

Determining the Physical Activity Level of Healthy Adults During Novel Coronavirus (COVID-19) Pandemic: A Descriptive Study

Yeni Koronavirüs (COVID-19) Salgını Sürecinde Sağlıklı Yetişkinlerin Fiziksel Aktivite Düzeyinin Belirlenmesi: Tanımlayıcı Bir Çalışma

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ABSTRACT Objective: With coronavirus disease-2019 pandemic, online education, remote and flexible working was introduced. Thus the process of stay-at-home has begun. The aim of the study was to determine level of physical activity of healthy adults in the pandemic process. **Material and Methods:** This is a descriptive survey study which was applied via internet. The physical activity level was evaluated with International Physical Activity Questionnaire Short Form. Healthy adults aged 18-65 years who live in Turkey were included in the study. **Results:** Total 205 responses were evaluated. The mean age of the participants was 27.35±7.30 years. The number of the participants working in the workplace was 42 (20.5%). The level of physical activity was as follows: 39 (19.0%) participants performed vigorous, 87 (57.6%) participants performed moderate physical activity. The number of participants who walked was 163 (79.5%). The participants who continued to work in workplaces were more active than those stay-at-home (p=0.048). **Conclusion:** The stay-at-home during pandemic process reduce the risk of spread but also increase the risk of chronic disease can be caused by sedentary behaviours. Therefore the society must be informed about the importance of simple exercises that can be done at home without any equipment and should be motivated to exercise by using the media's power.

Keywords: Pandemic; exercise

ÖZET Amaç: Koronavirüs hastalığı-2019 salgını ile çevrim içi eğitim, uzaktan ve esnek çalışmaya geçildi. Böylece evde kalma süreci başladı. Çalışmanın amacı, pandemi sürecinde sağlıklı yetişkinlerin fiziksel aktivite düzeyini belirlemektir. **Gereç ve Yöntemler:** İnternet üzerinden uygulanan tanımlayıcı bir anket çalışmasıdır. Fiziksel aktivite düzeyi Uluslararası Fiziksel Aktivite Anketi Kısa Formu ile değerlendirildi. Türkiye’de yaşayan 18-65 yaş arası sağlıklı yetişkinler çalışmaya dâhil edildi. **Bulgular:** Toplam 205 yanıt değerlendirildi. Katılımcıların yaş ortalaması 27,35±7,30 yıldır. İş yerinde çalışan katılımcı sayısı 42 (%20,5) kişiydi. Fiziksel aktivite düzeyi şu şekildedeydi: 39 (%19,0) katılımcı şiddetli, 87 (%57,6) katılımcı orta derecede fiziksel aktivite yaptı. Yürüyen katılımcı sayısı 163 (%79,5) kişiydi. İş yerlerinde çalışmaya devam eden katılımcılar, evde kalmayı takip edenlere göre daha aktifti (p=0,048). **Sonuç:** Pandemi sürecinde evde kalma, yayılma riskini azaltırken, sedanter davranışlardan kaynaklanan kronik hastalık riskini de artırabilir. Bu nedenle toplum, evde herhangi bir ekipman kullanmadan yapılabilecek basit egzersizlerin önemi konusunda bilgilendirilmeli ve medyanın gücü kullanılarak egzersiz yapmaya motive edilmelidir.

Anahtar Kelimeler: Pandemi; egzersiz

Throughout human history, the world has witnessed many pandemics. These pandemics such as plague of 664 (668-664 BC) in the British Isles, black

death (1347-1351), cholera (1817-1823), smallpox (15th-17th centuries), Spanish flu or H1N1 (1918-1919) (showed its effect in the 20th and 21st century),

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Hong Kong flu or H3N2 (1968-1970), HIV/AIDS (1981-present), severe acute respiratory syndrome (SARS) (2002-2003), swine flu or H1N1 (2009-2010) and Ebola (2014-2016) have deeply affected the history of the world.¹

Pandemic is the definition of a situation when disease happens either globally or spreads from a country, region or continent to the whole world.² According to the World Health Organization (WHO), a pandemic is the spread of a new disease around the world. An influenza pandemic occurs when a new flu virus appears and spreads to the world and most people do not have immunity against it. Viruses that caused past pandemics were mainly animal flu viruses. Influenza pandemics and seasonal influenza have both similarities and differences. For example, both seasonal and pandemic influenza can cause infections in all age groups and most cases turn into self-limiting diseases where the person recovers without any treatment. Moreover, most of the fatalities of the typical seasonal flu are among the elderly people, while on the contrary, influenza pandemics cause severe or fatal outcomes for young people regardless of their health status or they chronic disorders.³ The novel type coronavirus pandemic (now called SARS-CoV-2, causing COVID-19 disease) appeared in Wuhan, China first and later it has spread all around the world.⁴ The first COVID-19 case in Turkey was detected on March 11, 2020.⁵

With the detection of the first case, the distance learning system was introduced for schools and universities on March 16, 2020, as the first measure to minimize the spread of the disease.⁶ Additionally, due to the pandemic, most of the public and private workplaces started implementing the model of working remotely and flexible working timings in line with the official newspaper circular dated 22 March 2020 and numbered 2020/4.⁷ The process of stay-at-home started with this, and many individuals continued their education or their work remotely for about three months. The process of stay-at-home, while preventing the transmission of the disease, directly affects the social life of individuals such as commuting from home to work or school, going shopping, walking in the park, etc.. Therefore, the process of stay-at-home

might affect the physical activity level of healthy adults.

The primary objective of this study was to determine the physical activity levels of healthy adults aged 18-65 years in Turkey during the novel type of coronavirus pandemic. The secondary objective of the study was to compare the levels of physical activity among individuals who continued to work in their workplaces during the pandemic process and those who were following stay-at-home instruction including working from home, the distance learning and the ones who did not work.

MATERIAL AND METHODS

STUDY DESIGN

This study, which was planned as a prospective, descriptive survey study, had online-based questions. The participants answered the questions via the internet between April and July 2020. Ethical approval of the study was obtained from the Non-interventional Clinical Research Ethics Committee of Afyonkarahisar Health Science University (Date/issue: 13.04.2019/2020/318) and the study follows the principles of the Declaration of Helsinki 2008. All individuals were informed through written online documents and they were permitted to answer the questions after the informed consent approval button was clicked.

PARTICIPANTS

Firstly the questionnaire was sent to approximately 500 individuals residing in various provinces in Turkey randomly and was answered by 249 individuals. Then, the participants who met the inclusion criteria among the completed surveys were evaluated within the scope of the research. Communication with the participants of the study was conducted via online survey software (Google Forms) and social media communication application (WhatsApp). Forty-four individuals' questionnaires were incomplete and could not meet the inclusion criteria therefore they were excluded from the study. The study included a total of 205 individuals with a mean age of 27.35 ± 7.30 (18-49) years. The inclusion criteria for the participants were as follows; to be between the age of 18-65, healthy (physically, psychologically and cognitively) and to live in Turkey.

Individuals with pregnancy, with a history of any surgery in the last 6 months, and with the presence of any acute or chronic diseases (infection-related, neurological, rheumatological, cardiovascular, orthopedic... etc.) were excluded from the study.

OUTCOME MEASURES

The demographic data of the participants and the International Physical Activity Questionnaires-Short Form (IPAQ-SF) were recorded using the internet. Participants needed approximately 10 minutes to answer the questions.

IPAQ-SF: In the study, IPAQ-SF which was developed for international screening studies with the support of the WHO was used. The validity and reliability of the Turkish version of the questionnaire were performed by Saglam et al.⁸ The short form of the questionnaire (7 questions) provides information about walking, moderate and vigorous activities and time spent sitting. Total score calculation of the short form included the sum of frequency (days) and duration (minutes) of walking, moderate and vigorous activities. The energy required for the activities was calculated with the Metabolic Equivalent of Task (MET)-minute score. The sitting score (sedentary behavior level) was calculated separately. A score as "MET-minute/week" was obtained by multiplying the minute, day and MET value (multiples of resting oxygen consumption). Walking time (minutes) was multiplied by 3.3 MET for the calculation of the walking score. During the calculation, 4 MET values for moderate activities, and 8 MET values for vigorous activities were used. Following the calculation, a MET score under 600 was regarded as physically inactive; a score between 600 and 3,000 was regarded as minimally active and a score of over 3,000 was regarded as sufficiently active or Health-enhancing Physical Activity.⁹

STATISTICAL ANALYSIS

Data were analyzed with SPSS version 22.0 (IBM statistics Armonk, NY, USA). Descriptive statistics were presented as mean±standard deviation (SD), values, number (n) and percentage (%). The Kolmogorov-Smirnov test was used to determine the normal distribution of the parameters. The comparisons between the groups were evaluated by univariate AN-

COVA with age and body mass index (BMI) as covariate variable. Statistical significance was accepted as $p < 0.05$. As a result of the power analysis, a minimum of 143 participants could achieve 80% power at a 95% confidence level for $w = 0.3$ effect size.

RESULTS

A total of 205 healthy individuals with a mean age of 27.35 ± 7.30 (18-49) years and BMI average of 22.75 ± 3.71 kg/cm² were included in this study. The demographic characteristics of the participants such as gender, education level, the habit of smoking, working status and working method are shown in [Table 1](#).

Information about vigorous and moderate physical activity, walking and sitting time of the participants are shown in [Table 2](#).

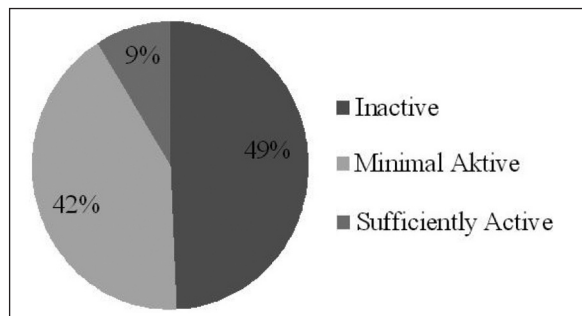
The number of inactive participants was 101 (49.3%), while the number of minimally active participants was 86 (41.9%) and the number of sufficiently active participants was 18 (8.8%). Physical activity levels of the participants according to their total MET scores are shown in [Figure 1](#).

TABLE 1: The demographic characteristics of the participants.

Variables		n (%)
Gender	Women	152 (74.1)
	Men	53 (25.9)
Education level	Primary school	4 (2)
	High school	15 (7.3)
	Undergraduate	156 (76.1)
	Graduate	30 (14.6)
Smoking	Yes	35 (17.1)
	No	170 (82.9)
Job	Student	93 (45.4)
	Physiotherapist	54 (26.4)
	Housewife	12 (5.9)
	Officer	11 (5.4)
	Teacher	11 (5.4)
	Academician	5 (2.4)
	Worker	4 (2)
	Other	15 (7.1)
Working status	Yes	68 (33.2)
	No	137 (66.8)
Working method	Workplace	42 (20.5)
	Home	26 (12.7)
	Unemployed	137 (66.8)

TABLE 2: Information about vigorous and moderate physical activity, walking and sitting time of the participants.

Variables		n (%)
Physical activity	Vigorous	39 (19.0)
	Moderate	87 (57.6)
Walking	Yes	163 (79.5)
	No	42 (20.5)
Sitting Time	≤8 hours a day	96 (46.8)
	>8 hours a day	109 (53.2)

**FIGURE 1:** Physical activity levels of the participants.**TABLE 3:** Comparison of the participants who were following stay-at-home and continued to work in their workplaces in terms of physical activity level by ANCOVA (age and body mass index as covariate).

Variable	Participants		p value
	Following stay-at-home (n=42)	Working in workplaces (n=163)	
Physical activity level (Total MET)	913.55±1111.48	2971.18±6214.98	0.049*

*p<0.05; MET: Metabolic Equivalent of Task.

When the physical activity levels of those who were following stay-at-home instruction (including working from home, following the distance learning, the ones who did not work) and the participants who continued to work in their workplaces were compared, a difference was found in favor of those who continued to work in their workplaces (p=0.049) (Table 3).

DISCUSSION

In this study, the physical activity level of healthy individuals was evaluated during the pandemic, and

comparison among those who continued to work in their workplaces as usual, and those who follow the stay-at-home model was carried out. As a result, approximately half of the participants were found to be inactive. Moreover, participants who continued to work in their workplaces were found to be more active than those who stayed at home.

COVID-19 caused a global outbreak that led to a large number of infected people and fatalities. To be able to control the spread of the COVID-19 virus, governments implemented restrictions on outdoor activities and strict quarantine on overall society. An important consequence of quarantine is lifestyle changes such as reduced physical activity.¹⁰ Potential causes of the decline in physical activity might be related to the closure of gyms, swimming pools and parks and restrictions on access to open areas and restriction on movement.¹¹ According to the American College of Sports Medicine recommendation, in order to maintain their health conditions, all healthy adults between the ages of 18-65 should perform either the moderate-intensity level of aerobic physical activity for a minimum of 30 min on 5 days a week or vigorous-intensity aerobic activity for a minimum of 20 min on 3 days a week.¹² According to this study results, the participants could not manage this recommendation during the pandemic. In addition, considering the studies evaluating the physical activity level of healthy adults which were conducted before the pandemic, the physical activity level of the adults has clearly decreased due to the quarantine application. The results of the 'Eurobarometer Sports and Physical Activity Survey-2018' (2018) conducted regularly in the European Union countries indicate that 42% of the healthy adults perform the vigorous physical activity; 52% of them perform a moderate level of physical activity, 84% of them walk at least 10 minutes and 12% of them sit more than 8 hours.¹³ In Turkey, the studies that were conducted in the pre-pandemic period report the physical activity levels of healthy adults as follows; in the study of Naz et al., 17% of the participants as inactive, 70% of them as minimally active and 13% of them as sufficiently active; Serel Arslan et al. 27.1% of the participants as inactive, 57.9% of them as minimally active and 15% of them as sufficiently active; Aktaş et al. 41.8% of the participants as inactive, 43.5% of them as minimally

active and 14.8% of them as sufficiently active.¹⁴⁻¹⁶ Similarly, Kaya Ciddi et al. stated that individuals were physically inactive during the pandemic and stay-at-home period and did not perform regular physical activities compared to the pre-isolation period.¹⁷

Recent systematic reviews and meta-analysis suggest that the occupational tasks, working hours and workplace conditions affect the individual's physical activity level. According to the studies that compared the individuals working in jobs which are more physical (blue-collar workers) and others working in the office (white-collar workers), reported that the level of physical activity of blue-collar workers was higher.^{18,19} Also, considering the fact that most of the workers spend their waking hours of a day at work, workplaces could be considered as an opportunity for physical activities. Previously conducted studies showed that changes happening in the workplace environment could cause differences in physical activity levels of the workers and improve cardiometabolic health indicators of them.^{20,21} Our study results reveal that the participants who continued to work in their workplaces are physically more active than the ones who stayed at home. According to our opinions, the ability to move freely to get to their workplace and back to their homes, the choice to be able to use all means of transport, and active working hours of the participants who continued to work in their workplaces during the pandemic, would increase their physical activity levels. The limited space at home to walk or exercise could be caused the physical activity levels to reduce for the participants who stayed-at-home. In addition, their opportunity and motivation to perform physical activities might be reduced due to restrictions on social activities and access to open areas.

Considering the information obtained from the literature, the strength of this study is that, it is one of the rare studies evaluating the level of physical activity among healthy adults during the pandemic and being the only study comparing the physical activity levels of those who continued to work in their workplaces and those who stayed at home during the pandemic.

One of the limitations of the study was that most of the participants were young individuals as the survey was conducted via the internet and young individuals use social media more actively than the others. This may affect the average physical activity level in the study therefore the individuals looked more active physically than they should have been probably. Another limitation of the study was that the physical activity level of the participants before the pandemic could not be questioned. Therefore, the comparison of the physical activity levels of the participants before and during the pandemic could not be done. However, comparing physical activity levels between participants who continued to work in their workplace and participants who stayed at home may provide clues about the inactivity experienced during the pandemic.

CONCLUSION

As a result, this study suggested that the pandemic process can reduce the physical activity level of healthy adults and the participants that continued to work in their workplaces may be more active than the participants who stayed at home. Stay-at-home during the pandemic to be able to control the spread of the virus is a priority in terms of public health. However, although staying at home is a safe method of preventing the spread of the virus, it causes physical activities to reduce which might lead to sedentary behaviors that would contribute to anxiety and depression. All of these might lead to a lifestyle that will be the reason for various chronic diseases development that will eventually cause the overall health condition of the individual to deteriorate.²² Therefore, precautions must be taken to make sure that individuals follow the daily exercise and physical activity routines as well as to maintain the function of the immune system obtained through regular exercises. The society must be informed about the importance of simple exercises (strengthening exercises, balance and coordination exercises, yoga, Tai Chi, pilates, etc.) that can be done at home without any equipment by physiotherapists and should be motivated to exercise by using the media's power.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or mem-

bers of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Emel Taşvuran Horata; **Design:** Emel Taşvuran Horata; **Control/Supervision:** Emel Taşvuran Horata, Erdal Horata; **Data Collection and/or Processing:** Emel Taşvuran Horata, Erdal Horata; **Analysis and/or Interpretation:** Emel Taşvuran Horata, Erdal Horata; **Literature Review:** Emel Taşvuran Horata, Erdal Horata; **Writing the Article:** Emel Taşvuran Horata, Erdal Horata; **Critical Review:** Emel Taşvuran Horata, Erdal Horata; **References and Fundings:** Emel Taşvuran Horata, Erdal Horata; **Materials:** Emel Taşvuran Horata, Erdal Horata.

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