TURKISH PSYCHOLOGICAL COUNSELING AND GUIDANCE JOURNAL
2023, VOL. 13, NO. 68, 61 - 74.

Official Journal of
Turkish Psychological Counseling
and Guidance Association

ISSN: 1302 – 1370, E-ISSN: 2822 – 6569

https://doi.org/10.17066/tpdrd.1208263el

Psychological Effects of the Pandemic on Turkish University Students During the Period of Returning to Universities

Ezginur ÇELİK[a] Sinem BALTACI[a] Neslihan YAMAN[a]

[a]Yalova University, Yalova, Turkey

ARTICLE HISTORY

Received: 03.11.22
Accepted: 26.01.23

KEYWORDS

Psychological effects of COVID-19; University students; Psychological health; Psychological problems.

ABSTRACT

The COVID-19 pandemic may have been psychologically stressful for everyone who was affected by it, but people who are predisposed to mental health problems may have felt it more intensely than others. Students at universities are one of these vulnerable populations. The uncertainty brought on by COVID-19 had a negative psychological impact on them, but this effect became more complex in the process of restarting education after a long break. The purpose of this study is to investigate the psychological situation of Turkish university students during the period when face-to-face education began to reappear as a result of the COVID-19 precautions being reduced. For this aim, the psychological situation of 224 Turkish students aged 17–25 was assessed using the Beck Depression Inventory (BDI), State and Trait Anxiety Scale (STAT), Connor Davidson-Resilience Scale (CD-RISC), Positive and Negative Affect Schedule (PANAS), and Brief Symptom Inventory (BSI). In addition, the students were asked about their life satisfaction, chronic illness, duration of physical activity, screen time, and needs of psychological support. The results revealed that during this period, students reported low levels of exercise and physical activity time, increased time spent in front of a screen, low life satisfaction, higher rates of receiving and needing psychological support, and higher levels of negative affect, depression, anxiety, and brief symptoms. Furthermore, the results showed that positive affect and resilience are protective factors for psychological health. The findings of the study highlighted the critical role of psychological support services at universities in promoting and preserving students' mental health.

While measures to protect people's physical health were prioritized with the COVID-19 pandemic (Sohrabi et al., 2020), mandatory social isolation of the population produced significant psychological consequences; thus, the adverse effects of this virus on psychological health such as loneliness, anxiety, depression (Galea et al., 2020), social withdrawal (Kato et al., 2020) have made it clear how crucial it is to pay attention to the pandemic's psychological effects (Brooks et al., 2020; Holmes et al., 2020; Rogers et al., 2020).

The pandemic's impact on psychological health could manifest itself in the short, medium, and long term. The short-term psychological impacts of the pandemic may resemble the first reactions to traumatic experiences (e.g., shock, freezing, fighting). There are many studies focusing on the short-term effects of the pandemic on psychological health (e.g., Braquehais et al., 2020; Carriedo et al., 2020; Dawson & Golijani-Moghaddam, 2020; Ripon et al., 2020). On the other hand, previous pandemics have shown that psychological effects of pandemic last longer than physical effects (Shigemura et al., 2020). Thus, the long-term psychological impacts of the pandemic could bring to mind the symptoms of Post-Traumatic Stress Disorder, which were limited

CORRESPONDING AUTHOR Ezginur ÇELİK, ezginur.celik@yalova.edu.tr, ORCID: 0000-0002-5399-9255, Yalova University, Yalova, Turkey.

results.

Long-term effects of pandemic on students

Although COVID-19 had an impact on several groups, one of the groups negatively affected by the epidemic was students. Especially, students' daily routines suddenly changed because of shifting to online education. Undoubtedly, the effects of this change might be different for primary school, high school, and university students. Especially, senior year high school students experienced increased stress because of the pressure of university entrance exams combined with the uncertainty of the exam's timing and conditions caused by COVID-19 (Giannopoulou et al., 2021). According to reports, depression and anxiety among senior high school students increased during the lockdown, and the level of psychological distress was a significant risk factor of poor psychological health during the lockdown. Moreover, It was highlighted that students taking the exam during Covid-19 had experienced higher anxiety than the others taking the exam before Covid-19 (Fernandez-Castillo, 2021). Even students of all educational level have experienced difficulties in different ways during Covid-19. However, there is a commonality between these groups: "new" daily routine has limited students' social support (Liu et al., 2020) although social support was reported one of the protective factors for psychological health (Li et al., 2021). Boyraz and Legros (2020) found that restricted social support was associated with the level of anxiety, depression, stress, and loneliness of university students. Additionally, spending more time in front of screen and social media, being exposed to bad news more frequently, and decreasing the level of physical activity are all risk factors for university students developing psychological symptoms (Browning et al., 2021; Fennell et al., 2022; Giri & Maurya, 2021; Islam et al., 2021).

However, thanks to the development of the Covid-19 vaccine, the virus's spread has been limited, and the normalization process has begun. As a result of this procedure, face-to-face education began in Turkey in September 2021. Thanks to the invention of vaccine, the virus' spread has been limited and the normalization process has begun. As a result of this procedure, face-to-face education began in Turkey in September 2021. During this period, university students begun their lessons by abiding to specific rules, such as wearing a mask and maintaining social distance in the classroom. It was suggested that this period, called "new-normal", could be a stressor for both university employees and students (Liu et al., 2020). Moreover, studies have found a link between psychological resilience (which is defined as the capacity of quickly recovering from a stressful circumstance and returning to one's usual life) and lower levels of anxiety, sadness, and physical symptoms (Doğan, 2015; Kılıç, 2014; Song et al., 2021). Before the COVID-19, most studies studies on the mental health of university students have generally focused on how well they adjusted to the university life (Özkan & Yılmaz, 2010), psychological state (İlhan et al., 2014), quality of life and happiness levels (Akyüz et al., 2017), depressive symptoms and hopelessness level (Çam & Erkorkmaz, 2008), leisure activities (Akyüz & Türkmen, 2016), and technology addiction (Demir & Kumcagiz, 2019). In the literature, few studies have been conducted to investigate the medium and long-term effects of the COVID-19 on psychological well-being of university students (Gündoğan, 2022; Horita et al., 2022). Therefore, focusing and understanding the "new-normal" and medium to long-term effects of the pandemic on university students' psychological health could be beneficial in preventing psychological disorders before they occur and/or later in reducing their severity.

Based on this need, the aim of this study was to examine the mid-term effect of COVID-19 on psychological health of university students. For this aim, students' psychological situations were investigated in terms of the level of depression, state anxiety, trait anxiety, psychological resilience, positive and negative affect, and brief psychological symptoms. The following research questions were attempted to be answered in the current study: (1) Do the variables of chronic illness, time spent on exercise, time spent on physical activity, time spent in front of screen, life satisfaction, receiving psychological support and needing psychological support have effect on depression, state anxiety, trait anxiety, resilience, psychological symptoms experienced by COVID-19 in the medium term? (2) Which of variables explain psychological symptoms experienced in the medium term of COVID-19?

Method

Participants

The sample of the current study consisted of 224 undergraduate students ($\bar{X}$ = 19.52, SD = 1.52 years, range: 17 to 25). Data was collected from 23 different universities in Turkey, mostly from Yalova University (N = 161). 81.3% of the sample was first grade and the remaining sample consisted of second grade (4.5%), third grade (5.4%), fourth grade (6.7%) and preparatory grade (2.2%).

There is a demographic characteristic of sample in Table 1. Accordingly, 88.4% of the students do not have any chronic illness, 11.6% of them have a chronic illness; 33% of them received psychological support, 67% did not receive psychological support, 50.9% of them did not need psychological support, and 49.1% needed psychological support. Besides that, 51.3% of the students have been physically active for at least one hour a day for the past week and 64.7% of the students exercise at most once a week. Moreover, 55.4% of them spend their time on screen for more than four hours in a day. Finally, 44.3% of students have low life satisfaction and 55.7% high life satisfaction.

Table 1. Demographic characteristics of the sample (N = 224)

Variables	N	Percentage (%)
Had have any chronic illness		
No	198	88.4
Yes	26	11.6
Taken psychological support		
No	150	67
Yes	74	33
Needed psychological support		
No	114	50.9
Yes	110	49.1
Exercise time		
Low	145	64.7
High	79	35.3
Physical activity		
Low	109	48.7
High	115	51.3
Screen Time		
Low	100	44.6
High	124	55.4
SWL		
Low	99	44.3
High	125	55.7

Note. SWL = Satisfaction with life, N = Number of participants.

Data Collection Procedure

After receiving ethical approval from intuition of Yalova University Human Research Ethics Committee for the current study, a booklet was created on Google Form to collect data via online. Informed consent form and other measurement tools described below were included in the study. After participants read the description of the study offered the option of voluntary participation, other measurement tools were screened. To preserve the privacy of the participants, no personal information was included in the survey. Participation in the study last approximately 15 minutes. The data collection process, which started one month after the institutions started teaching, took a total of three weeks.

Data Collection Tools

Demographic Form. Age, socioeconomic status, whether they have had any chronic illness, time spent on exercise, time spent on physical activity, time spent on screen, satisfaction with life (SWL), taken psychological support and needed psychological support were questioned. In line with the aim of the study, the responses from the variables of Exercise time, Physical activity, Screen Time, SWL were grouped as low and high in scoring in order to reveal the effects of COVID-19 on psychological health. Thus, scores on time spent on exercise, time spent on physical activity, time spent on screen and SWL were used to separate participants into low and high. Time spent on exercise and time spent on physical activity were measured by 7-point scale whose cut-off point was 4. Time spent on screen was calculated by 14-point scale whose cut off point was 7. Moreover, SWL was measured by 10-point scale whose cut off point was 6. In order to decide the cut off points, the median point was taken into account.

Beck Depression Inventory (BDI). Participants' depression level was measured by BDI in this study. It is a self-report measurement developed to assess the level of depression with 21 questions. Each question is responded four possible answers rated by their intensity. Scores between 0-9 stand for no depression; 10-18 stand for mild-to-moderate depression; 19-29 stand for moderate-to-severe depression, and 30-63 stand for severe depression (Beck et al., 1988). Turkish version of BDI was developed by Hisli (1988). Internal consistency coefficient of the scale was .80. In this study, its Cronbach's alpha was .86.

State and Trait Anxiety Scale (STAT). STAT was developed to measure the level of state and trait anxiety (Spielberg et al., 1970). While state anxiety means how anxious people are under specific time and situations, trait anxiety means how anxious people are in general like a personality trait. Thus, the measurement has two separate scales to measure them which consist of 20 items each. These items are rated by 4-point Likert type scale. The Turkish version of the scale was developed (Öner & Le Compte, 1985), and whereas for the subscale of state anxiety, test-retest reliability was found between .26 and .86, for the subscale of trait anxiety, test-retest reliability was found between .71 and .86. In this study, Cronbach's alphas were .52 and .71 for the subscales of state and trait anxiety, respectively.

Brief Symptom Inventory (BSI). BSI was developed to measure several psychological symptoms with 53 items rated by 5-point Likert type scale (0 = not at all; 4 = extremely; Derogatis, 1992). BSI has nine subscales (i.e., anxiety, depression, somatization, hostility, phobic anxiety, obsession-compulsion, interpersonal sensitivity, paranoid ideation, and psychoticism) and three global indices of distress (global severity index, positive symptom distress index and positive symptom total). Its Turkish version was developed and grouped into five subscales (anxiety, depression, negative self, somatization, and hostility) while three global indices of distress stayed the same (Şahin & Durak, 1994). Its internal consistency coefficient was .98 for total score. In this study, its Cronbach alpha for total score was .96.

Connor Davidson-Resilience Scale (CD-RISC). CD-RISC was developed to measure the level of psychological resilience with 25 items ranged by 5-point Likert scale (0 = not true at all; 4 = true nearly all of the time) and higher scores stand for greater resilience (Connor and Davidson, 2003). Its internal consistent reliability was found as .89. The Turkish version of the scale was developed, and its Cronbach's alpha was reported as .92 (Karaırmak, 2010). In this study, its Cronbach's alpha was .93.

Positive and Negative Affect Schedule (PANAS). PANAS is a self-report measurement created to measure positive and negative trait affect with 20 items (Watson et al., 1988). Each of both subscales consists of ten words describing feelings and emotions rated by 5-point Likert type scale (1 = not at all; 5 = extremely). Higher scores mean higher positive and negative affect level. Its Turkish version was created (Gencöz, 2000). Cronbach's alphas were .81 and .79 for positive and negative affect, respectively. In this study, its Cronbach's alphas were .89 and .86 for the subscale of positive affect and negative affect, respectively.

Data Analysis

Before conducting the analysis of correlational survey model, normally distribution was checked (between -1.50 and +1.50) (Tabachnick & Fidell, 2013). All of the variables were normally disturbed (for depression .87 and 1.14; for state anxiety .40 and -.37; for trait anxiety -.05 and -.64; for positive affect -.12 and -.54; for negative affect .71 and -.09; for resilience -.36 and -.08; for psychological symptoms .52 and -.43; skewness

and kurtosis respectively). To analyze group differences on psychological health, Independent Samples t-test was conducted with the independent variables of chronic illness (whether they have had any chronic illness or not), exercise (how frequently they exercise in their free time), physical activity (how much they are active at less than 60 minutes in the last 7 days), screen time (time spent in front of the screen), satisfaction with life (SWL; how satisfied they are with their life), psychological support taken (whether they have taken any kind of psychological support) and psychology support needed (whether they claim they need any kind of psychological support). Dependent variables were depression, state anxiety, trait anxiety, positive and negative affect, resilience, and psychological symptoms including depression, anxiety, negative self, somatization, and hostility. In the second part of the analysis, a multiple linear regression analysis was conducted to explain the variance of the variable of psychological symptoms measured by BSI.

Results

Descriptive characteristics of continuous variables were shown at Table 2. The values of arithmetic mean, standard deviation and standard error mean, respectively; $\bar{X}$ = 30.21, SD = 8.75, S.E. Mean =.58 for positive affect, $\bar{X}$ = 20.88, SD = 7.88, S.E. Mean = .53 for negative affect; $\bar{X}$ = 86.78, SD =18.43, S.E. Mean = 1.23 for resilience; $\bar{X}$ = 14.55, SD = 8.95, S.E. Mean = .60 for Beck Depression Inventory; $\bar{X}$ = 42.44, SD = 11.49, S.E. Mean = .77 for state anxiety; $\bar{X}$ = 45.55, SD = 10.97, S.E. Mean =.73 for trait anxiety; $\bar{X}$ = 116.98, SD = 39.31, S.E. Mean = 2.63 for Brief Symptom Inventory.

Table 2. Descriptive characteristics of continuous variables (N = 224)

Variables	$\bar{X}$	SD	S.E.Mean
Positive affect	30.21	8.75	.58
Negative affect	20.88	7.88	.53
Resilience	86.78	18.43	1.23
Beck Depression Inventory	14.55	8.95	.60
State anxiety	42.44	11.49	.77
Trait anxiety	45.55	10.97	.73
Brief Symptom Inventory	116.98	39.31	2.63

Note. $\bar{X}$ = Mean, SD = Standard deviation, S.E. Mean = Standard error of the mean.

Descriptive statistics of the independent and dependent variables and the results of Independent Samples t-test analyses were shown on Table 3.

Table 3. Descriptive statistics of the independent and dependent variables and the results of independent t-test analyses.

	DV	D					SA				TA				PA				NA			
		N	X̄	SD	t	p	X̄	SD	t	p	X̄	SD	t	p	X̄	SD	t	p	X̄	SD	t	p
IV	Groups																					
Chronic illness	No	198	14.23	8.96	-1.49	.14	42.09	11.61	-1.25	.21	44.95	11.03	-2.11	.04	29.73	8.48	-2.32	.02	20.53	7.80	-1.89	.06
	Yes	26	17.00	8.62			45.08	10.38			49.73	9.74			33.92	10.0			23.62	8.08		
Exercise time	High	79	13.85	9.39	-.87	.39	42.67	11.83	.22	.82	42.62	11.45	-2.95	.00	32.75	7.80	3.27	.00	20.65	8.51	-.33	.74
	Low	145	14.94	8.71			42.31	11.35			47.08	10.41			28.83	8.95			21.01	7.53		
Physical activity	High	109	13.11	8.16	-2.38	.02	41.45	11.31	-1.25	.21	44.61	10.48	-1.20	.23	31.41	7.94	2.01	.04	20.60	7.77	-.53	.60
	Low	115	15.92	9.47			43.37	11.64			46.36	11.40			29.08	9.35			21.16	8.00		
Screen time	High	124	15.81	8.46	2.36	.02	43.48	11.48	1.52	.13	47.86	10.54	3.68	.00	28.73	8.35	-2.88	.00	21.90	8.03	2.18	.03
	Low	100	13.00	9.33			41.14	11.44			42.58	10.84			32.06	8.92			19.62	7.53		
SWL	High	127	11.32	6.73	-6.46	.00	38.29	9.92	-6.76	.00	41.17	9.86	-7.58	.00	31.97	8.59	3.52	.00	18.59	6.93	-5.28	.00
	Low	97	18.78	9.73			47.86	11.20			51.18	9.74			27.92	8.46			23.89	8.06		
Psych. sup. taken	No	150	12.88	8.66	-4.13	.00	40.98	43.95	-2.74	.01	43.95	11.24	-3.08	.00	30.12	8.99	-.23	.82	19.41	7.26	-4.14	.00
	Yes	74	17.95	8.61			45.39	48.66			48.66	9.74			30.40	8.30			23.88	8.27		
Psych. sup. needed	No	114	11.13	7.24	-6.29	.00	37.87	10.05	-6.61	.00	40.33	9.96	-8.17	.00	31.43	8.72	2.13	.03	17.82	7.06	-6.43	.00
	Yes	110	18.10	9.20			47.17	11.00			50.86	9.30			28.96	8.64			24.05	7.44		

	DV	R				PS			
		$\bar{X}$	SD	t	p	$\bar{X}$	SD	t	p
IV	Groups								
Chronic illness	No	86.38	17.98	-.88	.38	114.12	38.67	-3.06	.00
	Yes	89.77	21.69			138.74	38.01		
Exercise time	High	90.06	19.31	1.98	.04	112.39	43.07	-1.24	.22
	Low	84.98	17.75			119.48	37.02		
Physical activity	High	87.61	18.55	.66	.51	114.23	39.52	-1.02	.31
	Low	85.98	18.36			119.59	39.10		
Screen time	High	82.88	16.03	-3.53	.00	124.21	38.30	3.13	.00
	Low	91.60	20.08			108.01	38.87		
SWL	High	90.75	18.44	3.80	.00	103.44	33.53	-6.41	.00
	Low	81.58	17.16			134.71	39.41		
Psyc. sup. taken	No	87.51	18.30	.85	.40	107.83	36.28	-5.25	.00
	Yes	85.28	18.72			135.52	38.90		
Psyc.sup. needed	No	89.65	18.87	2.40	.02	99.44	32.94	-7.62	.00
	Yes	83.80	17.55			135.16	37.17		

Note. IV= Independent variables, DV = Dependent variables, D = Depression, SA = State anxiety, TA = Trait anxiety, PA = Positive affect, NA = Negative affect, R = Resilience, PS = Psychological symptoms, SWL = Satisfaction with life, $\bar{X}$ = Mean, SD = Standard deviation.

People with any chronic illness had higher trait anxiety score ($t(222) = -2.11$, $p < .05$), higher positive affect score ($t(222) = -2.32$, $p < .05$), and higher psychological symptoms ($t(222) = -3.06$, $p < .05$) than people without any chronic illness had. Moreover, positive affect was differed on exercise level and physical activity level. People spending more time on exercising ($t(222) = 3.27$, $p < .05$) and physical activity ($t(222) = 2.01$, $p < .05$) had higher positive affect score than people spending less time spending on exercise and physical activity had. However, while people with high exercise level had less trait anxiety ($t(222) = -2.95$, $p < .05$) and higher resilience ($t(222) = 1.98$, $p < .05$) than people with low exercise level did, people with high physical level had less depression than people with low physical level ($t(222) = -2.38$, $p < .05$) did. Additionally, there were significant differences between people spending more and less time on screen in terms of depression, trait anxiety, positive affect, negative affect, resilience, and psychological symptoms. Higher time spent on screen was associated with higher depression ($t(222) = 2.36$, $p < .05$), higher trait anxiety ($t(222) = 3.68$, $p < .001$), lower positive affect ($t(222) = -2.88$, $p < .05$), higher negative affect ($t(222) = 2.18$, $p < .05$), lower resilience ($t(222) = -3.53$, $p < .05$) and higher psychological symptoms ($t(222) = 3.13$, $p < .05$).

Additionally, people who had taken any psychological support and people who had not taken any psychological support differed from each other on scores of the variable of depression, state anxiety, trait anxiety, negative affect, and psychological symptoms. The former had higher scores on all of them than the latter, $t(222) = -4.13$, $p < .001$, $t(222) = -2.74$, $p < .05$, $t(222) = -3.08$, $p < .001$, $t(222) = -5.25$, $p < .001$, respectively.

People who claimed that they needed psychological support differed from people who claimed that they did not need psychological support in terms of all dependent variables, for depression t (206) = -6.29, p <.001, for state anxiety, t (222) = -6.61, p <.001, for trait anxiety, t (222)= -8.17, p <.001, for positive affect t (222) = 2.13, p <.05, for negative affect, t (222) = -6.43, p <.001, for resilience, t (222) = 2.40, p <.05 and for psychological symptoms, t (222) = -7.62, p <.001.

Moreover, people with high SWL differed from people with low SWL in terms of all dependent variables, for depression t (162) = -6.46, p <.001, for state anxiety, t (222) = -6.76, p <.001, for trait anxiety, t (222)= -7.58, p <.001, for positive affect t (222) = 3.52, p <.001, for negative affect, t (222) = -5.28, p <.05, for resilience, t (222) = 3.80, p <.001 and for psychological symptoms, t (222) = -6.41, p <.001.

For the second part of the results, the multiple linear regression analysis was conducted for the variable of psychological symptoms measured by BSI. Correlation of the variables were shown at Table 4 and the results of the multiple linear regression analysis were shown at Table 5.

As can be seen in Table 4, while there was a positive relationship between BSI and negative affect (r = .82, p < .001); there were negative relationships between BSI and positive affect, resilience, and satisfaction with life (r = -.23, p < .001; r = -.26, p < .001; r = -.43, p < .001, respectively). Positive affect had a negative relationship with negative affect (r = -.17, p < .001), and positive relationships with resilience and satisfaction with life (r = .63, p < .001; r = .31, p < .001, respectively). Negative affect had negative correlations with both resilience and satisfaction with life (r = -.32, p < .001; r = -.39, p < .001, respectively). In addition, there was a positive relationship between resilience and SW (r = .36, p < .001).

Table 4. Correlations between the variables used for multiple linear regression analysis.

Variables	1	2	3	4	5
1.BSI	1	-.23**	.82**	-.26**	-.43**
2. PA		1	-.17**	.63**	.31**
3. NA			1	-.32**	-.39**
4. R				1	.36**
5. SWL					1

Note. BSI = Brief symptom inventory, PA = Positive affect, NA = Negative affect, R = Resilience, and SWL = satisfaction with life.
** Correlation is significant at the 0.01 level (2-tailed).

With all predictors in the equation, it was found that R2 = .69, F (4, 219)= 123.46, p < .05. The adjusted R2 value of .69 indicates that more than two third of the variability in psychological symptoms measured by BSI was explained by these variables (see in Table 5). According to the results of multiple regression analysis to determine the predictive level of PA, NA, Resilience scale scores, and Life Satisfaction scores on BSI scores, all scores showed a high and significant relationship with BSI scores. When the results regarding the significance of the regression coefficients were examined, PA (β = -.13), NA (β =.78), Resilience (β = -.11), SWL scores (β = -.13) were found to have a significant effect on BSI scores (p < .05). In addition, considering the VIF and Tolerance values, it was decided that there was no multicollinearity between the variables.

Table 5. The result of the multiple linear regression analysis for the variable of psychological symptoms measured by BSI.

Predictors	B	SD	B 95% CI [LL, UL]	β	t	p
Constant	39.3	10.42	[25.96, 67.01]		4.47	.00
PA	-.56	.22	[-1.0, -.13]	-.13	-2.56	.01
NA	3.90	.20	[3.49, 4.31]	.78	18.75	.00
R	-.24	.10	[-.02, -.45]	-.11	-2.17	.03
SWL	-2.52	.85	[-4.20, -.83]	-.13	-2.95	.00
$R=.83$ $R^2=.69$ $F_{(4, 219)}= 123.46, p <.05$						

Note. PA = positive affect, NA = negative affect, R = resilience, SWL = satisfaction with life.

Discussion

Pandemics that affect society with different way have clearly negative consequences on people's life (Trauer et al., 2011). From previous pandemics, it is known that psychological effects of pandemic last more than physical one (Shigemura et al., 2020). Even, some researchers reported that COVID-19 is a risk factor of panic, anxiety, depression and post-traumatic stress disorders (e.g., Jakovljevic et al., 2020). As a result, it is critical to reassess university students' psychological health and identify areas of need before returning to face-to-face education. Because of switching from face-to-face education to online education, especially young generation has exposed to adverse effects of pandemic in a variety of ways (Lee, 2020; Zengin & Şengel, 2020). It was reported that having stressors during pandemic, experiencing changes in daily life, switching to online education and diminished social support were the causes of increasing the level of anxiety of university students (Cao et al., 2020). With the increased number of diagnosis of depression, anxiety disorders (Costello et al., 2003) and internalizing problems (Görmez et al., 2017), university students could be more at risk in terms of experiencing psychological problems (O'Brien, 2010). Besides that, it was appointed that psychological health of university students is worsening by increased the level of anxiety and fear caused by pandemic (Mei et al., 2011). Moreover, psychological problems experienced during college may result in deteriorating mental health, which has the potential to impair individuals' daily functioning (Dursun et al., 2010).

Current research aimed to investigate psychological problems of university students in these days when face-to-face education has returned due to the release of the COVID-19 precautions. Examining the findings of the research, psychological support emerged as an important area of need. Students who stated needing psychological support had higher scores for depression, state anxiety, trait anxiety, negative affect, and psychological symptoms than those who stated not needing psychological support. Moreover, students who reported that they needed support, experienced lower resilience, and positive affect. Furthermore, it was shown that students who taken or needed psychological support had higher depression, state anxiety, trait anxiety, negative affect, and psychological symptom scores. Having a chronic disease was identified as one of the significant factors to this increase. People with chronic disease exhibited greater trait anxiety negative affect, and psychological symptoms than those without chronic disease. Other studies have supported the role of chronic illness in the psychological effects of COVID-19 on individuals (e.g., Özdin & Bayrak-Özdin, 2020). In addition, it was reported that individuals who felt anxious and depressed during COVID-19 and who needed psychological help had higher psychological symptoms than those who did not (Wang et al., 2020).

Physical activity has been difficult to maintain during the pandemic's stay-at-home period. In the context of the current study, it was observed that 64.7% of the students engaged in physical exercise no more than once

a week, while 55.4% spent more than four hours per day in front of the screen. According to other studies that support this finding, the physical activity level of university students was low during the pandemic, with 30.7% of students not being physically active (Bulguroğlu et al., 2021). A meta-analysis reported that approximately 40-50% of university students were not physically active (Keating et al., 2005). However, it was noted that inactivity is a significant factor in the decline of mental and physical health (Pinto et al., 2017). Additionally, physical inactivity significantly predicts high perceived stress (Aslan et al., 2020). In another research, it was supported there is a negative association between university students' physical activity level and depression symptoms, and a positive relationship with quality of life (Tekin et al., 2009). Students' exposure to online education and the pandemic may both contribute to an increase in the likelihood that they will lead a sedentary lifestyle. It was reported that this increase could have a negative influence on the quality of life of students (Bulguroğlu et al., 2021). Similarly, it was discovered in this study that people who spent more time on exercising and engaging in physical activity had a higher positive effect score than people who spent less time on it. In addition, those with a high level of exercise had lower trait anxiety and greater resilience than those with a low level of exercise, while those with a high level of physical activity had lower levels of depression. In addition, those with a high level of exercise had lower trait anxiety and greater resilience than those with a low level of exercise, while those with a high level of physical activity had lower levels of depression. Higher screen time was associated with higher depression, trait anxiety, negative affect, higher psychological symptoms, and lower positive affect and resilience. As a result of them, it can be said that presence of physical activity was pivotal in improving psychological health and this was supported by other research findings (eg., Fisher & Heymann, 2020).

Another finding of the study was that 44.3% of university students were dissatisfied their lives. Those individuals had higher levels of depression, state anxiety, trait anxiety, negative affect, and psychological symptoms, while those individuals had lower levels of resilience and positive affect. In addition, positive affect, negative affect, resilience, and life satisfaction were found as significantly associated with psychological symptom scores. While there was a negative relationship between psychological symptoms and positive affect, resilience and life satisfaction, psychological symptoms had a positive relationship with negative affect and life satisfaction. This finding may provide evidence that anxiety and depression of students having risen after the pandemic (Zhai & Du, 2020). According to reports, students find working at home more challenging than working at school and working at home is associated with greater levels of self-negation and depression (Chena et al., 2020). On the other hand, despite negative effects of COVID-19 on the psychological health of university students, resilience plays a crucial role on coping with those effects. People with high psychological resilience can deal with problems in their daily lives more effectively. Therefore, resilience can be viewed as a protective factor that helps in the reduction of stressors and prevention of psychological disorders. Çuhadar et al. (2014) discovered a negative relationship between BSI-measured psychological symptoms and level of resilience. According to Bozdağ (2020), people who experienced high levels of depression and anxiety during the COVID-19 have lower levels of psychological resilience than others.

There were some limitations of this study. Gender of the participants was not examined and majority of them were Yalova University students. In future studies, it is recommended that gender be look at to see how the mental health of college students varies by gender. Moreover, to improve the generalizability of the findings, larger number of university students from different cities should be included in the study.

In conclusion, the current study examined the psychological health of university students returning to face-to-face education after the COVID-19 pandemic in terms of the effect of chronic illness, duration of exercise, physical activity, screen time, level of life satisfaction, taking and needing psychological support, positive affect, negative affect, resilience, and psychological symptoms. According to the findings of the study, the

level of psychological symptoms of university students is positively associated with chronic illness, time spent doing exercise, physical activity, and in front of the screen, taking psychological support, needing psychological support, and level of negative affect. Furthermore, resilience and life satisfaction have emerged as protective factors in the improvement of psychological health. The current study yielded significant findings in determining the factors influencing the psychological health of university students who continued their education after the pandemic. This study suggests that providing psychological support services for university students and taking steps to increase the number of students who can benefit from these services are becoming increasingly crucial in order to meet the demand for psychological support and improve psychological health.

Author Contributions: All authors worked on the concept of the study, gathering data and data analysis, write and made the critical revisions about the article. All authors have read and approved the final article.

Funding Disclosure: This work has been supported by Yalova University Scientific Research Projects Coordination Unit under grant number of 2021/AP/0013.

Conflicts of Interest: The author declares that no competing interests in this manuscript.

Data Availability: The data that support the findings of this study are available on request from the corresponding author.

Ethics Approval and Consent to Participate: The participants were reached after the approval of the Ethics Committee of Yalova University with the 13.10.2021 date and 2021/119 number was obtained for the study.

References

Aslan, I., Ochnik, D., & Çınar, O. (2020). Exploring perceived stress among students in Turkey during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health,* 17(8961): 2-17. https://doi.org/10.3390/ijerph17238961

Akyüz, H., & Türkmen, M. (2016). Üniversite öğrencilerinin boş zaman faaliyetlerine yönelik tutumlarının incelenmesi: Bartın Üniversitesi örneği [Investigation of university students' attitudes towards leisure time activities: bartin university sample]. *International Journal of Sport Culture and Science*, *4*(Special Issue 1), 340-357. https://doi.org/10.14486/IntJSCS562

Akyüz, H., Yaşartürk, F., Aydın, İ., Zorba, E., & Türkmen, M. (2017). Üniversite öğrencilerinin yaşam kalitesi ve mutluluk düzeyleri arasındaki ilişkinin incelenmesi [The investigation of the relationship between university students' levels of life quality and happiness]. *Uluslararası Kültürel ve Sosyal Araştırmalar Dergisi*, *3*(Special Issue 2), 253-262.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: psychometric properties. *Journal of Consulting and Clinical Psychology, 56*(6), 893–897. https://doi.org/10.1037/0022-006X.56.6.893

Bozdağ, F. (2020). Pandemi sürecinde psikolojik sağlamlık [Psychological resilience during pandemic]. *Electronic Turkish Studies*, *15*(6), 247-57. https://doi.org/10.7827/TurkishStudies.44890

Braquehais, M. D., Vargas-Cáceres, S., Gómez-Durán, E., Nieva, G., Valero, S., Casas, M., & Bruguera, E. (2020). The impact of the COVID-19 pandemic on the mental health of healthcare professionals. *An International Journal of Medicine*, 113(9), 613–617. https://doi.org/10.1093/qjmed/hcaa207

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet, 395*(10227), 912-920. https://doi.org/10.1016/s0140-6736(20)30460-8

Browning, M., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T. M., Thomsen, J., Reigner, N., Metcalf, E. C., D'Antonio, A., Helbich, M., Bratman, G. N., & Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: risk factors across seven states in the United States. *PloS One*, *16*(1), Article e0245327. https://doi.org/10.1371/journal.pone.0245327

Bulguroğlu, H. İ., Bulguroğlu, M., & Özaslan, A. (2021). Covid-19 pandemi sürecinde üniversite öğrencilerinin fiziksel aktivite, yaşam kalitesi ve depresyon seviyelerinin incelenmesi [Investigation of physical activity, quality of life and depression levels of university students during the COVID-19 pandemic process]. *Acıbadem Üniversitesi Sağlık Bilimleri Dergisi*, *12*(2): 306-311. https://doi.org/10.31067/acusaglik.852175

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of COVID-19 epidemic on college students in China. *Psychiatry Research, 287*, 112934. https://doi.org/10.1016/j.psychres.2020.112934

Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, *60*(8), 837-44. https://doi.org/10.1001/archpsyc.60.8.837

Çam, Ç. F., & Erkorkmaz, Ü. (2008). Üniversite öğrencilerinde depresif belirtiler ve umutsuzluk düzeyleri ile ilişkili etmenler [Factors related to depressive symptoms and hopelessness among university students]. *Nöropsikiyatri Arşivi*, *45*(4), 122-129.

Carriedo, D. A., Cecchini, J. A., Fernandez-Rio, D. J., & Méndez-Giménez, D. A. (2020). COVID-19, psychological well-being and physical activity levels in older adults during the nationwide lockdown in Spain. *The American Journal of Geriatric Psychiatry, 28*(11), 1146-1155. https://doi.org/10.1016/j.jagp.2020.08.007

Chena, R., Liangb, S., Pengc, Y., Lia X., Chena J., Tanga S., & Zhaob, J. (2020). Mental health status and change in living rhythms among college students in China during the COVID-19 pandemic: A large-scale survey. *Journal of Psychosomatic Research*, *137*, Article 110219. https://doi.org/10.1016/j.jpsychores.2020.110219

Çuhadar, D., Tanrıverdi, D., Pehlivan, M., Kurnaz, G., & Alkan, S. (2016). Determination of the psychiatric symptoms and psychological resilience levels of hematopoietic stem cell transplant patients and their relatives. *European Journal of Cancer Care*, *25*(1), 112-121. https://doi.org/10.1111/ecc.12219

Dawson, D. L., & Golijani-Moghaddam, N. (2020). COVID-19: Psychological flexibility, coping, mental health, and wellbeing in the UK during the pandemic. *Journal of Contextual Behavioral Science, 17*, 126-134. https://doi.org/10.1016/j.jcbs.2020.07.010

Demir, Y., & Kumcağız, H. (2019). Üniversite öğrencilerinin sosyal medya bağımlılığının farklı değişkenler açısından incelenmesi [Investigating the Effects of Several Variables on University Students' Social Media Addiction]. *Turkish Psychological Counseling and Guidance Journal*, *9*(52), 23-42.

Derogatis, L. R. (1992). *SCL-90-R: Administration, Scoring & Procedures Manual-II, for the R (Revised) Version and Other Instruments of the Psychopathology Rating Scale Series*, (2nd ed.). Clinical Psychometric Research.

Doğan, T. (2015). Kısa Psikolojik Sağlamlık Ölçeğinin Türkçe uyarlaması: Geçerlik ve güvenirlik çalışması [Adaptation of the Brief Resilience Scale into Turkish: A validity and reliability study]. *The Journal of Happiness & Well-Being*, *3*(1), 93-102.

Dursun, O. B., Güvenir, T., & Özbek, A. (2010). Çocuk ergen ruh sağlığında epidemiyolojik çalışmalar: Yöntemsel bir bakış [Epidemiologic Studies in Child and Adolescent Psychiatry: A Review of Methodology]. *Psikiyatride Güncel Yaklaşımlar*, *2*(3), 401-416.

Fernandez- Castillo, A. (2021). State-anxiety and academic burnout regarding university access selective examinations in Spain during and after COVID-19 lockdown. *Frontiers in Psychology, 12,* Article 621863. https://doi.org/10.3389/fpsyg.2021.621863

Fennell, C., Eremus, T., Puyana, M. G., & Sanudo, B. (2022). The importance of physical activity to augment mood during COVID-19. *International Journal of Environmental Research and Public Health, 19*(3), Article 1270. https://doi.org/10.3390/ijerph19031270

Fisher, D., & Heymann, D. (2020). Q&A: the novel coronavirus outbreak causing COVID-19. *BMC Medicine, 18*(1), Article 57. https://doi.org/10.1186/s12916-020-01533-w

Gençöz, T. (2000). Pozitif ve negatif duygu ölçeği: geçerlik ve güvenirlik çalışması [Positive and Negative Affect Schedule: A study of validity and reliability]. *Türk Psikoloji Dergisi*, *15*(46), 19-26.

Giannopoulou, I., Efstathiou, V., Triantafyllou, G., Korkoliakou, P., & Douzenis, A. (2021). Adding stress to the stressed: Senior high school students' mental health amidst the COVID-19 nationwide lockdown in

Greece. *Psychiatry Research, 295*, Article 113560. https://doi.org/10.1016/j.psychres.2020.113560

Giri, S. P., & Maurya, A. K. (2021). A neglected reality of mass media during COVID-19: Effect of pandemic news on individual's positive and negative emotion and psychological resilience. *Personality and Individual Differences, 180*, Article 110962. https://doi.org/10.1016/j.paid.2021.110962

Görmez, V., Örengül, A. C., Baljinnyam, S., & Aliyeva, N. (2017). Çocuk ve ergen psikiyatrisi polikliniğine başvuran hastalarda tanı dağılımı ve demografik özellikler [Assessment of symptoms, diagnosis and comorbidity of patients referring to a child and adolescent psychiatry outpatient clinic]. *Journal of Mood Disorders*, *7*(1), 41-46. https://doi.org/10.5455/jmood.20170215091605

Gundogan, S. (2022). The relationship of COVID-19 student stress with school burnout, depression and subjective well-being: Adaptation of COVID-19 Student Stress Scale into Turkish. *Asia-Pacific Education Researcher*, *32*, 165–176 https://doi.org/10.1007/s40299-021-00641-2

Hisli, N. (1988). Beck Depresyon Envanterinin geçerliği üzerine bir çalışma, *Journal of Psychology,* 6(22), 118-22.

Holmes, E., O'Connor, R., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C. G., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Michie, S., Przybylski, A. K., Shafran, R., Sweeney, A., ... Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, *7*(6), 547-560. https://doi.org/10.1016/S2215-0366(20)30168-1

Horita, R., Nishio, A. and Yamamoto, M. (2022). Lingering effects of COVID-19 on the mental health of first-year university students in Japan. *PLoS One,* 17(1), Article e0262550. https://doi.org/10.1371/journal.pone.0262550

İlhan, N., Bahadırlı, S., & Toptaner, N. E. (2014). Üniversite öğrencilerinin ruhsal durumları ile sağlık davranışları arasındaki ilişkinin belirlenmesi [Determination of the relationship between mental status and health behaviors of university students]. *Marmara Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi*, *4*(4), 207-15. https://doi.org/10.5455/musbed.20140913124019

Islam, M. S., Sujan, M. S. H., Tasnim, R., Mohona, R. A., Ferdous, M. Z., Kamruzzaman, S., Toma, T. Y., Sakib, M. N., Pinky, K. N., Islam, M. R., Siddique, M. A. B., Anter, F. S., Hossain, A., Hossen, I., Sikder, M. T., & Pontes, H. M. (2021). Problematic Smartphone and Social Media Use Among Bangladeshi College and University Students Amid COVID-19: The Role of Psychological Well-Being and Pandemic Related Factors. *Frontiers in psychiatry*, *12*, Article 647386. https://doi.org/10.3389/fpsyt.2021.647386

Jakovljevic, M., Bjedov, S., Jaksic, N., & Jakovljevic, I. (2020). COVID-19 pandemia and public and global mental health from the perspective of global health security. *Psychiatria Danubina*, *32*(1), 6-14. https://doi.org/10.24869/psyd.2020.6

Karaırmak, Ö. (2010). Establishing the psychometric qualities of the Connor–Davidson resilience scale (CD-RISC) using exploratory and confirmatory factor analysis in a trauma survivor sample. *Psychiatry Research, 179*(3), 350-356. https://doi.org/10.1016/j.psychres.2009.09.012

Karasar, N. (2008). *Bilimsel Araştırma Yöntemi* (18th ed.). Nobel Yayın Dağıtım.

Keating, X. D., Guan, J., Piñero, J. C., & Bridges, D. M. (2005). A meta-analysis of college students' physical activity behaviors. *Journal of American College Health, 54*(2), 116-25. https://doi.org/10.3200/JACH.54.2.116-126

Kılıç, Ş. D. (2014). *Üniversite öğrencilerinin yalnızlık ve psikolojik dayanıklılıklarının incelenmesi* (Publication No. 366539) [Master dissertation, Atatürk University]. Council of Higher Education Thesis Center.

Lee, S. A. (2020). Coronavirus anxiety scale: a brief mental health screener for COVID-19 related anxiety. *Death Studies, 44*(7), 393-401. https://doi.org/10.1080/07481187.2020.1748481

Li, F., Luo, S., Mu, W., Li, Y., Ye, L., Zheng, X., Xu, B., Ding, Y., Ling, B., Zhou, M., & Chen, X. (2021). Effects of sources of social support and resilience on the mental health of different age groups during the COVID-19 pandemic. *BMC Psychiatry*, *21*(16), Article 16. https://doi.org/10.1186/s12888-020-03012-1

Mei, S. L., Yu, J. X., He, B. W., & Li, J. Y. (2011). Psychological investigation of university students in a university in Jilin province. *Medicine and Society (Berkeley), 24*(05), 84-86.

O'Brien, C. (2010). *Student Mental Health Policy Report*. University College Cork.

Öner, N., & Le Compte, A. (1983) *Durumluk Sürekli Kaygı Envanteri El Kitabı.* Boğaziçi Üniversitesi Yayınları.

Özdin, S., & Bayrak-Özdin, Ş. (2020). Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *International Journal of Social Psychiatry*, 66(5): 504-11. https://doi.org/10.1177/0020764020927051

Özkan, S., & Yılmaz, E. (2010). Üniversite öğrencilerinin üniversite yaşamına uyum durumları (Bandırma örneği). *Fırat Sağlık Hizmetleri Dergisi*, 5(13), 153-71.

Pinto, A. J., Roschel, H., de Sá Pinto, A. L., Lima, F. R., Pereira, R. M. R., Silva, C. A., Bonfá, E., & Gualano, B. (2017). Physical inactivity and sedentary behavior: Overlooked risk factors in autoimmune rheumatic diseases?. *Autoimmunity reviews*, *16*(7), 667–674. https://doi.org/10.1016/j.autrev.2017.05.001

Ripon, R. K., Mim, S. S., Puente, A. E., Hossain, S., Babor, M. M. H., Sohan, S. A., & Islam, N. (2020). COVID-19: psychological effects on a COVID-19 quarantined population in Bangladesh, *Heliyon, 6*(11). https://doi.org/10.1016/j.heliyon.2020

Rogers, J. P., Chesney, E., Oliver, D., Pollak, T. A., McGuire, P., Fusar-Poli, P., Zandi, M. S., Lewis, G., & David, A. S. (2020). Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *The lancet. Psychiatry*, *7*(7), 611–627. https://doi.org/10.1016/S2215-0366(20)30203-0

Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., & Benedek, D. M. (2020). Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: mental health consequences and target populations. *Psychiatry and Clinical Neurosciences, 74*(4), 281-282. https://doi.org/10.1111/pcn.12988

Spielberger, C. D., Gorsuch, R. L., & Lushene. R. E. (1970). *Manual for the State-Trait Anxiety Inventory.* Consulting Psychologists Press.

Song, S., Yang, X., Yang, H., Zhou, P., Ma, H., Teng, C., Chen, H., Ou, H., Li, J., Mathews, C. A., Nutley, S., Liu, N., Zhang, X., & Zhang, N. (2021). Psychological Resilience as a Protective Factor for Depression and Anxiety Among the Public During the Outbreak of COVID-19. *Frontiers in psychology*, *11*, Article 618509. https://doi.org/10.3389/fpsyg.2020.618509

Şahin, N. H., & Durak, A. (1994). Kısa semptom envanteri: Türk gençleri için uyarlanması. *Türk Psikoloji Dergisi*, 9(31), 44-56.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics*. Pearson.

Tekin, G., Amman, M. T., & Tekin A. (2009). Serbest zamanlarda yapılan fiziksel egzersizin üniversite öğrencilerinin depresyon ve atılganlık düzeylerine etkisi. *International Journal of Human Sciences*, *6*(2), 148-159.

Trauer, J. M., Laurie, K. L., McDonnell, J., Kelso, A., & Markey, P. G. (2011). Differential effects of pandemic (H1N1) 2009 on remote and indigenous groups, Northern Territory, Australia, 2009. *Emerging Infectious Diseases, 17*(9), 1615-1623. https://doi.org/10.3201/eid1709.101196

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5), 1729. https://doi.org/10.3390/ijerph17051729.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063-1070. https://doi.org/10.1037//0022-3514.54.6.1063

Zengin, B., & Şengel, Ü. (2020). Üniversite öğrencilerinin gelecekleriyle ilgili kaygı ve beklentilerinin belirlenmesi [Determination of the Anxiety and Expectations of University Students about Their Future]. *Optimum Ekonomi ve Yönetim Bilimleri Dergisi*, *7*(2), 435-54. https://doi.org/10.17541/optimum.684605

Zhai, Y., & Du, X. (2020). Addressing collegiate mental health amid COVID-19 pandemic. *Psychiatry Research*, *288*, Article 113003. https://doi.org/10.1016/j.psychres.2020.113003