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Özgün Araştırma

Pandemi Döneminde Gençlerin Fiziksel Aktivite Durumu, Egzersiz Bariyerleri, Uyku ve Yaşam Kalitesinin İncelenmesi

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Öz

Amaç: Çalışma, COVID-19 döneminde uzaktan eğitim alan gençlerin fiziksel aktivite düzeylerini, egzersiz bariyerlerini, uyku ve yaşam kalitelerini incelemek amacıyla planlanmıştır. Ayrıca fiziksel aktivite düzeyinin bu faktörlerle ilişkisinin belirlenmesi amaçlanmıştır.
Yöntemler: Uluslararası Fiziksel Aktivite Anketi-Kısa Form (IPAQ-SF) ile fiziksel aktivite düzeyi; Egzersizin Faydaları/Bariyerleri Ölçeğinin (EBBS) Bariyer Ölçeği ile egzersiz bariyerleri; Pittsburgh Uyku Kalitesi İndeksi (PSQI) ile uyku kalitesi; Yaşam kalitesi ise Kısa Form Sağlık Anketi 36 (SF-36) ile değerlendirilerek analiz edildi. Değişkenler Kolmogorov-Smirnov testi ile analiz edildi.
Bulgular: Araştırmaya sağlık bilimleri alanında öğrenim gören 18-24 yaş arası 339 öğrenci dahil edildi. Bireylerin %25,7'sinin inaktif olduğu ve egzersiz yapmaya en büyük engelin çevresel faktörler olduğu belirlendi. PUKİ puanı 6 (4-8) olarak bulundu ve %70,8'inin uyku kalitesinin kötü olduğu ve yaşam kalitesinde duygusal rol zorluğu 33,3 (0-100) alanının en düşük puana sahip olduğu tespit edildi. Fiziksel aktivite düzeyinin toplam egzersiz bariyer puanı, uyku süresi ve fiziksel fonksiyon ile anlamlı ilişkisi olduğu belirlendi ($p<0.05$).
Sonuç: Araştırmanın sonuçlarına göre üniversite öğrencilerinin fiziksel aktivite düzeyi, uyku kalitesi ve yaşam kalitelerini arttırmak için önlemlerin alınması gerekmektedir. Önümüzdeki yıllarda olası bir kapanma veya hareketsizlik döneminde gençlere sağlıklı yaşam koşullarını sağlayabilmek önemlidir.

Anahtar kelimeler: *egzersiz, pandemik, COVID-19*

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Original Research

Examination of Physical Activity Status, Exercise Barriers, Sleep and Quality of Life of Youth During the Pandemic Period

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Abstract

Objectives: The study was planned to examine the physical activity levels, exercise barriers, sleep, and life quality of young people receiving distance education during the COVID-19 pandemic period. It also aims to determine the correlation between physical activity levels and these factors.
Methods: Physical activity level was assessed with the International Physical Activity Questionnaire-Short Form (IPAQ-SF); exercise barriers were evaluated with the Barrier Scale of the Benefits/Barriers Scale of Exercise (EBBS); sleep quality was assessed with the Pittsburgh Sleep Quality Index (PSQI); and quality of life was analyzed with the Short Form Health Questionnaire 36 (SF-36). Variables were analyzed with the Kolmogorov-Smirnov test.
Results: Three hundred and thirty-nine students aged between 18-24 years and studying in health sciences were included in the study. 25.7% of individuals were inactive; the biggest exercise barriers were environmental factors. The PSQI score was found to be 6 (4-8), 70.8% had poor sleep quality, and the emotional role difficulty domain in quality of life had the lowest score, 33.3 (0-100). Physical activity level was correlated with the total exercise-barrier score, sleep duration, and physical function ($p<0.05$).
Conclusion: According to the results of the study, it is necessary to take measures to improve the physical activity level, sleep, and quality of life of university students as they may have sustained problems. It is also important to be ready for increasing healthy life in possible shutdown or immobilization period.

Keywords: *physical activity, pandemic, COVID-19*

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Introduction

The novel coronavirus disease (COVID-19) was first identified in a group of patients who developed respiratory symptoms, such as fever, cough, and shortness of breath, in late December 2019 in Wuhan, China (Chen et al., 2020; Li et al., 2020; Yang et al., 2020). The process, which started with the World Health Organization's (WHO) reporting the disease that emerged in China on January 5, 2020, to the world as "pneumonia of unknown cause," confirmed that the disease was transmitted from person to person on January 20, and WHO's status on January 30, 2020 (World Health Organisation, 2020). It continued with the declaration of a "global pandemic" on March 11, 2020, by declaring it an "Emergency Public Health Situation of International Importance" (Şirin & Özkan, 2020).

With the introduction of quarantine practices during the pandemic, the living conditions and social environments of young people who continue university education have undergone a sudden change. For this reason, physical activity (PA) behaviors should be monitored, and barriers to their activities should be determined. Thus, it should be ensured that they maintain or increase their PA habits. At the same time, it is necessary to examine the sleep quality and quality of life of young people, which have been reported to be associated with both the pandemic and PA (Barrea et al., 2020; Diniz et al., 2020; Faulkner et al., 2021). A previous review found severe mental health problems among individuals and populations who have undergone quarantine and isolation in different contexts (Hossain et al., 2020). Another review stated that social distancing measures reduce PA levels and that PA may be protective for mental health (Caputo & Reichert, 2020). Suboptimal sleep patterns have been linked to a range of mental health and other health-related consequences (Zhang et al., 2017). Considering that lifestyle habits are formed during youth, it is important to determine what influences young people during this period.

In this study, we aimed to evaluate PA levels, exercise barriers, sleep quality, and quality of life of university students who continued distance education during the period of quarantine restrictions due to the pandemic. The second aim of the research is to determine the relationship between exercise barriers, sleep quality, quality of life, and physical activity level.

Methods

Study data was collected in January 2021 during the 2020–2021 fall academic year, when quarantine restrictions continued. This study was approved by the decision of the ethics committee of Gazi University (Decision number: E-77082166-302.08.01-8739). An online link

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was sent to individuals who agreed to participate in the study, and their answers were collected. During this period, individuals under the age of 20 could only go out between 1.00 and 4.00 p.m., and all individuals had a weekend curfew. The inclusion criteria were being between 18 and 24 years old, having remote continuing university education, and agreement to participate in the study. If they continued education in the classroom or school and if there was a missing answer in the questionnaires, they were excluded from the study. The information about age, sex, height, weight, whether they had any diseases, with whom they lived during distance education, and their class information were recorded from the individuals included in the study.

Physical activity was assessed using the Turkish version of the International Physical Activity Scale-Short Form (IPAQ-SF). The Turkish validity and reliability of the questionnaire were conducted on university students, and it was reported that it is a reliable and valid method for evaluating physical activity (Saglam et al., 2010). IPAQ-SF consists of 7 questions and provides information about individuals' activity levels in the last week. The questions in the survey include the duration of vigorous and moderate physical activity, the time spent walking, and the time spent sitting in the last week. In their meta-analysis published in 2020, Sember et al. stated that using the IPAQ-SF to assess physical activity is one of the most valid and reliable self-reported methods (Sember et al., 2020). In our study, individuals with a weekly energy expenditure of less than 600 METs according to the IPAQ-SF were categorized as inactive, and those with more than 600 minimally active and very active were classified as active (Alsufiany et al., 2020; Hussain, 2017).

The Benefits/Barriers to Exercise Scale (EBBS), whose Turkish validity and reliability were tested on university students, was used to determine the obstacles to university students' doing exercise (Ortabag et al., 2010). The EBBS consists of two main components: benefits and barriers, and these two components can be used separately. In this study, the barrier component was used alone because it was reported that barriers were more guiding in predicting exercise behavior (El Ansari & Lovell, 2009). The barrier component includes 14 items organized into four subscales: exercise milieu, time expenditure, physical exertion, and family discouragement. This component exhibits high internal consistency (0.87) and test-retest reliability (0.77) (Sechrist et al., 1987). Each of the 14 barrier items is scored in a 4-point Likert format (1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree). The test result is calculated between a minimum of 14 and a maximum of 56 points, and a high score indicates that the individual's perception of obstacles to exercise is high.

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The sleep quality of the participants was evaluated using the Pittsburgh Sleep Quality Index (PSQI). The PSQI evaluates the sleep quality of individuals in the previous month. The questionnaire consisted of 24 questions. Scored questions are calculated by dividing them into seven components. Each component is scored between 0-3, and the total score is calculated between 0-21 to determine the PSQI total score. A total PSQI score of five or more is indicative of "poor" sleep quality (Buysse et al., 1989). The Turkish version of the survey is valid and reliable (Agargun, 1996).

Participants' quality of life was assessed using the "Short Form Health Questionnaire-36" (SF-36). SF-36 includes questions evaluating physical function, role limitations due to physical health and emotional problems, energy and fatigue status, emotional well-being, social function, pain, and general health subparameters. Each subparameter is evaluated within itself while scoring; 0 points indicate poor health, while 100 points indicate good health. The Turkish version of the survey has validity and reliability (Demiral et al., 2006).

Statistical Analysis

The "Statistical Package for Social Sciences" (SPSS) version 21.0 (SPSS Inc., Chicago, II, USA) was used to analyze the data obtained in the study. Variables were analyzed using the Kolmogorov-Smirnov test and expressed as the median and Interquartile Range (IQR) due to non-normal distribution. The data obtained from the study were presented with frequency and percentage analysis for categorical variables. Individuals were divided into two groups according to their IPAQ-SF values, and the Mann-Whitney U test was used to compare values between the groups. Spearman's correlation analysis was used to examine the relationship between PA levels and exercise barriers, sleep quality, and quality of life. $P<0.05$ was determined as the statistical significance level. In the study, the degree of correlation was interpreted according to the correlation coefficient as "weak" ($r < 0.40$), "moderate" ($r = 0.40$ to 0.69), or "strong" ($r \geq 0.70$) (Schober et al., 2018).

Results

Table 1 presents the demographic characteristics. 83% of individuals who agreed to participate were female, and the mean age was 19.48 ±1.2 years (Table 1).

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Table 1. Sociodemographic characteristics (n=339)

Characteristics	
Age, mean (SD)	19.48 (1.2)
Sex, n (%)	
Female	283 (83.5)
Male	56 (16.5)
BMI (kg/m^2), median (IQR)	
Underweight	66 (19.5)
Normal weight	222 (65.5)
Overweight	43 (12.7)
Obesity	8 (2.4)

SD; standard deviation, IQR; interquartile range, BMI; body mass index

According to the IPAQ-SF, 25.7% of the individuals were inactive, 56% were minimally active, and 46.9% spent more than 6 hours a day sitting. The total exercise barrier score of the individuals was calculated as 28 (23-33). According to the answers given by individuals, the biggest barriers to exercising during the pandemic period were caused by factors related to the exercise environment and physical exertion. When the exercise barriers were compared between the active and inactive groups, a significant difference ($p<0.05$) was observed in 9 out of 14 questions. According to the answers given by individuals, the biggest barriers to exercising during the pandemic period were factors related to the exercise milieu and physical strain.

According to the PSQI results, 70.8% of individuals had poor sleep quality (PSQI ≥ 5). When we compared the sleep quality of inactive and active individuals, there was no difference between the groups ($p>0.05$). The quality of life of individuals was affected mainly by emotional role difficulties, energy, and mental health dimensions (Table 2).

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Table 2. The PA levels of individuals, activity levels, their sleep, and quality of life (n=339)

IPAQ-SF Total Energy Expenditure (MET-min/week), median (IQR)	1208 (579 - 2430)
Inactive (0-600 MET min/week), n (%)	87 (25.7)
Minimal active (600-3000 MET min/week), n (%)	190 (56)
Very active (>3000 MET min/week), n (%)	62 (18.3)
Vigorous PA, MET (min/week), median (IQR)	0 (0 - 480)
Moderate PA, MET (min/week), median (IQR)	160 (80 - 480)
Walking MET (min/week), median (IQR)	528 (198 - 1386)
Sitting hours (min/day), median (IQR)	300 (180 - 540)
< 2 h, n (%)	33 (9.7)
= 2-5 h, n (%)	147 (43.4)
> 6 h, n (%)	159 (46.9)
PSQI	**Median (IQR)**
1. Subjective sleep quality	1 (1-2)
2. Sleep latency	2 (1-2)
3. Sleep duration	0 (0-0)
4. Sleep efficiency	0 (0-0)
5. Sleep disturbance	1 (1-2)
6. Use of sleep medication	0 (0-0)
7. Daytime dysfunction	1 (0-2)
Sleep Quality	**n (%)**
Good Sleep Quality (PSQI Total Score<5)	99 (29.2)
Poor Sleep Quality (PSQI Total Score ≥5)	240 (70.8)
SF-36	**Median (IQR)**
Physical functioning	95 (85-100)
Role limitations (physical)	75 (25-100)
Role limitations (emotional)	33.3 (0-100)
Energy/Vitality	45 (30-60)
Mental health	48 (36-60)
Social functioning	62.5 (37.5-75)
Bodily pain	67.5 (57.5-87.5)
General health perceptions	55 (50-65)

IQR, interquartile range

There was a negative and low-significant relationship between IPAQ-SF and the EBBS and a positive and low-significant correlation with PSQI only with sleep duration ($p<0.05$, Table 3). When the relationship between IPAQ-SF and SF-36 subparameters was examined, a low-level positive correlation was found only between physical function sub-parameters ($p<0.05$, Table 3).

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Table 3. Investigation of the relationship between PA levels and exercise barriers, sleep, and quality of life

	IPAQ-SF	
	r	**p-value**
EBBS	-0.216	**<0.0001***
PSQI total score	-0.034	0.535
1. Subjective sleep quality	-0.091	0.094
2. Sleep latency	-0.076	0.162
3. Sleep duration	0.211	**<0.0001***
4. Sleep efficiency	-0.012	0.824
5. Sleep disturbance	-0.006	0.916
6. Use of sleep medication	0.034	0.536
7. Daytime dysfunction	-0.085	0.118
SF-36		
Physical functioning	0.146	**0.007***
Role limitations (physical)	-0.010	0.849
Role limitations (emotional)	0.008	0.084
Energy/Vitality	0.000	0.133
Mental health	0.049	0.366
Social functioning	0.096	0.078
Bodily pain	-0.048	0.375
General health perceptions	0.031	0.567

*=p<0.05

Discussion and Conclusion

Our study aimed to identify and analyze PA behaviors, exercise barriers, sleep quality, and the quality of life of young people during the quarantine period due to the COVID-19 pandemic. According to the results, most young people were 56% minimally active, and 26% were inactive. Only 18.3% of the students were very active, and very few engaged in vigorous activities. Of the youth, 46.9% spent more than six hours a day sitting. It has been determined that the biggest barriers to exercise are environment and physical strain. 70% of individuals had poor sleep quality. They had low quality of life scores, especially in the dimensions of emotional state, energy, and mental health. In addition, inactive individuals had more environmental and individual barriers than active youth. Physical activity level and exercise barriers, sleep duration, and the physical function subdimension of quality of life were related.

Kaya Ciddi and Yazgan evaluated the PA level of 140 university students during the pandemic period and reported an inactivity rate of 70% (Kaya Ciddi & Yazgan, 2020). This result was much higher than the inactivity rate obtained in the present study. Faulkner et al. evaluated the PA levels of 8,425 individuals with the IPAQ-SF at the beginning of the COVID-19 restrictions (Faulkner et al., 2021). Similar to our study, most individuals were minimally

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active. It is an expected result that physical activity decreases and sedentary behaviors increase as a result of physical distance.

Romero-Blanco et al. evaluated the weekly PA of 213 university students with a mean age of 20.5±4.5 years in Spain using IPAQ-SF before and during quarantine (Romero-Blanco et al., 2020). They found that they did PA and spent more time sitting. The individuals in our study also showed similar activity behavior and spent much time walking and sitting together with moderate-intensity activities. They also reported that the social environment of students can be a barrier to the formation of exercise habits and that motivation has an impact on the PA of university students (Romero-Blanco et al., 2020). Similarly, lack of motivation and curfews have been shown to be the most important barriers to exercise in the isolation process (Kaya Ciddi & Yazgan, 2020). This study showed that the biggest barrier for young people to exercise during the pandemic period was the physical environment. At the same time, they thought that exercise was tiring; that is, the physical strain factor was another barrier in this process. Lesser and Nienhuis evaluated PA barriers in 1908 individuals and showed that individuals with low PA levels felt more difficulty participating in PA since the COVID-19 pandemic began (Lesser & Nienhuis, 2020).

Similarly, we found that individuals with low PA levels had higher perceptions of exercise barriers, and this result was expected. It has been observed that the obstacles of especially inactive individuals are mostly individual obstacles. Considering the results obtained from our study and those in the literature, removing the barriers young people face to exercise is a method that can increase the level of PA. In particular, information should be shared in order to exercise and overcome the perception of fatigue, and regular exercises will reduce the fatigue and make them more vigorous and dynamic. It is necessary to explain that it is possible to perform exercises at home. Physiotherapists need to encourage PA (Lowe et al., 2018). For this purpose, it is an important solution for physiotherapists or researchers to inform young people about workout programs and easy-to-make recipes and share them on social media (Pope et al., 2019).

Although individuals reach sufficient sleep duration, most have poor sleep quality scores. Moreover, it was observed that the largest area of deterioration in sleep quality in the young participants in our study was the time to fall asleep. This brings us to the conclusion that with the deterioration of biorhythms, falling asleep becomes difficult, and sleep quality deteriorates (Dong et al., 2019; Ong et al., 2021). In Italy, Cellini et al. examined sleep quality using PSQI in 1310 individuals and found similar results. In this study, the beginning and two

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weeks later data of quarantine practices were evaluated, and it was determined that individuals had worse sleep quality despite spending more time in bed. In addition, they found that the proportion of individuals reporting poor sleep quality increased from 40% to 52% after a 2-week quarantine (Cellini et al., 2020). The increase in poor sleep quality in individuals who were restricted for only two weeks was the reason why most of the individuals evaluated in our study were included in similar pandemic restrictions for about one year. This helps to explain why they have poor sleep quality. As a significant consequence of lack of exposure to natural daylight and increased time spent indoors online, numerous health risks, ranging from physiological disorders (sleep, obesity), psychological problems (depression, anxiety), and cognitive disorders have been reported (Dresp-Langley, 2020). Public strategies during the pandemic should actively encourage spending more time outdoors during the day, as daylight exposure can alleviate the adverse effects of social restriction and prevent sleep disruption (Korman et al., 2022).

Considering that there is a relationship between PA levels and sleep in our study, no difference was observed between the sleep quality of active and inactive individuals. In addition, PA level was found to be associated only with sleep duration but not with the PSQI total score. When we examined the literature, our results were compatible with studies showing that PA does not affect sleep (Çalık, 2013; Sayaca & Karaman, 2021). Zhang et al. stated that the reason for this may be the negative emotions caused by the COVID-19 pandemic in individuals rather than physical activity (Zhang et al., 2020). Even though the results are similar, they stated that physical activity will have a positive effect on the negative emotions caused by the pandemic and that the activity can increase sleep quality by indirectly affecting it. Another reason can be interpreted as the insufficiency of weekly moderate and vigorous PA levels of the individuals we included in our study because, in previously published studies reporting that PA is effective on sleep quality and its subcomponents, it has been shown that regular moderate and vigorous activities have an improving effect on sleep quality (Carson et al., 2016; Feng et al., 2014).

The quality of life of the individuals included in the study was examined using SF-36, and the lowest quality of life scores during the pandemic period were in the areas of emotional role difficulty, energy, and mental health. This result shows that during the pandemic period, the mental health area related to the mood of individuals' quality of life was more affected than the area representing physical health. Studies have shown that the quality of life during the pandemic is mainly affected by social functions, emotional states, and mental health areas due

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to fear and anxiety (Bulguroglu et al., 2021; Liu et al., 2020; Ozkul, 2021). This situation is similar to that in our study. Many studies showing anxiety about being sick due to the presence of COVID-19, increased stress during the pandemic period, and anxiety and depression support these results (Constant et al., 2020; Faulkner et al., 2021; Zhang et al., 2020).

Our study showed that PA level and quality of life were only related to physical function. When other studies examined the effects of PA levels on quality of life, Ozkul showed that PA is associated with general and mental health areas, while Ciddi and Yazgan also showed that PA is associated only with mental health areas (Kaya Ciddi & Yazgan, 2020; Ozkul, 2021). When our study findings and other study results are examined together, physical activity can be an effective tool to increase or maintain the quality of life, which was negatively affected during the pandemic period.

A limitation of our study is that we did not have pre-pandemic data for the individuals we evaluated. Therefore, we were not able to show the changes in physical activity, exercise barriers, sleep, and quality of life during the pandemic, and we did not evaluate the changes in stress, anxiety, and depression levels and emotional states of individuals that may affect the areas we evaluated. The strengths of our study are that it evaluates the effects of the pandemic period from many different aspects and that we completed the study with 97% power. At the same time, it is one of the few studies in Turkey that evaluated the physical activity level, exercise barriers, sleep, and quality of life of university students during the pandemic period.

"Stay at home" calls made to protect people from the pandemic should encourage more staying active at home, should include the necessity of interrupting sitting times with activities every half an hour and exercise recommendations that can be done at home. Today, pandemic restrictions are over. New studies can be planned to determine whether the detected problems continue. This study provides us with a detailed resource to protect physical health during any pandemic that will require confinement at home in the coming years.

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Competing Interests

None declared.

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