The Effects of COVID-19 and the Environment on the Psychology of Students Working from Home

The World Health Organization declared COVID-19 as a pandemic on March 11, 2021. COVID-19 brought the word 'pandemic' back to the agenda. In fact, mankind has encountered more than one pandemic throughout its history. For example, Malaria, tuberculosis, Spanish Flu, influenza, etc. are the pandemics that mankind has faced. COVID-19 has caused many changes in people's lives. With COVID-19 and its accompanying lockdowns that emerged in 2019 and its limitations made people reconsider their working, social, living environments. Interruptions in many areas of life have led to changes in the work and education environments of people and the transformation of the home environment into an education, working environment. To exemplify, people started doing most of their daily activities at home or arranging their living spaces as working, social, education and working environments. The aim of this study is to investigate, together with their work environment, how students who receive education from home during the COVID-19 process are affected psychologically. In this article, the psychological effects of COVID-19 on students working from home and the effects of their work environment on this situation were investigated by conducting an online survey. In the survey, questions were asked to the students about the indoor parameters of the environment in which they study, and in this context, the different effects of the indoor parameters on the students were examined. The interior design parameters which decrease the negative physiological effects of being at home are investigated, too. Participants participated in this research were composed of people who are continuing their master's degree in architecture and interior architecture departments to obtain more accurate results. As a result of the data which are collected from the survey and the literature review, it can be said that the psychological effect of the COVID-19 process and home education on students varies according to the quality of the work environment. We can say that the indoor quality of the working environment depends on a furniture layout that supports the student's working order, quality air, minimum noise, and good light, especially sunlight. In addition, as a result of the research, it was found that the majority of the participants felt depressed because socialization rates decreased, insufficient air and light quality in the space, and mistakes in furniture placement.

Keywords: COVID-19, lockdown, house, studying, psychological effects, indoor quality

Introduction

As of March 11, 2021, the World Health Organization has declared COVID-19 infectious disease as pandemic. Pandemics have been in mankind’s lives throughout their history. Spanish Flu, Ebola, SARS, MERS, etc. are epidemic that people survived throughout the history. Unfortunately, these diseases are caused a lot of people’s deaths, i.e., 20 million people were died due to influenza in 1919. According to WHO (2011), pandemic is an epidemic which affects all over the World, many people. Mankind has been affected from these diseases throughout their history, including cholera, plague, AIDS,
etc. To demonstrate, 20 million people were dead because of the influenza which occurred between in 1918-1919. Pandemics can be characterized by high velocity of the spread, being infectiousness, being spread by the human interactions (Qiu et al., 2017).

In history, the pandemics are not affected just on individuals, but they are also affecting other fields such as science, design, architecture, interior architecture, and urbanism (Eltarabily et al., 2020). According to Talen (2008), urbanism is defined as a study of the cities which focuses on their geographic, economic, social, culture on the built environment. According to WHO (2020), the quarantine, social distancing and being isolated are the significant ways for decreasing the speed of the spread of pandemics. The social interaction between people should be reduced. From reviewing the background of pandemics, their effects, and results of changing the design of built environment can be seen easily (Eltarabily et al., 2020). For example, the mixed use of drinking water and wastewater caused Cholera (WHO, 2020). As a result of cholera, the Victoria embankment which is located at near of Thames was designed by Sir Joseph Bazalgette. This design provided citizens for reaching clean water supply (Eltarabily et al., 2020). As seen, throughout the history, pandemics and design decisions have been in an interaction.

After the industrial revolution, the population of cities had been enhanced and reached its peak point between 1914. This growth was the reason for dense populations, building tall buildings, creating larger public spaces, etc. Unfortunately, Spanish Flu Pandemic stopped this growth by killing more than 50 million people and had an impact on slowing down in urban design decisions. To demonstrate, the usage of public transportation had decreased whereas walking ratio had increased (Eltarabily et al., 2020). In addition, design parameters in urban scale have been changed according to pandemics effects. To make it clearer, streets were redesigned where another cycling line have been added for creating healthier cities or artificial intelligence have been used in smart cities such as South Korea after the MERS outbreak in 2015 (Eltarabily et al., 2020). According to Constable (2020), the focus point for cities has been associated only with growing in recent years but history shows that this approach should be given up for creating better cities.

Literature Review

Nowadays, mankind is fighting against COVID-19 which is a disease that caused by coronavirus. ‘CO’ represents the corona, ‘VI’ is related with virus and ‘D’ symbolizes diseases (WHO, 2019). According to WHO (2020), the coronavirus is transmitted by the human interactions and contacts and the way for decreasing the speed of the spread is achieved by staying at home, covering mouth and nose with mask, washing hands often and cleaning the surfaces and objects.

Covid19 had frozen most of the industries and their employees are all being affected from it, they should work from their homes (Marimuthu et al.,
According to WHO (2020), self-isolation and quarantine are the key elements for reducing the pandemics spread so industries have adapted themselves into this situation by giving their workers permissions to work from their own working spaces. Working from home is not new topic, but Covid-19 makes it more popular issue (Shareena et al., 2020).

Due to those preventions, World Health Organization declared that people should stay their home, public organizations should be postponed. Accordingly, later restrictions and lockdowns began in many countries. During this period, people had to do all their activities from home. More specifically, most schools and universities around the world have switched to distance education systems.

The constant state of being at home has many physical and psychological effects on people. Physically, the step counts are decreased and the related activities such as walking, running, and exercising are done by less people because of the social distance limitations (Tyson et al., 2020). Decreased physical activity creates negative effects on people and these negative effects can cause health problems. Besides physical negative effects of being at home, also there could be counted many negative psychological effects of being at home that the study mainly focused on.

Working from Home and Pandemics and the Psychological Effects of Being at Home

Working from home has its own pros and cons. For example, it is hard to motivate and monitor a worker’s working performances or spending the time in the same place for a long duration can be boring for workers. On the other hand, studies show that working from home saves time, the productivity is increased, and employees become freer in their personal life (Shareena et al., 2020). Annenberg School for Communication and Journalism (2020) declares that 65% employees who are working from home can adapt their job to this situation and 26% of them can adapt all their works to their homes. The benefits to working from home are flexibility, controlling the environment that away from work politics or being without irritating workmates. The challenges are missing being different places, structure of workplace, personal relationships and having less interaction with other people (Annenberg School for Communication and Journalism, 2020). Before COVID-19, employees did not have that much experience working from home. However, with Covid-19, the transition from home to work has accelerated and the process has been accelerated (Kniffin et al., 2020). According to a study conducted in Australia, it has been revealed that working from home does not negatively affect family relationships. However, having long working hours at home has a negative effect (Dockery & Bawa, 2020).

Other important common psychological reactions in the general population are anxiety, frustration, boredom, uncontrolled fears, loneliness, reintegration problems, etc. as shown in Figure 1) (Wang, Wang, & Yang, 2020). During the lockdown, people stayed at home for a long time and lived a monotonous life.
That is why most people have increased anxiety (Malakar, 2020). Feeling depressed and loneliness, which are directly related to these psychological reactions, were cited as a negative effect on working at home. As understood from the table, because of all these negative effects, subjective wellbeing in houses is getting decreased. However, resilience and social support; generally, provide significant adaptations to new lifestyle could be solutions to increase the level of wellbeing at homes.

**Figure 1. Most Relevant Psychological Reactions to COVID-19 Infection**

During the lockdown period, people and homes have become the only places where people perform activities such as sleeping, eating, working, sports and socializing. This situation has had great effects on people in terms of wellbeing and mental health (Amerio, Brambilla, Morganti, Aguglia, Bianchi, D., Santi, F., ... & Serafini, G. (2020). Covid-19 lockdown: Housing built environment’s effects on mental health. *International journal of environmental research and public health*, 17(16), 5973).

**Psychological Effects of Studying from Home**

Governments have temporarily closed educational institutions to prevent the spread of the epidemic, and this affects more than 60% of the student population in the world (UNESCO, 2020). With the increase of the epidemic...
and the closure of educational institutions, education has begun to continue
from home in many countries. Some technical problems emerged in distance
and online education, such as lack of internet, computers, and electricity. This
situation negatively affects the motivation of the student and even the teachers
and parents (Reimers & Schleicher, 2020).

Loneliness and depression started to increase in students as the education
process was negatively affected and face-to-face relationships decreased (Akat,
2020). At the same time, negative psychological conditions such as anxiety and
fear that affect the well-being of students and their parents arise due to social
distance and restrictions (Özer, 2020).

With the Lockdown decisions, loneliness at home increased between April
and September 2020. Depression and suicidal thoughts are associated with
loneliness. Loneliness has increased with the lockdown and remains a major

Serious quarantine measures have been taken by the government in Italy.
A study was conducted with participants made up of university staff, faculty
members and students in Northern Italy, one of the places most affected by the
pandemic. The questions included socio-demographic features of the
participants; international evaluation scales designed to recognize depressive-,
anxiety and sleep-related symptoms, impulsivity, quality of life; architectural
parameters investigating housing physical characteristics (Amerio et al., 2020).
The analysis revealed that poor housing increased depressive symptoms during
lockdown. Depressive symptoms are seen in those who live in houses smaller
than 60m² with no view. In these cases, it was found that the working
performance of the subjects working from home worsened and the probability
of reporting depression increased 4 times. The findings suggest that during the
covid-19 outbreak, housing significantly affected mental health and well-being.
Living in flats with poor quality view, indoor and smaller than 60 m²,
increases moderate and severe depressive symptoms (Amerio et al., 2020).

Indoor Design Parameters Proposed for Decreasing the Negative
Psychological Effects of Being at Home

Interior environments have a closed contact with the psychology of user in
interiors. Especially, it becomes more significant in the residential spaces due
to its relaxing and private role in people’s life. As stated in the study, pandemic
effects the psychological wellbeing of people in their houses negatively
according to many situations. Also, even minor changes in interior design
parameters cause mental and psychological improvements if they are used
accordingly (Nanda et al, 2010, as cited in Gutkowski et al, 1992). For
example, using visual materials can improve mental health and cause positive
effects on human body (Nanda et al, 2010).

With the COVID-19 pandemic, students continue their education life with
distance education from their homes thanks to online education. The
environmental factors they are in during the study affect the students. Indoor
features of their working areas; Plan layout, acoustics, natural lighting, indoor
weather conditions have an impact on the mental health of people studying. Certain variables such as lighting, ventilation, and noise can create stress under certain conditions, which has a negative effect on productivity (Evans & Cohen, 1987). Students who study at home may experience distraction and stress with unwanted voices created by other family members unconsciously, voices from neighbors. Students who work in an unventilated environment for a long time may feel psychologically constricted. While they have to study constantly in a closed space, they can have air flow and daylight factors thanks to the openings in the area. All these are interior elements that affect student’s psychology. The inadequacy of the physical and social conditions of the space together has much more negative power on the mental health of people than the stress-causing environmental stimuli create separately. Environmental factors that affect the quality of the space also affect the mental status of the students.

Air Quality

Indoor parameters and personal factors can be shown as factors that create indoor air. Indoor parameters: indoor air temperature, average radiant temperature, relative air velocity, air humidity; personal factors are determined as the person's activity level and dressing style (Fanger, 1970). How the individual feel in the environment is an important factor in terms of high productivity when working from home. The air flow created by the openings in the houses can increase the mental production of working people.

Furniture Layout

The layout of the working environment, that is the layout of the furniture, affects the psychological status of the employees. Insufficient and poorly planned personal spaces negatively affect people’s work. When environmental stimuli are excessive, until the cessation of planned ongoing actions; It causes various distractions (Wohlwill, 1974). More boring and gloomy areas may occur in work areas where stimuli, that is, space is emptier. It may cause distraction in areas where furniture and interior items are used excessively. Glare, which is the undesirable negative effect of daylight, can also be prevented by furniture planning. Mousavi et al. (2018), They carried out light measured studies in different study rooms, concluding that the importance of the furniture layout in reducing the interior light level is more logical when it is placed in a way to reduce the depth of daylight by preventing sunlight from reaching. They talked about the importance of furniture layout in providing homogeneity in the distribution of daylight.

Schaap, G. (2020) In a study conducted, it was observed that the amount of occupational inactivity (OSB) increased due to the sedentary and constant presence of the employees who started working from home with the pandemic.
Noise Control

Acoustics, which affect user comfort indoors, also affect the mood of the employee when it cannot be provided in working environments. Annoying sounds that develop out of control while working in the home environment become a distraction in the work environment. Various studies have shown that by controlling the noise in indoor spaces and preventing undesirable sounds, stress on people is reduced, the learning performance of students in educational buildings increases, the productivity of employees in offices is contributed, concentration-attention disorders are reduced (Fleming & Baum & Weiss, 1987). Noise effect on performance is that noise increases arousal and causes distraction (Broadbent, 1953). Noise caused by uncontrollable voices may have psychological effects such as tension, distraction, and decrease in learning efficiency (Kutlu, 2018).

Lighting: Daylight

Daylight is one of the well-known effects of its anti-depression properties, helping the synthesis of vitamin D in the body and energizing the human, stimulating the mind, balancing the biological rhythm by affecting hormones (Russell, 2008). Therefore, it is important to illuminate the area with daylight during long hours spent in the same indoor space while reading from home.

In a 1998 study of 100 workers at a business in Southern Europe, those who worked in places where more employees were exposed to daylight were more comfortable with their jobs and reported being more productive (Leather et al., 1998).

A study conducted by the Design and Environmental Analysis Department at Cornell reported an 84% reduction in symptoms of eye strain, headache, and blurred vision in employees sitting within 10 feet of a window (Kohll, 2019). In these environments where physiological reasons affect the psychology, it is therefore important that the use of daylight is sufficient.

It has been seen in literature reviews that physical environmental conditions have an effect on the psychology of employees. Although the studies were carried out on working people, it was also associated with studying from home, which is the subject of this paper. Physical conditions have the same effect on student’s motivation and psychology to work.

Methodology

The methodology of the study included literature review, face-to-face questionnaires that were conducted with 13 participants who were graduated from Yasar University in Izmir. It aims to understand the effects of COVID-19 on students and their working environments at homes. Firstly, this questionnaire is asking to evaluate their current working environments with 12 questions to evaluate the current and desired working environments and the factors of feeling depressed are tried to be examined from their answers. The
questions asked to the participants are mainly related to indoor parameters and how they make them feel. Participants were asked what they felt in their work environment, what they were satisfied/dissatisfied with and what kind of changes they made.

**Results and Discussions**

The study participants consisted of 13 people, and they are dominantly female (90%), young adult between 18-25 (100%) that are graduate students at Yasar University. The findings were revealed according to parameters. In the context of the questionnaire, participants were asked about the working environments at their houses. According to the results, during this pandemic duration, 84.6% of participants are using their bedrooms whereas the percentage of the working room and living room are same (7.7%) (Figure 2).

To evaluate the general satisfaction in the working environments in houses of participants, the satisfaction levels were asked. According to the results, it is seen that 100% participants evaluated some of the elements as disturbing in their working spaces. Moreover, 23% of the participants are not satisfied from their working spaces in terms of having lack social environments, whereas the percentage of the satisfied participants is same (23%).

**Figure 2. The Graphic of the Working Spaces at Home During COVID-19 Pandemic**

Related with the aim and the scope of the study, questions of the questionnaire were divided into 4 parts: air quality, daylight, noise control, furniture layout. The mainly focus of the questions is to evaluate the satisfaction of the interior parameter asked for.
According to the results, the percentage of the participants who are satisfied from their air quality is 7.7% and the ratio of unsatisfied participants is over the average (92.7%).

For evaluating the satisfaction of daylight, they were asked to answer if the ratio of the daylight is enough for working duration and it was seen that over the half of the participants were satisfied from their daylight amounts (84.7%).

For evaluating the appropriateness of furniture layout, the orientation of the furniture was asked, and about 70% of the participants are satisfied from the layout of them, while 30% of them are not. Additionally, it was asked whether they require any change of the furniture layout during the pandemic process, and it was seen that most of the participants changed their desks’ orientation when they felt depressed and about 7.5% of participants are changed nothing during this COVID-19 pandemic.

As a general and last question, whether there is any attempt that enhances their mood in the house or not was asked. According to the results, 23% of the participants prefer to work in another room which is specialized only for studying, 30% of participants preferred to change just their furniture orientations in existing work environment.

Indoor parameters created by the working environment affect how employees feel and the reflection of their productivity on their performance. By the changes in pandemic process, the working environments were carried from offices, schools to houses. Thus, the indoor parameters in our houses are become having more critical role on the psychological entity of people and effect their performance relatedly. Among other employees, students are one of the effected group in this process. The negative effects of indoor environmental factors on students who study from home cause them to feel psychologically depressed and their productivity to decrease. With the pandemic situation, studying from home period has begun for universities. It is clear that studying from house is negatively affect students.

Also, according to the data obtained in the survey, students' psychology is negatively affected when they study from home, and this negativity and its reasons are in parallel with the data in the literature research.

When studying from home, it is important that students feel ready and focused during their study or lesson. However, as clearly stated in the study, the students feel depressed due to some of the problems in interiors. The effect of indoor environmental factors mentioned in this article on students overlaps with the answers given in the questionnaire. As revealed from the questionnaire, mostly air quality and then, furniture layout are having effect on that negative situation. Users who do not have a separate room or space as their study area stated that they studied in their bedrooms. This shows that they spend time in the same environment for a long time and the factors that affect the indoor quality negatively affect their psychology. The environments where single work for long hours caused the students not to improve themselves socially and they felt psychologically overwhelmed. The students who interacted with the window or outside stated that they are generally satisfied with the air quality, and it is better to have natural ventilation.
Most of the students have a common opinion on other factors that negatively affect them. Unwanted noise disturbs students while they are in their working environment. Furniture layout has been an element that students can interfere with. By the way, environmental interior parameters and factors are problems that students cannot interfere with. Unwanted sounds, openings that allow the room for connecting with the outside, appear as elements that they cannot control. According to the survey, it was also revealed that students negatively affect their psychology. Indoor comfort parameters, which affect the quality of the interior, affect the psychology of the students who work as more than one factor to a different extent.

Conclusion

Lockdowns have started all over the world after the COVID-19 infectious disease was declared as an epidemic. Since then, many changes have occurred in people's daily lives. One of these changes is the transition to online education. In this article, the working environment of university students studying from home and the psychological effects of these environments on them were investigated. With a literature review, the psychological effects of COVID-19 lockdowns were investigated in the context of home-school students. Students' feeling overwhelmed at home and the factors that may contribute to this were examined. The link between the feelings of students while working at home and the quality of the working environment was investigated. For this, first, interior quality parameters were examined by grouping them as furniture layout, acoustics, air quality and lighting. These parameters have been the main factor in preparing the survey questions. The feelings of students about working from home were examined with indoor quality parameters and it was investigated which situations were disturbing for them. At the same time, how they struggled with this disorder, what kind of changes they made or how they approached this issue, what their thoughts were examined.

It is seen that all of the respondents are mostly affected from the indoor quality parameters in their working area. The data collected as a result of the survey, it is possible to say that there is a strong link between the psychology of the student and the indoor quality in COVID-19 lockdowns. Lockdown's psychological impact on students varies with the quality of the work environment. It can be said that the indoor quality of the working environment depends on a furniture layout that supports the student's working order, quality air, minimum noise and good light, especially sunlight. By opening subheadings to these basic parameters, it is possible to elaborate and research on different student types and needs, and can be explored in this context in future studies.
References


