

# Exploring the stress of home quarantine among schoolchildren to discover the components that affect the meaning of place in residential complexes in Isfahan city

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## Abstract

In today's world, due to the necessity of home quarantines under various conditions such as air pollution and the spread of infectious diseases, students spend long hours at home. Therefore, adolescents who are exposed to such events are at risk of stress- and trauma-related disorders due to their immature emotional reactions and underdeveloped coping strategies. Hence, the necessity of examining student housing in the wake of the quarantine process and considering their physical and psychological needs to achieve their comfort at home is clear and important. The overall aim of this research was to understand and phenomenologically investigate the stress caused by home quarantines among students in order to enhance the components that are effective in experiencing the meaning of place in the environment of residential complexes. Therefore, the present qualitative (exploratory) study was conducted using a descriptive phenomenological approach. In this method, information was collected from existing reliable sources and semi-structured interviews with students in District 3 of Isfahan city, who were selected based on purposive sampling criteria and sampling continued until saturation was reached. To analyze the findings, the thematic analysis method was used using Atlas.ti software, and the data were categorized and described. The research results indicate that by examining the phenomenon of stress caused by home quarantine in students, considering their individual psychological-emotional and physiological behaviors during that period, and paying attention to the symptoms associated with this phenomenon, it is possible to discover the components that are effective in experiencing the meaning of place (environmental characteristics that are effective in promoting the environment and creating vitality in it). In fact, the indicators that affect the individual behavior of students in the residential environment during a long period of home quarantine have also affected the indicators of environmental vitality (physical and psychological indicators).

**Keywords:** Stress; Home quarantine; Students; Residential complex; Meaning of place.

## 1. Introduction

Housing has always been a platform for human life, interacting and influencing other aspects of life. It is the most complex aspect of building design. The design of this function goes beyond answering the program; It should also display a public face while maintaining the private life of its residents (Asfi and Eimani, 2014: 64). Therefore, choosing a suitable and appropriate housing according to the different needs of individuals is one of the most important concerns that every person faces at least once in their lifetime (Heydari et al., 2018: 58). Depending on the cultural, social and even demographic characteristics of individuals in different societies, the factors and criteria that define the spatial desirability of a house are different from each other (Ibraimović, 2013). On the other hand, in today's world, with the necessity of home quarantines under various conditions such as air pollution, the spread of infectious diseases, and people spending long hours at home, the attention of designers and architects to housing design has increased. For example, in recent years, with the expansion and spread of COVID-19, changes have been made to the way people

live in society, which has led to people being quarantined at home and the closure of many recreational and educational centers, and has negatively affected the mental health of people. In fact, during the spread of COVID-19, staying at home for different members of society (social distancing) is the most common and best strategy to prevent the spread of the disease. Based on this, with people staying at home, various psychological disorders may be observed among different members of the family (Kao et al., 2020). Therefore, in crisis situations, the social and individual structures of life are disrupted. Disruption of individual structures means a decrease in the individual's power of control and a decrease in the predictability of the flow of life (Robin and Weissl, 2020). Therefore, this insecurity will cause anxiety. Therefore, during the outbreak of this disease, people are looking for more information to relieve their anxiety (Chang et al., 2020).

Given the increasing number of home quarantines under various conditions and the necessity of people staying at home and the lack of research in this field, it seems that conducting research in the field of residential environment design with a focus on long-term home stay and the

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different needs of people in the home environment during this period, to help better pass this category and reduce the consequences of it, such as ways to deal with anxiety and the consequences of long-term home quarantines, is essential and can help improve the quality of life of people and the mental health of the community. (Sun L, 2020).

On the other hand, research indicates that adolescents who are exposed to such events are more likely to experience stress- and trauma-related disorders due to their immature emotional reactions and underdeveloped coping strategies. Adolescents need to connect with peers and the social environment outside the family to go through the natural process of their growth. Therefore, in such circumstances, home quarantine will be accompanied by more challenges for adolescents (Aghkatee and Abdolkhdaei, 2021). Therefore, understanding the feelings and responses of adolescents is essential to properly address their needs during long-term home quarantines in the home environment. It is also necessary to provide solutions to improve the design of the residential environment to address the needs of adolescents during the home quarantine period in order to control and prevent the possible consequences of these conditions on adolescents who are an important and influential group in society. Any psychological problems they may experience can lead to serious problems in the future of society. Therefore, with a look at the future of human life and the occurrence of various changes such as global warming, it is expected that people will stay at home more and work from home. As a result, the future of home design needs to change. Therefore, given the current lifestyle and the need to examine people's housing in the wake of the quarantine process and to consider the physical and psychological needs of residents in order to achieve their comfort at home, it is clear and important. Based on the foregoing, the present study will aim to understand and phenomenologically investigate the stress caused by home quarantines among students in order to enhance the components that are effective in experiencing the meaning of place in the environment of residential complexes. In other words, according to the researchers, if the environmental issues of residential complexes are repaired, the chronic stress caused by the quarantine period will be more tolerable. Therefore, this research seeks to answer the question of how by examining the phenomenon of stress caused by home quarantines among students, the components that are effective in experiencing the meaning of place are revealed (extracted)?

## **2. Research Background**

In the context of the current research, it is important to acknowledge the existing literature related to the concepts of stress and meaning of place. Among the relevant studies, "A Process Approach to Stress in Social Psychology of Mental Health: A Sociological Study of Stress" (Riahi & Rahbari, 2014) delves into the sociological aspects of stress and its various forms.

Additionally, works such as "Basic Concepts in Environmental Psychology" (Eshtgh & Colleagues, 2017) explore the definition and application of environmental psychology concepts in architecture and urban planning. Furthermore, research has been conducted on the concept of place and its various aspects, including the role of meaning in the formation of a sense of place (Kelali & Modiri, 2012) and the factors contributing to the vibrancy of residential spaces (Tolu' Del & Ashraf, 2017). These studies highlight the significance of space, time, and human interaction in shaping the meaning of place and the vibrancy of living environments. In the context of the COVID-19 pandemic, Todd (2020) examined the impact of the pandemic on education, noting that the sudden shift to virtual teaching has created numerous challenges for both educators and students. Peacock & Cowan (2019) also found that the transition to virtual learning has negatively affected student engagement and their positive attitudes towards academics. Regarding the health of residents during home quarantine, Mojtabovi et al. (2021) conducted a study titled "Exploring Effective Components for Promoting Health in Residential Spaces During and After the COVID-19 Pandemic: A Case Study of the 600-Unit Residential Complex in Mashhad." The study aimed to identify and categorize the challenges faced by residents in residential spaces during and after the pandemic and to develop a conceptual model. The findings indicated that the 600-Unit Residential Complex in Mashhad adheres to essential criteria such as green spaces, terraces, access to open spaces, desirable views, ventilation, climate control, and noise pollution reduction, contributing to the overall satisfaction of the residents.

Ehsani oskoui et al. (2021) conducted a study titled "The Effect of Residential Environmental Conditions on Individual Adaptation to Quarantine During the COVID-19 Pandemic." The study aimed to identify the environmental criteria of housing that are effective in individuals' adaptation to quarantine conditions. Additionally, the study examined the changes that residents have made to adapt their homes to the needs and conditions of the quarantine period. The research findings indicate that the environmental conditions of housing can significantly impact individuals' adaptation to home confinement. Residential environments that have greater flexibility and have satisfactorily responded to the conditions of the quarantine period have been more successful in creating adaptation to long-term home confinement. Based on the research findings, to enhance residents' adaptation to quarantine conditions, the possibility of engaging in various activities such as gardening, having solitude, exercising, and virtual activities should be considered. Additionally, the quantity and quality of common areas, connection to nature, the use of color in interior spaces, and unit density in residential complexes should be given greater attention in housing design. Based on the review of existing research related to the current research topic, it can be concluded that no study has investigated the role of meaning in the environments of residential complexes, considering the

long-term quarantine in these complexes and the consequences that cause stress in individuals. The research topic lacks empirical research examples.

### 3. Theoretical Framework

Stress caused by events and crises such as home quarantine, due to various causes such as the COVID-19 pandemic and its detrimental psychosocial effects, has significantly impacted the health, psychological well-being, and adaptation of all age groups. In Iran, 39% of students suffer from behavioral and emotional problems, with a higher prevalence among girls than boys (74.19% vs. 91.15%). The findings of Shakhani et al.'s research showed a significant negative relationship between life expectancy and mental health in high school girls (Aliniadun & Forghani, 2022: 236). For many individuals, especially children and adolescents, enduring long-term quarantine is an unpleasant and stressful experience that disrupts their daily routines. In addition to quarantine, the detrimental effects of stress caused by events such as the potential for contracting infectious diseases involve children and adolescents like other age groups (Abolmali, 2020). Indeed, research findings indicate that children and adolescents engage in less physical activity, have disrupted sleep patterns, and adhere less to a healthy diet during summer weekend breaks (Mason et al., 2018). This phenomenon intensifies when children are confined to their homes and lack outdoor activities. On the other hand, due to the prevailing circumstances, stressors at home such as long-term fear of contracting COVID-19, unpleasant thoughts and boredom, lack of interaction with classmates, friends, and teachers, insufficient space at home, and in some cases, financial and economic problems of parents can have lasting effects on the mental health of children and adolescents (Brooks et al., 2020).

Students are one of the most vulnerable groups to events and crises. Research indicates that crises have significant impacts on educational services in society. These impacts are not only due to the harm inflicted on teachers and students but also due to the sudden disruption of the educational period and the resulting psychological disorders that occur in students (Vosoghi et al., 2020). In other words, school closures and home quarantine due to the COVID-19 infectious and contagious disease have a significant impact on the physical and mental health of children and adolescents (Moridi & Nouri Moghaddam, 2022:89). Among the important psychological variables in students that are affected by environmental stress are emotions and emotion regulation strategies. Cognitive emotion regulation refers to the internal and external response processes in the face of control and monitoring,

evaluation, and also moderation of emotional interactions, especially their transient characteristics, to achieve the intended goal (Goldberg et al., 2016). Furthermore, high school students undergo significant changes due to the transition from childhood to adolescence and the resulting transformations. These changes can bring about various sources of stress that can affect students' academic progress and success in the present and future (Aliniadun & Forghani, 2022:235). When examining the quarantine environment for these individuals (home), it is worth noting that the prolonged time spent indoors can pose various challenges for post-pandemic housing design. As we are forced to stay and work from home, the spaces after home and the afternoon office will witness a major transformation, as we become more aware of an interesting and new approach to the function of our homes and workspaces (Arabani & Bavar, 2020). In the face of this background, the current health crisis should also develop our built environment to enhance health (Chang, 2020).

Extensive research has been conducted on the concept of place and its experiential dimensions, aiming to understand and explain the reciprocal relationship between the environment and individuals, and its impact on their quality of life. In 1936, Kurt Lewin pioneered the discussion of the place-person relationship within the framework of personality psychology, highlighting the role of physical place in behavior (Lewin, 1936). During the 1970s, disciplines such as geography, sociology, and landscape architecture sought to measure the connection between place and individuals and its consequences for human behavior. In this context, concepts such as place attachment (Manzo, 2001; Low & Altman, 1992), social attachment, sense of place (Tuan, 1974), social cohesion, place dependence (Williams & Roggenbu, 1989), place identity (Proshansky, 1978), place belonging, and rootedness were developed. Today, behavioral environmental studies (Rapaport, 1990) have emerged as a significant field in understanding, analyzing, and evaluating the impact of the environment on the perceptions and behaviors of users within a given environment. By comprehending the parameters that influence human behavior and the users' understanding and perception of space, environmental designers can achieve better outcomes in designing higher-quality environments. Therefore, Table 1 provides an overview and categorization of the meaning of place from the perspectives of various experts relevant to the current research.

Table 1  
Examining the meaning of place from the view of different experts

Perspective	Author(s)	Definition
Experiential	Merleau-Ponty, 1998	The meaning of place emerges from a combination of factors that result from the interaction between humans and place. This interaction occurs through the messages conveyed by the various elements present in the place.

Cultural	Rapoport, 1990	People give meaning to the environment through culture (including their values, beliefs, and worldview).
Cognitive	Lynch, as cited by Heidari, 2013	The meaning of place arises from the relationship between the physical elements of space and mental patterns.
Geographic, Physical, and Identificational	Gieryn, as cited by Heidari, 2013	Place encompasses three components: a specific geographic location, physical form, and identity, which includes meaning and value.
Physical, Functional, and Social	Van der Klis & Karsten, as cited by Heidari, 2013	The meaning of place is derived from three parameters: the physical environment, function, and social aspects.
Distinction, Value, Coherence, and Change	Gustafson, as cited by Heidari, 2013	Gustafson identifies four underlying factors that play a significant role in shaping meaning: distinction, value, coherence, and change

An examination of meaning from various perspectives reveals that it encompasses all the mental constructs that a stimulus evokes in an observer when they compare it to their own experiences, goals, and intentions. Therefore, the meaning of place emerges from a combination of factors that result from the interaction between humans and place. This interaction occurs through the messages conveyed by the various elements present in the place. In essence, deciphering these messages establishes a connection between humans and place. Consequently, one of the primary aspects and objectives of the communication and interactions between the two is to receive and perceive the meanings of place. In this context, understanding the process of meaningful perception requires considering the human and the world in a reciprocal relationship. According to this perspective, one cannot comprehend the subject without considering the world in which they live. Perception, therefore, is a holistic structure founded on biological behaviors and culminating in higher meanings and conceptual awareness. Both of these aspects are integral to perception and cannot be separated from it (Merleau-Ponty, 1998).

A comprehensive review of various theories on the meaning of place suggests that three principles govern the content of place meaning: distinction, connection, and continuity (Alihahsabi & Charbgoon, 2014). These principles are independent of the positive or negative values that govern the processes of meaning perception. Distinction is a necessary precondition for the perception of meaning, and meaning cannot be conceived without connection. Continuity, on the other hand, stands in contrast to discontinuity and, through its temporal nature, encompasses the preservation of authenticity and identity over time. In this sense, meanings must be formed on the basis of shared familiar meanings that have persisted over time in order to be referable to the mind in the passage of time (Alihahsabi et al., 2016:19). Based on a review of theories, this research presents a triadic model of place. Drawing on Rapoport's theory of the environment as constituted by space, time, meaning, and communication, as well as the definition of meaning and communication provided by other scholars in urban geography, and the spatio-temporal and social nature of place, the triadic model of space, time, and human forms the vertices of the proposed model of place (Figure 1). In the proposed model, not only the vertices but also their relationships are

important. The three components of space, time, human, and their relationships, which constitute the environment, form place when they are in a reciprocal and dynamic relationship with each other (Seamon, 2014).

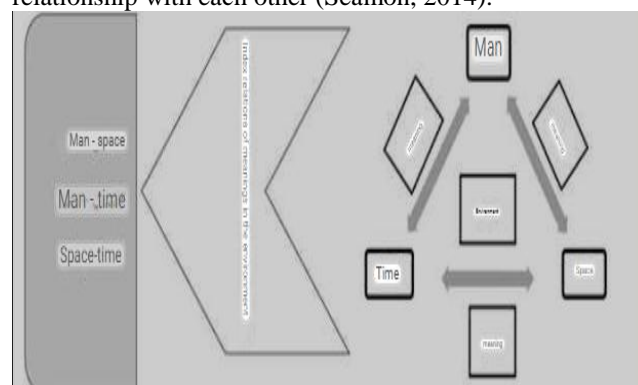


Fig. 1. The triple relationship of space, time and man in the construction of place  
 (Source: Ali al-Hesabi, 2016)

In addition to understanding the physical elements and tangible features of the environment, comprehending the meanings and messages that arise from it is crucial when examining the time component in the relationship between humans and the environment. A better understanding of the temporal environment is achieved at its best when, in addition to examining the physical elements, the meanings and concepts that arise from it, and the various perceptions of the actors towards it, are explored (Falihat & Noohi, 2012: 32). Individuals' emotional states in a place, as well as the memories they have of different places, play a significant role in how they perceive the meanings of different places. Therefore, by understanding the different meanings that individuals perceive in different environments, it is possible to achieve higher-quality environments. In this regard, understanding the different meanings, the mechanisms that shape these meanings, and the factors that influence the quality of these meanings is of great importance (Heidari et al., 2019: 68). Therefore, given the aforementioned discussions about the time component in evoking the meaning of place and the necessity of examining the temporal perception of the long-term home quarantine environment to improve the time-human and ultimately space-human relationship, examining individual movements and activities in the environment is essential. By considering and creating different environmental layers, the time span of temporal



perception in the home environment can be extended, which leads to longer information processing and better control of the individual's emotional states through sensory perception of the environment. Consequently, this process will physically calm the person by extending the processing time of environmental information, and ultimately, by improving the components of meaning-making in the home, individual tensions such as stress will be controlled, and ultimately, stress will be reduced. In general, the time component in evoking the meaning of place is examined in the diagram below (Figure 2).

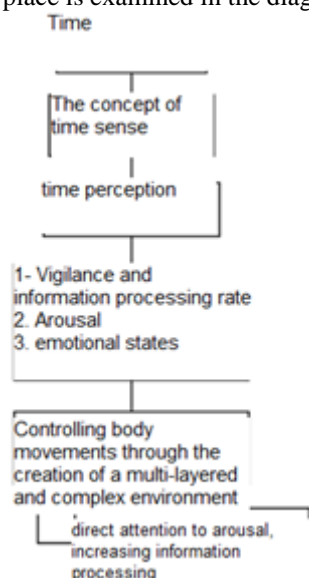


Fig. 2. Examining the time component  
 Based on the preceding discussion, the conceptual framework of the research is categorized and presented in Figure 3. In shaping this framework, the researchers, based on the conducted studies, have considered the meaning of place in this environment to be influenced by the interaction of the three-component triad of the student (human), the prolonged home quarantine period (time), and the residential complex environment (space), after examining the phenomenon of stress in home quarantine among students and understanding the environment of residential complexes. Consequently, each student will have a different meaning of the environment based on the elements that constitute the evocation of the meaning of place. Therefore, by renovating the environment of residential complexes and considering the phenomenology of sensory perception in the environment, it is possible to control the individual's body movements by creating a multi-layered environment, which will ultimately create a better sense of well-being and satisfaction in the individual. Students will receive better and more prolonged environmental information and stimuli, which will lead to a better presence in the home environment based on time perception, and the students' environmental perception will improve, ultimately ensuring the continuity of the meaning of place in the home.

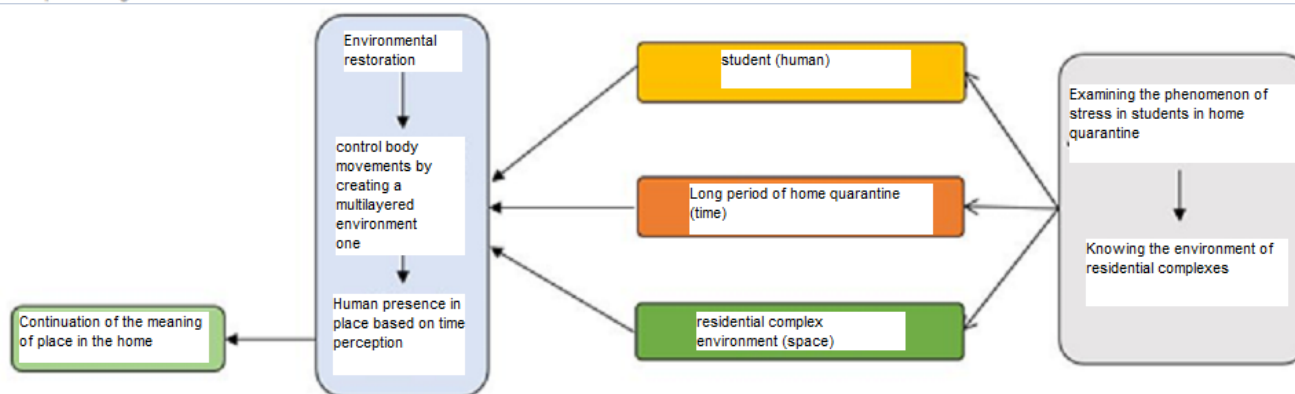


Fig. 3. The conceptual process of research

#### 4. Research Methodology

The present research adopts a qualitative approach of descriptive phenomenology with analysis using the Clausius method. Data collection was conducted through library studies on the theoretical foundations of the research and semi-structured interviews with purposeful sampling. The participants in this research were 10 female high school students (grade 10) from District 3 of Isfahan. The data collection method in this research involved the development of an interview protocol by the researchers. After conducting a few initial interviews, the questions were reviewed and the final interview protocol was finalized. The interviewee was then questioned based on the final protocol, informing them about the research. To

adhere to ethical principles, prior consent was obtained from all participants in the interview, and the researchers assured them of confidentiality. After conducting the interviews, the audio files were transcribed verbatim. It is noteworthy that all stages of data analysis and presentation of outputs in this research were carried out using the Atlas.ti software. To validate the findings, sampling was continued until data saturation was reached. The codes derived from the analysis were clearly presented to the participants, and their feedback was sought to verify the accuracy of the researchers' understanding of their statements. To achieve trustworthiness, the Clausius analysis method, which is an acceptable method among phenomenological researchers, was chosen. For confirmation, the researchers tried not to

let their pre-existing assumptions interfere with the process of data collection, analysis, and reporting.

## 5. Results and Discussion

By reviewing the key sentences and meanings extracted from the interviews, the data was categorized and presented in the form of content descriptions (main). Each

content description was obtained using the Atlas.ti software to manage data for finding answers to the research questions, considering the theoretical foundations and research question. Some of the indicators obtained from the content description of the data are categorized and presented in Table 2.

Table 2

Some indicators obtained from the content description of the data

Themes	Evidence
<b>Behavioral Time (Prolonged Home Quarantine Period)</b>	<b>Activities in the home during quarantine:</b> - Performing activities in a fixed environment during quarantine - Increased family interaction during quarantine - Performing frequent activities over a long period of time at home - Desire to engage in diverse recreational activities during prolonged quarantine - Engaging in personal favorite activities to pass the time during quarantine
<b>Individual Behavior (Student)</b>	<p><b>Increasing security layers to prevent the spread of disease:</b> - Maintaining social distancing outside the home - Limiting contact with others - Limiting contact with neighbors</p> <p><b>Individual harm in virtual education:</b> - Impact of the disease on the educational process - Stress caused by low quality and lack of appropriate communication in virtual education - Impact of long-term quarantine on the educational process - Insufficient attention to all subjects in virtual education - Ineffective virtual education process - Lack of concentration in virtual education - Dissatisfaction with virtual education and being away from school - Exam stress in virtual education</p> <p><b>Positive aspects of virtual education in home quarantine:</b> - Access to nationwide education through virtual means - Strengthening weaknesses through virtual education - Having a positive feeling in virtual education and being away from school</p> <p><b>Individual harm control:</b> - Creating a sense of calm and security in open spaces - Performing meditation to reduce individual stress - Engaging in various activities to reduce individual stress - Creating silence and peace in the home - Controlling the inappropriate mental state caused by disease and quarantine conditions</p> <p><b>Individual harm caused by quarantine:</b> - Mental fatigue from spending a long time in quarantine - Negative mental effects of quarantine on the individual - Controlling family contact during quarantine - Creating a negative feeling in the individual due to reliving memories - Mental fatigue from prolonged quarantine - Behavioral sensitivity and tension with family members - Excessive activity due to mental fatigue - Incompatibility of conditions with the individual's social dimension - Disrupted mental balance of the individual - Impaired performance due to stress - Fear and anxiety from unstable conditions - Stress caused by contracting the disease - Depression caused by communication limitations with others in person - Creating fear in the individual due to prolonged home quarantine - Creating a negative feeling in the home due to the long period of home quarantine</p>
<b>Behavioral Environment (Home)</b>	<p><b>Physical indicators of liveliness in the home environment:</b> - Impact of natural light on the liveliness of the environment - Impact of natural elements on the individual's mental balance - Impact of color on the liveliness of the environment</p> <p><b>Psychological indicators of liveliness in the home environment:</b> - Introversion and interest in staying at home - Not socializing much with neighbors under normal conditions - Feeling safe in the family environment - Feeling safe and relaxed in the personal space</p> <p><b>Enhancing physical indicators of liveliness in the home environment:</b> - Desire to create spatial diversity in the home during quarantine - Desire to create a good visual view from the inside to the outside - Need to change the internal structure of the home due to the long period of quarantine - Desire to live in a smart home - Desire to have a swimming pool and do water sports at home - Desire to have a private outdoor space at home - Desire to have private sports facilities at home</p>

An examination of the findings of the present research suggests that the behavioral environment of students during home quarantine has a significant impact on their individual behavior over the prolonged quarantine period. In general, these dimensions, through their internal interrelationships, have influenced the nature and characteristics of these components. In other words, the crisis conditions of home quarantine and their underlying

causes have led to psychological disorders such as post-traumatic stress disorder in students. In addition, due to the constant presence of students in the home environment and their continuous interaction with it, these conditions have further consequences. According to Steg and colleagues (2016), an environment that is not in a satisfactory state can place significant pressures on individual capabilities, disrupting the balance between

environmental pressures and human capabilities to respond to them. Therefore, given the psychological crisis of home quarantine and the need to control and alleviate COVID-19-related stress in students, the need to re-examine the relationship between the individual and the environment becomes doubly important. Consequently, the structure of the students' behavioral environment (home) and its impact on their individual behavior during the prolonged quarantine period have been found to be effective. One of the most significant theoretical findings of the present research is the development of a unified perspective and conceptual framework for understanding the impact of student stress and the home environment during prolonged quarantine, with a focus on the case study under consideration. This framework links psychological approaches with the meaningful characteristics of the residential complex environment. These concepts, in conjunction with each other, pave the way for improving the environmental tensions in apartments and providing recommendations for the planning of future residential spaces. Thus, the conceptual

framework of the research provides an appropriate response to the research question, which seeks to reduce quarantine-related stress in students by enhancing the meaning-evoking indicators in the environment and ultimately creating a lively home environment.

The necessity of home quarantine due to the COVID-19 pandemic and the individual behavior of students in response to the unstable and challenging conditions of the disease outbreak and prolonged virtual education of subpar quality further accentuates the importance of a well-designed behavioral environment (home) that considers its various dimensions. Under these circumstances, the imposed home quarantine during this crisis necessitates a rich environment that allows individuals to manage their situation through prolonged interaction with it. Based on the research findings and the categorization of findings related to behavioral time (home quarantine) as expressed by the students, influential indicators have emerged. These indicators are summarized and presented in Table 3.

Table 3

Student's behavior time (dimension of time in the sense of place) as a result of research findings

Structured Descriptions	Thematic Meanings
<b>Desire to engage in diverse recreational activities during home quarantine</b>	Activities in the home during quarantine
	Creation of limitations on home activities
	Engaging in personal favorite activities to pass the time during quarantine
<b>Behavioral time (prolonged home quarantine period)</b>	Fixed nature of the study and virtual education space for students
	Performing activities in a fixed environment during quarantine
	Performing frequent activities over a long period of time at home
	Failure of the environment to respond to the individual's mental balance
	Increased family interaction during quarantine
	Engaging in excessive activity due to fatigue from prolonged quarantine
	Creation of spatial limitations for engaging in diverse activities during quarantine

According to the categorized findings, one of the significant factors influencing the meaning-evoking indicators of the environment based on the tripartite relationship of human-space-time is the concept of time, which has been considered by students in various aspects during the prolonged home quarantine period. Activities, which are categorized based on their characteristics and scope, and the significant impact of time on various activities from various perspectives, such as the amount of time spent on an activity, the duration of the activity, and the continuous performance of the activity, have had a significant impact on the individual mental state of students. The quarantine period and its prolonged nature are among the factors mentioned by the interviewees in their responses that have an impact on various aspects. Therefore, one of the factors that causes tension in the individual's perception of the environment and that

environmental pressures are not adequately responded to is attention to the concept of time, which has an impact based on the characteristics of the activity and the scope of activity in the home. In other words, performing activities in a fixed environment over a prolonged quarantine period disrupts the balance between the environment and the individual due to the prolongation of activities over a long period but in a fixed environment. By creating a flexible environment and providing the individual with the possibility of creating spatial diversity in the fixed environment, the relationship between the time-human component in the fixed space can be enhanced, and thus, individual harms such as stress can be reduced.

Among the various categories of research findings related to the factors influencing the meaning-evoking component of the environment, the individual behavior of students in

the home (the human dimension of place meaning) stands out. The indicators extracted within the scope of this component include those that represent individual harms caused by the conditions and harms caused by virtual education during home confinement, as well as indicators

aimed at preventing the spread of disease and controlling individual harms caused by prolonged home quarantine. In general, these indicators are categorized and presented in Table 4.

Table 4  
 Individual Behavior of Students (Human Dimension in the Meaning of Place) derived from research findings

Formed meaning	Content Descriptions	Structured Descriptions	Comprehensive description
Performing excessive activities due to fatigue from prolonged quarantine	Individual harms caused by quarantine	Individual behavior	Individual behavior of students and the behavioral environment of the home during prolonged home quarantine
Stress in the individual due to the prolonged home quarantine			
Creation of a negative feeling in the individual due to reliving bad memories			
Negative mental effects of home quarantine			
Disruption of the individual's mental balance			
Controlling family contact during quarantine			
Mental fatigue from prolonged home quarantine			
Incompatibility of conditions with the individual's social dimension			
Mental fatigue from spending a prolonged quarantine in a closed apartment			
Creation of a negative feeling in the home due to the prolonged home quarantine			
Behavioral sensitivity and tension with family members during prolonged quarantine			
Stress caused by contracting the disease			
Depression caused by communication limitations with others in person			
Exacerbation of stress due to the lack of comfortable conditions for the user			
Fear and anxiety from unstable conditions			
Performing meditation to reduce stress	Controlling individual harm		
Creating silence and peace in the home			
Creating a sense of calm and security in the home			
Engaging in various activities to reduce individual stress			
Controlling the inappropriate mental state caused by disease and quarantine conditions			
Impact of nature on the individual's mental balance	Individual harms in virtual education		
Creating mental balance based on the structure of the environment			
Stress caused by low quality and lack of appropriate communication in virtual education			
Dissatisfaction with virtual education and being away from school			
Insufficient attention by the individual to all subjects in virtual education			
Ineffective virtual education process			
Exam stress in virtual education			
Impact of the disease on the educational process			
Lack of concentration in virtual education			
Impact of long-term quarantine on the educational process			
Creating limitations in communication with others	Increasing security layers to prevent the spread of diseases		
Maintaining social distancing outside the home			
Restricting contact with nature			
Restricting communication outside the home			
Restricting face-to-face activities			

In addition to the aforementioned aspects, in examining the behavioral environment (home) component of students, which is one of the important categories of meaning-evoking components in residential space (space),

it is possible to categorize indicators from the data obtained from the research findings into two groups: psychological environment (mental indicators effective on the liveliness of housing) and physical environment



(physical indicators effective on the liveliness of housing). These are categorized and presented in Table 5 below. In fact, the prominent meaning-evoking component in the spatial dimension in the residential environment creates a positive and good feeling and is also effective in reducing the stress of quarantined individuals. According to the findings, this includes various indicators. In fact, the analyses indicate that these include natural light, open space and courtyard, green space, a sense of security in the personal room, sunny weather, flowers and plants, candles, light, and water. These factors, which affect the individual's sensory perception, will increase the liveliness indicators in the environment of residential complexes by correlating the senses and human perception in space. As a result, the individual will better understand the passage of time during prolonged quarantine, and individual and environmental stress and tension will be reduced. It should be noted that given the student's sense of security and peace in their personal

space, and the fact that silence, peace, security, safety, and the separation of public and private spaces are important indicators of the mental indicator in creating liveliness in housing, it is necessary to transfer individual activities in the student's personal room, which can also be done in semi-private spaces such as the living room, to other spaces. In fact, by examining the behaviors and events of students in the personal space of the room, the components of semi-private spaces are strengthened. In this way, the individual transfers activities such as virtual education or studying to another space during prolonged quarantine periods, which creates spatial diversity for the individual and is effective in reducing stress, especially since it itself is a reason for additional stress under quarantine conditions. And the individual can better control and spend the prolonged period of home quarantine and staying at home. In general, these indicators are categorized and presented in Table 5.

Table 5  
 Behavioral environment of home (dimension of space in the meaning of place) as a result of research findings

Behavioral environment of home (dimension of space in the meaning of place) as a result of research findings			
Formed meaning	Content Descriptions	Structured Descriptions	Comprehensive description
Introversion and liking to stay at home	Psychological index in the vitality of the environment	behavioral environment (home)	Student's individual behavior and the behavioral environment of the home during the long period of home quarantine
Lack of communication with neighbors in normal conditions			
Having a sense of security in the family atmosphere			
Having a sense of security and peace in one's personal space	Physical index in the vitality of the environment		
The effect of natural elements on a person's mental balance			
The effect of color on the vitality of the environment			
The effect of natural light on the vitality of the environment	Improving the physical index of vitality in the home space		
The possibility of performing various activities for different users in the home environment			
Creation of spatial diversity by users at home during quarantine			
Creating a good visual view from the inside to the outside			
Having a private open space in the home			
Having a swimming pool and doing water sports at home			
The presence of private sports facilities at home			
There are facilities for keeping animals at home			
The presence of personal outdoor facilities			
Considering smart facilities at home			
Presence of elements of nature in space			
Changes in the internal structure of the house based on the type of activity			
Spatial design based on users' interests and activities			

## 6. Conclusion

Based on the research findings, the desirable characteristics of place meaning (space-human-time) can be utilized to enhance the quality of place meaning in residential complexes. This will ensure that the perceived meaning in the minds of students is at its highest level, ultimately reducing their mental disorders (stress). Therefore, by improving the physical environment and psychological environment of the home (psychological and physical indicators of liveliness in residential complexes), a high-quality sensory space can be created. By refining the environment, students will have a better

sensory perception with a different time perception of the environmental layers. Ultimately, this will lead to an enhanced sense of place in the home environment and reduce the stress caused by quarantine and virtual education. Hence, to reduce the stress caused by home quarantine due to the spread of disease and virtual education in students, considering the prolonged quarantine period, the liveliness index in the environment can be improved. By creating different environmental layers in the space, the individual's stress, such as post-traumatic stress disorder (PTSD) or virtual education stress, can be reduced through multi-layering of the

environment and better management of the prolonged quarantine period. In response to the research question regarding how to extract the effective components of the experience of place meaning in the environment of residential complexes by examining the phenomenon of stress caused by home quarantine in them, it should be noted that in examining the findings obtained regarding the behavior and mental states of students in the home environment during the prolonged period of home quarantine, the stress caused by the COVID-19 pandemic can be identified, which consequently leads to PTSD and stress from low-quality virtual education. Initially, in response to the nature and examination of these events, the symptoms, mental state, and behavior of students can be mentioned. Based on the signs of stress disorder and PTSD, the existence of this disorder in students due to the instability of conditions and the disruption of the educational process is an obvious issue. Some of the research findings include emotional effects (feelings of depression and anxiety), physiological effects (disruption of physical functioning), cognitive effects (decreased concentration and attention), and behavioral effects (avoidance of activity). These are all due to the individual's experience of the threatening situation and the environment they are in over a long period of time. These conditions lead to a defect in the functioning of semantic and episodic memory. Since changes in the student's home environment can lead to changes in their individual behavior and mental states, the method of examining the phenomenon of student stress caused by prolonged home quarantine to enhance place meaning should be explained. This phenomenon is linked to the environmental characteristics that effectively enhance the environment and create liveliness in it. Therefore, the research findings on the liveliness of the environment (physical and psychological indicators), which have an impact on the environment and are interrelated, also affect the individual behavior of students in the residential environment during prolonged quarantine. In other words, when examining the phenomenon of stress caused by home quarantine in students, PTSD and virtual education stress are among the most common types of stress in this case. By considering the opinions and behaviors of each individual during that period (emotional-psychological and physiological behaviors) and paying attention to the symptoms of these types of stress, the phenomenon of stress caused by prolonged quarantine has been identified. Based on these, the effective components of the experience of place meaning have been extracted, each of which has been described in detail.

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