

## Research Article,

# Determining the Anxiety and Anxiety Levels of University Students in the COVID 19 Outbreak.

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### Abstract:

#### Objective

The outbreak of the 2019 novel coronavirus disease (COVID-19) caused considerable public health problems. Departing from the case of COVID-19, this paper aims to not only find out the psychological impacts of the changes in universities' educational programs on undergraduate students in Turkey but also make a scientific contribution to determining what kinds of supports can be given to university students in social catastrophes such as the COVID-19 that could take place in any future time.

#### Method

1117 university students over the age of 17 participated in this study voluntarily on the Internet (Google Forms) by completing a personal information form and a Likert type questionnaire consisting of Beck Anxiety Inventory (BAI) and State-Trait Anxiety Inventory-1 (STAI-1). The participants were asked to provide their age, gender and class year through an electronic form and they were hindered to fill in the form and the questionnaire from the same IP address.

#### Result

1117 university students over the age of 17 from 23 universities (15 public and 8 private) took part in this study by completing the online questionnaire we prepared on the Internet between 2-17 May 2020. The relationship between university students' stress and anxiety levels and their age, gender and class year was examined. While average BAI scores of male students were 11.56, female students' average BAI scores were 16.65. Average STAI-1 points of male and female students were 46,71 and 49.04, respectively. As a result, it was found that there were significant differences between BAI and STAI-1 scores of male and female students.( $p < 0.05$ )

#### Conclusion

Our study found that more than half of the university students suffered from anxiety symptoms during the COVID-19 outbreak. In this regard, it can be said that university students should learn to deal with such mental and emotional problems as stress, anxiety and fear, which more likely require psychological and physical effort, by taking necessary measures during important social catastrophes such as the COVID-19 outbreak. And, they should be provided with necessary support by administrators and their families.

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**Key words:** Anxiety, COVID-19, outbreak, stress, university students,

#### Introduction:

Anxiety disorders are among the most frequent psychiatric conditions in humans and cause loss of quality of life. Anxiety disorders represent a huge burden in terms of both their social impact and their economic cost. [1] Anxiety disorder is a

kind of mental disorder. Anxiety is a worry that can make us distressed and affect our future life.[2] High stress amongst university students is a serious public health issue, with university students reporting higher chronic stress than the general population.[3] We react to anxiety by fear in and

these feelings can cause some physical symptoms such as quicker pulse rate and tremor. Youth is a life period where individuals experience multiple stressors due to their developmental stage, adjustment to new college environment, academic expectations, and their specific higher education program of study.[4]

The World Health Organization (WHO) on March 11, 2020, declared the novel coronavirus (COVID-19) outbreak a global pandemic.[5] As part of the measures taken following this declaration, university education was suspended on 16 March 2020 and then universities started distance education as of 23 March 2020 in Turkey.[6] We are of the opinion that upon that, during this period, university students have anxiety and situational stress about the future. At the time of outbreak, in which distance education was continuing due to universities' being closed, we carried out this study through a questionnaire comprised of BAI (a Likert type scale having 21 questions) and STAI-1 (a Likert type scale having 20 questions). University students were asked to complete the questionnaire through the Internet and based on the scores obtained from the questionnaire students' psychological conditions were determined by looking at their stress and situational anxiety in the last week.

## **Materials And Methods:**

### **Study Design:**

We conducted a survey using a self-administered questionnaire delivered through the Internet. Data were collected in Turkey from 02 May to 17 May 2020.

### **Sample and Procedure:**

We included in our study university students from all over Turkey. Participants, who met the following criteria, were included: university students, who were older than 17 years, could read a questionnaire in Turkish, were internet users, volunteered for the survey and could submit survey responses using the same IP address only once. University students, who were unable to understand the questionnaire, were excluded from the study. Participants of the questionnaire were also encouraged to forward the survey to others. Total number of participants amounted to 1117. The study was approved by the Ethics Committee of Taksim Education and Research Hospital. The study was done on the Internet at the time of outbreak, in which distance education was continuing due to universities' being closed. Moreover, the participants were asked to provide

their age, gender and class year through an electronic form and they were hindered to fill in the form and the questionnaire from the same IP address. Students' psychological conditions were determined by looking at their stress and situational anxiety in the last week through the results obtained from the questionnaire. To protect the respondents' privacy, the survey was conducted anonymously.

### **Measurement Tools:**

Using the online form, we collected demographic data and we determined anxiety and stress levels through BAI and STAI-1.

### **Score interpretation:**

#### **Beck Anxiety Inventory (BAI):**

The BAI is a self-reporting tool that evaluates the severity of generalized anxiety symptoms. This tool consists of 21 questions with a point range from 0 to 63 and focuses on somatic symptoms of anxiety. Responses are based on a Likert scale with four choices in each question whose points range from 0 (not at all) to 3 (severely). BAI, which is a brief scale that measures anxiety with a focus on somatic symptoms of anxiety, was developed as a measure adept at discriminating between anxiety and depression. There are four anxiety levels indicated by BAI depending on certain thresholds: normal anxiety: 0-7 points, mild anxiety: 8-15 points, moderate anxiety: 16-25 points, and severe anxiety: 25-63 points.[7] The BAI demonstrates internal consistency and convergence with other anxiety measurements and has been tested in many populations, including college students.[8]

#### **State-Trait Anxiety Inventory-1 (STAI-1):**

In this scale, there are four options for each question, which are "not at all", "somewhat", "very much" and "completely", and participants choose the option that best describes their situation. Among 20 questions in STAI-1, positive points that are increasing the total score of anxiety are given for the 3<sup>rd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 9<sup>th</sup>, 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> questions, and negative points that are decreasing the total score of anxiety are given for the 1<sup>st</sup>, 5<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, 15<sup>th</sup>, 16<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup> questions. In evaluating STAI-1, each question is scored from 1 to 4 or between -1 and -4 depending on their being in positive or negative category and fixed value of 50 is added to the total score. The highest and lowest scores are 80 and 20, respectively. The higher is the total anxiety score, the higher is the anxiety level of the student that completed the STAI-1.[9] According to STAI-1

scores, anxiety symptoms were defined as low (<33), medium (33–49) and high (> 49)[10].

**Statistical Analysis:**

The statistical analyses were performed using IBM SPSS Statistics for Windows (version 26.0). Descriptive statistical analyses (n,%) were performed using the Chi-Square Test and Mann-Whitney utest. Normality control was made through Shapiro-Wilk and Kolmogorov-Smirnov tests, histogram, Q-Q plot and boxplot graphics. Because there wasn't normal distribution, the correlation of age, gender and class years with BAI and STAI-1 and the correlation between BAI and STAI-1 was compared by using Spearman tests. Post-hoc analyses were performed on multiple category data with Bonferroni correction. In examining the relationship between demographic factors and anxiety, p-value<0.05 was considered statistically significant.

**Research Hypothesis:**

We supposed that the stress level of university students increased more with the addition of the COVID-19 outbreak not only to the existing fears of university students of not having adequate education necessary for their educational developments and but also especially the fears of last year students' of the possibility of not being able to start their careers timely and other stress factors related to the period of youth.

**Results:**

1117 university students over the age of 17 from 23 universities (15 public and 8 private) participated in this study by filling in the online questionnaire through the Internet from 2 to 17 May 2020. 57.8% (n=646) and 42.2% (n=471) of the participants were females and males, respectively. According to class years, the percentages of 1st, 2nd, 3rd, 4th, 5th and 6th year students were 23.5% (n=262), 23.6% (n=264), 12.3% (n=137), 19.9% (n=222), 13.2% (n=148) and 7.5% (n=84), respectively. Age ranges of the respondents were as follows: 16% (n=179) between 17 and 19 years; 48.1% (n=537) between 20 and 22 years; 29.9% (n=334) between 23 and 25 years and 6% (n=67) above 26 years. The details of the relevant statistics can be seen at the table below. (Table 1)

As also stated above, the questionnaire was composed of two parts. There were both a small section for personal information of the students and the BAI in the first part, and the STAI-1 constituted the second part of the study. According to BAI, while the average score of male students was 11.56±11.283, the average score of female

students was 16.65±12.594. (p<0.05) There was a significant difference between BAI scores of university students. (p<0.05) Average scores for age ranges of 17-19, 20-22, 23-25 and 26+ were calculated as 15.15±12.573, 14.63±12.379, 14.75±12.468 and 10.58±9.747, respectively.

**Table1. Demographics of University Students (x<sup>2</sup> test)**

		Frequency	Male	Female	Percent (%)
Age	17-19	179	57	122	16,0
	20-22	537	216	321	48,1
	23-25	334	160	174	29,9
	26 and +	67	38	29	6,0
Gender	Male	471	471		<b>42,2</b>
	Female	646		646	<b>57,8</b>
Class Year	1	262	103	159	23,5
	2	264	115	149	23,6
	3	137	67	70	12,3
	4	222	79	143	19,9
	5	148	68	80	13,2
	6	84	39	47	7,5
	Total	1117	471	646	100,0

As for the class year of university students, average scores were come out as 13.76±11.573 for the 1<sup>st</sup> year, 15.24±13.010 for the 2<sup>nd</sup> year, 16.80±13.180 for the 3<sup>rd</sup> year, 14.90±12.068 for the 4<sup>th</sup> year, 13.71±12.921 for the 5<sup>th</sup> year and 11.24±9.423 for the 6<sup>th</sup> year. BAI scores didn't show significant difference in regard to class year and age range. (p>0.05) Average BAI score of our sampling composed of 1117 students was 14.51. (Table 2) According to STAI-1, while the average score of male students was 46,72±11.565, the average score of female students was 49.04±11.890. There was a significant difference in terms of gender. (p<0.05) Average scores for age groups of 17-19, 20-22, 23-25 and 26+ were found out as 49.53±10.934, 48.01±12.232, 47.88±11.685 and 45.52±10.823, respectively. When looked at the class year of university students, average scores in regard to class years were found out as 48.17±11.869 for the 1<sup>st</sup> year, 48.26±12.101 for the 2<sup>nd</sup> year, 50.39±11.379 for the 3<sup>rd</sup> year, 47.14±12.068 for the 4<sup>th</sup> year, 47.43±11.913 for the 5<sup>th</sup> year and 46.89±10.088 for the 6<sup>th</sup> year. There wasn't significant difference in regard to class year and age between STAI-1 scores of university students. (p>0.05) Average STAI-1 score of our sampling composed of 1117 students was 48.07±11.804. (Table 2)

**Table 2. The Relationship between BAI and STAI-1 Scores in regard to Class Year, Age and Gender**

		N	Mean	Std. Deviation	Minimum	Maximum	P
<b>BAI</b>	Class Year 1	262	13,76	11,573	0	59	>0.05
	Class Year 2	264	15,24	13,010	0	63	>0.05
	Class Year 3	137	16,80	13,180	0	63	>0.05
	Class Year 4	222	14,90	12,068	0	52	>0.05
	Class Year 5	148	13,71	12,921	0	63	>0.05
	Class Year 6	84	11,24	9,423	0	48	>0.05
	Total	1117	14,51	12,314	0	63	<b>0.339<sup>S</sup></b>
<b>STAI-1</b>	Class Year 1	262	48,17	11,869	20	78	>0.05
	Class Year 2	264	48,27	12,101	20	80	>0.05
	Class Year 3	137	50,39	11,379	20	79	>0.05
	Class Year 4	222	47,14	12,068	22	75	>0.05
	Class Year 5	148	47,43	11,913	20	80	>0.05
	Class Year 6	84	46,89	10,088	25	75	>0.05
	Total	1117	48,07	11,804	20	80	<b>0.128<sup>S</sup></b>
<b>BAI</b>	17-19	179	15.16	12.523	0	59	>0.05
	20-22	537	14.64	12,379	0	63	>0.05
	23-25	334	14.75	12,468	0	63	>0.05
	26 and +	67	10.58	9,747	0	48	>0.05
<b>STAI-1</b>	17-19	179	49.53	10,934	23	78	>0.05 <sup>K</sup>
	20-22	537	48.01	12,232	20	80	>0.05 <sup>K</sup>
	23-25	334	47.88	11,685	20	80	>0.05 <sup>K</sup>
	26 and +	67	45.52	10,823	20	75	>0.05 <sup>K</sup>
<b>BAI</b>	Male	471	11.56	11.283	0	63	<b>&lt;0.05<sup>S</sup></b>
	Female	646	16.65	12.594	0	63	<b>&lt;0.05<sup>S</sup></b>
<b>STAI-1</b>	Male	471	46.72	11.565	20	80	<b>&lt;0.05<sup>S</sup></b>
	Female	646	49.04	11.890	20	80	<b>&lt;0.05<sup>S</sup></b>

K; Kruksal Wallis, M; Mann-Whitney U, S; Spearman's p,

While BAI scores of third year students (n=137) were 16.80±13.180, sixth year students' (n=84) BAI scores were 11.24±9.423. When students' BAI scores were compared according to the class year, there found a significant difference between scores of third year and sixth year students. (p<0.05) (Table 3)

**Table 3. The Relationship between BAI Score and Class Year (t-test, Benforini)**

Class Year	N	Mean	Std. Deviation	P	
<b>BAI</b>	Third.	137	16,80	13,180	0.001
	Sixth.	84	11,24	9,423	0.001

According to BAI scores, it was found that 397 students scored 0 to 7 points didn't have any anxiety, 311 students scored 8 to 15 had a mild

anxiety, 215 students scored 16 to 25 showed moderate anxiety and 194 students scored 26 to 63 had a severe anxiety. As for STAI-1 scores, the results demonstrated that 107 students scored 0-33 had a mild situational anxiety, 514 students scored 33-49 showed moderate situational anxiety and 496 students scored 49 or above had a severe situational anxiety. There was a positively significant difference between BAI scores and STAI-1 scores of the university students taken part in the study.(p<0.01 & Spearman Correlation r=0.635)BAI and STAI-1 scores showed positive correlation with gender.(p<0.01, r=0.227 and r=0.096, respectively)There existed a positive correlation between ages and class years of the students participated in the study.(r=.674 and

$p < 0.01$ ) (Table 4.)

**Table 4. The Correlation between Age, Gender, Class Year, BAI Score and STAI-1 Score**

Spearman Correlations					
	BAI	STAI	Gender	Age	Class
BAI	1,000	,635**	,227**	-0,043	-0,029
STAI	,635**	1,000	,096**	-,068*	-0,046
Gender	,227**	,096**	1,000	-,128**	-0,022
Age	-0,043	-,068*	-,128**	1,000	,674**
Class Year	-0,029	-0,046	-0,022	,674**	1,000
N	1117	1117	1117	1117	1117
**Correlation is significant at the 0.01 level(p value)					
*Correlation is significant at the 0.05 level(p value)					

### Discussion:

One of the most common problems faced by people throughout their life is anxiety. The prevalence of anxiety is higher among students than the general population.[11] Anxiety appears in individuals either depending on the situation or in a permanent manner. Situational anxiety comes out periodically as a reaction to a situation triggered by an event or condition. Permanent anxiety, which is characterized by experiencing all changes of life with a severe anxiety, can be observed for a long time or even throughout one's life.[12,13]The level of anxiety can vary from one person to another and people's behaviours are affected from the amount of tension. [13]

In our questionnaire study that was carried out anonymously, BAI score and STAI-1 score were utilized to determine the anxiety level of university students. While average BAI and STAI-1 scores of male students were  $11.56 \pm 11.283$  and  $46.72 \pm 11.565$ , average BAI and STAI-1 scores of female students were  $16.65 \pm 12.594$  and  $49.04 \pm 11.890$ , respectively. When examined in terms of gender, it was found out that there was a positive relationship between BAI and STAI-1 scores indicating the anxiety level of students, and the BAI and STAI-1 scores of female students came out higher than those of males. There was a significant difference in regard to gender. ( $p < 0.05$ ) In parallel to the findings of the study by Lala Acharya et al. And other similar studies, the anxiety scores of females also came out higher in our study. [4] As also the case in other similar studies, there were more female students than male students in the sampling of our study. [5-14] In a study carried out by Othman N. Et al. A survey

with university students about perceived impact of contextual determinants on depression, anxiety and stress, the thresholds for anxiety was taken as 0-9 = minimal anxiety, 10-18 = mild anxiety, 19-29 = moderate anxiety and 30-63 = severe anxiety. It was found out that 71 students (48.3% of total) had minimal anxiety, 76 students (51.7% of total) had moderate or severe anxiety.[14] The students weren't asked to specify their departments in our study. It was found out that only 397 students (35.5% of total participants) whose scores were between 0-7 according to BAI, didn't have any anxiety and 720 students (64.5% of total) had moderate and severe anxiety. If BAI score  $\leq 9$  was taken as the basis, 491 students (44% of total) would have no or minimal anxiety and 626 students (56%) would have moderate or severe anxiety. It can be asserted from these results that anxiety scores of university students, which are higher than those of the general population, increased a bit more during the COVID-19 outbreak.

There wasn't any situational anxiety in 107 students (9.6% of total) whose STAI-1 scores were between 0 and 33. However, there found moderate and severe anxiety in 1010 students (90.4%) whose scores were above 33. We think that the high level of anxiety was caused by the worry of the students from different departments about how to continue their education and how to start a career timely during the time of COVID-19 outbreak. The strong positive correlation between BAI and STAI-1 scores supports our hypothesis. As to the situation of students attending health or other relevant departments, their level of anxiety was demonstrated higher than others in several studies, the brief details of some of which are as follows. In a study by Brenneisen Mayer F et al., STAI-1 was used to determine anxiety level and Beck Depression Inventory (BDI) was utilized to find out the level of depression. It was found out that the prevalence of anxiety of medical students was 81.7% and there was a high association between the symptoms of depression and anxiety.[15] In the study of Othman N. Et al., the students came from various departments of the university but majority were from psychology (38.5%) and health (31.8%).[14] The reason for finding higher anxiety level in this study can be attributed to the fact that the number of participants was relatively lower and students from psychology and health departments constituted the large part of the study group. This result is also supported by the finding of a study by Garber MC on pharmacy students that students

enrolled in health professions programs have high levels of stress.[16] As for the evaluation with regard to class years, there found out a significant difference between third and sixth class years. It was envisaged in our hypothesis that the anxiety level of last year students would come out higher due to their fear of not being able to graduate because of the current problems affecting education system and not being able to begin to work timely in case of graduation. In Turkey, only faculties of medicine have a six-year long program and in our study BAI scores of sixth year students came out lower. We are of the opinion that it was because that they weren't called to hospitals and they don't have anxiety of finding a job after graduation. With an aim to look for the ways to decrease, minimize or eliminate the anxiety of students whose anxiety scores were high, many studies were done. One of these studies was a study by Virginia L. Et al., in which there were 17 participants aged from 19 to 23. Thirteen participants were female and four were male. Nine of the students were enrolled in the Doctor of Pharmacy program and eight were enrolled in other academic programs. Changes in categorical data from pre- to post-intervention on the BAI and Perceived Stress Scale (PSS) were significant, with no students scoring in the "high" category for stress or anxiety on the post-intervention questionnaire. Students experienced a reduction in stress and anxiety levels after completing a six-week yoga and meditation program preceding final examinations. Results suggest that adopting a mindfulness practice for as little as once per week may reduce stress and anxiety in college students. Administrators should consider including instruction in nonpharmacologic stress and anxiety reduction methods, within curricula in order to support student self-care. In this vein, higher education institutions, including schools of pharmacy, should think of including such integrated methods as yoga and meditation in their programs to support personal care and developments of students. [17] According to another study, there is the potential for substantial gains by combining these two techniques mindfulness and Cognitive Behavioural Therapy (CBT) through Web-based interventions for students who are also technologically fluent and capable; studies also indicate that students prefer to self-initiate help-seeking for Web-based services compared with in-person services. Another study demonstrated the effectiveness of an internet-based mindfulness-CBT intervention in reducing

depression, anxiety, and stress symptoms among students. The student-centered design of the platform, which included design features identified through focus groups, might have contributed to the positive impact and reduced attrition.[18] Considering the results of the studies and given that increasing levels of common mental disorders like depression, anxiety and stress are becoming a global concern for young adults and college students.[19] We should apply necessary psychological support treatments to university students in order to reduce their anxiety for future and to alleviate their school anxiety. In this regard, we think that states should take a more active role in supporting university students psychologically to minimize their anxiety for future and make them to look at the future with hope.

### **Conclusion:**

Indeed, many studies also demonstrated high level of anxiety among university students. In our study, we found out that the large majority of university students has moderate and severe anxiety and situational anxiety. That the closure of the universities due to the COVID-19 outbreak was an unexpected pause for university students in their educational life more likely affected the university students negatively. It was found in our study that more than two third of the university students suffered from anxiety symptoms during the COVID-19 outbreak.

This result shows that the COVID-19 outbreak brought about an increase in anxiety levels of many students participated in our study. However, it should be stated at this point that further studies with larger samples are needed to enhance the generalizability of study results. In this regard, taking the results of our study into account, it can be put forward that students should take necessary measures and learn the ways to tackle with such mental and emotional problems as stress, anxiety and fear that could require considerable psychological and physical effort at the time of social catastrophes such as the COVID-19. And, in their endeavour, students should be given necessary and sufficient support by both administrators and their families.

### **Author's Contributions:**

MC designed this study, and made additional contributions to its design. MC conceived and conducted statistical analyses with additional advice regarding analyses. MC drafted the manuscript and approved the final manuscript.

### Ethics Statement:

To protect the respondents' privacy, the survey was conducted anonymously. Ethical approval for the research was obtained from Taksim Education and Research Hospital (Certificate e2020-63).

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### Conflict of Interest:

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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