Original Article

The Relationship between University Students' Depression, Anxiety, and Stress with Positivity Attitudes and the COVID-19 Pandemic

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ABSTRACT

Background: The physical activity of university students is restricted during the pandemic, changes in education and training, and uncertainties during the pandemic caused their social lives to change completely. **Aim:** This study aims to determine the relationship between the depression, anxiety, and stress, and positivity attitudes of university students during the Covid-19 (coronavirus disease-2019) outbreak and their attitudes and behaviors toward the pandemic. **Subjects and Methods:** This cross-sectional study was conducted online among university students, *n* = 2153 from April 30, 2020 to May 10, 2020. Data were collected with the Positivity Scale and the Depression Anxiety Stress Scale. **Results:** The proportion of those with moderate and above depression, anxiety, and stress symptoms in the study group, respectively, were 40.6%, 24.6%, and 22.5%. The risk ratio of these symptoms is higher among those with lower positive attitudes (OR [odds ratio] = 0.804, 0.897, 0.895, respectively), being women (OR = 1.446, 1.666, 1.471), who are concerned with the transmission of the Covid-19 (OR = 1.144, 1.374, 1.201), who believe their intra-family relations (OR = 1.886, 1.728, 2.083) and education (OR = 1.680, 1.682, 2.132) are negatively affected, and those who are more worried about life after the pandemic. **Conclusion:** Compared with the pre-pandemic period, the frequency of university students showing symptoms of depression increased, and there was no significant change in anxiety and stress levels.

KEYWORDS: *Covid-19, depression anxiety, positive attitude, stress, students*

INTRODUCTION

The virus, which emerged in Wuhan, China, in 2019, and was named Covid-19 (coronavirus disease-2019) by the World Health Organization, turned into a pandemic and still affects the whole world.[1,2] At the time of research, there was no vaccine against the virus and the spread of the virus could only be controlled by controlling the transmission route.[1] It should be emphasized that quarantine and social isolation are important in reducing the rate of Covid-19 transmission.[3] In Turkey, to reduce the speed of outbreak all educational institutions in the formal education institutions switched to long-distance and online learning practices. On April 4, 2020, the government ordered children aged 20 years and younger to stay in their homes.[4]

The restriction of the physical activity and "the stay-at-home" policy coupled with the uncertainties of pandemic have forced university students change their social lives completely. During the pandemic, students experienced fear of unemployment, economic, and social problems, which negatively affected their mental states. The most common mental problems experienced by university students are hopelessness and anxiety.[5]

In general, university education is an important period that determines the work and profession of students. During this period, the students are experiencing

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social and economic problems and the fear of being unemployed that negatively affect their mental states. The prevalence of depression in university students is between 21.2% and 38.3%.[6–8] Studies conducted on university students report that depression is the most important mental disorder detected in university students.[9]

Our country's struggle with the Covid-19 pandemic continues and it is uncertain when the pandemic will end. This uncertainty causes an increase in anxiety and hopelessness in society.[10] People may experience feelings of anxiety, depression, and stress at all stages of their lives.[11,12] Each individual's methods of coping with anxiety, depression, and stress may be different. This difference is related to the person's positivity or negativity psychological features. It is seen that individuals with high positivity attitudes cope with anxiety, depression, and stress more easily, while those with low positivity attitudes cope more difficult.[13,14]

This research, during the stay-at-home isolation period applied to control the Covid-19 outbreak in Turkey, was carried out to determine the depression, anxiety, and stress of university students and the factors affecting them.

Material and Methods

This research is cross-sectional. The population of the research consists of university students who are 18 years of age and over educating in Yozgat. In calculating the sample size, the minimum sample size was calculated as 384 people to find it between 45% and 55% at a 95% confidence interval, assuming that 50% of the society will comply with the worry or mental problems. The study was completed with 2153 people who voluntarily accepted to participate in the study and filled out the web-based questionnaire.

The research was made during the implementation of "Stay at Home Turkey," from April 30, 2020 to May 10, 2020. At the time of research, data were collected, the students were in their hometowns, and education at the university was done online. The data were collected via an electronic survey form. The questionnaire online link was sent to the lecturers who worked at the education units of the university and asked to be shared with students through the online educational platform, and social media (WhatsApp, Facebook, Instagram) applications. In addition, students were asked to share this link with their university fellows. Before starting the research questionnaire, consent was obtained stating the purpose of the research, its importance, that the data were anonymous, that no records were kept of the respondents, how the data would be used, and that they were free to participate in the study. If they gave their consent, they were allowed to filling the questionnaire. Participants of the study were not offered any compensation.

Surveys were delivered to university students online and participation was based on volunteerism. The data were obtained from the sociodemographic information form, the information attitude, and behavior form about the Covid-19 pandemic created by the researchers, the Positivity Scale (PS; 8 questions), and the Depression Anxiety Stress Scale short form (DASS21).

PS

The Positivity Scale was developed by Caprara *et al*.[13] The scale evaluates the level of positivity, which is defined as the tendency of people to view themselves, their own life, and the future from a positive outlook. The Turkish validity and reliability study of the scale was conducted by Çıkrıkçı *et al*.[15] The original form of the measuring tool has a 5-point Likert-type assessment. The PS consists of 8 items, one of which is reverse-scored (item 6). Internal consistency Cronbach's alpha coefficient of PS was reported as. 75. In this study, the Cronbach's alpha value of the scale was found to be. 805.

DASS21

This scale is the short form DASS21 used to determine the level of depression, anxiety, and stress.[16] The Turkish reliability and validity study of the short form DASS 21 was carried out by Yılmaz *et al*.[12] DASS21 has 7 items under 3 headings each, depression (3,5,10,13,16,17,21), anxiety (2,4,7,9,15,19,20), and stress (1,6,8, 11,12,14,18), it consists of a total of 21 items that aim to measure the level. In this study, the Cronbach alpha value of the scale was. 813 in the depression dimension;.826 in the anxiety dimension; and it was calculated as. 874 in the stress dimension.

Subdimensions of the scale have cutoff points. DASS scores in the moderate and higher ranges indicate that the respondent is likely to be experiencing difficulties with some daily activities such as sleeping, concentrating, processing information, and interacting with others.[17–19] Associations between each of the demographic and Covid-19 attitude and behavior variables and scores in the moderate and higher range on each of the DASS21 scales were modeled using binary logistic regression (BLR). In a study conducted in Hong Kong using the DASS scale (2006), the cutoff point was taken as moderate or higher depression, anxiety, and stress symptoms among university students.[18] In the studies carried out, moderate and higher levels of DASS 21 score have more commonly been used it.[18–20]

The data were evaluated using the Statistical Package for the Social Sciences (SPSS) 25v program. Descriptive tables of the data are made. Comparison of the arithmetic means of the scales according to demographic characteristics was made using the *t* test and the ANOVA (analysis of variance) test. The χ^2 test was used in the distribution of the data frequencies. The effects of students' demographic characteristics, knowledge, attitudes, and behaviors about Covid-19 on their mental health were analyzed using the backward elimination model in BLR. Dependent variables in BLR analysis, were those who had a score of 7 or higher in the depression, 6 and above in the anxiety, and 10 and above in the stress scales, were analyzed as having moderate or higher symptoms. The results that were found important as a result of the analysis are shown in the tables.

Ethics Approval

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013. The ethical approval of this study was obtained from the Ethical Committee of Yozgat Bozok University, on April 15, 2020, approval number 08/06.

Results

Of the participant in the study, 72.4% of them are women, 66.9% are undergraduate students, 46.7% are first-year students, and 48.1% are studying in health-related programs [Table 1].

During the Covid-19 outbreak, stated that staying at home negatively affected the intra-family relations of 35.3% of the students, their social relations of 81.2%, and their vocational education of 32.7%. Of the students, 72.9% stated that they were very worried that the disease would be transmitted to themselves or their family members, 62.8% fully followed the practice of staying home, and 59.9% will be worse life after the epidemic (11.9% will be very bad) [Table 1].

In the study group, the proportion of those with moderate and higher depression, anxiety, and stress symptoms were, respectively, 40.6% (15.4% severe), 24.6% (12.3% severe), and 22.5% (8.9% severe) [Table 1]. The students have moderate and higher levels of anxiety, depression, and stress symptoms were at least 1 in 20.6% of the students, at least 2 in 13.8%, and all 3 in 13.1%, while they have none in 52.4% [Table 2].

It was observed that as the PS score decreased, the depression score increased ($r = -.603$) and this relationship was strong. According to the multivariable BLR analysis, the likelihood of showing moderate- and higher-level depression symptoms increased as the positivity attitude decreased, the number of households decreased, and the anxiety about the Covid-19 virus transmission increased, 1.4 times higher in women compared with men, 1.9 times higher in those who say that it did not affect intra-family relations negatively, and 1.7 times higher in those who say affects more negatively professional education ($P < .05$). These important variables explained 35.8% ($R^2 = 0.358$) of showing depression symptoms as moderate and higher. In BLR analysis, the level of family income, affected social relations, compliance with the stay-home practice, and being diagnosed with Covid-19 (borderline insignificant ($P = 0.058$) were not found statistically significant [Table 3].

The likelihood of showing moderate- and higher-level anxiety symptoms increased as the positivity attitude decreased, compliance with staying at home practice decreased, and age and concern of Covid-19 virus transmission increased. Additionally, the anxiety symptoms increased 1.7 times higher in women compared with men, 1.7 times higher in those who say it did not affect intra-family relations negatively, 3.3 times higher in those who said it did affect their social relations positively, 1.7 times higher than those who stated that their professional education was affected negatively, and 1.7 times higher than those who stated that life after the epidemic will not be changed ($P < .05$). These important variables explain 22.3% ($R^2 = 0.223$) of showing anxiety symptoms. In the BLR analysis, the levels of family income, levels of grade, and the status of being diagnosed with Covid-19 were not found statistically significant [Table 3].

As the probability of showing moderate and higher level stress symptoms increased as the positivity attitude decreased, compliance with the practice of staying at home decreased, and the father's education levels and concern for Covid-19 virus transmission increased. Additionally, the stress symptoms increased 1.4 times higher in women compared with men, and 1.3 times higher in those who do not state that they have a Covid-19 diagnosis in their family and surroundings. The stress was found 2.1 times higher in those who said it did not affect their family relations, 2.1 times higher in those who stated that their professional education was affected negatively, and 2-fold higher in those who stated that life after the epidemic will not be changed ($P < .05$). These important variables explained 22.4% ($R^2 = 0.224$) of showing stress symptoms. In the BLR analysis, the levels of family income, the mother's education levels, and the social relations were not associated with stress [Table 3].

Table 1: Distribution of depression, anxiety, and stress symptoms levels by demographic characteristics

Characteristics	*n* (%)	Depression		Anxiety		Stress	
		Moderate Row *n* (%)	Severe Row *n* (%)	Moderate Row *n* (%)	Severe Row *n* (%)	Moderate Row *n* (%)	Severe Row *n* (%)
Gender	χ^2, *P*	9.5	.009	10.7	.005	5.3	.072
Female	1559 (72.4)	417 (26.7)	245 (15.7)	206 (13.2)	207 (13.3)	222 (14.2)	148 (9.5)
Male	594 (27.6)	125 (21.0)	86 (14.5)	59 (9.9)	58 (9.8)	71 (12.0)	43 (7.2)
Grades	χ^2, *P*	7.2	.513	14.4	.072	3.0	.933
Preparatory	120 (5.6)	32 (26.7)	16 (13.3)	13 (10.8)	18 (15.0)	17 (14.2)	8 (6.7)
1	1006 (46.7)	258 (25.6)	159 (15.8)	124 (12.3)	117 (11.6)	144 (14.3)	92 (9.1)
2	619 (28.8)	151 (24.4)	94 (15.2)	69 (11.1)	67 (10.8)	80 (12.9)	51 (8.2)
3	213 (9.9)	44 (20.7)	29 (13.6)	37 (17.4)	29 (13.6)	28 (13.1)	19 (8.9)
4	195 (9.1)	57 (29.2)	33 (16.9)	22 (11.3)	34 (17.4)	24 (12.3)	21 (10.8)
Degree	χ^2, *P*	2.2	.335	3.7	.159	2.3	.324
Associate degree	712 (33.1)	174 (24.4)	121 (17.0)	82 (11.5)	76 (10.7)	86 (12.1)	62 (8.7)
Undergraduate	1441 (66.9)	368 (25.5)	210 (14.6)	183 (12.7)	189 (13.1)	207 (14.4)	129 (9.0)
Sciences	χ^2, *P*	11.3	0.187	8.86	0.354	6.6	0.580
Associate Degree of Health	520 (24.2)	138 (26.5)	92 (17.7)	63 (12.1)	63 (12.1)	62 (11.9)	52 (10.0)
Social	236 (11.0)	57 (24.2)	42 (17.8)	28 (11.9)	20 (8.5)	39 (16.5)	19 (8.1)
Sciences, Engineering, Technical	210 (9.8)	45 (21.4)	29 (13.8)	28 (13.3)	22 (10.5)	28 (13.3)	15 (7.1)
Bachelor of Health	515 (23.9)	138 (26.8)	80 (15.5)	73 (14.2)	70 (13.6)	77 (15.0)	50 (9.7)
Theological	672 (31.2)	164 (24.4)	88 (13.1)	73 (10.9)	90 (13.4)	87 (12.9)	55 (8.2)
Mother education	χ^2, *P*	8.7	.189	9.4	.150	15.1	.019
Primary school	1369 (63.6)	363 (26.5)	213 (15.6)	183 (13.4)	180 (13.1)	199 (14.5)	120 (8.8)
Middle School	400 (18.6)	90 (22.5)	62 (15.5)	43 (10.8)	40 (10.0)	54 (13.5)	29 (7.2)
High school	271 (12.6)	70 (25.8)	41 (15.1)	30 (11.1)	34 (12.5)	36 (13.3)	32 (11.8)
University	113 (5.2)	19 (16.8)	15 (13.3)	9 (8.0)	11 (9.7)	4 (3.5)	10 (8.8)
Father education	χ^2, *P*	6.0	.419	8.1	.230	14.0	.029
Primary school	864 (40.1)	236 (27.3)	132 (15.3)	107 (12.4)	109 (12.6)	121 (14)	74 (8.6)
Middle School	502 (23.3)	123 (24.5)	78 (15.5)	57 (11.4)	54 (10.8)	72 (14.3)	35 (7.0)
High school	501 (23.3)	110 (22.0)	74 (14.8)	60 (12.0)	56 (11.2)	68 (13.6)	41 (8.2)
University	286 (13.3)	73 (25.5)	47 (16.4)	41 (14.3)	46 (16.1)	32 (11.2)	41 (14.3)
Household counts	χ^2, *P*	12.5	.250	8.6	.569	9.0	.528
1-2 people	84 (3.9)	18 (21.4)	13 (15.5)	9 (10.7)	8 (9.5)	10 (11.9)	6 (7.1)
3 people	292 (13.6)	76 (26.0)	57 (19.5)	34 (11.6)	47 (16.1)	47 (16.1)	28 (9.6)
4 people	570 (26.5)	148 (26.0)	90 (15.8)	79 (13.9)	62 (10.9)	87 (15.3)	48 (8.4)
5 people	615 (28.6)	143 (23.3)	87 (14.1)	71 (11.5)	74 (12.0)	70 (11.4)	56 (9.1)
6 people	317 (14.7)	80 (25.2)	53 (16.7)	43 (13.6)	40 (12.6)	38 (12.0)	33 (10.4)
7 and more people	275 (12.8)	77 (28.0)	31 (11.3)	29 (10.5)	34 (12.4)	41 (14.9)	20 (7.3)
Monthly family income	χ^2, *P*	15.6	.016	8.3	.218	6.6	.358
2500 TL or lower	1101 (51.1)	290 (26.3)	196 (17.8)	141 (12.8)	148 (13.4)	155 (14.1)	108 (9.8)
2501-4000 TL	627 (29.1)	150 (23.9)	80 (12.8)	84 (13.4)	73 (11.6)	89 (14.2)	48 (7.7)
4001-6000 TL	286 (13.3)	68 (23.8)	34 (11.9)	28 (9.8)	29 (10.1)	32 (11.2)	20 (7.0)
6001 TL and higher	139 (6.5)	34 (24.5)	21 (15.1)	12 (8.6)	15 (10.8)	17 (12.2)	15 (10.8)
Family relationships	χ^2, *P*	175.2	<.001	104.2	<.001	132.2	<.001
Did not affect	1084 (50.3)	245 (22.6)	101 (9.3)	111 (10.2)	74 (6.8)	99 (9.1)	57 (5.3)
Positively affected	310 (14.4)	61 (19.7)	27 (8.7)	29 (9.4)	38 (12.3)	37 (11.9)	16 (5.2)
Negatively affected	759 (35.3)	236 (31.1)	203 (26.7)	125 (16.5)	153 (20.2)	157 (20.7)	118 (15.5)
Social relationships	χ^2, *P*	49.7	<.001	39.8	<.001	34.3	<.001
Did not affect	333 (15.5)	66 (19.8)	21 (6.3)	30 (9.0)	10 (3.0)	19 (5.7)	16 (4.8)
Positively affected	71 (3.3)	15 (21.1)	4 (5.6)	10 (14.1)	11 (15.5)	10 (14.1)	4 (5.6)
Negatively affected	1749 (81.2)	461 (26.4)	306 (17.5)	225 (12.9)	244 (14)	264 (15.1)	171 (9.8)
Education	χ^2, *P*	87.7	<.001	46.5	<.001	74.5	<.001
Did not affect	297 (13.8)	69 (23.2)	35 (11.8)	23 (7.7)	30 (10.1)	23 (7.7)	21 (7.1)
Positively affected	197 (9.2)	39 (19.8)	26 (13.2)	23 (11.7)	28 (14.2)	21 (10.7)	14 (7.1)

Contd...

Table 1: Contd...

Covid-19 effects	*n* (%)	Depression		Anxiety		Stress	
		Moderate Row *n* (%)	Severe Row *n* (%)	Moderate Row *n* (%)	Severe Row *n* (%)	Moderate Row *n* (%)	Severe Row *n* (%)
Somewhat negatively affected	954 (44.3)	238 (24.9)	97 (10.2)	114 (11.9)	83 (8.7)	121 (12.7)	53 (5.6)
Too much negatively affected	705 (32.7)	196 (27.8)	173 (24.5)	105 (14.9)	124 (17.6)	128 (18.2)	103 (14.6)
Covid-19 transmission concern	χ^2, *P*	23.5	.001	55.	<.001	26.1	<.001
None	68 (3.2)	16 (23.5)	15 (22.1)	6 (8.8)	8 (11.8)	5 (7.4)	8 (11.8)
Low	514 (23.9)	103 (20.0)	72 (14.0)	50 (9.7)	37 (7.2)	62 (12.1)	26 (5.1)
Moderate	442 (20.5)	103 (23.3)	59 (13.3)	49 (11.1)	33 (7.5)	50 (11.3)	36 (8.1)
High	1129 (52.4)	320 (28.3)	185 (16.4)	160 (14.2)	187 (16.6)	176 (15.6)	121 (10.7)
Covid-19 diagnosed	χ^2, *P*	21.2	<.001	45.9	<.001	17.3	<.001
No	1821 (84.6)	445 (24.4)	258 (14.2)	214 (11.8)	190 (10.4)	232 (12.7)	148 (8.1)
Yes	332 (15.4)	97 (29.2)	73 (22)	51 (15.4)	75 (22.6)	61 (18.4)	43 (13.0)
Complying stay at home	χ^2, *P*	13.8	.031	17.2	.008	15.4	.017
Rarely	61 (2.8)	15 (24.6)	15 (24.6)	11 (18.0)	7 (11.5)	13 (21.3)	10 (16.4)
Moderately	135 (6.3)	44 (32.6)	27 (20.0)	26 (19.3)	25 (18.5)	24 (17.8)	17 (12.6)
Generally	604 (28.1)	155 (25.7)	90 (14.9)	71 (11.8)	80 (13.2)	80 (13.2)	56 (9.3)
Completely	1353 (62.8)	328 (24.2)	199 (14.7)	157 (11.6)	153 (11.3)	176 (13.0)	108 (8.0)
Post-pandemic life	χ^2, *P*	151.4	<.001	83.7	<.001	125.8	<.001
Not change	335 (15.6)	88 (26.3)	36 (10.7)	43 (12.8)	27 (8.1)	39 (11.6)	18 (5.4)
Better	528 (24.5)	114 (21.6)	41 (7.8)	54 (10.2)	50 (9.5)	59 (11.2)	28 (5.3)
A bit worse	1034 (48.0)	274 (26.5)	156 (15.1)	123 (11.9)	117 (11.3)	143 (13.8)	80 (7.7)
Worse	256 (11.9)	66 (25.8)	98 (38.3)	45 (17.6)	71 (27.7)	52 (20.3)	65 (25.4)
Total	2153 (100)	25.2	15.4	12.3	12.3	13.6	8.9

Table 2: Moderate or higher symptoms of the depression, anxiety, and stress

Depression, anxiety, stress	*n*=2153 Count	% (95% Confidence interval)
None of them	1129	52.4 (50.3-54.6)
At least 1 of them	444	20.6 (18.9-22.4)
At least 2 of them	297	13.8 (12.4-15.3)
All 3	283	13.1 (11.7-14.6)
Depression and anxiety	416	19.3 (17.7-21.1)
Depression and stress	418	19.4 (17.8-21.1)
Anxiety and stress	312	14.5 (13.0-16.0)
Depression	873	40.5 (38.5-42.7)
Stress	484	22.5 (20.7-24.3)
Anxiety	530	24.6 (22.8-26.5)

All 3 of the symptoms of depression, anxiety, and stress are more common in undergraduate students, those who do not have a positive attitude, in women, those who are concerned about the Covid-19 virus, and those who stated that their family relations and professional education were negatively affected.

Discussion

In this study, we have examined influencing factors of the depression, anxiety, and stress of university students during the Covid-19 pandemic countrywide isolation.

A total of 40.6% of the students participating in the study showed moderate and higher depression symptoms [Table 1]. During the Covid-19 outbreak, the frequencies of moderate and higher depression symptoms were 57.3% of university students in Greece,[21] 27.6% of medical students in Iran,[22] 31.9% of university students in China,[23] 52.9% in students in Russia and 41.8% in Belarus,[24] and 53.7% of university students in Bangladesh.[25] In studies conducted on medical students in Turkey pre-pandemic, the rates of depression were 42.5%[26] and 41%.[27] The frequencies of depression symptoms among university students in Turkey pre-pandemic were as follows: Üstün and Bayar[28] 18.6%, Gunay *et al*.[6] 21.2%, Çelik and Hocaoğlu[29] 22.2%, and Özdel *et al*.[30] 26.2%. In a study using the DASS scale in Hong Kong pre-pandemic, the frequency of moderate and higher depression symptoms was found 21% among university students.[18] The depression level of the students participating in the study was similar to the rate seen in medical faculty students before the pandemic, while it was higher than the university students in China, lower than the university students in Greece and Bangles, and approximately twice as high as the others. The students participating in the study said that the symptoms of depression increased approximately twice during the pandemic. According to the regression analysis, the decrease in a positive attitude, the increase in the concern of being infected with the Covid-19 virus, being a woman, family relations, and professional education are negatively affected, which increase

Table 3: Analysis of factors associated with showing depression, anxiety, and stress symptoms by binary logistic regression

	B	SE	*P*	OR	95% CI for OR	
					Lower	Upper
Depression (R^2=0.358)[a]						
Positivity	−0.219	0.012	0.000	0.804	0.785	0.823
Gender (male=1)	0.369	0.119	0.002	1.446	1.146	1.826
Number of households	−0.077	0.032	0.016	0.926	0.870	0.986
Intra-family relations (Unaffected=1)			0.000			
Positively affected	−0.055	0.161	0.730	0.946	0.690	1.296
Negatively affected	0.635	0.114	0.000	1.886	1.507	2.360
Covid-19 transmission concern	0.135	0.058	0.019	1.144	1.022	1.281
Diagnosed with Covid-19 (None=1)	0.267	0.142	0.059	1.306	0.990	1.724
Vocational training (unaffected=1)			0.001			
Positively affected	−0.075	0.230	0.746	0.928	0.592	1.456
Negatively affected (Mildly)	0.120	0.163	0.462	1.128	0.819	1.554
Negatively affected (Highly)	0.519	0.170	0.002	1.680	1.204	2.344
Constant	4.945	0.419	0.000	140.442		
Anxiety (R^2=0.223)[b]						
Positivity	−0.109	0.011	0.000	0.897	0.878	0.916
Gender (male=1)	0.510	0.146	0.000	1.666	1.252	2.217
Age (years)	0.038	0.017	0.030	1.039	1.004	1.075
Degree (Associate Degree=1)	0.836	0.275	0.002	2.307	1.345	3.954
Department (Associate of Health=1)			0.030			
Liberal arts	−0.757	0.300	0.012	0.469	0.260	0.845
Science, Engineering, and Technical sciences	−0.181	0.274	0.507	0.834	0.488	1.426
Health Degree	−0.536	0.317	0.091	0.585	0.314	1.089
Theology	−0.782	0.316	0.013	0.457	0.246	0.849
Education level of the mother	−0.165	0.075	0.027	0.848	0.732	0.981
Education level of the father	0.193	0.063	0.002	1.213	1.073	1.372
İncome level of the family	−0.149	0.075	0.046	0.862	0.745	0.997
Intra-family relations (unaffected=1)			0.000			
Positively affected	0.199	0.180	0.267	1.220	0.858	1.735
Negatively affected	0.547	0.126	0.000	1.728	1.349	2.214
Social relations (unaffected=1)			0.001			
Positively affected	1.220	0.338	0.000	3.386	1.745	6.570
Negatively affected	0.375	0.198	0.058	1.454	0.987	2.142
Covid-19 transmission concern	0.318	0.066	0.000	1.374	1.207	1.565
Diagnosed with Covid-19 (None=1)	0.564	0.142	0.000	1.758	1.331	2.322
Followed stay at home	−0.229	0.078	0.004	0.796	0.683	0.928
Vocational training (Unaffected=1)			0.031			
Positively affected	0.399	0.247	0.106	1.490	0.919	2.417
Negatively affected (Mild)	0.249	0.191	0.193	1.283	0.882	1.868
Negatively affected (high)	0.520	0.194	0.007	1.682	1.149	2.462
Life after pandemic (there will be no change=1)			0.010			
It will be a bit better	−0.016	0.189	0.934	0.984	0.680	1.426
It will be a bit worse	−0.117	0.167	0.484	0.890	0.642	1.233
It will be a much worse	0.445	0.208	0.032	1.561	1.038	2.346
Constant	−0.343	0.625	0.583	0.710		
Stress (R^2=0.224)[c]						
Positivity	−0.111	0.011	0.000	0.895	0.875	0.914
Gender (male=1)	0.386	0.140	0.006	1.471	1.117	1.937
Degree - Associate Degree (Associate Degree=1)	0.273	0.125	0.029	1.314	1.029	1.678
Education level of the father	0.117	0.060	0.051	1.125	1.000	1.265
Intra-family relations (unaffected=1)			0.000			

Contd...

Table 3: Contd...

	B	SE	*P*	OR	95% CI for OR	
					Lower	Upper
Positively affected	0.184	0.191	0.336	1.202	0.826	1.750
Negatively affected	0.734	0.130	0.000	2.083	1.615	2.686
Covid-19 transmission concern	0.183	0.067	0.006	1.201	1.054	1.368
Diagnosed with Covid-19 (None=1)	0.291	0.149	0.050	1.337	0.999	1.789
Followed stay at home	−0.191	0.079	0.016	0.826	0.708	0.964
Vocational training (unaffected=1)			0.000			
Positively affected	0.159	0.270	0.556	1.172	0.691	1.989
Negatively affected (mild)	0.342	0.203	0.091	1.408	0.947	2.095
Negatively affected (high)	0.757	0.203	0.000	2.132	1.432	3.174
Life after pandemic (there will be no change=1)			0.001			
It will be a bit better	0.079	0.202	0.694	1.083	0.729	1.607
It will be a bit worse	0.064	0.176	0.716	1.066	0.755	1.505
It will be a much worse	0.696	0.214	0.001	2.006	1.318	3.052
Constant	0.480	0.546	0.380	1.616		

SE=standard error, OR=odds ratio, CI=confidence interval. [a]Depression independent variable(s) entered on step 1: Positivity, gender, age, grades, degrees, departments, family members, family income level, family relationship status, social relationship status, worrying about Covid-19 contamination, Covid-19 diagnosed, complying stay at home, worrying about professional training, after the outbreak life. Hosmer and Lemeshow Test P=0.127, Nagelkerke R^2=0.358. [b]Anxiety independent variable(s) entered on step 1: Positivity, gender, age, grades, degrees, departments, mother education level, father education level, family members, family income level, family relationship status, social relationship status, worrying about Covid-19 contamination, Covid-19 diagnosed, complying stay at home, worrying about professional training, after the outbreak life. Hosmer and Lemeshow Test P=0.482, Nagelkerke R^2=0.219. [c]Stress independent variable(s) entered on step 1: Positivity, gender, age, grades, degrees, departments, mother education level, father education level, family relationship status, social relationship status, worrying about Covid-19 contamination, Covid-19 diagnosed, complying stay at home, worrying about professional training, after the outbreak life. Lemeshow Test P=0.634, Nagelkerke R^2=0.234

the risk of depression. It was observed that as the PS score decreased, the depression score increased (r = −.603), and this relationship was strong.[34] Similar to the findings of our study, there was a relationship between depression and positive emotions (r = −.42) and Covid-19 anxiety (r =0.18) in university students in China, while the frequency of depression was not found different by gender.[23] The frequency of depression among university students in Russia and Belarus has correlated with the concern of Covid-19,[24] this result supports our findings.

Among the students participating in this study, the rate of those who show moderate or higher anxiety symptoms was 24.6%. During the Covid-19 pandemic, the frequency of anxiety symptoms was 38.1% among medical faculty students in Iran[22]; among university students in China, it was 24.9% to 26.3%[23,31]; among university students in Poland, it was 65% (mild and over)[32]; in nursing students in Israel, it was 42.8%[33]; and 42.9% in Bangladesh.[25] Before the pandemic, in studies conducted on Medical Faculty students, rates of anxiety symptoms were 49.8%[26] and 45%.[27] In another study conducted on university students (2015), the rate of those who showed moderate and severe anxiety symptoms were reported as 43.4%.[28] While the anxiety level of students participating in this study was at a similar level as university students in China, it was observed that it was much lower than the levels of university students in Bangladesh and medical school students in Turkey before the pandemic. In a study by Sögüt *et al*.,[34] it was found that 5.5% of university students had moderate and severe anxiety levels in the Covıd-19 period. The reason for the low level of anxiety in Sögüt's study is thought to be science that the study was conducted only on midwifery students and the scale used was different.

In this study, the risk of students showing anxiety symptoms is higher in those with a low positivity attitude and adaptation to the practice of staying at home, those who are older, those who are more concerned about Covid-19 virus transmission, women, those who think that their intra-family and social relations are negatively affected, those who state that their professional education is very negatively affected, and it is higher in those who think life will be very bad afterward pandemic [Table 3]. It was observed in this study that as the PS score decreased, the anxiety score increased (r = −.380), and this relationship was at a low level. In a study conducted among university students in China, similar to our study, there was a negative (r = −.270) relationship between anxiety and positive emotions, and a positive (r =0.17) relationship between Covid-19 concern, while the frequency of anxiety was not found different according to gender.[23] In France, 60.2% of university students stated that their anxiety levels

increased after isolation.[35] In Bangladesh, it was found contrary to our findings, anxiety levels were found to be higher in male students,[25] while in Iran[22] and İsrael were[33] similar to our findings, the frequency of anxiety was found to be higher in female students and those with high concern for Covid-19 transmission.

In the study, it was found that 22.5% of the students showed moderate and higher stress symptoms [Table 1]. In a study conducted with university students in Greece during the pandemic period, the prevalence of stress symptoms was 68.0%,[21] in Poland university students, it was 56%,[32] and it was 42.9% in Bangladesh.[25] These rates were much higher than our findings. In France, 61.6% of university students stated that their stress levels increased during isolation.[35] Before the pandemic, medical students' stress rates were 36.1%[26] and 40.4% in Turkey.[27] In a study conducted on university students (2015), it was reported that the rate of those who showed moderate and severe stress symptoms was 25.4%, and this rate was no different according to gender.[28] While the stress levels of the students participating in this study were lower than the medical faculty students pre-pandemic, it was observed that they were similar to other students.

In this study, the risk of showing stress symptoms increases as the positivity attitude decreases, the adaptation to stay at home practice decreases, the father's education level increases, and the concern of Covid-19 virus transmission increases. In addition to these, the risk of stress increased being a woman, who state that there are people diagnosed with Covid-19 in their family and surroundings, their intra-family relations and professional education were affected negatively, those who thought that life after the pandemic would be very bad [Table 3]. It was observed that as the PS score decreased, the stress score increased (r = −.419) and this relationship was measured at a medium level.

Conclusion

During the Covid-19 pandemic, while the frequency of university students showing symptoms of depression increased, there was no significant change in the frequency of showing symptoms of anxiety and stress. Positive attitude, concern for Covid-19 virus transmission, being a woman, intra-family and social relations, vocational education, and post-epidemic life concerns were found to be important for university students to show symptoms of depression, anxiety, and stress.

The limitation of the research

Internet access is required to participate in the research. Therefore, students who do not have access to the Internet are excluded from the research.

The strengths of the research

Students who undertake university education in Yozgat, come from almost all provinces in Turkey. In the period of the survey, it is considered to be the participation of university students from the most provinces in Turkey, because it is in their own homes.

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Ethics approval and consent to participate

The students were informed about the research and consent was obtained. Before starting the survey, those who approved to participate in the survey online were allowed to complete the questionnaire. The research was conducted under the rules and ethic codes mentioned in the Helsinki Declaration of 1975.

Availability of data and materials

The study data are stored. The data may be provided if desired. The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

MK: The research's planning, implementation, statistical analysis, writing, and reviewing. NUO: The research implementation, conducting surveys, conducting ethical permits, writing, and reviewing. GU: Conducting surveys, conducting ethical permits, writing, and reviewing.

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Conflicts of interest

There are no conflicts of interest.

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