



Anxiety and Coping Attitudes in Medical School Students During the COVID-19 Pandemic

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Abstract

Aim: The coronavirus (COVID-19) pandemic process has affected individuals of all ages, from children to the elderly, both physically and mentally. This study aimed to determine the anxiety levels and coping attitudes of Medical Faculty students during the COVID-19 pandemic period.

Material and Methods: A personal information form (containing questions about COVID-19), the State Trait Anxiety Inventory and the Coping Strategies Scale were applied online to the students (n=186) who volunteered to participate in the study, studying at the Faculty of Medicine. The scores of the scales were evaluated statistically.

Results: The study included 186 participants consisting of 57% (n=106) females and 43% (n=80) males. A statistically significant positive correlation was found between trait anxiety scale score and emotion focused scale score ($r=0.151$ $p=0.040$). A statistically significant positive correlation was found between trait anxiety scale score and dysfunctional coping scale score ($r=0.455$ $p<0.001$). According to the simple linear regression analysis, a 1-unit increase in the trait anxiety scale score increased the dysfunctional coping scale score by 0.35 units.

Conclusion: As seen in our study, an increase in anxiety levels leads to dysfunctional coping attitudes. Dysfunctional coping attitudes are among the reasons that lead people to mental illnesses. Therefore, goals should be determined to reduce the anxiety levels of future physicians and to increase their functional coping attitudes.

Keywords: COVID-19, coronavirus, pandemic, medical students, anxiety, coping strategies

INTRODUCTION

The new type of coronavirus disease (COVID-19), which the World Health Organization determined as a public health emergency of international concern on January 30, 2020, started in China and quickly spread all over the world and was accepted as a pandemic (1). The low predictability and little awareness of COVID-19 affects the mental health of individuals in terms of cognitive and emotional as well as physical health (2). In the studies, anxiety and depression levels were found to be higher in healthcare workers compared to non-health workers during the pandemic period (3,4).

Stress is a physiopsychological reaction that occurs when the physical and mental health of the person is threatened and these limits are pushed (5). It can be said that the basis of stress lies in the evaluation of human perception and experiences, and giving meaning to, evaluating and directing their experiences is the main factor in reducing or increasing stress (6). In this context, it can be predicted that the individual's gaining preventive health behavior is related to the development of coping skills with stress (5). Coping attitudes are considered as the adaptation process that is at a conscious and voluntary level and that the individual carries out to re-establish the internal and external balance that is disrupted in stressful situations (7).

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The way a person solves a problem in the face of a stressor can affect the normal course of stress and complicate the solution of the problem. Therefore, knowing the coping attitudes that the person uses in the face of a stressful situation; It will help in determining the treatment targets and monitoring the therapeutic effectiveness of the mental problems that may occur (8). The multiplicity of classes, long working hours, exams, peer competition, insomnia and other similar factors put medical students more stressed and difficult to cope with, which gradually puts them into mental problems. Over the Covid-19 pandemic and mandatory curfew in Turkey, medical school students faced economic ambiguity, occupational pressure, threat of infection, difficulties of distance education, lack of protective equipment at work, etc. In the literature, very few studies have been found on the anxiety levels of medical faculty students during the pandemic process. Apart from individual risks, medical school students are exposed to many stress factors arising from both medical education and the difficulties in the pandemic process. As far as we know, there is no study examining anxiety and coping attitudes together in this group. This study goaled to investigate students' attitudes, anxiety and coping strategies during the COVID-19 pandemic.

MATERIAL AND METHOD

Hitit University Medicine Faculty students were asked to fill in the State Trait Anxiety Scale (STAI) and Coping Attitudes Scale (COPE) online via google questionnaire for individuals aged 18-65 who volunteered to participate in the study. The study was carried out in October-December 2021. The scales were administered online to minimize face-to-face interactions and facilitate participation. At the start of the survey, each participant indicated their electronic informed consent to engage in the study by answering a yes-or-no question. All participants were made aware that the information they provided was coded and kept private. The study was approved by the Hitit University Non-Interventional Ethics Committee with protocol number 2021/78 and was completed at Hitit University Faculty of Medicine. The study was conducted in compliance with the Helsinki Declaration and publishing ethics.

The State-Trait Anxiety Inventory (STAI): The scale includes two subscales consisting of 20 items, namely State Anxiety (STAI-I) and Trait Anxiety (STAI-II) (9). Each subscale consists of 20 items and includes a total of 40 items. The answers given to the items are scored between 1 and 4. The scores obtained from the scale range from the lowest 20 to the highest 80. A high score indicates a high level of anxiety. It was developed by Spielberger in 1970, and its Turkish adaptation was made by Öner N and Le Compte A (1983) (10).

The Coping Strategies Scale (COPE): Coping Strategies brief form consists of 28 items and 14 sub-dimensions. There are two items in each sub-factor. The COPE scale consists of 3 main groups.

(a) Emotion-focused:

1. Humor is making jokes or making fun of a stress situation.
2. Acceptance is acknowledging the existence of the stressful situation.
3. Positive reinterpretation is recreating the stress situation in a positive way.
4. Religion is creating a source of emotional support through a positive reinterpretation of the situation.
5. The seeking for emotional social support is to provide moral support, sympathy and decency.

(b) Problem-focused:

1. Active coping is the process of taking steps to eliminate stress or its effects.
2. Planning is thinking about how to deal with stress.
3. Seeking social support for instrumental reasons is a referral, a help, a search for information.

(c) Dysfunctional coping:

1. Focus on and venting of emotions the tendency to focus on the stress experienced by a person and to express their emotions.
2. Behavioral distancing is a decrease in one's efforts to cope with stress, or even a lack of effort to reach a goal.
3. Mental disengagement diverting one's attention away from the stress situation.
4. Denial is the refusal to believe that the stressful situation exists.
5. Substance use includes the use of alcohol and other substances.
6. Self-blame is a tendency to criticize oneself (11,12).

Participants were asked to fill in the strategy defined in each item, taking into account the COVID-19 process, and how often they used it. The Biref COPE was used to evaluate coping strategies during previous epidemics of infectious disease, like the SARS epidemic (13).

Statistical Analysis

Statistical analysis of the data obtained by using questionnaires and scales in our study was performed with SPSS (Version 22.0, SPSS Inc., Chicago, IL, USA, Undergraduate: University) package program. The normal distribution of data was tested with the Kolmogorov-Smirnov test and the Shapiro-Wilk test. Descriptive statistics of continuous data obtained from questionnaires and scales were reported together with mean±standard deviation (SD) and median (min-max) depending on data distribution. Descriptive statistics of categorical variables obtained from socio-demographic questions were presented with frequency and percentage (%). When comparing the scale scores according to socio-demographic characteristics, Student's t-test was used

for data showing normal distribution and Mann-Whitney U test was used for data not showing normal distribution between two independent groups. When more than two independent groups were compared, normally distributed data were calculated with one-way analysis of variance (ANOVA), and data that were not normally distributed were calculated with the Kruskal Wallis test. Correlations between the numerical scores to be obtained from the scales were investigated with the Pearson or Spearman correlation coefficient, depending on the normal distribution of the data. Simple linear regression analysis was used to identify the cause-effect relationship between two scale scores with significant correlations. Statistical significance level was evaluated as $p < 0.05$.

RESULTS

A total of 186 medical students participated in the study. 57% (n=106) of the participants were female and 43% (n=80) were male. 61.3% (n=114) of the participants were receiving preclinical and 38.7% (n=72) clinical class education. Other descriptive statistics regarding the participants are presented in Table 1.

Table 1. Descriptive statistics of the socio-demographic characteristics of the participants

		N	%
Gender	Female	106	57
	Male	80	43
Class	Pre-clinic	114	61.3
	Clinic	72	38.7
Accommodation	Family home	23	12.4
	Student house	51	27.4
	Dormitory	112	60.2
Chronic disease status	Yes	15	8.1
	No	171	91.9
Status of being diagnosed with COVID-19	Yes	45	24.2
	No	141	75.8
Ongoing pre-diagnosed psychiatric disease state	Yes	29	15.6
	No	157	84.4
Psychotropic drug use status	Yes	23	12.4
	No	163	87.6
Total		186	100

The comparison of the STAI and the subscale scores of the coping scale (COPE) between the research groups (preclinical and clinical) are given in Table 2. The scores of the STAI and the COPE subscale scores (emotion-focused, problem-focused and dysfunctional coping) were not statistically different between the research groups ($p > 0.05$; Table 2).

Table 2. Comparison of STAI subscale scores (STAI-I and STAI-II) and COPE subscale scores (emotion-focused, problem-focused and dysfunctional coping) among research groups

	Pre-clinic (n=114)	Clinic (n=72)	p value
STAI			
STAI-I	40 (29-58) (40.65±5.80)	41 (23-61) (41.69±7.02)	0.204 ^b
STAI-II	47 (35-63) (47.42±6.54)	47 (27-65) (47.11±7.29)	0.886 ^b
COPE			
Emotion-focused	27 (17-39) (26.98±4.52)	27 (11-40) (27.06±5.49)	0.600 ^b
Problem-focused	17 (8-24) (16.93±3.30)	16 (6-24) (16.20±3.98)	0.178 ^a
Dysfunctional coping	24 (14-47) (24.60±5.12)	25 (15-48) (25.20±5.09)	0.430 ^b

STAI State and trait anxiety scale, STAI-I State Anxiety, STAI-II Trait anxiety, COPE Coping Strategies Scale, ^a Students' t-test with Mean±SD, ^b Mann-Whitney U test with Median (min-max), SD Standard deviation

The STAI scores among the socio-demographic characteristics of the participants is presented in Table 3. The STAI scores were statistically significantly different between the genders and places of residence of the participants (respectively; $p = 0.025$; $p = 0.033$; Table 3). The STAI scores of the participants were not statistically different between the presence of a chronic disease, the status of being diagnosed with COVID-19, whether or not they had a history of ongoing psychiatric illness, and their use of psychiatric drugs ($p > 0.005$; Table 3).

The comparison of the COPE subscale scores (emotion-focused, problem-focused, and dysfunctional coping) among the socio-demographic characteristics of the participants is presented in Table 4. Emotion-focused, problem-focused, and dysfunctional coping scale scores were not statistically different among the socio-demographic characteristics of the participants ($p > 0.005$; Table 4).

The results of the correlation analysis between the STAI-I, STAI-II and the COPE subscale scores are presented in Table 5. The STAI-I score and the scores on the emotion-focused, problem-focused, and dysfunctional coping scales did not show any statistically significant link ($p > 0.05$; Table 5). There was a very low statistically significant positive correlation between STAI-II score and emotion focused scale score ($r = 0.151$ $p = 0.040$; Table 5). The STAI-II score and the dysfunctional coping scale score were shown to have a statistically significant low level positive correlation ($r = 0.455$ $p < 0.001$; Table 5). The STAI-II scores and the problem focused scale scores did not show any statistically significant link ($p > 0.05$; Table 5). According to the simple linear regression analysis, a 1-unit increase in the STAI-II score increased the dysfunctional coping scale score by 0.35 units (Figure 1).

Table 3. Comparison of STAI scores among the socio-demographic characteristics of the participants					
		STAI-I	p value	STAI-II	p value
Gender	Female	40 (25-55) 40.06±5.87	0.025 ^b	47.5 (27-63) 48.28±6.60	0.016 ^b
	Male	41 (23-61) 42.37±6.64		45.5 (34-65) 46±6.93	
Accommodation	Family home	43 (29-54) 42.39±5.64	0.033 ^d	46.52±6.69 46 (36-60)	0.607 ^c
	Student house	42 (23-61) 42.21±7.36		46.76±7.83 46 (27-65)	
	Dormitory	40 (29-58) 40.25±5.82		47.70±6.37 47 (35-63)	
Chronic disease status	Yes	41 (28-58) 41.13±7.73	0.968 ^b	48 (35-61) 47.13±7.8	0.914 ^b
	No	41 (23-61) 41.05±6.19		47 (27-65) 47.31±6.75	
Status of being diagnosed with COVID-19	Yes	41 (29-58) 42.71±7.03	0.093 ^b	49 (34-61) 48.82±6.79	0.053 ^b
	No	41 (23-61) 40.53±5.98		46 (27-65) 46.81±6.78	
Ongoing pre-diagnosed psychiatric disease state	Yes	41 (30-61) 40.55±6.28	0.586 ^b	49 (35-58) 48.75±6.22	0.147 ^b
	No	41 (23-58) 41.15±6.32		46 (27-65) 47.03±6.91	
Psychotropic drug use status	Yes	40 (31-61) 40.21±6.45	0.339 ^b	48 (35-55) 47.47±5.81	0.729 ^b
	No	41 (23-58) 41.17±6.29		47 (27-65) 47.27±6.97	

^a Students' t-test (Mean±SD), ^b Mann-Whitney U test (Medyan (min-max)), ^c ANOVA (Mean ±SD), ^d Kruskal Wallis with (Median (min-max)), SD Standart Deviation

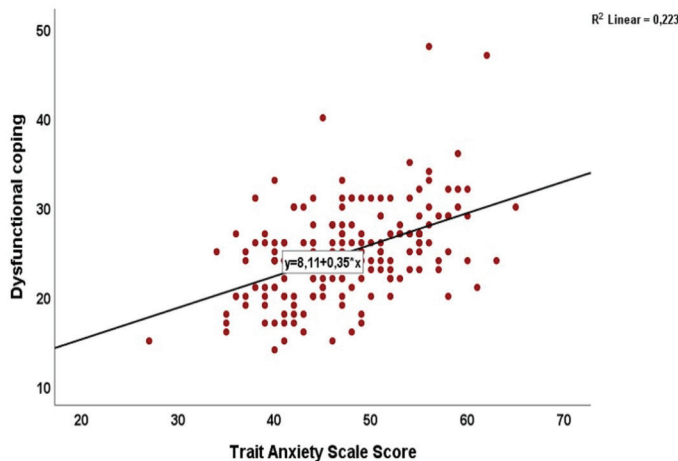
Table 4. Comparison of the subscale scores of the COPE (emotion-focused, problem-focused and dysfunctional coping) among the socio-demographic characteristics of the participants							
		Emotion-focused	p value	Problem-focused	p value	Dysfunctional coping	p value
Gender	Female	28 (11-39) 27.33±4.78	0.249 ^b	16.68±3.35 17 (6-24)	0.887 ^a	25 (15-47) 25.55±4.71	0.006 ^b
	Male	27 (13-40) 26.58±5.07		16.61±3.90 16.5 (6-24)		24 (14-48) 23.88±5.47	
Accommodation	Family home	28.43±4.83 28 (20-40)	0.186 ^c	17 (12-24) 18±3.86	0.204 ^d	24 (18-48) 25.08±6.38	0.831 ^d
	Student house	26.19±5.51 26 (11-38)		16 (6-24) 16.05±3.66		25 (14-34) 24.64±4.97	
	Dormitory	27.09±4.60 27 (13-39)		17 (6-24) 16.65±3.45		24 (15-47) 24.87±4.92	
Chronic disease status	Yes	27 (20-33) 26.33±4.13	0.574 ^b	17 (12-23) 17±2.75	0.666 ^b	24 (16-33) 25.33±5.12	0.621 ^b
	No	27 (11-40) 27.07±4.97		17 (6-24) 16.62±3.66		24 (14-48) 24.79±5.12	
Status of being diagnosed with COVID-19	Yes	28 (20-36) 27.42± 4.04	0.435 ^b	17 (8-24) 16.73±3.96	0.907 ^b	25 (15-40) 25.22±4.53	0.419 ^b
	No	27 (11-40) 26.88±5.16		17 (6-24) 16.63±3.48		24 (14-48) 24.71±5.28	
Ongoing pre-diagnosed psychiatric disease state	Yes	26 (17-33) 25.72±4.78	0.172 ^b	16 (10-24) 16.82±3.77	0.959 ^b	26 (14-40) 25.89±5.26	0.099 ^b
	No	27 (11-40) 27.25±4.91		17 (6-24) 16.62±3.57		24 (15-48) 24.64±5.07	
Psychotropic drug use status	Yes	26 (17-33) 25.73±4.87	0.280 ^b	17 (12-24) 17.17±3.49	0.658 ^b	25 (14-40) 25.65±5.21	0.350 ^b
	No	27 (11-40) 27.25±4.91		17 (6-24) 16.58±3.61		24 (15-48) 24.72±5.10	

^a Students' t-test (Mean±SD), ^b Mann-Whitney U test (Medyan (min-max)), ^c ANOVA (Mean ±SD), ^d Kruskal Wallis with (Median (min-max)), SD Standart Deviation

Table 5. Correlation analysis results between STAI subscale scores and COPE subscale scores (emotion-focused, problem-focused, and dysfunctional coping) (n=186)

		Emotion-focused	Problem-focused	Dysfunctional coping
STAI-I	r	0.075	0.081	-0.043
	P	0.308	0.271	0.563
STAI-II	r	0.151	0.133	0.455
	P	0.040	0.071	<0.001

r: Spearman correlation coefficient, STAI-I State Anxiety, STAI-II Trait anxiety

**Figure 1.** Scatterplot and regression curve showing the relationship between trait anxiety scale score and dysfunctional coping scale score (n=186)

DISCUSSION

The current study examines medical school students' pandemic coping mechanisms and how they relate to anxiety symptoms. Pre-pandemic study on medical students' anxiety levels in the literature revealed that they had higher levels of anxiety than their peers in other faculties (14,15). Also, it was observed that there was a similarity in anxiety prevalence in medical school students before and after the pandemic (16,17). During the pandemic, while the anxiety levels of medical students remained stable, it was shown to increase in their non-medical peers and general population. This situation has been interpreted as increasing the knowledge and cognition about the transmission, treatment, prognosis and prevention of COVID-19, as the anxiety levels are negatively proportional (18). On the other hand, there are also studies that emphasize the increase in anxiety rates during the COVID-19 process (18,19). There are studies showing that preclinical students have more anxiety symptoms than clinical students (19,20). Although there was no significant difference in the state and trait anxiety levels between preclinical and clinical students, the mean scores were found to be higher than the stated mean score of the STAI, scale in both groups in our study (Table 2) (21,22). The presence or absence of a diagnosis of COVID-19 infection did not make a significant difference in the anxiety levels of the students. The anxiety levels of

female students were found to be substantially greater than those of male students, which is consistent with the literature (16,23,24).

Some occupations are more stressful than others. The profession of medicine is among these stressful professions in terms of working conditions and requires effective coping attitudes, especially in difficult processes such as pandemics. Developing the ability to cope with stress effectively in medical school students will not only protect their mental and physical health and their relationship with the environment, but will also help maintain their professional motivation and directly affect their approach to patients. In the literature, coping strategies of medical school students during the pandemic have not been investigated yet. In our study, coping attitudes were examined in 3 groups (emotion-focused, problem-solving-focused, and dysfunctional coping attitudes). No difference was found between preclinical and clinical medical students in terms of coping attitudes, but female students' use of dysfunctional coping attitudes was found to be significantly higher than male students in our study (Table 2,4). This may lead to the interpretation that female students use dysfunctional coping attitudes more because of their high level of anxiety. This is also supported by our research, which found a significant positive correlation between trait anxiety scale scores and dysfunctional coping attitudes. Furthermore, simple linear regression analysis revealed that for every unit increase in trait anxiety scale scores, the dysfunctional coping scale score increased by 0.35 units (Figure 1). Similarly to our study, it was reported that there is a positive significant correlation between desperate and the submissive approaches which can be evaluated in the dysfunctional coping attitudes group and anxiety level (25). From another perspective, using emotion-focused or problem focused functional coping styles suggests that it may be a protective factor for anxiety. The more functional coping attitudes, the lower the stress severity. These findings were similar to studies that found functional coping attitudes as the method with significant impact on reducing stress (26,27).

Limitations

The limitations of our study are that it did not include a clinical interview, was a cross-sectional study, used self-reported screening scales, could not establish a cause-effect relationship, and had a heterogeneous sample. At the same time, it should be noted that the results of our study conducted at our university may not be representative of the whole population. Despite these limitations, our study offers some common implications for the management of medical students' distress in exceptional circumstances such as the COVID-19 outbreak.

CONCLUSION

Our research may serve as a roadmap for therapeutic interventions designed to enhance and safeguard medical students' mental health throughout the ongoing

COVID-19 pandemic. As seen in our study, an increase in anxiety levels leads to dysfunctional coping attitudes. Dysfunctional coping attitudes are among the reasons that lead people to mental illnesses. Therefore, goals should be determined to diminish the anxiety levels of future physicians and to increase their functional coping attitudes.

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Conflict of Interest: *The author declare that they have no competing interest.*

Ethical approval: *The study was approved by the Hitit University Non-Interventional Ethics Committee (reference number:2021-78).*

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