The Impact of the New Coronavirus Disease on University Students: Anxiety, Health Anxiety, and Physical Activity

Yeni Koronavirüs Hastalığının Üniversite Öğrencileri Üzerindeki Etkisi: Kaygı, Sağlık Kaygısı ve Fiziksel Aktivite

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ABSTRACT

Aim: Epidemics in the past have shown that anxiety and health concerns were common at pandemic. Physical activity has an important role in mental health and cognitive function. Staying at home for a long period of time is probably lead to reduced regular physical activity, established sedentary behaviors. The aim of this study is to determine the level of physical activity, health-related anxiety, and anxiety levels and the relationship between them in university students during the COVID-19 outbreak.

Method: The study was carried out with 190 health sciences faculty students. International Physical Activity Questionnaire-short form to determine the level of physical activity, Beck Anxiety Inventory to determine the anxiety level, and Health Anxiety Inventory-Short to determine the health anxiety level were used. All data were collected online.

Results: In this study, 153 female (mean age: 20.82±1.541 years), 37 male (mean age: 21.22±2.760 years) students participated. Male students were significantly more active (p=0.022). While the level of health anxiety was found to be higher in both female and male students who went to the hospital (respectively, p=0.006, p=0.055), the level of anxiety was only higher in female students (p=0.006). There was a moderate negative correlation between walking activity level and anxiety level in male students (p=0,013;r=-0,406).

Conclusion: It was found that even an easily accessible activity, such as walking, has a positive effect on anxiety and concluded that it should be encouraged. Indoor or outdoor exercise programs should be encouraged, especially for female students who are more sedentary than males.

Keywords: Anxiety, Coronavirus, Outbreak, Physical Activity, Student

ÖZ

Amaç: Geçmişteki salgınlar, pandemide kaygı ve sağlık endişelerinin yaygın olduğunu göstermiştir. Fiziksel aktivitenin zihinsel sağlık ve bilişsel işlevde önemli bir rolü vardır. Salgın döneminde olduğu gibi uzun süreli evde kalmak, düzenli fiziksel aktivitenin azalmasına, yerleşmiş hareketsiz davranışlara yol açabilir. Bu çalışmanın amacı, COVID-19 nedeniyle yaşanan salgında üniversite öğrencilerinde fiziksel aktivite düzeyi, sağlıkla ilgili kaygı ve kaygı düzeylerini ve bunların aralarındaki ilişkiyi belirlemektir.

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Gereç ve yöntemler: Çalışma, sağlık bilimleri fakültesi öğrencilerinden 190 kişi ile gerçekleştirildi. Fiziksel aktivite düzeyini belirlemek için Uluslararası Fiziksel Aktivite Anketi-kısa form, kaygı düzeyini belirlemek için Beck Anksiyete Envanteri, sağlık kaygısı düzeyini belirlemek için Sağlık Anksiyetesi Envanteri-Kısa formu kullanıldı. Tüm veriler çevrimiçi olarak toplandı.
Bulgular: Bu çalışmaya 153 kadın (ort. yaş: 20.82 ± 1.541 yıl) ve 37 erkek (ort. yaş: 21.22 ± 2.760 yıl) öğrenci katılmıştır. Erkek öğrenciler anlamlı olarak daha aktifti (p=0.022). Hastaneye başvuran hem kadın hem de erkek öğrencilerde sağlık kaygısı düzeyi anlamlı olarak yüksek bulunurken (sırasıyla, p=0.006, p=0.055), yalnızca kadın öğrencilerde kaygı düzeyi daha yüksekti (p=0.006). Erkek öğrencilerde yürüme aktivite düzeyi ile kaygı düzeyi arasında negatif yönlü orta düzeyde korelasyon vardı (p=0,013; r=-0,406).
Sonuç: Çalışma sonucunda yürüme gibi kolay ulaşılabilir bir aktivitenin bile kaygı üzerinde olumlu etkisi olduğu bulunmuş ve teşvik edilmesi gerektiği sonucuna varılmıştır. Salgında özellikle erkeklere göre daha inaktif olan kız öğrenciler için egzersiz programları teşvik edilmelidir.
Anahtar Kelimeler: Kaygı, Koronavirüs, Salgın, Fiziksel Aktivite, Öğrenci

Introduction

The new coronavirus, named COVID-19, was born in China and on January 30, 2020, the World Health Organization (WHO) declared an "International Public Health Emergency". In Turkey, the Ministry of Health reported the first case on March 11, 2020, and as of March, 2023, more than 17.232.000 cases and over 102 thousand deaths were announced. Beginning March 16, 2020, universities across the country were declared on break for three weeks, and distance learning began soon thereafter, continuing intermittently until the fall of 2021 (1). The pandemic quickly impacted all aspects of daily life; the way students live, enjoy themselves, shop, socialize with family and friends, and plan for the future. Epidemics in the past have shown that anxiety, health concerns and panic behaviors were common during these times (2,3).

According to the American Psychological Association (APA) definition, anxiety is "an emotion characterised by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune"(4). Health anxiety, on the other hand, is associated in the literature with excessive worry about current or future health (5). In a study conducted in China, it was found that 24.9% of university students were affected by pandemic anxiety (6). In another study, Jungmann et al. examined the impact of the COVID-19 outbreak on health anxiety among adults in Germany and found that half of the participants (n = 1,615) developed moderate to severe anxiety (7), whereas a similar study in the USA found that 31.2% of participants had experienced severe anxiety due to the COVID-19 outbreak (8).

The stay-at-home/mandatory quarantine processes resulting from the outbreak are a safe measure to prevent human-to-human transmission of the virus. But at this point, we were faced with the risk of decreased physical activity. Mandatory increased screen activities (distance learning) and video games can lead to sedentary behaviors such as lying down or sitting for long periods of time. In addition, even the most basic and simple suggestions for physical activity, such as walking may not be implemented (9). Physical activity (PA) plays an important role in mental health and cognitive function. Recent studies have found that the type of PA; whose main component is exercise, can be used as both a stand-alone and adjunctive therapy to reduce anxiety symptoms in both clinically diagnosed and undiagnosed individuals. The low cost, low risk nature of PA, may help it become an important component of treatment for anxiety and depressive symptoms (10).

The purpose of this study is to determine the levels of physical activity, health-related anxiety, and anxiety among university students during the COVID-19 outbreak and the relationship between them. The suspension of the formal education process and the change in current residence of most students (return to family home, etc.) may affect them mentally and physically in different ways (11). The results of the study are expected to help understand the state of physical activity and anxiety levels in quarantine and social isolation processes, draw the attention of health professionals to the problem and develop solutions.

Materials and Methods

The study was conducted among the students of the health sciences faculty studetns, between September 2020 – November 2020. Ethical

approval for the study was granted by the Hamidiye Scientific Research Ethics Committee of University of Health Sciences (decision no:11/18, dated:17.07.2020).

The inclusion criteria were as follows: (1) being an Undergraduate student; (2) using computer or smartphone and have internet access; (3) ability to read and write in Turkish. The exclusion criteria were as follows: (1) suspending education , (2) being diagnosed with Covid 19.

The demographic data of the participants were obtained from a questionnaire prepared by the researchers.

Physical activity levels were assesed using the "International Physical Activity Questionnaire - Short Form (IPAQ)". The IPAQ-SF evaluate many physical activities in the last 7 days. These are: leisure time physical activities, home and garden activities, work-related physical activities, and transportation-related physical activities. The short form requires the sum of time (minutes) and frequency (days) when calculating the total score for all activities. In scoring, sections are calculated by summing the light, moderate, and intense activities. These calculations result in a score in "MET-minute". In calculating the walking score, the walking time (minutes) is multiplied by 3.3 METs; 4 MET for moderate activity and 8 MET for vigorous activity. Physical activity levels are classified as physically inactive (<600 MET-min/week), minimal physical activity level (600-3000 MET-min/week), and high physical activity level (>3000 MET-min/week) (12).

Health anxiety was assesed with the "Health Anxiety Inventory - Short Version". This is a short self-report scale with 14 items specially designed to query health-related anxiety. The scoring of the scale is between 0 and 3 for each item, and a high score indicates a high level of health anxiety. HAI-SF scores of 0–27 represented no or mild health anxiety, 28–32 moderate health anxiety and 33–42 substantial health anxiety (13,14).

The anxiety level of the participants in the last one week were evaluated with the "Beck Anxiety Inventory". The scale consists of 21 statements and a Likert-type answer is made. The score range is 0–63. A total score of 0–7 is considered minimal range, 8–15 is mild, 16–25 is moderate, and 26–63 is severe. (15).

All forms, including information disclosure and voluntary consent forms, were completed online via Google Forms.

Sample Size

The sample size and power calculation were performed using the G*Power 3.1 power analysis program. In the sample size calculated using the correlation model "Correlation: Bivariate normal model," the effect size was small to moderate ($|\rho|=0.2$), α error was 0.05, the 95% confidence interval, and the desired power was 80%. These parameters generated a sample size of at least 193 participants. Due to the expected drop-out rate of internet-mediated university studies, 200 students were invited to the present study.

Statistical Analysis

Data recording and all statistical analyzes were performed with IBM SPSS version 22.0 software (IBM Corp., Armonk, NY, USA). The compliance of the data with the normal distribution was evaluated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Smirnov/ Shapiro-Wilk's tests) and it was determined that the data did not show normal distribution. Therefore, differences between groups were tested by Mann-Whitney U test and Cohen's guidelines was used as an effect size indicator; a large effect is .5, a medium effect is .3, and a small effect is .1 (16). Effects of grouping variables on activity levels were tested by Chi-square test. Spearmans's test was used for determine correlations. In the correlation coefficient, 00-.19 was accepted as "very weak", .20-.39 "weak", .40-.59 "moderate", .60-.79 "strong", .80-1.0 "very strong". A p value of ≤ 0.05 was considered significant.

Results

190 students (153 female, 37 male; mean age: 20.82 ± 1.541; 21.22 ± 2.760 respectively) participated in this study. It was found that a relative of 27.5% of the female participants and 24.3% of male participants had COVID-19 infection. It was found that 51.6% of female participants and 62.2% of male participants visited a hospital or clinic for other reasons (Table 1).

Table 1. Descriptives and Characteristics of Participants (n=190, female=153)

	Female	**Male**
Gender (n (%))	153 (80.5)	37(19.5)
Age (years)	20.82 ± 1.541	21.22 ± 2.760
BMI (kg/m2)	21.653± 3.265	23.06 ± 2.960
Hospital or clinic visit (n (%))	79 (51.6)	23 (62.2)
Covid death of relative(s) (n (%))	10 (6.5)	3 (8.1)
Covid infection of relative(s) (n (%))	42 (27.5)	9 (24.3)

The variables are expressed as mean ± standard deviation. BMI: Body mass index

Health anxiety and general anxiety was positively correlated both in female and male students (respectively, p<0.001, r=0.578; p<0.001, r=0.624). These correlations was moderate in females and strong in males (Table 2). The activity levels of male and female students were significantly different (p=0.022) (Table 3).

Table 2. The Correlation Between Anxiety and Health Anxiety

	Female (n=153)	Male (n=37)	
BAI	13.72 (±9.777)	11.62 (±10.054)	
HAI	19.29 (±7.252)	17.84 (±7.780)	
	0.578	0.624	r
	<0.001*	<0.001*	p

Spearman's. HAI: Health Anxiety Inventory-Short, BAI: Beck Anxiety Inventory. The variables are expressed as mean ± standard deviation. *p≤0,05

Table 3. Differences in Activity Levels By Gender

Gender	**Inactive**	**Minimally Active**	**Very Active**	**p**
Male (n)	11	15	11	**0.022***
Female (n)	80	51	22	

Chi-square test. Activity levels are determined according to IPAQ-Short. *p≤0,05.

There was no significant difference in the health anxiety levels of students with and without Covid 19 infected relative (p>0,05). Health anxiety was significantly higher in both females and males who visit a hospital or clinic for any reason (p=0.006, p=0.055). The effect size was medium for female students (r=0.454), and large for male students (r=0.662). Anxiety level was significantly higher only in females who visit a hospital (p=0.006), with a medium effect size of r=0.458 (Table 4).

A moderate level negative correlation was found between walking activity MET and anxiety level in male students (p=0.013, r=-0.406) (Table 5).

Table 4. Difference Between HAI and BAI Levels in Terms of Hospital/Clinic Visit and Infection of a Relative

		Hospital or clinic visit				**Infection of a relative**			
		Yes	No	p	z	Yes	No	p	z
HAI	Female	20.68 (7.096)	17.80 (7.165)	**0.006***	-2.744	20.00 (6.793)	19.02 (7.430)	0.297	-1.044
	Male	19.61 (7.873)	14.93 (6.933)	**0.055***	-1.917	21.33 (9.526)	16.71 (6.959)	0.365	-0.906
BAI	Female	15.57 (9.682)	11.74 (9.552)	**0.006***	-2.765	14.57 (9.939)	13.40 (9.741)	0.494	-0.683
	Male	12.35 (10.620)	10.43 (9.304)	0.649	-0.455	15.78 (12.617)	10.29 (8.944)	0.221	-1.224

Mann Whitney U test. HAI: Health Anxiety Inventory-Short, BAI: Beck Anxiety Inventory. *p≤0,05.

Table 5. Correlation of Activity Level (MET*minute/week) and Anxiety

Activity			**HAI**	**BAI**
Walking	Female	p	0.559	0.449
		r	-0.48	-0.62
	Male	p	0.715	**0.013***
		r	-0.62	**-0.406***
Moderate intensity	Female	p	0.644	0.270
		r	-0.38	-0.90
	Male	p	0.918	0.507
		r	0.018	-0.113
Vigorous intensity	Female	p	0.203	0.989
		r	0.103	0.001
	Male	p	0.218	0.981
		r	0.207	-0.004
Sitting time	Female	p	0.148	0.185
		r	0.123	0.112
	Male	p	0.602	0.917
		r	-0.91	0.018

Spearman's. BAI: Beck Anxiety Inventory, HAI: Health Anxiety Inventory; r: correlation coefficent. *p≤0.05.

Discussion

The pandemic changed the schedule of educational institutions, meetings, and sporting events, and institutions canceled classroom-based classes and converted it to online sessions. With the advent of distance learning at universities, many students returned to their family homes. Time spent in front of a screen has increased significantly as a result of distance learning. In Bargı et al.'s 2021 study of 281 university students, they found depression in 68.3%, anxiety in 55.9%, and significant stress in 46.3% of participants. In addition, 31.7% of the students were classified as inactive and 40.9% as minimally active; only 27.4% of these students were classified as very active (17). In our study, 52.3% of females and 29.7% of males were inactive, 33.3% of females and 40.5% of males were minimally active. This could be because our study was conducted on days when quarantine was stricter. In another study examining the effects

of Covid-19, results showed that males had significantly higher levels of physical activity compared with females (18). In this study, we found that the activity levels of male and female students were significantly different.

A 2022 systematic review showed that health anxiety was higher in women than in men. This situation in female students was found to be due to the increase in their responsibilities in the home environment (19). In Ozdin et al's study examining the effects of Covid 19 on mental health in Turkish society, they found, depression, anxiety and health anxiety levels were higher in women, showing that the psychiatric impact during the Covid 19 pandemic may be greater on women (20). In this study, while the anxiety level of the male students who visited the hospital/clinic were not different from those of the male students who did not, it was found that the anxiety levels of the female students who visited the hospital/clinic was significantly higher than those of the female students who did not.

Conflicting results have been found in the literature that the presence of people who had Covid-19 infection in their relatives increased the level of anxiety (21). In this study, no difference in the level of anxiety or health anxiety was found among those who had relatives with Covid-19 infection. In literature, the level of anxiety was found to increase significantly among those who visited the hospital or clinic for other reasons (routine checkups or other health emergencies) during the outbreak (21). Our study also found that health anxiety levels were significantly higher among participants who visited the hospital or clinic for a reason other than Covid-19.

The relationship between exercise and anxiety symptoms is a frequently discussed topic in the literature. Maintaining regular physical activity during lockdown is important to reduce anxiety. It plays an important role in preventing anxiety, improving learning and cognitive functions (22). Data from a meta-analysis published by Stubbs et al. in 2017 suggest that exercise should be considered as an evidence-based option for treating anxiety symptoms in people diagnosed with an anxiety/stress disorder. Notably, the effect size of exercise is moderate compared with control conditions (23). In a 2017 study, in which the authors examined physical activity and anxiety in 47 countries, it was found that individuals with low physical activity were 32% more likely to suffer from anxiety compared with individulas with high physical activity. Low levels of physical activity and female gender were associated with a higher prevalence of anxiety (24). In this study, we also found that the amount of walking (MET*minutes) had a negative correlation with anxiety in men.

In a systematic review that examined the relationship between PA with anxiety during Covid-19, it was found that anxiety was lower in individuals who maintained regular and more frequent PA routines. Those who reported prolonged periods of moderate to severe PA were 15-34% less likely to develop anxiety symptoms (25). The Covid-19 lockdown effects study published by Kajtna et al. in 2022 examined the physical activity and anxiety levels of 150 members of a fitness center. Their results show that prolonged sitting time due to Covid-19 lockdown significantly affects physiological anxiety and anxiety in female participants (26). However, in our study, no difference was found between time spent sitting and the level of anxiety or health anxiety.

In this study, anxiety levels were found to be significantly lower in those who engaged in prolonged periods of light physical activity, whereas no such difference was found for moderate and vigorous physical activity. We think that this difference from the literature is due to the small number of participants who engaged in moderate and vigorous physical activity.

Conclusion

As a result of this study, even an easily accessible activity such as walking was found to have a positive effect on anxiety and should be encouraged. Indoor or outdoor exercise programs with social distance should be encouraged, especially for female students who are more inactive than males.

We attribute the fact that moderate-intensity and vigorous-intensity activities did not show a significant relationship with anxiety data to the small number of students with these activity levels. These activity levels were not reported by a sufficient number of students because the study data were collected at the time of full quarantine.

The results of this study have practical guidance, but also have some limitations. This study was a cross-sectional study, data were collected at one time, and no follow-up study was conducted. The sample size was 190 students from the health sciences faculty and the gender distribution was far from even, so the results can only be generalized to a certain extent. Finally,

the activity level of the participants prior to the outbreak was not queried. Equal of data on this topic with a more even distribution in future studies will contribute to the literature.

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