

**EVALUATION OF REMOTE WORKING IN THE CONTEXT OF OCCUPATIONAL HEALTH AND SAFETY FOR EMPLOYEES IN THE COVID-19 PERIOD****Asst. Prof. Burcu ARISOY (Ph.D.)** **ABSTRACT**

*Due to the COVID-19 pandemic that emerged in 2019, the traditional full-time working model was replaced by alternative working models. The current standard working model -with the progress of COVID-19- was abandoned by companies, and various companies have preferred the remote working model. This study was conducted to highlight the legal gaps concerning occupational health and safety measures in the increasingly prevalent remote working models today. This research was designed as qualitative research. Data were collected by phone calls or Zoom meetings over a semi-structured interview with 20 people working in various sectors and experienced in remote working. The results showed the disadvantages of remote working, such as communication problems arising from the inability to communicate face-to-face and extended working hours. It is recommended that countries adapt their laws considering the effects of remote work, and companies can prefer the hybrid model instead of office work.*

**Keywords:** *Flexible Working, Labor Market, Occupational Health and Safety, Remote Working, Working Life.*

**JEL:** *J00, J28, J81.*

**1. INTRODUCTION**

Since the 1980s, technological advancements, changes in economic and social policies, the proliferation of neo-liberal policies, and the increasing demand for flexibility have led to the emergence of atypical forms of employment, as described in the literature. Consequently, questions have arisen about how occupational health and safety measures should be implemented within this work model.

One of the atypical forms of employment, remote work, has gained even greater prevalence due to the COVID-19 pandemic. The pandemic has had a significant impact on individuals' physical health, necessitating various measures by governments to protect public health. While the measures taken by countries have varied, the most commonly repeated precautions against the pandemic have included the closure of schools, the interruption of all non-essential production and commercial activities, and the

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transformation of the workplace from a physical office space to a virtual environment. Consequently, this has led to the proliferation of work models that rely on technology for their execution. (Vincenzi, 2022).

Although remote work has increased its importance and awareness with the COVID-19 outbreak, it is a concept that has been introduced previously. While interest in working remotely increased in the 1970s, the concept was used to express working remotely from the office via telephone communication in this period. In comparison, the term "workplace revolution" was used to express the concept in the 1980s (Lamond et al., 1997).

After 1980's in response to the ongoing technological transformation in the field of information technology, businesses have started looking for alternative work models in an effort to displace the conventional production and employment models that have long dominated labor markets. Labor markets are socially and economically affected by technological changes in the world. While this change process makes digital technologies important in labor markets, it also forces firms to abandon the traditional production and working models dominating the labor markets, causing firms to compete or disappear. However, widespread digital markets require only an internet connection for individuals and companies to trade goods and services in digital environments, along with non-massive scaling, providing economic opportunities to millions of people who do not live in industrialized countries or even industrial zones (World Bank Group, 2019).

On the other hand, it's critical to acknowledge that not all industries and professions within labor markets may be compatible with alternative work models. Working from home may only be possible in the context of some sectors and jobs in labor markets, which the COVID-19 pandemic process has revealed. Although some work cannot be done at home, it is a fact that the trend towards working from home has accelerated with COVID-19. Considering this situation, employers and employees will most likely adapt to the working-from-home model, and its further spread will be on the agenda (ILO, 2020b). While remote work is predicted to increase in the future, prior to the COVID-19 pandemic, only a fraction of the workforce worked from home occasionally. Indeed, the proportion of remote workers in the European Union (EU) was 10% or less in Denmark, the Netherlands and Sweden, the Czech Republic, Greece, Italy, and Poland. Although the COVID-19 pandemic effect varies in the countries, as a result of the legal measures and the stay-at-home policies implemented by the government, approximately 4 out of 10 employees in Europe have started to work remotely (ILO, 2020a). Similarly, according to EUROSTAT data; the percentage of those working from home was 12.3 (<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20210517-2>). This proportion was 12.8% in 2023, while the proportion of hybrid workers—those who work both in an office setting and remotely—rose to 28.7% (FORBES, 2023).

How remote work affects employees' occupational health and safety is one of the prominent issues that has arisen as a result of the rising popularity of remote work. It is true that there were legal voids surrounding remote work that needed to be filled, particularly during the abrupt shift to remote work brought on by the COVID-19 pandemic, even though the idea is not new in the literature. It is necessary to provide clarifications on a number of remote work-related issues, including working hours, the provision of tools and equipment, occupational health and safety measures, employee expense reimbursement, contract modifications, obstacles to work, and notification procedures in the event of illness or accidents at work (Metin, et al., 2021).

Additionally, initiatives have been made to clarify through research studies both the advantages and disadvantages of working remotely. On this matter, different findings have been made, though. For example, the environment for working from home may improve focus and decrease interruptions, allowing for a better work-life balance and producing favorable psychosocial effects because of the increased flexibility. Conversely, if working hours are too flexible, there may be negative effects on sleep quality, physical and mental health, and work-life balance (Niebuhr, 2022).

This study was conducted to highlight the legal gaps concerning occupational health and safety measures in the increasingly prevalent remote working models today. It also aims to provide recommendations to governments and companies by evaluating the remote working model, which gained significance during the COVID-19 pandemic, within the context of occupational health and safety. Although existing literature includes studies on the advantages and disadvantages of remote work, there has been no direct study on the evaluation of remote work in the context of occupational health and safety in the Turkish labor market. Addressing this gap in the literature and drawing attention to the occupational health and safety issues and necessary precautions in remote work underscores the importance of this study. Based on the experiences of individuals who worked remotely during the COVID-19 period, this study seeks to answer the following questions:

- How is remote work evaluated?
- What are the opinions on remote work?
- What are the problems encountered by remote workers in the context of occupational health and safety?

The theoretical contribution of this study is to fill the gap in the evaluation of remote work in the context of occupational health and safety in the Turkish labor market. Its practical contribution is to draw attention to the legal gaps and illuminate the measures that need to be taken in this context. Additionally, it aims to contribute to the development of a safe organizational culture for organizations and employees.

## **2.LITERATURE REVIEW**

Labor markets are affected by technological developments. Technological developments have emerged in work, how it is done, and the working models (Ulu and Birgün, 2022; Ulu and Birgün, 2024). While working has shifted from home and small workshops to factories with the industrial revolution, working has shifted back to home with technological developments. In the literature, there are forms of work called teleworking, mobile working, virtual working, and working from anywhere, where technological opportunities allow. These ways of working enable workers to do their jobs outside the workplace, with the opportunity to work from various places, with the development of technological knowledge and communication. Remote working, also known as flexible working models, includes working from home, in a support office, at a nearby job center, or outside the office, such as mobile working. In remote work from home, some employees work from home several days a week. Working from home has no legal definition but can often be understood as work done from one's home. Working from home is legally considered remote working. In this form of work, some workers are in business affiliations and those who work independently or on their account. On the other hand, this does not include unpaid family workers, subsistence workers, and domestic and care workers (ILO, 2021a).

In support office work (Satellite Office), one of the other remote working models, employees work in a convenient place for themselves and their customers instead of the traditional office. The company provides office supplies and equipment. A neighborhood work center is similar to support office work. In mobile work, employees frequently use telecommunication equipment on the road, from home, car, plane, or various locations such as hotels and business centers (Ministry of Manpower). Teleworking is yet another type of remote work. It can be defined as doing the work, in whole or in part, at an alternative location other than the default place of work (ILO, 2020d).

Although remote work can be categorized, how definitions may differ from country to country. In addition, the literature needs to define remote work clearly. Despite the increasing importance and awareness of COVID-19, remote work is a concept that has been introduced previously, contrary to popular belief. According to the ILO, telework -also known as remote work- is; work outside the employer's premises utilizing smartphones, tablets, and laptops of information and communication technologies (ILO, 2020c).

Despite the lack of a clear definition, remote work, as it is practiced in the world of employment, has many advantages for both people and businesses. Remote working has some benefits for individuals and organizations. The benefits for individuals can be listed as providing flexibility and independence to a great extent, providing flexibility in fulfilling their responsibilities at home, being included in working life for people with disabilities or those who have health problems, preventing time loss in commuting to work and preventing discomfort that may occur while working at the workplace (Ulu and Şahin, 2020; Ulu and Arısoy, 2022). The benefits of this working style for organizations are reduced

office costs, access to a global talent pool, increased productivity, improved employee loyalty, retention of personnel, and reduced absenteeism (Raffaele et al., 2016). In the context of occupational health and safety research, studies have identified a number of benefits of remote work, such as the reduction of specific environmental hazards present in office settings (e.g., air quality, outdoor noise issues, areas causing concentration difficulties), as well as the mitigation of related commuter discomforts (such as time and stress) (Montreuil et al., 2003).

There are also psychosocial risks associated with remote work in terms of occupational health and safety. While working remotely can improve an employee's well-being, job satisfaction, and organizational commitment, it can also increase stress and fatigue at work and present risks that could jeopardize that commitment. The economic and social context of work, as well as how work is designed, organized, and managed, can all lead to psychosocial risks. These dangers may cause serious problems, such as increased stress levels, and may affect both mental and physical health (European Agency for Safety and Health at Work, 2021).

Similarly, in addition to ergonomic issues, remote work can result in problems with isolation and detachment from coworkers and the organization. Musculoskeletal disorders, eye strain, and improper use of office supplies and furniture are a few examples of these potential problems. On the other hand, remote working brings problems such as isolation and disconnection from teammates and the organization and ergonomic problems (musculoskeletal problems, eyestrain, etc.) resulting from inadequate office equipment and furniture (ILO, 2021b). It can also have potentially harmful effects on physical and mental health. It is even debatable to what extent it helps to draw the boundaries between work and private life (European Agency for Safety and Health at Work, 2021). In the context of occupational health and safety, The problem of recognizing, assessing, and controlling workplace hazards is another issue to be considered in remote working (Kelloway et al., 2021). The employer has the duty to manage risk factors in the area of occupational health and safety management. Monitoring remote work, however, can be difficult and leave room for ambiguity in both real-world applications and legal procedures (Hrast et al., 2022).

### **3. METHODS**

#### **3.1. Research Methodology**

This research was designed as qualitative research. Qualitative research is inductive and often seeks insights and insights in a particular situation. This method; also refers to a set of data collection and analysis techniques that use purposeful sampling and semi-structured, open-ended interviews (Mohajan, 2018).

#### **3.2. Participants**

The participants of the research consist of 20 people working in various branches of the private sector and working remotely, whose roles are experts, managers and similar positions.

### **3.3.Data Collection Tools**

In qualitative research, data is commonly collected through participant observation, in-depth interviews, and focus groups. Participant observation is suitable for collecting data on naturally occurring behavior. In-depth interviews, however, are ideal for collecting data on individuals' personal histories, perspectives, and experiences, especially when investigating sensitive topics. Focus groups effectively uncover data on a group's cultural norms and create broad assessments of issues that concern the cultural groups or subgroups represented (Qualitative Research Methods: A Data Collector's Field Guide). In this study, a semi-structured interview form developed by the researcher per the purpose and sub-objectives of the research was used to collect qualitative data.

### **3.4. Data Collection Process**

After the semi-structured interview form was created on the subject, it was presented to the expert opinion; interviews lasting 30 minutes on average were made with the participants via phone calls or Zoom. There are eight questions in the questionnaire. The research was completed between June and August 2023.

### **3.5. Data Analysis**

The collected data were analyzed using the content analysis method. Content analysis was used because it is an inductive analysis focused on the origins of the investigated phenomenon or event. Content analysis analyzes what is said, written, or recorded. The systematic classification process of coding and identifying themes or patterns is a research method for the subjective interpretation of the content of text data (Parveen et al., 2017).

In content analysis, data obtained through interviews, observations, or documents are analyzed in four stages: (1) coding the data, (2) finding the codes, categories, and themes, (3) organizing the codes, categories, and themes, and (4) defining and interpreting the findings. (Eysenbach and Köhler, 2002). The key to coding is conceptualizing important components of the data (Arik et al., 2016). Coding is based on categorizing the information gathered from interviews, where incidents from the same category are contrasted between groups that are similar and those that are different (Glaser et al., 1987). Coding can be done manually or with the aid of superior software. Transcribing interview notes is the first step in building a text database. The coding process starts after the database is created. Codes are used to uniquely identify expressions within the data, and similar codes are grouped together. Following that, codes are combined into descriptions and themes, which are then interpreted and the data is verified (Creswell et al., 2018)

During the reliability phase of the study, the questions were shared with the experts, and the necessary changes were made and put into practice. In addition, the researchers agreed on coding.

#### 4. RESULTS

In this section, the answers given by the research participants to the questions in the semi-structured interview form are included. Table 1 contains the demographic information of the participants. Accordingly, 70% of the participants work in a local company, while 30% work in an international company. While 60% of the participants have 16 years or more of work experience, 20% have 11-15 years of experience, and 20% have 0-10 years of experience. While 45% of the participants work in a workplace with 1001 or more employees, 35% work with 101-300 employees, and 20% work with 1-100 employees. 15% of the employees are in retail, 15% in consultancy, 10% in pharmaceuticals, 10% in textile, 10% in information technologies, 10% in manufacturing sectors, and the remaining 30% in e-commerce, press, fast-moving consumer goods, advertising, construction, and healthcare sectors.

**Table 1. Demographic Data**

	Demographic Data	Total	
			%
<b>Company Type</b>	Local	14	70
	International	6	30
<b>Experience</b>	0-10 years	4	20
	11-15 years	4	20
	16+ years	12	60
<b>No of employees</b>	1-100	4	20
	101- 1000	7	35
	1001+	9	45
<b>Sector</b>	Retail	3	15
	Consulting	3	15
	Pharmaceuticals	2	10
	Textile	2	10
	IT	2	10
	Manufacturing	2	10
	E-commerce	1	5
	Press	1	5
	Fast-Moving Consumer Goods	1	5
	Advertising	1	5
	Construction	1	5
	Healthcare	1	5

Table 2 summarizes the participant's responses to the interview question, "What are the disadvantages of remote working?" Responses are classified into two categories. In terms of companies, 48% of the participants stated the problems of communication, decreased emotional commitment, technical problems, ensuring employee commitment, lack of teamwork, not taking occupational health and safety measures (OHS), prolongation of work, and decreased efficiency. In terms of participants, they expressed their problems such as prolonged working hours, difficulty in orientation, food problems, lack of work-life balance, loss of motivation, lack of movement, feeling of being controlled, increase in workload, inability to convey their feelings, increase in expenses at home, inability to get the documents, being alone at work, crowded home environment.

**Table 2. Disadvantages of Remote Working**

Category	Theme	Total	
			%
<b>In Terms of Companies</b>	Communication problems	13	48
	Emotional commitment	3	
	Technical problems	2	
	Employee commitment	1	
	Lack of teamwork	1	
	Prolongation of work	1	
	Lack of OHS measures	1	
	Decreased efficiency	1	
<b>In Terms of Participants</b>	Prolonged working hours	5	52
	Difficulty in orientation	4	
	Food	3	
	Lack of work-life balance	2	
	Loss of motivation	2	
	Lack of movement	2	
	Feeling of being controlled	1	
	Increase in workload	1	
	Inability to convey feelings	1	
	Increase in expenses at home	1	
	Inability to reach documents	1	
	Loneliness at work	1	
	Crowded home environment	1	

The responses of some participants to the interview question; "What are the disadvantages of remote working?" are given below with direct quotations;

P2; During the entire time we worked from home, there was a perception that we were not working efficiently.

P3; Since we were working as a team, the synergy and motivation disappeared when we suddenly went home.

P14; The work that can be done in 5 minutes with employees in an office working environment can take longer with working from home.

Table 3 summarizes the participants' responses to the interview question, "What are the advantages of remote working?"



**Table 3. Advantages of Remote Working**

Category	Theme	Total	
			%
In Terms of Companies	Prevention of the loss of time	13	51
	Cost reduction	3	
	Increase in efficiency	3	
	Completion of tasks fastly	2	
	Working without time and place boundaries	1	
In Terms of Participants	Allocate time for oneself	6	49
	Work-life balance	5	
	Freedom of dressing	3	
	Motivating	1	
	Reduction in food cost	1	
	Opportunity to be employed internationally	1	
	Reduction in babysitting cosy	1	
	Ability to define working hours flexibly	1	
Freedom	1		

Responses are classified into 2 categories. Regarding companies, 51% of the participants provided the answers to prevent loss of time, reduce costs, increase efficiency, complete tasks faster, work independently of time and place, and take time for themselves. In terms of employees, 49% of the participants used the expressions of being able to balance work-life, dressing quickly, being motivated, decreasing food costs, employing labor in international markets, not having childcare costs, determining working hours, and freedom.

The responses of some participants to the interview question; "What are the advantages of remote working?" are given below with direct quotations;

P4; Having extra time motivates me; companies that keep it going will be more successful.

P10; Regarding companies, rent, service, etc., provides cost advantages.

P15; I can respond more quickly to the needs of family members.

Table 4 summarizes the participants' responses to the interview question, "What are your predictions for the future of remote working?" and responses are classified into 2 categories. In terms of professions, 42% of the participants used expressions such as; it can be applied in some professions, it cannot be applied in all jobs, it cannot be applied in the health production sector, it can be applied entirely in the call center and IT sector, it will be permanent in the IT sector and call centers. 58% of the participants stated that the hybrid working model will be implemented, remote working will become more widespread, plazas will become empty, and flat offices will increase.

**Table 4. Future of Remote Working**

Category	Theme	Total	
			%
In Terms of Professions	Can be applied in some job-based occupations	8	42
	Not applicable to all jobs	2	
	Not applicable in the healthcare and manufacturing sectors	1	
	It will be permanent in the IT sector	1	
	Fully applicable in the IT and call center sectors	1	
In Terms of Future	Will be hybrid	10	58
	Will be more widespread	5	
	Plazas will become empty	2	
	Flat offices will show an increase	1	

The responses of some participants to the interview question; “What are your predictions for the future of remote working?” are given below with direct quotations;

P1; Teams do not want to do office work every day of the week on a full-time basis.

P6; I can't find staff to do office work every day of the week. Candidates do not prefer such a way of working.

P7; Fully flexible working may not be preferred by the employer.

Table 5 outlines the participant's responses to the interview question, “What are the effects of remote working on working conditions?” and responses are categorized into three groups. In the category of positive effects, 23% of the participants stated that increased motivation, contribution to work-life balance, and reduced workload. In the negative effects category, 68% of the participants stated that the workload and working hours increased, work-life balance was negatively affected, and motivation decreased. In the no effects category, 9% of the participants stated that their work-life balance and workload did not change.

**Table 5. Effects of Remote Working on Working Conditions**

Category	Theme	Total	
			%
Positive Effects	Increase in motivation	6	23
	Contribution to work life balance	2	
	Reduced workload	2	
Negative Effects	Increased workload	13	68
	Increased working hours	10	
	Negatively affected work life balance	5	
	Decrease in motivation	2	
No Effects	No change in work life balance	2	9
	No change in workload	2	

The responses of some participants to the interview question; “What are the effects of remote working on working conditions?” are given below with direct quotations;

P3; Not being able to socialize reduced my motivation.

P8; If I consider a new job, the hybrid model satisfies me in terms of job satisfaction.

P16; There were more working hours while working in the office. Because time is wasted in the office, I can work more focused from home while working remotely.

Table 6 summarizes the participants' responses to the interview question, “How did remote work affect your psychology?” and responses are classified into 2 categories. 11% of the participants stated that it positively affected their psychology in the category of positive effects. 89% of the participants are in the category of negative effects, and they stated that; trying to prove that I work, not being able to socialize, panic, stress, pressure, long working hours, not being able to manage time, focusing problems, work-centered life, exhaustion, lack of communication are the negative effects.

**Table 6. Psychological Effects of Remote Working**

Category	Theme	Total	
			%
Positive Effects	Effectuated positively	3	11
	Trying to prove that I work	5	
Negative Effects	Unable to socialize	5	89
	Panic	3	
	Stress	3	
	Pressure	2	
	Long working hours	1	
	Unable to manage the time	1	
	Lack of focus	1	
	Work-centered life	1	
	Exhaustion	1	
	Lack of communication	1	

The responses of some participants to the interview question; “How did remote work affect your psychology?” are given below with direct quotations;

P1; Everyone initially enjoyed remote work, then it got boring after a while.

P19; I am so worn out. I worked harder at home than at the office.

P20; I am mentally depressed. My whole life has been working.

Table 7 summarizes the participants' responses to the interview question, “What are the occupational health and safety measures taken by your company during the COVID-19 period?” and responses are classified into two categories. In the measures for office workers category, 44% of the participants stated that the office environment was suitable for COVID-19 measures, a hygiene kit was provided, an information e-mail was sent, and a COVID-19 test was applied in the recruitment process. On the other hand, 56% of the participants stated that no measures were taken, food aid was provided, and an additional budget was provided for those working at home.

**Table 7. Occupational Health and Safety Measures**

Category	Theme	Total	
			%
For Office Workers	Office arrangement in accordance with COVID-19 measures	7	44
	Hygiene kit	2	
	Information e mail	1	
	COVID-19 test in recruitment	1	
For Remote Workers	No measures	9	56
	Additional budget	4	
	Food aid	1	

The responses of some participants to the interview question; “What are the occupational health and safety measures taken by your company during the COVID-19 period?” are given below with direct quotations;

P4; In order to provide ergonomics at home, around 5,000€ additional budget payments were made.

P5; The ergonomics budget was paid for us to buy a table, chair, etc.

P11; Our company paid an extra €200 in salary.

Table 8 summarizes the participants' responses to the interview question, “Can you compare the environment you use to work remotely with your workplace in terms of ergonomic conditions?” and responses are classified into 2 categories. Regarding noise, ventilation, lighting, office equipment, and temperature conditions, 55% of the participants stated that the office environment is more ergonomic. On the other hand, 45% of the participants stated that the home environment is more ergonomic.

**Table 8. Ergonomic Conditions**

Category	Theme	Total	
			%
Office	Office is more ergonomic	11	55
Home	Home is more ergonomic	9	45

The responses of some participants to the interview question; “Can you compare the environment you use to work remotely with your workplace in terms of ergonomic conditions?” are given below with direct quotations;

P2; I provided ergonomic conditions at home by myself.

P15; Since we work in an open office, I had the opportunity to work at home in a more quiet environment.

P17; Working in the office is more ergonomic; I am disturbed while working at home.

Table 9 summarizes the participants' responses to the interview question, “Did you experience any problems in terms of occupational health and safety during remote work?” and responses are grouped into 3 categories. In terms of occupational, 59% of the participants stated that there were no occupational accidents during remote working. Regarding physical disorders, 38% of the participants stated; waist-neck-back pain, eye diseases, nodule formation, wrist pain. Additionally, regarding psychological disorders, 5% of the participants stated that they experienced psychological pressure.

**Table 9. Occupational Health and Safety Problems**

Category	Theme	Total	
			%
Work accident	No work accident	20	59
	Waist, neck and back pain	9	
	Eye problems	2	38
Physical disorders	Nodule formation	1	
	Wrist pain	1	
Psychological disorders	Psychological pressure	1	3

The responses of some participants to the interview question; “Did you experience any problems in terms of occupational health and safety during remote work?” are given below with direct quotations;

P4; Low back and neck pain due to uninterrupted long working hours and inactivity in addition to non-ergonomic equipment.

P11; I worked under a psychologically pressurized environment, my workload increased, and I had no concept of working hours.

P20; Back and neck pain increased due to constant computer use, and skin diseases occurred on the skin because I could not get enough sunlight.

## 5. DISCUSSION

Although it is a matter of debate how widespread teleworking will become in labor markets and in which jobs, the importance of remote working in labor markets has increased with the COVID-19 process. On the other hand, working remotely has some consequences for employers and employees. Participants in the research generally identified the difficulties of remote work as communication problems, extended working hours, issues of commitment and adaptation, increased workload, isolation, and inadequate occupational health and safety measures. Conversely, participants highlighted the advantages of remote work as the prevention of time loss, cost savings, increased productivity, the ability to allocate time to oneself, and the establishment of a work-life balance. Similar results were found in a study conducted by Ipsen et al. (2021), which identified the advantages of remote work as the establishment of a work-life balance, increased productivity, and enhanced job control, while the disadvantages included home-office restrictions, job uncertainties, and insufficient tools. Another study investigating the advantages and disadvantages of remote working, time spent on the way to work and

travel expenses, and the opportunity to organize their working hours independently are seen as the advantage of working remotely. On the other hand, employees who do not have children stated the opportunity to determine their working time and organize their work independently compared to those who work at home with children or at the office, as well as the advantages of working remotely. The disadvantages are; monotonous place, lack of work and life balance, lack of face-to-face communication, lack of motivating working environment, and compulsory work in the evenings (Simenenko et al., 2021). It has been determined that this study is consistent with the findings of the previous researchers mentioned above in terms of factors such as loss of motivation, work-life balance, and working hours.

Lack of collaborative organizational culture, problems in the adaptation of management and employees, distrust of employee performance and failure to review results, preference of office workers at the expense of remote workers, the requirement for ink signature of documents, and problems with the handling of physical objects, deficiencies in the Labor Code, lack of motivation to work and procrastination of work duties, very long working hours and excessive workload, increased costs of housekeeping, lack of personal contact with colleagues and a feeling of loneliness in an isolated environment, a sense of insecurity by the manager regarding the employee's adequate performance and concerns about promotion, pay raises or salary bonuses, inability to separate personal and work life, confusion and disorder, lack of workspace, lack of understanding from one's family are the results found in yet another study (Navrátil et al., 2017). In this context, the results obtained are similar.

Participants expressed that remote work is generally applicable to some professions but not others and that hybrid work models will be implemented and become more widespread in the future. According to the Economic Forum report, working models shaped by technological developments and the digital revolution over the past 20 years have increasingly transformed into new remote hybrid working models due to the pandemic. It is predicted that digital jobs that can be performed remotely will increase by 2030 (World Economic Forum, 2024).

Participants indicated that the effects of remote work on working conditions included increased motivation, a better work-life balance, and decreased workload, while also noting that the workload and working hours increased, motivation decreased, and the work-life balance was negatively affected. Similarly, a study by Eurofound found that the working hours of remote workers increased, but the work-life balance was positively affected (Eurofound, 2023).

Participants reported the psychological effects of remote work as performance pressure, stress, panic, long working hours, focus and time management issues, burnout, and a work-centered life. Similarly, another study identified the difficulties of working remotely as workaholism or domestic violence, disruptions at work as a result of poor communication, future concerns of employees, psychological disorders such as sleep problems, depression, technical problems experienced, or more workload due to lack of communication (Kučera et al., 2022). Furthermore, it has been observed that

remote workers frequently experience high levels of time pressure, increased workloads, constant oversight and monitoring, and challenges with taking breaks. (Franca,et., 2023) In another study, as psychological problems, loneliness, and lack of face-to-face discussion and informal meetings were noted, key factors such as lack of physical activity, childcare difficulties, and workload management were identified as difficulties in working remotely. (Al-Habaibeh et al., 2020). On the other hand, there is debate in the literature about the effects of remote work on both physical and psychological health. The limited research that is currently available suggests that working remotely can have positive health effects, such as lowered blood pressure and lowered health risks (Beckel et al., 2022).

Another issue that has become important with the widespread implementation of remote work is occupational health and safety measures for the employee and employer while performing remote work. Participants generally stated that no measures were taken by employers at home regarding occupational health and safety, while the office environment was adapted to COVID-19 conditions. Some participants additionally mentioned that employers provided assistance to those working from home during the COVID-19 period. According to the research done by McCrindle, while working remotely, 75% of the participants reported that they encountered some workplace health and safety issues. In contrast, the other participants stated that there is a lack of ergonomics in the home environment, they feel responsible for occupational health and safety measures, the problem of not being able to take a break from work, insufficient working space at home (McCrindle Research, 2018). Another study can be evaluated in terms of the occupational health and safety results of teleworking, the lack of interaction between the employees, the inadequacy of the adequate technical system at home, the need to fulfill the chores at home at the same time while working, the absence of separation between work and life, home accidents and adverse effects on relations between family members. It has been determined that psychological pressures arise with individual problems, such as staying away from social environments, being constantly disturbed by the employer for control purposes, and being controlled negatively affecting employee productivity. At the same time, not providing the necessary ergonomic conditions in the home environment causes various health problems, including musculoskeletal problems, and reduces working efficiency (Arat et al., 2022).

Participants identified the occupational health and safety issues of remote work as back, neck, and shoulder pain, eye diseases, nodule formation, wrist pain, and psychological disorders, while also stating that there were no work accidents at home during remote work. In terms of health and safety, the participants expressed similar statements. Additionally, numerous studies have linked remote work to conditions like attention deficit disorders, sleep disorders, headaches, gastrointestinal problems, excessive weight gain, cardiovascular problems, and musculoskeletal conditions, particularly pain in the neck and shoulders (Zalat et al., 2022). Unsuitable workspace ergonomics, sedentary behavior, and psychosocial and organizational factors all play significant roles in the development or exacerbation of work-related musculoskeletal disorders, according to another study (Milaković et al., 2023). As a result,

it is crucial for businesses to reduce the occupational health and safety concerns related to working remotely. Managers need to have a solid understanding of the rules and specifications contained in occupational health and safety, particularly with regard to general risk and workplace management. The following categories can be used to group the main dangers of working remotely: work environment, tools, solitary work, physical and mental health, and response to emergencies and natural catastrophes (New Zealand Government, 2021). In terms of occupational health and safety, companies need to reduce the risk of working remotely. In this context, they must develop and adapt a safe culture to their employees. At the same time, they should be aware of the negative effects and risks of working remotely and make arrangements to minimize them. Rather than focusing on less productivity, more absenteeism, more burnout, and more turnover, firms should emphasize effective collaboration, employee participation in decisions, and policies that increase income levels (PWC, 2020). At the same time, companies can achieve employee productivity by applying remote working models with less intervention and pressure on employees, flexibility-based personal and professional development and improvement are encouraged, and work-life balance is established (Tremblay et al., 2012).

It should be kept in mind that remote work can benefit an employee's mental health, social wellbeing, and physical attributes if it is planned and supported properly. But when employees are unable to make healthy decisions while working remotely and the health and safety hazards of remote work are not considered, such activities can have serious repercussions and have a negative impact on health (ILO, 2021c).

## **6.CONCLUSIONS**

In this study, the effects of remote working on employees were examined. As a result of the study, communication problems arising from the inability to communicate face-to-face and the prolongation of working hours were determined as the primary drawbacks. Significantly the increase in working hours and workload is among the benefits of remote working. On the other hand, the opportunity for employees to spare time for themselves has been determined as the advantage of working remotely. Although remote work will not be applicable in all professions and sectors, the hybrid model will be more applicable instead of full-time and everyday office work. In addition, it has been determined that the remote working model creates psychological pressure on the employees because they must prove that they are working on the task.

In the context of occupational health and safety, it has been observed that the participants did not face any occupational accidents during remote working. However, long working hours can cause musculoskeletal disorders in employees. It has also been determined that the office environment is more ergonomic regarding its conditions. In addition, it has been seen that working in the home environment is spatially and consciously not suitable enough to work. It can also be said that employees have difficulty establishing a work-life balance while working from home and expressing this to their family



members during working hours. According to the organizational structures of the companies, it is seen that the opportunities given to remote workers in the context of occupational health and safety also change. While international companies allocate additional allowances for occupational health and safety for their employees working from home during the COVID-19 period in the context of occupational health and safety, such an allowance has yet to be found in local companies.

Identifying risk factors that can lead to musculoskeletal discomfort, which is the most commonly encountered issue in remote work, can be of significant importance. Additionally, ensuring that remote workers have comfortable positions, the ability to change their position and move, providing adequate workspace with sufficient lighting, thermal comfort, and low noise levels, arranging for proper placement of air conditioning equipment, ensuring that remote workers' work furniture is ergonomically designed and providing them with ergonomic training, organizing the workspace for a comfortable, neutral working posture, incorporating breaks for long working hours, establishing mutually agreed-upon job descriptions by both managers and remote workers, and considering rotation, job enrichment, or job expansion to prevent monotony are all recommended measures to address these issues (OSHWIKI, 2022, p.1)

## REFERENCES

- Al-Habaibeh, A., Watkins, M., Waried, K. and Javareshk, M.B. (2020) “Challenges and Opportunities of Remotely Working from Home During COVID-19 Pandemic”, *Global Transitions*, 3: 99-108. <https://www.sciencedirect.com/science/article/pii/S2589791821000165> (21.06.2022).
- Arat, Y. and Gül, H. (2022) “Pandemi Sonrası Ofis Planlamasında Ergonomik Tasarım Önerileri”, *Ergonomi*, 5(1): 26-42. <https://dergipark.org.tr/tr/download/article-file/2022971>(21.06.2022)
- Arık, F. and Arık, I. A. (2016) “Ground Teorisi Metodolojisi Ve Türkiye’deki Groundend Teori Çalışmaları”, *Akademik Bakış Dergisi*, 58, 285:309, ISSN:1694-528X.
- Beckel, L. J. and Fisher, G. G. (2022) “Telework and Worker Health and Well-Being: A Review and Recommendations for Research and Practice” *Int J Environ Res Public Health*, 24;19(7):3879. Doi: 10.3390/ijerph19073879.
- Creswell, J. W. and Creswell J.D. (2018) “Fifth Edition Research Design Qualitative, Quantitative, and Mixed Methods Approaches” London, Sage.
- European Agency for Safety and Health at Work (2021) “Home-Based Teleworking and Preventive Occupational Safety and Health Measures in European Workplaces: Evidence from ESENER-3”, ISSN: 1831-9343, [https://osha.europa.eu/sites/default/files/2021-11/Home\\_Based\\_TW\\_OSH\\_Preventive\\_Measures\\_Evidence\\_ESENER\\_3.Pdf](https://osha.europa.eu/sites/default/files/2021-11/Home_Based_TW_OSH_Preventive_Measures_Evidence_ESENER_3.Pdf)(19.05.2022).

- Eurofound. (2023) “Hybrid Work in Europe: Concept and Practice”  
<https://www.eurofound.europa.eu/system/files/2023-05/ef22011en.pdf>(21.06.2024).
- Eurostat. (2021) <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20210517-2>(21.06.2024).
- Eysenbach, G. and Köhler, C. (2002) “How Do Consumers Search for and Appraise Health Information on the World Wide Web? Qualitative Study Using Focus Groups, Usability Tests, and in- Depth Interviews”. *Bmj*, 324 (7337), 573-577. <https://doi.org/10.1136/bmj.324.7337.573>(22.06.2022)
- FORBES. (2023) “Remote Work Statistics and Trends in 2023”,  
<https://www.forbes.com/advisor/business/remote-work-statistics/>, (02.09.2023).
- Franca, V. and Muren, V. D. (2023) “Working from Home During The COVID-19 Pandemic: Lessons on Well-Being, Work-Life Balance, and Health” *Sosyal Siyaset Konferansları Dergisi / Journal Of Social Policy Conferences JSPC 2023*, 84, 1–14, Doi: 10.26650/Jspc.2023.84.1207474.
- Glaser, B. G. and Strauss, A. L. (1967) “The Discovery of Grounded Theory Strategies for Qualitative Research”,  
[http://www.sxf.uevora.pt/content/uploads/2013/03/Glaser\\_1967.pdf](http://www.sxf.uevora.pt/content/uploads/2013/03/Glaser_1967.pdf)(15.09.2023)
- Hrast, N. and ŽIŽEK, S. (2022) “Health and Safety at Work in Times of Remote Work”, ISBN 978-961-286-600-6. Doi <https://doi.org/10.18690/um.epf.5.2022.46>.
- ILO. (2020a) “Teleworking During the COVID-19 Pandemic and Beyond A Practical Guide”, ISBN 978-92-2-032405-9, [https://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---travail/documents/instructionalmaterial/wcms\\_751232.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/instructionalmaterial/wcms_751232.pdf) (14.05.2022).
- ILO. (2020b) “An Employers’ Guide on Working from Home in Response to the Outbreak of COVID-19”,  
[https://www.ilo.org/wcmsp5/groups/public/---ed\\_dialogue/---act\\_emp/documents/publication/wcms\\_745024.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_745024.pdf), ISBN 9789220322536 (19.05.2022).
- ILO. (2020c) “Telework”, [https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-budapest/documents/genericdocument/wcms\\_753334.pdf](https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-budapest/documents/genericdocument/wcms_753334.pdf),(21.05.2022).
- ILO. (2020d) “Defining and Measuring Remote Work, Telework, Work at Home and Home-Based Work”,  
[https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms\\_747075.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/publication/wcms_747075.pdf),(22.06.2022).
- ILO. (2021a) “Working from Home from Invisibility to Decent Work”, ISBN 978-92-2-033709-7  
[https://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---travail/documents/publication/wcms\\_765806.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_765806.pdf),(22.06.2022).
- ILO. (2021b) “Teleworking Arrangements During the COVID-19 Crisis and Beyond”,  
[https://www.ilo.org/wcmsp5/groups/public/---dgreports/---ddg\\_p/documents/publication/wcms\\_791858.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---ddg_p/documents/publication/wcms_791858.pdf), (23.05.2022).

- ILO. (2021c) “Healthy and Safe Teleworktelework”, [https://www.ilo.org/wcmsp5/groups/public/---ed\\_dialogue/---lab\\_admin/documents/publication/wcms\\_836250.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---lab_admin/documents/publication/wcms_836250.pdf), (23.09.2023).
- ILO. (2021a) “Working from Home from Invisibility to Decent Work”, ISBN 978-92-2-033709-7 [https://www.ilo.org/wcmsp5/groups/public/---ed\\_protect/---protrav/---travail/documents/publication/wcms\\_765806.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_765806.pdf),(22.06.2022).
- Ipsen, C. Veldhoven, M. V. Kirchner, K. and Hansen, P. J. (2021) “Six Key Advantages and Disadvantages of Working from Home in Europe During COVID-19”, *International Journal of Environmental Research and Public Health*, 18: 1826. [https://www.researchgate.net/publication/349279803\\_Six\\_Key\\_Advantages\\_And\\_Disadvantages\\_Of\\_Working\\_From\\_Home\\_In\\_Europe\\_During\\_COVID-19](https://www.researchgate.net/publication/349279803_Six_Key_Advantages_And_Disadvantages_Of_Working_From_Home_In_Europe_During_COVID-19) (20.06.2022).
- Kelloway, E.K. Francis, L. Gatién, B. and Belcourt, M. (2021) “Management of Occupational Health and Safety”, Eighth Edition, London, Nelson,.
- Kučera, J. Krulický, T. and Navrátilová, P. (2022) “The Trend of Work from Home and Its Advantages and Disadvantages During the COVID-19 Pandemic: A Comparative Study”, *Journal of Interdisciplinary Research*, 145-150. [http://www.magnanimitas.cz/ADALTA/1102/Papers/A\\_Kucera.pdf](http://www.magnanimitas.cz/ADALTA/1102/Papers/A_Kucera.pdf) (21.06.2022).
- Lamond, D. Daniels, K. and Standen, P. (1997) “Defining Telework:What Is It Exactly”, [https://www.academia.edu/20588605/Defining\\_Telework\\_What\\_Is\\_It\\_Exactly#:~:text=For%20example%2C%20Grant%20\(1985%3A,Away%20from%20the%20central%20office%E2%80%9D](https://www.academia.edu/20588605/Defining_Telework_What_Is_It_Exactly#:~:text=For%20example%2C%20Grant%20(1985%3A,Away%20from%20the%20central%20office%E2%80%9D) (22.05.2022).
- Ministry of Manpower. “Flexible Work Arrangements - Singapore - Ministry of Manpower”. <https://www.mom.gov.sg/-/media/mom/documents/employment-practices/flexible-work-arrangements.pdf> (31.05.2022).
- Mccrindle Research. (2018) “Working From Home:The Benefits and the Cost” [https://mccrindle.com.au/wp-content/uploads/2018/04/Working-From-Home\\_The-Benefits-And-The-Cost\\_Mccrindle-Research.pdf](https://mccrindle.com.au/wp-content/uploads/2018/04/Working-From-Home_The-Benefits-And-The-Cost_Mccrindle-Research.pdf) (20.06.2022).
- Metin, G. Z. and Yıldız, N. C. (2021) “ İş Sağlığı ve Güvenliği Boyutuyla Uzaktan Çalışma”. <https://www.turkis.org.tr/storage/2021/10/i4hl0v1tnpt-pdf.pdf> (23.09.2023).
- Milaković, M. Koren, H. Bradvica-Kelava, K. Bubaš, M. Nakić, J. Jeličić, P. Bucić, L. Bekavac, B. Čvrlić, J. and Capak, M. (2023) “Telework-Related Risk Factors For Musculoskeletal Disorders.” *Front Public Health*. 2023 (3), 11:1155745. Doi: 10.3389/fpubh.2023.1155745. Ecollection 2023.

- Mohan, H. (2018) “Qualitative Research Methodology in Social Sciences and Related Subjects”, MPRA Paper No. 85654, [https://Mpra.Ub.Uni-Muenchen.De/85654/1/MPRA\\_Paper\\_85654.Pdf](https://Mpra.Ub.Uni-Muenchen.De/85654/1/MPRA_Paper_85654.Pdf) (20.06.2022)
- Montreuil, S. and Lippel, K. (2003) “Telework and Occupational Health: A Quebec Empirical Study and Regulatory Implications”, *Safety Science*, 41(4):339-358, DOI: 10.1016/S0925-7535(02)00042-5
- Navrátil, M. Hladká, M. Dušánek, D. and Duspivová, K. (2017) “Remote Work Problems and Their Solution For Employees”, [https://İpodpora.Odbory.İnfo/Soubory/Dms/Wysiwyg\\_Uploads/Bba5a5c7366cdaf3/Uploads/4\\_REMOTE\\_WORK\\_PROBLEMS\\_2017.Pdf](https://İpodpora.Odbory.İnfo/Soubory/Dms/Wysiwyg_Uploads/Bba5a5c7366cdaf3/Uploads/4_REMOTE_WORK_PROBLEMS_2017.Pdf) (21.06.2022).
- New Zealand Government. (2017) “Good Practice Guide Remote Working”, <https://Www.Healthandsafety.Govt.Nz/Assets/Uploads/Good-Practice-Guide-Remote-Working.Pdf> (20.09.2023).
- Niebuhr, F., Borle, P., Börner-Zobel, F. U., and Volter-Malknecht, S. (2022) “Healthy and Happy Working from Home? Effects of Working from Home on Employee Health and Job Satisfaction”, *Int. J. Environ. Res. Public Health* 2022, 19, 1122. <https://Doi.Org/10.3390/İjerp19031122>
- OSHWIKI. (2022) “Practical Tips To Make Home-Based Telework as Healthy, Safe and Effectivpossible” <https://Oshwiki.Osha.Europa.Eu/En/Themes/Practical-Tips-Make-Home-Based-Telework-Healthy-Safe-And-Effective-Possible> (22.09.2023).
- Qualitative Research Methods: A Data Collector’s Field Guide, <https://Course.Ccs.Neu.Edu/İs4800sp12/Resources/Qualmethods.Pdf> (22.06.2022).
- Parveen, H. and Showkat N. (2017) “Content Analysis”, [https://Www.Researchgate.Net/Publication/318815342\\_Content\\_Analysis#:~:Text=The%20analysis%20of%20what%20is,Hsieh%20%26%20Shannon%2C%202005](https://Www.Researchgate.Net/Publication/318815342_Content_Analysis#:~:Text=The%20analysis%20of%20what%20is,Hsieh%20%26%20Shannon%2C%202005) (20.06.2022).
- PWC. (2020) “The Costs and Benefits of Working from Home, Part II The Impact of Working from Home on Innovation, People Engagement and Well-Being”, <https://Www.Pwc.Nl/Nl/Actueel-Publicaties/Assets/Pdfs/Pwc-Working-From-Home-Part-II.Pdf> (21.06.2022).
- Raffaele, C. and Connell, J. (2016) “Flexible Work Organizations, The Challenges of Capacity Building in Asia”, Springer.
- Simenenko, O. and Lentjushenkova, O. (2021) “Advantages and Disadvantages of Distance Working”, *Perspectives of Business and Entrepreneurship Development: Digital Transformation for Business Model Innovationat: Brno University of Technology, Faculty of Business and Management*,

- [https://www.researchgate.net/publication/357484444\\_advantages\\_and\\_disadvantages\\_of\\_distance\\_working](https://www.researchgate.net/publication/357484444_advantages_and_disadvantages_of_distance_working) (20.06.2022)
- Tuna, A. A. and Türkmendağ, Z. (2020) “COVID-19 Pandemi Döneminde Uzaktan Çalışma Uygulamaları ve Çalışma Motivasyonunu Etkileyen Faktörler”, *İşletme Araştırmaları Dergisi*, 12 (3), 3246-3260. [https://www.issarders.org/2020/vol.12\\_issue.3\\_article68.pdf](https://www.issarders.org/2020/vol.12_issue.3_article68.pdf) (21.06.2022).
- Tremblay, D-G. and Thomsin, L. (2012) “Telework and Mobile Working: Analysis of Its Benefits and Drawbacks”, *Int. J. Work Innovation*, Vol. 1, No. 1, <https://core.ac.uk/download/pdf/35146847.pdf> (21.06.2022).
- World Bank Group. (2019) “The Changing Nature of Work”, <https://documents1.worldbank.org/curated/en/816281518818814423/pdf/2019-WDR-Report.pdf> (31.05.2022).
- World Economic Forum. (2024). “The Rise of Global Digital Jobs”, [https://www3.weforum.org/docs/WEF\\_The\\_Rise\\_Of\\_Global\\_Digital\\_Jobs\\_2024.pdf](https://www3.weforum.org/docs/WEF_The_Rise_Of_Global_Digital_Jobs_2024.pdf) (20.06.2024).
- Ulu, M. and Birgün, S. (2022) “A New Model Proposal for Occupational Health and Safety”. In: Durakbasa, N. M. Gençyılmaz, M.G. (Eds) *Digitizing Production Systems. Lecture Notes in Mechanical Engineering*. Springer, Cham. [https://doi.org/10.1007/978-3-030-90421-0\\_29](https://doi.org/10.1007/978-3-030-90421-0_29)
- Ulu, M. and Birgün, S. (2024) “A Case Study on Lean Occupational Safety”. *Sigma Journal of Engineering and Natural Sciences*, Vol. 42, No. 3, <https://doi.org/10.14744/sigma.2022.00108>.
- Ulu, M. and Şahin, H. (2020) “Hata Türü ve Etkileri Analizi Tekniği ile Bir Mühendislik Fakültesinde Risk Değerlendirmesi”. *Electronic Letters on Science And Engineering*, 16(2), 63-76.
- Ulu, M. and Arısoy, B. (2022) “İş Sağlığı ve Güvenliği Açısından Özel Politika Gerektiren Çalışanların Değerlendirilmesi”. *Sağlık ve Sosyal Refah Araştırmaları Dergisi*, 4(1), 113-125.
- Vincenzi, C.D.,Panzini, M., Ferrara,B., Buonomo, I. and Benevene, P. (2022) “Consequences of COVID-19 on Employees in Remote Working Challenges, Risks and Opportunities An Evidence-Based Literature Review”. *Int. J. Environ. Res.*, 19 (11672), <https://doi.org/10.3390/ijerph191811672>
- Zalat, M. and Bolbol S. (2022) “Telework Benefits and Associated Health Problems During the Long COVID-19 Era”, *Work* 71 (2022), 371–378, DOI:10.3233/WOR-210691.

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