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Perceptions and attitudes of medical students regarding the coronavirus disease 2019 pandemic and relationships with personality traits and psychological resilience

Ece Yazla [1], Ahmet Alp Karakasli [1], Unsal Aydinoglu [1], Elvan Ozalp [2]

[1] Department of Psychiatry, Hitit University Faculty of Medicine, Corum, Turkey
[2] Private Psychiatric Practice, Ankara, Turkey

ORCID of the author(s)

EY: https://orcid.org/0000-0002-7120-9333
AAK: https://orcid.org/0000-0002-1472-1437
UA: https://orcid.org/0000-0001-5261-8687
EO: https://orcid.org/0000-0001-9618-8148

Corresponding Author
Ece Yazla
Department of Psychiatry, Hitit University Faculty of Medicine, Ulukavak, Ciftlik Cayiri Cd. 45 A, 19040 Merkez/Corum, Turkey
E-mail: eceyazla@yahoo.com

Ethics Committee Approval
The study was approved by the Clinical Ethics Committee of Hitit University Faculty of Medicine (Date: March 2, 2021, No:398). All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

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No conflict of interest was declared by the authors.

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Abstract

Background/Aim: COVID-19 adversely affects mental health. We aimed to investigate COVID-19-related perceptions and attitudes in medical school students and to assess possible relationships with students' psychological resilience levels and personality traits.
Methods: This was a cross-sectional study carried out with 186 students in medical school at Hitit University Faculty of Medicine from March 18, 2021 to May 27, 2021. The sociodemographic form, perceptions and attitudes related to the COVID-19 pandemic, the Eysenck Personality Inventory (short form), and the Brief Psychological Resilience Scale were delivered to the students via mobile phone or e-mail and data were collected online.
Results: In the COVID-19 perception scale, the assessment of dangerousness was found to be significantly higher among those living with at-risk individuals (P=0.026). In the perception of control subscale, personal control was found to be significantly higher in students who did not live with at-risk individuals (P=0.018). In the COVID-19 avoidance attitudes scale, behavioral avoidance was significantly more pronounced in students living with at-risk individuals (P=0.016). In our study, anxiety and depression were predominant in the brief symptom inventory. In the short form of the Eysenck Personality Inventory, it was observed that higher scores were obtained mostly in the neuroticism and extraversion dimensions.
Conclusion: The findings of this study examining medical students show links between demographic factors, personality traits, and responses in the context of COVID-19 coping behaviors.

Keywords: COVID-19 pandemic, personality, resilience, medical school students

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Introduction

The coronavirus disease 2019 (COVID-19) pandemic has been shown to have negative effects on mental health [1-3]. Varying research results in the literature suggest that medical school students experienced considerable psychological adverse outcomes during the COVID-19 pandemic, both in Turkey and other countries [4-7].

Psychological resilience is defined as "the mental processes and behaviors that are effective in protecting an individual from the potential negative effects of stress factors" [8]. It has been reported that one of the most important factors predicting anxiety associated with COVID-19 is the psychological resilience of the individual [9]. As a recent example, a study from China evaluated psychological resilience for its role in the relationship between stressful experiences and acute stress disorder in university students. The results showed that resilience was a factor that determined the development of acute stress disorders due to COVID-19 [10].

Additionally, evidence from recent studies show that personality can impact overall coping responses, including coping responses to the COVID-19 pandemic. In particular, personality subdimensions such as extraversion, conscientiousness, and emotional stability (instability) seem to influence individuals' abilities to cope with COVID-19 [11]. In a study investigating young adults' coping responses to COVID-19 with respect to personality traits and demographic characteristics, many personality subgroups were found to be directly related to coping responses [12]. To our knowledge, no studies have investigated the relationship between personality traits and COVID-19-related perceptions and attitudes in medical school students.

In the present study, we investigated medical students' perceptions and attitudes regarding the COVID-19 pandemic and evaluated their relationships with students' psychological resilience levels and personality traits. In addition to revealing various personality traits that determine pandemic-related thoughts and attitudes of medical school students, we aimed to ascertain how the psychological resilience levels of students affected their thoughts and attitudes about the pandemic, and which personality traits were effective in resilience.

Materials and methods

Participants and study design

This cross-sectional study was carried out among medical students in their first to fourth year of study at Hitit University Faculty of Medicine from March 18 to May 27, 2021. Data were collected through online questionnaires and forms sent to students by mobile phone or email via the help of student representatives after obtaining necessary permissions from the Faculty of Medicine. Students who completed the questionnaire were included in the study. The faculty has a total of 556 students enrolled in years 1-4. All students were contacted and 186 were included in the study. Investigations were begun after approval was granted from the Clinical Ethics Committee of Hitit University Faculty of Medicine (Date: March 2, 2021, No: 398). All steps of the study were in agreement with the principles of the Declaration of Helsinki.

Comparisons were performed based on students' gender, presence/absence of an at-risk individual living with the student, and the presence/absence of a relative with severe COVID-19.

Scales used in the study

Sociodemographic form: This was prepared by the physicians responsible for the study.

Scale of perceptions and attitudes related to the COVID-19 pandemic: This scale performs assessments of the following COVID-19-related dimensions: attitudes toward vaccines, perceptions of COVID-19, avoidance attitudes, perceptions of the control of COVID-19, and perceptions of causes of COVID-19. Henceforth, we refer to this scale as the "COVID-19 opinions scale" for simplicity [13].

Perception of COVID-19 scale scoring

The Perception of COVID-19 Scale consists of seven Likert-style items which assess the two subdimensions of dangerousness and contagiousness. The first category (dangerousness; Questions 1, 2, and 3) assesses the dangers perceived in relation to COVID-19, whereas the second subdimension, (Questions 4, 5, 6, and 7) evaluates contagiousness. The first and second questions in the dangerousness subdimension of the scale are scored inversely. Inverse items are coded as 1→5, 2→4, 3→3, 4→2, 5→1 points. Scores range from 1 to 5, calculated as the average score from items in each subdimension. High dangerousness and contagiousness scores indicate greater perception (more severity) of these features among individuals.

Avoidance attitudes from COVID-19 scale scoring

The Avoidance Attitudes from COVID-19 Scale consists of ten items scored using a five-point Likert scale. It contains the two subdimensions of cognitive avoidance (Items 1-5) and behavioral avoidance (Items 6-10). Cognitive avoidance evaluates avoidance of information related to COVID-19 (refusing to pay attention or think about other subjects when faced with COVID-19 information). Behavioral avoidance assesses avoidance of social activities, personal contacts, and public transportation. Higher scores indicate greater avoidance.

Perception of control of COVID-19 scale scoring

This scale comprises 12 items scored on a five-point Likert scale. The three categories include macro control (Items 1-4), personal (micro) control (Items 5-8), and controllability (Items 9-12). Macro control concerns beliefs about the effectiveness of measures implemented at institutional, national, or global levels, while personal control relates to the efficacy of individual actions to prevent the disease. Controllability evaluates perceptions about the degree to which the disease can be managed. Higher scores in macro control reflect confidence in the adequacy of implemented measures, while elevated scores in personal control indicate belief in the effectiveness of personal actions. Likewise, heightened scores in controllability suggest a belief in the disease's manageability.

Perception of causes of COVID-19 scale scoring

The COVID-19 Perception Scale consists of 14 items, utilizing a five-point Likert scale, and is categorized into three subdimensions: conspiracy, environment, and faith. Conspiracy (Items 1-6) addresses media-driven beliefs like biological warfare and big-pharma conspiracies. The environment subdimension (items 7-11) explores social and environmental factors like diet and pollution. The faith category (Items 12-14) examines religious

interpretations, such as viewing the pandemic as destiny or divine punishment. Each subdimension's score, ranging from 1-5, indicates the strength of perception within it.

Attitudes toward the COVID-19 vaccine scale scoring

The COVID-19 Vaccine Attitudes Scale includes nine items, which are divided into positive and negative attitude groups. In the negative attitude section (Items 5-9), scoring is reversed. Each subdimension's score (1-5) is obtained by dividing the total score by the number of items. Higher scores in the positive attitude section (Items 1-4) indicate a positive vaccine attitude. In contrast, higher scores in the negative attitude section suggest a less negative attitude toward the vaccine after reversing the scores.

Eysenck Personality Inventory (short form)

This form examines personality traits in four dimensions (psychoticism, extraversion, neuroticism, and lies) There are 48 items, 12 for each dimension, and each item is answered with 'yes' and 'no' options. Topcu [14] translated and adapted the Eysenck Personality Inventory (short form) to the Turkish language.

Brief psychological resilience scale

This scale measures psychological resilience with a six-item Likert-type (5 points) scale, as described by Smith et al. (2008) [15]. It was adapted into Turkish by Doğan [16]. Responses of "I strongly disagree" correspond to a score of 1, while "I completely agree" correspond to a score of 5. Scores increase in parallel with level of psychological resilience.

Brief symptom inventory

This scale comprises five subscales: anxiety (13 items), depression (12 items), negative self (12 items), somatization (9 items), and anger (7 items). It employs a Likert-type self-assessment format, with responses ranging from (0) "Not at all" to (4) "Advanced" for each question, yielding a total score range of 0 to 212. Higher scores indicate a greater frequency of symptoms. The Turkish validity and reliability study of this scale was conducted by Şahin and Durak (1994) [17].

Statistical analysis

All statistical analyses were conducted using SPSS version 21 (SPSS Inc., Chicago, IL, USA). Normality of distribution for variables was assessed using Q-Q plots and histograms. Continuous variables are presented as mean (standard deviation) or median (1st quartile - 3rd quartile) based on their distribution, while categorical variables are expressed as frequency (percentage). Between-group comparisons were conducted using the Mann-Whitney U test. Spearman correlation coefficients were calculated to assess directional relationships between continuous variables. Statistical significance was defined as two-tailed *P*-values less than 0.05.

Results

The majority of participants (n=186) were females (63.98%) and the mean age was 21.14 (1.47) years. The great majority of participants (n=155, 83.33%) lived with their families. It was observed that 82.26% of the students had obtained information about COVID-19 from the media. Fear of contracting severe COVID-19 was present in 87.63%. With regard to attitude toward the COVID-19 vaccine, the positive subdimension revealed a score of 4.25 (3.75-4.75), while the negative subdimension revealed a score of 3.8 (3.4-4.4) points. Overall scores of other scales were as follows: 17.01 (5.11) points from the brief psychological resilience scale, 66 (34-104) points from the brief symptom inventory, and 11.62 (3.15) points from the Eysenck Personality Inventory (short form). Scores were similar for genders on the COVID-19 opinions scale (*P*>0.05 for all).

Overall, 92 of the 186 students were living with individuals who were defined to be in risk groups. In the perception of COVID-19 scale, the dangerousness subdimension was found to be significantly higher in those living with risk groups (*P*=0.026). In the perception of control of COVID-19 feature, personal control was found to be significantly higher in students who did not live with risk groups (*P*=0.018). In the COVID-19 avoidance attitudes scale, behavioral avoidance was higher among students living with risk groups (*P*=0.016) (Table 1).

Table 1: Summary of participants' COVID-19 opinions scale scores with regard to the presence of individuals at risk in their household

	Live with individuals in risk groups		
	No (n=94)	Yes (n=92)	*P*-value
Perception of COVID-19			
Dangerousness	4.33 (3.67 - 4.67)	4.67 (4 - 5)	0.026
Contagiousness	4 (3.5 - 4.5)	4 (3.75 - 4.5)	0.378
Perception of Causes of COVID-19			
Conspiracy	2.17 (1.5 - 3)	2.67 (1.5 - 3)	0.564
Environment	3 (2 - 3.4)	3 (2.2 - 3.4)	0.736
Faith	2 (1 - 2.67)	1.83 (1 - 2.5)	0.386
Perception of Control of COVID-19			
Macro	2 (1.25 - 2.5)	1.88 (1.5 - 2.5)	0.381
Personal	2.75 (2 - 3.25)	2.5 (1.88 - 3)	0.018
Controllability	3.25 (2.5 - 3.75)	3 (2.5 - 3.5)	0.064
Avoidance Attitudes from COVID-19			
Cognitive	2.2 (1.8 - 3.6)	2 (1.4 - 2.9)	0.093
Behavioral	4 (3.4 - 4.4)	4.2 (3.4 - 5)	0.016
Attitudes Towards the COVID-19 Vaccine			
Positive	4.13 (3.5 - 4.75)	4.38 (3.75 - 4.75)	0.556
Negative	3.9 (3.4 - 4.4)	3.8 (3.4 - 4.2)	0.547

Data are given as median (1st quartile - 3rd quartile) according to normality of distribution

There was no significant difference between students with or without relatives who had suffered from severe COVID-19 in terms of COVID-19 opinions scale scores (*P*>0.05).

A range of demographic factors and personality traits appeared to have significant positive or negative correlations with responses to coping with COVID-19 (Table 2).

Discussion

Our study aimed to explore the association between the perceptions and attitudes of medical school students toward the COVID-19 pandemic and their levels of psychological resilience and personality traits. Initial findings indicated that various demographic factors and personality traits were correlated, either positively or negatively, with responses to coping with COVID-19. The majority of the 186 participating students were female and resided with their families. Gender did not influence scores on the COVID-19 opinions scale. Notably, among the medical students surveyed, anxiety regarding infecting at-risk family members was notably higher compared to anxiety about personal infection.

Our study determined that anxiety and depression were more common in the brief symptom inventory. However, in the Eysenck Personality Inventory (short form), it was seen that the participants mostly scored higher on neuroticism and extraversion. A personality trait is an enduring characteristic of an individual's psychological makeup that influences how they perceive and interact with the world around them, as well as how they are affected by their experiences [18]. Three broad personality traits are believed to have implications for dealing

Table 2: Correlations between age and scale/inventory/questionnaire scores

		P-COVID-19		PCa-COVID-19			PCo-COVID-19			AA-COVID-19		ATV-COVID-19	
		Dangerousness	Contagiousness	Conspiracy	Environment	Faith	Macro	Personal	Controllability	Cognitive	Behavioral	Positive	Negative
Age	r	0.003	-0.120	**-0.330***	0.005	**-0.249***	-0.081	-0.092	-0.049	**-0.163***	-0.037	0.034	-0.024
	P	0.966	0.105	**<0.001**	0.946	**0.001**	0.275	0.215	0.513	**0.027**	0.622	0.645	0.742
BRS	r	-0.021	-0.010	0.050	-0.041	0.032	0.079	0.111	0.087	-0.023	-0.065	-0.031	-0.053
	P	0.774	0.888	0.500	0.578	0.661	0.283	0.132	0.237	0.751	0.375	0.672	0.473
BSI Anxiety	r	0.021	0.036	**-0.173***	0.021	**-0.267***	**-0.235***	**-0.255***	-0.140	-0.072	0.078	-0.042	0.033
	P	0.774	0.629	**0.018**	0.774	**<0.001**	**0.001**	**<0.001**	0.057	0.327	0.293	0.569	0.651
BSI Depression	r	-0.037	-0.061	**-0.156***	0.037	**-0.263***	**-0.270***	**-0.262***	**-0.171***	-0.044	-0.004	-0.061	-0.006
	P	0.619	0.406	**0.034**	0.616	**<0.001**	**<0.001**	**<0.001**	**0.020**	0.550	0.953	0.408	0.937
BSI Negative self-concept	r	-0.094	-0.139	-0.041	0.020	**-0.168***	**-0.205***	-0.134	-0.116	0.018	-0.078	**-0.168***	-0.111
	P	0.201	0.059	0.575	0.789	**0.022**	**0.005**	0.069	0.114	0.805	0.288	**0.022**	0.133
BSI Somatization	r	0.081	-0.043	-0.104	0.041	**-0.269***	**-0.235***	**-0.201***	-0.079	0.007	0.108	-0.037	0.049
	P	0.269	0.564	0.159	0.580	**<0.001**	**0.001**	**0.006**	0.286	0.920	0.142	0.614	0.502
BSI Hostility	r	-0.002	-0.023	-0.100	0.081	**-0.232***	**-0.275***	-0.121	-0.122	-0.060	-0.106	-0.076	-0.078
	P	0.978	0.754	0.173	0.271	**0.001**	**<0.001**	0.100	0.097	0.419	0.150	0.302	0.292
BSI Total	r	-0.020	-0.055	-0.125	0.044	**-0.249***	**-0.256***	**-0.210***	**-0.144***	-0.027	-0.008	-0.086	-0.032
	P	0.788	0.452	0.090	0.549	**0.001**	**<0.001**	**0.004**	**0.049**	0.715	0.914	0.242	0.668
EPQR-A Extraversion	r	0.038	-0.058	0.040	-0.024	0.047	**-0.186***	-0.041	0.030	-0.026	-0.064	0.004	0.079
	P	0.605	0.434	0.589	0.747	0.523	**0.011**	0.577	0.685	0.724	0.385	0.961	0.286
EPQR-A Neuroticism	r	-0.089	**-0.145***	-0.058	0.097	-0.067	-0.139	-0.142	-0.025	0.067	-0.044	-0.070	-0.057
	P	0.228	**0.048**	0.433	0.188	0.366	0.058	0.054	0.734	0.363	0.551	0.344	0.441
EPQR-A Psychoticism	r	-0.014	-0.024	-0.132	-0.046	**-0.283***	**-0.294***	-0.100	0.126	-0.062	0.002	-0.010	0.068
	P	0.851	0.750	0.073	0.531	**<0.001**	**<0.001**	0.174	0.086	0.401	0.977	0.888	0.359
EPQR-A Lie	r	-0.005	**0.148***	0.011	-0.062	0.039	**0.173***	0.138	0.095	-0.103	0.072	0.092	0.021
	P	0.945	**0.044**	0.878	0.399	0.595	**0.018**	0.060	0.196	0.163	0.327	0.211	0.776
EPQR-A Total	r	-0.017	-0.032	-0.044	-0.040	-0.073	**-0.236***	-0.077	0.121	-0.051	-0.015	0.018	0.064
	P	0.816	0.668	0.552	0.584	0.321	**0.001**	0.294	0.101	0.489	0.836	0.805	0.389

r: Spearman correlation coefficient, * Correlation is significant at the 0.05 level (2-tailed). P-COVID-19: perception of COVID-19, PCa-COVID-19: perception of causes of COVID-19, PCo-COVID-19: perception of control of COVID-19, AA-COVID-19: avoidance attitudes from COVID-19, ATV-COVID-19: attitudes towards the COVID-19 vaccine

with COVID-19: extraversion, conscientiousness, and emotional stability. Extraversion, which reflects a person's inclination toward social engagement, was surprisingly associated with a reduced inclination to practice social distancing with others [11]. People with high extraversion are likely to have difficulty adhering to restrictions (particularly social distancing containment measures) aimed at slowing the spread of COVID-19. The high extraversion scores in our study can be attributed to the inclusion of university students who generally have relatively higher socialization characteristics. Conscientiousness, reflecting aspects of self-control and planning, is positively linked with adherence to various regulations such as social distancing, hand hygiene, and stockpiling [11,19]. Finally, low emotional stability (e.g., neuroticism) is associated with stress and anxiety [19,20]. In a multicenter study by Al-Omiri et al. [21], higher neuroticism scores were associated with more adverse changes and effects related to COVID-19. In the aforementioned study, higher extraversion, compatibility, and conscientiousness scores were associated with greater acceptance of COVID-19 containment measures, in addition to less change and impact related to COVID-19. The negative impact and consequences of COVID-19 are very broad, including increased depressive and anxiety symptoms, stress disorders, insomnia, anger and fear, as well as negative consequences on mental health [22,23].

Gender had no impact on the distribution of COVID-19 scale scores in the present study. Gender is influential in coping behaviors and stress reactions [24]. Recent research on COVID-19 has primarily concentrated on the varying behavioral reactions between men and women. Findings have consistently shown that women exhibit higher levels of emotional distress and negative thoughts in response to the pandemic compared to men [25-30]. We could not obtain results compatible with the literature in our study. This can primarily be attributed to the high female proportion in our population, the fact that these women were financially dependent on their families, and the timing of the study (late stages of the pandemic).

In our study, COVID-19 opinions scale scores were similar among students with and without a relative who had a history of severe COVID-19. In the COVID-19 avoidance attitudes scale, behavioral avoidance was found to be significantly higher in students living with at-risk individuals. In the perception of COVID-19 scale, the perception of dangerousness was significantly higher among those living with at-risk individuals, whereas personal control was significantly higher for students who did not live with at-risk individuals. Our findings show that medical students' anxiety levels related to possible infection/or serious illness of their relatives in the risk group were significantly greater compared to their anxiety of being infected themselves. From this point of view, it can be said that students' concerns about COVID-19 are of an altruistic nature; that is, they are more concerned about the survival or well-being of their loved ones than their own health [31]. This type of altruistic anxiety is common in healthcare workers involved in the treatment of patients with COVID-19 [32]. In a study by Chan et al. in Hong Kong, it was reported that many healthcare workers volunteered to stay in hospital facilities instead of going home, thereby forfeiting their rights to interact with the outside world for fear of transmitting the virus to their family members [33].

Limitations

The first limitation of our study is that it was conducted during the relatively later stages of the COVID-19 pandemic, when all health institutions were on maximum alert and health policies had been stabilized. Secondly, our study was cross-sectional and was conducted in a single medical school, and therefore, may not be universal and should not be generalized to dissimilar populations. Thirdly, while anonymous self-reporting is generally considered reliable, enabling individuals to accurately describe both positive and negative aspects of their behavior, our reliance on self-reporting may have introduced participant bias [34]. Finally, since the data is entirely based on online surveys, there is a potential risk of bias. There is a need for multicenter studies with a larger number of participants.

Conclusion

In conclusion, the perception of dangerousness was higher among students living with at-risk individuals. Conversely, the perception of control was significantly higher among students who did not live with at-risk individuals. Behavioral avoidance was notably higher among students living with at-risk individuals. Anxiety and depression emerged as predominant factors. Moreover, higher scores were predominantly observed in the neuroticism and extraversion dimensions in the short form of the Eysenck Personality Inventory. In our study of medical school students, we identified several direct and indirect connections between demographic factors, personality traits, and responses to coping with COVID-19. Notably, certain personality traits were observed to function as both adaptive and maladaptive factors in health-related coping responses. Further research and evaluation, from both clinical and theoretical viewpoints, are warranted to fully understand these findings.

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