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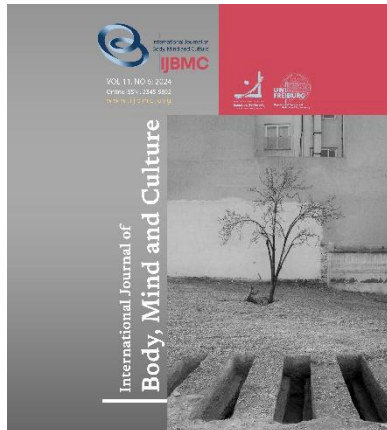
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Explaining the Influence of Architecture in Reducing Depression Symptoms

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ABSTRACT

Objective: The current research has been to investigate the effect of architecture and environmental design on mental states and human interactions, as well as to identify spatial elements that increase or decrease the symptoms of depression, finally, by designing a questionnaire to provide practical suggestions to architects in order to improve the mental health of depressed people and their interpersonal communication, especially in the residential space.

Methods and Materials: The research employed a combined exploratory approach. Data collection methods in the qualitative phase included documentary, field, and semi-structured interview techniques. In the quantitative phase, a researcher-designed questionnaire was utilized. Data analysis was conducted using SPSS version 26 for quantitative data, content analysis for qualitative data, and the Chi-square test in the quantitative section.

Findings: Findings showed that among the investigated elements, color, materials, lighting, sound system, and sound insulation, private space, green space, placement of spaces, and architectural style affect decreasing depression symptoms and improving interpersonal relationships ($P<0.05$).

Conclusion: Based on the findings of the research, architectural and environmental design components can reduce symptoms of depression and improve interpersonal relationships. Finally, a suggested questionnaire was presented along with effective and practical guidelines for the use of architects and designers.

Keywords: Architecture, depression, mental health.

Introduction

The quality of the environment and architectural space is one of the main characteristics of life in the present era, so a major part of the quality of human life is affected by the surrounding architecture (Martin et al., 2015). Therefore, the role of architecture and environmental design cannot be ignored in increasing the health of the body, soul, and mind of people and reducing their negative emotions (Spence, 2020). In this context, the book "Surrounded by Environment" has comprehensively examined the findings of environmental psychology as one of the postmodern paradigms that create theory in architecture and urban planning. In this book, while introducing the findings of environmental psychology in two branches of behavioral sciences and cognitive sciences, suggestions for applying these findings in the design of the living environment are presented. Topics such as metabolic design, environmental graphics, sociability and antisocial design, flexibility design, capability-based design, perceptual-based design, behavioral design, multi-

sensory architecture, and design compatible with perception are some of the topics that have been reviewed. Among the other proposals presented in this book to the designers and environmental (Yang & Yuan, 2022). planners, architects, and urban planners, we can mention holistic planning - component-oriented design, ambiguous or deceptive design, reminiscent design, difficult creation of beauty, and finally, creation of place (Shahcheraghi, 2014).

Even though nowadays designers and architects use various facilities to provide favorable living conditions again, it can be seen that, contrary to their expectations, there are negative effects on the body, soul, and spirit of many people, which threatens their health (Mclaughlan & George, 2022). Therefore, despite many efforts, many negative effects are still visible in the human living environment, and this can be caused by the inappropriate quality of people's living environment and insufficient knowledge of humans, their moods, and psyche as beneficiaries. Research related to health and urban life places psychological disorders, especially depression, at the top of the diseases of modern urban life (Jovan Faruzandeh, 2017). Considering the position and effects that environmental design, especially residential space, has on the state of lifestyle and the level of vitality, satisfaction, and hope of life and mental health of man and the quality of his relationships (Martin et al., 2015). Therefore, identifying effective architectural indicators and investigating their effects can be very helpful in reducing psychological disorders, especially depression.

Methods and Materials

Study Design and Participants

A mixed method was used in this research. Therefore, this research includes two qualitative and quantitative stages. The research strategies in the qualitative phase are case study and correlation in the quantitative phase. In this research, the necessary information was collected in two stages. The first stage is the qualitative phase, which considers that the qualitative research plan starts with a problem or an idea about the phenomenon that the researcher seeks to understand. To collect information, the subject's literature has been reviewed at the beginning. For this purpose, written sources such as books, articles, theses, magazines and newspapers,

images (photos and maps), sounds, and internet sites have been used. It means the library or documentation method.

Then, by referring to the places related to the research subject, influential symbols and related examples were identified and examined; It means the field method. Next, to accurately identify the hidden components and deeply understand the existing relationships, multiple semi-structured interviews were conducted with sample people. During the interviews, a tape recorder was used to record them, and then the text of the interviews was completely and accurately written down to be examined and analyzed in depth. The second stage, the quantitative phase: in this stage, the questionnaire created by the researcher in the previous stage was used to collect data. This questionnaire was sampled from all people, and their answers were collected and recorded. Because the samples were selected from the clients of Jan Ziba Clinic in Tehran, it can be said that non-probability (non-random) sampling was chosen in this research.

In general, the steps of this research are as follows: Investigating what depression is; Examining the place of architecture, landscape, and environment in improving and facilitating the treatment of depression disorder; Examining the relationship between health and architectural variables such as form, nature, color, sound, and light. from the perspective of practical concepts and strategies to improve and facilitate the treatment of depression and collecting materials related to the process of depression improvement around architectural variables; Examining samples with depression disorder; Designing a questionnaire to examine trauma as well as happy memories of people and examine its significance in the intra-personal and interpersonal relationships of depressed people; Analysis of findings and examination of various dimensions of related variables; Presenting theoretical results for the application of depression treatment teachings in architecture.

The studied population consists of all the clients of the Jan Ziba Clinic in Tehran. In deciding to choose the sample size, three basic factors should be considered: First, the necessary degree of accuracy or the consequences of wrong estimation of population indicators; second, the degree of variability of key characteristics in the field of population study; and third, the characteristics of the levels of measurement and

analysis that have been used. In the qualitative part, the theoretical saturation criterion has been used as a standard for deciding on the endpoint of sampling and the number of samples studied. In other words, after observing the mere repetition of previous information in new interviews, the collection of information was stopped.

Although in the research method and statistical fields, wide differences are seen in the field of sample size selection, and sometimes fixed ratios are stated for the sample size selection. However, the sample size in the quantitative part of this research is 100 items determined based on Glen D. Israel's table to calculate the sample size.

The sample studied in the research was selected from the clients of Jan Ziba Clinic in Tehran. In this regard, people who had symptoms of depression according to the diagnosis of a clinical psychologist and whose score on the Beck Depression Test was above 20 were included in the sample group of depressed people. Those who did not have symptoms of depression, according to the clinical psychologist, and whose Beck depression test score was 19 or less were included in the group of healthy people.

Before the beginning of the research, written consent was obtained from all sample subjects for their participation in the research, and there was no coercion or external pressure to participate in the study and interviews and answer the questions and questionnaires. Also, the subjects are assured that their information is only for research purposes and will remain completely confidential.

Data Collection Tools

Most of the time spent writing this treatise was spent on designing the questionnaire, which, according to the author, is the most important part, as well as the interpretation of its answers. Here is the first response questionnaire and the final version of the researcher-made questionnaire. Introduce and describe your current family. How much is your family's monthly expenses? Describe your paternal and maternal family. What is the image of family in your mind? How do you feel about your father's house (color, sense, and mood)? What is your most vivid good memory from the beginning of your life about home?

What is your most vivid bad memory about home from the beginning of your life until now? Introduce and describe other family members. (Habits, tastes, mood, energy level) How would you describe the general atmosphere of the family? What are your family hobbies? If someone listens to the sounds of your house from outside, what sounds do they hear at different hours of the day and night? Describe three of the arguments and fights that happened in your home during the last month. Who was he with? What was it about, and where did it happen in the house? How many televisions do you have at home, and where are they located? How long and at what times is the TV on?

What TV/satellite program are you interested in? Who spends the most time watching TV at home? At what times? With what volume? How important or interesting is cooking to you? How much time do you spend cooking? Who cooks, and what people are involved in cooking? In which part of the house do you gather together? What makes you feel good in your company? Describe your personality. What do others who know you and see you from the outside say about you? Please take a picture of where you live and tell your opinion about different parts of it. What part of your life do you dislike? Why? Which part of your life do you like? Why?

What things bother you when you come home from work/out? What things are desirable and pleasant? What are your interests and opinions in the field of nature and flora? If you want to make a change in the same place you live - with the same conditions and the same size - what would it be? What is not to your liking about the personal spaces of other family members? What are your hobbies? How often do you attend family gatherings? How much do you enjoy it? What is your hobby in such gatherings? How frequently are you in friendly groups? How much do you enjoy it? What is your hobby in such gatherings? What kind of music are you interested in? How much, at what time, and in which part of the house do you listen the most? How is your weekend going?

Describe your schedule for the past three weekends in detail. What materials are you interested in at home? What materials are currently used in your home? What cartoon image was enjoyable for you as a child? Would you rather have a guest come to your house or go to a party or restaurant? Describe the most enjoyable trip you took. What are pleasant and unpleasant fragrances

for you? What fragrances do you like/dislike in terms of longevity? What is a memorable smell for you? What was the gender and color of your parents when you were a child? What color and gender is the person in the family who bothers you?

Where was the safe space of home for you during happy and sad times as a child? What were you doing there? How friendly are you? If you want to imagine your home with infinite possibilities, what would it look like? What facilities does your dream room have?

The Beck Depression Inventory (BDI): This inventory developed by Beck (1988) is a 21-item multiple-choice self-report questionnaire that is one of the most widely used psychometric tests for measuring depression severity. In this questionnaire, each substance (symptom of the disease) is divided into four grades, from zero to three, based on its severity. A score of zero indicates the lowest level, and a score of three indicates the highest level of severity of experiencing a depressive symptom. The patient should mention the experience of the mentioned symptoms in the last two weeks. This questionnaire is used to evaluate the severity of depression in people over 13 years old. The total scores of each questionnaire can be between 0 and 63; Scores of 0-13 indicate the lowest level of depression, scores of 19-14 indicate mild depression, scores of 20-28 indicate moderate depression, and scores of 29-63 indicate severe depression. Criterion validity of the BDI-II is positively correlated with the Hamilton Depression Rating Scale (r = 0.71) with a high one-week test-retest reliability r = 0.93 (suggesting robustness against daily variations in the mood) and internal consistency of α =0.91 (Bahodirovna et al., 2023; Bakhtiyarovich et al., 2023; Sauletzhanovna et al., 2024).

Data analysis

In the qualitative stage, the content analysis method is used to analyze the data. In the quantitative stage, the data collected from the researcher-made questionnaire is analyzed with the chi-square test and with the help of SPSS software (version 26).

Findings and Results

The result of the chi-square test showed that for depressed people, there is a significant difference between the space annoyance factors. According to the

frequencies observed, many people in the depressed sample group consider "lack of privacy" to be the most basic disturbing factor in home design. The next factor, "difficulty hearing loud TV sounds and family members' conversations," was mentioned. Based on the obtained results, the architect needs to design the privacy that the person needs. Also, in the placement of spaces and the connection between them and the selection of consumables, sound insulation should be considered, especially in the case of private spaces.

The result of the chi-square test in examining pleasant memories in the home environment showed that there is a significant difference between the specified elements for depressed people. According to the frequencies observed, the bright house was ranked first, followed by the greenness of the house and the order of the spaces. In contrast, low light at home was ranked last. As a result, for depressed people, a bright, bright, and greenhouse reminds and evokes their pleasant memories. So, using these elements will have the most positive effect on depressed people.

In examining the color of happy memories in depressed people, the result of the chi-square test showed that there is a significant difference between the colors chosen by people. According to the reported frequencies, most of the depressed people in the sample group considered white and bright colors to be the color of their happy memories, and the second rank was green and close to it. While red, orange, and yellow colors took the last rank for happy memories of depressed people.

The highest observed frequency was related to the smell of fresh grass. In the next ranks, the similarity of good memories was to the smell of bread, sweets, and firewood, and the least frequency was related to the smell of Oud. Therefore, scents also remind and evoke pleasant memories for depressed people. In examining the relationship between the two variables of pleasant memories in the atmosphere of the home and the color of the memory, the results of the chi-square test indicated that there was a significant relationship between these two variables in the groups that chose the elements of greenery and a bright and bright house. Those who chose a green element for a pleasant memory often considered green as the color of a pleasant memory, But in the group that did not select the green element, the dominant color was white. On the other hand, the group that chose the bright and bright element

as a pleasant memory often recognized the white and bright color as the color of the pleasant memory.

In examining the relationship between the two variables of pleasant memories in the home environment and the smell of memories, the results of the chi-square test indicated that there was a significant relationship between these two variables in the groups that chose elements of greenery and simple architecture. People who chose a green element for a pleasant memory often recognized the smell of fresh grass as the smell of a lovely memory. However, in the group that did not choose the green element, the dominant smell was the aroma of bread and sweets.

In examining the color of negative memories, the chi-square test showed that there is a significant difference between the mentioned colors for depressed people. The color brown and close to it, with the highest observed frequency, took the first place in the color of unpleasant memories. The colors green and close to it and the colors red, orange, and yellow were the least chosen by depressed people for the color of negative memories. The result of the chi-square test about the smell of negative memories in the home environment showed that for depressed people, there is a significant difference between the smells that evoke unpleasant memories. So, among the identified smells, the first rank was related to the smell of cigarettes, and the next rank was the smell of rotting.

In examining the relationship between the two variables of unpleasant memories in the home space and the color of that memory, the results of the chi-square test indicated that in the groups that chose the elements of lack of private space, coldness, and soullessness of the space, intense feeling of loneliness and lack of scenery There was a significant relationship between these two variables. The results of the chi-square test showed that there is a significant relationship between these two variables in people whose negative memories were related to the elements of lack of private space and lack of space.

The result of the chi-square test showed that if depressed people had flowers and plants during their negative memory, the negative effects of that memory would be reduced. The results of the chi-square test showed that for people whose negative memories were related to the element of lack of private space, there is a significant relationship between these two variables. The result of the chi-square test showed that there was a significant difference between the mentioned spaces. The most frequently observed argument was in the bedroom, and the second place was the argument in the kitchen. After that, arguments in the yard and living room were the least frequent.

Discussion and Conclusion

The current research has been to investigate the effect of architecture and environmental design on mental states and human interactions, as well as to identify spatial elements that increase or decrease the symptoms of depression. Regarding the architectural aspects that affect depression, the annoyingness of interior design in the house was investigated by the members of the depressed sample group. The result of the chi-square test showed that for depressed people, there is a significant difference between the space annoyance factors. According to the frequencies observed, many people in the depressed sample group consider "lack of privacy" to be the most basic disturbing factor in home design. The next factor, "difficulty hearing loud TV sounds and family members' conversations," was mentioned. Based on the obtained results, the architect needs to design the privacy that the person needs. Also, in the placement of spaces and the connection between them and the selection of consumables, sound insulation should be considered, especially in the case of private spaces.

Therefore, people's responses to this item help architects understand what things are annoying for people to include in their plans. If the thing that is annoying for the person is not observed in the design, it can have negative psychological consequences, For example, increasing anxiety in a person, creating tension between him and family members, and the occurrence or increase of depressive symptoms. In this regard, Artek (1994) stated that the main goal of interior design is to develop functionality, enrich aesthetics, and consider the psychological effects of interior space (Queirós et al., 2020).

The result of the chi-square test in examining pleasant memories in the home environment showed that there is a significant difference between the specified elements for depressed people. According to the frequencies observed, the bright house was ranked first, followed by the greenness of the house and the order of the spaces.

In contrast, low light at home was ranked last. As a result, for depressed people, a bright, bright, and greenhouse reminds and evokes their pleasant memories. So, using these elements will have the most positive effect on depressed people. Therefore, by using the person's response to this item, the architect can use more elements in his design that remind the person of his good memories at home. A house with these features can reduce the symptoms of depression or prevent it in susceptible people.

According to a study (Ertek, 1994), what elevates a space to a place is its combination with deep concepts and meanings that have expanded and deepened over time. Also, A study (Jovan Faruzandeh, 2017) stated that place is the result of meanings that are obtained over time and with the perception of the environment. It should be noted that the creation of meaning arising from human perception over time is an issue that is more related to the unconscious part of people and their perceptions in the silent layers. In psychology, it is interpreted as dependence and a sense of belonging; It means a feeling combined with emotion in a place. As a result, the place is experienced in a rooted way and also includes various socio-cultural layers.

In examining the color of happy memories in depressed people, the result of the chi-square test showed that there is a significant difference between the colors chosen by people. According to the reported frequencies, most of the depressed people in the sample group considered white and bright colors to be the color of their happy memories, and the second rank was green and close to it. While red, orange, and yellow colors took the last rank for happy memories of depressed people.

. In line with these findings, the research results of Yunavskait et al. (2020) indicate that different color routines can be a factor that affects the human body and mind. It may also be used to address a person's psychological characteristics and issues, such as depression, But not through direct physical contact with it. Also, in the investigation of the smell of pleasant memory in depressed people, the result of the chi-square test showed that there is a significant difference between the pleasant smells chosen by people(Marshall, 2020).

The highest observed frequency was related to the smell of fresh grass. In the next ranks, the similarity of good memories was to the smell of bread, sweets, and firewood, and the least frequency was related to the

smell of Oud. Therefore, scents also remind and evoke pleasant memories for depressed people. Consequently, they can be used to recall and even restore pleasant memories, to create positive effects on people's mental states. In this regard, architects can, based on people's answers to this question, suggest to them which scent to use more in their home or private space to have positive effects on their moods (Croijmans et al., 2021).

In examining the relationship between the two variables of pleasant memories in the atmosphere of the home and the color of the memory, the results of the chi-square test indicated that there was a significant relationship between these two variables in the groups that chose the elements of greenery and a bright and bright house (Cai et al., 2021). Those who chose a green element for a pleasant memory often considered green as the color of a pleasant memory. However, in the group that did not choose the green element, the dominant color was white. On the other hand, in the group that chose the bright and bright element as a pleasant memory, they often recognized the white and bright color as the color of the pleasant memory (Yrondi et al., 2020). According to Steer et al. (2000), considering that knowledge of color and cultural aspects affect the choice of color, It is possible to design the interior environment in a way that improves people's quality of life and reduces symptoms of depression (Steer et al., 2000).

In examining the relationship between the two variables of pleasant memories in the home environment and the smell of memories, the results of the chi-square test indicated that there was a significant relationship between these two variables in the groups that chose elements of greenery and simple architecture. People who chose a green element for a pleasant memory often recognized the smell of fresh grass as the smell of a pleasant memory. However, in the group that did not choose the green element, the dominant smell was the aroma of bread and sweets. Also, in the group that chose the simple architectural element as a pleasant memory, they often considered the smell of fresh grass as a pleasant memory, but in the group that did not choose the simple architectural element, the predominant pleasant smell was the aroma of bread and sweets.

In general, in explaining these findings, it can be said that in the human mind, a series of memories, colors, scents, feelings, and elements are symbolically tied together with feelings. Considering that such symbols

and elements, unconsciously, have significant effects on mental and spiritual states, behaviors, and communication between people, The purpose of asking these questions is to find these symbols, decipher them, and use the obtained data in the design. As a result, the answer to such questions provides practical and useful information to architects and designers, Such as the state of mind, experiences and feelings of the person, interests and things that he does not like and even bother him, as well as everything that they evoke for the person. The result of the chi-square test in examining unpleasant memories at home for depressed people showed that there was a significant difference between the specified elements. In the first place was the intense feeling of loneliness in a certain space of the house. In the next place was the lack of private space in the house. In explaining these findings, it can be said that just as elements and symbols can evoke pleasant memories and positive emotions in humans, they can also evoke unpleasant memories and negative emotions (Luan et al., 2023).

Acknowledgments

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this study.

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