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Physical and Psychological Reflections of the COVID-19 Pandemic on University Students

COVID-19 Salgınının Üniversite Öğrencileri Üzerindeki Fiziksel ve Psikolojik Yansımaları

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ABSTRACT

Purpose: One of our purpose is to determine the relationships between the physical activity levels of university students and musculoskeletal system problems, psychological resilience, intolerance to uncertainty, and psychological distress related to COVID-19 during the COVID-19 pandemic process. Other purpose of this study is to examine whether the psychological resilience of individuals is significantly predicted by intolerance to uncertainty, psychological distress related to COVID-19, physical activity level, and musculoskeletal system problems. Methods: 860 university students participated in the study. Results: It was seen that, while the activity levels of university students increase, their psychological resilience increases, and the lowest level of psychological distress related to COVID-19 is the most active group, intolerance to uncertainty and total physical activity level significantly predict resilience. Musculoskeletal pain was mostly seen in the lumbar region in university students during the pandemic. Additionally, individuals with low back pain had lower levels of psychological resilience, vigorous physical activity, and a higher intolerance to uncertainty. Conclusion: The increased physical inactivity during the pandemic both negatively affects the psychological resilience of the students and causes musculoskeletal pain; consequently, it is important for university students to participate in physical activity in order to protect their physical and psychological health.

Keywords: *COVID-19 pandemic, university students, physical activity, psychological resilience*

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ÖZ

Amaç: Bu çalışmanın amaçlarından biri, COVID-19 pandemisi sürecinde üniversite öğrencilerinin fiziksel aktivite düzeyleri ile kas-iskelet sistemi problemleri, psikolojik sağlamlık, belirsizliğe tahammülsüzlük ve Covid-19 ile ilgili psikolojik sıkıntı arasındaki ilişkileri belirlemektir. Araştırmanın diğer amacı ise, belirsizliğe tahammülsüzlük, COVID-19 ile ilgili psikolojik sıkıntı, fiziksel aktivite düzeyi ve kas-iskelet sistemi problemlerinin bireylerin psikolojik sağlamlığını anlamlı düzeyde yordayıp yordamadığının incelenmesidir. Yöntem: Araştırmaya 860 üniversite öğrencisi katılmıştır. Bulgular: Üniversite öğrencilerinin aktivite düzeyleri arttıkça psikolojik sağlamlıklarının da arttığı, COVID-19 ile ilgili psikolojik sıkıntı düzeyi en düşük olan grubun en aktif grup olduğu, belirsizliğe tahammülsüzlük ve toplam fiziksel aktivite düzeyinin sağlamlığı anlamlı düzeyde yordadığı görülmüştür. Pandemi döneminde üniversite öğrencilerinde kas-iskelet sistemi ağrıları en çok bel bölgesinde görülmüştür. Bu bulgulara ek olarak, bel ağrısı olan bireylerin psikolojik sağlamlık ve kuvvetli fiziksel aktivite düzeyleri daha düşük, belirsizliğe karşı tahammülsüzlükleri ise daha yüksek bulunmuştur. Sonuç: Pandemi sürecinde artan fiziksel inaktivite, hem öğrencilerin psikolojik sağlamlıkları olumsuz etkiliyor hem de kas-iskelet sistemi ağrılarına neden oluyor; dolayısıyla üniversite öğrencilerinin fiziksel ve psikolojik sağlıklarını koruyabilmeleri için fiziksel aktiviteye katılmaları önemlidir.karşılayan özerklik, yetkinlik ve kişilerarası ilişkilerin bileşenlerinin farkındalığını geliştiren bir etkinlik düzenlenebilir.

Anahtar Kelimeler: *COVID-19 pandemisi, üniversite öğrencileri, fiziksel aktivite, psikolojik sağlamlık*

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INTRODUCTION

During pandemic periods, individuals are affected both psychologically and physically, and this causes many different mental problems such as restlessness, fear, anxiety, and depression. However, the uncertainty created by not knowing when the epidemic will end increases the current anxiety and triggers other psychological problems (Koçak et al., 2021). The COVID-19 infection, first seen in December 2019, spread rapidly all over the world, affecting more than 160 countries and evolving into a global pandemic. The increase in the number of cases in the pandemic has significantly affected human life. As a result, many countries have temporarily closed all universities and decided to provide education with distance education systems (Ciftci et al., 2023). In March 2020, many measures were taken in Turkey, such as lockdowns, stay-at-home, and distance education to prevent the spread of the disease (Varol & Tokuç, 2020). During this quarantine period, the closure of various social areas (gyms, parks, entertainment centers, beaches, etc.) limited both physical and social activities. By spending almost all of the day at home, people's eating behaviors and sleep patterns have been disrupted, their physical activity levels have decreased, and as a result, the physical and mental health of individuals has been adversely affected. (Violant-Holz et al., 2020).

During the COVID-19 measures in Turkey, all universities transition to online education. During the online education period, university students continued their lessons through computers, laptops, tablets, and smartphones. Prolonged inactivity in front of a screen during lessons, in anti-ergonomic positions, may cause pain and disorders in the musculoskeletal system, especially in the upper limb and spine. On the other hand, students whose use of technological devices increases do more repetitive movements such as using the keyboard and mouse, which can lead to musculoskeletal problems (Prajapati & Purohit, 2021; Tigli et al., 2020). It is known that skeletal system pain is also associated with psychological problems (Gałczyk et al., 2021; Olaya-Contreras & Styf, 2013).

"Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. The World Health Organization (WHO) recommends at least 150 min of moderate physical activity, 75 min of vigorous activity, or a combination of the two, per week" (World Health Organization, 2019). However, since a large part of the world's population is inactive, physical inactivity is seen as a public health problem today. University students are in the risk group in terms of inactivity and they are reported to be moderately physically active in studies (Kljajević et al., 2021). During the COVID-19 pandemic, the prevalence of physical inactivity has increased considerably due to the lockdown (Tigli et al., 2020). It has been reported that participation in physical activity in Turkish students decreased from 38% to 13% with the pandemic. (Aslan et al., 2020). In another study, it was reported that students with long computer

and mobile phone usage times felt more discomfort in the waist, back, and neck regions, however, as the physical activity levels of the students increased, the perceived stress decreased (Özdinç et al., 2019).

During the pandemic, people experience emotional, cognitive, physical, and behavioral problems. It is known that physical activity leads to positive behavioral changes, helps to adopt a healthy lifestyle, and improves mental health. Studies in the literature show that physical inactivity is associated with increased psychological stress and that physical activity is a highly effective method to reduce stress in adults (Cairney et al., 2014, Özdinç et al., 2019). There are studies showing that the level of physical activity and the fear of COVID-19 are related to each other, but the stress levels of physically active individuals are lower even if they are afraid of COVID-19 (Alsalhe et al., 2020, Aslan et al., 2020, To et al., 2022).

Psychological resilience is an individual's ability to endure and recover from difficulties. Individuals with high resilience are prepared to deal effectively with negative feelings and emergencies and therefore have better mental and physical health (Chaharbaghi et al., 2022). Physical activity is thought to be an easily applicable method to develop psychological resilience and protect individuals from psychological disorders (Antonini Philippe et al., 2021). Physical activity improves self-esteem and independence and reduces anxiety by making changes in the brain arousal level, and biochemical and psychological structure of the individual. Thus, physical activity enables individuals to show a higher tolerance threshold in coping with problems. As the level of physical activity in young individuals increases, psychological resilience and self-confidence increase; negative emotions, anxiety, and depression have been reported to decrease (Chaharbaghi et al., 2022; Rogowska et al., 2020). However, as a result of quarantine during the pandemic period, individuals' daily physical activity levels have decreased, their normal social lives have been isolated, and stress, anxiety, and depression levels have increased with fear of COVID-19 and death (Kuśnierz et al., 2021). Since studies show that physical activity has psychological benefits (reducing stress, depression, anxiety problems, increasing psychological resilience, etc.) in addition to improving physical health, it is important to monitor the level of physical activity during the pandemic, especially in groups that are vulnerable to psychological problems such as students (Aslan et al., 2020).

It is important to understand how individuals react and how they deal with this process during the pandemic period. It is thought that psychological resilience plays a decisive role in coping effectively with this process (Duru et al., 2022; Zalewska et al., 2021). There was uncertainty in the process as there was little information about the risk of virus transmission, prevention methods, and treatment during the pandemic. Each individual experiences feelings of anxiety and uncertainty regarding this process at different levels (Cerea et al., 2022). Limited

interpersonal contact, uncertainty, and unpredictability brought about by restrictions have caused the mental health of individuals to worsen. In the literature, it has been shown that the inability to tolerate uncertainty during the pandemic can trigger fear of COVID-19 and consequently negatively affect psychological health (Satici et al., 2022). The risk of virus transmission, the uncertainty of the pandemic process, social and economic problems, and concerns about how to protect themselves and their relatives can also cause individuals to experience severe stress and anxiety (Karataş & Tagay, 2021). However, regular physical activity is widely accepted as a coping strategy for dealing with stressful situations and anxiety (Cairney et al., 2014).

The COVID-19 pandemic includes many uncertain situations, both individual and social. In this context, it is considered important to examine both the psychological and physical problems caused by the pandemic, the tolerance levels of individuals, psychological distress related to COVID-19, physical activity levels, and musculoskeletal system problems from the perspective of psychological resilience.

When the studies on the COVID-19 pandemic and the isolation experience necessitated by this epidemic process were examined, no study was found that dealt with the relationships between individuals' psychological resilience, intolerance to uncertainty, psychological distress related to COVID-19, physical activity levels, and musculoskeletal system problems. In light of this knowledge, the main purpose of this study is to examine the psychological and physical effects of social and physical isolation caused by the COVID-19 pandemic on individuals. In accordance with this purpose; It aims to determine the relationships between the physical activity levels of individuals and musculoskeletal system problems, psychological resilience, intolerance to uncertainty, and psychological distress related to COVID-19 during the COVID-19 pandemic process. The secondary aim of the study is to examine whether the psychological resilience of individuals is significantly predicted by intolerance to uncertainty, psychological distress related to COVID-19, physical activity level, and musculoskeletal system problems.

METHOD

Study Model

This study, which investigates the psychological and physical effects of social and physical isolation caused by the Covid 19 pandemic, was designed as a cross-sectional study and the data were collected between April and June 2021.

Population and Sample Size

University students studying at different universities in Turkey in the 2020-2021 academic year participated in the research. A web-based evaluation was made through Google

Forms. Informed consent was obtained from the students who wanted to participate in the survey before filling out the form. The inclusion criteria are as follows: (a) age >18, (b) being a university student actively studying in Turkey, (c) having the ability to speak and understand Turkish.

Data Collection Tools

International Physical Activity Questionnaire (IPAQ)-Short Form. It is a valid and reliable questionnaire used to detect physical activity and sedentary lifestyles of adults. (IPAQ-SF has been consistently shown to have a high reliability (ranging from 0.66 to 0.88). The questionnaire, which consists of four separate sections, includes 7 questions about physical activity performed for at least 10 minutes in the last 7 days. In order to determine the level of physical activity, the amount of MET spent is calculated by determining the number of days they engage in PA (vigorous activity, moderate activity, and walking), and the time spent in the activity. Physical Activity level is classified into 3 categories. Inactive: <600 MET-min/week, Minimum Active: >600–3000 METmin/ week, high active: <3000 METmin/ week. The Turkish validity and reliability study of this questionnaire was performed by Sağlam et al. The test-retest reliability coefficient of the Turkish IPAQ short form is rs = .69 (p< .001). Walking activity had better reliability coefficients than vigorous and moderate-intensity activities. The test-retest reliability of the sitting activities items of the Turkish IPAQ short form was acceptable (rs = .78). (Saglam et al., 2010).

Nordic Musculoskeletal Questionnaire (NMQ). This questionnaire contains 27 items that determine the presence of musculoskeletal symptoms in nine different parts of the body for the last 12 months and last 7 days. All answers are based on a binary 'yes/no' answer. Turkish version of NMQ is valid and reliable. The internal consistency of the Turkish versionof the NMQ, measured by the Cronbach's alpha coefficient, was excellent (alpha:0.896).The test–retest reliability was examined with the thePABAK; PABAK coefficients were between 0.57 and 0.90. (Kahraman et al., 2016).

The COVID-19 Related Psychological Distress Scale(CORPD). The scale developed to measure the level of psychological distress associated with COVID-19 was adapted into Turkish by Ay, Oruç, and Doğru (2020). The scale, which includes the dimensions of suspicion, anxiety, and fear, consists of 12 items. Scale items are scored on a 5-point Likert style ranging from 1 (strongly disagree) to 5 (strongly agree), and higher scores indicate higher psychological discomfort. The CORPD is a valid and reliable form. The reliability ranged from 0.75 to 0.83 for the suspicion dimension, from 0.64 to 0.83 for the fear and anxiety dimension, and from 0.80 to 0.88 for the total scale. It has a satisfactory internal reliability for the CORPD Turkish Form. The Cohen's d:0.60 so the CORPD Turkish Form has a good criterion validity (Ay et al., 2022).The

Cronbach's alpha internal consistency coefficient of the scale for the current study was calculated as .92.

Brief Resilience Scale. The scale, which was developed to measure the psychological resilience of individuals and adapted to Turkish, is a 5-point Likert-type, 6-item, self-report-style measurement tool. After the reverse-coded items in the scale were translated, high scores indicate high psychological resilience. The Turkish form of Brief Resilience Scale is a valid and reliable scale to measure the psychological resilience levels of university students. It is also preferred because it is a scale that is easy to use and score, is practical, and can be applied in a short time. The internal consistency coefficient of the scale is 0.83 (Doğan, 2015).The Cronbach's alpha internal consistency coefficient of the scale for the current study was calculated as .92.

The Intolerance of Uncertainty Scale (IUS-12). The scale consists of 12 items and 2 sub-dimensions (anticipatory anxiety and inhibitory anxiety). The Turkish version is available. Items are scored on a 5-point Likert scale classifying from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). A high score indicates a high intolerance to uncertainty. Cronbach alpha internal consistency coefficient of scale is 0.88 for the overall scale, 0.84 for the prospective anxiety subscale, and 0.77 for the inhibitory anxiety subscale. The test-retest reliability coefficient is 0.74 (Sarıçam et al., 2014). The Cronbach's alpha internal consistency coefficient of the scale for the current study was calculated as .89.

Data Collection Process

Demographic and clinical characteristics of the participants, such as age, gender, and being diagnosed with COVID-19 were recorded. “International Physical Activity Questionnaire (IPAQ)-Short form” to determine the physical activity and sedentary lifestyles of individuals; “The Nordic Musculoskeletal Questionnaire” to investigate the presence of musculoskeletal symptoms; The “COVID-19 related Psychological Distress Scale (CORPD)” to measure the level of psychological distress, the “The Intolerance of Uncertainty Scale (IUS-12)” to measure the tolerance levels of individuals in situations involving uncertainty and the “Brief Resilience Scale” to measure the psychological resilience levels were used.

Analysis of Data

As descriptive statistics in the research; mean and standard deviation and minimum-maximum values are given for continuous data, and frequency and percentage values are given for qualitative data. The conformity of continuous data to normal distribution was evaluated by Kolmogorov-Smirnov test. In group comparisons; since the parametric test conditions were met for continuous data, the significance tests of the difference between the two means were used. The data obtained with the data collection tools were analyzed using the SPSS 23 package

program. The MANOVA technique was used to analyze whether the participants' intolerance to uncertainty, psychological resilience, and psychological distress related to COVID-19 showed a significant difference according to their physical activity levels. 'Multiple Linear Regression Analysis' was used to determine whether total physical activity, intolerance to uncertainty, and psychological distress levels related to COVID-19 predict psychological resilience.

In addition, the relations between the variables were examined with the 'Pearson Product-Moment Correlation Analysis'. In the continuation of the analysis, the prevalence of musculoskeletal pain in the last 1 year and in the last 1 week of the participants was examined. Afterwards, the Independent Samples t-test was used to compare the mean scores obtained from other scales according to low back pain experience. In the whole of the study, the level of significance is accepted as 0.05.

Ethical Approval

This study was approved by XXX University Faculty of Medicine Clinical Research Ethics Committee (approval number: 2021/128, approval date: 26/05/2021) and performed in accordance with the Declaration of Helsinki principles.

RESULTS

860 university students (651 female and 209 male) participated in the study. 75.7% of the participants were female and 24.3% were male. The mean age of the participants was 20.82 ±2.31 years, and 15.5% had previously been diagnosed with Covid 19, while 84.5% were undiagnosed. When examined in terms of physical activity levels, 34.9% of the participants were inactive, 44.4% were minimum active and 20.7% were high active.

A comparison of demographic characteristics, physical activity, intolerance to uncertainty, psychological distress related to COVID-19, and psychological resilience is shown in Table 1.

Table 1

Comparison of demographic characteristics, physical activity, intolerance to uncertainty, psychological distress related to COVID-19, and psychological resilience

Parameters	**Female** *Mean ± SD*	**Male** *Mean ± SD*	**p**
Age	20,68 ± 1,95	21,23 ± 3,16	0.003*
Gender (female/male), n (%)	651 (75,7)	209 (24,3)	
Body mass index (kg/m2)	21,47 ± 3,65	24,55 ± 4,15	<0,001*
Physical activity			
Vigorous Physical Activity (MET-min/week)	295,06 ± 982,67	1081,72 ± 1599,81	<0,001*
Moderate Physical Activity (MET-min/week)	237,88 ± 500,96	244,69 ± 528,95	0.086
Walking (MET-min/week)	897,70 ± 1170,89	1235,74 ± 1985,32	0.003*
Total Physical Activity (MET-min/week)	1416,86 ± 1773,47	2536,49 ± 2830,83	<0,001*
Sitting (hour/day)	8,48 ± 3,38	7,96 ± 3,86	0.065
The Intolerance of Uncertainty (IUS-12)	36,16 ± 7,89	35,38 ± 8,26	0,220
Psychological Distress Related to COVID-19	40,46 ± 10,71	36,49 ± 11,57	<0,001*
Psychological Resilience	18,08 ± 5,33	20,41 ± 5,37	<0,001*

*Independent sample t test, p<o.o5

When Table 1 is examined; it is seen that the participants' psychological distress related to COVID-19, psychological resilience, vigorous physical activity, walking, and total physical activity differs significantly according to their gender status.

Whether the participants' intolerance to uncertainty, resilience, and psychological distress related to COVID-19 differed according to their physical activity levels were analyzed using MANOVA and presented in Table 2.

Table 2

MANOVA Pillai's Trace Test statistic results

Effect	Value	F	Hypothesis df	Error df	p
Group TOLT Pillai's trace	0,027	3,84	6	1712	,001

Before using the MANOVA technique, it is necessary to determine whether the relevant assumptions are met. For this reason, first of all, the results of the Boxs test, which is one of the initial requirements of the analysis, were examined; since the significance value of the test is greater than .05; the assumption of homogeneity of covariance matrices is met became clear. In addition, for the activity level variable; it was concluded that four different multivariate statistical results were significant at the .05 level. Since the groups differ in more than one variable; Pillia's Trace Test was preferred as the test statistic. In order to meet the requirement of univariate homogeneity of variance between groups, the results were examined with the knowledge that the significance values should be greater than .05; it was determined that the requirement of homogeneity of variances was met in terms of both psychological resilience and intolerance to uncertainty variables. In the variable of psychological distress related to COVID-19, the relevant value was found to be very close to .05. In the research; groups differ in all three variables [Pillia's trace= 0.027, $F(6.1712)=3.84$, $p<.05$.]. This result shows that the participants' levels of psychological resilience, intolerance to uncertainty and psychological distress related to COVID-19 vary according to the level of physical activity.

MANOVA results on intolerance of uncertainty, psychological resilience, and levels of psychological distress related to COVID-19; reveal that the levels of psychological resilience and psychological distress related to COVID-19 differ significantly according to the physical activity levels of the participants and the level of intolerance to uncertainty does not differ significantly (Table 3).

Table 3

Mean, Standard Deviation Values and ANOVA Results of Psychological Resilience, Intolerance of Uncertainty, and Psychological Distress Related to COVID-19 by Physical Activity Levels

Dependent Variable	Physical Activity Levels	n	Mean	Std. Deviation	df	F	p
Intolerance of Uncertainty	Inactive	300	36,27	7,92	2-857	1,62	,199
	Minimum active	382	36,18	7,95			
	High active	178	35,02	8,16			
Psychological Resilience	Inactive	300	18,25	5,48	2-857	5,96	,003
	Minimum active	382	18,38	5,26			
	High active	178	19,89	5,55			
Psychological Distress Related to COVID-19	Inactive	300	39,63	11,42	2-857	6,63	,001
	Minimum active	382	40,57	10,27			
	High active	178	36,95	11,70			

It is observed that as the activity levels of the participants increase, their psychological resilience levels increase. In addition, it is striking that the group with the lowest level of psychological distress related to COVID-19 is the group described as "high active". According to Table 2; the psychological resilience levels of the participants differ significantly according to their physical activity levels [F(2,857)=5.96, p<.05], and similarly, the psychological distress levels related to COVID-19 of the participants differ significantly according to their physical activity levels [F(2,857)=6.63, p<.05]. At this point, it is seen that there is no linear order according to the increase in the level of physical activity.

When Table 4 is examined; Intolerance of uncertainty and total physical activity level seems to predict psychological resilience significantly (R^2=0.092, p<.05).

Table 4

Examining the way of predicting Psychological Resilience of Total Physical Activity, Intolerance of Uncertainty, and Psychological Distress Related to COVID-19

Variable	B	Std. Error	β	t	p	Zero Order	Partial R
Constant	24,810	,835		29,721	,000		
Intolerance of Uncertainty	-,186	,022	-,273	-8,38	,000	-,279	-,275
Physical Activity Level	,000	,000	,120	3,698	,000	,133	,125
R=0,304 F(2,857)= 43,513			R^2=0,092 p<.05				

Accordingly, intolerance to uncertainty and total physical activity level together explain 9% of the total variance of psychological resilience. At the beginning of the regression analysis, the psychological distress variable related to COVID-19 was also included in the analysis, but since

it did not significantly predict psychological resilience, the relevant variable was excluded from the regression analysis, and the analysis was repeated with other variables and the regression equation was created.

According to these findings, the regression equation is as follows:

Psychological Resilience= 24,810 - 0.186. Tolerance of Uncertainty + 0,000. Physical Activity Level

Table 5

Bilateral correlation results

N=860	Intolerance of Uncertainty	Psychological Distress Related to COVID-19	Psychological Resilience	Vigorous Physical Activity MET	Moderate Physical Activity MET	Walking MET	Total MET
Inolerance of Uncertainty	--	.236*	-.279*	.013	-.094*	-.050	-.047
Psychological Distress Related to COVID-19		--	-.109*	-.072*	-.036	-.034	-.068*
Psychological Resilience			--	.141*	.108*	.033	.133*
Vigorous Physical Activity (MET-min/week)				--	.174*	.125*	.692*
Moderate Physical Activity (MET-min/week)					--	.134*	.425*
Walking (MET-min/week)						--	.765*
Total physical activity (MET-min/week)							--

Pearson Correlation Test * p<.05

When Table 5 is examined; there is a low positive and significant correlation between the level of intolerance of uncertainty and psychological distress related to COVID-19; and there is a negative, low, and significant correlation between the level of intolerance of uncertainty and psychological resilience level and it is seen that there is a very low positive and significant relationship between intolerance of uncertainty and vigorous physical activity level.

In addition, it is observed that there is a low positive and significant relationship between moderate physical activity and total activity level and similarly there is a low positive and significant relationship between the level of psychological resilience and the levels of vigorous physical activity. This result reveals that being physically active can be associated with the participants being psychologically stronger. It is noteworthy that the relationships between physical activity styles are mostly positive, moderate, and significant.

The prevalence of musculoskeletal pain in the last 12 months and in the last 7 days of the participants is shown in Table 6.

Table 6

Prevalence of musculoskeletal pain within last 12 months and last 7 days

60	Area of body affected	Pain within last 12 months n (%)	Pain within last 7 days n (%)	Pain-preventing daily activities n (%)
	Neck	478 (55.6)	291 (33.8)	199 (23.1)
	Shoulder	423 (49.2)	247 (28.7)	149 (17.3)
	Elbow	94 (10.9)	44 (5.1)	31 (3.6)
	Wrist hand	236 (27.4)	11 (12.9)	90 (10.5)
	Upper back	522 (60.7)	309 (35.6)	216 (25.1)
	Lower back	537 (62.4)	321 (37.3)	279 (32.4)
	Hip	217 (25.2)	110 (12.8)	80 (9.3)
	Knee	295 (34.3)	143 (16.6)	113 (13.1)
	Ankle	224 (26.0)	115 (13.4)	105 (12.2)

Values are presented as number (%)

Among the musculoskeletal pain symptoms in the last 12 months, the lower back (62.4%), upper back (60.7%), neck (55.6%), and shoulders (49.2%) were the body areas with the highest pain prevalence. Similarly, pain prevalence was found to be highest in the lower back (37.3%), upper back (35.6%), and neck (33.8%) areas, respectively, in the last 7 days. In addition, participants who experienced pain, especially in the lower back (32.4%), upper back (25.1%), and neck (23.1%) reported that they could not do their routine work for a day or longer.

When Table 7 is examined; it is seen that the participants' low back pain status differs significantly according to their intolerance to uncertainty, psychological resilience, and vigorous physical activity.

Table 7

Independent Samples t-Test result for comparing the averages of intolerance to uncertainty, psychological distress related to COVID-19, psychological resilience, vigorous physical activity level, moderate physical activity level, walking and total activity level according to low back pain experience.

Variable	Group (Low Back Pain YES/NO)	N	M	SD	Mean Difference	t	df	p
The Intolerance of Uncertainty (IUS-12)	**NO**	323	34,61	8,12	-2,18	-3,902	858	,000
	YES	537	36,79	7,80				
Psychological Distress Related to COVID-19	**NO**	323	38,68	10,48	-1,30	-1,670	858	,095
	YES	537	39,98	11,37				
Psychological Resilience	**NO**	323	19,78	5,05	1,82	4,82	858	,000
	YES	537	17,96	5,54				
Vigorous Physical Activity (MET-min/week)	**NO**	323	614,76	1450,65	205,82	2,232	519,293	,026
	YES	537	408,94	1032,83				
Moderate Physical Activity (MET-min/week)	**NO**	323	243,59	515,64	6,49	,181	858	,856
	YES	537	237,10	503,17				
Walking (MET-min/week)	**NO**	318	1014,81	1564,63	56,40	,560	844	,576
	YES	528	958,41	1323,12				
Total Physical Activity (MET-min/week)	**NO**	323	1857,46	2441,48	269,85	1,696	559,547	,090
	YES	537	1587,61	1919,78				

It is concluded that the state of experiencing low back pain is significant in favor of individuals with a high level of intolerance to uncertainty individuals with low levels of psychological resilience and individuals with low levels of vigorous physical activity. However, it is striking that the state of experiencing low back pain does not differ significantly according to the psychological distress related to COVID-19, moderate physical activity, walking, and total physical activity.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The main results of this research are that as the activity levels of university students increase, their psychological resilience increases and that the group with the lowest level of psychological distress related to COVID-19 is the most active group. Another important result of

this study is that intolerance to uncertainty and total physical activity level significantly predict resilience. However, in this study, it was determined that musculoskeletal pain was mostly seen in the lumbar region in university students during the COVID-19 pandemic period. It has been shown that individuals with low back pain have lower levels of psychological resilience and vigorous physical activity, and higher intolerance to uncertainty. Additionally, the results of this study show that male and female individuals had significantly different levels of physical activity, psychological Distress Related to COVID-19, and psychological resilience.

The COVID-19 outbreak has had physical and psychological negative effects on university students. It has been shown in studies that physical activity level decreases during the epidemic period, along with significant increases in emotional stress, depression, and anxiety (Amo et al., 2022; Lee et al., 2021). In a study conducted with 1512 university students in Ukraine, it was reported that 43% of the students were physically active and the depression and anxiety levels of these students were lower than the inactive group (Rogowska et al., 2020). It was stated that 56% of Chinese university students were moderately or severely physically active, however, increasing physical activity to cope with negative emotions during the epidemic was reported to be a low-cost and practical coping strategy for students (Zhang et al., 2020). When other studies around the world were investigated, it was reported that 47.7% of university students in Poland (Kuśnierz et al., 2021), 62.9% in Switzerland (Taeymans et al., 2021), 24% in Colombia (De la Rosa et al., 2022) and 13% in Turkey (Aslan et al., 2020) are physically active during the COVID-19 epidemic. As it is seen, the level of participation in physical activity among university students during the epidemic varies between 13% and 62.9%, although it differs between countries. In a systematic review, it was reported that university students' walking, moderate, vigorous, and total physical activity levels decreased during COVID-19 (López-Valenciano et al., 2021). In our study, similar to the literature, it was seen that 44.4% of the students were minimum active, 20.7% were high active and 34.9% were inactive. This is in line with most of the findings in previous studies cited above.

Lockdown and social distance restrictions changed the daily lifestyles of young people, causing both a decrease in the level of physical activity (PA) and an increase in the level of psychological distress. Decreased normal social relations with peers, fear of losing relatives, and economic concerns were the main stressors of the COVID-19 pandemic. Additionally, there were several factors such as the closure of schools, sports, and outdoor entertainment centers that prevented young people from participating in physical activity during the COVID-19 pandemic. All these obstacles have caused both the psychological and physical conditions of young people to deteriorate (Dana et al., 2022). For this reason, many studies have been conducted to examine participation in regular physical activity and psychological distress associated with COVID-19 in

university students during the pandemic period, and it has been reported that participation in regular physical activity reduces psychological distress associated with COVID-19 in these studies (Gentile et al., 2022; Kuśnierz et al., 2021; Sfendla & Hadrya, 2020). In this study, it was observed that the CORPD level varied according to the physical activity levels of university students and the CORPD level was the lowest in the physically active group. However, it was also found that there was a low negative correlation between students' CORPD levels and vigorous physical activity and total weekly MET values. All these results support the information in the literature that COPRD decreases with the increase in physical activity level.

Limitations at interpersonal contact, uncertainty, and unpredictability brought about by restrictions have caused the mental health of individuals to worsen. In previous research, it has been shown that the inability to tolerate uncertainty during the pandemic can trigger fear of COVID-19 and consequently negatively affect psychological health (Satici et al., 2022). In addition, it is thought that effective coping strategies and psychological resilience decrease as the intolerance to uncertainty increases (Duru et al., 2022; Sarıçam et al., 2020). Although there are many studies in the literature examining the relationship between physical and psychological variables during the COVID-19 pandemic, the number of studies examining the relationship between the level of intolerance of uncertainty, which significantly affects the psychological state, and physical activity, is quite limited. However, as far as we know, no study has addressed the relationship between tolerance for uncertainty and physical activity in this pandemic period, where uncertainty has increased considerably among university students at high risk of experiencing psychological problems. Therefore, in our study, we examined intolerance to uncertainty, CORPD, and psychological resilience according to physical activity levels, and we found that as the level of physical activity increased, psychological resilience increased, but the level of intolerance to uncertainty did not change. However, we also found that intolerance to uncertainty was associated with CORPD, resilience, and MET values of moderate physical activity. Cerea et al. similarly examined the levels of physical activity and intolerance to uncertainty in healthy adults during lockdown and reported that the change in physical activity may affect the intolerance of uncertainty very little and that this is not enough to reach a definite conclusion. They also highlighted the need for more research on whether changes in physical activity during the COVID-19 pandemic could help individuals cope with uncertainty (Cerea et al., 2022). As we have shown in our study, physical activity is directly related to CORPD and psychological resilience, but tolerance to uncertainty is more related to the psychological states of individuals. For this reason, we assume that individuals with higher levels of physical activity experience less psychological distress and are more psychologically stable, thus increasing their tolerance for uncertainty. Thus, we think that there is no difference in the level of intolerance of uncertainty

compared to the level of physical activity since the interaction between physical activity and intolerance to uncertainty is more limited.

Since physical activity has protective effects against psychological problems, it is thought to contribute to increasing the psychological resilience of individuals (Chaharbaghi et al., 2022). Studies conducted during the quarantine period have also found a positive correlation between psychological resilience and physical activity levels (Carriedo et al., 2020; Zach et al., 2021). Zach et al. In a study of 1855 healthy individuals, it was shown that participation in continuous physical activity before and during the COVID-19 quarantine was associated with higher resilience and positive emotions, and lower depressive symptoms (Zach et al., 2021). In a study examining the effects of mindfulness and physical activity practices on psychological resilience, it was reported that physical activity reduces psychological symptoms such as depression and anxiety and thus improves resilience more (Antonini Philippe et al., 2021). Similarly, in our study, there was a relationship between physical activity parameters and psychological resilience and psychological distress associated with Covid 19. However, as the physical activity levels of the individuals increased, their psychological resilience levels also increased. In another study supporting these findings, it was shown that depression, anxiety, and stress levels of physically active individuals were within normal limits and their psychological resilience levels were higher than those of physically inactive individuals during the quarantine period (To et al., 2022). In addition to all these, this study also found that intolerance to uncertainty and physical activity level significantly predicted resilience in university students during the Covid 19 pandemic. Considering all these physical and mental benefits of physical activity, it is very important to examine the effects of physical activity on psychological resilience, especially in studies to be planned that include physical activity practices in university students.

During the COVID-19 quarantine, university students experienced musculoskeletal pain in many body regions with increased sedentary behavior and increased use of technology along with the distance education period (de Paiva Gomes et al., 2021; Prajapati & Purohit, 2021). Karatel et al. reported that individuals in Turkey experienced musculoskeletal pain in various body parts during the COVID-19 quarantine and that the most common musculoskeletal pain was in the upper back and lower back, respectively (Karatel et al., 2022). In a study conducted with university students during the COVID-19 quarantine, it was found that increasing the time of using devices such as mobile phones, computers, and laptops increases musculoskeletal disorders (Amro et al., 2020). However, the association between increased sedentary behavior and low back pain in youth and adults was also highlighted in a previous systematic review (Mahdavi et al., 2021). In this study, it was determined that musculoskeletal system pain was mostly seen in the lumbar region in university students during the Covid 19 pandemic period. 62.5% of the students

reported that they had low back pain in the last year. In a study conducted with 1654 university students in Italy, it was reported that students complained of neck and low back pain most during the COVID-19 pandemic, and the physical activity levels of individuals with pain were low. They also emphasized that low physical activity level is associated with low back pain and neck pain (Roggio et al., 2021). Similarly, Rodriguez et al. also reported that the region where university students experienced the most musculoskeletal pain during the pandemic period was the neck with 69.9% and the waist with 63.4% (Leirós-Rodríguez et al., 2020). In recent years, the focus has been on the biopsychosocial model in the approach to pain (Kamper et al., 2015). Due to the biopsychosocial nature of pain, it is thought that musculoskeletal pain that occurs in university students during the COVID-19 pandemic may be caused by psychological factors (Güneş et al., 2022; Karatel et al., 2022). In a study conducted in Turkey, it was shown that the prevalence of pain in the musculoskeletal system is quite high among university students receiving distance education during the COVID-19 pandemic and that students with pain have more depressive symptoms, however, pain negatively affects the quality of life of students (Güneş et al., 2022). At the same time, there are studies showing that students with musculoskeletal pain have a higher level of anxiety in this process (Örgev & Kınalı, 2022). In this study, the fact that students with low back pain had lower levels of psychological resilience and severe physical activity and higher intolerance to uncertainty supports the view that musculoskeletal pain may be caused by physical inactivity and psychological problems.

This study has some limitations. First of all, since all university students continued their education life with distance education during the quarantine, all evaluations were made with the online survey method. Second, the results of this study cannot be generalized to other adult populations, as the participants in this study were only college students. Finally, the study evaluated only the physical and psychological state during the pandemic, so it is difficult to comment on the physical and psychological state before the pandemic.

Within the scope of this study, a total of 860 students studying at 52 universities in Turkey were reached. This is a very good sample size when compared to other studies in the national and international literature. However, the results of the research are generalizable for Turkey as it is spread throughout the country. In addition, although there are many studies in the literature examining physical activity, musculoskeletal pain, and the psychological state of university students during the COVID-19 pandemic, no study has been found in which all of these parameters are examined in a single group. Our study shows the feature of being the first in its field with this aspect.

The results of this study, similar to other studies in the literature, showed that physical activity helps protect people's mental health even in times of uncertainty around the world. With

this study, we have proven that the increased physical inactivity among university students due to the pandemic both negatively affects the psychological resilience of the students and causes musculoskeletal pain. For this reason, it is obvious how important it is for university students to participate in physical activity in order to protect their physical and psychological health. For this reason, there is a need for training and support that will increase the awareness of university students about their physical and psychological health, and increase their level of physical activity with lifestyle changes. More efforts should be made to create strategies that motivate university students to lead a healthy lifestyle in all aspects, with a particular emphasis on engaging in physical activity and reducing sitting time. Education campaigns on the importance of PA should be prepared for university students. These strategies could create the opportunity to increase PA among this group and positively impact health behaviors extending into lifelong.

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GENİŞLETİLMİŞ ÖZET

Giriş

2019 yılı sonunda ortaya çıkan ve 160'tan fazla ülkeyi etkisi altına alan COVID-19 enfeksiyonu, küresel bir pandemiye dönüşmüştür. Bu süreçte birçok ülkede geçici olarak tüm üniversiteleri kapatma ve uzaktan eğitim sistemlerine geçiş kararı alınmıştır. Türkiye'de de tüm üniversitelerde online eğitime geçiş yapılmıştır. Ancak online eğitim döneminde üniversite öğrencileri derslerini bilgisayar, dizüstü bilgisayar, tablet ve akıllı telefon üzerinden sürdürmekte ve bu uzun süreli inaktivite kas-iskelet sisteminde ağrı ve problemlere neden olmaktadır. Pandemi sürecinde insanların duygusal, bilişsel, fiziksel ve davranışsal sorunlar yaşadığını, ayrıca fiziksel aktivitenin olumlu davranış değişikliklerine yol açtığını, sağlıklı bir yaşam tarzı benimsemeye yardımcı olduğunu ve ruh sağlığını iyileştirdiğini biliyoruz. . Bu bilgiler ışığında, bu çalışmanın temel amacı, COVID-19 pandemisi nedeniyle oluşan sosyal ve fiziksel izolasyonun bireylerde oluşturduğu psikolojik ve fiziksel etkilerin incelenmesidir. Bu amaç doğrultusunda; Covid 19 pandemi sürecinde bireylerin fiziksel aktivite düzeyleri ile kas iskelet sistemi sorunları, psikolojik sağlamlık, belirsizliğe tahammülsüzlük ve COVID-19 ile ilgili psikolojik sıkıntı düzeyleri arasındaki ilişkilerin belirlenmesi hedeflenmektedir. Araştırmanın ikincil amacı ise bireylerin psikolojik sağlamlıklarının, belirsizliğe tahammülsüzlük, COVID-19 ile ilgili psikolojik sıkıntı, fiziksel aktivite düzeyi ile kas iskelet sistemi sorun düzeyleri tarafından anlamlı olarak yordanıp yordanmadığını incelemektir.

Yöntem

Araştırmaya 2020-2021 eğitim-öğretim yılında, Nisan-Haziran 2021 tarihleri arasında, Türkiye'deki farklı üniversitelerde öğrenim gören 860 üniversite öğrencisi katılmıştır (651 kadın ve 209 erkek). Google Forms üzerinden web tabanlı bir değerlendirme yapılmıştır. Ankete katılmak isteyen öğrencilerden formu doldurmadan önce bilgilendirilmiş onamları alınmıştır. Dahil edilme kriterleri şunlardır: (a) 18 yaşından büyük olmak, (b) aktif olarak Türkiye'de okuyan bir üniversite öğrencisi olmak, (c) Türkçe konuşabilme ve anlama becerisine sahip olmak.

Katılımcıların yaş, cinsiyet, COVID-19 tanısı alma gibi demografik ve klinik özellikleri kaydedilmiştir. Bireylerin fiziksel aktivite ve sedanter hayat biçimlerini tespit etmek için "Uluslararası Fiziksel Aktivite Anketi (IPAQ)-Kısa form"; kas-iskelet semptomlarının varlığını araştırmak için "İskandinav Kas İskelet Sistemi Sorgusu"; psikolojik sıkıntı düzeyini ölçmek için "COVID-19 ile İlişkili Psikolojik Sıkıntı Ölçeği (CORPD)", bireylerin belirsizlik içeren durumlara ilişkin tahammül düzeylerini ölçmek için "Belirsizliğe Tahammülsüzlük Ölçeği (BTÖ-12)" ve psikolojik sağlamlık düzeylerini ölçmek için "Kısa Psikolojik Sağlamlık Ölçeği" kullanıldı.

Bulgular

Araştırmada; her üç değişkende de gruplar farklılık göstermektedir [Pillia's trace= 0,027, F(6,1712)=3,84, p<.05.]. Bu sonuç katılımcıların psikolojik sağlamlık, belirsizliğe tahammülsüzlük ve COVID-19 ile ilgili psikolojik sıkıntı düzeylerinin fiziksel aktivite düzeyine göre değiştiğini göstermektedir. Katılımcıların aktivite düzeyleri arttıkça psikolojik sağlamlık düzeylerinin arttığı göze çarpmaktadır. Bunun yanında COVID-19 ile ilgili psikolojik sıkıntı düzeyinin en düşük olduğu grubun "çok aktif" olarak nitelendirilen grup olduğu göze çarpmaktadır. Belirsizliğe tahammülsüzlük ve toplam fiziksel aktivite düzeyinin birlikte psikolojik sağlamlığı anlamlı olarak yordadığı görülmektedir (R2=0,092, p<.05). Buna göre belirsizliğe tahammülsüzlük ve toplam fiziksel aktivite düzeyi birlikte psikolojik sağlamlığın toplam varyansının %9'unu açıklamaktadır.

Bunun yanı sıra psikolojik sağlamlık düzeyi ile şiddetli fiziksel aktivite, orta şiddetli fiziksel aktivite ve toplam aktivite düzeyleri arasında düşük düzeyde pozitif ve anlamlı ilişkiler olduğu göze çarpmaktadır. Üniversite öğrencilerinde pandemi döneminde kas-iskelet sistemi ağrı prevelansının en yüksek olduğu vücut bölgeleri sırasıyla; bel (%62,4), üst sırt (%60,7), boyun (%55,6) ve omuzlardı (%49,2). Bel ağrısı olan bireylerin psikolojik dayanıklılık ve şiddetli fiziksel aktivite düzeylerinin daha düşük, belirsizliğe karşı tahammülsüzlüklerinin ise daha yüksek olduğu gösterilmiştir.

Tartışma ve sonuç

Fiziksel aktivitenin dünya çapında belirsizlik dönemlerinde bile insanların ruh sağlığını korumaya yardımcı olduğunu, pandemiye karşı artan fiziksel hareketsizliğin hem öğrencilerin psikolojik dayanıklılıklarını olumsuz etkilediğini hem de kas-iskelet sistemi ağrılarına neden olduğunu gösterdi; dolayısıyla üniversite öğrencilerinin fiziksel ve psikolojik sağlıklarını koruyabilmeleri için fiziksel aktiviteye katılmaları önemlidir.