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YEDİTEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION

**INVESTIGATION OF PHYSICAL ACTIVITY,
FATIGUE SEVERITY, FEAR OF COVID-19, AND
COVID-19 AWARENESS LEVELS ACCORDING TO
THE STATUS OF DIAGNOSIS COVID-19 DURING
THE PANDEMIC.**

MASTERS THESIS

ELİF İREM GÜRGAN, PT

ISTANBUL 2023

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ISTANBUL 2023

THESIS APPROVAL FORM

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This study have approved as a Master Thesis in regard to content and quality by the Jury.

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APPROVAL

This thesis has been deemed by the jury in accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated and numbered

Prof. Dr. Bayram YILMAZ
Director of Institute of Health Sciences

DECLARATION

This thesis, to the best of my knowledge and belief, does not contain any content that has been published or written by someone else and has been approved for the award of any other degree. The only exceptions to this are passages where appropriate textual references have been made.

ELİF İREM GÜRGAN

DEDICATION

I wanted to dedicate my thesis to my lovely parents' full support through my degree.

ELİF İREM GÜRGAN



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LIST OF SYMBOLS AND ABBREVIATIONS

American Psychological Association (APA)
Coronavirus 19 (COVID-19)
COVID-19 Awareness Scale (CAS)
Fatigue Severity Scale (FSS)
Fear of COVID-19 Scale (FCS)
International Physical Activity Questionnaire (IPAQ)
Moderate Intensity Activities (MIA)
Percent %
Physical Activity (PA)
Vigorous Intensity Activities (VIA)
World Health Organization (WHO)

ABSTRACT

Gürkan, E.İ (2023) Investigation Of Physical Activity, Fatigue Severity, Fear Of COVID-19, And COVID-19 Awareness Levels According To The Status Of Diagnosis COVID-19 During The Pandemic. Yeditepe University, Institute of Health Science, Department of Physiotherapy and Rehabilitation, MSc thesis, Istanbul.

Our study aimed to evaluate the differences between physical activity, fatigue severity, fear of COVID-19 and COVID-19 awareness levels according to status of COVID-19 during the pandemic. The study consists of 500 participants and participants were divided into two as a “Group 1” for those diagnosed with COVID-19 and “Control Group” for those who had never been diagnosed with COVID-19. The demographic info of the participants examined with demographic information form. The average age of participants was 28.82 and the standard deviation was $\pm 11,35$. The average height of participants 170,45 cm and standard deviation $\pm 7,91$. The average weight was 73.52 and standard deviation was $\pm 12,47$. To assess the Physical Activity, “International Physical Activity Questionnaire Short Form (IPAQ-SF)” was used. The fatigue severity was measured by using “Fatigue Severity Scale (FSS)”. To understand the COVID-19 fear, “Fear of COVID-19 (FCS)” was used. The COVID-19 Awareness of individuals was measured by using “COVID-19 Awareness Scale (CAS)”. There wasn’t statistically significant difference between the mean scores of the IPAQ, FSS, FCS, and CAS between “Group 1” and “Control Group” according to the independent samples t-test ($p < 0.05$). According to the Pearson correlation analysis, positive correlation was found between FSS and FCS ($r = 0.159$, $p < 0.001$), FCS and CAS ($r = 0.392$, $p < 0.001$) for “Group 1”. Additionally, the Pearson correlation analysis results showed that there was a positive correlation between FSS and FCS ($r = 0.230$, $p < 0.001$), FSS and CAS ($r = 0.161$, $p < 0.05$), FCS and CAS ($r = 0.405$, $p < 0.001$) for “Control Group”. ANOVA results showed that the total scores of the Fatigue Severity Scale was significantly different according to the activity levels ($F = 6.17$; $p < 0.05$). To understand the difference between groups, the post hoc Tukey test used. The fatigue severity scores of participants in category 3 (highly active) significantly different from the others.

Key words: Physical Activity, Fatigue Severity, Fear of COVID-19, COVID-19 Awareness

ÖZET

Gürkan, E.İ (2023) Pandemi Sırasında Fiziksel Aktivite, Yorgunluk, COVID-19 Korkusu ve COVID-19 Farkındalık Düzeylerinin COVID-19 Geçirip Geçirmeme Durumuna Göre İncelenmesi. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü Fizyoterapi ve Rehabilitasyon Anabilim Dalı Yüksek Lisans Tezi, İstanbul.

Çalışmamızın amacı, pandemi sırasında COVID-19 geçirip geçirmeme durumuna göre fiziksel aktivite, yorgunluk şiddeti, COVID-19 korkusu ve COVID-19 farkındalık düzeyleri arasındaki farklılıkları değerlendirmektir. Çalışma 500 katılımcıdan oluşmaktadır. Katılımcılar COVID-19 tanısı alanlar “Grup 1” ve hiç COVID-19 tanısı almamış olanlar “Kontrol Grubu” olarak ikiye ayrılmıştır. Katılımcıların demografik özellikleri demografik bilgi formu ile incelenmiştir. Katılımcıların yaş ortalaması 28,82 ve standart sapması 11,35'tir. Katılımcıların boy ortalaması 170,45 ve standart sapması $\pm 7,91$ 'dir. Katılımcıların kilo ortalaması 73.52 ve standart sapması $\pm 12,47$ 'dir. Fiziksel Aktiviteyi değerlendirmek için “Uluslararası Fiziksel Aktivite Anketi Kısa Formu (IPAQ-KF)” kullanılmıştır. Yorgunluk şiddeti, “Yorgunluk Şiddet Ölçeği (YŞÖ)” kullanılarak ölçülmüştür. COVID-19 korkusunu değerlendirmek için “COVID-19 korkusu (KKÖ)” kullanılmıştır. Bireylerin COVID-19 Farkındalığı “COVID-19 Farkındalık Ölçeği (KFÖ)” kullanılarak ölçülmüştür. IPAQ, YŞÖ, KKÖ ve KFÖ puan ortalamalarında COVID-19 tanısına göre anlamlı fark olup olmadığını anlamak için yapılan bağımsız örneklem t-testi sonucunda anlamlı bir fark görülmemiştir ($p < 0.05$). “Grup 1” için yapılan Pearson Korelasyon Analizi sonuçlarına göre YŞÖ ile KKÖ ($r = 0.159$, $p < 0.001$), KKÖ ve KFÖ ($r = 0.392$, $p < 0.001$), KKÖ ve KFÖ ($r = 0.398$, $p < 0.001$) arasında korelasyon belirlenmiştir. Ek olarak, “Kontrol Grubu” için yapılan Pearson Korelasyon Analizi sonuçlarına göre YŞÖ ve KKÖ ($r = 0.230$, $p < 0.001$), YŞÖ ve KFÖ ($r = 0.161$, $p < 0.05$), KKÖ ve KFÖ ($r = 0.405$, $p < 0.001$) arasında korelasyon bulunmuştur. ANOVA sonuçları, Yorgunluk Şiddet Ölçeği toplam puanlarının aktivite düzeylerine göre anlamlı farklılık gösterdiğini göstermiştir ($F = 6.17$; $p < 0.05$). Gruplar arasındaki farkı anlamak için yapılan post hoc Tukey testine göre, aktivite düzeyi yüksek olan kategori 3'tekilerin yorgunluk şiddeti puanları diğer kategoridekilere göre anlamlı farklılık göstermiştir.

Anahtar Kelimeler: Fiziksel Aktivite, Yorgunluk Şiddeti, COVID-19 Korkusu, COVID-19 Farkındalığı

1. INTRODUCTION AND PURPOSE

The Chinese province of Hubei's capital, Wuhan City, experienced an outbreak of pneumonia in December 2019 for an unknown reason. SARS-CoV-2, previously identified as 2019-nCoV and later called Coronavirus Disease (COVID-19) in February 2020. On January 7th, 2020, Chinese researchers made the discovery from patients who had pneumonia caused by a virus. This virus outbreak had become a pandemic by the middle of March (1)

Once a pandemic has been noticed, it is critical to take the necessary steps to limit, control, and reduce the virus's transmission. At this stage, it's crucial to reduce the number of people who are infected. The number of cases will keep rising if the average transmission rate for a population is higher than one. The overall number of infections will diminish as a result of actions that bring the transmission rate down to less than one. When there is an important level of infection within a population, controlling the rate of transmission becomes essential (2,3)

From this moment, the terms "Isolation" and "Quarantine" have become a part of our lives. There are plenty of precautions taken by The Government of Turkey during coronavirus pandemic including to close onsite classes at schools and universities, theaters, cinemas, museums, archaeological sites, concert halls, wedding halls, shopping malls and restaurants, swimming pools, hair salons and, sports centers. Businesses that could not adapt to working from home had to close. Also, all flights on Turkish Airlines, both local and international, have been canceled. Many people were also affected economically due to COVID-19. It was made compulsory for people to wear masks, even in their own cars. A total of 25 cities are closed to vehicles entering or leaving. Residents under the age of 20 and those 65 and above have been ruled not to leave their houses. To decrease the spread of virus, people were advised to work from home (4).

As a result of all of this, quarantine caused serious physical, mental, social, and financial problems towards individuals for the good of the entire population. The experience was tough for some people who go through it. Individuals worry about getting the virus, especially in high-risk groups (5,6).

Numerous individual's face financial difficulties alongside the possibility of losing their jobs as a result of collapsing companies, which is negatively impacting the economy and increasing people's negative feelings. (7)

Some people supported quarantine, while others disagreed with the precautions. Even for those who advocate quarantine, the death of a loved one, losing freedom, not knowing the outcome of an individual's illness, and boredom can occasionally have devastating consequences. The pandemic's negative consequences on education were also noted (8,9) Individuals experienced major stress. The mental and physical health of every individual's affected by COVID-19 (10,11)

Individual's mental health was significantly impacted by their limited social and financial opportunities as a result of precautions. Numerous psychiatric symptoms were induced by feelings of perceived isolation from society and loneliness. These conditions have an effect on quality of life and can lead to depression and anxiety (12). It is essential to understand that numerous research has demonstrated the beneficial effects of physical activity (PA) on mental health (13,14).

Another important issue regarding the psychological health effects of COVID-19 and preventing fear that raising public awareness about COVID-19. PA and COVID-19 awareness may prevent COVID-19 fear potentially help prevent mental disorders (15,16).

Also, the long time spent at home due to quarantine led most people to a sedentary lifestyle. In addition to the sedentary life style, studies have shown that people who have previously been diagnosed with COVID-19 complain of fatigue during daily physical activities (17). In the literature, this situation has begun to be called "Post COVID-19 fatigue" by the researchers (18).

This study was performed to compare the fatigue severity with different PA levels of individuals according to status of COVID-19 diagnosis and to examine the public awareness level and the effects of the COVID-19 awareness on the fear level of individuals in Turkey.

There is no other research to examine the effects of different PA levels on fatigue by including COVID-19 fear and awareness data in Turkey. This study will add to the literature since no one has previously studied.

Two hypotheses were decided for this study:

H0 there is no relationship Physical Activity, Fatigue Severity, Fear Of COVID-19, and COVID-19 Awareness Levels according to the status of Diagnosis COVID-19 during the pandemic.

H1 there is a relationship Physical Activity, Fatigue Severity, Fear Of COVID-19, and COVID-19 Awareness Levels according to the status of Diagnosis COVID-19 during the pandemic.

Specific objectives of this research:

- Relationship between Physical Activity and Fatigue Severity.
- The relationship between Physical Activity, Fatigue Severity, COVID-19 Fear and COVID-19 Awareness.

2.GENERAL INFORMATION/LITERATURE REVIEW

2.1. COVID-19

Corona virus disease described by the World Health Organization (WHO) as “an infectious disease caused by the SARS-CoV-2 virus” (19).

It observed that COVID-19 causes lots of symptoms, including pains and dry cough, diarrhea, and tiredness, fever, headache, aches, conjunctivitis, nasal congestion, sore throat, loss of smell or taste or a rash on skin or color changes of fingers or toes (20). Inhalation of respiratory droplets caused by coughing and sneezing, as well as contact with the mucous membranes of the nose, mouth, and eyes, are all possible transmission pathways for coronavirus (21,22).

Typically, patients recover from the disease without requiring hospital care. The possibility of having a major illness was increased the risk, especially, in older adults and individuals with underlying chronic conditions (23,24). However, WHO warned people that anyone can get COVID 19 and experience the symptoms.

As of 26 April 2023, globally, there have been 764.474.387 confirmed cases of COVID-19 and 6.915.286 deaths. Additionally, as of 23 April 2023, a total of 13.325.228.015 vaccine doses have been administered. The number of confirmed cases in Turkey as on April 26, 2023, is 17.004.677 (25).

2.2.1. Endemic, Outbreak, Epidemic, and Pandemic

The words endemic, outbreak, epidemic, and pandemic describe the frequency of a disease now compared to when it first appeared. The categories are mostly determined by the actual quantity of disease's cases corresponding to the expected quantity of cases for a specific time frame, extent of geographic transmission of the cases (26).

2.2.1.1. Endemic

Endemic was derived from Greek, “En” meaning “in” and “demos” meaning “individual”. It is used to define a disease that affects a community or a nation at a

approximately constant rate. The population of a city, a region, a country, or an entire continent could be included in the group of individuals (26,27).

For examples:

- Malaria in Africa (28).
- Chickenpox in the UK (29).
- Coccidioidomycosis in northern Mexico and the southwest of the United States (30).
- Tropical and subtropical areas have dengue (31).

2.2.1.2. Outbreak

A condition is considered to be in an outbreak if there is a sudden and higher-than-expected rise in the number of cases. It can be in a community or geographical area. An endemic condition might cause an outbreak if there are either more cases than was expected or the disease is discovered somewhere it has never been before, a single incidence of a disease can be enough for an outbreak (26).

The places where outbreaks occur are usually relatively small. When a disease spreads quickly to a large number of individuals, an outbreak might be considered an epidemic (27). Some examples for an outbreak are given below;

- Cholera after Haiti earthquake (32).
- Escherichia coli outbreaks because of lettuce and ground beef (33).

2.2.1.3. Epidemic

An epidemic was derived from Greek, “Epi” meaning “upon or above” and “demos” meaning “individual”. An outbreak that spreads across a greater geographic area is referred to as an epidemic (26,27).

For example;

- The Ebola epidemic of Guinea started in 2013 and spreading to 2016 in West Africa (34).

- The epidemic because of Zika virus, starting in Brazil in 2014 and officially ended in Latin America and the Caribbean; the 2014-2016 (35).

2.2.1.4. Pandemic

A pandemic is derived from Greek, “Pan” meaning “all” and “demos” meaning “individual”. The word used to describe a disease's rapid spread across multiple continents or globally. The epidemic that is spreading throughout the globe can be referred to as a pandemic. In other words, pandemics may spread rapidly when the necessary immunity is not provided, affect large geographical regions and even the whole world, cause many deaths and sometimes last for years (26,27,36).

For example;

- H1N1 influenza in 2009 (37).
- COVID-19 in 2020 (38,39).

2.1.2. Quarantine and Isolation

The term quarantine originates from the word *quaranta*, Italian meaning of “forty”. Despite the fact that flags have only recently been used for signaling a quarantine, societies historically used alternative methods of separating ill individuals from healthy members of the community (40).

Many governments used a similar set of restrictions to fight with diseases and quarantine is one of the most common used methods. The main reason is to prevent spread of the virus and decrease the incidence which is newly diagnosed cases of a disease (40,41).

Individuals separate themselves from others because they are afraid of COVID-19 even though they didn't have any symptoms. Keeping at least a distance of 1m from individuals was one of the recommendations that everyone should take even if there is no symptom or known exposure to COVID 19. This was called “physical distancing” (42).

Following the restrictions, the mental health has been a concern. Numerous researches have demonstrated the negativity of social distancing on psychological health,

especially when it leads to social isolation (43). To make it obvious that retaining and encouraging social connection is essential now more than ever to protecting the mental health of our community, it is preferable for us to use the phrase "physical distancing" as opposed to "social distancing." (44). There was significant increases in depression and anxiety, substance usage, loneliness, and domestic violence during the COVID-19 pandemic. Additionally, closing of the schools lead to educational problems and some individuals were concerned that the 2020–21 academic year may be lost permanently (45,46).

The term “isolation” means separating individual was already infected and affected by COVID-19 and may be spread others (47). On the other hand, “quarantine” means restricting activities or separating individual was not infected but could have been exposed to virus (47,48).

The previous findings suggest that if quarantine is necessary, authorities should make every effort to make this experience as tolerable as for people. This can be accomplished by letting people know what is going on and why, describing how long it will last, giving them interesting activities to do in quarantine, making understandable communication, providing assurance that essential supplies (like water, food, and medical needs) was available, and reinforcing the sense of compassion that they should, by rights, be experiencing (48).

2.1.2. Fear of COVID-19

According to American Psychological Association (APA) dictionary, fear is “intense emotion aroused by the detection of imminent threat, involving an immediate alarm reaction that mobilizes the organism by triggering a set of physiological changes”. In contrast to anxiety, which is an extreme, uncontrolled fear that can be brought on by a number of different triggers, fear is an emotional response to a single, real threat (49).

The fear and anger was the natural and primary results of pandemic (50). Individuals experienced with severe fear of getting COVID-19, death, losing somebody they care about, or hurting others by spreading the disease to them (51). Additionally,

individuals had higher levels of loneliness as a result of their fear and the precautions they have taken to prevent the spread of virus (52).

The effects of COVID-19 on a healthy individual's mental, physical, and financial were quite challenging but the situation was harder for high-risk population such as individuals with chronic diseases and older age (53). Healthcare workers also face to face excessive stress due to fear of COVID-19 during pandemic (54,55,56). While many people had mental effects as a result of pandemic, suicides and other psychological issues like anxiety and depression also developed. The negative impacts of COVID-19 on psychology have been shown by researches (57,58,59). Also, rising unemployment and worsening finances were both pandemic-related factors that have been scientifically linked to an increased risk of suicide (60,61,62,63).

Individuals were expected to spend time with their families at home, do exercises, and continue their education and social and work life by using technology efficiently. Although some people adjusted to the quarantine, others adapted a sedentary lifestyle, complained that they weren't able to continue their work on the internet, and thought that education had been negatively impacted because of fear of COVID-19 (45,64).

2.1.3. COVID-19 Awareness

Concepts such as isolation, quarantine and self-isolation have entered our lives with the existence of a life-threatening risk caused by the pandemic. People looked for ways to access information, stay social, and stay connected to with each other and life during the lockdown process (65).

Therefore, social media, internet and television became the most important ways to reach information during the quarantine. It was an easy and safe way to stay connected. Through the use of the internet, people attempted to limit the pandemic's effects by pursuing their careers, businesses, and personal relationships. The only method to prevent the pandemic's consequences at first was to avoid contracting COVID-19. With the discovery of the vaccine, getting vaccinated has become the recommended way to protect against COVID-19 (66,67,68).

However, social media has allowed material that minimizes the pandemic's severity or ignores its negative impacts to spread widely. Also, getting reliable sources

is challenging, because of the data pollution on social media. Additionally, many adverse effects to the vaccine have been documented, including fever, muscle pain, and even immune system disorders. The public's distrust of the vaccine is developing as a result of these findings (66,67)

It was crucial at this time to obtain information from reliable sources and be aware of the steps we could take against COVID-19. The only way to do this is by increasing the public awareness of COVID-19 (69,70,71). The WHO and the Turkish Ministry of Health were the sources from which accurate information could be obtained to ensure public awareness.

The WHO recommends the following essential prevention steps to protect against COVID-19: (72).

- Wear face mask
- Physical distancing of at least 1 metre
- When you cough, cover your nose and mouth with a tissue or a bent elbow
- Use an alcohol-based hand or soap and water rub to regularly wash your hands.
- Get vaccinated
- Self isolation (any symptoms or tested positive for COVID-19)

2.2. Physical Activity (PA)

PA is movement that significantly increases energy consumption and is caused by the contraction of skeletal muscles. The term also covers the entire spectrum of individual's movement, from occupation, exercise and competitive sports, hobbies or activities that are part of daily life. The level of energy put into an activity, in addition to how frequently and how long it is done, are all important. Intensity is the rate at how much energy is expended during an activity or how hard individuals is working. Each person has a different level of physical activity in terms of duration, frequency, and intensity. Housework, exercise, and professional sports are all examples of movements carried out by skeletal muscles that can be considered as PA (73,74).

Regular PA is important for the regulation of body weight and bone development during childhood and adolescence. Additionally, it is believed that

developing physical activity-focused behaviors as a child may have good effect on the health of individuals in their adulthood (75).

Regular physical activity not only helps with weight loss and the prevention of cardiovascular problems, but it also strengthens the immunity and increases resistance to infections. The immune system adjusts by enhancing its performance based on the activity and its intensity. It is essential that exercise intensity be moderate in order to see immune system changes, as the immune system functions better at this level of intensity when battling pathogenic activity (76).

Additionally, moderate exercise has been associated with a reduction in the death rate from respiratory illnesses like COVID-19, which affects the respiratory system. PA can, therefore, help with a greater reaction to immunizations, which is why they can help with the pandemic (76,77).

Every individual should maintain their health during times of isolation by according to the WHO recommendations of 2,5 hours of moderate PA or 1 hour and 15 minutes of vigorous PA per week, or a combination of both. Walking, stair climbing, using static machines, and jogging are among the exercises that were most advised. Major muscular group strengthening exercises should be performed two or more days per week. Children and teenagers should engage in at least one hour of vigorous or moderate PA every day (77,78).

In contrary, “physical inactivity” is defined as a condition in which there is minimal bodily movement and energy consumption. The numerous research shown that sedentary lifestyle is linked to musculoskeletal disorders and the early onset or progression of diseases such as cardiovascular conditions (78,79) and type II diabetes mellitus (80). It is also linked to increase the risk of osteoporosis, fractures, and dementia (78,79,81).

On the other hand, PA helps cancer and diabetes mellitus type II patients and has an preventive effect on the development of hypertension, obesity, anxiety and depression and cancer. (82,83).

In the study of Bağrı et. al. it was observed that physical inactivity was common in most of the individuals. Healthy individuals' walking, PA, education level, age, body

weight, BMI, fear of COVID-19, kinesiophobia and fatigue levels also found to be related. Participants were recommended to engage in PA (84).

COVID-19 knowledge among students has been found to be above average. It revealed that the students' levels of daily food, water, and PA were low. Additionally, it was seen that anxiety levels had increased. It was not demonstrated that beliefs about eating well and exercising were linked to anxiety, but there was a weak correlation between the two (85).

In another study, there was a link between chronic diseases and depression as well as regular PA and anxiety. Despite the long pandemic process, it is still thought that the negativity of pandemic lead to anxiety, depression and decreased PA levels (86).

2.3.Fatigue

Fatigue is a symptom that happen after prolonged vigorous activity of the muscles. Despite the fact that fatigue is frequently a symptom of PA it is also may occur because of the mental illness. Many people also experience fatigue as a result of behavioural or environmental variables, such as stress or a lack of sleep (87). Quality of life, sleep quality and mental health may badly affected by prolong fatigue. It may became after various pathologic issues that restrict daily life, like cardiovascular, muscular, and neurological disorders or older age. A few likely causes of fatigue include differentiation in levels of neurotransmitter also inflammation, psychological problems, level of stress, cognitive problems (88,89).

Regular PA such as aerobic exercises can help individuals feel less fatigued. According to studies, those who frequently exercise have more physical and mental energy and feel less fatigued. The PA can lessen fatigue, particularly in patients receiving treatment for cancer or chronic fatigue syndrome (90,91) Physical inactivity also can be the reason of fatigue. Sitting for extended periods of time and leading a sedentary lifestyle can deplete energy (92).

On the contrary, excessive activity may cause fatigue. Vigorous-intensity activities (VIA) might overstress the body and make you feel more fatigued. Having a holistic exercise program and getting enough rest will help reduce fatigue also by releasing endorphins, PA may reduce stress and boost mood (93).

In case of COVID-19 pandemic, social media was the first place where the term "long COVID" or "post-COVID-19 condition" became widely known, and then the scientific and medical communities. While an official description of long COVID-19 may not yet exist, studies have found that fatigue and dyspnea are the most frequently reported symptoms which continue for months after affected by COVID-19 (94,95).

Other symptoms might involve memory loss, mental confusion, joint and chest pains, palpitations, myalgia, changes in smell and taste, coughing, headaches, and gastrointestinal and cardiac problems (95,96). Studies have shown that people experience fatigue and cognitive problems within 12 months of being diagnosed with COVID-19 (97).

The meta-analysis of Marques et. al. showed that PA was effective in reducing the severity of fatigue in patients with chronic fatigue syndrome. It was determined that as the level of PA increased, the severity of fatigue decreased (98).

The studies of Koohsari et. al. findings revealed that the COVID-19 epidemic had a bad effect on PA behaviors among business workers in Japan. The sedentary lifestyle of office workers could be influenced by social isolation and teleworking in the midst of a pandemic. The report concludes with a recommendation for public health strategies to lessen the pandemic's effects (92).

Tele-rehabilitation took place in another study. The 18-session (3 sessions/week) program included education of patient, PA, breathing exercise and airway clearance. Tele-rehabilitation programs may be a useful tactic for COVID-19 survivors to lessen post-COVID fatigue and dyspnea, according to the study's findings (99).

The study of Özkeskin et. al. included 104 Multiple Sclerosis patients in total, including 46 with a COVID-19 illness history. Participants, PA, and coronavirus-related fear factors all suffered as a result of COVID-19. However, they resulted that further research needs to be done to determine the exact cause of this influence (100).

3. MATERIALS AND METHODS

3.1. Subjects and Ethical Aspects

Turkish volunteers who matched certain inclusion and exclusion criteria and were in good health were chosen as study participants. They were told the goal of our study and asked if they would be willing to take out a questionnaire as part of the study (Appendix 1).

To collect informations about the individual's age, height, weight, chronic diseases, occupation etc. "Demographic Information Form" (Appendix 2), "International Physical Activity Questionnaire" (Appendix 3), "Fatigue Severity Scale" (Appendix 4), "Fear of COVID-19 Scale" (Appendix 5) and "Coronavirus Awareness Scale" (Appendix 6) were assessed.

Study were performed with 500 volunteered participants. Study were started on March 2022 and end on May 2023. The study protocol was approved by the ethical committee board of Balikesir University on March 23, 2022 (Appendix 7).

589 volunteered participant in this study and which later excluded 89 of them. The final number of participants was 500. The 500 individual's from Turkey between the ages of 18-65 included the study. The participants were divided into two groups; who were diagnosed COVID-19 (Group 1) and who were not diagnosed COVID-19 (Control Group). The "Group 1" was include 210 voluntary people. The "Control Group" was consist of 290 voluntary people. All measurements were out by single researcher.

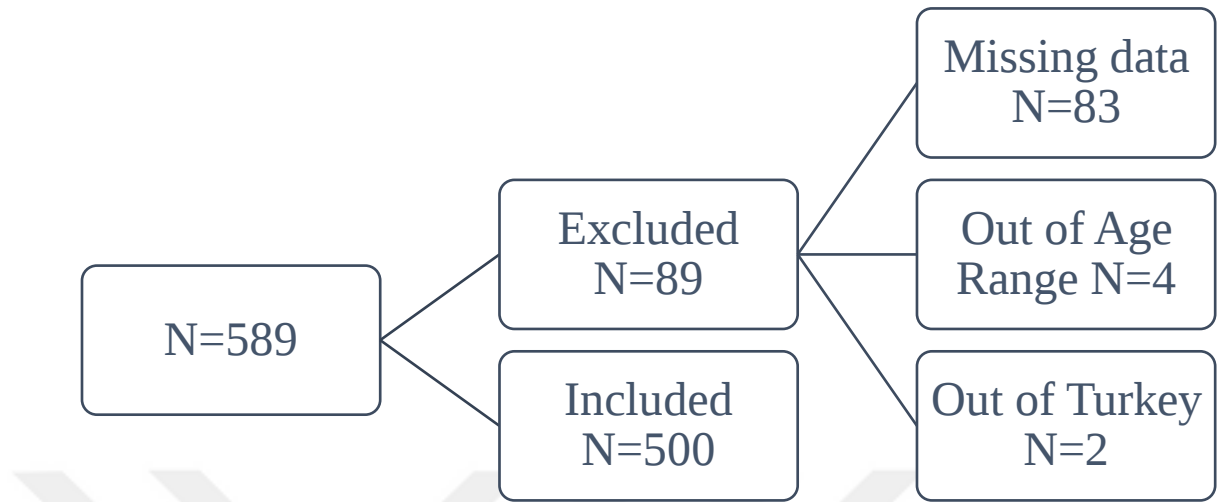
Inclusion criteria:

- Participants of this study should be aged between 18-65
- Participants was selected from Turkey

Exclusion criteria:

- Subject refused to include.
- Living out of Turkey

Figure 1. Process of exclusion and inclusion of sample



3.2. Sample Size

There is a formula for calculation of sample size in groups with known population number:

$$n = \frac{Nt^2 pq}{d^2(N-1) + t^2 pq}$$

- N : Population
- n : Sample size
- p : Sample proportion
- q : 1-sample proportion
- t : Critical value
- d : Acceptable error rate

The sample size was 500 which the sample proportion is 0.5, which the acceptable error rate for sample was 0.10 and critical t value with 95% confidence interval was 1.96.

3.3. Statistical Analysis

Data analysis was made by using SPSS 26 software. Parametric test statistics were used because the scores were normally distributed. The comparison between Group 1 and Group 2 was done using an independent sample t-test. To check if there existed a relationship between the scores of IPAQ, FSS, FCS, and CAS, the Pearson correlation coefficient was used. At a $p < 0.05$ error level, all statistical analyses were performed. ANOVA was used to examine how the means of more than two groups varied from one another. For the purpose of determining which groups differ in terms of the categories of PA, the post-hoc Tukey test was performed. (101,102)

3.4. Study Protocol

The surveying method was used to collect all outcome measurements in-person and Google forms. The scales which used was given below:

- 1) “Demographic information Questionnaire” used to collect info about participants.
- 2) The PA was measured by using the “The International Physical Activity Questionnaire Short Form (IPAQ-SF)”.
- 3) The fatigue was assessed by using “Fatigue Severity Scale (FSS)”
- 4) The fear of individuals was measured by using “Fear of COVID-19 Scale (FCS)”
- 5) The COVID-19 awereness of individuals was measured by using “COVID-19 Awereness Scale (CAS)”.

3.5 Data Collection Tools

3.5.1. Demographic Information Form

The demographic info was collected using a demographic information form and consists of information on gender, age, height, weight, smoking status, education, the presence of chronic diseases, etc. The full content was given in Appendix 2.

3.5.2. Physical Activity Questionnaire Short Form (IPAQ-SF)

The IPAQ used to assess PA levels. The Short Form IPAQ-SF questionnaire has an acceptable test-retest reliability and criterion validity (103,104). IPAQ provide info about time spent with activity which are walking, moderate intensity activities (MIA) and vigorous intensity activities (VIA) and sitting. The required energy was calculated with the MET (multiples of resting energy expenditure-minute score). There are standard MET values for activities.

These are;

- 1.5 for sit
- 3.3 for walk
- 4.0 for MIA
- 8.0 for VIA

The calculation of the total score of IPAQ-SF include of the sum of duration (minutes) and frequency (days) of the activity. The reported minutes per week for each category were converted to a continuous score using the MET values.

The formula is: The MET-min per week: MET level x minutes of activity/day x days/week.

Additionally, there is a Categorical score which includes three levels of PA:

1. Inactive

- No PA or
- Some PA was reported but not enough to include Categories two or three.

2. Minimally Active

Any one of the following 3 criteria

- or more days of VIA of at least 20 minutes per day OR
- or more days of MIA or walking of at least 30 minutes per day OR
- more days of any combination of walking, MIA or VIA achieving a minimum of at least 600 MET-min/week

3. Highly (more) active

- Any one of the following 2 criteria
- VIA on at least 3 days and accumulating at least 1500 MET-minutes/week OR
- 7 or more days of any combination of walking, MIA or VIA achieving a minimum of at least 3000 MET-minutes/week

3.5.3. Fatigue Severity Scale (FSS)

FSS is a short questionnaire to evaluate the impact of fatigue on individual. FSS has an acceptable test-retest reliability and criterion validity (105,106). Nine statements in the FSS are used to categorize the levels of individual fatigue symptoms. Each statement was read to each person, who then circled a number from 1 to 7 indicating how much they agreed or disagreed with it and how correctly it described their situation over the previous week.

For the scoring of the results, every the numbers which participants circled before were add to find the score. A total score of 36 or more suggests that individual suffering from fatigue may need further evaluation by a physician.

3.5.4. Fear of COVID-19 Scale (FCS)

FCS was developed in 2020 and consists of seven items. FCS has an acceptable test-retest reliability and criterion validity (107,108). The scale is designed in a five-point Likert type; for each item marking between “1-Strongly Disagree” and “5 Strongly Agree” is expected. The rised scores assosiated with increased level of fear about COVID-19.

3.5.5. COVID-19 Awareness Scale (CAS)

The Coronavirus (COVID-19) Awareness Scale is a 5-point Likert scale consisting of 17 items and varying between (1) Never and (5) Always. CAS has an acceptable test-retest reliability and criterion validity (109).

It is necessary to conduct independent analyses of the scale's sub-factors devoid of reversed items. The maximum score that can be achieved for the "prevention awareness factor" for contamination, which consists of nine items, is 45. The maximum score that can be achieved for the "following current developments awareness factor," which consists of four items, and the "hygiene measure awareness" factor, which consists of four things, is 20.

The increased scores that can be received from the sub-factors means that the awareness level about of factor was high.

4. RESULTS

4.1. Assessment of Demographic Information

The demographic informations of participants was examined.

Table 1. Demographic Information of Participants

	Mean $\pm$ SD
Age	28.82 $\pm$ 11.35
Height	170.45 $\pm$ 7.91
Weight	73.52 $\pm$ 12.47

The average age of participants was 28.82 and the standard deviation was $\pm$ 11.35. The average height of participants was 170.45 cm and standard deviation was $\pm$ 7.91. The average weight was 73.52 and standard deviation was $\pm$ 12.47 (Table 1).

Table 2. Distrubution of Age according to Gender

Gender	Frequency (f)	Percent (%)
Female	358	71.6
Male	142	28.4
Total	500	100

The study consists of 500 participants and 358 of the participants was female (71.6%) and 142 of the participants was male (28.4%). The average age of female participants was 28.74, while the average age of male was 29.02 (Table 2).

Table 3. Distrubution of Educational Status

Educational Status	Frequency (f)	Percent (%)
Primary school education	9	1.8
High school education	39	7.8
Associate degree	34	6.8
Bachelor degree	380	76
Postgraduate	38	7.6
Total	500	100

Table 3 shows the distribution of educational status of the participants. According to this frequency and percentage distributions, there are 9 primary school (1.8%), 39 high school (7.8%), 34 associate degree (6.8%), 76 bachelor degree (76%) and 38 postgraduate (7.6%).

Table 4. Distrubution of gender according to employment status

Employment Status		Gender		Total
		Female	Male	
Yes	Count	170	63	233
	%	72.3	27.7	100
	% of Total	34	12.6	46.6
No	Count	188	79	267
	%	70.4	29.6	100
	% of Total	37.6	15.8	53.4
Total	Count	358	142	500
	% of Total	71.6	28.4	100

Among the 233 participants, 170 female and 63 male were employed. However, 188 of the unemployed ($f=265$; 53.4%) were female (70.4%) and 79 were male (29.6%) (Table 4).

Table 5. Distribution of Participants According to Diagnosed with COVID-19

Diagnosed with COVID-19	Frequency (f)	Percent (%)
Group1	210	42
Control Group	290	58
Total	500	100

According to the results, while 210 of the 500 people participating in the study had previous COVID-19 diagnosis, 290 had never been diagnosed with COVID-19 before (Table 5).

Table 6. Distribution of Participants According to Vaccine Doses

Vaccine	Frequency (f)	Percent (%)
None	13	2.6
Four dose	30	6
Three dose	209	41.8
Two dose	236	47.2
One dose	12	2.4
Total	500	100

When the number of doses of the vaccine was examined, it was seen that 13 participant were not vaccinated, 12 participants had one dose, 236 participant had two doses, 209 participants had three doses, and 30 participants had four doses (Table 6).

Table 7. Distribution of Participants According to Smoking Habit

Smoking	Frequency (f)	Percent (%)
Smokers	139	27.8
Non-smokers	361	72.2
Total	500	100

The smoking habits of the participants were examined, it was seen that 139 out of 500 people were smoking (Table 7).

Table 8. Distribution of Participants According to Chronic Diseases

Chronic Diseases	Frequency (f)	Percent (%)
Yes	75	15
No	425	85
Total	500	100

In this study, the total number of 500 participants with chronic diseases were 75 and the number of participants without chronic diseases were 425 (Table 8).

Table 9. The distribution of participants according to IPAQ Categories

Categories	N
Inactive (1)	212
Minimally active (2)	125
Highly active (3)	163

The IPAQ is divided into 3 groups, inactive (n=212), minimally active (n=125) and highly active (n=163) (Table 9).

4.2. The Scores of IPAQ, FSS, FCS and CAS According to Diagnosis of COVID-19

Table 10. The Scores of IPAQ According to Diagnosis of COVID-19

		N	Mean	SD	t	p
IPAQ	Group 1	210	1776.55	4070.19	1.16	.20
	Control Group	290	2174.50	3363.25		

* $p < 0.05$

According to the t-test results to determine whether the IPAQ scores differ significantly according to the diagnosis of COVID-19, a significant difference wasn't discovered between the average scores of the IPAQ according to diagnosed with COVID-19. ($t=1,16$; $p < 0.05$). The average IPAQ score for those who were diagnosed COVID-19 "Group 1" was 1776.55, and the average of IPAQ for those who not diagnosed with COVID-19 "Control Group" was 2174.50 (Table 10).

Table 11. The Scores of Fatigue Severity Scale According to Diagnosis of COVID-19

		N	Mean	SD	t	p
Fatigue Severity	Group 1	210	42.10	11.53	-1.77	.08
	Control Group	290	40.20	12.10		

* $p < 0.05$

The scores were normally distributed. A significant difference was not found between the fatigue severity scores according to the t-test result for independent samples to determine whether the fatigue severity scores significantly different according to COVID-19 diagnosis ($t=-1.77$; $p<0.05$). The average fatigue severity score of “Group 1” was 40.20, and the average fatigue severity score of “Control Group” was 42.10 (Table 11).

Table 12. The Scores of Fear of COVID-19 Scale According to Diagnosis of COVID-19

		N	Mean	SD	t	p
Fear of COVID-19	Group 1	210	13.13	6.11	0.35	0.73
	Control Group	290	13.32	6.02		

* $p<0.05$

According to the t-test results to determine whether the FCS scores differ significantly according to the diagnosed with COVID-19, a significant difference was not discovered between the score averages ($t=-4.11$; $p<.05$). The average fear score of “Group 1” was 13.32, and the average fear “Control Group” was 13.13 (Table 12).

Table 13. The Scores of COVID-19 Awareness Scale According to Diagnosis of COVID-19

		N	Mean	SD	t	p
COVID-19 Awareness	Group 1	210	52.40	13.15	1.04	0.29
	Control Group	290	51.13	13.50		

* $p<0.05$

According to the independent t-test result to determine whether the scores of the CAS differ significantly according to COVID-19 diagnosis, a significant difference was

not found ($t=-4, 11; p<.05$). The average score of the CAS for “Group 1” was 52.40, and the average score of the CAS for “Control Group” was 51.13 (Table 13).

4.3. The Scores of IPAQ, FSS, FCS and CAS According to Diagnosis of Chronic Diseases

Table 14. The Scores of IPAQ According to Diagnosis of Chronic Disease

	Chronic disease	N	Mean	SD	t	p
IPAQ	Yes	75	1636.18	1969.75	-0.92	0.36
	No	425	2072.86	4025.80		

* $p<0.05$

In the t-test results for independent samples, a significant difference was not found between the mean score of IPAQ according to the status of being diagnosed with a chronic disease ($t=-.92; p<0.05$). The average score of the IPAQ for those diagnosed with a chronic disease was 1636.18 and the average of the IPAQ score of those who have not been diagnosed with a chronic disease was 2072.86 (Table 14).

Table 15. The Scores of Fatigue Severity Scale According to Diagnosis of Chronic Disease

	Chronic Disease	N	Mean	SD	t	p
Fatigue Severity	Yes	75	43.84	12.50	2.27	0.02*
	No	425	40.48	11.71		

* $p<0.05$

In order to determine whether the fatigue severity scores significantly different according to the status of being diagnosed with a chronic disease, a significant

difference was found between the fatigue severity average scores according to independent t-test results, in favor of those who did not receive a diagnosis of chronic disease ($t=2.27$; $p<.05$). The average FSS of those diagnosed with chronic disease was 43.84, and the mean fatigue severity score of those who have not been diagnosed with chronic disease was 40.48 (Table 15).

Table 16. The Scores of Fear of COVID-19 Scale According to Diagnosis of Chronic Disease

	Chronic disease	N	Mean	SD	t	p
Fear of COVID-19	Yes	75	14.55	6.29	2.02	0.04*
	No	425	13.01	6.00		

* $p<0.05$

According to the t-test results for independent samples, a significant difference was found between the FCS score averages according to the status of being diagnosed with a chronic disease ($t=2,02$; $p<.05$). The average score for fear of the COVID-19 among individuals who have chronic disease was 14.55, whereas the average score for those without a diagnosis of COVID-19 was 13.01 (Table 16).

Table 17. The Scores of COVID-19 Awareness Scale According to Diagnosis of Chronic Disease

	Chronic disease	N	Mean	SD	t	p
COVID-19 Awareness	Yes	75	53.79	13.43	1.35	0.18
	No	425	51.53	13.33		

* $p<0.05$

In the t-test results for independent samples, a significant difference wasn't found between the mean score of CAS according to the status of being diagnosed with a chronic disease ($t=1.35$; $p<.05$). The average score of the COVID-19 awareness scale of those diagnosed with a chronic disease was 53.79, and the average of the COVID-19 awareness scale score of those who have not been diagnosed with a chronic disease was 51.53 (Table 17).

4.4. The Scores of IPAQ, FSS, FCS and CAS According to Gender

Table 18. The Scores of IPAQ According to Gender

		N	Mean	SD	t	p
IPAQ	Female	358	1714.77	2921.69	-2.76	0.01*
	Male	142	2745.01	5336.70		

* $p<0.05$

A significant difference between the IPAQ score averages according to gender was found, as shown by the results of the t-test for independent samples used to determine if the IPAQ scores show a significant difference according to gender ($t=-2.76$; $p<0.05$). The mean score of IPAQ for female was 1714.77, and the mean score of IPAQ for male was 2745.01 (Table 18).

Table 19. The Scores of Fatigue Severity Scale According to Gender

		N	Mean	SD	t	p
Fatigue Severity	Female	358	42.25	11.57	3.83	0.01*
	Male	142	37.80	12.11		

* $p<0.05$

The parametric tests were used since fatigue severity scores were normally distributed. According to the independent t-test results made to determine whether the fatigue severity scores show a significant difference according to gender, there were significant difference between the fatigue severity score averages by gender ($t=3.83$;

$p < 0.05$). The average FSS score of female was 42.25, and the FSS score of male was 37.80 (Table 19).

Table 20. The Scores of Fear of COVID-19 Scale According to Gender

		N	Mean	SD	t	p
Fear of COVID-19	Female	358	13.75	6.16	2.96	0.03*
	Male	142	11.98	5.65		

* $p < 0.05$

The significant difference between the COVID-19 fear score averages according to gender was found, as shown by the results of the t-test for independent samples used to understand if the FCS scores show a significant difference according to gender ($t = 2.96$; $p < 0.05$). The mean score of FCS for female was 13.75, and the mean score of FCS for male was 11.98 (Table 20).

Table 21. The Scores of COVID-19 Awareness Scale According to Gender

		N	Mean	SD	t	p
COVID-19 Awareness	Female	358	52.41	13.23	1.44	0.15
	Male	142	50.51	13.62		

* $p < 0.05$

According to the t-test results to determine whether the COVID-19 awareness scale scores show a significant difference according to gender, no difference was discovered between the mean score of the CAS according to gender ($t = 1.44$; $p > .05$). The mean score of the CAS for female was 52.41, and the mean score of CAS for male was 50.51 (Table 21).

4.5. Pearson Correlation Analysis of CAS, FSS, CFS and IPAQ scores

Table 22. Pearson Correlation Analysis for Group 1

Group 1	IPAQ	FSS	FCS	CAS
IPAQ	1	-.057	-.043	-.022
FSS	-.057	1	.159**	.097
FCS	-.043	.159**	1	.392**
CAS	-.022	.097	.392**	1

Correlation is significant at the 0,01* level (2-tailed), Correlation is significant at the 0,05** level (2-tailed)

Table 23. Pearson Correlation Analysis for Control Group

Control Group	IPAQ	FSS	FCS	CAS
IPAQ	1	-.025	.011	.046
FSS	-.025	1	.230**	.161*
FCS	.011	.230**	1	.405**
CAS	.046	.161*	.405**	1

Correlation is significant at the 0,01* level (2-tailed), Correlation is significant at the 0,05** level (2-tailed)

According to the Pearson correlation analysis, positive correlation was found between FSS and FCS ($r=0.159$, $p<0.001$), FCS and CAS ($r=0.392$, $p<0.001$) for “Group 1”.

Additionally, the Pearson correlation analysis results showed that there was a positive correlation between FSS and FCS ($r=0.230$, $p<0.001$), FSS and CAS ($r=0.161$, $p<0.05$), FCS and CAS ($r=0.405$, $p<0.001$) for “Control Group”.

4.6. Variance Analysis of CAS, FSS, CFS according to IPAQ scores

Table 24. The One-Way Variance Analysis (ANOVA) of Fatigue Severity Scale Total Scores According to Activity Levels

Groups	Sum of Squares	Mean Square	F	p
Between	1706.031	853.016	6.17	.002*
Within	68758.871	138.348		
Total	70464.902			

* $p < 0.05$

According to the activity levels of the total scores of the Fatigue Severity scale; The mean score of 212 people in inactive (category 1) is 42.40, the mean score of 125 people in minimally active (category 2) is 42.05, and the mean score of 163 people in highly active (category 3) is 38.34. It was determined that the total FSS scores showed a significant difference according to the activity levels ($F=6.17$; $p < 0.05$). According to the post hoc Tukey test which performed to understand the difference between groups, the results showed that there is a significant difference between the category 1 and category 3 and also between category 2 and category 3 in favor of those in the 3rd category. In other words, the severity of fatigue decreased when the participant's level of physical activity increased. The estimated effect size (Eta Squared=0.024) was found to be significant. This result can be interpreted as the fatigue severity scores of those in category 3 with higher activity levels differed greatly from the others.

Table 25. The One-Way Variance Analysis (ANOVA) of COVID-19 Awareness Scale Total Scores According to Activity Levels

Groups	Sum of Squares	Mean Square	F	p
Between	388.88	194.44	1.09	.34
Within	88573.14	178.22		
Total	88962.02			

* $p < 0.05$

According to the overall scores of the CAS, the mean scores for 212 inactive (category 1) were 50.84, 125 minimally active (category 2) were 52.47 and 163 highly active (category 3) were 52.73. In a result of the ANOVA, it was determined that the total CAS scores did not show a significant difference according to the activity levels ($F=1.09$; $p>0.05$ (Table 25).

Table 26. The One-Way Variance Analysis (ANOVA) of Fear of COVID-19 Scale Total Scores According to Activity Levels

Groups	Sum of Squares	Mean Square	F	p
Between	173.290	86.645	2.37	0.10
Within	18182.942	36.585		
Total	18356.232			

* $p<0.05$

The FCS score of participants in the category 1, category 2 and category 3 was 13.37, 14.02 and 12.48, respectively, according to the activity levels of the total scores. The one-way analysis of variance showed that there wasn't significant difference between the total scores of the FCS and activity levels ($F=2.37$; $p>0.05$).

5. DISSCUTION AND CONCLUTION

This study was aimed to investigate the PA, fatigue severity, FCS and CAS of individuals in Turkey. To our knowledge this was the first study to evaluate relationship between PA, Fatigue Severity, COVID-19 awareness and COVID-19 Fear according COVID-19 diagnosis during COVID-19 pandemic.

Firstly, maintaining PA and minimizing sedentary behavior was essential during pandemic to reduce the chance of experiencing diseases. Strengthening, flexibility, stretching, balance, relaxation, meditation aerobic exercises have been suggested by many studies during the pandemic process (77,110,112).

The research by Visser et. al. showed that being diagnosed with COVID-19 caused changes in the PA levels and nutrition behavior of participants. A decrease in physical activity level, malnutrition, or weight gain due to overnutrition can increase the risk of injury (113). Also, there was research showed that bad eating behavior and decreased PA during the pandemic increase the risk of some problems such as obesity. (114)

The studies showed that walking, running, exercising on static equipment, doing tasks around the house, and going upstairs and downstairs are the advised forms of exercise. Exercise equipment or, if possible, moderate walking through the garden or house might make it easier to perform aerobic exercise at home (74, 113,115).

In order to benefit from the physiological and psychological benefits of aerobic exercise such as reducing high blood pressure, ischemic heart disease, and brain vascular problems; increased insulin sensitivity also helps to increase muscle mass; improve immune response, and fatigue-free effort; decreased stress; improving physical perception and sleep quality, reduced risk of metabolic disease, diabetes, and high blood pressure, aerobic exercise is advised (80,81,82). In this case, MIA is advised since it improves immunity and reduces the frequency, severity, and duration, of respiratory infections. Vigorous exercise additionally decreases the incidence of colon cancer and other digestive system-related diseases, according to the study (83,90).

Researchers thought that the decrease in PA may be related to the precautions (isolation, quarantine, lockdown, etc.) taken to prevent COVID-19.

However, in our study, according to the statistical analysis, there were not significant difference in IPAQ scores according to the COVID-19 diagnosis. The reason why this result was not supported the literature may be the year the study was conducted. The COVID-19 precautions taken in Turkey between 2022 and 2023 were softened considerably compared to 2020. We thought that vaccination of people for COVID-19 and reduced virus spread have had an important impact on this situation.

Secondly, it has become increasingly clear that people infected with COVID-19 can have long-term symptoms. Fatigue was one of the most important symptoms that affect PA and overall health. According to de Sire et al. Meta-analysis results, rehabilitation may be essential for post-COVID-19 patients, especially in terms of how it impacts fatigue (116).

Additionally, according to previous studies, aerobic and strengthening exercises, mindfulness training, and pulmonary rehabilitation including diaphragmatic breathing techniques relieve dyspnea and fatigue (98,99,117,118). In our study, a significant difference was not found the fatigue severity score averages according to the status of diagnosis of COVID-19.

However, as a result of the One-Way Variance Analysis (ANOVA) of the fatigue severity scale total scores on activity levels, it was determined that the total scores of the Fatigue Severity Scale showed a significant difference according to the activity levels ($F=6.17$; $p<0.05$). The IPAQ is divided into 3 groups, inactive ($n=212$), minimally active ($n=125$), and highly active ($n=163$). The post hoc Tukey test which was performed to understand the difference between groups, the results showed that there is a significant difference between category 1 and category 3 and also between category 2 and category 3 in favor of those in the 3rd category.

In other words, when the PA level of the participants increased, the severity of fatigue decreased. This result supported the literature.

Thirdly, panic, fear, anxiety, depression, etc., during COVID-19 was expected by researchers (44,50,84). The fear of COVID-19 also was reported as the reason for some suicides and became an important problem for the public (61,63). According to the study of Özmen et.al., it was found that the participants' results on the COVID-19 fear were significantly different according to gender, and the presence of any chronic diseases (119). There were a few studies that examine COVID-19 fear (120,121).

Additionally, there was no other study that investigate the COVID-19 fear according to diagnosis of COVID-19.

According to statistical analysis, a significant difference was not discovered in this study between the FCS scores according to COVID-19 diagnosis ($t=-4.11$; $p<.05$). However, the COVID-19 fear scores show a significant difference according to gender ($t=2.96$; $p<0.05$) and female participants were experienced more COVID-19 fear than male participants. Also, the mean scores of COVID-19 fear significantly different between according to the status of being diagnosed with a chronic disease ($t=2.02$; $p<.05$). These results supported the previous literature.

Fourthly, the study by Değirmenci et.al. showed moderate correlation between COVID-19 phobia and environmental awareness as well as a moderate relationship between COVID-19 fear and stress, depression, and anxiety (122). Additionally, another research showed that nursing students in Turkey, especially female students, experience severe fear and anxiety because of COVID-19 (123).

In our research, no significant difference was found the CAS scores according to the diagnosis of COVID-19, gender, or diagnosis of chronic disease. Some of the studies were not used validated scales to collect information and the information was based on self-report data which has the risk of bias. We used reliable and validated scales to collect information. It may be the reason why our study had different results in the Turkish population.

In another scientific research, the participants were divided into two groups as fatigued and normal. This research's results showed that the normal group had better COVID-19 knowledge than the fatigued group. Also, the normal group believed more than the fatigued group that COVID-19 will be controlled. The normal group showed better behavior when it came to wearing a mask and gloves, cleaning their hands, following the rules, and maintaining a physical distance (124).

According to the Pearson correlation analysis, a positive correlation was found between FSS and FCS ($r=0.159$, $p<0.001$), FCS, and CAS ($r=0.392$, $p<0.001$) for "Group 1". Additionally, the Pearson correlation analysis results showed that there was a positive correlation between FSS and FCS ($r=0.230$, $p<0.001$), FSS and CAS ($r=0.161$, $p<0.05$), FCS and CAS ($r=0.405$, $p<0.001$) for "Control Group".

Additionally, based on academic literature, the study by Pieh et. al. showed the symptoms such as anxiety depression, and severe insomnia have increased during the pandemic. Especially, young adults, women, and the unemployed more affected by COVID-19 (125). The effects of PA on psychological health have been proven by many scientific studies. The importance of PA should be remembered again to decrease the bad impact of fear of COVID-19 on mental health (112,125).

According to the results of this study, fatigue severity scores show a significant difference according to gender and chronic diseases. The fatigue severity of the female participants was higher than male participants. Also, the participants with chronic diseases experience more fatigue as expected. There were also some differences in IPAQ according to gender. A significant difference between the IPAQ score averages according to gender was found ($t=-2,76$; $p<0.05$). The activity level of male participants was higher.

In conclusion, a significant difference was not found between the IPAQ, FSS, FCS, and CAS averages according to the status of diagnosed with COVID-19. However, there were some differences according to chronic diseases and gender. According to the results, the female participants experience severe fatigue and fear. Also, they were inactive more than male participants during COVID-19. Since the fear scores of female participants are higher than male participants, it may have negatively affected their PA levels and indirectly increased the severity of fatigue due to a decrease in PA.

5.1. Study Limitations and Offers

In this study, data were analyzed according to COVID-19 status, Chronic Diseases and Gender. There was “Group 1” an “Control Group” for COVID-19 status. There were participants with Chronic Diseases. They showed as “Yes” and participants who don’t have any Chronic Diseases showed as “No”. There was two gender group as “Female” and “Male”. Also, there was an activity level groups of IPAQ scores as a category 1 (inactive), category 2 (minimally active), and category 3 (highly active). The groups did not have an equal number of participants. This was the main disadvantage of the study. Another limitation was the pandemic itself because of the fear of COVID-19

the study data were collected mostly from Google Forms. The information given may be misleading, as it is not possible to directly contact with some participants. It may lead to bias.

We suggest that it might be a “Pulmonary Diseases Group” to compare with healthy participants. Patients with Chronic Pulmonary Diseases may experience COVID-19 differently from healthy individuals. In this study, there was not enough sample size for the “Pulmonary Diseases Group” to compare others.



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7. APPENDICES

APPENDIX 7.1. INFORMED WRITTEN CONSENT FORM

Koronavirüs Pandemisi Sırasında COVID-19 Geçiren ve Geçirmeyen Kişilerin Fiziksel Aktivite Yorgunluk, COVID-19 Korkusu ve COVID-19 Farkındalığı Düzeylerinin İncelenmesi

Bu form Yeditepe Üniversitesi Fizyoterapi ve Rehabilitasyon Bölümü öğrencisi Elif İrem Gürkan'ın Yüksek Lisans tezine veri toplamak amacıyla hazırlanmıştır. Çalışma gönüllülük esasına dayanmaktadır. Katılımcı araştırmadan istediği zaman ayrılma hakkına sahiptir. Bu çalışma için gönüllü katılımcıdan, özel ya da devlete ait sağlık ödeneklerinden hiçbir şekilde ücret talep edilmeyecektir. Araştırma verileri anket üzerinden toplanacaktır. Eğer anlayamadığınız ve sizin için açık olmayan şeyler varsa, ya da daha fazla bilgi isterseniz bize sorunuz. Cevaplarınız bizim için değer taşımaktadır. Bu araştırmada toplanan veriler yalnızca araştırma kapsamında kullanılacaktır. Kişisel bilgileriniz herhangi bir amaçla, kurum yöneticileri veya üçüncü kişilerle kesinlikle paylaşılmayacaktır. Lütfen tüm soruları cevaplayınız.

Katılımınız için çok teşekkür ederiz.

Danışman Öğretim Üyesi: Prof. Dr. Rasmi MUAMMER

İletişim: Fzt. Elif İrem GÜRGAN

elifirem.gurgan@std.yeditepe.edu.tr

Bu araştırmaya katılmayı kabul ediyor musunuz?

Evet

Hayır

APPENDIX 7.2. Demographic Information Form

1. Ad soyad:

2. Yaş:

3. Boy:

4. Kilo:

5. Cinsiyet:

6. Eğitim durumunuz nedir?

İlköğretim	Lise	Önlisans	Lisans	Lisansüstü
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7. Bir işte çalışıyor musunuz?

Evet	Hayır
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8. Yaptığınız işi aşağıdakilerden hangisi en iyi tanımlamaktadır?

- Yaptığım iş fiziksel olarak çok yorucu ve güç gerektiren bir iştir.
- Yaptığım iş fiziksel olarak yorucu ve güç gerektiren bir iştir.
- Yaptığım iş fiziksel olarak orta derecede yorucu ve güç gerektiren bir iştir.
- Yaptığım iş fiziksel olarak az yorucu ve az güç gerektiren bir iştir.
- Yaptığım iş fiziksel olarak hiç yorucu olmayan ve güç gerektirmeyen bir iştir.
- Çalışmıyorum.

9. Covid-19 ile ilgili aşağıdaki şıklardan en uygun olanını işaretleyiniz.

- Covid-19 tanısı almadım
- Bir defa Covid-19 tanısı aldım.
- İki defa Covid-19 tanısı aldım.
- İki defadan fazla Covid-19 tanısı aldım.

10. Sizin için aşağıdakilerden en uygun olanını işaretleyiniz

- Yaptığım fiziksel aktivitelerde, Covid-19 tanısı almadan önce daha az yoruluyordum.
- Yaptığım fiziksel aktivitelerde, Covid-19 tanısı aldıktan sonra daha az yorgun hissediyorum.
- Yaptığım fiziksel aktivitelerin yoruculuğu açısından Covid-19 tanısı almadan öncesi ya da sonrası arasında bir fark yok.
- Covid-19 tanısı almadım.

11. En son Covid-19 tanısı almanızın üzerinden ne kadar süre geçmiştir?

0-3 ay	4-6 ay	7-9 ay	10-12 ay	12 aydan fazla	Covid-19 tanısı almadım
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12. Covid-19 aşısı ile ilgili size uygun şıkkı işaretleyin.

Aşı olmadım.	Tek doz aşı oldum.	İki doz aşı oldum.	Üç doz aşı oldum.	Dört doz aşı oldum.
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13. Türkiye'de mi ikamet ediyorsunuz?

Evet

Hayır

14. Sigara içiyor musunuz?

Evet

Hayır

15. Günlük sigara tüketim miktarınız ne kadardır?

- Sigara içmiyorum
- 5 taneden az
- 5-10 tane
- 11-15 tane
- 1 paket
- 21-30 arası
- 2 paket ve daha fazla

16. Doktor tarafından teşhisi konulmuş herhangi bir kronik rahatsızlığınız var mı?

Evet

Hayır

17. Cevabınız evet ise teşhis edilen hastalığınız aşağıdakilerden hangisi / hangileridir?
(birden fazla seçim yapabilirsiniz.)

- Kalp damar hastalıkları
- Kanser
- Şeker hastalığı
- Romatizma
- Ortopedik rahatsızlıklar
- Nörolojik problemler
- Travma
- Sindirim sistemi hastalıkları(karaciğer, mide vs.)
- Yüksek tansiyon
- Solunum sistemi hastalıkları(akciğer vb.)
- Kas-iskelet sistemi problemleri
- Endokrin sistemi hastalıkları
- Vitamin ve mineral yetersizlikleri (Demir,B12 vitamini yetersizliği vb.)
- Diğer.....

18. Düzenli olarak kullandığınız bir ilaç var mı?

Evet

Hayır

19. Cevabınız evet ise kullandığınız ilacın ismi nedir?

.....

APPENDIX 7.3. Physical Activity Questionnaire Short Form (IPAQ-SF)

1. Ağır kaldırma, kazma, aerobik, basketbol, futbol veya hızlı bisiklet çevirme gibi şiddetli bedensel güç gerektiren faaliyetlerden SON BİR HAFTA içinde KAÇ GÜN yaptınız? (Hiç yapmadım şikkını işaretlerseniz 3. soruya geçiniz)

- a) Hiç yapmadım
- b) 1 gün yaptım
- c) 2 gün yaptım
- d) 3 gün yaptım
- e) 4 gün yaptım
- f) 5 gün yaptım
- g) 6 gün yaptım
- h) 7 gün yaptım

2. Şiddetli fiziksel aktivite yaptığınız BİR GÜNDE genellikle kaç dakika zaman harcadınız? (Sadece SAYI İLE DAKİKAYI yazınız.) Örneğin=> 13

.....

3. Hafif yük taşıma, normal hızda bisiklet çevirme, halk oyunları, dans, bowling veya tenis gibi ORTA DERECELİ bedensel güç gerektiren ve en az 10 DAKİKA süren faaliyetlerden SON BİR HAFTA içinde KAÇ GÜN yaptınız? (Hiç yapmadıysanız 5. soruya geçiniz) (Yürüme hariç)

- a) Hiç yapmadım
- b) 1 gün yaptım
- c) 2 gün yaptım
- d) 3 gün yaptım
- e) 4 gün yaptım
- f) 5 gün yaptım
- g) 6 gün yaptım
- h) 7 gün yaptım

4. ORTA DERECELİ bu fiziksel aktivitelerden yaptığınız BİR GÜNDE genellikle kaç dakika zaman harcadınız? (Sadece SAYI İLE DAKİKAYI yazınız)

.....

5. İşyerinde, evde, bir yerden bir yere ulaşım amacıyla veya sadece dinlenme, spor, egzersiz veya hobi amacıyla yaptığınız en az 10 DAKİKA süren YÜRÜYÜŞLERDEN, SON BİR HAFTA içinde KAÇ GÜN yaptınız?

- a) Hiç yapmadım
- b) 1 gün yaptım
- c) 2 gün yaptım
- d) 3 gün yaptım
- e) 4 gün yaptım
- f) 5 gün yaptım
- g) 6 gün yaptım
- h) 7 gün yaptım

6. SON BİR HAFTADA en az 10 DAKİKA süren yürüyüşlerden yaptığınız BİR GÜNDE genellikle kaç dakika zaman harcadınız? (Sadece SAYI İLE DAKİKAYI yazınız)

.....

7. İş yerinizde ya da evde masada çalışırken, evde dinlenirken, arkadaşınızı ziyaretiniz sırasında otururken, koltukta kitap okurken, otururken veya yatarak televizyon seyrettiğiniz zamanlarda, BİR GÜNDE OTURARAK genellikle kaç dakika zaman harcadınız? (Sadece SAYI İLE DAKİKAYI yazınız)

.....

APPENDIX 7.4. Fatigue Severity Scale

BUGÜN DAHİL SON BİR HAFTA içinde ne derecede yorgun olduğunuzu öğrenmek istiyoruz. Bu bölümdeki sorularda

1 "Kesinlikle Katılmıyorum",

2 "Katılmıyorum",

3 "Katılmama eğilimindeyim",

4 "Kararsızım"

5 "Katılma eğilimindeyim",

6 "Katılıyorum"

7 "Kesinlikle Katılıyorum" olacak şekilde yorgunluğunuzu puanlayın lütfen.

1. Yorgun olduğum zaman motivasyonum azalır.

1 2 3 4 5 6 7

2. Egzersiz yapmak beni yoruyor.

1 2 3 4 5 6 7

3. Kolay yorulurum.

1 2 3 4 5 6 7

4. Yorgunluk fiziksel fonksiyonumu etkiler.

1 2 3 4 5 6 7

5. Yorgunluk benim için sıklıkla problemlere neden olur.

1 2 3 4 5 6 7

6. Yorgunluğum fiziksel fonksiyonumu sürdürmeme engel olur.

1 2 3 4 5 6 7

7. Yorgunluk belirli görev ve sorumluluklarımı yerine getirmemi etkiler.

1 2 3 4 5 6 7

8. Yorgunluk beni yetersiz bırakan 3 (   )  nemli  ikayetden biridir.

1 2 3 4 5 6 7

9. Yorgunluk i imi, aile veya sosyal ya antımı etkiler.

1 2 3 4 5 6 7



APPENDIX 7.5 Fear of COVID-19 Scale

Lütfen bu bölümdeki sorularda COVID-19 korkunuzu

- 1 "Kesinlikle Katılmıyorum",
2 "Katılmıyorum",
3 "Kararsızım",
4 "Katılıyorum"
5 "Kesinlikle Katılıyorum" olacak şekilde puanlayınız.

1. En çok COVID-19'dan korkuyorum.

1 2 3 4 5

2. COVID-19'u düşünmek beni rahatsız ediyor.

1 2 3 4 5

3. COVID-19'u düşündüğümde ellerim titriyor.

1 2 3 4 5

4. COVID-19 nedeniyle hayatımı kaybetmekten korkuyorum.

1 2 3 4 5

5. Sosyal medyada COVID-19 ile ilgili haberleri ve hikayeleri izlerken endişeleniyorum.

1 2 3 4 5

6. Uyuyamıyorum çünkü COVID-19'a yakalanmaktan endişe ediyorum.

1 2 3 4 5

7. COVID-19'a yakalanabileceğimi düşündüğümde kalbim hızla atıyor ya da çarpıyor.

1 2 3 4 5

APPENDIX 7.6. COVID-19 Awareness Scale

Bu bölümdeki sorular Pandemi Farkındalığını belirlemek için hazırlanmıştır.

Her soruda;

- (1) Hiçbir zaman
- (2) Nadiren
- (3) Sık sık
- (4) Genellikle
- (5) Her zaman

anlamına gelmektedir.

Cevaplarınızı pandemi sırasındaki davranışlarınızı düşünerek veriniz.

1. Diğer insanlarla sosyal mesafeme dikkat ederim.

1 2 3 4 5

2. Kalabalık ortamlara girmekten kaçınırım.

1 2 3 4 5

3. Hastalık belirtisi (öksürme, hapşıma vb) gösterdiğini düşündüğüm kişilerden uzaklaşıyorum.

1 2 3 4 5

4. Hastalık belirtisi gösterdiğimi düşündüğümde vakit kaybetmeden bir sağlık kuruluşuna başvururum.

1 2 3 4 5

5. Günlük hayatımda sarılma, öpme, tokalaşma vb davranışlardan kaçınırım.

1 2 3 4 5

6. Zorunlu olmadıkça evden dışarıya çıkmaktan kaçınırım.

1 2 3 4 5

7. Ellerimi düzenli olarak sabunla yıkarım.

1 2 3 4 5

8. Su ve sabun olmadığı yerlerde dezenfektan ürünleri ile ellerimi temizlerim.

1 2 3 4 5

9. Evime zorunlu olmadıkça ziyaretçi kabul etmem.

1 2 3 4 5

10. Sosyal medyada koronavirüs ile ilgili haberleri takip ederim.

1 2 3 4 5

11. Sağlık bakanlığının açıklamalarını takip ederim.

1 2 3 4 5

12. Ülkemdeki günlük vaka, ölüm, iyileşen ve yapılan test sayıları vb bilgileri takip ederim.

1 2 3 4 5

13. Diğer ülkelerdeki koronavirüs ile ilgili bilgileri ve değişimleri takip ederim.

1 2 3 4 5

14. Evden dışarı çıktığımda eldiven takarım.

1 2 3 4 5

15. Evde temas ettiğim yüzeylerin (kapı kolu, masa vb) temizliğine dikkat ederim.

1 2 3 4 5

16. Dışarı çıkmak zorunda kaldıysam eve döndüğümde kıyafetlerimi yıkarım.

1 2 3 4 5

17. Dışarıdan eve giren ürünleri (alışveriş poşetleri, ürün paketleri vb) temizlerim.

1 2 3 4 5

APPENDIX 7.7. Ethical Committee Approval

Evrak Tarih ve Sayısı: 23.03.2022-E.127730



T.C.
BALIKESİR ÜNİVERSİTESİ REKTÖRLÜĞÜ
Rektörlük

Sayı :E-19928322-302.08.01-127730
Konu : Etik Kurul Onayı

23.03.2022

NECATİBEY EĞİTİM FAKÜLTESİ DEKANLIĞINA

İlgi : 17.03.2022 tarihli ve 52899066/302.08.01/126381 sayılı yazı.

Fakülteniz Eğitim Bilimleri Bölümü Rehberlik ve Psikolojik Danışmanlık Anabilim Dalı Öğretim Üyesi Prof. Dr. Uğur GÜRGAN ve Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Bölümü Öğretim Üyesi Prof. Dr. Rasmi MUAMMER ile Yüksek Lisans öğrencisi Elif İrem GÜRGAN'ın birlikte hazırladığı " **Koronavirüs Pandemisi Sırasında Covid-19 Geçiren ve Geçirmeyen Kişilerin Fiziksel Aktivite Yorgunluk, Covid-19 Korkusu ve Covid-19 Farkındalığı Düzeylerinin İncelenmesi**" isimli Tez çalışmalarının Alan Araştırmasını (Veri Toplama) yapabilmeleri için etik kurul onay belgesi isteği ile ilgili Sosyal ve Beşeri Bilimler Etik Komisyonu 17.03.2022 tarihli ve 2022/02 sayılı toplantısında alınan karar gereği düzenlenen onay belgesi ekte gönderilmiştir.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Mehmet NARLI
Rektör Yardımcısı

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu :BSC5Y92ZUE Pin Kodu :20042

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T.C.
BALIKESİR ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER ETİK KOMİSYONU
ONAY BELGESİ

Balıkesir Üniversitesi Necatibey Eğitim Fakültesi Dekanlığının, Eğitim Bilimleri Bölümü Rehberlik ve Psikolojik Danışmanlık Anabilim Dalı Öğretim Üyesi Prof. Dr. Uğur GÜRGAN ve Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Fizyoterapi ve Rehabilitasyon Bölümü Öğretim Üyesi Prof. Dr. Rasmi MUAMMER ile Yüksek Lisans öğrencisi Elif İrem GÜRGAN'ın birlikte hazırladığı “ **Koronavirüs Pandemisi Sırasında Covit-19 Geçiren ve Geçirmeyen Kişilerin Fiziksel Aktivite Yorgunluk, Covit-19 Korkusu ve Covit-19 Farkındalığı Düzeylerinin İncelenmesi**” isimli Tez çalışmalarının Alan Araştırmasını (Veri Toplama) yapabilmeleri için bilimsel etik kurul onay belgesi talebi komisyonumuzca değerlendirilmiş ve etik açıdan uygun bulunmuştur. 17.03.2022

8. CURRICULUM VITAE

Kişisel Bilgiler

Adı	Elif İrem Gürkan
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Öğrenim Durumu

Derece	Alan	Mezun Olduğu Kurumun Adı	Mezuniyet Yılı
Yüksek Lisans	Fizyoterapi ve Rehabilitasyon	Yeditepe Üniversitesi	2023
Lisans	Fizyoterapi ve Rehabilitasyon	Yeditepe Üniversitesi	2020

Bildiği Yabancı Dilleri	Seviye
İngilizce	B2

İş Deneyimi (Sondan geçmişe doğru sıralayın)

Görevi	Kurum	Süre (Yıl - Yıl)
Fizyoterapist	Avicenna Hastanesi	1 yıl 3 ay-Halen devam ediyor
		-

Bilgisayar Bilgisi

Program	Kullanma becerisi
Microsoft	İyi
SPSS	Orta