc, Berman, 2001), and women are at the risk of anxiety and depression disorders during their lifetime more than men (50 to 60 percent). (Doornbos, Zandee, Timmermans, Moes, DeGroot, DeMaagd-Rodriguez, Scholman, Zietse, Heitsch & Quis, 2018, 524; Ashrafi, 2006). According to the global charts of mental health in WHO, the position of Iran shows a high percentage of depression symptoms prevalence (Fig. 2).

Environment and Mental Health

In psychological studies of the environment, humans are not separate from the natural environment. (Proshansky, Ittleson, Rivlin, 1970, 60) an impartible dimension from the environment and by environment they can find the depression symptoms for recovery. (Abbasian, et al., 2018). In addition, the sociologists' views in the congress of 2000, entitled Discourses and Gender, highlight the need for cities and considers special attention to feminine characteristics (Paravvsini & Urtusella, 2015, 85). Therefore, the necessity of women`s biology in cities in terms of architectural components can reduce the symptoms of depression. Various methods have been proposed by researchers such as Baum, Springer, and Fleming in terms of evaluating the methods affecting the mental health and the environment features (Kaiserman, Baum, Springer & Fleming, 2017). Individual reports, behavioral measures, measurement of biological and mental indexes , mental and reaction indicators should be inspected. Based on the studies of Williams and et al , the behavioral therapies and individual treatments are suggested for being in the environment (Antony, Purdon, Huta & Swinson,1998; Farr, et al, 2011). Accordingly, short and long-term experiments can be useful to identify behavioral therapies in the environment. The architectural components' accuracy, especially landscape architecture, as a mediating ring between architecture and the city, can provide a good way to recover the mental health of the citizens, both in special environments and urban elements (Antonovsky, 1991; Landscape and urban design, 2014, 182).

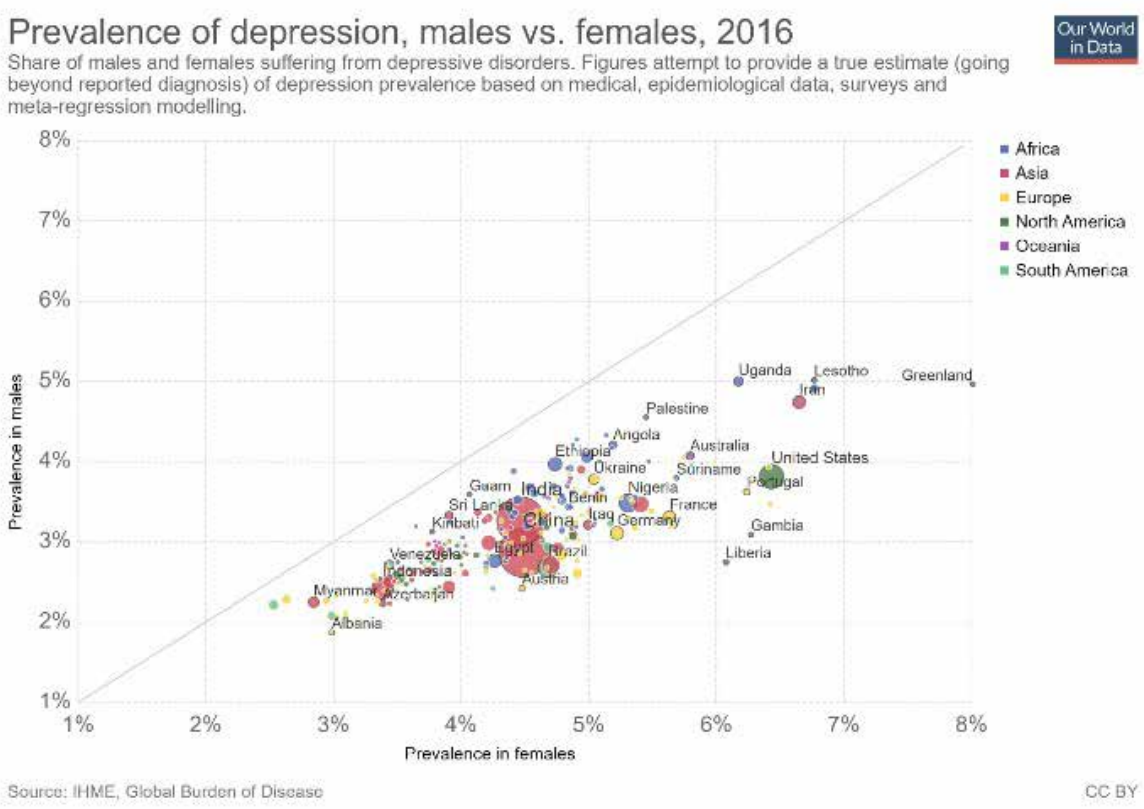

Fig. 2. the position of Iran in Depression Rates in the World and. Source: WHO, 2016.

This is the best identification through the interaction of psychologists, psychiatrists, botanists, environmental designers, architects, and urban planners. Therefore, testing the environments through interdisciplinary collaborative processes of virtual reality, medical engineering and cognitive science provide the best base to plan healthier urban spaces. (Frumkin, 2003, 1453; Fu, 2018, 1). The following (Fig. 3) shows the methods of evaluation and performed research.

Research Background

• Landscape architecture and mental disorder decline n cities and the researches done

The Olmsted's ecological values regarding the human connection with nature , concentrating on the direct attention the theory of care renewal, revival of environmental health in terms of mental issues are defined under the umbrella of environmental landscape. (Ulrich & Parsons, 1990; Ulrich, Simons, Losito, Fiorito, Mile & Selson, 1991, 215; Kaplan, 1983, 1995, 2001). Landscape architecture provides important visual and perceptual features, biological and ecological processes in human experiences by linking people and places. (Taghvaie, 2018). Mitchell, Bernosqwick, Vandenberg, Takano, Nakamura and Watanabe, Berlaien, Nackmerd, Fuji, Mansouri, Ashouri, Ibrahim Zadeh, and Ebadi believe that landscape architecture knowledge affects mental objectivities of users objectively by various methods. By constructing and shaping the green spaces as well as landscape architecture we can directly affect the people`s reactions in the environment and their mental features. The researches by Ulrich, Hartig, and Lumen also show that an important part of the healing landscape purpose is outlined just in observing the natural landscapes not necessarily in doing activities in green fields and natural landscapes . natural activities such as being present in regenerative outdoor spaces (nature is a restorative environment and its effects are seen positively on mentality and emotional processes). indicate positive impacts of mental health among

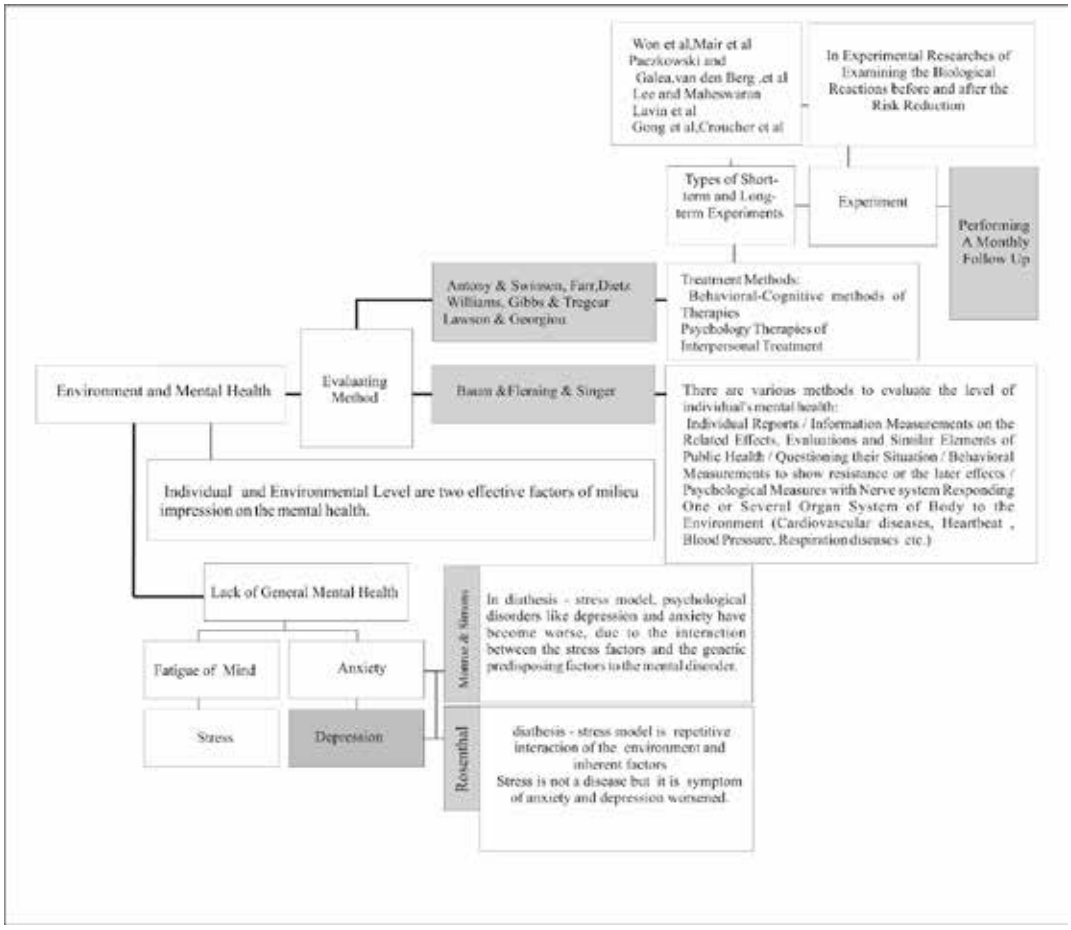

Fig. 3. Mental Health and Performing Environmental Experiments. Source : Abbasian, et al, 2019a.

people in the space (Hartig, Book, Garvill, Olsson, Garling, 1995; Hartig, Kaiser, Strumse, 2007,293; Shermana, Varnib, Ulrichc, Vanessa, Malcarne, 2005,168-169; Maller et al, 2006).

Quantitative development of public places (Herzog & Kernick, 2000; Bingley, 2007) &Landscape design and people`s processing based on the environmental effects and the users' reactions in the environment (Helbich, 2018, 132) have sanitary outcomes such as concentration revival, stress reduction, arousal of positive emotions and physical activity in and out of the city, social integration and the collective experience of nature. Landscape elements such as natural plants, flowers (Gascon, Triguero, Martíezn, Rojas-Rueda, Plasència, Nieuwenhuijsen, 2016; Dadvand, 2018, 236) and water (DeVries, Have, Dorsselaer, Wezep, Hermans, Graa, 2016, 369) reduce stress, depression, etc., in open spaces (Heath & Gifford, 2001, 22-24; NIMH, 2016; Chun, Sullivan & Bin,2013; Bin, Sullivan, Chun, 2018; Guizzo, 2013; Lau, 2009 ؛Anderson & Brock, 2001). The following Fig. 4 represents a part of the conducted researches.

In the diathesis-stress model, the level of stress stressors effectiveness on depression symptoms are described, and based on the studies of Brereton (2005), Hartig (2003) the Netherlands Health Center, Ulrich, and Greene Even, landscape architecture has its own influence by watching The richness and space complexity with water and vegetation can recover symptoms. Researchers like Herzog and Kernick (2000), Kaplan (2000), Sullivan et al., (2001), and Bangley (2007) believe that Impact of components has been seen in positive feeling shown in cognition and psychology evaluations. 4 group of researchers

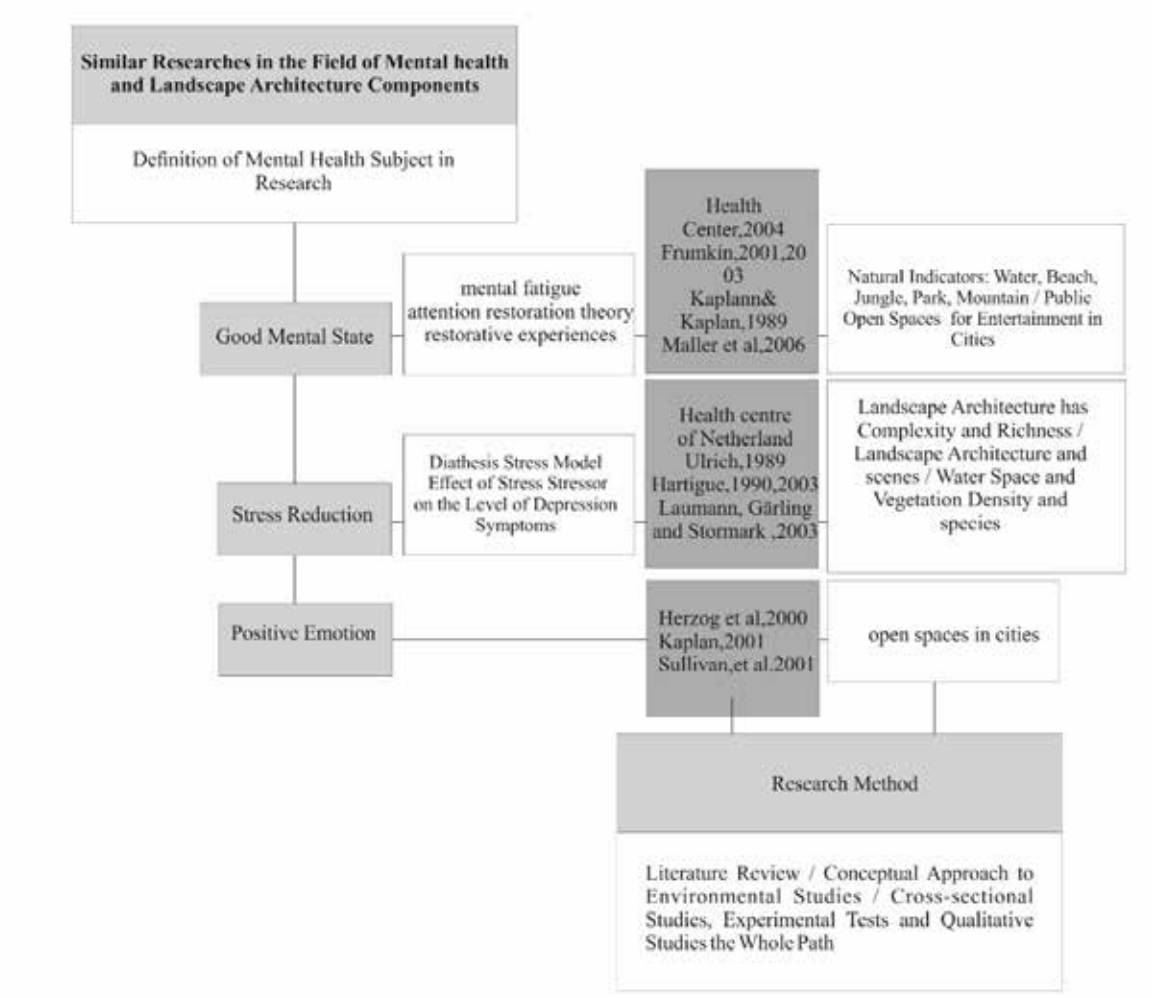

Fig. 4. Landscape Architectural Research on Health Components in depression symptoms. Source: authors.

based their studies on concentration restoration, stress reduction, and mind fatigue as well as natural indicators and open spaces. The results of these researches show that the additionally community has increasing health care, health professionals, individual culture services, language preferences (USDHHS, 2017), attention to gender, ethnicity, income level and living environment (White, Alcock, Benedict & Wheeler, 2013, 920; Doornbos, Zandee, DeGroot, 2013), landscape architecture components, and urban open space play an important role in mental health and it is expected that various urban spaces are planned with health patterns appropriately with men and women `s health to improve symptoms of depression. (Helbich, 2018, 129, 132).

Vries in his experiments at a time and limited environment, by comparing medical reports, people and their close connection with natural components found a meaningful relationship between vegetation density in the environment, water, the amount of sunlight, and the reduction of mood disorders.

Daily sample experiences, reviewing and utilizing several images to identify positive stimulus environments and the effectiveness of each component, the use of health and satisfaction questionnaires which have used in an environment in a period of time indicate the effect of the environments on mental health. Also, in Basinger Theory, the natural rhythm of body is controlled by natural light, and women`s depression symptoms have been recovered during 3 weeks of light therapy (Walch et al., 2005; Tanja-Dijkstra & Andrade, 2010). By adding water to the environment the level of depression is reduced and makes people feel better. According to Gestalt psychology, the geometrical arrangement, symmetry, homogeneity of the field

elements by regulating the plants, running water, the variations of colors, body endorphin control by smelling wood will reduce the depression controller. Based on declared health criteria in WHO corresponding with researches done , the table of landscape architecture components on recovering the depression symptoms is briefly proposed (Table 1).

The distinctive aspect of this research by considering

Table 1. Landscape Architecture Components Affecting Mental Health. Source: Abbassian et al., 2019b.

Effective Environmental Components of Landscape Architecture	Biological Reactions	Features of Environment	References
Geometric Features	Control of Mental Reconstruction Readability Organization Organizing Sensory Receptions Reducing Stress	Circular Elements and Cheerful Curve Lines Diagonal, Angular Settings Can be a Threat Totality of Components Geometric Shapes and Design Readability Simple Spatial Patterns Symmetrical Objects Creating Axes, stretching to move	Kaplan, McGuire Vaughan, Gestalt Psychologists, Bechtel, Makin, 2012
Materials	Neuroscience	Lack of Attraction Having Organic Materials in the Right Place (this has been discussed in hospitals).	Neuroscience E.R.C.M. Huisman E. Morales. van Hoof a, H.S.M. Kort JohnRadcliffe Hospital site, Headley Way, Oxford
Smell	Relaxing muscles Increased Concentration Endorphin production Reduction of heartbeat	Roses, Saffron, Lavender, Rosemary, Nettle wood, Amin al-Dawlah, Violet, Atlasi, Mullein Willow and Pine Trees of Restorative Environment of Jungles, Smell of Wood	Saki, Bahmani, Rafieian-Kopaei, 2016 The Iranian Psychologists of Olfaction
Sound	Changing social behaviors Physiological disorders Stress, blood pressure and heart rate and respiration Causing anxiety, headaches, and mental function disorders	Iranian Environmental Standard:55 dB Bird sound and perception of water sounds Reduce negative perception of sound with presence of plants	King and davis, chapman, Denboaer,schroten, 2007 Alimohammadi et al., 2015 ; Irvine et al., 2009 González-Oreja et al.2010 Urban green spaces and health. Copenhagen: WHO Regional Office for Europe, 2016 Dzhambov, A., Dimitrova2014::
Color	The positive result of warmer colors with a longer wavelength is more than cold colors. Spatial recognition and a sense of familiarity in the environment is achieved by the yellow color, the perfect color for depressed people.		Golledge & Lingwood:Janzen and Jansen 2010; Parsons Group, 1998 and Ulrich, 2008
Water	A good stimulant to recover depression Doubling the green space effect	Hierarchical presence of water	MacKerron Mourato Barton ESSEX researches
Natural Light	Recovery of depression symptoms Reducing stress Controlling melatonin The daily biological rhythm of the human body	Sunlight treatment and antidepressant effects Minimal effect of three weeks of treatment Morning Sunlight and its double effect on depression	Tanja-Dijkstra1 and Campos Andrade, Walch et al.,2005 Schweitzer Gilpin and Frampton,2004, E.R.C.M. Huisman ,E. Morales b, J. van Hoof a, H.S.M. Kort,2012
Vegetation Density	Reduction of the symptoms of depression, anxiety of mental illness Concentration restoration recovery Reduction of people's anger Treatment of mental illness Increasing activity and mental health recovery Direct restorative features: effects of parks with plant species	Good state in places with over 33% of green space The Positive Role of Looking at natural landscapes Vegetation density of 1.7 to 24%: stress reduction Over 24% complete recovery of stress The effect of medium density of plants on stress reduction Influence of high plant density on concentration Increased susceptibility of the human brain to deciduous trees More acceptance of trees than the shrubs Acceptable height of trees 10 to 30 meters Simpler species of tall trees	Jiang, 2008 Mass, 2001 Francis et al., 2012 Berman, Barton, Hine & Pertty, Mass and Roe and Aspinal, Van den Bosch et al,2015; Roe et al,2013; Mitchell etal:2011 Annerstedt et al,2012; Hansmann, Hug, &Seeland,2005 . White, Alcock, Benedict. Wheeler, and. Depledge,2013 Nutsford et al., 2013;

women and the effects of landscape architecture components on their depression symptoms from the viewpoint of the researchers and other members of society. In health-related environments, the body's natural rhythm is primarily controlled by the natural light and eating the necessary food. As people do not use one type of food, natural light should be considered a design key in labs. Light, free from equipment, is one of the effective factors on architecture and health. Warmer colors with a longer wavelength have more positive effects on the process of recovery from the symptoms of depression in comparison with the cold ones. This design feature is used as visual marks, spatial recognition, and familiarity with the environment (Golledge, 1992 Lingwood et al, 2015; Janzen and Jansen, 2010; Parsons Group, 1998; Ulrich, 2008). In environmental studies of the health motivator, flooring has been less considered. Emotional healing resulting from the restorative environment turns people's negative emotions into positive and provides physiological healings. Therefore, evaluating the behaviors in environment must be considered in four parts: desiring to stay, explore, work in, and have relationship with the environment (Abbasian, et al., 2018).

Research method

At first, the present research model describes and analyzes the position of landscape architecture components on women's mental health, and after identifying the components by the aid of experts in this field, the criteria are determined by the psychologists and psychiatrists in Tehran for each component. The components are analyzed and classified with an unstructured interview from 32 psychologists, psychiatrists, environmental designers, and botanists who are experts in therapy and environment and then a visual questionnaire was prepared in which one expert in each category of priority components was asked. The components are classified and evaluated in 7 categories.

As variables are of qualitative type, the study was conducted by using structural analysis and t variables independence tests, by Kruskal-Wallis nonparametric test. A variance analysis test is a generalized **t**-test used for equality of two or some societies. Kruskal-Wallis test is one of the nonparametric tests, which corresponds to the F test and is used where the number of groups is more than two and the observations should be categorized among independent groups.

Discussion and Analysis

• Classification of the Landscape Architectural Components effectiveness on the Reduction of Depression Symptoms in Women

Nakhaee Moghaddam considers the microclimates of green spaces and Michelle Perman presence of trees as a powerful sensory-mental reactive in the environment effective in the ameliorative atmosphere. (Gascon et al., 2016, 60; Van den Bosch & Ode Sang, 2017, 373-378; White et al., 2013). The significant stress reduction (White et al., 2013; Monroe & Simons, 1991), restoration and concentration revival (Kaplan & Kaplan, 1983, 1995, 2002, 2001) and the effect of plant diversity on the level of aggression of users indicate a positive correlation between green space and mental health in researches done (White et al., 2013). The vegetation density reduces 1. 7 to 24% of stress and eliminates the high level of stress. Due to decrease of readability with the increase in density, experts find moderate levels of density more appropriate (Fig. 5). In the researches, trees and flowers are the first, shrubs and growing plants in the second rank, bushes, and grand covers, respectively, have effects on the reduction of depression symptoms. By examining the visual features and the perspective created in the environment, pendant trees such as crazy willow and then flowering trees have been the most effective on women's happiness with the average of 78.5. Deciduous trees generate more sensitivity in the brain and are more acceptable than shrubs to increase women`s happiness. Psychologists believe that women feel secure alongside evergreen trees. Simpler trees provide visual security for them, and they show a better reaction toward watching the space. Foliage and trees whose crowns are upper that sight cone do not close the perspective depth.

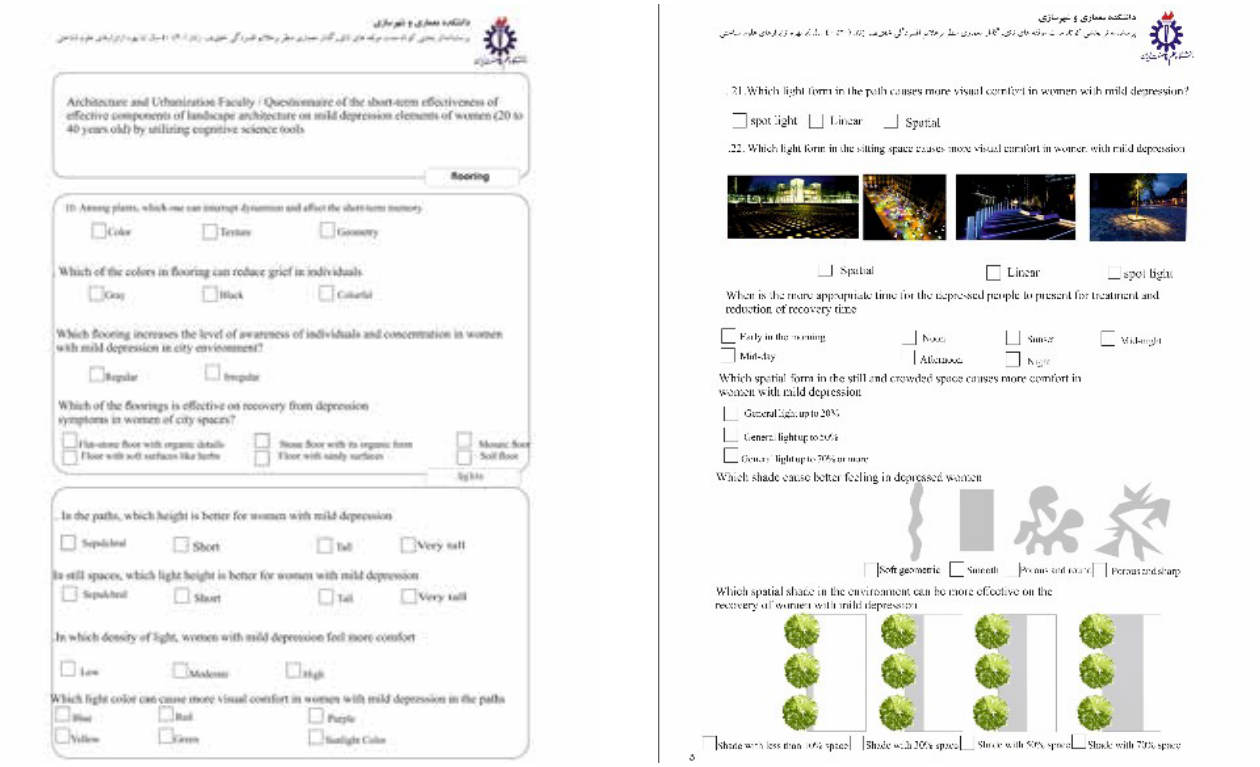

Fig. 5. Sample Questionnaire Pages. Source: authors.

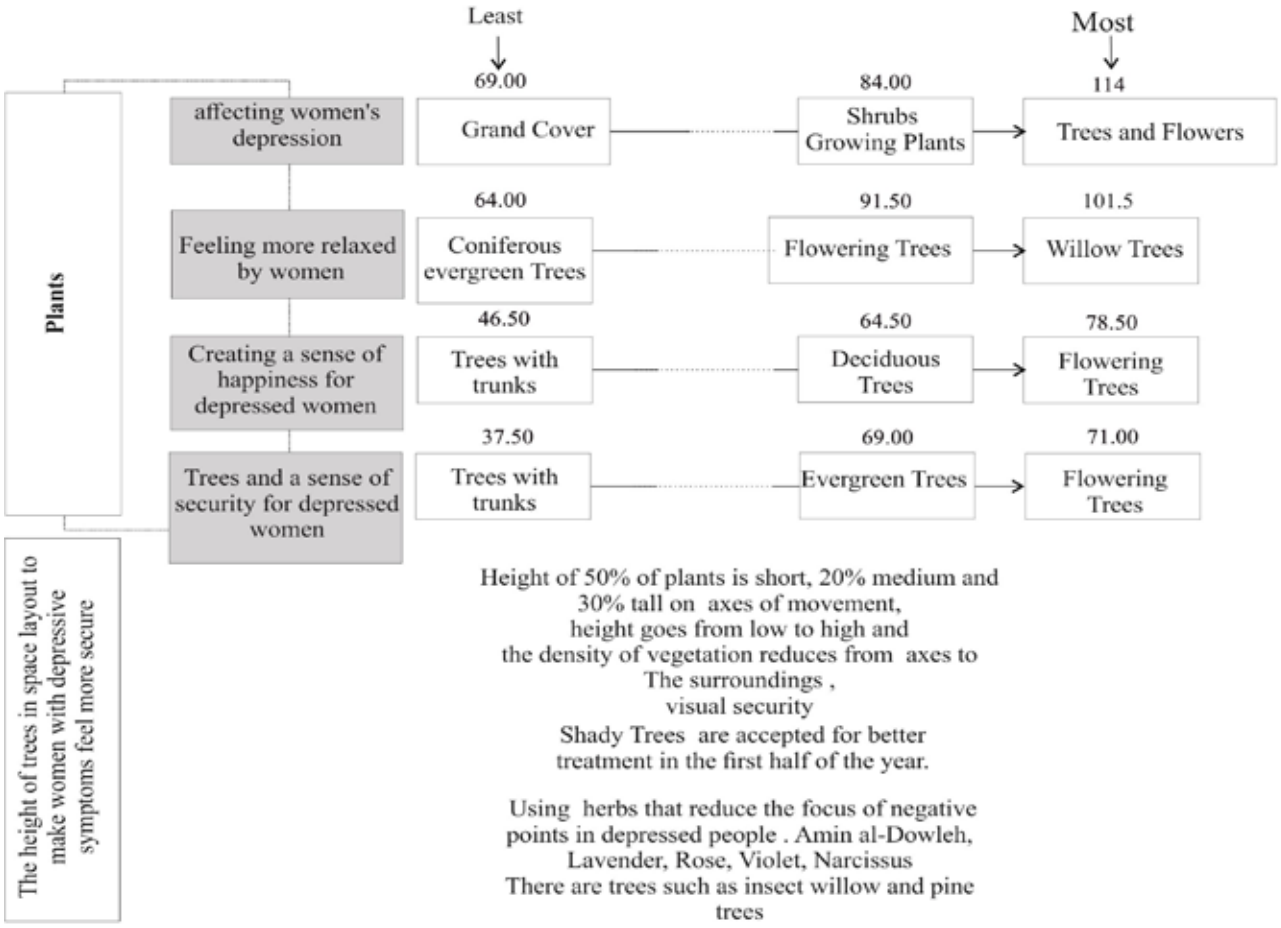

Fig. 6. Diagram of Plant Classification from the Highest to the Lowest. Source: authors.

Maybe, looking at the produced edges have more justification on psychologists` claim in interpreting the effectiveness of trees height, However, trees in the visual cone give more opportunity to women to touch the components of plants and then their sensory reactions are more involved. They believe that the presence of trees in visual cone will reduce environmental stimuli (Fig.6). Almost, 73% of experts believe that the average height of trees (3 to 12 meters) will have positive influence on patients` moods. 43.3% of experts in combining the plants in space proposes[50] percent height of short plants, 20 percent of average plants and 30 percent tall plants. If the height of plants in the motion path is closer to the route edge, the height will be short and if it goes toward two directions, it will be taller. Also, the density of planted trees on the motion path has been reported average to provide visual safety for women in the environment as well as the motion stimulus of people. Saki et .al (2016) believe that a good odor in the environment helps the muscles relax, increase the concentration, release endorphins, and reduce the heartbeats. Ibrahim Zadeh considers the presence of pine trees in the environment due to producing photosynthesis is impressive to reduce depression symptoms. present researchers believe presence of plants that flowers such as roses, Amin al-Dawlah, Lavender, violet, Narcissus can provide mental well-being and health benefits for women by spreading appropriate odor. Surely, the presence of crazy willow and pine trees and have been also recommended.

In the flooring, colorful floorings enhance the quality of treatment improvement process for women with depression symptoms. 46.7% of experts agreed with using yellow, green, and neutral colors in flooring and believe that visual arrangement either geometrical array of colors increase concentration and attention. Floor coatings with soft surfaces like plants and organic stones are more acceptable to encourage women to move in the environment (Fig.7).

Light is very important in treatment. Joseph, Ulrich, Bassinger, the Walch Group, and Tanja Dijkstra Huysman believe that natural light recovers the symptoms of depression, reduces stress, controls

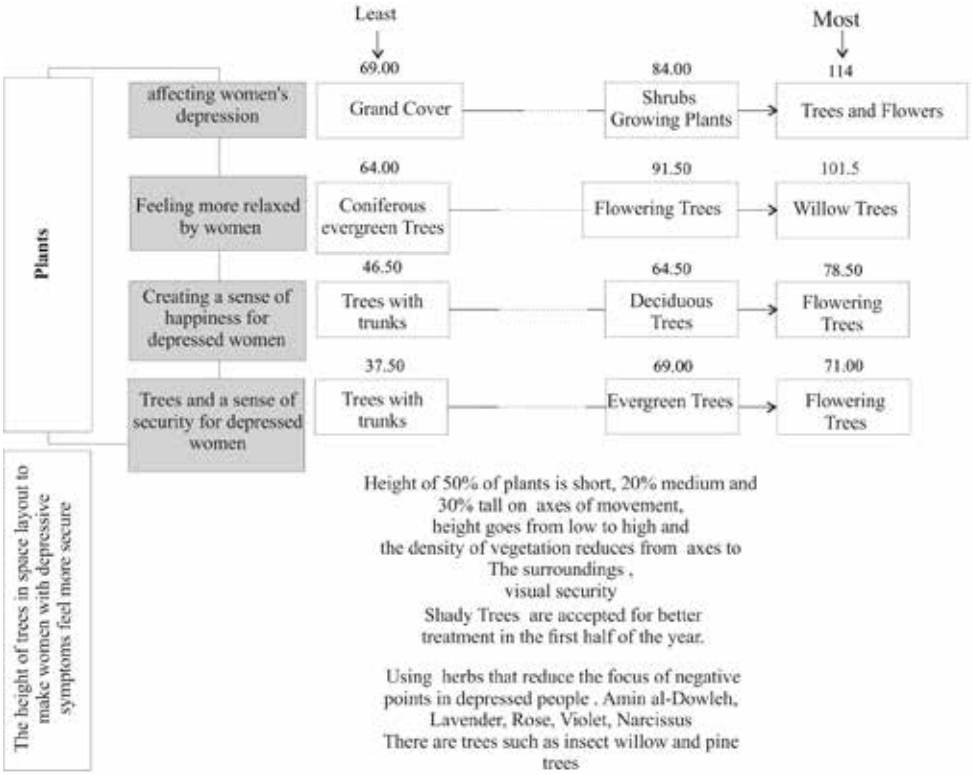

Fig. 7. Flooring Classification Diagram from highest to lowest. Source: authors.

the production of melatonin and thus regulates the daily biological rhythm of the human body, and its effect can be observed for at least three weeks. They believe that morning light will have a great effect on reducing the symptoms of depression. psychologists have given priority to use natural, green and yellow light, respectively in lighting.

The presence of natural light broadly on the motion path or sitting areas will cause visual relaxation for women with depression symptoms and encourage their movement and reduce environmental stressor (stress and anxiety base). The general light should enlighten 20 percent of the surrounding at the height of 4 meters, light intensity should prevent the eye dazzle along the path (Fig. 8). The first half of the year is considered as appropriate time then shade trees were selected, based on the intensity, warmth, and color of the natural light. Spring is considered as a treatment season and the selected months of mid-May to the end of June are proposed. Early in the morning and midday is acceptable, respectively for treatment process and commuting in urban spaces in Tehran.

Kaplan, McGuhee Weivan, Gestalt psychologists, Bechtel, Mackin consider curved line and round elements as happiness factor in space geometry. Diagonal and angular setting can be considered threat. The totality of components in geometric shapes and readability of the design with simple spatial patterns, creating axes, traction for movement and the presence of symmetrical objects can help the environment to recover women's depressive symptoms. There was no specific information about the arrangement and the overall geometry of the space, but the details of some elements were discussed. It is better than 50% of the environments consist of green space and the pattern model 70 to 30 vegetation selected. circle and square shapes with the average rank of 103 and 80.[5] are more effective and the triangle is the least effective stimulus to improve depression symptoms. The combination of straight and curved lines would be more pleasant to movement for women. In the environment, the movement of water is considered positive to create concentration, a pleasant feeling, and decrease lethargy of movement. Water and its

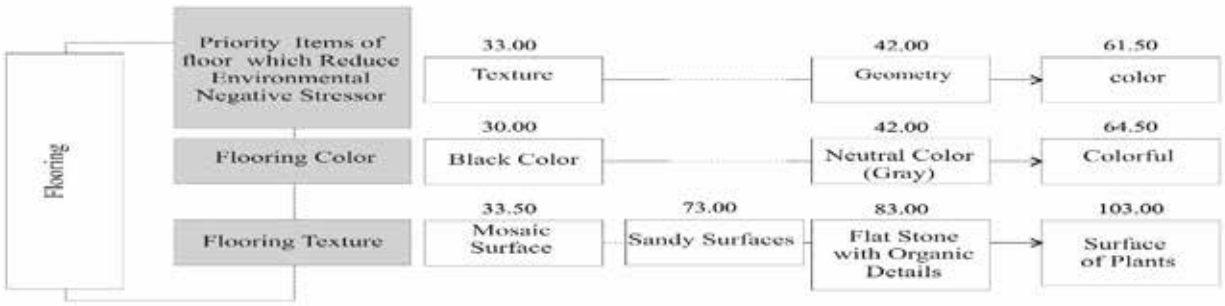

Fig. 8. Light Classification Diagram from Highest to Lowest. Source: authors.

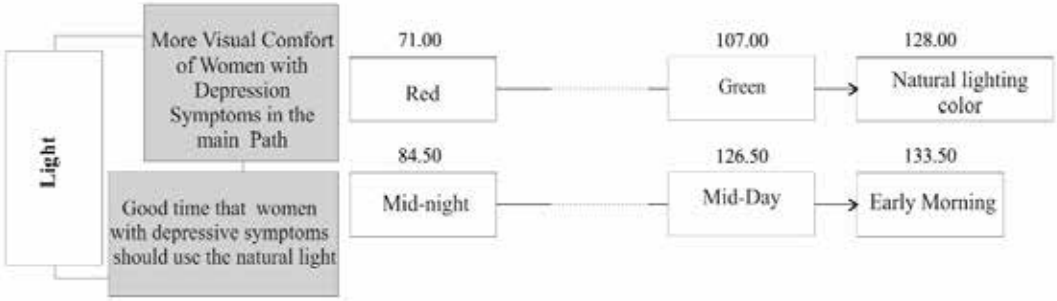

Fig. 9. Form Diagram in Geometry. Source: authors.

sound are the factors that reduce environmental stress stimuli and symptoms of depression in women. Studies by Bertho, Hartig, the Netherlands Health Center, Ulrich, and Vergenson consider water space complexity and vegetation species for recovering depression symptoms. Water movement in gutters, fountains, and also the water playing are positive elements for more activity among women with depression symptoms in the environment. Regarding the amount of water in the circular basins and the movement paths, 1 out of 3 of the surface areas of movement is proposed. Gutters and circular ponds encourage women to be in the environment.

Edges with protrusion can affect the reaction of women's depressive symptoms, as a positive or negative environmental stimulus. There is no information about which type of edges encourages people to be present at the site, but psychologists believe that soft edges give more sense of security in women and the produced edges of plants with more curved form create **a** sense of happiness in the environment. The edges of shadows should also be smooth, soft corner, and porous so as to reduce the negative effect on the environment. Curved edges have the highest effect with a mean of 67. 7 and broken edges have the least.

Final Summary of the Effective Landscape Components on Reducing Depression Symptoms from the Viewpoints of Global Researchers and Domestic Experts

Regular geometry in the environment and combination of curved and rectangular elements in the movement paths, allocation of 1/ 3 of the movement area to water, paying attention to its hierarchy, moderate plant density with correct planting height and diverse species make it easier for women with depressive symptoms to move around in public open spaces (Fig. 9). Paying attention to appropriate lighting, and created shadows organizing the general lighting, yellow and green in the regular arrangement of lights and natural materials can create an appropriate space for reducing stress, anxiety, and depression in women (Fig.10).

Conclusion

Health has an important place in city space from different dimension. Improving the urban environment will be an effective factor in reducing the women' depressive symptoms. The gardens of Tehran, which are used as the public open space can play an important role in women's health. Based on the obtained pattern of universal subject literature and native experts related to environmental and fundamental components in reducing the depression symptoms of women and it can be said that the pattern of historical gardens in Tehran has hidden the components and they can be used as health microcosms. Natural light,[20] percent of general lighting with the height of a 4 - meter path will lead to the creation of visual security of women and the reduction of psychological stimuli. The best natural light for treatment is suggested in May and June. Floorings with regular geometry, soft edges, water with fountains, and pools in different parts of the garden and varied vegetation species with serotonin stimulation provoke women to move happily in public open gardens.

Geometry and color have been some of the most effective elements in gardens. In addition to their role as an independent effect, they can be traced to other components. It is expected that according to the experts' viewpoints with the features of the landscape

Fig. 10. Edge Effect Diagram. Source: authors.

Table 2. Modeling the Appropriate Environment for Women, by Domestic Specialists and Global Researchers Source: Abbassian, et al, 2018 a.

		Literature Review and Researcher's Opinion	Professionals In Tehran	Recovery Pattern
Light	Light Color		Natural Light	Natural Light
	Light Intensity		600 Luxury Equipment	
	The appropriate time for Treatment	Any Time Appropriate with Equipment	Appropriate Light: Spring, May and Late in June	May to Late June
	Type of Existing Light			Natural Light
Vegetation	Security			Evergreen Trees
	Appropriate Vegetation Type	Deciduous Tress		Moderate Vegetation, Flowering Trees, Deciduous Trees Trees Height from 10 to 30 meters Having Flowers in the Collection Planting from Movement Path to the End with Increasing Height. Presence of Coniferous evergreen Trees
	Appropriate for Treatment	Deciduous Tress	-	
	Flowers	Violets, Rose, Saffron, Hades	Amin Al-doula, Lavender, Rose, Flowering Trees	
	Height	20 to 30 Meters	Increasing a Sense of Security	
Water	Amount	Moderate Volume and about 1.3 of Total Area	Great Volume of water Brings Happiness	Hierarchy of Water in Iranian Gardens
	Presence Type		Gutter, Fountain, Basin	
Flooring	Type	Organic Materials that Cause no Dazing	Organic Material	Organic Materials Materials compatible with biological properties
	Color			Neutral Color with Colors which have Recovering impression on Concentration along
	Geometry	Regular Geometry	Regular Geometry	Regular Geometry
Geometry	Paths Type	Straight and Curved Paths		Iranian Garden Geometry
	Space Arrangement		circular elements and cheerful curve lines Diagonal settings Angles can give a sense of threat Generality of components, geometric shapes and readability of the design Simple spatial patterns	
	Perspective			
	Elements in the Environment		Circular and Diagonal Elements	

architectural components present in the gardens creates future planning in the context of urban city health in the public spaces of the world. In the future projects, it is hoped to observe the effect of the components in the design of the city by quantifying the amount of effect.

Reference list

• Abbasian, E., Faizi, M. & Mohammad Moradi, A. (2019a). *Utilizing Urban Potentials in Women's Mental Health, Occupational Residency, Depression Symptoms,* The 6th Specialized Congress and the Third International Congress on Hospital and Equipment Manufacturing, Tehran, Iran.

• Abbassian, E., Feizi, M. Mohammad moradi, A. (2019b). *Iranian Gardens*, Women's Mental Health and Symptoms of Depression, Second International Conference on Psychological and Scientific Horizons, Tehran, Iran.

• Abramson, L.Y., Alloy, L.B., Hankin B.L., Haeffel, G.J., MacCoon, D. G. & Gibb, B. E. (2002). *Cognitive vulnerability–stress models of depression in a selfregulatory and psychobiological context*. In: Gotlib IH and Hammen CL (Eds). Handbook of Depression, pp. 268–294. New York: Guilford Press.

• Agency for Healthcare Research and Quality (AHRQ). (2017). Priority populations.

• Ahmadi, H. (2006). The Origins of the Genesis of the Idea of the Healthy City, *Building the City*, 3, 2-9.

• Anderson, B. J.(2011). An Exploration of the Potential Benefits of Healing Gardens on Veterans with PTSD, *All GraduatePlan B and other Reports*, (50), 200-214.

• Antonovsky, A. (1991). *Hälsans Mysterium,* Natur och Kultur, Stockholm: Bokförlaget.

• Antony, M.M., Purdon C.L., Huta V. & Swinson R. P. (1998). Dimensions of perfectionism across the anxiety disorders, *Behav Res Ther*, 36(12), 43-54.

• Ashrafi, M. (2006). Depression of the Philosophy and the Word of Lessons from the School of Islam, *Noor*, 44(5), 74-70.

• Baum, A., Fleming, R. , & Singer, J. E. (1985). *Understanding environmental stress: Strategies for conceptual and methodological integration.* In A. Baum & J. E. Singer (Eds.), Advances in environmental psychology (Vol. 5, pp. 185-207). Hillsdale, NJ: Lawrence Erlbaum.

• Bin, J., Sullivan, W.C. & Chun, Y.C. (2014). A dose of nature: Tree cover, stress reduction, and gender differences, *Landscape and Urban Planning*, 132, 26–36.

• Chun, Y.C., Sullivan, W.C. & Bin, J. (2013). A dialogue on the impact of urban landscape on human health, *Urbana-Champaign,* 1(3), 84-91.

• Connellan, K., Gaardboe, M., Riggs, D., Due, C., Reinschmidt, A. & Mustillo, L. (2013). Stressed Spaces, Mental Health and Architecture, *HERD: Health Environments Research & Design Journal*, 6(4), 16-127.

• De Vries, S., Have, M., Dorsselaer, S., Wezep, M., Hermans, T. & Graa, R. (2016). Local availability of green and blue space and prevalence of common mental disorders in the Netherlands, *BJPsych Open*, (2), 366–372.

• Doornbos, M., Zandee, G.L., Timmermans, B., Moes J., DeGroot J., (2012). Clinging to Any Bit of Joy: Urban, Ethnically Diverse, Impoverished Women's Descriptions of Anxiety and Depression, *Archives of Psychiatric Nursing,* 26(6), 437–447.

• Doornbos, M., Zandee, G.L., Timmermans, B., Moes, J., DeGroot, J., DeMaagd-Rodriguez, M., Scholman, J., Zietse, M., Heitsch, E. & Quis, M. (2018). Women supporting women, Supportive/educative groups for ethnically diverse, urban, impoverished women dealing with depression and anxiety, *Archives of Psychiatric Nursing*, (32), 524–529.

• Doornbos, M.M., Zandee, G.L., DeGroot, J. & Warpinski, M. (2013). Desired mental health resources for urban, ethnically diverse, impoverished women struggling with anxiety and depression, *Qual Health Res*, 23(1), 78-92.

• Farr, S.L., Dietz, P. M., Williams, J. R., Gibbs, F. A. & Tregear, S. (2011). Depression screening and treatment among nonpregnant women of reproductive age in the United States, *Prev Chronic Dis*, 8(6), 122.

• Frumkin, H. (2003). Healthy places: exploring the evidence. Am. J. *Public Health* ,93 (9), 1451–1456.

• Fu, Q. (2018). Communal space and depression: A structural-equation analysis of relational and psycho-spatial pathways, *Health and Place*, (53), 1–9.

• Gascon, M., Triguero, MasM, Martíezn, D., Dadvand, P., Rojas-Rueda, D., Plasència, A. & Nieuwenhuijsen, M.J. (2016). Residential green spaces and mortality: a systematicreview, *Environ. Int*, 86, 60–67.

• Gehl, J. (2013). Cities for People. Island Press, USA: Washington.

• Golledge R, G. (1992). Place recognition and wayfinding: Making sense, of space, *Geoforum*, 23(2), 199-214.

• Gopalan, P., Glance. J., Valpe, y. R., Joseph, H. & Shenai, N. (2018). Development of a women's mental health curriculum and evolution to a Women's Mental Health Area of Concentration in a psychiatry residency program, *Arch Womens Ment Health*, (21), 113–116.

• Grinde, B. & Patil, G. (2009). *Biophilia: Does Visual Contact with Nature Impact on Health and Well-Being*? Norwegian Institute of Public Health, PO Box 4404 Nydalen, 0403 Oslo, Norway Department of Plant and Environmental Sciences, Norwegian.

• Guizzo, A. O. (2013). *Landscape Architecture and Neuroscience-the New Meaningof Contemplative Landscapes*, Retrieved from https://www.researchgate.net/publication/261645891.

• Hartig, T., Book, A., Garvill, J., Olsson, T. & Garling, T. (1995). Environmental influences on psychological restoration, *Psychol*, (37), 378–393.

• Hartig, T., Kaiser, F. & Strumse, E. (2007). Psychological restoration in nature as a source of motivation for ecological behavior, *Environmental Conservation*, (34), 291-299.

• Heath, Y. & Gifford, R. (2001). Post-Occupancy Evaluation of Therapeutic Gardens in a Multi- Level Care Facility for the Aged, *Routledge*, (25), 2, 21-43.

• Helbich, M. (2018). Toward dynamic urban environmental exposure assessments in mentalhealth research, *Environmental Research*, (161), 129–135.

• Helgason, R. & Daly, J. (1988). *Depressive Illness: Prediction of Course and Outcome*, Berlin: Springer-Verlag.

• J. Lingwood, M. Blades, E.K. Farran, Y. Courbois, D. MatthewsThe development of wayfinding abilities in children: Learning routes with and without landmarks, *Journal of Environmental Psychology*, (41),74-80.

• Janzen, G. & Jansen, C. (2010). A neural wayfinding mechanism adjusts for ambiguous landmark information, *NeuroImage*, 52(1), 36-47.

• Jiang, B., Chang, C. & Sullivan, W.C. Bin, J., Sullivan, W.C. & Chun, Y.C. (2014). A dose of nature: Tree cover, stress reduction, and gender differences, *Landscape and Urban Planning*, (132), 26–36.

• Kaiserman, J. (2017). *Urban Nature for Well-being: Design Recommendations forPsychological Benefits in Urban Public Spaces*, the degree of Master of Urban Planning. USA: University of Washington.

• Kaplan R. (2001). The nature of the view from home: psychologicalbenefits, *Environ. Behav*, (33), 507–542.

• Kaplan, R. & Kaplan, S. (1983). *Cognition and Environment: Functioning in an Uncertain World.* New York.: Praeger Publishers.

• Kaplan, R. & Kaplan, S. (1989). *The Experience of Nature.* New York: Cambridge

• Kaplan, S. (1995). The restorative benefits of nature: toward an integrative framework, Environ. *Psychol* ,(15), 169–182.

• Kardan, O., Gozdyra, P., Misic, B., Moola, F., Palmer, L.J., Paus, T., Marc, G. & Berman. (2001). *Neighborhood greenspace andhealth in a large urban center, report*. USA: washengton reports.

• Lau, Y. (2009). Introducing Healing Gardens into a Compact University Campus: Design Natural Space to Create Healthy and Sustainable Campuses, *Landscape Research*, 34(1), 55-81.

• Lee, A.C.K. & Maheswaran, R. (2011). The health benefits of urban green spaces: a review of the evidence, *Public Health*, 33(2), 212–222.

• Lee, I., Choi, H., Bang, K.S., Kim, S., Song, M. & Lee B. (2017). Effects of Forest Therapy on Depressive Symptomsamong Adults: A Systematic Review Int. *Public Health*, 14(3), 321.

• Lemogne, C., Basard, G.t. le., Mayberg, H., Volle, E., Bergouignan, L. & Lehéricy, S. (2009). In search of the depressive self: extended medial prefrontal network during self-referential processing in major depression, *Social cognitive and affective neuroscience*, 4(3), 305-312.

• Liuc, B., Liu, J., Wang M.i., Zhang Y. & LiL. (2017). From Serotonin to Neuroplasticity: Evolvement of Theories for Major Depressive Disorder Front Cell, *Neurosci*, 10, 33-89.

• Maller, C., Townsend, M., Pryor, A., Brown, P. & Leger, L. (2006). Healthy nature healthy people: contact with nature' as an upstream health promotion intervention for populations, *Health Promot*, 21(1), 45-54.

• Mayberg, H.S., Lozano, A.M., Voon, V., McNeely, H.E. & Seminowicz, D. (2005). Deep brain stimulation for treatment-resistant depression, Neuron, *Journal of Social Issues*, 63 (1), 79-96.

• Milligan C, Bingley A. (2007). Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults, *Health Place*, 13(4), 799-811.

• Ministry of Social Affairs and Health. (2006). *Health in All Policies*, Health Department, Finland, ISBN 952-00-1964-2.

• Monajemi, A. (2015). Family Medical Guide, Depression, Salis, Tehran, *Iran*, (2), 1-67.

• Monroe, S. M. & Simons, A. D. (1991). Diathesis-stress theories in the context of life stress research: Implications for the depressive disorders, *Psychological Bulletin,* 110(3), 406-425.

• Montazeri, A., Mousavi Seyyed, J., Omidvari, S., Tavousi, M., Hashemi, A. & Rostami, T. (2013). Depression in Iran: A systematic review Research texts, *Quarterly journal*, 12(6), 567-578.

• Motallebi, Q. & vojdanazadeh, N. (2011). The Impact of the Physical Environment of Therapeutic Spaces on Reducing Patients' Stress, Tehran, *Honar-ha-ye ziba,* 20(2), 35-46.

• Musa, H.D. & Yacob, M. R. (2018). Enhancing subjective well-being through strategic urban planning: Development and application of community happiness index, *sustaincle city and society*, (38), 184-194.

• National Institute of Mental Health. (2016). *Statistics Any mood disorder among adults.* Retrieved from https://www.nimh.nih.gov/health/statistics/any-mood-disorder.shtml.

• Nazari, H., Hermeshi, C., Mashayekhi, F., Valizadeh, M. & Falahati, F. (2001). Prevalence of Depression in Tehran City, *Tehran*, 3(22), 23-28.

• Oxman T. & Hull, J. (2000). Social support, and treatment response in older depressed primary care patients. *J Gerontol: Psychol Sci*, (56), 35–45.

• Oxman, TE. Barrett, M.D., Anjana Sengupta, K. W., Williams, JW Jr., Frank, E, Hegel, M. (2001). A Status of minor depression or dysthymia in primary care following a randomized controlled treatment',*General Hospital Psychiatry*, (23) 301–310

• Pagliaccio, D., Luby, J. L., Bogdan, R., Agrawal, A., Gaffrey, M. S., Belden, A. C., Botteron, K. N., Harms, M. P., & Barch, D. M. (2015). Amygdala functional connectivity, HPA axis genetic variation, and life stress in children and relations to anxiety and emotion regulation. *Journal of Abnormal Psychology*, 124(4), 817–833.

• Proshansky, H.M., Ittleson, H.W. & Rivlin, G.L. (1970). *Environmental Psychology: Man and His Physical Setting*. New York: Holt Rinehart and Winston, 43-86.

• Proshansky, H.M., Ittleson, H.W. & Rivlin, G.L. (1970). *Environmental Psychology: Man and His Physical Setting*. New

York: Holt Rinehart and Winston, 43-86.

• Sadeghi, Y. (2015). How to Prevent Depression and Its Prevention, Tehran, *Psychology and Educational Sciences*, (1), 127-105.

• Saki, k, Bahmani M, Rafieian-Kopaei, M. (2014). The effect of most important medicinal plants on two important psychiatric disorders (anxiety and depression)-a review, *Asian Pac J Trop* , 7(1), 34-42.

• Shermana, S.A., Varnib J.W., Ulrichc R.S., Vanessa, L. & Malcarne, S. (2005). Post-occupancy evaluation of healing gardens in a pediatric cancer center, *Landscape and Urban Planning,* (73), 167–183.

• Sullivan, W. C., Frumkin, H., Jackson R. J. & Chang. Ch-Y. (2014). Gaia meets Asclepius: Creating healthy places, *Landscape and Urban Planning*, 127, 182–184.

• Sullivan, W. C., Frumkin, H., Jackson R. J. & Chang. Ch-Y. (2014). Gaia meets Asclepius: Creating healthy places, *Landscape and Urban Planning,* (127), 182–184.

• Taghvaie, H. (2018). Landscape Architecture: An Introduction to Definitions and Theoretical Foundations, First Edition, Beheshti Publishing, Biobank participants, *planetary-health,* (2) , 162-173.

• Tanja-Dijkstra, K. & Andrad,C.C. (2018). health care setting Environmental Psychology and Human Well-Being,Effects of Built and Natural Settings,313-334.

• Thomas E. Oxman, Sengupta, A. (2001). Evidence-based practices in geriatric mental health care: an overview of systematic reviews and meta-analyses, *Am J Geriatr Psychiatry*, (10), 3.

• Ulrich, R. S. (2004). *Aesthetic and Affective Response to Natural Environment*. In Behavior and the Natural Environment, edited by I.Altman and J. Wohlwili, 85-125. New York: Plenum Press.

• Ulrich, R.S. & Parsons, R. (1990). *Influences of passive experiences with plants on individual well-being and health,* presented at the National Symposium on the Role of Horticulture in Human Well-Being and Social Development, Washington, D.C.

• Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Mile, B.A. & Selson, M. (1991). Stress recovery during exposure to natural and urban environments, *Journal of Environmental Psychology*, 11, 201-230.

• Van Den Berg, A.E., Hartig, T. & Staats, H. (2007). Preference for Nature in Urbanized Societies: Stress, *Restoration, and the Pursuit of Sustainability*, 63(1), 79–96.

• Van den Bosch, M. & Ode Sang, Å. (2017). Urban natural environments as nature-based solutions for improved public health – A systematic review of reviews, *Environmental Research,* (158), 373–384.

• Walsh, C.J., Roy, A.H., Feminella, J.W., Cottingham, P.D., Groffman, P.M., II RPM. (2005). The urban stream syndrome: current knowledge and the search for a cure. *Journal of the North American Benthological Society*, 24(3), 706-23.

• White, M.P., Alcock, I., Benedict, W. & Wheeler Michael, H. (201). Depledge, Would You Be Happier Living in a Greener Urban Area?, A Fixed-Effects Analysis of Panel Data, *Psychological Science*, 24(6), 920-928.

• WHO. (2011). Burden of Disease from Environmental Noise: *Quantification of Healthy Life Years Lost in Europe.* The World Health Organization European Centre for Environment and Health, Bonn.

• WHO. (2012). *Action Plan for Implementation of the European Strategy for the Prevention and Control of Non communicable Diseases* 2012−2016. WHO Regional Office for Europe, Copenhagen.

• WHO. (2016). *Urban Green Spaces and Health*, A Review of Evidence.

• Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities "just green enough." *Landscape and Urban Planning,* 125, 234–244.

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