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Article

Investigation of the determinants of user satisfaction in social mass housings in Edirne during the COVID-19 period

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ABSTRACT

The pandemic, with increased time spent at home, has heightened the importance of user satisfaction as needs have evolved. We aim to evaluate user satisfaction in COVID-19-era state-built mass housing and contribute to mass housing design literature.
The study focused on social housing in Edirne, analyzing architectural observations, surveys, demographic information, house characteristics, and spatial adequacy. Correlation and regression analyses explored satisfaction relationships, factors affecting satisfaction, and their influence.
User satisfaction is influenced by demographic characteristics, with insufficient living spaces due to the pandemic causing structural changes. Structural, environmental, interior, location, and access features significantly impact satisfaction, with structural features having the most significant impact.
Maximizing thermal comfort, ensuring high resistance to disasters, and maintaining good physical condition are the key factors that positively affect user satisfaction. However, poor-quality sound insulation materials and craftsmanship standards decrease satisfaction levels. It has been found that users prefer houses located near the city center. Additionally, users consider the environmental and green spaces of the house more important than its interior features.
Satisfaction with houses is greatly influenced by their structural and environmental features. It has been recognized that green areas and social spaces are essential and should be increased. Furthermore, flexible space planning has been emphasized to ensure the house can adapt to changing living conditions.

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INTRODUCTION

The COVID-19 pandemic, which started in Wuhan, China, rapidly affected the whole world and changed our lives, lifestyles, social relations, and habits, adversely affecting many sectors such as health, education, trade, etc. (Salama, 2020). To avoid the danger of the deadly epidemic, all business areas reorganized their work. As a result of the rapid spread of the virus, educational institutions took an immediate break from face-to-face education and switched to online education. Most business sectors turned to

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working from home. The rapid increase in the number of cases caused curfews. People became familiar with concepts such as "social distance," "mask," "quarantine," and "washing hands frequently during the day." Our homes are no longer just places where we eat, rest, and meet our daily needs; they take on many various functions. For adults who find it inconvenient and dangerous to leave the house, the rooms have turned into offices where online working orders are established, places where meetings and teleconferences are held, gyms where exercise is done, and balconies that have turned into closed spaces have turned into classrooms where children listen to their teachers over computer screens (Gür, 2022). The virus, which carries a higher fatal risk, especially for individuals over the age of 65, has caused them to stay at home for much longer periods, not being able to go out at all (Güngör, 2022). Although the epidemic was partially controlled with the discovery of the vaccine, this extraordinary situation between 2020 and 2022 made everyone unprepared to question life's social, economic, and societal aspects. Just as Paris and London renewed their entire infrastructure during the cholera epidemic in 1954 (Yüksel, 2022), it changed the perspectives of designers, city planners, and interior architects. It showed that all design dynamics should be rearranged despite the pandemic being left behind. Urban planners and landscape architects saw the importance of open and green spaces in planning much better (Andreucci et al., 2019). The concept of "pandemic architecture" came to the fore, and architectural design evolved into spatial arrangements where social relations and business life could coexist.

The housing phenomenon has reminded us again of the vitality of architectural design, as it is one of the issues where the user spends the most time during the pandemic and meets all life needs. In addition to the living function, the installation of additional functions and the increase in the use of the house have changed the need for additional spaces and the expectations from the house (Rogers & Power, 2020). In particular, the owners of the houses built for low- and middle-income families, whose size and usage area are kept to a minimum to enable more families to own housing by producing the maximum number of houses, faced this situation more during the pandemic.

The study aimed to identify the factors determining user satisfaction in social mass housing and residential areas built by the state for Turkey's low- and middle-income families during the pandemic. We selected the sample area of the research as Edirne, a rapidly developing border city in Turkey that hosts social housing projects. Since no previous study had analyzed the statistical data to evaluate user satisfaction in social mass housing built in Edirne during the COVID-19 pandemic, we saw this as a weakness and a decisive factor in choosing Edirne as the study area.

The State Mass Housing Administration builds social mass housing that offers affordable housing options for families who wish to own a house. These houses are cheaper compared to the free housing market. Despite the recent earthquake, which caused damage to many buildings in the affected provinces, the social housing estates remained undamaged thanks to reliable construction solutions such as "raft foundation," "tunnel formwork carrier system," and high-strength concrete. Due to their reliability, the demand for these houses has increased among families (NTV News, 2023). We conducted an intense application process for 11,844 houses, the foundations of which have been laid, and they are scheduled for delivery in 2025. We completed the draw for the houses on March 11, 2023. Our research conducted in Edirne aimed to set an example for similar studies to be carried out in other regions of Turkey. This research is unique in determining the criteria contributing to user satisfaction with their housing during the pandemic period. The study also identifies spatial qualities that should be present in mass housing designs to be produced in the future. We used a survey investigation as the research method for this study. We will analyze the survey results statistically to obtain answers to the questions posed in the research. The main question of the research is whether users were generally satisfied with their residence and its features, including structural, environmental, location, and access features, throughout the pandemic. The study also aims to determine the demographic characteristics that affect housing satisfaction and the factors contributing to user satisfaction with their housing during the pandemic. Additionally, the study aims to identify the design approaches that should be followed in future social housing for low- and middle-income families.

Although the COVID-19 pandemic is behind us, we have learned valuable lessons from the research conducted during this time. Specifically, we have identified critical design criteria that can increase the satisfaction of users living in social mass housing built for low- and middle-income families, particularly in the event of possible pandemic situations in the future. These findings can pave the way for new and improved designs that prioritize the safety and well-being of residents.

LITERATURE REVIEW

User satisfaction is a complex and subjective matter that varies depending on the person, place, and time. Researchers have conducted studies to understand the relationship between the quality of life and user satisfaction, evaluate the success of housing projects built by both the private and public sectors, and determine users' perceptions of the inadequacies of the residential environment. In the literature, many researchers have investigated the economic, social, physical, and personal dimensions of user satisfaction in different areas. Generally, demographic characteristics,

physical characteristics of the house, characteristics of the housing environment, and the relationship between the location of the house and satisfaction are chosen as the main topics in user satisfaction studies. Some researchers have examined the relationship between time spent in housing and satisfaction (Kasarda & Janowitz, 1974; Hunter, 1978; Hourihan, 1984; Satsangi & Kearns, 1992; Mohit et al., 2010; Caldieron, 2011); some have pointed out how factors such as age, family size, whether the woman of the house works or not, and the size of the area per person in the house affect satisfaction. It is important to note that housing satisfaction is a subjective concept that depends on individuals' perceptions and expectations, so research cannot come to a definitive conclusion. This study explored user satisfaction; nonetheless, significant studies in both domestic and foreign literature have contributed to user satisfaction.

Studies frequently include socio-demographic characteristics directly related to satisfaction in the literature (Marans & Rodgers, 1975). Mohit et al. (2010) found that having more family members and a working woman in the household negatively affects satisfaction with housing. Adams (1992) identified marital and educational status as additional factors determining housing satisfaction. In a recent study, Özdeniz (2022) examined the impact of quality of life on housing preferences in Mersin, a city in the Mediterranean region of Turkey, and found that quality of life factors directly influence housing preferences. In a study by You et al. (2022), the relationship between the physical and mental health of individuals living in affordable housing in Hangzhou, China, and their housing satisfaction was investigated. They found that the mental and physical health of the users is affected by their own socio-economic and demographic characteristics. As a result, their satisfaction with their housing was high. Esen & Çivici (2022) also explored the satisfaction levels of public housing users with their living conditions and surroundings in Balıkesir, Turkey. They considered the satisfaction levels based on household size and ownership status. They found that forcing families of different sizes and income levels to live in the same type of housing reduces user satisfaction. They suggested that flexible space solutions are the correct planning principle in housing designs.

The literature also includes studies showing how the house's physical characteristics affect user satisfaction. Lane & Kinsey (1980) stated in their study that housing characteristics are more important than demographic characteristics. Suggested that various housing features, such as the number of bedrooms, the size and location of the kitchen, and the quality of housing units, strongly correlate with user satisfaction. Similarly, Mohit & Raja (2014) stated that the number and size of bedrooms, the placement of the kitchen in housing planning, its relationship with other spaces, and the number of bathrooms and toilets are also factors that affect satisfaction. Physical features of the house, such as comfort, building quality, housing plan, and house size, provide higher satisfaction (Türkoğlu, 1997). Tran & Vu (2017) investigated the relationship between house features and user satisfaction with life. They emphasized the importance of improving the facilities of houses where the elderly live, as satisfaction with the house has a strong positive effect on a person's satisfaction with life. In his study conducted in 2009, Gür aimed to measure the satisfaction levels of users who lived in houses built by the Mass Housing Administration in Bursa. The study showed that the users were unhappy with their houses due to specific spatial and structural problems. Gür also provided suggestions for future improvements in the design of these houses. Lee & Jeong conducted a study in 2021 to investigate the effect of residential environment features on user satisfaction in Seoul, Korea. They examined the relationship between housing-environment satisfaction and social environment factors such as accessibility, comfort, security, and location attachment. The study found that place attachment, especially accessibility, positively affected housing satisfaction. The production of high-quality housing was also found to be important in ensuring the architectural sustainability of the house. In Adriaanse (2007)'s comprehensive research on residential environment satisfaction in the Netherlands in 2007, he used multivariate analysis techniques to analyze data collected from a housing demand survey he conducted with users. The study found that the user's relationship with their social environment was satisfaction's most critical component. Çanakçıoğlu (2021) discussed the significance that residents attach to social-environmental relationships in their homes and pointed out that they do not favor urban transformation as they are content with their neighborly relationships. Another study in Bursa, Turkey, examined the relationship between happiness and user satisfaction. It was concluded that residents' satisfaction with their housing and neighborhood relations impacted their perception of happiness (Gür et al., 2020). Berköz & Kellekçi (2007) researched determining the satisfaction of Bahçeşehir mass housing residents with their housing and environment and identifying the necessary conditions for their satisfaction. They concluded that the housing environment is equally important as the housing quality for the residents and that physical, social, and economic factors affect both. Kellekçi & Berköz (2006) conducted another study to determine the factors affecting satisfaction with housing and environmental quality in the Istanbul Metropolitan area public housing. They found that the location of the house, residents' opinions about the environment and recreational areas, structural and environmental security, neighborly relations, and the physical appearance of the residential areas are the factors that most significantly increase the quality and, therefore, the residents' satisfaction. You et al. (2022) found that immigrants living in affordable

housing in Hangzhou, China, were dissatisfied with their housing environment and security expectations. They also highlighted the importance of following housing policies to improve housing conditions for the future. Another study by Mohit et al. (2010) investigated user satisfaction in public housing built at low costs in Kuala Lumpur. The study found that users were more satisfied with open spaces, service units, social environment, and neighborhood relations than the house's physical features. Uşma & Akıncı (2021) emphasized the need to investigate all factors affecting satisfaction in housing thoroughly. They evaluated different opinions based on existing studies on user satisfaction in the literature. By comparing satisfaction criteria in certified buildings, they concluded that the house and its environment should be considered together in future housing designs. They also highlighted the importance of the socio-demographic and cultural characteristics of the user, as well as the physical, social, and economic characteristics of the house and its surroundings when analyzing satisfaction.

Asim et al. (2021) highlighted that the COVID-19 pandemic has emphasized the importance of housing in human life. They noted that users' satisfaction with their homes is directly linked to factors such as natural light, proper ventilation, and the inclusion of open areas such as balconies and terraces in the design. They also mentioned that housing satisfaction significantly impacts physical, mental, and emotional well-being. Bettaieb & Alsabban (2020) conducted a study to determine how Cide residents met their users' psychological, social, and cultural needs during and after the pandemic. They found significant differences in users' satisfaction levels and perceptions before and after COVID-19. The study revealed that the flexibility of the design was related to the house's functional, cultural, and structural features. The authors proposed design suggestions to develop the foundations of flexible housing based on social and cultural values. Torres et al. (2021) investigated the perspective of homeowners in Mexico during the pandemic period. They revealed that most homeowners were satisfied with the size of their homes and spaces but felt that the open spaces were inadequate. The authors suggested that, in light of the current conditions, there is a need to rethink architectural design and incorporate new paradigms that emerged during the pandemic. Torres et al. (2021) researched in Spain to investigate if residential properties satisfied the needs and expectations of users during the pandemic period. The study revealed that architectural design had a significant impact on user satisfaction. The researchers suggested that housing design should be rethought, and existing housing should be renewed, considering the emerging spatial needs. Alavad (2021) investigated how users interact with and adapt to their homes in line with their increasing needs during the pandemic in different countries and found that users have been giving new functions to their existing spaces and adding appropriate equipment to meet their increasing needs (such as turning bedrooms into study rooms with added desks) and argued that flexible space solutions should be included in housing design. According to Li & Tang (2021), the COVID-19 pandemic has highlighted the importance of good home ventilation. Poor ventilation can lead to a higher risk of infection and can negatively impact user satisfaction. Li and Tang's study found that occupants were less satisfied with their living conditions in houses with unmet ventilation needs. In 2022, Gür examined how the pandemic affected the use of space in homes in different regions with varying socio-economic levels in Bursa, Turkey. The study found that changes in hygiene, shopping, and transportation habits also impacted the frequency of people meeting others outside their homes. As a result, users require flexible design solutions that provide multi-purpose spaces. Bayer & Yazıcı (2022) investigated the impact of daylight on working spaces in homes, which became increasingly important during the pandemic when many people were working from home. The research revealed that users who lacked adequate daylight in their workspaces made changes to their homes, highlighting the significance of daylight in terms of the function of the space. The importance of solutions that enable change in residential interior designs and green space arrangements around the residence was discussed by Yüksel (2022) in terms of architectural sustainability. This is based on the increase in the functions of the residents due to the pandemic.

The Concept of User Satisfaction and its Examination in Mass Housing for Low-Income Families

The state of "well-being in general" is the most tangible result that is directly related to the satisfaction of one's life (Diener et al., 2009). The factors that affect happiness and well-being and the components that make up life as a whole are in interaction (Larsen et al., 1985; Diener, 2000; Kahneman, 1999; Veenhoven, 2000; Larsen & Eid, 2008; Diener et al., 2009). Quality of life, satisfaction with life, well-being, and living conditions are essential for satisfaction (Headey & Wearing, 1992; Diener, 2000; Veenhoven, 2000). Satisfaction is a concept related to fulfilling one's goals and meeting one's needs in various areas of life (Ibem & Amole, 2013). The most important of these living spaces are the residences where the person spends most of his life. Housing satisfaction, one of the critical factors in an individual's quality of life, is a relative concept and varies depending on time and person (Huang & Du, 2015). Housing is where the need for shelter is met, people's cultural, social, and economic identity takes shape, and social rules and relations are learned, representing comfort and security (Karahan & Özüerken, 2009). User satisfaction, an important parameter in determining the

residents' reactions to their environment, defines the user's satisfaction regarding the current housing situation (Mohit & Nazyddah, 2011). The dwelling and its immediate surroundings, which occupy an essential place in the user's life and determine the quality of life, are well-planned and can meet needs, increasing satisfaction (Güremen, 2016). Understanding the true meaning of user satisfaction is possible by first measuring the determinants and effects of this concept (Gifford, 2014). These measurements, whose results differ from country to country from the past to the present, are usually carried out through survey research with users in scientific studies (Smrke et al., 2018). Moreover, determining the parameters that increase the satisfaction of homeowners with their homes is seen as the primary goal (Wang & Wang, 2016). Another issue that is as important as housing planning is a well-planned housing environment. Satisfaction with the residential environment, a primary living area where the various needs of people living in the house are met (Lawrence, 1987), has also been the subject of much research, just like housing satisfaction (Oktay, 2001). There are many factors (such as location) that affect the user's satisfaction with the residence (Cao & Wang, 2016; Lin & Li, 2017). Demographic characteristics, socioeconomic status (age, occupation, economic status, marital status, etc.) (James et al., 2019), physical characteristics of the residence (number of rooms, insufficient or unnecessarily large rooms, whether there is a balcony, number of bathrooms, etc.) (Fuller et al., 2000), features of the residential environment (open and green areas, sports areas, recreation and social areas, etc.), location of the house, and features that determine the relationship of the house with the city (access to the city center, access to shopping and health units, etc.) are the variables that determine the satisfaction or dissatisfaction of the user with his home (Gan et al., 2019). The evolution of today's living conditions, driven by the technological age we live in, has changed the needs of homeowners and their perception of their living environment. This shift has increased the importance of satisfaction with one's home, especially in extraordinary situations such as pandemics. With the COVID-19 pandemic, it has been better understood that the flexible planning approach that can be adapted to all kinds of user needs, depending on the changing living conditions, is today's ideal design approach. It is not the individual's adaptation to the dwelling; the adaptability of the dwelling to the individual is an essential factor in increasing the residents' satisfaction. User satisfaction is related to architectural design, urban planning, geography, psychology, etc. Although it has been a subject that has been researched in many disciplines for many years, its importance has increased even more with the COVID-19 pandemic, whose effects have been ongoing since 2019 (Dekker et al., 2011; Aigbavboa & Thwala, 2016; Wang & Wang, 2016). Since the house undertakes many additional functions besides its own, such as sleeping, eating, and resting, the user's expectations from the house have increased accordingly, and the house has been insufficient in many respects to meet the user's needs.

When mass housing applications produced for low-income families worldwide are investigated, different dimensions are seen in housing production for various reasons, such as migration, rapid urbanization, and population growth in every geography. Considering the development of social housing, it is noteworthy that after the Second World War, large-scale mass housing was produced for the working class in the city peripheries in Europe. However, there was no social housing construction in Turkiye at that time (Bican, 2020). Large-scale social mass housing practices, which emerged as a solution to the housing problem with the government's policies in Turkiye, started mainly after the 2000s (Alkiser & Yürekli, 2004). The government focused on constructing social housing to address the housing crisis during a specific period. The objective was to build a significant number of homes in a short amount of time without generating profit. Construction began in 2003, and the goal of 500,000 homes was achieved by 2011. A new objective of 700,000 homes was established with a completion target of 2023, aiming to produce 1.2 million homes (TOKİ, 2023). The primary emphasis in constructing social mass housing is ensuring the fundamental human right of access to housing. This involves providing financial support to families who cannot afford housing (Bayraktar, 2006). The goal is to ensure that low-income families can access stable and affordable housing with low payments over extended periods. Moreover, the objective is to regulate the housing market using the production model it has determined while minimizing costs and maximizing quality by utilizing state-owned lands. Research has demonstrated that the contentment of families living in social mass housing projects is crucial. These projects encompass housing production and social amenities such as education, health care, commerce, sports, recreation, and religious areas, as stated in Chapter 2. Mass housing production has resulted in the emergence of many properties, but the quality is often subpar due to the increase in housing demands (Gür, 2009). Numerous studies in the literature demonstrate that while social mass housing projects fulfill the expected housing demand by increasing the production of housing units, they often fail to provide user satisfaction due to the lack of emphasis on producing high-quality housing. In Turkey, social housing, urban transformation, and improvement projects have been subject to frequent criticism by both academic and non-academic media. Difficulties in obtaining social housing for low-income families, along with the feeling of social exclusion experienced by those who live in such areas and the poor quality of housing planning and design,

have been long discussed by architectural designers. It has been argued that using the same architectural plans for all housing production without considering the design's social, cultural, topographic, and geographical context leads to physical and functional deficiencies. The spatial organization of these plans results in fixed layouts and low-usage areas that do not allow for remodeling (Bican, 2020). Given the current circumstances, it has become crucial to conduct research to assess the level of satisfaction of families residing in social housing, particularly during the pandemic when most people are confined to their homes. This will help identify areas for improvement in the social housing designs that are being developed daily to enhance the residents' overall living experience.

DATA AND METHOD

Study Area

The city of Edirne, chosen as the study area, is a city in the northwest of Turkiye, located in the Marmara region, which includes metropolitan cities such as Istanbul, Bursa, and Tekirdag and covers the entire border of the country with Greece and most of the border with Bulgaria. The city, adjacent to the Aegean Sea in the south, has maintained its importance as a settlement on transit routes throughout history due to its location. Today, Turkiye, which is mainly in the Anatolian peninsula and the Asian continent, is the most extreme point on the European continent, as it is located in the Thrace region, separated by the straits. This means that the country and the Middle East are on the border with the European Union, being on the border between East and West both culturally and politically, and this location has economic, social, and cultural consequences. Despite this, according to TUİK data, although there was a decrease in the population until 2010, a rapid increase was observed in the city's population after this year (Türkiye İstatistik Kurumu, 2023). The reasons for this increase include the rise in the number of university students due to the Higher Education Institution's Strategic Plan in 2007, Turkey's offering of a more comfortable life for citizens from Europe because of the global economic crisis since 2008, immigration and refugee movements resulting from the civil war in Syria and other Muslim-based countries since 2010, and Edirne's location on transit routes between countries (Deniz, 2014).

Housing construction has increased rapidly in Edirne in recent years, in parallel with the increase in population in many cities in Turkiye. Today, owning a house has become a challenge not only for low-income families but also for middle-income families. As housing prices continue to rise, there is a growing demand for social housing that provides more affordable solutions to owning a house. In Edirne, social housing projects were developed in 7 stages in Fırınlarsırtı and Hadımağa. (Figure 1, Figure 2) Since the number of houses and users in the Hadımağa settlement was insufficient and did not have conditions suitable for the study, it was excluded, and the houses in the Fırınlarsırtı locality were included. In 2021, the foundations of 221 houses were laid in Hadımağa as the 7th stage, and finally, 120 houses as the 8th stage in 2022.

All residences, except for stages 4 and 7, are situated in Fırınlarsırtı. The first phase of the residences was built in 2007, consisting of 784 residences in 49 blocks. Each block has 16 flats, and 26 of them are "K type" with a 3+1 plan, while 23 are "F type" with a 2+1 plan scheme. The second phase of the residences was built in 2009, comprising 458 residences in 28 blocks. There are 176 flats in 11 blocks, called "BY type," with a 1+1 plan scheme, and 282 flats in 17 blocks, called "DY type," with a 2+1 plan scheme. The 3rd stage, built in 2010, includes 368 flats with a 2+1 plan scheme in 11 blocks called "CYB" type. The 5th stage consists of 80 residences, "B1 type," built in 5 blocks in 2014, consisting of 2+1 residences. In 2017, 137 residences were built, 97 of which are called "A type," with a 2+1 plan scheme, and 40 are called "D type," with a 3+1 plan scheme. Due to the growing need for public housing for low-income individuals, the number of social houses in Edirne increased from 784 to 2468 in 2021. These residences are

Figure 1. Social mass housing in Edirne.

Figure 2. Working area: Social housing in Fırınlarsırtı location (Edirnejet news, 2022).

on a 60,000-square-meter settlement in Fırınlarsırtı, with 24,000 square meters of green areas. Besides the residences, the Fırınlarsırtı settlement also includes schools, nurseries, health centers, commercial centers, mosques, children's playgrounds, outdoor seating, recreation areas, and sports areas in the design. (Figure 3)

In addition to allocating space for a healthy infrastructure system, the planning includes transportation connections with the city, ramps for disabled access at residential entrances, and necessary points. (Figure 4)

The apartment complex comprises buildings with four floors, a ground floor, and three upper levels. Each floor has four apartments, most 2+1; they have 1+1, 2+1, or 3+1 plan schemes. (Figure 5) The apartments have a usable area ranging from 48 to 106 square meters. Depending on the plan scheme, the apartments have two or three bedrooms, a kitchen, a bathroom, and a balcony. For instance, the 1+1 apartments are designed without a balcony, with an open kitchen-living room, a bedroom, and a bathroom. On the other hand, the 2+1 and 3+1 apartments have separate kitchen-living rooms, bedrooms, and a bathroom. The 3+1 apartments have a balcony that is connected to their kitchens. The design clearly shows that the day and night parts of the apartments have been planned separately, and spatial relations have been established functionally. The planners included a sufficient size and number of windows to provide room lighting and ventilation. In contrast, small numbers and sizes have included open spaces such as balconies. The apartment sizes have been planned to create minimum areas to meet the needs.

Figure 3. Images from the social areas of the residences.

Figure 4. Images from residences.

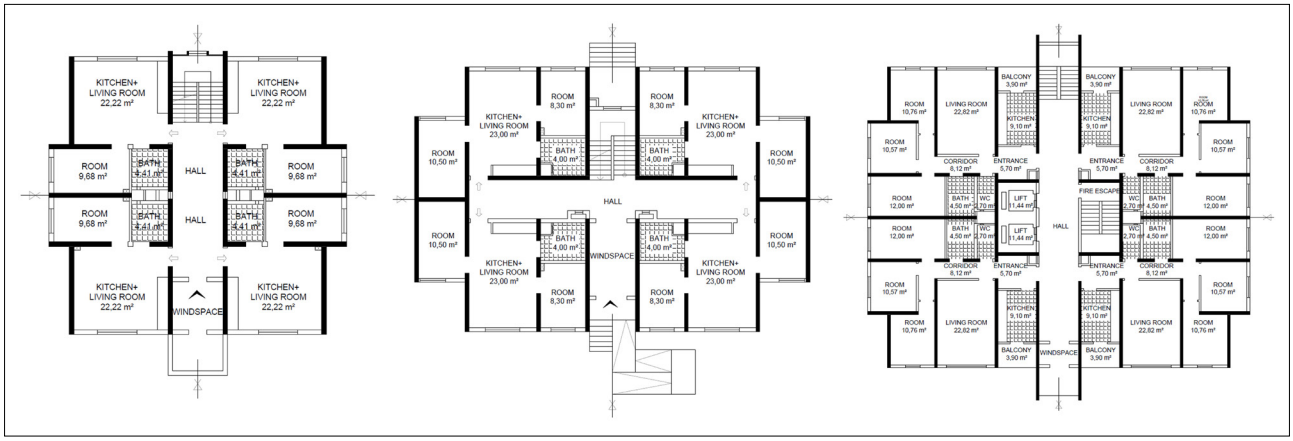

Figure 5. 1+1,2+1 and 3+1 housing plans of Edirne Fırınlarsırtı social housing (TOKİ, 2023).

Data Collection

The data for the study, which aims to measure the satisfaction level of users living in social mass housing built by the state during the pandemic, was obtained through a survey. During this period, curfews and the rapid infectious effect of the virus prevented users and surveyors from meeting face-to-face, and the necessary legal permissions to conduct the survey could not be obtained, so the survey investigation could only be carried out after the pandemic. All survey forms prepared using scientific research methods were conducted in face-to-face interviews with users. A simple random sample selection technique determined the participants among the probability-based sample selection types. All 50 questions were asked to users, of which ten were multiple-choice. The remaining 40 questions were based on a 5-point Likert scale, ranging from "very dissatisfied" to "very satisfied." These questions were carefully selected after reviewing previous literature on user satisfaction in social housing for low- and middle-income groups and satisfaction with housing during the pandemic. The survey was divided into five main sections: demographic characteristics of the user, spatial characteristics of the residences, environmental characteristics of the residence, structural characteristics of the residence, and characteristics of the residence-city relationship. The survey was conducted between April 13, 2023, and May 15, 2023. It targeted 457 people between 12:00 and 18:00, during which housewives usually stayed home most of the day. The necessary permissions were obtained from the Trakya University Institute of Social Sciences Ethics Committee in February 2023, along with the survey questionnaire and application petition. The sample size was calculated using Cohen's sample calculation table (Cohen, 1988). Out of the total number of users, 73 individuals declined to participate in the survey, and the responses of 6 users were considered invalid. The survey was conducted with the remaining 378 participants who spent the entire pandemic period in these residences.

Method

We first thoroughly reviewed national and international literature in our research. We examined user satisfaction studies in mass housing built for middle- and low-income families in various countries worldwide and also researched the changing use of houses during the COVID-19 pandemic. In the next stage, on-site detection, examination, observation, and photographs were carried out in Edirne Fırınlarsırtı residences, which was determined as the study area. A face-to-face meeting was held with the site management to obtain the necessary information and access the architectural projects of the residences. In the next stage, a survey investigation was conducted, a quantitative data collection technique widely used in housing satisfaction research to measure user satisfaction. The answers were transferred to the SPSS program, and answers to the research questions were sought with correlation and factor analysis. In order to measure the relationship between satisfaction and the variables in each section of the survey, correlation analyses were conducted between the variables. In order to determine their effect on general satisfaction, the variables were classified by factor analysis. Regression analyses were subsequently conducted to determine the effect of the found factors on satisfaction. The stages of the study are shown below. (Figure 6)

RESULTS AND FINDINGS

Demographic Information

In light of the information obtained from the survey, the frequency distribution of the demographic characteristics of the users is shown in Table 1. According to this,

- 225 (59.5%) of the participants are female, and 153 (40.5%) are male participants.
- 116 participants (31%) are 18-24 years old, 46 people (12.2%) are 25-39 years old, 81 people (21.4%) are 40-54 years old, 115 people (30.4%) are 55-69 years old, and 20 people (5.0%) are over age 70.
- 207 participants (54.8%) are married, and 171 (45.2%) are single.
- 89 (23.5%) of the participants are literate, 47 (12.4%) are primary school graduates, 99 (26.2%) are high school

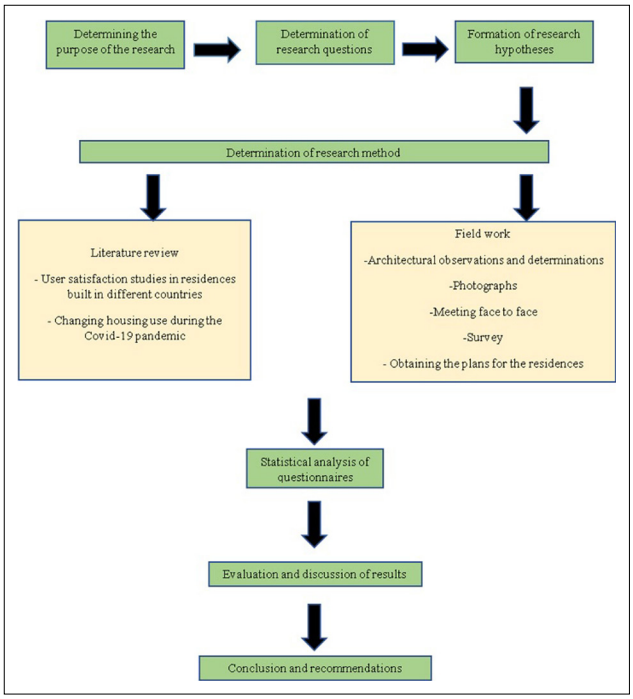

Figure 6. Stages of the study.

Table 1. Demographic information frequency analysis

	N	%
Gender		
Female	225	59,5
Male	153	40,5
Age		
18-24	116	31,0
25-39	46	12,2
40-54	81	21.4
55-69	115	30,4
70>	20	5,00
Condition		
Married	207	54,8
Single	171	45,2
Educational status		
Literate	89	23,5
Completed primary school	47	12,4
High school graduate	99	26,2
Associate degree	53	14,0
Bachelor's degree	82	21,8
Post graduate	8	2,1
Vocation		
Civil cervant	35	9,3
Worker	28	7,4
Health	18	4,8
Housewife	54	14,3
Unemployed	8	2,1
Retired	83	21,9
Freelance	82	21,7
Student	70	18,5
Total monthly income (₺)		
5.000-9.000	46	12,2
9.001-11.000	52	13,7
11.001-20.000	100	26,5
20.001-35.000	110	29,1
35.001>	70	18,5

graduates, 53 (14.0%) have associate degrees, 82 (21.8%) have Bachelor's degrees, and 8 (2.1%) have postgraduate education.

- In the occupational status distribution, 35 participants (9.3%) are civil servants, 28 (7.4%) are workers, 18 (4.8%) are healthcare professionals, 54 (14.3%) are housewives, 8 (2.1%) are unemployed, 83 (21.9%) are retired, 82 (21.7%) are freelance, and 70 (18.5%) are students.
- In monthly income distribution, 46 of the participants (12.2%) earn between 5,000-9,000 ₺, 52 (13.7%) earn 9,001-11,000 ₺, 100 (26.5%) earn 11,001-20,000 ₺, 110 (29.1%) earn 20,001-35,000 ₺, and 70 (18.5%) have a monthly income of 35,001 ₺ and above.

FINDINGS REGARDING HOUSING TYPE AND USERS

The first stage of the residences, which were built in 7 stages in total, is the Fırınlarsırtı residences, which were built in 2007 and consist of 784 houses. In the same region, the construction of a total of 826 additional houses continued in the second and third stages in 2009 and 2010. In 2011, 420 houses were built in the 4th stage in Hadımağa. In 2014 and 2017, 217 houses in the fifth and sixth stages were constructed in Fırınlarsırtı, and in 2021, 221 houses in the 7th stage were built in Hadımağa. Finally, in 2022, the foundations of 120 houses were laid as the 8th stage in the Hadımağa location. According to the survey results, information about the characteristics of the houses and the users is shown in Table 2.

Table 2. Residence and housing estate information

	N	%
House satisfaction during the pandemic		
Very satisfied	0	0
Satisfied	225	60
Medium	117	31
Not satisfied	17	4
Not satisfied at all	19	5
Property status		
Homeowner	160	42,3
Tenant	209	55,3
Other	9	2,4
Number of household		
1	64	16,9
2	118	31,2
3	142	37,6
4	47	12,4
5>	7	1,9
Type of residence		
2+1	264	69.8
3+1	52	13.7
1+1	62	16.5

- 160 participants (42.3%) are renters, 209 participants (55.3%) are homeowners, and 9 participants (2.4%) live temporarily in a relative's house.
- 64 (16.9%) of the participants live alone, 118 (31.2%) live with two people, 142 (37.6%) live with three people, 47 (12.4%) live with four people, and 7 (1.9%) live with five or more people in their residences.
- 264 (69.8%) of the residences consist of 2+1, 52 (13.7%) consist of 3+1, and 62 (16.5%) consist of 1+1 plan schemes.

The hypotheses of the study, which aims to measure user satisfaction in social housing where middle and low-income families live during the pandemic, are as follows:

- H1: User satisfaction is related to the user's demographic characteristics.
- H2: The most influential factor in user satisfaction during the pandemic is the adequacy of the house's interior space.
- H3: During the pandemic, the environmental characteristics of the house and its open and green area arrangements affected user satisfaction.
- H4: The house's location relates to satisfaction during the pandemic period.
- H5: During the pandemic, users' access to the needed units did not affect user satisfaction.

STATISTICAL ANALYSIS FINDINGS

Reliability Analysis

The reliability of the scales of the 5-point Likert-rated questions throughout the questionnaire was tested and compared with both Cronbach's alpha and exploratory factor analysis. In the reliability analysis of the questionnaire, in which participant preferences were measured with 35 Likert-scale expressions, the "Cronbach's alpha" finding of 0.892 showed that the scale was highly reliable (Table 3). (Cortina, 1993).

Analyses Determining the Relationship Between Demographic Characteristics and General Satisfaction

The relationship between the user's demographic characteristics and overall satisfaction with the residence was determined by multivariate regression analysis at a 95% confidence interval. As a result of the analysis, the Anova Sig. $p<0.001$ value showed that the established regression model was significant and that at least one of the independent variables consisting of demographic characteristics significantly affected overall satisfaction. In addition, finding the "adjusted R^2" value of 0.280, as shown in the model summary table, has shown that 28% of the overall satisfaction was due to the demographic characteristics of the users (Table 4).

In the next step, correlation analysis was performed to determine the degree, strength, and direction of the relationship between the variables that make up the demographic characteristics and general satisfaction. Correlation analysis is an analysis method that shows the linear relationship between two or more variables in scientific research. The correlation coefficient calculates the relationship between the variables. The correlation coefficient to use depends on the scale level of the variables, whether they are continuous or discontinuous, and whether the data is linear or not. In the analysis, the overall satisfaction average was found to be 3.45. The VIF

Table 3. Reliability Analysis (Cronbahs alpha)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,892	,895	35

Table 4. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	ANOVA Sig.
1	,544a	0,296	0,280	0,673	<0,001

Table 5. Relationship between demographic characteristics and general satisfaction, Correlation table

	Mean	Std. Deviation	N	VIF	Sig.	Pearson Correlation
General Satisfaction	3,45	0,794	378			
Age	2,67	1,170	378	2,592	,300	,111
Gender	2,81	1,453	378	1,401	<,001	-,194
Marital Status	2,36	1,495	378	2,072	<,001	,275
Educational status	2,10	1,131	378	1,419	,922	,005
Vocation	3,60	2,586	378	3,370	<,001	,194
Property status	2,69	1,474	378	1,463	,015	-,125
Number of House hold	2,81	1,076	378	1,480	,003	-,150
Monthly income	2,24	1,044	378	1,073	,790	,014

(variance inflation factor) values, as shown in Table 5, were below 4, indicating that the relationship between the variables was not strong. Therefore, the model did not have a multicollinearity problem (Hair et al., 1995). According to the correlation analysis table, the "sig. value" of demographic characteristics such as gender, marital status, occupation, property, and the number of people in the household statistically significantly affects overall satisfaction, with $p<0.05$. In this instance, the data did not support the H1 hypothesis, positing that all demographic characteristics affect satisfaction. It was observed that age, education level, and income level do not significantly affect satisfaction ($p>0.05$). Upon examining the Pearson correlation values among these characteristics, it was found that marital status and occupation positively correlated with general satisfaction. At the same time, gender, property ownership, and the number of people in the household showed a negative correlation. This analysis suggests that individuals who are married, male, retired, and homeowners tend to be more satisfied with their homes. Furthermore, it was observed that satisfaction levels tend to increase as the number of people in the household decreases.

Analyses Determining the Spatial Adequacy of the House During and Before the Pandemic Period

The adequacy of the spatial features of the house, which constitutes the second part of the survey, was evaluated by frequency analysis. It has been observed that changing lifestyles before and after the pandemic have changed users' ideas about their homes (Table 6).

The acquired data from frequency analysis reveals that 76% of users were satisfied with the spatial adequacy of their residences before the pandemic. However, following the pandemic, this percentage decreased to 57%. Additionally, it was ascertained that out of the 42% of users who found their homes inadequate after the pandemic, 14% undertook spatial changes to cater to their needs. The findings indicate that the changes made to the living spaces were predominantly aimed at increasing the usable area. Specifically, 68% of users reported incorporating their kitchen balcony into the kitchen, while 31% combined their kitchen and living room.

Table 6. Frequency analysis of spatial adequacy and changes in housing before and during the pandemic

	Frequency	Percent(%)
Before the Pandemic		
Sufficient	288	76,20
Insufficient	90	23,80
During the pandemic		
Sufficient	216	57,10
Insufficient	162	42,90
Spatial changes during the pandemic		
Spatial changes made	54	14,30
No spatial changes	324	85,70
Type of the spatial chang		
Combining the balcony with the kitchen	37	68,52
Combining Kitchen and Living Room	17	31,48

In the next step, factor analysis was performed to reduce the number of variables by separating the correlated ones among 35 variables according to their categories and obtaining fewer factors. However, before this stage, whether the data was suitable for factor analysis was measured with the "KMO coefficient" and "Bartlett's Test of Sphericity" (Büyüköztürk, 2007). The KMO coefficient is a number that indicates whether the sample size is suitable for factor analysis. For the sample size to be sufficient, the KMO value must be at least 0.60 and above; Bartlett's test should also be significant ($sig.<0.05$) (Tabachnick & Fidell, 2013). As a result of the analysis, the KMO value was 0.627, and the Bartlett test result was $sig<0.005$, indicating that the data were suitable for factor analysis and that the sample size was sufficient (Table 7).

Analyses Determining the Factors Affecting Satisfaction and Their Degree of Impact

After conducting exploratory factor analysis, we excluded satisfaction scales with a "factor loading" value below 0.5 and those loaded on more than one factor. These scales included bath size, number of bathrooms, separate kitchen, open kitchen, open spaces, pedestrian ways, resting areas, shopping opportunities, scenery, anti-theft security, and ventilation. We concluded that these factors did not affect housing satisfaction during the pandemic. Among the variables that were not included in the analysis, when the kitchen size scale was excluded, the reliability rate decreased, so it was included in the analysis without being excluded from the grouping. Among the 35 variables, 22 scales with a "factor loading" value above 0.5 were considered. Following the factor analysis, we identified variables with an "eigenvalue" exceeding 1, reducing the variables to five primary factors: environmental house features, accessibility to necessities, interior adequacy, location characteristics, and structural attributes. The structural features of the house constituted 28% of the total variance, the environmental

Table 7. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,627
Bartlett's Test of Sphericity	
Approx. Chi-Square	4928,483
df	210
Sig.	,001

features 14%, the interior adequacy 10%, the location of the settlement 7%, and accessibility 7%. All factors together explained 65% of the total variance, showing that they affected 65% of the variation in overall satisfaction (Table 8).

In the next step, as a result of factor analysis, the average of the scales divided into five main groups (variables computed by mean) was subjected to multiple linear regression analysis. Thus, the effects of these five main factors on overall satisfaction were revealed. (Table 8)

According to the "adjusted R^2" value in the model summary, all factors affect approximately 29% of overall satisfaction. In other words, 29% of overall satisfaction is based on these five main factors. Since the significance value in the ANOVA analysis is $p<0.001$, at least one factor significantly affects overall satisfaction. (Table 9).

A correlation analysis was conducted between the variables and satisfaction in order to determine the effects of the variables determined under the five main factors on user

Table 8. Factor analysis of variables that have an effect on satisfaction

Items	Variables	Factor Loading	Eigenvalue	Variance(%)	Cumulative Variance(%)
Main factor: Structural features			6,081	27,639	27,639
HA1	Disaster resistance	0,821			
HA2	Physical condition	0,736			
HA3	Thermal insulation	0,653			
HA4	Sound insulation	0,649			
HA5	Material quality	0,649			
Main factor: Environmental features of the house			5,078	13,609	41,248
HA6	Green spaces	0,729			
HA7	Playgrounds	0,694			
HA8	Sports fields	0,575			
HA9	Block distances	0,565			
HA10	Parking adequacy	0,565			
Main factor: Interior adequacy			2,186	9,937	51,185
HA11	Number of rooms	0,788			
HA12	Balcony size	0,778			
HA13	Kitchen size	0,570			
HA14	Living room size	0,538			
HA15	Bedroom size	0,517			
HA 16	Entrance hall size	0,471			
Main factor: Location			1,591	7,233	58,418
HA17	Public transport facilities	0,869			
HA18	Urban location	0,807			
HA19	Distance to the city center	0,710			
Main factor: Accessibility			1.547	7,033	65,452
HA20	Access to health units	0,586			
HA21	Access to shopping units	0,580			
HA22	Access to education units	0,577			

Table 9. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	ANOVA Sig.
1	,543[a]	,295	,285	,671	<0,001

a. Predictors: (Constant), structural features, location, accessibility, external features and interior adequacy

Table 10. Descriptive statistics and correlations between variables

	1	2	3	4	5	VIF
General Satisfaction						
1- Exterior features	1					1,369
2- Accessibility	0,271*	1				1,497
3-Interior adequacy	0,299*	0,339*	1			1,850
4- Location	-0,176*	0,441*	0,325*	1		1,566
5- Structural features	0,182*	0,255*	0,586*	0,168*	1	1,538

*p< 0.01.

satisfaction (Table 10). Column 1 on the table shows the values about exterior features: the 2nd column is accessibility, the 3rd column is interior adequacy, the 4th column is location, and the 5th column is structural features. Upon examining the ratios of all factors to each other in the matrix based on the values in Table 10, it is evident that no value exceeds 0.800, and the VIF values are all less than 4. This indicates that the relationship between the variables is not highly robust, thus confirming the absence of multicollinearity in the established model. (Hair et al., 1995).

In the next step, the accuracy of The study's H2, H3, H4, and H5 hypotheses was tested by regression analysis. In the regression analysis, it was found that all five factors have a significant effect on overall satisfaction, with p-values less than 0.05 (see Table 11). The β value examined in this test quantifies the influence of the independent variables on the dependent variable. The fact that the β value of the house's structural features is β=0.317 showed that the variable that most affected satisfaction was the structural features. The residential environment characteristics followed this β value ranking, the interior space adequacy of the house, and the house's location. Access to needs in the settlement was found to have little effect on satisfaction (Table 11).

Table 11. Effect of factors on general satisfaction*

	β	t	Sig.
(Constant)	0,963	4,215	<0,001
Structural features	0,317	4,586	0,000
Environmental features	0,277	4,890	0,000
Interior adequacy	0,251	3,847	0.000
Location	0,176	3,192	0,002
Accessibility	-0,150	-2,066	0,040

*Dependent Variable: General Satisfaction.

DISCUSSION AND EVALUATION

The pandemic has forced us to stay home, making ensuring user satisfaction with our living space more important than ever. A recent study identified five factors that determine satisfaction, all of which positively affect it. The data gathered from the survey revealed that during the pandemic, users were mainly satisfied with their homes' structural features, environmental features, and interior adequacy. However, they were less satisfied with the location and access opportunities. Regression analyses were conducted separately to determine the relationship between satisfaction and the subheadings of each of the five primary factors. While the correlations between the variables were examined to determine the relationship, not all were included in the article due to page limitations. The main findings of the study can be summarized as follows:

- Through this exceptional process, it has been determined that most users are generally content with their homes. The house's spatial and structural aspects, the surrounding environment's features, and the location and accessibility of the settlement where the house is situated have all contributed to ensuring that the user is satisfied with their dwelling.
- It has been observed that users' specific demographic characteristics directly impact their satisfaction levels. Among these characteristics, marital status, profession, gender, ownership status, and the number of people living in the household are the key factors that affect satisfaction. Studies have shown that users who are male, married, retired, homeowners, and have 1-2 people living in their household tend to be happier. However, these findings may differ from study to study, as the demographic parameters affecting satisfaction can vary. For instance, Maina (2021) conducted a study in Nigeria and found user satisfaction was higher among families with 4-6 people, high-income levels, who had lived in their residences for more than ten years, and had more than three bedrooms. In a study conducted by Mohit et al (2010), the researchers explored the factors affecting

user satisfaction in homes built for low-income families in Malaysia. They discovered that satisfaction was influenced by various aspects such as age, household size, number of working individuals, profession, house size, previous residences, and even the house floor. Meanwhile, Inha et al (2009) found that satisfaction levels decreased in Korea with lower income and higher age. Another study in Bangladesh examined housing satisfaction from a socio-demographic perspective and revealed that age, gender, and marital status impacted the level of satisfaction. In particular, married, elderly, and women expressed higher satisfaction levels. Dekker et al. (2011) researched nine European countries and discovered that as age and income levels increased, families tended to become more satisfied with their housing.

- During the pandemic period, the house's structural features had the most positive effect on user satisfaction. Other sub-factors that increased satisfaction included the excellent physical condition of the houses, the provision of qualified thermal insulation, and the good physical appearance of the buildings. The thermal insulation of the rooms, which were frequently ventilated to reduce the spread of infectious viruses, satisfied the users by ensuring thermal comfort. Choosing high-quality materials that provide thermal insulation during the construction phase, reflecting innovations in construction practices by considering the advancements in material technology, and carrying out inspections with a meticulous attitude and sensitivity during the application phase have enabled the production of structurally high-quality houses. Good sound insulation has become very important during this period for individuals who spend most of their daily lives working remotely and sharing separate spaces, as well as for students receiving distance education. However, it was determined in the analysis that users were not satisfied with the sound insulation and craftsmanship of the materials used and the heat insulation. Users evaluated the presence of social facilities in their settlements as a positive factor during closure periods with curfews. So much so that the environmental features of the house affected satisfaction even more than the interior space capabilities. The importance of settlements having places where individuals can go to open spaces, walk-in gardens, spend time in nature, provide entertainment for children in playgrounds, carry out sports activities, and have a high-quality physical environment was better understood in this period. During this period, individuals over 65 are at higher risk of going out on the streets. Therefore, having access to open and green areas within their settlement, where they can maintain social distance, has been crucial. It has allowed them to spend this period more comfortably and improve their quality of life and satisfaction. Users have expressed satisfaction with the social areas of their residences and the adequacy of these areas. Spending time in open spaces helped to mitigate the adverse effects of being away from social life and interaction. Martin et al. (2012) found that the lack of open spaces around housing negatively affects satisfaction. Torres et al. (2021) reported that users were generally unsatisfied with the insulation during this period. However, having open spaces such as terraces and verandas in their residences helped them go through this process more comfortably. Peters & Halleran (2020), Gür (2022), and Yüksel (2022) have pointed out that giving importance to environmental regulations in design can increase user satisfaction. Grum (2016) identified three parameters that determine user satisfaction: the house's physical, environmental, and socio-economic characteristics. Ghazizadeh & Rückert (2013) stated that designers should consider residential environmental design an essential part of the planning process.
- Most houses have 2+1 plan schemes and 1+1 and 3+1 plan types. The houses' interior space adequacy and physical features are important factors that positively affect users' general satisfaction. Before the pandemic, users were generally satisfied with the spatial features of their houses. However, after the pandemic, there has been a decrease in the number of people satisfied with their houses. The size and number of some spaces, such as balconies and kitchens, were inadequate to the users' needs, which reduced satisfaction with the interior space adequacy. As a result, some users have enlarged the usable area by including the balcony belonging to the kitchen or expanded the living room volume by removing the wall between the living room and the kitchen. This situation has highlighted the importance of including flexible spatial solutions in planning during the design phase. The cost of flexible planning is often avoided despite being the most beneficial solution for users in the long run. Özyurt & Altun (2015) found that the number and size of balconies in housing were insufficient, and users needed more balcony space. Studies in the literature mainly conclude that user satisfaction during the pandemic is related to satisfaction with the house's interior. Bettaieb & Alsabban (2020) emphasized that spatial needs have changed due to COVID-19 and that planning should include flexible spatial solutions. The lack of flexibility in design is attributed to cultural, structural, and functional issues. Alawad (2021) stressed the importance of adequate interior space and flexible space solutions in design. The pandemic allowed users to get to know their homes better, and their perspectives on their homes have changed. Peters & Halleran (2020)

emphasized that architects are responsible for creating healthier user living environments in their designs. They highlighted the importance of mental health, suggesting that interior windows be designed to maximize daylight exposure and placed in positions that overlook the sky, green areas, or city streets. Clean air quality, thermal comfort, and acoustic separation were necessary for good living conditions. In addition to balconies, green spaces, common lounges, roof terraces, and courtyards should be included in outdoor spaces for residences, allowing for access to nature while maintaining social distancing. Yüksel (2022) also stressed the importance of flexible design for housing, while Gür (2022) noted that user habits and spatial needs have changed with the pandemic, necessitating additional space in residences. They recommended that future designs prioritize balconies and outdoor green areas. According to Martin et al. (2012), three critical factors affect satisfaction when it comes to housing. These factors are related to outdoor space, interior quality, and satisfaction with structural features. The study found that the type of housing, the number of spaces in the house, the small size, and the general insulation in the interior spaces harm satisfaction. Additionally, the authors suggest that existing housing stock should be updated to prepare for possible emergencies and improved to enhance the user's quality of life.

- Although the location of the settlement appears to have less impact on satisfaction than other factors, users' satisfaction was increased because the residences are near the city center. However, limited and inadequate access to the center and other parts of the city through public transportation reduced the effect of satisfaction. Users were least satisfied with their access to healthcare units, shopping centers, and education units. Access to hospitals via public transportation is risky for users, mostly aged between 55 and 69, who have health issues and no private vehicle due to the contagious effect of the virus. In this period, when there are curfews throughout the country of Turkey, accessing markets during certain hours on weekdays and full-time on weekends to meet families' food needs has been difficult for users due to the remoteness of the settlement. In general, it has been concluded that users are dissatisfied because the settlement is far from health, education, and shopping facilities. Therefore, it is essential to plan social housing designs according to the principles of correct location selection. Böge (2019) and Yin et al. (2019) discovered that satisfaction decreased as the distance of residences from shopping centers increased. Similarly, Aksel & İmamoğlu (2020) found that satisfaction decreased as the distance from the city center increased. Ruiz et al. (2019) stated that user satisfaction with the settlement's location is linked to their perception of well-being.

Several studies have examined local and foreign publications investigating user satisfaction in social housing built for low-income families, regardless of the pandemic's impact on user satisfaction. Gür (2009) conducted a study on social housing implemented in Turkey, which found that quality housing is available in these housing units. Nevertheless, some findings indicate that production targets are not considered, and typical projects are produced. Böge (2019) conducted a study investigating user satisfaction in social housing and emphasized the need to design social housing environments in new areas that align with the user's usage habits and preferences. The study concluded that security measures in residences and inadequate garbage collection services negatively affect satisfaction. Kutor et al. (2022) revealed that housing users who have lived in the settlement for a long time, have good social relations, and receive support from local governments are more satisfied with their housing. Özyurt & Altun (2015) found that satisfaction mainly stems from the choice of location where the houses are located, and being in areas outside the city with green areas and playgrounds for children positively affects satisfaction. The studies show that dissatisfaction with housing during the pandemic is related to the limited usage area and number of spaces. The need for more extensive and more comfortable living spaces has become apparent. The housing design should prioritize open spaces, balconies, terraces, and flexible spaces. Insulation is also deemed necessary in general. The studies have also highlighted the significance of social reinforcement areas and environmental regulations. Overall, these findings are similar to those of many other publications reviewed, and any differences detected are thought to be due to the socio-cultural and economic reasons of the user.

CONCLUSION AND RECOMMENDATIONS

This research focused on determining the satisfaction of users living in social mass housing produced for low- and middle-income families during the COVID-19 pandemic. For this purpose, the parameters affecting user satisfaction and the relationships between them were determined by regression analysis, which is the most widely used in scientific studies and gives the most accurate results. In the study, five factors were found to affect user satisfaction positively. Among these, the three highest factors were determined to be the structural features of the house, environmental features, and interior space adequacy. It has been observed that the location of the settlement and access to needs are the factors that have the least positive effect on satisfaction, and even the access to needs factor has a decreasing effect on satisfaction.

In general, it was observed that 91% of the users were satisfied with their homes during the pandemic, and some demographic characteristics affected satisfaction. These features include the user's marital status, profession, and gender. According to the research results, married, retired, and male users are more satisfied with their homes than other user profiles. It can be said that single users were not satisfied with this period because social interaction was minimized, and people could only communicate with individuals within the house. Before the pandemic, family members who could not stay at home or be together for long periods due to busy school and work lives had the opportunity to spend time together and get to know each other better during this time. However, the fact that all family members are always at home during the day has increased the workload of the women in the house. While women continue to work remotely, they have had to deal more with eating and drinking, cleaning, childcare, and household chores. Due to changes in the amount of time spent at home and how homes are used during the pandemic, many people have found that their living spaces are insufficient for their needs. Women, who typically have more involvement with the home than men, have experienced decreased satisfaction with their living arrangements. For this reason, it has been determined that the overall satisfaction of male users is higher than that of females. The fact that retired users over the age of 65, who were most targeted by curfews and most negatively affected by the virus, had the opportunity to spend time with each other in the green areas of their settlement during this period increased their satisfaction levels. Satisfaction levels were higher for homeowners who owned residential property, as they lived here permanently, than tenants.

Researchers have been attempting to answer a question regarding the COVID-19 pandemic: "What factors affect housing satisfaction, and how do these factors impact satisfaction apart from demographic characteristics?" The findings indicate that users were primarily satisfied with the structural features of their homes, such as disaster resistance, thermal insulation, and physical appearance. Notably, satisfaction with the house's structural features was considered more important than other factors like interior comfort, adequacy, and physical environmental quality. Among the structural features, it was observed that the factor that increased user satisfaction the most was the disaster resistance of houses, thanks to solutions such as raft foundations, tunnel formwork carrier systems, and high concrete strength applied in buildings. The fact that the Fırınlarsırtı location was considered the safest area of the city by seismic experts has increased users' confidence and satisfaction in their homes in the Edirne social housing. This study has again shown how vital ground strength is in choosing the location of mass housing. Adequate insulation material thickness and coated-insulated glasses help maintain thermal comfort in houses, increasing user satisfaction. Moreover, the good exterior appearance of buildings is another structural factor that enhances satisfaction. It has been observed that environmental and climatic conditions do not harm houses; even after 16 years of age, they look solid and durable from the outside. However, two structural factors can reduce house user satisfaction: sound insulation and the quality of materials used in construction. During the pandemic, users faced difficulties due to sound interference between floors. The absence of materials such as stone wool and glass wool for sound insulation led to poor sound insulation. Despite aiming for quality in housing production, it has been observed that material and technical requirements are not met sufficiently, leading to user dissatisfaction.

In all mass housing settlements, the design of the surroundings of the houses is as important as the housing design. This study observed that the users of Edirne social housing estates were more satisfied with the housing environment's features than the adequacy of the house's interior space. This can be explained as the longing for nature and understanding the importance of green spaces, as users must stay home during the pandemic. The presence of vast open and green areas in the settlement, the communication established with the neighbors in the apartment gardens, and the hours spent ensured that the neighborly relations remained strong. The playgrounds in the neighborhood allow children who are unable to attend school to engage in distance learning. Additionally, residents have access to sports facilities for activities like basketball and volleyball, and there are plenty of safe parking spaces for their vehicles. These amenities contribute to the overall satisfaction of the residents. Considering the social distance, the common areas that strengthen the interaction between the individuals have increased satisfaction. In addition to the social reinforcements, users stated they were satisfied with the distance between the blocks.

The study observed that satisfaction with the adequacy of the residential interior space was also high, except for balcony size, kitchen size, and number of rooms. During this period, open spaces such as terraces and balconies were life-saving, so the interest and need for these spaces increased, and the size of the existing balconies became insufficient. The importance of including more oversized balconies in the design that can be opened and closed when necessary has been understood. The fact that the entire household stays at home all the time and there is an increase in the time and number of meals prepared at home has led to increased use of the kitchen, which has caused the kitchen size to be insufficient for the users. In addition, since kitchens, like many other spaces, sometimes serve as study rooms and classrooms, the available space is insufficient for the users. Some users have tried to intervene

in this situation by making spatial changes of their own. Apart from these two factors, it was seen that the users were satisfied with all the spatial features of the house.

Another study finding is that the user was satisfied with the house's location, an essential factor in residential settlements. Considering that the city is developing towards the ring road in the north, it is seen that the Fırınlarsırtı residences are also located in the developing region of the city as a part of this process. Due to its proximity to residential areas, it has been determined that the users are generally satisfied with their residences. However, according to other factors, the reason for the lower effect on satisfaction was that users avoided public transport due to the contagious virus during the pandemic period. In addition, the limited number of public vehicles reaching the region during this period was seen as a situation that reduced satisfaction and restricted access to health and education units. It has been concluded that users are not satisfied with their access to hospitals and shopping units.

This study evaluated user satisfaction in social housing built for low- and middle-income families during the pandemic. The findings showed that preparing for possible future pandemics in the housing and its surroundings is crucial for user satisfaction. The sudden and unprepared situation during the pandemic shed light on the need for new design approaches to address the negative experiences in and around the house. Therefore, conducting more studies in this direction, domestically and internationally, is essential to improve housing design further and ensure better user satisfaction.

Housing should be constructed using high-quality materials that do not compromise safety and comfort. As homes now double as schools and workplaces, it is essential to use insulation materials that effectively control sound and prevent noise pollution. A team of experts should install these materials with care and precision. Landscape design is just as important as interior design for residential spaces. The environment around the homes should be planned according to the occupants' needs, focusing on functional and practical social facilities and avoiding unused spaces. All environmental arrangements should be considered holistically, considering the continuity of life inside the house. The positive effects of green areas on human psychology should also be considered, and landscape areas should be designed in proportion to the size of the settlement, taking into account social distances and following regulations. Landscape architects play a crucial role in this regard. Social areas suitable for various activities, such as walking, eating, spending time together, resting, doing sports, parks, and hobby gardens, should be arranged in these areas. Children's playgrounds should be designed in safe areas away from traffic and visible to families. Pedestrian paths should be included in the settlement to provide easy access. In this day and age, when daylight and visual connection with the outdoors are more crucial than ever, these areas should be considered in settlement planning.

In this extraordinary period where all time is spent at home and spatial needs increase, it has been understood that interior spaces should be able to respond to activities such as work, eating, resting, and sports. The ability of a space to serve more than one function depends on its ability to be a place that can change and transform. Therefore, the COVID-19 pandemic has shown designers the importance and necessity of flexible space solutions. By incorporating flexible space solutions and modular systems into the design, spaces will have multiple functions, the number of spaces will increase, and architectural sustainability will be ensured in a spatial sense. Spaces can meet needs with open and closed systems, enlarged, reduced, and detachable. In addition, since needs will vary depending on family types, analyzing different plans will increase user satisfaction as it will offer a choice to the user. In our age where technology is rapidly advancing, including smart home systems in designs is an important method that enables the transformation of spaces in line with needs. It is a situation that increases satisfaction when the designer and the user come together, consider the user's demands, and make joint decisions by evaluating the user's opinions through mutual discussions.

According to a study, user satisfaction in the field of social mass housing in Edirne was found to be high, with a value above the average during the COVID-19 pandemic.

Two primary stages must be followed to increase user satisfaction in all future social housing plans. The first stage is to enhance and improve the positive results determined in the research conducted for this purpose to benefit the user. The second stage involves designing plans to eliminate all the negatives and deficiencies that reduce satisfaction. In future studies, user satisfaction with social housing in different countries or cities can be investigated and compared to determine similarities or differences between the factors affecting satisfaction. Therefore, with the help of the design strategies developed, housing designs with high user satisfaction can be achieved.

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