# How Does "Stay Home" Transform a House? The Route Map of a Research

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## Abstract

COVID-19 pandemic caused transformation by influencing the physical and psycho-social status of houses, and by introducing different functions and needs which led to or will lead to changes in individuals' expectations from their houses. Drawing on this idea, this study allows for the detection of such changes through examination and for the consideration of future house arrangements, housing designs and their production by identifying the usage possibilities of existing houses. The research design is structured in three main steps. First step is the literature part that draws the conceptual framework of the study. Second step includes survey technique with use of panel design as a quantitative research method. In the research, third step has built with semi-structured interview to be deepen analyzing of the results of the quantitative part. The findings reached through this study have the potential to lead future house arrangements as well as housing production and design which are also significant in terms of innovative and creative housing designs studied within disciplines such as interior architecture and architecture. Sample of the research is the city of Istanbul which is first of the most affected cities from COVID-19 pandemic. Selecting a big and multi-component metropolis like Istanbul as research area for residential spaces brought different difficulties in the application processes of research methods while allowing the multidimensional examination of the subject. The research design proposed by this study possess the quality of a guiding sample for future scientific studies.

**INTRODUCTION**

It is a well-known fact that natural disasters are processes which directly affect the physical space and even cause their total destruction and reestablishment. In addition to the political, social, and economic consequences, pandemics have always caused spatial changes throughout human history (Chang, 2020; Dejtiar, 2020; Muggah & Ermacora, 2020).

Humanity is witnessing a similar process in the 21st century. The pandemic, which started in December 2019 in the city of Wuhan, the capital of China's Hubei Province, has affected the whole world. Following the outbreak of COVID-19, which was declared a pandemic by the World Health Organization, our lives have changed rapidly. First, the borders were closed, and each country retreated to its own shell. With the application of quarantine regulations, societies were forced to withdraw into their houses.

As a result of the social isolation brought by the pandemic, public spaces were abandoned, and people had to fit their lives into all spatial layers of their homes ("COVID-19 lockdowns by country," 2022). The house which isn't thought properly about its reality and meaning during daily life routines and be seen as an equivalent to the action of sheltering, has become a haven with the pandemic.

Therefore, both the physical and the semantic realities of the idea of 'house' have changed. Houses meet people's needs for schools and offices with the use of digital tools. They function as family health centres through online health services while being used as social spaces (gym, cinema, theatre etc.) providing online broadcasts and meetings. Remote work and distance education systems made the organisation of all education and business processes possible from home. Museums can be visited at the comfort of one's home through virtual space experience (Kasapoğlu Akyol, 2020). People now enjoy their coffees on online meeting platforms. The duty of all public and semi-public spaces which bring the society together is now assigned to houses.

Houses have become a gateway for transformed online social relationships in addition to be private place of their users'.

As a result of these dynamics, the variety of functions and uses of the houses changes in addition to the transformation of their physical reality and psycho-social meaning. The perception that houses limit people's relationship with the outside world is abandoned because now they are the places where the relationship to the outside world is established (Pennington, 2021). While houses are opened to the world by means of online platforms, users' private lives become visible. On the other hand, balconies and terraces, which were once closed to increase the indoor square metre of the house, have gained importance as places of communication with the outside world. As stated in Origoni and Origoni (2020), balconies are no longer tools for observation, but places of participation in the city and public life.

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On the other hand, productive activities such as sewing, growing plants, knitting and painting became new ways to spend time at home (Yeşilay, 2020). Besides, people started to do sports by joining courses at digital platforms to avoid inactivity and support their health. All these changes and transformations have identified new spatial needs, characteristics, and relationships among them at houses. The physical thresholds of houses have changed mostly due to the understanding of hygiene.

While staying home is being encouraged, houses have undergone changes in all aspects. It is predicted that the fear created by outbreak of COVID-19 will make it difficult for people to leave their houses for a long time (Makhno, 2020). It is also suggested that instead of living in houses which are close to workplaces but with low square metres, people will prefer houses with high square metres even if they are relatively far from the city centre. Furthermore, houses will be expected to provide spaces suitable for the working environment (Başdoğan, 2020). It is also suggested that new spatial reality and meanings attached to houses after the pandemic might cause a necessity to fulfilment of different needs and the creation of a new atmosphere as a demand.

In the light of such events, this study aims to identify how COVID-19 and staying home have changed people's use of their houses, how physical realities of houses have changed, and what the meaning of houses evolved into.

Through the hypothesis that the COVID-19 pandemic affects physical and psychosocial status of houses, this study contains various determinations. Those are based on new & different functions/needs that are added to houses, and the idea of there are or will be changes in the expectations of people from their houses.

## CONCEPTUAL FRAMEWORK: HOUSES DURING THE COVID-19 PANDEMIC

It is thought that one of the places most affected by the pandemic is the house. In the future, many studies and ideas are going to be put forward about how and in which direction this change happens (Düzen & Gezici, 2020). Therefore, it is suggested that identifying how the pandemic has changed and transformed the status of houses is a priority in the creation of future scenarios.

The concept of house examined within the scope of this research refers to the place where the individual lives and/or encounters with other people. It reflects the social structure and corresponds to building systems including physical, social, cultural, economic, and psychological interactions. While some of the features attributed to houses concern the individual, others include the interaction with the social environment.

According to Bachelard (2013), every place of residence hosts the idea of house at its core. However, houses are also the source of the closest and private relationship between humans and the environment

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(Seagert, 1985). From this point of view, Hayward (1975) defines the house as the physical structure reflecting the characteristics of the individual as his reference point in the world, connected to the environment and as a form of social environment including the daily interactions of the individual with others. Houses are physical elements of mutual connections built up by family members between their emotional lives and possessions. (Alexander, 1970).

In short, houses are the most important and indispensable unit of life for human beings. Domestic life is a need, a way of self-expression and realization for people. When a person sets up his/her home, he/she likens it to himself/herself (Pekpostalcı, 2009). Beyond being a place that meets the physical needs of the individual, houses also meet the psycho-social needs of the individual.

For this reason, this study first identifies the psycho-social and physical components that make up a house and then examines them. It discusses how the pandemic has affected houses through these components.

While the pandemic caused changes in expectations about the house, it had to adapt itself to the actions taken outside; hence, the relationship of individuals with their houses and the environment changed which also affected the psycho-social and physical components. When lifestyles are concerned, it can be observed that the pandemic has caused changes in terms of daily routines, communications among individuals and their expectations from life. Since private life mingled with the professional life, the routines realised at home shifted and caused the communication in the household to increase. As Yıldırım emphasises in his study (2020), remote working and distance education caused the mother figure at home to appear as a professional figure too and children are also students at home now.

Another new characteristic caused by the pandemic in terms of lifestyle is the use of online social life platforms. Individuals try to fulfil their socialization and communication needs through online platforms or by communicating with individuals outside the household maintaining social distance. In Davran's (2020) study, it is concluded that after the pandemic, old cultural habits such as hosting guests will change as it will loosen guest-neighbour relations.

In terms of the privacy, borders of the privacy have been changed due to the changes in the frequency of the household's time that they spent together and the density usage of spaces. In addition, it is suggested that the boundaries of social privacy and personal privacy are blurred with the intertwining of social life and professional life.

In terms of security, it is claimed that safe places and feeling safe have become a necessity for maintaining health (Gezici & Düzen, 2021). When being protected from the virus is concerned, houses have moved to a different level as an individual's safe space.

Communication, however, as another psycho-social component gained importance in terms of changing the values and methods of

communication established between the household and people outside the house. This period is thought to cause change regarding the way people host their neighbours and communicate with each other as a family. Together with such changes, new communication tools are believed to be influential in people's lives and houses. In brief, it can be suggested that those changes are observed when social components such as personality, lifestyle, privacy, security, and communication dynamics constituting the psycho-social components of the house are examined.

It is thought that while the psycho-social components transformed in this way, the physical components that make up a house also have changed compared to how they were before the pandemic. When the function and usage, lighting, noise, hygiene, and personal space, which constitute the physical components of a house, are investigated, it can be observed that there has been a significant change in use. Changes in the intensity and ways of using space, as well as the emergence of new functions are distinct differences. Especially activities like remote working and distance education made the usage of already existing spaces for such purposes compulsory. It can be said that the intensity in the usage of all home spaces changes as the whole day is spent at home for individuals who are not at home during a certain period of the day. Houses are now supposed to meet the requirements of several other functions such as working, socializing and education in addition to its accommodation function (Ensarioğlu, 2020).

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Along with this, there have been changes in the need of especial open spaces. Therefor the ways and frequencies of usages of the spaces such as balconies and terraces have also been changed.

During the quarantine, balconies became places of socialization. According to the report published by the American Society of Interior Architects, the state of being in touch with nature contributes to individuals' stress management and accelerates the recovery of emotions and moods. For this reason, balconies and terraces in houses have had positive effects on users who had to spend their time at home (Ak, 2020).

Lighting and noise components have also altered in parallel with the change of usage and function. Occupying houses throughout the day, using them as places of work, school, socialization and entertainment reminded us the importance of lighting and noise management. In terms of hygiene, supplying the hygiene component became more significant in order to minimise the risk of contamination. Cleaning the surfaces used at home has become more important. It is suggested that as individuals develop new hygiene methods, spaces go through changes accordingly.

When private spaces are concerned, it is thought that individuals' expectations of personal space cannot be fulfilled due to the intense usage of their houses. The extended amount of time spent together by the household, the intensity of family relations, the decline in the

relations with the environment outside, the deteriorations people experience while meeting their basic needs such as sleep, or nutrition have a negative influence on the future of relations (Yıldırım, 2020). It is possible to suggest that, unlike the before pandemic period, meeting the need for personal space is getting more difficult for family members who have to spend a whole day together as they cannot set up their personal boundaries properly.

In the light of the given information, it can be concluded that houses have changed in terms of their psycho-social and physical components after the outbreak of COVID-19 Pandemic. It is estimated that recent changes are likely to affect the design and production of houses after the pandemic. For this reason, the spatial correspondence of the emerging needs and reflection of changes indicated in the literature are revealed through quantitative and qualitative research methods.

**RESEARCH DESIGN**

The research design is built as a process in which quantitative and qualitative research techniques are used together. It based on a conceptual framework in which the changes in the psycho-social and physical components of the house are presented. The research design is developed depending on the continuation of the pandemic for the detection and investigation of spatial (physical) and semantic (psycho-social) changes experienced at houses due to the COVID-19 pandemic. Therefore, quantitative and qualitative research methods are used together in a dialectical structure. In the process with the adoption of an inductive approach, it is aimed to be cross-sectional and exploratory (Miles & Hubermen, 1994). In accordance with these aims and hypothesis, an ethics committee approval has been taken from the university which this study had been conducted. Also, an approval from the Ministry of Health about the health of the participants and process approvals from the sponsor public intuitions have been taken. Subsequently the study had been started and conducted.

First step of the study is building the conceptual framework. In the second step, it is aimed to question the changes participants' experiences about their houses during the COVID-19 pandemic and the relationships with the acts that are taken or will be taken after the pandemic. The survey technique which is a quantitative research method have been used in this step. Accordingly, panel design technique which is examines the same participants' behaviours or opinions in different times (Gifford, 2016) have been used. Thus, changes in same participants' attitudes and opinions in different times of the COVID-19 process have been determined. The survey consists of three periods: COVID-19 pandemic before quarantine (before March 2020), the COVID-19 pandemic during quarantine (between March 2020-June 2020) and the COVID-19 pandemic after quarantine (after June 2020). In the definition of these three periods official announcements of the Ministry of Health have been taking into consideration. The process has been

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started in March 2020 with the first positive case in Turkey. Between March and June 2020, quarantine measures had been taken and the measures are ended dating from June 2020 (Ministry of Health of the Republic of Turkey, 2020a; Ministry of Health of the Republic of Turkey, 2020b).

Sample group of the survey a purposeful and layered sample group which contains sub-groups that are enable to comparison (Sandelowski, 2000). Istanbul was chosen as the target case defining the sample group since it is one of the provinces most affected by the COVID-19 pandemic in Turkey. The survey has shared to the participants in between 13/10/2020 and 05/11/2020. To increase the accessibility of the survey by the sample group, a web page has built, and support from Istanbul Metropolitan Municipality and all other County Municipalities has been taken. The survey which has conducted via "Limesurvey", has reached 672 people with announcements and support of the municipalities. It has completed with 372 participants' data who are living in Istanbul. The size of the sample group has been defined according to necessary formulas (Yazıcıoğlu ve Erdoğan, 2004) for the size of the universe for total population of Istanbul province in the Turkish Statistical Institute's "Address Based Population Registration System Results for 2020" dated 04/02/2021 (Turkish Statistical Institute, 2021; Yazıcıoğlu ve Erdoğan, 2004). According to these formulas, the necessary number for participants have been reached. Distribution of the participants' counties in Istanbul has matched up with the "Address Based Population Registration System Results for 2020" (Turkish Statistical Institute, 2021). However, considering the cosmopolitan structure of the Istanbul, the diversity that can be generalized is limited. This limitation was eliminated with the qualitative research step.

In the survey, it is aimed to understanding the changes in participants' experiences about their houses during the COVID-19 pandemic and questioning the acts that are taken or will be taken after the pandemic, also their foresights about after the pandemic. The survey consists of multiple-choice question groups aiming to determine individual attitudes along with the questions that are questioning demographics, and characteristics of the houses which are defined as background variables. In addition to questions of demographics, and characteristics of the houses, in background variables group also multiple-choice questions about remote working and distance education have been take places.

Survey results were analysed through SPSS (Statistical Package for the Social Sciences) software using Pearson Correlation chi-square, average and frequencies obtained from descriptive statistics. The validity and reliability tests have been done via SPSS with assistance of statistician. Additionally, these tests have been approved by the sponsor institution.

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Other parts of the survey which focus on the process of COVID 19 use closed-ended questions using five step likert scale in relation to attitudes and opinions determining the changes experienced at houses. As seen in Figure-1, this part of the survey includes three periods: before, during and after the quarantine. Questions which are centred upon these periods aim to identify the changes occurred at houses. Accordingly, the second part of the survey comprises questions directed at the psycho-social and physical status of the house, new hygiene and social life needs caused by COVID-19, relations amongst family members, distance education and remote work.
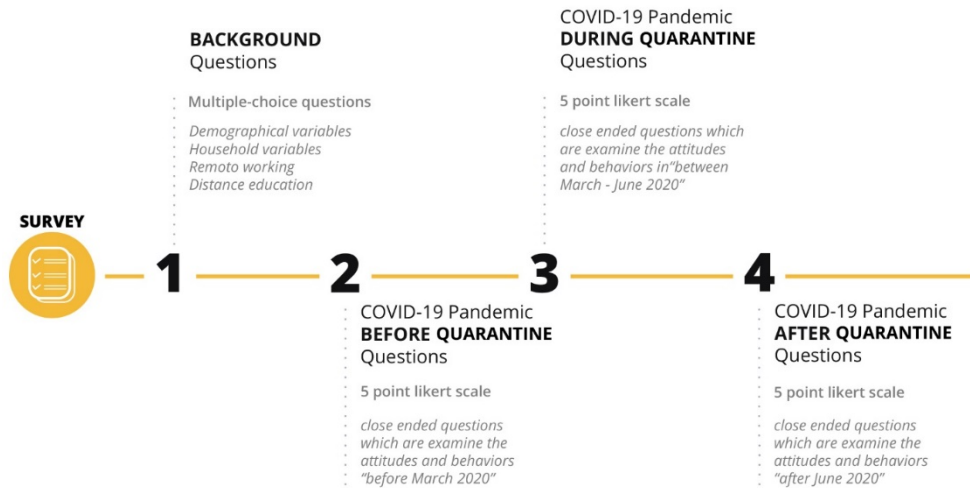


**BACKGROUND** Questions

Multiple-choice questions

*Demographical variables*
*Household variables*
*Remoto working*
*Distance education*

COVID-19 Pandemic **DURING QUARANTINE** Questions

5 point likert scale

*close ended questions which are examine the attitudes and behaviors in"between March - June 2020"*

SURVEY

1 — 2 — 3 — 4 —

COVID-19 Pandemic **BEFORE QUARANTINE** Questions

5 point likert scale

*close ended questions which are examine the attitudes and behaviors "before March 2020"*

COVID-19 Pandemic **AFTER QUARANTINE** Questions

5 point likert scale

*close ended questions which are examine the attitudes and behaviors "after June 2020"*

**Figure 1.** Drawings by the Authors. Question groups in the survey design (Drawings by the Authors).

Qualitative step which consists of semi-structured interviews, has been built to deepen the knowledge that have reached in the quantitative step. Results of the quantitative research part have taken into consideration for defining the sample group and generating the semi-structure interview form. Semi-structured interview form consists of background variables in the first part. The second part has been designed to question the changes and the needs in houses before-during-after the quarantine process. The third part which is named as future scenarios, questions about residential demand and expectations after the quarantine period have been take place.

42 people have completed the semi-structural interviews as sample group who have participated in the survey and supported the study via filling the interview form voluntarily. 12 people who filled the form have not been able to participate the interviews with various reasons. Due to this, interviews have been completed with 26 people. No probabilistic method was followed while determining the sample group. The sample group has been formed to support the theoretical background of the study in purposive sampling in parallel with the survey participants. Semi-structured interviews have been conducted in between 15/11/2020 and 27/11/2020 before the start of second wave quarantine measures.

The interview question groups were prepared according to the demographic variables, background variables together with the psycho-social and physical statuses of the house, distance education and remote working as outcomes of COVID-19, social life necessities, hygiene precautions, and household relations. However, as one could observe in Figure 2, following the demographic variables, the form was arranged in such a way that it included three possible scenarios. The questions were diversified by considering the possibility of participants' moving somewhere else or going to their summer houses after the quarantine and spending after the quarantine period there. Regarding the participants who moved to another house or those who went to their summer houses and stayed there more than usual, interview forms consisted of semi-structured questions about the process of moving and the new houses. During the interviews, the participants were expected to answer each question considering three different time periods: before, during and after the COVID-19 pandemic quarantine.
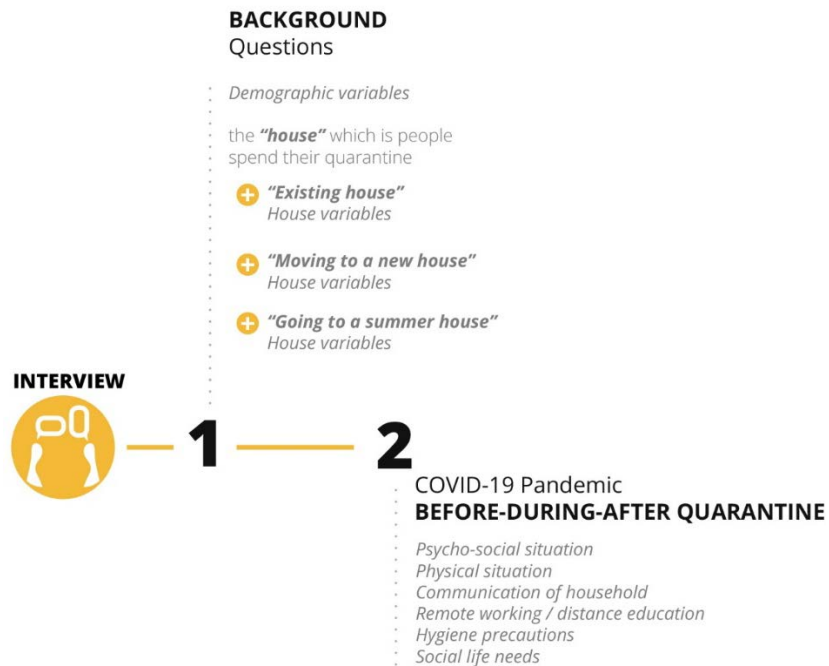


**Figure 2.** Question groups in the semi-structured interview form (Drawings by the Authors).

The data in the texts obtained after the interviews were divided into meaningful parts in accordance with the coding. The coding was done by the researchers with the help of the keyword scanning system provided by Microsoft Office Word. The code list was created in accordance with the conceptual framework and the hypotheses of the research so that the coding could be carried out in a systematic way. The repetition of the codes after the meaningful separation of texts according to these codes helped the qualitative data turn into quantitative sets; therefore, the data could be analysed more systematically. At this point, by means of Microsoft Office Word macro tool, the coded file was converted into tables and Excel files. Therefore, the functions and numeric values on it

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could be defined, which also made it possible to compare codes and to read the associations or differences.

As a result, within the scope of the research design, the information discussed in the context of the study subject was tested with quantitative and qualitative methods which was instructive in understanding the concept of house which is thought to have been transformed by the pandemic. Likewise, the findings obtained through questionnaires and interviews were also analysed quantitatively and qualitatively in the same systematic order. Starting from the conceptual framework of the study, the roadmap has been formed as can be seen in Figure 3.
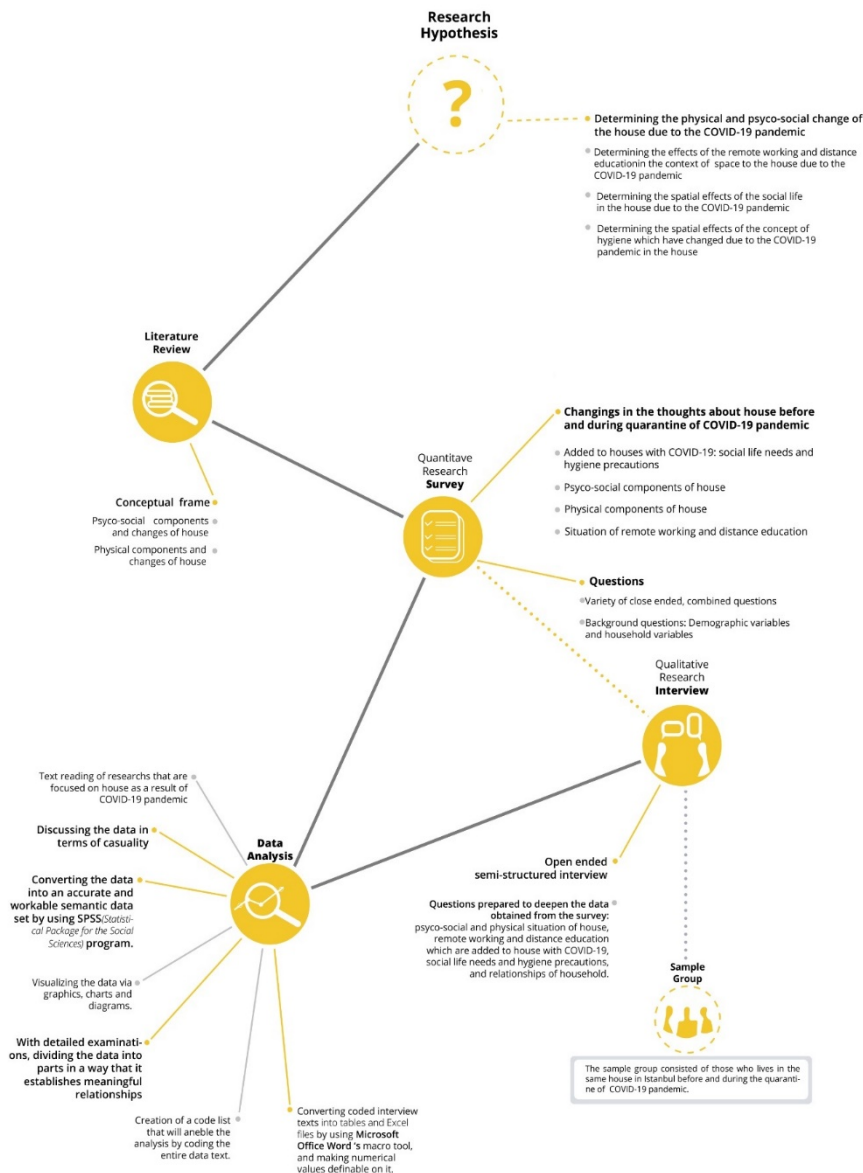
**Figure 3.** Devising the research design (Drawings by the Authors).

## RESEARCH FINDINGS

The findings obtained in accordance with the research design of the study were itemised under two headings as quantitative findings and qualitative findings.

**Quantitative Research Findings**

The questionnaire of the quantitative research step was devised with a focus on the physical and psycho-social components of the house together with hygiene measures, social life needs, home office/remote working and distance education which were added to houses due to COVID-19 pandemic quarantine processes.

Firstly, demographical features have been examined in the survey. Although there have been participants from all age groups, "25-34" and "35-44" age groups which are actively using the online platforms have participated more as expected. It is understood that this distribution is in coherent with population pyramid of registered individuals in the population of Istanbul in 2020 (Turkish Statistical Institute, 2021). This is also in parallel with results of level of education: "Undergraduate" (46%), "Graduate" (21%), "High School" (17%), "Associate Degree" (7%), "PhD" (5%), and "Primary School" (4%).

All categories in the features of houses have been participated. "Family with Children" is at the forefront with a high rate of 62% in the household type. This is followed by "Living with partner" with rate of 12% and "Extended Family" with rate of 7%. When the positions of the participants have been examined "Mother" with rate of 45% comes forward due to the high number of "Family with Children" and "Women" participants. It is followed by "+18 Child" with rate of 23% and "Partner" with rate of 15%. By reason of high participation of the families with children, rates of houses which are had 90m2 or more space and 3 or more rooms are high in the house variables. 3-4 roomed houses have higher rates. Accordingly, larger houses in terms of m2 , come to the forefront. 30% of the houses are in between 90m2-109m2, 26% are in 110m2-130m2, and 22% are larger than 130m2. 60% of the houses stated as "my own house". Types of the houses consist of "Single Apartment" with rate of 47% and "Apartment in Building Estate" with rate of 42%. When it is looked to demographic variables of participants and features of houses, a pluralist point has been reached.

Participants overall opinion on personality, way of living, privacy, security, and communication which are present the psycho-social characteristic of houses as stated in the conceptual framework are listed below:

• There is a statistically positive and significant relationship between the participants' views on the psycho-social state of the house before the quarantine, their social life needs during the quarantine and on the physical state of their houses after the quarantine.

• On the other hand, there is a statistically positive relationship between psycho-social components before and during the quarantine and physical components.

• It can be observed that while the opinions on the psycho-social state of the house before the quarantine have a positive relationship with "gender", they have an inverse correlation with the variables of education level and square metre of the house.

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• It can be observed that while opinions on the psycho-social state of the house have a positive relationship between the "type of household", they have an inverse correlation with the "level of education".

Participants' opinions on the physical status of their houses are as follows.

• Participants who consider the physical status of their houses before the quarantine sufficient also have a positive opinion on the psycho-social status of them and of hygiene precautions during the quarantine period. It can be suggested that having a positive opinion of physical status allows the individuals to overcome the quarantine period at home easily.

• Participants who live in bigger houses with more rooms and fewer people tend to have positive opinions on the physical status of the house prior to the quarantine.

• An inverse correlation between the physical status of the house during the quarantine and variables of "age" and "number of rooms in the house" was detected which stands for a contrary relation to the previous item and brings to mind the question why the positive relation observed between the physical status of the house and the number rooms turned into a negative one.

• An inverse correlation between "age" and the physical status of the house was detected. The opinions of participants who are from the older age group tend to be negative regarding the physical status of their house after the pandemic. While there is a meaningful relation between opinions on the physical status of the house and the gender, there was not a relation detected between the type of the household and property variables.

• Although participants show a tendency to select "I agree" as an answer to "my house meets my daily needs" regarding their opinions on the physical status of the house before and after the quarantine, they tend to make rearrangements after the quarantine in the same context. Participants showed a positive tendency towards the usage of open spaces such as balconies/ terraces before, during and after the quarantine.

• Participants who had to spend their time at home for a long period due to COVID-19 quarantine measures showed a variety in their activities regarding their social life needs and hygiene precautions. A positive relation was identified between their views on the psycho-social and physical statuses of their houses during the quarantine and rearrangement made in the house due to social life requirements. In the same process, hygiene precautions were also taken against the risk of virus transmission at home. When the relations between the household variables and those added to the house during the quarantine period were examined, it can be observed that as the total number of rooms in participants' houses decreased, the changes made due to the anxiety of virus contamination were more frequent.

• When evaluation is made in terms of the working models, the participants tend to continue working from home after the quarantine and accordingly to continue making changes in their houses. They showed this tendency despite the average response to the labour productivity was "undecided". Participants tend to continue distance education after the COVID-19 pandemic quarantine and make new arrangements for it in their houses. They showed this tendency even though the average of their responses to increased learning efficiency was an average between "undecided" and "I don't agree". The uncertainty the pandemic processes has compelled the participants to act for remote working and distance education in the future.

The survey that has been done in quantitative research step of the study have presented the relationship between physical and psycho-social statuses of houses and the changes of this relationship in the process of quarantine. Along with this, relationships of hygiene precautions, social life needs, remote working and distance education which are added to house with pandemic, have been presented. Nevertheless, spatial complexity which have been made by all the physical and psycho-social variables that are mentioned in conceptual frame, have needed to examine deeply. Due to this, the study has continued with qualitative research methods to enrich the data.

### Qualitative Research Findings

Qualitative research process is aimed to detail the relations put forward in the quantitative research step. In the qualitative research step, the changes in the physical and psycho-social statuses of the house with the outbreak of COVID-19, the needs arising from the quarantine processes and the need for remote working and distance education, the need for social life and hygiene measures, were discussed in a more comprehensive and detailed in a spatial context. In this step, the semi-structured interview technique was used to find out what features of spaces at houses caused certain needs and choices to emerge, what these needs and choices are, and what kind of spatial arrangements were made or planned and how these plans will be realised.

Firstly, demographical features have been examined in qualitative research. 5 of the 26 participants are living in Anatolian side and 21 are in European side. Results are in parallel with the survey data in terms of participants' distribution in counties. 25 of the participants are women, one is man. This is also in coherent with the survey data. The densest age group "25-34" with 16 participants is followed by "35-44" with 6, "18-24" with 2, "45-54" with 2, "55-64" with one, and "65+" with one. There have been participants from all age groups. It has been determined that 12 of the 26 participants' level of education are "Undergraduate", 9 are "Graduate", 4 are "High School", one is "Primary School". Among 22 participants that have family with children, 14 of them are positioned as "Mother", 7 are as "+18 Child", one is as "Father" in house. Other 4 participants' positions are "Partner" in house. Half of

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the participants are living in "3" roomed houses including living room. 10 participants are living in "4" and 3 participants in "+4" roomed houses. When the m2 are examined in parallel with the number of rooms, 14 participants have a house in the range of "75m2-100m2", 7 have in "101m2-135m2", 4 have in "+135m2"

It is possible to summarise the information gained at the end of the qualitative research as follows. Participants' opinions asked during the interviews on the changing psycho-social statuses of their houses including safety, attachment, personal space, belonging, privacy, communication with the household, hosting guests, neighbourhood with the COVID-19 are:

• The intertwining of the personal space and public space with the quarantine process made it necessary to clearly define the boundaries of private space where privacy is provided and other spaces where communication occurs.

• As a result of the quarantine period, houses became more important to the participants. The position of houses as places where one feels safe and peaceful and protected against outdoor dangers got stronger in addition to the stronger ties built up by the participants with their houses as they spent more time in them.

• Spending a long time in the house strengthened the sense of belonging. However, not being able to establish boundaries among members of a household in houses where there is a high number of people harms this sense of belonging.

• Participants' answers to questions on privacy vary. Although they consider their own rooms and bathrooms to be private, the fact that they had to share them with other members of the household for a long time has reduced the sense of privacy. On the other hand, it is clear that those who have to make online calls are concerned about privacy. Therefore, the participants pay attention to using backgrounds during online calls to make their houses less visible.

• Household members who were not able to spend enough time together before the pandemic started to spend more time during the quarantine period and strengthened communication among each other. Apart from the household, neighbourhood was positively affected by this period, and it was revealed that neighbours became more visible. However, it can also be suggested that due to the risk of virus transmission, participants have been much more cautious while communicating. When hosting guests is concerned, there is a completely opposite image regarding neighbourhood relations. Participants who frequently hosted guests before the pandemic became much more cautious during and after the quarantine period.

It is possible to list participants' opinions on the physical status of their houses in terms of hygiene, distance education, the spatial effects of remote working, the changing intensity, and ways of using various spaces of the house due to COVID-19 pandemic as follows:

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- Data ranging from macro scale to micro scale, that is, from the environment of the house to the furniture in the house was obtained by using participants' views on the physical status of their houses. Changes that are especially related to the interior of the house are dominant. The relocation of public activities to the house, the changes in daily needs and the increasing intensity of some needs have caused spatial changes in the interior of the house.

- The kitchen has become one of the spaces that are used intensely. Before the pandemic period, kitchens were places where the family members got together but they evolved into places where common breaks of remote working or distance education are taken. In addition, the fact that some participants prefer to cook or to experience cooking in their own kitchen rather than ordering food increased the intensity of kitchen usage.

- As forms of living space, living rooms have been used for various purposes such as watching television, communicating with the household, eating, and following the start of the quarantine, their functions were extended by remote working, distance education, doing sports and playing games. Therefore, due to such new functions in the living room, the arrangement of furniture and fittings was changed, especially by reducing the number of decoration products and furniture such as coffee tables in order to open up enough space.

- On the other hand, bedrooms went through changes to achieve isolation and privacy. They were frequently used for distance education and remote working, especially in crowded families. It has been revealed that various similar arrangements have been made in children's rooms for distance education.

- Terraces and balconies brought a solution to the problem of not being able to go out and use open spaces since the beginning of the pandemic. Such spaces are used more often now for dining purposes. On the other hand, they acquired a new characteristic as places where everything brought from outside is sterilized due to the concern of virus contamination.

- The entrance of houses became one of the places whose usage has changed in terms of hygiene measures. It was revealed that certain precautions were taken regarding various ways of storing shoes in front of houses, at the entrances or in the houses. What is more, other arrangements were made to store equipment such as disinfectants, masks, and gloves for hygiene purposes.

- With the transition to remote working order, the boundaries between home and workplace became ambiguous for the participants. The requirement of working could be fulfilled in various spaces of the house. Therefore, in order to create a separate space away from the household and to maintain noise management in favour of productivity, tables at living rooms, kitchens or new ones bought for the living rooms were used.

• With the transition to distance education, participants with young children have changed the arrangement of distracting elements in the children's rooms so that their children could focus on learning. Households with children from different age groups preferred to use different spaces such as living room, kitchen, or bedroom to be away from others. When the furniture is concerned, it is revealed that participants who used already existing chairs during their studies could not get the necessary comfort and wanted to buy a new office chair.

In the light of such information, one could reach the conclusion that the COVID-19 pandemic has changed and transformed the relation between the house and its user. This relationship has been strengthened by spending a long time at home. Being isolated at home for a long time has made the problems or deficiencies related to the use of the house visible. Although the activities done outside of houses are longed for, the calmness and peace of being at home under today's conditions have become the positive outcomes of this process.

It can be proposed that to understand the transformation of the concept of house, the findings received within the scope of the study should be evaluated in accordance with both subjective and objective aspects and therefore, a research design in which quantitative and qualitative findings complete each other is methodologically positive.

## CONCLUSIONS

The purpose of this research is to determine the changes that houses have been through due to quarantine period. Within the scope of this purpose, the physical and psycho-social components of houses are presented through literature review, the changes that these components went through as a result of COVID-19 pandemic, new functions and usage possibilities added to the components are studied. Components which have and have not gone through changes are identified. As a consequence of the pandemic, there have been changes in the relationship between individual's personality, lifestyle and his relation to space which defines the psycho-social component, in his understanding of communication, privacy and being available online as well as the sense of security in relation to the risk of infection and being isolated. On the other hand, the readings made for the research revealed differences in physical components defined by lighting, noise control and personal space boundaries due to spending too much time at home. It has been understood that the usage of spaces, their priority in meeting daily needs have changed and hygiene measures, the need for social life, remote working and education have been added to spaces as new functions.

The holistic evaluation of the data gained through qualitative and quantitative research results gave rise to the following conclusions, deductions, and suggestions.

• It was observed that the participants' opinions about the physical and psycho-social components their houses in addition to

hygiene measures, the need for social life, remote working and education introduced by COVID-19 in any period before, during and after the quarantine showed a positive tendency which could also be observed regarding other housing components and time periods of the COVID-19 process. Thus, it can be concluded that even simple interventions made in houses can bring about big changes in the comfort of the user.

• It was observed that the participants needed a designated area for each function during and after the quarantine. It has been understood that increasing the number of rooms does not provide a solution for such a designation because it was noticed that the participants living in houses with a large number of rooms during the COVID-19 period did not have a positive tendency in their views on the physical status of their houses. Therefore, it was understood that instead of houses with larger square meters and more rooms, flexible designs allowing various spatial arrangements and divisions for different functions and usage possibilities are needed.

• Another feature of houses which has differed with the COVID-19 pandemic is the need for social life. Participants stated that they could not enjoy the social activities they performed online at home as much as they did in real social places outside. However, experiencing online activities which are otherwise difficult to reach or go to provided psychological relief in this process.

• It can be suggested that when the pandemic loses its effect and when life returns to normal, participants will not prefer to participate in online events accessible from their homes, and therefore, there will be no significant need emerging in houses. However, meeting the participants' need for a social space has been an addition to houses which were already expected to be safe and peaceful shelters. This indicates that the social life need has integrated with the meaning of the house rather than being just a spatial need. It is now thought houses are meaningful to us to the extent that they perform as new public places.

The results of the research point out that the quarantine experience made the users question their expectations from their houses and their point of views towards them. It is possible to summarise the transformation of the houses and its reflections on their users as follows.

Now, as it shown in Figure 4, houses are expected to,
• be able to intervene by their users easily.
• provide flexible usage
• use for socialization
• have less furniture
• be functional
• to have qualities providing more interaction with the outside world.
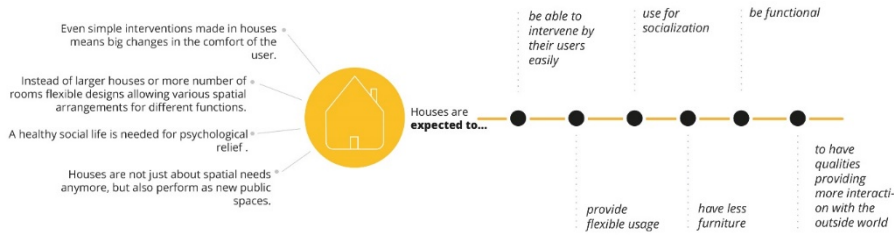
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**Figure 4.** Users' expectations from houses (Drawings by the Authors).

While the results of spatial transformation can be listed as given above, the results and suggestions within the scope of academic studies which focus on the house are as follows.

• This research was carried out in a multi-component city like Istanbul and the expectations of each age group were taken into account as much as possible which offered a general perspective on the subject. It is thought that the research design proposed by this study can be applied to districts of Istanbul and even to districts in other provinces in detail so that more specific data can be provided in the future.

• Besides, the idea that the pandemic will last for many years or that there will be new pandemics reveal the necessity of re-examining the responsibilities of the house. Accordingly, studies on the meaning of houses and how they meet the physical and psycho-social needs gained importance. It has been revealed that it is necessary to carry out further research focusing on developing strategies towards the adaptation of houses during pandemics or similar status.

In conclusion, the effect of the COVID-19 pandemic continues, and it has had various reflections on spaces within houses. In this context, the research design proposed by this study possess the quality of a guiding sample for future scientific studies and the conclusions or findings reached through this study have the potential to lead future house arrangements as well as housing production and design that are crucial in terms of innovative and creative housing designs studied within disciplines such as interior architecture and architecture.

### ACKNOWLEDGEMENTS/NOTES

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