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Article

The effect of the pandemic period on residence and residential environment preferences: The example of Istanbul

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ABSTRACT

In late 2019, Covid-19 emerged as a global crisis threatening the entire world. The first case in our country was announced on March 11, 2020. Governments carefully monitored the epidemic process from the first months and took the necessary measures in all areas of public life. Significant increases have been recorded, especially in the use of urban open spaces. Whether this process leads to permanent changes in recreation models and areas, residence and residential environment, remains among the debated issues. For this purpose following the questions "Have people's housing preferences in urban areas changed compared to the pre-pandemic period?" and "How effective are the social, physical, cultural, perceptual and economic opportunities of the residential environment in residence choice?" constitute the starting point of the research. Taking Istanbul as a case study, this article presents the results of an online survey administered to 263 people in December 2020. The results showed that resident and residential environment preferences changed during the pandemic period, and the perceptual, physical, functional and social features of the resident and its environment were most decisive in this change. Research results suggest parameters that may be effective for planning cities that are more resilient to future pandemics.

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INTRODUCTION

Throughout history, pandemics have had social, economic, and cultural impacts on societies (Başeğmez & Aydın, 2021). The Covid-19 outbreak was described as a "pandemic" by the World Health Organization (WHO) in January 2020 and has turned into a global crisis that threatens the whole world. Therefore, governments imposed strong restrictions to their populations such as keeping physical distance, stopping non-essential activities and limiting the movements of people. This global "lockdown" resulted in almost two thirds of the world population being asked to stay at home and placed under a confinement by April 2020 (Vimal, 2022). While social distancing has been shown to be an effective alternative to reduce the spread of the virus, it is predicted that other health problems may develop due to extended

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time spent at home. Since then, in many parts of the world, such drastic measures have also been reactivated to face the second and third waves of the pandemic (Vimal, 2022). The Covid-19 pandemic has had severe negative effects on populations worldwide (Olszewska-Guizzo et al., 2021). In the first months of 2020, the increase of patients needing medical assistance and intensive care, forced governments all over the world to take remedial actions to rapidly stop the spread of the disease. In particular, social distancing and home confinement were widely used to contrast the diffusion of the virus SARS-CoV-2 (Theodorou et al., 2021).

As of May 28, 2023, more than 767 million confirmed cases and more than 6.9 million deaths have been reported worldwide (WHO, 2023). The rapid spread and high mortality rate of Covid-19 has increased the need to have a healthy living environment to escape infection and has begun to appear as one of people's main concerns. Quarantine measures implemented during the pandemic period led to changes in the use of public spaces. Significant increases have been recorded, especially in the use of urban open spaces. Therefore the question of whether this process leads to permanent changes in preferences regarding housing and the housing environment has been added as a new topic to the discussed topics. On the other hand, it is estimated that staying at home for a long time may have negative consequences in terms of physical, social and psychological aspects. Researchers around the world while investigating the dynamics of the epidemic also have examined the effects of the epidemic on people and society in many areas such as economy, finance, education, tourism and the evolution of Covid-19 and the parameters of the epidemic. It also investigated what can be done to respond to Covid-19, prevent its spread and create healthier environments. Some of them: the important role of gardening activities on psychopathological distress during the days of austere lockdown in Italy, in the course of the first wave of Covid-19 (Theodorou et al., 2021), the impact of the stay at home on the neuro-psycho-physiological functioning of healthy adults during the pandemic period (Olszewska-Guizzo et al., 2021), the critical roles of residential gardens in cities, the spatial distribution of housing types and the degree of self-sufficiency of housing (Ghosh, 2021), the role of both public and private green space in subjective health and wellbeing during and after the first peak of the Covid-19 outbreak that took place in the UK (Poortinga, 2021).

The purpose of this study is to determine whether housing and residential environment preferences have changed after Covid-19. Within the scope of the study, answers were sought to the following questions:

- Have people's "housing" and "residential environment" preferences in urban areas changed compared to the pre-pandemic period?
- What features should a healthy home and residential environment have to be protected from the pandemic?
- How effective are the social, physical, cultural, perceptual and economic opportunities of the house environment in housing preference?
- What should be the parameters that can be effective in "residential environment" preferences for the planning of cities that are more resilient against future pandemics?

With the global spread of the Covid-19 pandemic in the world, domestic spaces have become dramatically important in terms of controlling pandemics and as an environment that must meet the needs of residents during the quarantine period (Zarrabi, Yazdanfar & Hosseini, 2021). Home gardens provide direct contact with nature and gardening activities which reduce stress, anger, fatigue, depression and anxiety (Marques et al., 2021). For this reason, the spaces that constitute "housing" and "residential surroundings" need to have some features to survive both this pandemic process and possible pandemics in the future. In summary it can be said that a healthy environment provides a healthy life opportunity and in this context it is thought that the pandemic process will have permanent effects on housing selection and housing purchase. In conclusion; the pandemic has made all actors related to housing and the city, including politicians, attach importance to a healthy "residential" and "residential environment" for a healthier life. After the pandemic, factors related to architectural design such as light, sun, heating, ventilation, water and energy, as well as factors such as access to gardens, green areas or open areas, began to be questioned in the selection of residence and residential environment. In other words, it is thought that the coronavirus causes people to change residence and residential environment preferences and therefore lifestyle, and increases efforts to improve the living environment. In this context, it can be said that green areas belonging to the residence or close surroundings of the residence have started to gain importance.

According to the results of a research conducted during this period, people are moving out of major cities of Australia to suburbs and beyond, households' choosing a lifestyle shift and settling down in regional towns and cities (Ghosh, 2021). In another study, during the pandemics, people who had access to greenery kept better mental health and had more social interactions. Also the sole presence of a view of vegetation outside the window had positive a effect on residents well-being, but it could scarcely make up for the direct possibility of a urban green spaces visit (Ugolini et al., 2020; Sikorska et al., 2023).

Residence and Residential Environment

The need for shelter, which was initially met by the use of caves and cavities, is now met with structures defined as residence produced by the human mind, which are one

of the important dynamics of cities (Asasoğlu, 2013). Residence is one of the basic elements that make up the city. Residence as a general definition; "It is defined as place, dwelling, residences, houses, apartments, etc. that people live in (Türk Dil Kurumu sözlükleri, 2024). Residence is also "a place where one or more people reside, a dwelling" (Hasol, 2010); It is defined as "a shelter built for one or more household members to live in, providing facilities such as sleeping, feeding, protection and cleaning that are necessary for human life."

Residence is shaped within the framework of the socio-cultural, socio-economic and demographic structure of the user like other functional areas. Residence has constantly changed throughout the historical process, according to the influence of daily life, working style, climate and topography, and economic and technological possibilities. In recent years, this need for change has been observed much more rapidly. As a result of external factors such as climate change and the Covid 19 pandemic, which have global and regional effects, and newly developed ways of working and living from home according to the developments in technology; the formation and transformation of residence (number of rooms, number of bathrooms, air conditioning solutions, etc.) have accelerated. The question for whom the residence will be produced affects the location selection, spatial formation and the characteristics of the environment in the urban dimension. (Kellekci & Berköz, 2006; Salihoğlu, 2012a; Mazıcıoğlu & Yenice, 2019).

The area that near the residence, where creates people's first positive or negative perceptions about the environment can be defined as the "residential environment". Residential environment; is the first space where a person connects with the city and directly affects his/her daily life and it is the basic living space at the closest distance where physical, psychological and social needs are met. The neighborhood unit, which is the basic building block of the spatial pattern in the urban area, that is, the meaningful part of the urban whole, constitutes the residential environment. Preferability of the neighborhood or neighborhood unit where the daily life functions of resicence, rest, transportation and (according to post-modern planning approaches) work are located; varies according to its capacity to respond to the social, psychological and spatial expectations of its inhabitants.

While the economic structure is effective in housing choice in cities, the social, cultural and spatial opportunities of the inear surroundings of the house, as well as the physical features of the house, and the equal accessibility of these opportunities to everyone are also effective (Türkoğlu & Kısar Koramaz, 2012; Kellekci & Berköz, 2006; Salihoğlu, 2012a; Yakın et al., 2019). Open and green areas around residences positively affect the perception of environmental quality and emerge as an important factor in housing preference. Especially green areas and home gardens near residences provide opportunities for psychological and physical health benefits (Chalmin-Pui, 2021). Additionally, home gardens are considered a platform for social participation, recreation, and human-nature interactions. Residence are privately owned areas where residents share their daily interactions with nature. A home garden connects to a household's cultural identities, memories, and traditional practices (Ghosh, 2021).

People always seek the most suitable home for choosing, buying, or renting. So, residential preferences are significant to designers, planners, and sociologists. Preferences point to a wide range of inclinations and desires to meet the basic and transcendent human needs. In other words, residential preferences reflect both the mental and ideal individual images and what can actually happen. Therefore, it is the preferences that guide an individual's goals in choosing a home (Zarrabi, Yazdanfar & Hosseini, 2021). Since the outbreak of the Covid-19 pandemic, as a result of the adoption of worldwide lockdown measures, the home environment has become the place where all the daily activities are taking place for many people. Stay-at-home mandates have transformed houses into places where to spend the entire day while working, home-schooling, taking care of families, nourishing, training, socializing, and finally resting (Torresin et al., 2021). This process increased the importance of residence and the residential environment for people's physical and mental health. In this study, it was aimed to evaluate the perception of residence and the resiential environment in relation to the new activities carried out at home, as well as the basic functions of the home, along with the changing social context. It is aimed to evaluate people's feelings of satisfaction with the environment they live in with psychological, mental and social context.

Urban Life Quality

Quality of life is a broad concept that aims to evaluate life in all its aspects. Urban quality of life is effective in the development of the individual and society and it is the interaction of the social, economic, health and environmental conditions of the city in which one lives (Shookner, 1997). Urban quality of life has been one of the important topics since the efforts to improve the negative health conditions that emerged as a result of the rapid and unplanned change in urban areas after the industrial revolution. Quality of life was first proposed as "livability" under the title of objective qualities in order to achieve a good settlement within the scope of the Habitat II Human Settlements Conference. Accordingly, for livability in the Habitat II Türkiye National Report and Action Plan various criteria have been determined these can be listed; adequate infrastructure, ensuring that women and children are safe everywhere in the urban area, adequate and accessible

housing, which is a basic need and human right, ensuring equitable services, especially a balanced distribution between open green areas and the built environment, sufficient space for recreation and sports purposes, especially ensuring easy and equitable accessibility of facilities, balanced structure and population density ets (Salihoğlu, 2012b). Urban quality of life is expressed as the reflection of human rights on urban life and is associated with the level of satisfaction of urban rights and the equal and accessible urban services for everyone.

In places where the quality of urban life is low, individuals tend to relocate (Türksever & Atalık, 2001). On the other hand, if individuals meet their physical, social, economic and psychological needs in the city they live in, they will be satisfied with the places they live in, their perception of quality of life will be positively affected and the quality of life in that city will be evaluated positively (Aydemir, 2008). In other words, urban quality of life can be measured by the satisfaction individuals derive from the city and their capacity to meet their needs. The basic determinants of quality in the urban environment are formed and developed by the mutual interactions of natural environmental elements, social environment elements and built environment elements, and change over time under mutual interaction (Çolakoğlu, 2005). Quality of urban life is evaluated through the provision of public services, neighborhood quality, crime, security, housing, natural environment and built environment (Bingöl, 2006). In short, quality of life is affected by all the elements that make up the urban environment and urban life (Kısar Koramaz, 2010).

Green areas, which are effective in evaluating the quality of urban life, contribute to the city in many ways. To list these: improving the urban climate and protecting natural life and natural resources are ecologically, directing and limiting the development of the city by balancing the structure and population distribution are developmentally; adding aesthetic value to the city is phycically; and providing social interaction and undertaking social and recreational functions with opportunities to develop social relations are socially contribute to improving the quality of life in urban environments (Kısar Koramaz, 2010). Green spaces as a component of urban green infrastructures are known to be important for the mental health of the urban population and the Covid pandemic has strengthened such awareness. Urban green infrastructure includes parks, home gardens, street trees and any other form of greening that is embedded in the urban matrix which has an ecological function and provides ecosystem services (Marques et al., 2021). Green areas enable users to establish relationships with their near surroundings and to develop the sense of belonging and ownership of urban people (Dunnet et al., 2002).

Researchers who have been dealing with space design for many years have determined that the users' perception of the quality of life and livability of that city increases in direct proportion to the facilities, quality and accessibility of the residential environment. Many factors such as the city's transportation system, the quality of public spaces, the green network system, land use decisions and the changing population and building density accordingly, the diversity, accessibility and fair distribution of the services offered are effective in determining the satisfaction and quality of life of the users in the urban area. The general approach to measuring urban quality of life is to evaluate the built and natural environmental conditions in cities and individuals' satisfaction together (Yakın İnan & Özdemir Sönmez, 2019). In this context, within the scope of the research, the relationship between users' satisfaction levels, expectations and quality of urban life regarding residence and its residental environment was discussed by comparing before and after the pandemic period.

Determinants of Residence and Residential Environment Selection

In its most general form, housing choice is a function of the socio-economic characteristics of the users, the features offered by the existing housing stock and the transportation network facilities (Pagliara & Wilson, 2010). Users' housing selection methods are determined on the axis of the socio-economic structure of the family, the structural and environmental characteristics of the existing house, and the characteristics of the house lived in before the current house (Alkay, 2017). It is not possible to consider the changes in the socio-economic profiles of users independently of social changes. Changes such as flexible working models that allow working at home depending on production styles and the increase in free time spent at home are reflected in the socio-economic profile and emerge as developments that create a need for more housing space, especially observed in recent years (Pagliara & Wilson, 2010; Friedrich & Piesch, 2007; Rossi, 2007).

There are two parties in residence selection. The first of the parties are the users who make the choice and constitute the demand side. The second is the presentation side that produces alternatives for selection. They show diversity and stratification in parallel with the social and economic structure on both sides (Pagliara & Wilson, 2010). The selection structure needs to be laid out in a way that takes into account not only user characteristics and expectations, but also macroeconomic conditions, residence market conditions and central and local government residence policies. The response of the supply side against the demand side, which exhibits an extremely dynamic and constantly changing structure, becomes important (Alkay, 2017). The main problem at this point is that new production is always less than the stock and the existing housing stock, due to its structure, has a weak ability to quickly adapt to changes in the socio-economic profile (Clark & Dieleman, 1996). It is clear

that this diversity and stratification cannot be independent of global changes and developments. Therefore, it is possible to talk about a structure that is constantly affected by internal and external changes (Alkay, 2017).

Clark, Deurloo, and Dieleman (2006) stated that when choosing residence, people do not only make their choice based on the suitability of socio-economic conditions, but also take into account factors such as low density in the environment, the presence of open-green areas, the opportunities and recreation opportunities offered by the residential environment and neighborhood relations. This shows that the perception of urban quality of life is an effective factor in choosing a residential location.

When the factors affecting the choice of residence and its environment are examined, it is seem that users' satisfaction also changes as a result of their different perceptions and different evaluations of the environment in connection with the different charecteristics of users such as age, gender, marrial status -married, single, having children or not-, education level, profession, income level, duration and ownership of residence. Knowing which criteria are effective in people's residence preferences in urban areas is important for creating livable and preferred cities and has always attracted the attention of researchers. Many valuable results have been obtained from the research conducted to date. However, pandemic conditions have brought the importance of this issue back to the agenda, literally returning researchers back to the point where they started. Because it is an expected result that there may be changes in people's residence preferences after the pandemic.

In this context, based on the research questions, the study aims to measure the status and level of change in people's residence and location preferences compared to before the pandemic, and also to determine the criteria and priorities that cause this change.

MATERIALS AND METHOD

Material

The research was conducted within the scope of the Istanbul Metropolitan Area. Istanbul Metropolitan Area, as a metropolitan city with 19% of Turkey's population (15,519,267/83,154,997 depending on the province of residence and place of birth) (Turkish Statistical Institute, 2023), is thought to have a potential to determine the changing perceptions of people and the population of our country. It was chosen because it is the most populous city in terms of urbanization and the city where the pressure of urbanization and its accompanying problems are felt the most. Istanbul has been an important cultural, social and economic center in every period of history, and has been a city where urban, social, economic and cultural transformations have occurred from the Ottoman Empire to the present day. Today Istanbul, is one of the most crowded metropolises in the world with a population of approximately 20 million, contains differences in housing areas, housing production styles and housing types with very different dynamics. In this context, the main material of the research consists of the thoughts and evaluations of people residing in Istanbul on the subject.

Method

This research, which aims to measure people's thoughts about residence and residence preferences during the pandemic period, was conducted in December 2020, while the pandemic process was still ongoing. It was thought that it was important to get the opinions of the users while the problems caused by the pandemic continue. In the research, answers were sought to the following questions by comparing the pre-pandemic and pandemic period.

1. Will Covid-19 have an impact on changing the type of residence people live in?
2. What are the factors affecting users' preferences regarding recidence and residential environments before and after Covid-19?
3. How effective are the social, physical, cultural, perceptual and economic opportunities of the residential environment in residence choice?
4. What is the level of relationship between life satisfaction and factors affecting residence and residential environment preferences due to the pandemic?
5. What are the effective factors on the user satisfaction scale in choosing residence and its near environment?

For the determined research questions, users' opinions on the subject were questioned using the online survey method. The ease of participants expressing their opinions on a certain issue and the difficulty of working face to face with users, especially during the Covid-19 pandemic period that affected the whole world, were influential in the selection of the method. It is seen that the same method is preferred in similar studies (Ugolini et al., 2020; Ugolini et al., 2021; Lehberger, Kleih & Sparke 2021; Blasco-Belled et al., 2020; Poortinga et al., 2021; Theodorou et al., 2021).

The first part of the survey includes demographic evaluations. This section included 8 questions evaluating gender, age, profession, education level, status, total household income, type of residence they live in and type of residence they want to live in. The second part of the survey includes 29 statements (Q1, Q2, …, Q29) compiled from the conceptual framework of the research, reflecting the factors affecting users' residence and residential environment preferences and their views before and during the pandemic. These expressions include physical, functional, cultural, perceptual, social and psychological

criteria. These statements were placed randomly on the survey form, regardless of group order. The aim here was to develop a valid and reliable measurement tool to measure satisfaction in residential environment choice. In creating this scale;

- Physical criteria were measured with eight questions (Q1, Q2, Q 4, Q5, Q6, Q7, Q9, Q14). Here, locational features, security, earthquake and accessibility criteria were evaluated.
- Functional criteria were measured with eight questions (Q11, Q12, Q13, Q17, Q18, Q21, Q23, Q24). In this context, mandatory and optional activities were evaluated.
- Cultural criteria were measured with four questions (Q15, Q19, Q20, Q26). Under this heading, criteria related to being together or in close relationships with family members and friends were evaluated.
- Perceptual criteria were measured with four questions (Q3, Q10, Q16, Q22). The quality of basic elements representing nature, such as air, water, soil and trees, was evaluated.
- Social criteria were measured with two questions (Q8, Q25). With these questions, the criteria that enable humans to establish bonds with other living creatures were evaluated.
- Psychological criteria were measured with three questions (Q27, Q28, Q29). Measures were evaluated for sensory health, mental health, and life satisfaction.

In this context, participants were asked to read each statement and make two separate evaluations, taking into account the period before the pandemic and the period during the pandemic. Participants were evaluated their agreement for each statement using a five-point Likert attitude scale. Here, 1 indicates that the level of agreement with the statement is close to the least (I strongly disagree) and 5 indicates that the level of agreement with the statement is the highest (I strongly agree). Survey questions were answered via internet access.

Statistical Evaluations

Statistical analyzes were performed using SPSS version 23. First of all, findings regarding demographic variables were obtained by looking at descriptive statistics. Then the effect of Covid-19 on changing the type of residence people live in was analyzed by frequency analysis, the factors affecting users' preferences regarding residence and residential environments before and after Covid-19 were evaluated by arithmetic average, the effect of the social, physical, cultural, perceptual and economic opportunities of the residential environment on residence choice was evaluated with the arithmetic average and the relationship level between the variables was evaluated with the correlation test.

The level of relationship between factors affecting residence and residential environment preferences due to the pandemic and life satisfaction was determined by correlation test. Inquiries were made using factor analysis to group the factors affecting user satisfaction in the choice of residence and residential environment. The reliability of the data was tested with Cronbach Alpha analysis, and the suitability of the research data for factor analysis was tested with Kaiser Mayer Olkin (KMO) and Bartlett tests.

FINDINGS

Participants

In the research, survey data from a total of 263 people living in different districts of Istanbul were evaluated. According to the data obtained, it was determined that 64% of the participants were women, 36% were men, and 43% of them were individuals between the ages of 46-55. It was determined that 24% of the participants in the total sample worked in the private sector. In addition, when the education level of the participants was evaluated, it was determined that 62% of them were university graduates. It was observed that 73% of the participants owned property and 48% of the household's total income was between 0-10,000 TL. One of our research questions was whether Covid-19 would have an impact on changing the type of residence people live in. With this question, we determined that 65% of the participants lived in an apartment, but when asked about the type of residence they wanted to live in during the pandemic, 71% preferred the house with a garden option (Table 1).

Within the scope of the study, the distribution of participants by districts was examined, it was determined that participants participated from a total of 33 districts: Kadıköy 18%, Üsküdar 11%, Ataşehir 7%, Bakırköy 6% (Fig. 1). Considering that there are a total of 39 districts in Istanbul, it is important to ensure participation from 33 districts in the research.

Findings on Factors Affecting Residence and Residential Environment Preference

The arithmetic averages and factor loadings of the participants' residence and residential environment preferences before the pandemic and during the pandemic period were determined. The aim here is to develop a valid and reliable measurement tool to measure satisfaction in residential environment choice. The six criterion groups that were effective in creating this scale were first evaluated within themselves (Table 2).

Accordingly, when looking at the total arithmetic averages of the participants' opinions before the pandemic and during the pandemic process;

Table 1. Percentage (%) distribution of the data regarding the demographic characteristics of the participants

	Percentage (%)
Gender	
Men	64
Woman	36
Age	
18-25	9
26-35	11
36-45	24
46-55	43
56-65	11
over 65 years old	3
Educational background	
Primary school	1
High school	17
Üniversity	62
Postgraduate	15
Doctorate	6
Type of residence live in	
Apartment	65
House with a garden	7
Residence	3
Villa	3
Site	22
Total household income	
-10 000	48
11 -15000	28
16-25 000	18
26 000-	6
Job	
Student	8
Housewife	10
Officer	11
Private sector	24
Retired	11
Engineer	13
Doctor	2
Teacher	15
Landscape architect	4
Unemployed	1
Household status	
Owner	73
Tenant	27
Type of housing you want to live in	
Apartment	7
House with a garden	71
Residence	3
Villa	10
Site	10

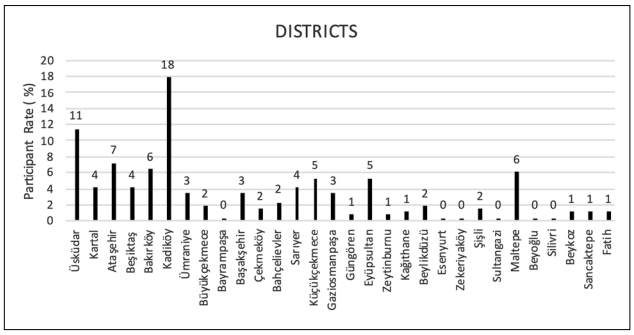

Figure 1. Percentage (%) distribution of participants by districts.

From the expressions in the physical criteria before the pandemic, respectively; While the statements "proximity to forests is an important criterion" ($\bar{X}$ 2.97) and "proximity to the city center is an important criterion" ($\bar{X}$ 2.88) stood out, during the pandemic period, "proximity to forests is an important criterion" ($\bar{X}$ 2.91) and "accessibility" "It is an important criterion" ($\bar{X}$ 2.76) statements came to the fore.

From the expressions among the functional criteria, before the pandemic and during the pandemic period, respectively; While the statements "sports activities are an important criterion" ($\bar{X}$ 2.95) and "proximity to educational buildings is an important criterion" ($\bar{X}$ 2.92) stood out, a decrease in these rates was detected during the pandemic period.

From the expressions among the cultural criteria, before the pandemic and during the pandemic period, respectively; While the statements " closeness to friends and associates is an important criterion" ($\bar{X}$ 2.98) and "neighbourhood relationship is an important criterion" ($\bar{X}$ 2.93) stand out, for the pandemic period a decrease was detected in statement "neighbourhood relationship is an important criterion" ($\bar{X}$ 2.88) as was of the functional critaria

From the expressions in the perceptual criteria, during the pandemic period compared to the pre-pandemic period, while an increase observing in the expression "proximity to water resources such as the sea or a lake is an important criterion" (BP: $\bar{X}$ 2.81, PP: $\bar{X}$ 2.86) a decrease was observed in the expression "open green area is an important criterion" (BP: $\bar{X}$ 2.64, PP: $\bar{X}$ 2.44).

From the expressions in the psychological criteria, there was a decrease in the statement "providing vital support (such as the presence of social facilities, sports fields, recreation areas) is an important criterion" during the pandemic period compared to before the pandemic (BP: $\bar{X}$ 2.849, PP: $\bar{X}$ 2.73).

From the experessions among the social criteria, there was a decrease in the statement "socializing/establishing social ties is an important criterion" (BP: $\bar{X}$ 2.84, PP: $\bar{X}$ 2.77) during the pandemic period compared to before the pandemic.

Table 2. Factor groups affecting housing and housing environment preferences

EXPRESSIONS	Before the Pandemic		Pandemic Period	
In residence preference (RP) **Residential environment (RE)**	**Arithmetic average**	**Factor loadings**	**Arithmetic average**	**Factor loadings**
Physical criteria				
1. (RP) Region/district/neighborhood is an important criterion.	2.52	0.66	2.52	0.51
2. (RP) Proximity to the city center is an important criterion.	2.88	0.54	2.71	0.59
4. (RP) Proximity to forests is an important criterion.	2.97	0.57	2.91	0.57
5. (RP) Security is an important criterion.	2.47	0.66	2.44	0.63
6. (RP) Accessibility is an important criterion.	2.86	0.59	2.76	0.69
7. (RP) Proximity to the workplace is an important criterion.	2.87	0.56	2.71	0.57
9. (RP) Earthquake resistance is an important criterion.	2.14	0.53	2.16	0.66
14. (RP) Suitability for use by disabled individuals is an important criterion.	2.62	0.40	2.62	0.63
Group average factor loadings		0.56		0.60
Functional criteria				
11. (RP) Proximity to health services is an important criterion.	2.87	0.50	2.67	0.57
12. (RP) Proximity to educational buildings is an important criterion.	2.92	0.56	2.83	0.60
13. (RP) Proximity to shopping centers is an important criterion.	2.64	0.58	2.50	0.62
17. (RP)The existence of hobby gardens is an important criterion.	2.86	0.57	2.79	0.59
18. (RP) Swimming pool is an important criterion.	2.41	0.58	2.41	0.66
21. (RP) Parking is an important criterion.	2.70	0.68	2.69	0.71
23. (RP) Children's playground is an important criterion.	2.78	0.44	2.68	0.59
24. (RP) Sports activities are an important criterion.	2.95	0.48	2.90	0.48
Group average factor loadings		0.54		0.6
Cultural criteria				
15. (RP) Other living residents and the general cultural structure are important criteria.	2.65	0.60	2.62	0.51
19. (RP)Proximity to relatives is an important criterion.	2.90	0.77	2.84	0.66
20. (RP) Closeness to friends and associates is an important criterion.	2.98	0.74	2.98	0.63
26. (RP) Neighbourhood relationship is an important criterion.	2.93	0.52	2.88	0.54
Group average factor loadings		0.65		0.58
Perceptual criteria				
3. (RP) Proximity to water resources such as the sea or a lake is an important criterion.	2.81	0.54	2.86	0.72
10. (RP) Clean air is an important criterion.	2.39	0.45	2.29	0.59
16. (RP) The existence and quality of trees is an important criterion.	2.64	0.55	2.51	0.55
22. (RP) Open green area is an important criterion.	2.64	0.63	2.44	0.68
Group average factor loadings		0.54		0.63
Psychological criteria				
27. (RP) Providing vital support (such as the presence of social facilities. sports fields. recreation areas) is an important criterion	2.89	0.62	2.73	0.47
28. (RE) Positively affects the physical and psychological health of individuals.	2.75	0.57	2.63	0.59
29. (RE) User satisfaction is essential for children. young people. adults and the elderly.	2.87	0.58	2.78	0.57
Group average factor loadings		0.59		0.54
Social criteria				
8. (RP) Socializing/establishing social releations is an important criterion.	2.84	0.50	2.77	0.59
25. (RP) Suitability is an important criterion for pets.	2.88	0.36	2.83	0.55
Group average factor loadings		0.43		0.57

It was determined that the changes that emerged in response to these statements during the pandemic period were physical needs at the basic level of Maslow's hierarchy of needs, and then other needs predominated. It has been observed that perceptual, physical, functional and social features are the most determining factors in the selection of residence and residential environment during the pandemic period. Therefore, people's residence and residential environment preferences are very important for designers, planners and sociologists (Zarrabi, Yazdanfar & Hosseini, 2021).

Evaluation of the Relationships Between Factors Affecting Residence and Residential Environment Preferences and Life Satisfaction

A correlation test was conducted to determine the factors affecting the participants' preferences of residence and residential environment (taking into account the pre-pandemic period and the pandemic period). The element for which a relationship will be sought is called the dependent variable, and the elements that may be related are called independent variables, and a correlation test was applied. With this approach, the dependent variable "user satisfaction is essential for children, young people, adults and the elderly in public housing areas." (Q29) and the independent variables consisting of expressions reflecting users' perceptions of residence and residential environment preferences, usage and expectation levels were evaluated with a correlation test. Two separate correlations were calculated before the pandemic period and during the pandemic period. According to the correlation test, the expressions that are related to each other are correlations that are significant at the $p<0.01$ level and are indicated with ** (Table 3). Accordingly, the functions that were most correlated with the expression of satisfaction in people's preferences of residence and residential environments before the pandemic period are, in order:

- Positively affects the physical and psychological health of individuals (n=263, $r^2=0.518$, $p<0.01$),
- Providing vital support (such as the presence of social facilities, sports fields, recreation areas) is an important criterion (n=263, $r^2=0.465$, $p<0.01$)
- The existence and quality of trees is an important criterion (n=263, $r^2=0.418$, $p<0.01$)
- Clean air is an important criterion (n=263, $r^2=0.367$, $p<0.01$)
- Suitability for use by disabled individuals is an important criterion (n=263, $r^2=0.365$, $p<0.01$).

During the pandemic period, the functions that correlate most with the expression of satisfaction in people's preferences of residence and residential environment are, in order:

Table 3. Correlation of life satisfaction with other expressions in residence and residential environment before the pandemic and during the pandemic period

Q29. In public housing areas. user satisfaction is essential for children. young people. adults and the elderly.																							
		Physical												**Functional**									
Q29	**Q1**	**Q2**	**Q4**	**Q5**	**Q6**	**Q7**	**Q9**	**Q14**	**Q11**	**Q12**	**Q13**	**Q17**	**Q18**	**Q21**	**Q23**	**Q24**							
BP	0.207**	0.167**	0.146*	0.264**	0.291**	0.310**	0.165**	0.365**	0.291**	0.231**	0.012	0.302**	0.095	0.112	0.356**	0.320**							
PP	0.142*	0.138*	0.221**	0.227**	0.269**	0.269**	0.211**	0.387**	0.223**	0.302**	0.140*	0.324**	0.064	0.133*	0.402**	0.258**							
		Cultural					**Perceptual**				**Psychological**			**Social**									
		Q15	**Q19**	**Q20**	**Q26**	**Q3**	**Q10**	**Q16**	**Q22**	**Q27**	**Q28**	**Q29**	**Q8**	**Q25**									
BP		0.313**	0.134*	0.262**	0.275**	0.176**	0.367**	0.418**	0.309**	0.465**	0.518**	1	0.307**	0.300**									
PP		0.345**	0.181**	0.242**	0.248**	0.181**	0.307**	0.429**	0.273**	0.440**	0.485**	1	0.272**	0.322**									

- Positively affects the physical and psychological health of individuals (n=263, r^2=0,485, p<0.01),
- Providing vital support (such as the presence of social facilities, sports fields, recreation areas) is an important criterion (n=263, r^2=0,440, p<0.01),
- The existence and quality of trees is an important criterion (n=263, r^2=0,429, p<0.01),
- Children's playground is an important criterion (n=263, r^2=0,402, p<0.01)
- Suitability for use by disabled individuals is an important criterion (n=263, r^2=0,387, p<0.01).

When comparing the correlation of life satisfaction in residence and residential environment with other questioned expressions before the pandemic and during the pandemic period, the strongest correlations belong to the psychological criteria group, respectively; the expressions residence and the residential environment "positively affects the physical and psychological health of individuals (Q28)" and "providing vital support (such as the presence of social facilities, sports fields, recreation areas)" is an important criterion (Q27). The value of these expressions during the pandemic period decreased compared to the pre-pandemic value.

These results also showed that when the participants' thoughts before the pandemic period and during the pandemic period were compared, the first three statements did not change, but children's playgrounds also gained importance during the pandemic period. In addition, it has been determined that the expressions "the importance of the existence and quality of trees" and "suitability for use by disabled individuals" have gained importance during the pandemic period.

In the research, it was observed that some expressions were responded to at a lower rate during the pandemic period than before the pandemic. These expressions are: (Q22) "Open green space is an important criterion", (Q24), "Sports activities are an important criterion", (Q26), "Neighborhood relations are an important criterion", (Q27) "Providing vital support (such as the presence of social facilities, sports fields, recreation areas) is an important criterion and (Q28) "Positively affect the physical and psychological health of individuals" It is thought that the reason for the decrease in these statements may be due to the fear and anxiety that people experience in developing the sense of confidence that is essential for going to open spaces and doing outdoor activities. Thus, it was once again understood how effective the need for protection and security defined by Maslow in hierarchy of needs in the Covid-19 pandemic.

Analysis of Factors Related to User Satisfaction Scale in Preference of Housing and Housing Environment

In the study, it was aimed to determine the factors that the participants took into consideration when determining their housing and location preferences and to determine which factors were more related to the satisfaction of the users. It was also wanted to determine whether these factors changed with the pandemic period. For this purpose, factor analysis was performed to determine the statements that affected the satisfaction of the participants, taking into account the pre-pandemic period and the pandemic period. By grouping and interpreting many variables in factor analysis, understanding and interpreting the relationships between variables were facilitated. In this context, all expressions (variables) queried within the scope of the research were grouped by bringing together the related ones using Varimax rotation (Table 4). As a result, factor groups were named by determining the common point between the variables within the same group and looking at the variable with the highest loading.

The suitability of research data for factor analysis was evaluated by Kaiser Mayer Olkin (KMO) and Bartlett tests. From the 29 statements evaluated, statements Q4, Q13, Q18, Q19, Q21, and Q29 were removed before the pandemic period and a scale consisting of 23 statements that were found to be related to each other at the **level was used in the correlation analysis. Before the pandemic period, the KMO value was found to be 0.870 and the Bartlett test result was X^2=1514.408 (p≤ 0.0001).

From the 29 statements evaluated, during the Pandemic period, the statements Q1, Q2, Q13, Q18, Q21, Q29 were removed and a scale consisting of 23 statements that were found to be related to each other at the **level was used in the correlation analysis. KMO value was found to be 0.851, and Bartlett test result was found to be X^2=1437.621 (p≤ 0.0001). The fact that the KMO value determined for the pre-pandemic and pandemic periods was in the range of $0.80 < \alpha < 1.00$ showed that the data was highly reliable and the Bartlett test was significant, indicating that the data was suitable for factor analysis.

According to the data obtained from the pre-pandemic period, five factors with eigenvalues above 1.0 explain a total of 49.630% of the variance in the scale scores. The total variance of the 1st factor is 26.548%. These results (Table 4) reveal that the statements under the 1st factor group (natural and cultural values) that meet the satisfaction levels of all user groups with housing and its immediate surroundings are more important than the statements under other groups. The total variance of the 2nd factor group (Proximity to Services) was determined as 6.985%, the total variance of the 3rd factor group (Security) was determined as 5.971%, the total variance of the 4th factor group (Location) was determined as 5.511%, and the total variance of the 5th factor group (Earthquake) was determined as 4.615. These factor groups are listed in Table 5. According to this,

Table 4. Factor analysis results evaluating the satisfaction levels of participants with housing and residential environments before the pandemic and during the pandemic period

Before the pandemic			
Factors	**Factor eigenvalues**	**Variance explained %**	**Cumulative variance %**
1	6.106	26.548	26.548
2	1.606	6.985	33.533
3	1.373	5.971	39.504
4	1.268	5.511	45.015
5	1.061	4.615	49.630
Pandemic period			
Factors	**Factor eigenvalues**	**Variance explained %**	**Cumulative variance %**
1	5.776	25.059	25.059
2	1.597	6.860	31.918
3	1.395	6.112	38.030
4	1.302	5.570	43.601
5	1.097	5.215	48.816
6	1.048	4.690	53.506

- In the pre-pandemic period, the headings that most affected the level of satisfaction in the house and its immediate surroundings in terms of natural and cultural values were determined as "Presence of trees", "Open green area" and "Cultural structure".
- In terms of proximity to services, proximity to "Educational buildings", "Health services" and "Workplace" comes to the fore.
- “Security” and “Accessibility” come to the fore as separate categories in terms of satisfaction.
- The most important headings affecting the level of satisfaction in terms of location were determined by the "Importance of the region/district/neighborhood", "Proximity to water resources" and "Proximity to the city center" criteria.
- The earthquake factor presented itself as a separate group.

According to the data obtained from the pandemic period, six factors with eigenvalues above 1.0 explain a total of 53.506% of the variance in the scale scores. The total variance of the 1st factor is 25.059% (Table 4). These results reveal that the expressions under the 1st factor group (natural and cultural values) that meet the satisfaction levels of all user groups with housing and its immediate surroundings are more important than the expressions under other groups. The total variance of the 2nd factor group (Proximity to Services) is 6.860%, the total variance of the 3rd factor group (Security) is 6.112%, the total variance of the 4th factor group (Communication) is 5.570%, and the total variance of the 5th factor group (Location) is 5.215.6%. The total variance of the factor group (Earthquake) was determined as 4.690%. According to the distribution of these factor groups (Table 6),

- During the pandemic period, the parameters "Open green space", "Presence of trees" and "Clean air" come to the fore among the natural and cultural values that most affect the level of satisfaction.
- Regarding proximity to services, the parameters "Proximity to the workplace", "Socialization" and "Neighbourhood relationship" were evaluated as among the most important headings.
- “Accessibility” and “Security” come to the fore as separate categories in terms of satisfaction.
- In terms of location, proximity to "Water resources" and "Forests" has been determined as separate and important groups.
- The earthquake factor presents itself as a separate group.
- Additionally, unlike the pre-pandemic period, the parameters "Closeness to relatives" and "Closeness to friends" were separated from the other groups and appeared as the 4th Factor group.

The differences detected when comparing the participants' thoughts before the pandemic period and during the pandemic period are summarized below.

- While the statements "security is an important criterion in housing preference" and "region/district/neighborhood is an important criterion in housing preference" were important before the pandemic period,

Table 5. Factor groups that met the participants' satisfaction levels with their housing and immediate surroundings in the pre-pandemic period (BP)

BP		Factor loadings				
Expressions	**Concept**	**Natural and cultural**	**Proximity to services**	**Security**	**Location**	**Earthquake**
Q16	Presence of trees	0.674				
Q22	Open green field	0.625				
Q15	Cultural structure	0.596				
Q17	Hobby gardens	0.590				
Q24	Sportive activity	0.554				
Q27	Vital support	0.515				
Q23	Children's play area	0.485				
Q28	Health	0.478				
Q25	Suitability for pets	0.410				
Q10	Fresh air	.376				
Q5	Security		0.769			
Q6	Accessibility		0.675			
Q14	Suitability for individuals with disabilities		0.412			
Q1	Importance of region/ district/neighborhood			0.745		
Q3	Proximity to water sources			0.600		
Q2	Proximity to the city center			0.593		
Q12	Proximity to educational buildings		0.652			
Q11	Proximity to healthcare services		0.572			
Q7	Proximity to workplace		0.561			
Q20	Proximity to friends		0.517			
Q26	Neighborly relations		0.506			
Q8	Socializing		0.478			
Q9	Earthquake resistance				.661	

- During the pandemic period, the expressions "proximity to water resources such as the sea or lake is an important criterion", "open green areas are an important criterion", "proximity to relatives is an important criterion" have gained importance.

Therefore, based on these data, while crowded and lively city centers were preferred in housing preference before the pandemic, on the contrary, after the pandemic, people moved to natural, calm and healthy environments such as the sea, lake and forest, away from the crowd, people and the city center, as well as to relatives. It has been observed that the attractiveness of houses in easy-access areas has increased. In other words, before the pandemic period, entertainment, shopping and the social environment were the determining factors of people's housing preferences, but with the pandemic period, protection from the pandemic and healthy living have become the determining factors.

DISCUSSION

This study primarily focused on whether there was a change in the user satisfaction scale in people's preference for housing and residential surroundings in urban areas before and during the Covid-19 pandemic. At the same time, it aimed to raise awareness about the importance of urban open spaces during epidemic periods. In this context, the study conducted specifically in Istanbul focused on the characteristics of a healthy residence and its close environment (home in order to be protected from pandemics in the future and the impact of the social, physical, cultural, perceptual and economic opportunities of the residential environment on housing choice.

Results clearly show that we need to pay more attention to the contribution of residential gardens and urban open spaces to people and the city during the epidemic period. When the effect of Covid-19 on changing the type of housing people live in was questioned, it was revealed that 65% of the participants lived in an apartment, but with

Table 6. Factor groups that met the participants' satisfaction levels with their housing and immediate surroundings during the pandemic period (PP)

PP		Factor loadings					
Expressions	**Concept**	**Natural and cultural**	**Proximity to services**	**Security**	**Communication**	**Location**	**Earthquake**
Q22	Open green field	0.795					
Q16	Presence of trees	0.691					
Q10	Fresh Air	0.606					
Q27	Vital support	0.533					
Q15	Cultural structure	0.532					
Q28	Health	0.477					
Q24	Sportive activity	0.469					
Q23	Children's play area	0.421					
Q17	Hobby gardens	0.349					
Q25	Suitability for pets	0.329					
Q7	Proximity /closeness to workplace		0.615				
Q8	Socializing		0.605				
Q26	Neighborly relations		0.585				
Q11	Proximity to healthcare services	0.562					
Q12	Proximity to educational buildings	0.498					
Q14	Suitability for individuals with disabilities	0.407					
Q6	Accessibility			0.770			
Q5	Security			0.696			
Q19	Proximity to relatives				0.790		
Q20	Closeness to friends				0.767		
Q3	Proximity to water sources				0.796		
Q4	Proximity to forests					0.540	
Q9	Earthquake resistance					0.650	

Covid-19, 71% of the participants wanted to live in house with a garden. In a study examining the change in people's perspectives on the city and housing during the pandemic period, it was found that city centers lost their attractiveness, apartment life limited people and was described as unhealthy, those with the means preferred detached houses away from the crowd, surrounded by nature, and those with less means preferred their current living conditions. It has been determined that they transform their areas into more livable areas. In a study examining the change in people's perspectives on the city and housing during the pandemic period, it was found that city centers lost their attractiveness with the epidemic, apartment life limited people and was described as unhealthy, and those with the means preferred detached houses away from the crowd and surrounded by nature. It has been determined that those with fewer opportunities can transform their existing living spaces into more livable ones. It has also been observed that sales of houses with gardens have increased and the rents of these houses have also increased (Tayanç, 2022). Residential or home gardens or yards are the places where residents share everyday interactions with nature and are under private ownership (Ghosh, 2021). In a study conducted with residents of Rio de Janeiro during the Covid-19 epidemic, it was emphasized that although urban parks and green landscapes are important for people, residential gardens are the most effective factor in reducing mental distress (Marques et al., 2021). Another study confirmed that participating in gardening activities reduced psychological distress during isolation (Theodorou et al., 2021). In a study with similar results, the reasons for gardening during the pandemic period were investigated. Among the responses received, giving life satisfaction, especially liking gardening activities and enjoying seeing plants/flowers grow stood out as the most frequently mentioned expressions (Chalmin-Pui, 2021).

Using nature, including residential gardens and public green spaces, is known to be positively correlated with measures of subjective well-being (Lehberger, Kleih & Sparke, 2021).

It also shows that engaging in gardening activities is important for some people and can be creative and have the opportunity for self-reflection (Chalmin-Pui, 2021). On the other hand, it is known that a private garden can partially compensate for the lack of access to public green space, but in times of crisis, nearby public green spaces are especially important for households without a private garden (Poortinga et al., 2021). This supports the results of many studies that having open space and a garden has potential benefits and contributions to life satisfaction (Lehberger, Kleih & Sparke, 2021; Corley et al., 2021; Poortinga et al., 2021; Hanson, Eckberg & Widenberg, 2021).

Our research findings, as in similar studies, emphasized that the presence and quality of trees in the immediate vicinity of residences in urban areas are important during the pandemic period, and also emphasized the role of open green spaces (Olszewska-Guizzo et al., 2021; Poortinga et al., 2021). A study conducted by Chalmin-Pui (2021) revealed that the generally open and green prevalence of houses and the perception of environmental quality are an important factor in positive credit and housing preferences. In addition, the benefits of green structures in residences and residential gardens for psychological and physical health have been expressed (Chalmin-Pui, 2021). It is also clear that private gardens provide opportunities for daily nature experiences (Hanson, Eckberg & Widenberg, 2021). This is a result consistent with previous findings.

Another study supporting our research findings was conducted among apartment residents in Tehran. This study, which examines the effectiveness of factors related to mental health, physical health and socio-economic lifestyle in determining priorities in housing selection after the COVID-19 crisis, shows that the view from the window to the open space reaches the highest average among other preferences. The study also recommended the use of plants in the immediate vicinity of residences due to their calming effects on stress reduction, as well as their effects on improving air quality, reducing noise and creating favorable views. Determining the depth of appropriate private open or semi-open spaces per capita in line with the socio-cultural context of each region has been suggested as a strategy that will positively affect the mental health of urban residents (Zarrabi, Yazdanfar & Hosseini, 2021).

In this article, the statement "proximity to water sources such as the sea or lake is an important criterion", which is among the perceptual criteria regarding the house and its environment, stands out and suggests that spending time here can be an important source of health. Similarly, in a different study, people described the coastal area as an integral part of their extended home networks (Jellard & Bell, 2021). In this context, our research supports previous studies and contributes to the literature showing that water is beneficial for people's health.

According to our research results, the statements "proximity to forests is an important criterion" and "accessibility is an important criterion" came to the fore among the physical criteria during the pandemic period. According to the results of a study conducted with real estate agents in Italy, where Guglielminetti et al. (2021) investigated the impact of the pandemic on housing preference, the pandemic caused a large increase in the demand for houses located in areas with lower population density. Accordingly it has been determined that a significant shift in home preferences towards larger, single-family homes with outdoor areas. Therefore, it is possible to say that there is a tendency towards natural areas with low population, away from crowds. Again, in a study on housing purchasing preferences, it was observed that with the pandemic, homeowners started to prefer houses surrounded by greenery where they could get fresh air. Therefore criteria such as having a garden terrace or balcony and proximity to the forest directly affected the housing purchasing process. In addition, the criterion of proximity to the forest in housing preference was determined as the least important criterion in both pandemic and non-pandemic situations. Online education and online working situations arising from the pandemic have caused users to pay more attention to the interior features of the house. For this reason, there has been no change in the importance of the proximity to forest criterion (Çalık & Ergülen, 2023). A study conducted in Izmir also showed that the epidemic had an impact on housing preferences. While preferences are changing from gated communities and residences to detached houses, personal pools and walking areas and, if possible, nature and sea views have also been determined as preferred factors. In addition, due to the effect of the epidemic, the demand for housing increased, but due to limited land, construction increased in locations further from the city center (Diyadin Lenger, 2023).

In addition, along with various studies indicating that crowded environments cause negative health problems, the World Health Organization has also stated the characteristics of healthy housing. It is stated that in such epidemic situations, completely detached houses with a reasonable amount of garden space in the surrounding area, providing better opportunities for social distance and food production, having the healing effects of light, air and nature, would be a good solution. It is clear that the idea of creating indoor garden areas even in multi-storey buildings should now be considered. Research areas and questions on architecture and urbanization were defined in a study that included lessons to be learned about built environments after the Covid-19 pandemic. Accordingly, under the title of post-pandemic housing, the layout of houses, indoor air quality, flexible use and transformation are stated as the subject of this study. One of the research questions related

to these topics is “Should our terraces, balconies, and roofs be planted?” Therefore, it seems that it is important for the house to have as much plant presence as possible in terms of what the pandemic has taught us (Megaheda & Ghoneim, 2020).

While the statements "sports activities are an important criterion" and "proximity to educational buildings is an important criterion" were prominent among the functional criteria before the pandemic, a decrease in these rates was detected during the pandemic period. Similarly, Akbari et al.'s (2021) study showed that environmental factors are the first priority in residents' housing preferences compared to space and activities, and the most important priorities are air quality, daylight quality and view quality, respectively. Air quality and natural light are among the priority criteria for healthy homes when choosing housing. In the research that determines the level of satisfaction and preference regarding the residence, the lowest indicators are seen in "activities and functions", and the highest indicators are in "terrace", "green area" and "exercising outdoors". In the research, a decrease was observed in the statement "providing vital support (such as the presence of social facilities, sports fields, recreation areas) is an important criterion" among the statements among the psychological criteria. While healthy socialization in terms of psychological health and recreational activities in terms of physical health define vital support during the pandemic, a healthy diet and access to food can also be discussed under this heading. From this perspective, Megaheda and Ghoneim (2020) stated that we need physical interaction with living plants for our mental health and that we should also grow what we eat to reduce the risk, especially during self-isolation. For this reason, they state that we should focus on green again, especially from what the pandemic has taught us, and that we should consider planting options and green roof system applications in our gardens and terraces.

In the research, a decrease was observed in the statement "providing vital support is an important criteria"(such as the presence of social facilities, sports fields, recreation areas) which among the psychological criteria While healthy socialization in terms of psychology and recreational activities in terms of physical health are defined as vital support during the pandemic, a healthy diet and access to food can also be discussed under this heading. From this perspective, Megaheda and Ghoneim (2020) stated in their study that we need physical interaction with live plants for our mental health and that we should also grow what we eat to reduce the risk, especially during self-isolation. They also stated that we should focus on green again, especially based on what the pandemic has taught us, and that we should consider planting options and green roof system applications in our gardens and terraces.

It is known that being in contact with green areas positively affects psychological health. This relationship can be achieved in public spaces. However, when public spaces cannot be accessed or used, the role of green spaces within or in the immediate surroundings of the home is important (Spano et al., 2021). As a result of the online surveys conducted by Akbari et al. (2021) with 421 people during the pandemic period, it turns out that environmental factors have a higher mean in housing preferences than space, functions and activities, and that optimal mental health is associated with a very high level of satisfaction with indicators of roof, green space and outdoor exercise. Findings regarding housing type revealed that people living in private homes had better mental health than those living in low-rise or high-rise housing.

As a result of the research, there was a decrease in the statement "socializing/establishing social ties is an important criterion" among the statements among the social criteria. Among the cultural criteria, the statements "closeness to friends and acquaintances is an important criterion" ($\overline{X}$ =2.98) and "neighbourhood relationship is an important criterion" stand out, while a decrease in the statement "neighbourhood relationship is an important criterion" was detected during the pandemic period. Different from these results, a study showed that a living environment that allows the establishment of social relationships is important. While security is determined as the most important factor in housing and residential environment preferences, people prefer safe living spaces that allow neighborly relations. In terms of construction type, low-rise buildings are more preferred. The vast majority prefer living spaces in a site layout. Security, perception of exclusivity, common areas, social facilities and integrated building layout are effective in this decision. As a result of the study, it was revealed that the Covid-19 epidemic affected people's priorities regarding housing and the residential environment to a limited extent (Levend & Sağ, 2023).

Although our study provides important information about the factors affecting the choice of housing and the housing environment, this study has some limitations. The number of women among the participants is significantly higher than the number of men, meaning that the imbalance in gender distribution may change the results. New studies with a larger number of participants will be fundamental to better understand how effective factors in the selection of housing and residential environments can help reduce possible problems during a possible epidemic period. Since only the parameters of the residential environment were evaluated in this study, it is recommended that the parameters of the building structure and interior design should also be taken into account in the future.

CONCLUSION

The COVID-19 pandemic has revealed the necessity of planning cities in the face of possible future global health crises. Developing new approaches within the scope of housing, business and social life activities has become vital and many disciplines have evaluated the issue through field studies. Our study was conducted to reveal how the COVID-19 epidemic affects people's housing and immediate surroundings and quality of life preferences. In this context, preferences and satisfaction levels are discussed under physical, functional, cultural, perceptual, psychological and perceptual criteria. Together with the evaluations made, it is possible to discuss the results based on the research questions stated at the beginning of the study.

- Will Covid-19 have an impact on changing the type of housing people live in? What are the factors affecting users' preferences regarding housing and residential environments before and after Covid-19? Considering both this research and other research conducted during the pandemic, it is seen that people's housing preferences have changed. These changes seem to be influenced by the location and quality of the house, the physical opportunities offered by the housing environment, the presence of opportunities such as interior space/balcony/terrace/garden/roof garden, neighborhood relations and socialization with other people, security, access to the city center and therefore to crowded places. In addition to changing preferences, there are also situations where economic conditions are not possible to change the house and its surroundings. In this case, people made some changes to their existing homes, at least within their means. With this result, these demands of users should be prioritized in the residential areas that will be planned and designed from now on.
- How effective are the social, physical, cultural, perceptual and economic opportunities of the residential environment in housing choice? Among the physical criteria affecting housing choice during the pandemic period, proximity to forests and accessibility were determined as important criteria. Many studies have shown that having accessible green areas in people's living spaces has positive effects. This research also shows that users demand this. When we look at the functional criteria, it is seen that it is not as prominent as it was before the pandemic. On the other hand, research shows that during the pandemic period, environmental factors such as air quality, light, etc. are considered before the diversity of places and activities. The importance of a healthy social life in the development of an individual is an undeniable fact. However, this situation remained in the background during the pandemic period. Although restricting people's social activities and environments is a requirement of isolation measures, it has also produced negative consequences. This situation has been the subject of different research. When we look at the choice of housing and its immediate surroundings, establishing social relationships during the pandemic was not a desired situation. It has been observed that there are also studies that show the opposite. Therefore, although the probability of recurrence of pandemics is low, it is also an important consequence that people have to stay away from social life in a possible situation.
- What is the level of relationship between factors affecting housing and housing environment preferences due to the pandemic and life satisfaction? In this inquiry, the functions that are most correlated with the expression of satisfaction in people's preferences regarding housing and residential environments before the pandemic period are, respectively, positively affecting the physical and psychological health of individuals and providing vital support (such as the presence of social facilities, sports fields, recreation areas). These results also showed that children's playgrounds gained importance during the pandemic period. In addition, the expressions "The importance of the existence and quality of trees" and "Suitability for use by disabled individuals" gained importance during the pandemic period.
- What are the effective factors on the user satisfaction scale in choosing housing and its immediate surroundings? During the pandemic period, natural and cultural values affected the level of satisfaction the most, and within this factor group, the parameters "Open green space", "Presence of trees" and "Clean air" came to the fore the most.

As a result, our study clearly showed the contribution of residential gardens and urban open spaces to people and the city during the epidemic period. With Covid-19, it has been revealed that the type of housing people wants to live in is a house with a garden. For adaptation and resilience cities against to the effects of the pandemic such as Covid-19, managers should consider a flexible and sustainable urban development strategy. It is thought that the evaluations made with the results obtained from this study for possible future pandemics can form the basis for the physical and social resilience of cities and contribute to finding solutions.

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