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New Design Proposals for Shopping Centre Structures as a Result of COVID-19

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Abstract

The COVID-19 pandemic, declared a pandemic by the World Health Organization, continues to be a serious threat to life. There is considerable anxiety due to the rapid spread of the disease and the continuous increase in patients and deaths.

It is known that architecture changed significantly in various periods due to similar concerns. The study examines the effect of the COVID-19 process on architecture and provides design suggestions related to shopping centre designs, especially in the Mediterranean climate. The study will examine shopping centres, where users access spaces with many different functions simultaneously, investigating the harmful effects of the COVID-19 pandemic on architecture and propose new solutions by including users in the study. The survey method was used and analysed in the SPSS program. As a result, it is believed that this study will produce architectural solutions to the problems caused by COVID-19 and constitute a source for new research.

Keywords

COVID-19, design proposals, shopping centres, user-oriented survey, architectural design

1 Introduction

Infectious and pandemic diseases have resulted in considerable suffering over human history, interactions that have been going on for thousands of years. On the one hand, humanity is trying to adapt to the living system it has evolved in; however, its efforts to write its own history have often shaped the infectious disease-human relationship. This is clearly illustrated by the 2019 Coronavirus disease (COVID-19) caused by a new type of coronavirus (SARS-CoV-2) that emerged from the Chinese city of Wuhan in the last months of 2019 and spread very quickly around the world. Due to this virus, now found almost everywhere as a negative result of globalisation and rapid population growth, the World Health Organization (WHO) announced a pandemic on 11 March 2020. Although approximately 1.5 years have passed since the announcement, it has been reported that there are still 227,025,470 cases and 4,669,974 deaths worldwide as of September 2021 due to the COVID-19 epidemic (The Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU), 2021). In addition to treatment regimes, scientists continuously work on the vaccine developed within a year of the pandemic. This situation, which requires an effective organisation, is a burden for scientists and requires research and coordination of different fields of expertise ranging from economics to psychology to architecture, both for today and the future.

Many diseases such as tuberculosis occur in regions exposed to changing environmental pressures. These changes affected building and urban design. One of the most important principles of modern architecture, spaciousness and cleanliness, emerged following the effects of tuberculosis disease (Blumberg, 2020). Although the importance of these design criteria is known, they are still not sufficiently applied, especially in public building designs. This is one of the main reasons for the rapid spread of the Covid-19 pandemic. Creating circulation areas directly connected to the open air instead of closed corridors, using air filters in mechanical ventilation systems and design that ensures sufficient distance between users are examples of some important criteria (Murphy, 2020). Among precautions to be taken during the

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COVID-19 pandemic, the criteria for wearing a mask (filtering) and compliance with social distance (World Health Organization) support the importance of these criteria.

This study aims to reveal the effect of the current COVID-19 pandemic process on the design features of shopping centres, an important social or cultural activity area for the city, and why users prefer specific shopping centres during this outbreak of the disease. The survey method was used to collect data in the study. The survey was applied to 116 people, with three responses deemed invalid. The results were then analysed in the "Statistical Package for the Social Sciences (SPSS)". In this program, a "Cronbach's alpha reliability analysis" was first prepared for the question groups. In the later stages, a "frequencies analysis" was conducted to determine the distribution of the questions' responses. Thirdly, a "cross-tabulation analysis" method was used to determine the distribution of the responses to related questions. Finally, depending on the number of variables in demographic characteristics questions, "independent samples t-test" or "one way ANOVA tests" were conducted.

In the literature regarding the impact of pandemic periods on architectural structure design, Kyle Chayka (2020) "How the Coronavirus Will Reshape Architecture", Nathan Bahadursingh (2020) "8 Ways COVID-19 Will Change Architecture", and Alyssa Giacobbe (2020) "How the COVID-19 Pandemic Will Change the Built Environment" can be given as an example. However, this issue has not been studied on a single building type scale, especially for shopping centres. As a result, using surveys, we analysed shopping centres and structures operating in a Mediterranean climate, such as Mersin in Turkey, Forum Mersin, and Palmcity Sayapark.

Survey questions were produced in three-stage groups to determine the demographic characteristics of the participants, the effect of the pandemic process on the participants and the impact of this process on the shopping centre structures. The survey included 12 questions, four of which are demographic characteristics. As a result of the analysis, to reduce the spread of pandemic diseases such as COVID-19, proposals were made to the designers for new shopping centre designs and the transformation of existing shopping centres. In the evaluation of these proposals, the characteristics of the Mediterranean climate were considered. The aim is to create a resource for designing and transforming shopping centres operating in a Mediterranean climate, using Mersin as an example.

2 Material and method

Mersin, located in the south of Turkey, is a coastal city on the Mediterranean coast. According to the Mersin Köppen Trewartha climate classification, it has a Mediterranean climate, with hot summers and mild winters. Annual humidity varies between 60–74%, and the hottest months are July and August (Bölük and Kömüşcü, 2018).

The population of Mersin is 1,868,757 (in 2022), following a rapid increase from 1.496.000 in 2002. As a result of rapid population growth, the need for space in the city has also changed. Currently, there are four shopping centres in the city centre; Palm City (opened in 2003), Mersin Marina (opened in 2011), Forum Mersin (opened in 2007) and Sayapark (the shopping centre, which was opened as Kipa in 2008, was transformed into Sayapark in 2020).

Mersin Marina is a complex created mainly by combining the marina and shopping venues. There are restaurants and shops in the coastal part of the structure, while the harbour is designed as a marina. This complex was not included in the scope of the study because it is completely integrated into the harbour and is a complex consisting of a small number of shopping and entertainment units (total of 14000 m²) rather than a shopping centre. Forum Mersin is the largest shopping centre in Mersin, with 206 shops, entertainment, eating and drinking venues, and open spaces (Şeker et al., 2016). In the design of Forum Mersin, the open shopping street is integrated with its indoor spaces and transition areas. Landscape elements and street structures that form the identity of Mersin were combined with modern materials and used in Forum Mersin design. The shopping centre was presented as one of the best shopping centres in Europe at the MAPIC EG awards in 2008 and won the ICSC "Best of the Best" honour award in 2010 (IHA News, 2017). When considering the ICSC definitions (International Council of Shopping Centers (ICSC), 2011) regarding shopping centres, Forum Mersin is included in the group of open-air shopping centres. Palm City, with a total rentable area of 34,000 m² and Sayapark, which has a total of 70 store-entertainment venues, are included in the enclosed shopping centre group according to the ICSC definitions (CEFIC, 2003). The primary areas in Palm City and Sayapark shopping centres, such as shops and entertainment units, are designed as indoor areas.

The survey, which is the study method, was grouped into three stages for participants who live in Mersin and know the shopping centres. The survey was conducted online. The aim was to determine the demographic

characteristics of the participants in the first group questions of the study. Demographic characteristics questions provide descriptive information about the participant. In this way, the impact of demographic characteristics of the population on the environment is determined. In the second group of questions, the aim was to assess the effect of the pandemic process on the everyday life of the participants. The impact of the COVID-19 pandemic process on participants is one of the topics of this study. In addition, determining the extent to which users' shopping centre preferences are affected by COVID-19 is also one of the research topics. The third group of questions aimed to determine the change in the participants' shopping centre preference due to the COVID-19 pandemic effect. In this context, a comparison was made of the pre-and-post COVID-19 pandemic processes of Forum Mersin, Sayfair and PalmCity shopping centres.

The criteria were determined as the quality, concept, target audience and design of the new proposals by demographic characteristics questions. In the future, the need to develop sub-concepts alongside the main concepts was seen as a proposal for shopping centre design or transformations of the COVID-19 process.

3 The appearance and development of the shopping centre concept in Turkey

The International Council of Shopping Centers (ICSC) (2011) defines Shopping Centres as a complex of designed buildings built by combining commercial buildings with common areas. ICSC groups these buildings, which have become the consumption centres of cities worldwide, into shopping centres and open-air shopping centres. Open-air shopping centres generally consist of shopping units lined up along a road without a common roof covering all units. On the other hand, enclosed shopping centres consist of a single body with a single top cover (Çakar, 2010; International Council of Shopping Centers (ICSC), 2011). This type of building, built in the early periods to provide people with shopping, cultural activities and social communication, quickly achieved its design aims by becoming the centre of consumer culture globally (Gruen and Smith, 1960). Kowinski (1985), of this building type, states that it emerged as a result of the gathering of supermarkets and stores as a building community in California in the 1920s for the first time.

The appearance of shopping centres in Turkey is based on the bazaars formed by the merchant performing the same role in the Ottoman Empire. During the Ottoman period, buildings such as "*han*", "*arasta*" and "*bedesten*" were the main elements of the bazaars (Halaç and Ergün, 2020). The Grand Bazaar located in Istanbul is the most developed of these buildings and is considered one of the first shopping centres in the world (Eray and Kutlu, 2021). The Grand Bazaar has characteristics of a shopping centre that has traces of history and has continued to function actively.

The first modern shopping centres started to be built in the 1980s after the increase in Turkey's imports and exports, the ease of transportation between countries, and the changing needs and expectations of the public with the development of computer technology (Barlas, 2010). The first of today's shopping centre types is Galleria, built in Istanbul in 1988 (Köksal and Aydin, 2015). Over time, shopping centres were not limited to Istanbul, and with Atakule and Karum buildings in Ankara, shopping centres began to be constructed in different cities (Barlas, 2010).

A total of fifty shopping centres were built between 1980 and 2000, the first phase of retail sales in Turkey. The shopping centres constructed during this time were generally built by domestic individual investors. The total number of open shopping centres developed from 2000 to 2010, considered the second stage of retailing, increased rapidly and reached 232 with the inclusion of foreign investors in the Turkish market. Between 2010 and 2019, the third phase of retail sales, 454 shopping centres operated actively (Barlas, 2010; Ceylan et al., 2017; Gyoder, 2020).

4 The effect of Covid-19 on architectural design

Pandemics have been influential throughout history in both urban and building design. The cholera pandemic in the 19th century showed the necessity of sewage systems, the importance of wider and flat roads and the balanced spread of the population. The third plague pandemic that started in China in 1855 changed many things from wastewater pipes in cities to door sills and building foundations. The aesthetic of modernism, bringing fresh air, sunlight and connection to nature, is considered partly the result of tuberculosis (Blumberg, 2020; Giacobbe, 2020).

As a result of COVID-19, which emerged in late 2019 and continues, society is experiencing the re-encountering disease and architecture. In this process, which WHO declared a pandemic, conditions such as social distance and hygiene directly affect what kinds of areas we want. As a result, COVID-19 leads to spending more time in homes that create living spaces and to prefer digital technologies for communication with the immediate environment.

Worldwide, COVID-19 has created an atmosphere of crisis in terms of health, economy and geopolitics. Life now continues behind social distances that minimise touch and contact, and the concept of "supervised management" is now dominant in all areas of our lives (Yılmazsoy et al., 2021). As a result of these effects, while tuberculosis has shaped modernism, it is thought that COVID-19 and the experience of staying inside for months will shape architecture in the near future. The necessity of social distance has revealed deficiencies in the design of our public space in most cities. Narrow pavements and wide roads emphasise the lack of public spaces and parks in most countries. With COVID-19, many city streets are being converted into pedestrian areas and extensive bicycle networks (Blumberg, 2020). The new restrictions imposed on the user during the COVID-19 period have been catalysts for rethinking much of what we naturally see in the built environment. With the COVID-19 pandemic, architects seeking to adapt to this new lifestyle are trying to bring innovation to their designs.

Since cities are the centres of change and resource use in globalisation, the local changes also trigger global changes. Therefore, it is necessary to take precautions against specific risks in cities and develop strategic action to manage the process appropriately. Design decisions of public and private spaces change with how priorities should be recognised after the pandemic. It should be noted that the way our spaces are designed also has the power to harm or keep us safe.

5 Findings

As a result of the analysis of surveys for typical users of shopping centres, this indicates that gender is a distinguishing factor and the number of female users is almost twice the number of male users (Table 1).

When the participants were evaluated based on age distribution, it was determined that the largest group, 53.1%, were in the 18–25 age group (Table 2).

When the participants' educational level was determined, it was found that users mainly were university graduates −53.1% (Table 3).

Table 1 Gender distribution of the participants

Gender	Number	Per cent
Male	42	37.20%
Female	71	62.80%
Total	113	100.0%

Table 2 Age distribution of participants

Age	Number	Per cent
17 and under	20	17.70%
18–25	60	53.10%
26–40	29	25.70%
41–65	4	3.50%
Total	113	100.0%

Table 3 Distribution of the education levels of the participants

Education level	Number	Per cent
Primary education	13	11.50%
High school	35	31.00%
University	60	53.10%
Postgraduate	5	4.40%
Total	113	100.0%

When the professions were evaluated, it was determined that the largest group were students at 39.8% (Table 4). These results support the responses to the age question where most are 18–25 years old.

In this section, the responses to six questions were evaluated. The "Cronbach's alpha reliability coefficient" value was 0.715 and is acceptable because it is greater than 0.7.

The first question of this section tried to determine the level of care resulting from warnings by WHO, the Ministry of Health of the Republic of Turkey and many doctors for the COVID-19 global pandemic. When asked for this purpose, "Are you care about the warnings for the COVID-19 pandemic?" 80% of the participants responded "yes" to the question. When the responses to this question were evaluated according to the age distribution, it was found that all participants aged 41–65, who were classified as older, responded "yes". Some 35% of participants aged 17 and under who classified as children and 27% of participants aged 18–25 who classified as young adults responded other than "yes" (Table 5). It is concluded that in the designs to prevent the spread of COVID-19 in shopping centres, especially the young and child population

Table 4 Profession distribution of the participants

Profession	Number	Per cent
Public personnel	18	15.9%
Private sector	22	19.5%
Retired	1	0.9%
Unemployed	15	13.3%
Student	45	39.8%
Other	12	10.6%
Total	113	100.0%

Table 5 According to the age distribution of participants, "Are you concerned about the warnings regarding the Covid-19 pandemic?" responses to the question

Age	Number/Per cent	No	Rarely	Sometimes	Often	Yes	Total
17 and under	Number	0	0	1	6	13	20
	Per cent	0.0%	0.0%	5.0%	30.0%	65.0%	100.0%
18–25	Number	2	2	2	10	44	60
	Per cent	3.3%	3.3%	3.3%	16.7%	73.3%	100.0%
26–40	Number	1	2	1	6	19	29
	Per cent	3.4%	6.9%	3.4%	20.7%	65.5%	100.0%
41–65	Number	0	0	0	0	4	4
	Per cent	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Total	Number	3	4	4	22	80	113
	Per cent	2.7%	3.5%	3.5%	19.5%	70.8%	100.0%

should be considered. The World Health Organization (WHO) statement that "the people who spread the new type of coronavirus the most are adults in their 20s, 30s and 40s who do not know that they are infected" supports these results (Euronews, 2020).

World Health Organization (WHO) (2020) states that the COVID-19 pandemic, likely to result in death by causing respiratory infections, is highly contagious and that people are in close contact with each other outside their houses. Considering this situation, "Did COVID-19 affect your frequency of going out?" this question tried to be determined the frequency of people spending time outdoors during the pandemic. When the responses to this question were evaluated according to the age distribution, all participants aged 41–65 responded "yes", with 30% of the group aged 17 and under responding other than "yes". In addition, 32.7% of the participants between the ages of 18–25 also responded other than "yes" (Table 6). The results suggest that, despite COVID-19, it can be stated that the younger population and those of child age pay less attention to the frequency of going out compared to the elderly population. In addition, the similarity of the responses compared to Table 5 and Table 6 supports the accuracy of the results.

Within the scope of the study, "Which architectural design approach would you prefer for shopping centres?" when the responses to the question were examined, it was determined that 54.2% of the participants mostly preferred shopping centres with indoor + outdoor design (Table 7). Many people preferred indoor + outdoor design shopping centres for personal reasons before the COVID-19 pandemic.

The responses to the question "Where would you prefer to shop after COVID-19?" were 33.60% in shopping centres. It was determined that 42.20% of those who responded "shopping centres" were students (Table 8). Considering that shopping centres in Mersin are indoor or indoor + outdoor design types, students usually prefer open spaces for social and cultural activities. Therefore, during the COVID-19 process, it was also necessary to develop design proposals for open spaces in shopping centre structures. World Health Organization (WHO) (2020) stated that the social distance rule (at least 1 m) is the first consideration for open space design proposals.

Table 6 According to the age distribution of participants, "COVID-19 affected your frequency of going out?" the responses to the question

Age	Number/Per cent	No	Rarely	Sometimes	Often	Yes	Total
17 and under	Number	0	3	1	2	14	20
	Per cent	0.0%	15.0%	5.0%	10.0%	70.0%	100.0%
18–25	Number	5	4	7	3	41	60
	Per cent	8.3%	6.7%	11.7%	5.0%	68.3%	100.0%
26–40	Number	0	1	1	4	23	29
	Per cent	0%	3.4%	3.4%	13.8%	79.3%	100.0%
41–65	Number	0	0	0	0	4	4
	Per cent	0,0%	0,0%	0.0%	0.0%	100.0%	100.0%
Total	Number	5	8	9	9	82	113
	Per cent	4.4%	7.1%	8.0%	8.0%	72.6%	100.0%

Table 7 The responses by the participants to the question "What architectural design approach do you prefer to shopping centres?"

Design approach	Number	Per cent
Indoor	2	1.80%
Outdoor + indoor	61	54.20%
Outdoor	50	44.00%
Total	113	100.0%

To determine how the preferences for shopping centres in Mersin were affected during the COVID-19 process, the participants were asked, "Which shopping centre do you prefer before and after COVID-19?" As a result of the warnings regarding COVID-19, it is expected that there will be a tendency from enclosed shopping centres such as Sayapark and PalmCity toward open-air shopping centre types such as Forum Mersin. However, as a result of the survey evaluation, although there was a 7.1% shift from Sayapark and 16.7% from PalmCity to Forum Mersin, there was also a 23% shift from Forum Mersin to other shopping centres (Table 9). It is possible that these results do not have a significant relationship with COVID-19. This suggests that the public should be more aware and involved in the study and design of the shopping centres, which take COVID-19 into account.

In this section, the responses to two questions have been evaluated. The *"Cronbach's alpha reliability coefficient"* value of the questions was determined to be 0.805 and is at an acceptable level because it is greater than 0.7.

In order to compare the reasons for choosing the shopping centre before and after COVID-19, the participants were asked firstly, "What was your reason for choosing the shopping centre before COVID-19?" the question was asked and then "What is your reason for choosing the shopping centre after COVID-19?" question was asked. To the first question, 38.8% of the participants answered, "Because it includes my preferred brands" and "Because it includes many activities with different features". It was determined that the answers to the second question as "Because it has enough open space" or "The ventilation system is adequate?" (Table 10). These responses show that the participants are aware that after Covid-19, the virus spreads less in open spaces. However, it was determined

Table 8 According to the age distribution of the participants, "Where would you prefer to shop after COVID-19?" responses to the question

Profession	Number/Per cent	Bazaar	Shopping Centre	Flea market	Metropol Bazaar	Other	Total
Public Personnel	Number	3	7	0	0	8	18
	Per cent	16.7%	38.9%	0.0%	0.0%	44.4%	100.0%
Private Sector	Number	8	6	1	1	6	22
	Per cent	36.4%	27.3%	4.5%	4.5%	27.3%	100.0%
Retired	Number	1	0	0	0	0	1
	Per cent	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Unemployed	Number	3	3	0	0	9	15
	Per cent	20.0%	20.0%	0.0%	0.0%	60.0%	100.0%
Student	Number	5	19	0	2	19	45
	Per cent	11.1%	42.2%	0.0%	4.4%	42.2%	100.0%
Other	Number	3	3	0	0	6	12
	Per cent	25.0%	25.0%	0.0%	0.0%	50.0%	100.0%
Total	Number	23	38	1	3	48	113
	Per cent	20.4%	33.6%	0.9%	2.7%	42.5%	100.0%

Table 9 Comparison of the shopping centres preferred by the participants before and after COVID-19

Before COVID-19		After COVID-19			
	Number/Per cent	Forum Mersin	Sayapark	PalmCity	Other
Forum Mersin	Number	57	3	2	12
	Per cent	77.00%	4.10%	2.70%	16.20%
Sayapark	Number	1	11	1	1
	Per cent	7.10%	78.60%	7.10%	7.10%
PalmCity	Number	1	0	3	2
	Per cent	16.70%	0.00%	50.00%	33.30%
Other	Number	5	0	3	11
	Per cent	26.30%	0.00%	15.80%	57.90%

Table 10 Comparison of participants' reasons for choosing shopping centre before and after COVID-19

Before COVID-19	Number/Per cent	After COVID-19				
		Because it has enough open space	Because ventilation system	Because I feel safer in indoor	For hosting my preferred brands	Contain different activities
Because it has enough open space	Number	43	3	0	1	0
	Per cent	91.5%	6.4%	0.0%	2.1%	0.0%
Because ventilation system	Number	3	8	0	0	1
	Per cent	25.0%	66.7%	0.0%	0.0%	8.3%
Because I feel safer in indoor	Number	0	0	2	2	1
	Per cent	0.0%	0.0%	40.0%	40.0%	20.0%
For hosting my preferred brands	Number	7	7	0	22	0
	Per cent	19.4%	19.4%	0.0%	61.1%	0.0%
Contain different activities	Number	4	0	0	0	9
	Per cent	30.8%	0.0%	0.0%	0.0%	69.2%
Total	Number	57	18	2	25	11
	Per cent	50.4%	15.9%	1.8%	22.1%	9.7%

that none of those who responded "I felt safer indoors" to their shopping centre preference reasons before COVID-19 preferred the options related to open space. This situation shows that the needs of users who feel insecure in open-air shopping centres should also be considered in open-air shopping centre designs after COVID-19.

6 Evaluation and discussion

In the age group 65 and over, immune systems are weaker than in younger populations, are referred to as vulnerable, and are most affected by the COVID-19 pandemic. However, there are also cases of death in the younger population. Because of the possibility that this age group is a main carrier of the disease and may transmit the disease to the vulnerable age group, young people should also pay attention to warnings and social isolation (Üstün and Özçiftçi, 2020:p.145). When the second group responses of the participants in the survey were considered in general; some suggestions and solutions can be offered as proposals for existing buildings in accordance with the Mediterranean climate discussed in the study:

- It was observed that children and younger age groups are less concerned regarding warnings about the COVID-19 pandemic. It was also determined that there is little change in the frequency of going out in these age groups. For this reason, the age factor should be included in the process, taking into account the emotional experience in new designs and transformations following COVID-19. Information provided for precautionary purposes should be considered for all age groups. In addition, informational strategies should be developed in which the benefits can be transferred emotionally by the user. For example, for 45 years old and above; it can be said that when you go out, travel in open areas and away from other people, and do this at your workplace. However, it is not realistic to expect this from students, for example, in a primary school. For this age group, the seating arrangements can be rearranged depending on the social distance rules and the importance of this situation can be supported by visuals.
- Precautions related to the pandemic should not be left to emotional intelligence, especially in places where children and younger age groups mainly use shopping centres.
- In this context, restaurant and cafe tables should be adjusted and fixed according to social distance rules.
- Seats in cinemas should be rearranged according to pandemic precautions. If possible, halls should be redesigned with natural ventilation. Mersin is favourable for natural ventilation systems due to the clean air conditions provided by the Mediterranean climate.
- Even if mechanical ventilation is used, the hall should be ventilated regularly with newly opened windows/doors inappropriate places.
- Screens showing the "number of people inside" and "number of people able to enter" should be placed at the store entrances and be clear and visible. Such practices will reduce emotional attrition in the process and prevent the spread of the pandemic.
- Designers should consider creating alternative spaces in the interior of the building (hygiene, hobby, maintenance room, study room, etc.).
- In shopping centres, where the number of users is significant and there are no outdoor corridor spaces,

"multiple elevators and multiple common stairs must be provided".
- Structural solutions that consider hygiene and social distance indoors should be developed, such as interior cross corridors.
- More attention should be paid to the relationship between indoor and outdoor spaces – balconies, windows, courtyards, galleries, and other elements – forgotten for aesthetic reasons and financial benefit weight. Closing the open balconies with glass in order to increase the square meter of the room is an important example that explains this situation. Closing the balconies damages the ventilation between indoor and outdoor.

The Ministry of Health for the Republic of Turkey, on COVID-19 related to indoor situations during the pandemic, made some recommendations. The emphasis on natural ventilation in these suggestions reveals the importance of open spaces.

This study investigates the effects of COVID-19 on the participants' preferences for the Mersin shopping centre in a Mediterranean climate. According to the results, 66.3% of the participants' responses are related to the open space, showing that they are aware of the importance of this need.

In the user analysis from Mersin, the majority of people after COVID-19 preferred Forum Mersin with its open-air shopping centre design supports this situation. To provide natural ventilation in shopping centres built in the Mediterranean climate, various suggestions can be offered in the design decisions:

- Considering the hot and humid weather conditions, night ventilation is necessary for cooling the building. The courtyard system, wind catcher and solar chimneys can be used independently or integrated. The cold air accumulating in the courtyard during the night fills the rooms during the day, and the indoor air that is heated during the day is extracted via solar chimneys. Windcatchers provide natural ventilation by taking in the fresh air and expelling the polluted air. However, the Mediterranean climate is a suitable environment for insects, so it is necessary to use systems that will prevent insects from entering the spaces from the windcatcher.
- Considering that shopping centres cause heavy human-vehicle traffic and therefore an increase in CO_2 and other pollutants, the use of afforestation in open spaces to reduce these effects should be considered. The selection of trees such as ash, beech, linden and chestnut that grow especially in the Mediterranean can effectively reduce CO_2 (Uyar, 2020). Improving air quality will also improve natural ventilation and reduce the need for indoor ventilation systems.
- The necessity for natural lighting emerges when considering the amount of heat produced by the lighting elements in the shopping centres in the hot Mediterranean climate. In this case, it is proposed to design roof covers with transparent materials that provide high levels of light transmittance and minimum levels of heat transfer. Natural temperature control will also reduce the risk of spreading the COVID-19 virus through the use of mechanical cooling systems.
- Due to the Mediterranean climate, earth cooling systems should also be considered in shopping centre designs. In this case, the spaces that do not need a particular lighting system can be designed below ground level, or the spaces can be ventilated with special systems such as channels and pipes for underground heating and cooling.

Urban design proposals have been developed as a result of COVID-19:

- Increasing the number of accessible open areas in the city/increasing the areas it covers, and encouraging the public to utilise the nearest open area as precautions that can be taken within the scope of the city.
- Streets, sidewalks, and recreation areas should be considered in a broader green perception of public spaces, health and social distance rules and considered during the design process.
- In addition, activities that cause groups to congregate outside of shopping centres, making it difficult to comply with the social distance rules, should be prohibited, especially during the pandemic period.
- If such activities are held, open spaces should be divided into sections following social distancing with flexible landscape elements or horizontal space limiters. It is clear that the use of open space is possible, especially in regions with a Mediterranean climate. This is an advantage for this region.

The responses to the questions investigating why users prefer shopping centres before and after COVID-19 will also constitute an important roadmap in shopping centre

design. According to the findings of the study, it was determined that some participants felt safer indoors. Although the importance of being in open spaces during the pandemic period was emphasized by many health institutions, it was determined that none of these participants changed their preferences for the indoor shopping mall design before the pandemic. This situation is due to the need for people to feel safe, which also finds a place in Maslow's hierarchy of needs. Akıncı (2013) stated that some people see shopping centres as a place of escape from the traffic, noise and chaos of the city and because they feel safe (Akıncı, 2013). In addition, in the survey conducted by Tatlı and Kazancıoğlu (2017) to determine the shopping centre preferences of consumers in Malatya, 69.8% of the participants chose "I Agree" or "Strongly Agree" option, which supports this situation (Tatlı and Kazancıoğlu, 2017).

That some people feel safe indoors is related to their spatial perception in general. The reason for this situation is that the most important space limiters are vertical space limiters, and the most important type of sensory perception is visual perception. Designs should consider the spatial perception of people who feel safe indoors and do not prefer open-air shopping centre designs despite recognising the benefits of naturally ventilated spaces under COVID-19. While this situation creates the space boundary in shopping centre designs, it is revealed by applying horizontal space limiting elements instead of vertical space limiters such as walls. Because during the pandemic period, designs should be made not only to prevent the spread of the disease, but also to positively affect human psychology. For example, colour, texture and product selection can give a sense of spatial limitation in visual perception in floor coverings. Landscape elements should also be used as spatial delimiters. In addition, users should feel the spatial boundaries with visual perception. Mersin, which forms the scope of the study, is located in the most favourable region where the proposals can be applied in terms of climatic features.

7 Conclusion

It is essential to understand and prepare accordingly for the basic dynamics of the "new life", "new normal", "new economy", and "new work" that will emerge during and after the pandemic.

The COVID-19 pandemic, which appeared in China towards the end of 2019, started to spread rapidly worldwide. Unless a permanent solution is found, societies will have to continue the social, economic, educational and tourism precautions. Otherwise, the spread of the disease will continue rapidly. Although a solution to the COVID-19 pandemic may be found, new pandemics are possible. For this reason, extra precautions should be taken in areas that are heavily used by the community.

Considering that one of the most significant socialisation areas are shopping centres, essential precautions should be taken in this type of building. In this study, new design proposals are presented to minimise the spread of COVID-19 in shopping centres based on the shopping centre designs in Mersin. This study aims to guide shopping centre designs built or transformed during and after the pandemic.

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