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CREATING FAST AND SAFE STRUCTURAL DESIGNS AND QUARANTINE STRUCTURES DURING AN EPIDEMIC

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ABSTRACT

From the existence of human history to the present day, there have been fractures in societies due to different epidemics and infectious diseases. Especially with the Industrial Revolution, because of the business life in the cities, the need for shelter was also needed and unhealthy living spaces increased and epidemic diseases that caused great destruction in the process were experienced. When the living conditions of individuals with contagious diseases or the onset of epidemics are examined, the close relationship between health, architecture and engineering disciplines draws attention in the context of the need for healthy and safe accommodation and the creation of a healthy and safe workplace environment.

Individuals who have to struggle with communicable diseases throughout their lives should design their living spaces and work lives for themselves, their families and the health of the individuals around them, taking precautions for personal care areas and common use areas that will take care of social distance.

The first aim of this study is to investigate the importance of social distance when it comes to epidemics and infectious diseases and what measures should be taken to be protected from the dangers that may arise from common areas. By using standard forms and on-site survey method, a questionnaire study was applied to patients who had covid-19, which is one of the epidemic diseases, and to patients who experienced different infectious diseases and their relatives in June and July, August 2022.

As a result of the research, determining the deficiencies in the buildings so that the patients with epidemic diseases and contagious diseases do not infect their families, environment and friends in the work environment, with alternative solution suggestions, designing a comfortable accommodation and working area until the patients regain their health and safety, so that they can stay safely and healthily in their surroundings. It has been determined that it will contribute to the revision of existing structures or alternative quarantine structures designs.

Keywords: Modern construction technologies, Sustainable architecture, Sustainability, Living Standards.

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INTRODUCTION

The construction and architecture sectors, which are one of the fastest developing sectors in the world, offer services with more different designs every day. With the active working life in the modern world, the needs of the residences are changing day by day. Although more comfortable designs come to the fore compared to the old traditional houses, now the indispensable part of the houses is the study room or study areas. Open living floor plans have gained immense popularity in recent years by removing walls and doors to unify living spaces. Open plans, which are thought to be multifunctional, where the kitchen, living area and even the work area are together, lost their comfort to some extent during the quarantine days when all households had to spend time at home and everyone needed a separate and private space. In these unprecedented times, the importance of an extra room, even a few square feet, was recognized.(url-2)

Although the living standards of the whole world changed during the epidemic period, it drew attention in a different situation. The deficiencies needed during the epidemics were investigated and solutions were presented by identifying the deficiencies in line with the problems experienced about what to do in such cases.

MATERIALS AND METHODS

Antalya Province of Turkey was chosen as the research area. Antalya province is located in the Mediterranean region. The other materials of the study consist of people over the age of 18, living in the research area, suffering from an epidemic disease at different socio-economic levels or having to live with an infectious disease constantly, their family members and their friends in the working environment. These are the questionnaire forms used to determine the basic needs of individuals, what kind of structures they need for healthy and safe accommodation, and in which subjects they have difficulties, and studies on the subject.

This research; The determination of the scope and method was carried out in the form of pre-testing the questionnaire and eliminating the deficiencies, applying the questionnaire and evaluating the data after the

collection of information on the subject and study area and the preparation of the questionnaire.

In order to determine the demands and opinions of sick individuals, relatives (families and colleagues) of sick individuals about creating a safe living space without infecting other individuals during the epidemic period or in the event that individuals with lifelong infectious disease have to live in the same residence, on-site survey method was used through standard forms.

Since it was not possible to conduct a survey on all individuals in the province in terms of time and financial means, the simple random sampling method with equal probability was applied and the sampling volume was obtained using the equation below in cases where the number of population units is over 10,000. (Yazıcıoğlu and Erdoğan, 2014).

$$n=P\times Q\times Z\alpha^{2}/d^{2}$$

n: sample size, P: The probability of the event occurring,Q (1-P): The probability of the event not happening, $Z\alpha$ 2: Confidence coefficient (This number is taken as 1.96 for a 5% margin of error.), d: It is the accepted sampling error according to the incidence of the event.

$$. n=0.5\times 0.5\times 1.962 /0.052=384.16$$

The obtained data were analyzed and interpreted in the MS-Excel program and the results of the research were evaluated.

The study was carried out with 100 people over the age of 18, randomly selected from the community, and 90 people were evaluated.

The questions in the questionnaire include the socio-economic structure and demographic characteristics of the target group, and the patients and their relatives (families and colleagues) who have an epidemic disease or struggle with a lifelong infectious disease in Antalya province are safe-healthy-comfortable accommodation and the potential to create a workplace environment, designing temporary quarantine areas and

creating a different accommodation area for individuals who have to struggle with contagious diseases throughout their lives.

The total number of questions is 20 and has been prepared as closed-ended, open-ended and triple-rated. The prepared questionnaire was applied to 10 randomly selected individuals, so the questionnaire was pre-tested. The questionnaire was rearranged in line with the opinions obtained from this stage.

The questionnaire was applied to individuals living in Antalya province who had an epidemic disease/individuals who had to struggle with contagious disease throughout their lives and their relatives (family and colleagues), through personal interviews with individuals in the sample population in June, July and August 2022.

RESULTS AND DISCUSSION

Socio-economic Characteristics for the surveyed target audience

64.8% of the respondents are female and 35.2% are male. In their age group distribution, 30-44 age groups are in the first place, 48.2%, and 18-29 age groups are 27.4% in the second place. It is 75.6%. Their educational status is 41.2% high school, 34.6% university-high school, 14.4% secondary school, 8.8% primary school, and 1% is only literate.

While the rate of literate people over the age of 6 in Turkey is 97.42 percent, 773 million adults in the world are still illiterate and cannot access information technologies. The first in Turkey in literacy rate is Antalya with 99.07 according to 2020 data.

(url-1) In the research area, this rate is 100%. The distribution by occupations is 27.6% civil servants, 36.5% self-employed, 15.3% workers, 4.8% retired, 11.3% unemployed and 4.5% students. In this case, the economically active population is 79.4%.

Due to the Mediterranean climate in the Antalya region, the summer months are quite hot, and since the spring months are warm, open space is actively used in the terraces and balconies in the gardens for a long time, that is, about 9 months in a year.

Individuals with epidemic diseases and lifelong infectious diseases stated that they can spend a safe and comfortable time in open areas by paying attention to social distance, and that they can continue their social lives without being disadvantaged in the society and without feeling marginalized.

The subjects participating in the research used the whole year's (64.9%) time period for open areas (seaside -beach-woodland-parks-gardens-balconies-terraces-patios-roof gardens) in Antalya, due to the presence of a climatic advantage. They have to stay indoors for a long time (35.1%) of the year due to climatic reasons.

The climatic advantage allows individuals with these diseases to spend time without encountering an extra factor that triggers diseases by paying attention to social distance. However, (74.6%) of the individuals with the aforementioned diseases live with their family members. (25.4%) live alone. (77.3%) of the individuals with the aforementioned diseases state that they cannot lead a comfortable and comfortable life in the house where they live with their families.

They stated that in the houses where they live with their families (65.9%), the sick individuals are uncomfortable because they do not have a private toilet and shower area in their rooms, increasing the risk of infecting their families. Individuals with the aforementioned disease and their relatives staying in detached houses (72.1%) stated that they would like to have at least a room in their garden with a different entrance, wc, bathroom and a mini kitchen section.

In this way, they will be in the same garden with their families, they will not be alone, they will be comfortable and comfortable, and they will feel happy because they will not infect their families.

The residents (27.9%) of the detached houses do not want it to be seen as an independent section from the outside by adding to the existing house instead of an independent house in their garden, and although the existing house has a holistic appearance when viewed from the outside, it still has a different entrance and a wc, shower and a kitchen niche. They want a living space with parts of it.

The patients and their relatives living in apartments or mass housing, who have epidemic diseases or have to live with infectious diseases throughout their lives, stated that they do not want to use the elevators together (75.9%), which are common areas.

During the epidemic, it is necessary to create a buffer zone (56.7%) of those living in apartments, housing estates, and housing estates, because the risk of infecting many individuals in the apartment, especially from the common areas, is very high, and the risk of infecting family members is very high. They stated that they had expectations for the patient to spend the quarantine period comfortably and safely.

In the said group, individuals living in apartment life or in mass housing, individuals who have an epidemic disease in the residence, or individuals who have to continue their lives with a contagious disease throughout their lives (70.4%) expect a WC, shower, and a small kitchen area in their rooms, and they have to live in the whole house. instead of reaching a balcony-terrace-patio by passing through, they emphasized the demand for a balcony from which they can exit their rooms.

CONCLUSION

As a result of the difficulties they experienced, it was learned that they had different expectations from the houses as a result of the survey conducted for individuals who have to live with epidemic diseases and infectious diseases throughout their lives.

Solution proposals can be developed by adding some design parameters in existing residences.

If the existing houses are detached and have a garden, an area should be defined for a different entrance-exit to the existing house, and if there is no one in the existing room, an area should be defined for the needs of a WC, shower and a small kitchen.
Or, a new planning should be made in the garden, which is located close to the house where his family lives, but not adjacent. In this way, the patient will be able to maintain a comfortable and comfortable life and provide access to his family in case of need. And spiritually, they will be

able to spend quality time with their families in common areas such as gardens and patios at social distance.

For individuals living in apartments – complexes or in mass housing, a buffer zone should be created for epidemic disease cases, and a quarantine accommodation area should be created by finding an average value according to the number of households in the apartment.

Again, there should be an elevator for individuals with such special conditions in public living areas - apartments - estates.

A work area should be organized for the individuals in question, who have active economic mobility, especially considering their business life. In workplaces, a special work area should be reserved in case of quarantine.

There should be an office where they can meet their basic needs, such as a mini bar and WC, specific to that work area. At the same time, they are required to use a different elevator when accessing these offices.

Working environments should be designed with systems that can be transformed for individuals who cannot leave their homes, and when they complete their procedures, they should be able to return to their normal routine in their rooms.

In periods of epidemic disease, an area where prefabricated or bungalow small houses can be restored in a comfortable and safe quarantine should be designed in rural areas or in areas close to the beach, and a health center should be located in this area, equipped to intervene.

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