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Research Article

Knowledge, attitude and anxiety of medical students about the current COVID-19 outbreak in Turkey

Tıp fakültesi öğrencilerinin Türkiye'deki mevcut COVID-19 salgını hakkında bilgi, tutum ve kaygıları

Crossref

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Abstract

Introduction: The aim of this study was to assess the knowledge, attitude, and behavior of medical students about the COVID-19 and the effect of the outbreak on the students' anxiety levels.

Methods: The cross-sectional study was carried out between 07-14 April, with the online questionnaire forms applied to the medical students. A questionnaire forms were sent to one of every two students in the faculty using the systematic sampling method. A total of 530 volunteers were included in the study. The data was collected through a self-administered questionnaire of the socio-demographic characteristics, opinions about the epidemic, knowledge, and attitude of medical students regarding COVID-19. Anxiety levels of the participants were measured with the State-Trait anxiety inventory.

Results: A total of 530 medical students had a mean score of knowledge and attitude of 7.83±1.27 and 45.18±5.12, respectively. Participants demonstrated good knowledge and a positive attitude towards COVID-19. Clinical period students had a higher level of knowledge (p<0.001) and positive attitude (p=0.025) compared to preclinical students. While the knowledge score was higher in men (p = 0.033), the attitude score was higher in women (p <0.001). There was a negative correlation between attitude scores and state (p=0.003) and trait anxiety scores (p<0.001).

Conclusion: Medical students had sufficient knowledge and attitude towards COVID-19. Anxiety caused by the outbreak may have negative effects on the positive attitudes of the participants.

Keywords: COVID-19, novel coronavirus, SARS-CoV-2, medical student, attitude, knowledge, anxiety

Öz

Giriş: Bu çalışmanın amacı tıp fakültesi öğrencilerinin COVID-19 hakkındaki bilgi, tutum ve davranışlarını ve salgının öğrencilerin kaygı düzeyleri üzerindeki etkisini değerlendirmektir.

Yöntem: Kesitsel araştırma 07-14 Nisan tarihleri arasında, tıp fakültesi öğrencilerine uygulanan online anket formları ile gerçekleştirilmiştir. Fakültedeki her iki öğrenciden birine sistematik örnekleme yöntemi kullanılarak bir anket formu whats-up üzerinden gönderilmiştir. Toplam 530 gönüllü çalışmaya dahil edildi. Katılımcıların sosyodemografik özellikleri, COVID-19 salgını hakkında ki bilgi ve tutumları anket formları ile elde edilmiştir. Katılımcıların kaygı düzeyleri Durumluk-Sürekli kaygı envanteri ile ölçülmüştür.

Bulgular: Çalışmaya dahil edilen 530 tıp öğrencisinin bilgi soruları doğru cevap ortalaması 7.83 ± 1.27, tutum anket puan ortalaması ise 45.18 ± 5.12 idi. Katılımcılar COVID-19'a karşı yeterli bilgi ve olumlu tutuma sahipti. Klinik dönem öğrencilerinin bilgi puanı (p<0.001) ve tutum puanı (p=0.025) preklinik öğrencilerden daha yüksek saptandı. Bilgi puanı erkeklerde daha yüksek iken (p = 0.033), tutum puanı kadınlarda daha yüksekti (p <0.001). Tutum puanları ile durumluk (p = 0.003) ve sürekli kaygı puanları (p <0.001) arasında negatif korelasyon saptandı.

Sonuç: Tıp öğrencileri COVID-19 hakkında yeterli bilgi ve olumlu davranışa sahipti. Salgının neden olduğu kaygı, katılımcıların olumlu tutum sergilemelerini azaltabilir.

Anahtar kelimeler: COVID-19, yeni tip koronavirüs, SARS-CoV-2, tıp fakültesi öğrencisi, tutum, bilgi, kaygı

Introduction

Coronavirus disease 2019 (COVID-19) caused by a novel coronavirus (SARS-CoV-2) first appeared in the Wuhan region of China in December 2019. COVID-19 is highly contagious and has been reported to present with symptoms of fever, cough, fatigue, muscle pain and dyspnea [1]. In addition to the symptoms of the disease respiratory tract infection, serious complications such as acute respiratory distress, septic shock, metabolic acidosis, bleeding and clotting disorder have been reported in 18.5% of patients [2]. The low pathogenicity and high infectious properties of the new coronavirus make it difficult to control infection. Due to this property, the COVID-19 has made an outbreak and has created an important public health problem for the whole world [3].

After the COVID-19 was declared as a pandemic by WHO, isolation preventions taken against the epidemic in many countries caused a break in social life, work and education. The epidemic caused not only the risk of disease and death due to COVID-19 but also adverse psychological conditions [4]. In the past two decades, viral respiratory infection outbreaks like COVID-19 have occasionally occurred around the world. Between 2002-2003, severe acute respiratory syndrome coronavirus (SARS-CoV), H1N1 influenza in 2009, Middle East respiratory syndrome coronavirus (MERS-CoV) outbreaks were identified in 2012. It is possible to find studies in the literature about negative emotions such as anxiety, stress, frustration, depression, fear, anger caused by epidemic diseases in healthcare personnel [5, 6].

Due to the pandemic affecting the whole world, it has been reported that the fear of getting ill, stay in isolation at home, delays in education and graduation may negatively affect the mental health of university students [7]. Outbreaks have been reported to have negative effects on medical education and students just like healthcare workers. In a study conducted by Loh et al., it was reported that lower class students' anxiety rates were higher than senior students affected by SARS were [8].

There is no specific treatment for COVID-19 disease, which causes pandemics worldwide. It has been reported that the most effective way to limit the disease is to prevent the spread and transmission of the virus [9]. In order to prevent the spread of the disease in our country, measures have been taken by the Ministry of Health and it has been emphasized that it is important for all citizens to comply with these measures. It is known that individuals' knowledge, attitudes, and behaviors are important in combating infectious diseases. In the SARS epidemic in 2003, it was reported that the knowledge, attitude, and panic levels of individuals played an important role in the fight against disease [10]. Experience from previous outbreaks has revealed that individuals' knowledge, attitudes, and behaviors are important to control the spread of the virus.

In this context, in current study is aimed to assess the knowledge, attitudes and behaviors of the medical students toward COVID-19 pandemic. Another aim is to investigate the effect of COVID-19 outbreak on students 'anxiety levels and the effect of anxiety on students' knowledge, attitude and behavior.

Methods

The cross-sectional study was carried out among medical students between 07-14 April 2020. The participants were divided into two groups as preclinical and clinical periods. 1st year, 2nd year and 3rd year students are defined as preclinical period, 4th year, 5th year and 6th year students are defined as clinical period. The data collection tools of the study were sent to the participants online and the participants were asked to fill. The first question of the questionnaire was asked whether the participants volunteered to participate in the study. For those who did not volunteer to participate in the study, the questionnaire was terminated and the volunteer participants were directed to complete the questionnaire. The study inclusion criteria were as follows: (i) being over 18 years old and (ii) Being registration in the medical school and continuing education in the 2019-2020 academic year.

Participants

At the time of the study, there were 1144 students enrolled in the faculty. One of two students was included in the study with the systematic sampling method. The 572 medical students were sent questionnaire forms online. A total of 530 students who volunteered to participate in the study and filled in the questionnaire were included in the study (response rate: 92.98%).

Data collection tools

The data was obtained through a self-administered questionnaire. The anxiety levels of the participants were measured with a state-trait anxiety inventory. The self-administered questionnaire form is composed of three parts. The first part included demographic data and opinions of the participants about COVID-19 pandemic.

The second part of the questionnaire included 10 multiple-choice questions prepared to measure the level of knowledge of the participants about COVID-19. The knowledge questions were asked about the cause of the disease, the course of the disease, the ways of prevention, treatment options and risky conditions for the disease. The knowledge questionnaire was evaluated as 1 point for the correct response of the participants and 0 points for the wrong answer. The information questionnaire was evaluated within a range of 0-10 points. The level of knowledge of the respondents who answered seven questions or more correctly, was classified as sufficient and those who answered less than seven questions were classified as insufficient.

In the third part of the questionnaire, the attitudes and behaviors of the participants during the COVID-19 pandemic were questioned with 10 questions. The questions were prepared by considering the 14 rules that should be followed during the COVID-19 pandemic of the Ministry of Health of Turkey to question the attitude characteristics of the participants [11]. The attitude questionnaire has been prepared in a 5-point Likert style. Participants were asked to mark the questions most suitable for them at all, rarely, sometimes, often and always. Participants from each question from the questionnaire scored between 1 and 5 points (none = 1 point, always = 5 points). The lowest score to be taken from the survey

was 10 and the highest score was 50 points. The high score from the attitude questions was interpreted as the participants' high positive attitude towards COVID-19.

Anxiety states of the participants were measured with Spielberger's State-Trait anxiety inventory (STAI) which is developed by Speilberger and Gorsuch in 1964. STAI inventory aimed to measure the levels of state and trait anxiety in normal and abnormal individuals. Its validity in Turkish society was demonstrated by Necla Oner and it has been translated into Turkish [12]. STAI measures state and trait anxiety levels. It has two separate scales consisting of twenty items. STAI is an easy-to-apply inventory that the individual can answer on his own. Both scales can be applied at the same time. When the inventory is applied individually to illiterate individuals, the practitioner reads the items, and marks the answers given on the form. It can be applied to patients who are conscious at the age of fourteen and above. The answer options collected in four classes on the state anxiety scale are (1) None, (2) A little, (3) Many and (4) Completely; The options in the Trait Anxiety Scale are (1) Almost never, (2) Sometimes, (3) Much time, and (4) Almost always. The scores obtained from both scales theoretically range from 20 to 80. Big score means high anxiety level, small score means low anxiety level. Reliability coefficients determined by the alpha correlations of the scale; 0.83 to 0.87 for "Trait Anxiety Scale", for the "State Anxiety Scale", it was reported between 0.94 and 0.96.

Ethical approval

The study was approved by the Firat University Non-Interventional Ethics Committee with decision numbers 2020/07-03. The first question of the questionnaire was asked whether the participants volunteered to participate in the study. Participants were able to fill out questionnaire that answered yes to the volunteer question.

Statistical analysis

Statistical analysis of the data was performed by IBM SPSS 22 statistics package program. Kolmogorov-Smirnov test was used to determine whether the data showed normal distribution. Descriptive statistics of the data were expressed as mean ± standard deviation for variables with normal distribution in continuous data, (median (minimum: maximum)) for non-normal distribution variables, and frequency for categorical variables as numbers and percentages (n (%)). In comparison of two independent groups, Student t test was used for normal distributed continuous data, Mann-Whitney U test for non-normal distributed continuous data. In comparison of more than two independent groups, One-Way ANOVA and LSD test for post-Hoc test were used for normal distributed continuous data, Kruskal Wallis test and Dunn test for post-Hoc test for non-normal distributed continuous data. Pearson chi-square test was used to analyze categorical data. Spearman's correlation coefficient was used to evaluate the association between anxiety score and knowledge, attitude scores. Significance level was $\alpha = 0.05$. Statistically significant significance values are indicated in bold in the tables.

Results

A total of 530 medical students responded to the questionnaire giving the response rate of 92.98%. Of the study population, 58.30% (n = 309) of the participants were female and 41.70% (n = 221) were male. 52.3% (n = 277) of the participants were preclinical students, 47.7% (n = 253) were clinical students. While 60.95% of the participants thought that they had enough information about COVID-19, 91.32% reported that they followed the data related to the pandemic daily. The demographic and COVID-19 characteristics and thoughts of the participants are presented in Table 1.

The correct answer means of the 10 questions on the COVID-19 knowledge questionnaire were 7.83±1.27. The most correctly answered question in the study was "What is the cause of COVID-19 disease?" the least correctly answered question was, "How does COVID-19 usually progress in humans?". The students of the clinical period compared to the students in the preclinical period regarding the factors of the disease (p = 0.019), the course of the disease in humans (p <0.001), the first-line treatment of the disease (p <0.001) and whether there is a suitable vaccine to prevent disease (p = 0.002) gave a higher rate of correct answers. Preclinical students responded to the question of the most effective method in preventing COVID-19 disease at a higher rate than the clinical term students prevent (p = 0.027). The clinical period students had a higher level of knowledge than the preclinical period students did (p <0.001). The comparison of the correct response rates given by the participants to the information questions is presented in Table 2.

The average attitude questionnaire score of the participants was 45.18 ± 5.12 (min: 10 - max: 50 score). It was determined that the participants showed a positive attitude towards COVID-19 pandemic. Hand washing was the rule that the participants showed the most positive attitude. It was the rules that the participants had difficulties in showing positive attitude in the order of "I avoid touching my eyes, mouth, and nose with my hands", "I consume plenty of fluids, I pay attention to my sleep pattern" and "I clean the door handles, faucet every day". The trait anxiety inventory score of the participants was 42.49 ± 7.64 and the state anxiety inventory score was 43.54 ± 10.31. (Table 3)

The knowledge score of the males (p = 0.033) and the clinical period students (p <0.001) were higher. In the attitude score comparison, the mean scores of women (p <0.001) and clinical period students (p = 0.025) were higher. The attitude score averages of those who answered yes to the question of "Can you take sufficient preventions against COVID-19?" were higher (p <0.001). Comparison of some variables of participants with knowledge and attitude questionnaire scores are presented in Table 4.

Both trait (p = 0.002) and state anxiety (p <0.001) scores were higher in female. Participants who thought that COVID-19 affected their psychological lives mostly had higher trait (p = 0.027) and state anxiety (p <0.001) scores. Trait (p <0.001) and state anxiety (p = 0.005) scores of the participants who thought they had sufficient information about COVID-19 were lower. Trait anxiety scores were lower in those who answered no to the question of "Are there people at risk for COVID-19 you live with?" (p = 0.026). Both continuous (p = 0.001) and state anxiety (p <0.001) scores were lower in the participants who answered yes to the question of "Can you take sufficient preventions against COVID-19?". (Table 5)

Table 1. Demographic data and outcome of the study

Variables	n	%
Gender		
Female	309	58.30
Male	221	41.70
Level of education		
Preclinical period	277	52.26
Clinical period	253	47.74
Which situation do you think COVID-19 mostly affects?		
Education	51	9.62
Social life	176	33.21
Psychological life	123	23.21
Economy	180	33.96
Do you have enough information about COVID-19?		
Yes	323	60.95
No	27	5.09
Undecided	180	33.96
Do you follow the COVID-19 incident / death rates in our country daily?		
Yes	484	91.32
No	6	1.13
Sometimes	40	7.55
Are there any individuals at risk for COVID-19 you live with?		
Yes	238	44.91
No	252	47.54
I don't know	40	7.55
Do you have a chronic illness?		
Yes	32	6.04
No	498	93.96
Can you take sufficient preventions against COVID-19?		
Yes	373	70.38
No	22	4.16
I don't sure	135	25.46
Are you worried about getting COVID 19?		
Yes	316	59.62
No	115	21.69
Undecided	99	18.69
Are you worried one of your family members may get COVID-19?		
Yes	503	94.91
No	15	2.83
Undecided	12	2.26
Source of COVID-19 information (yes) (n=1307)*		
Website of the Ministry of Health	350	66.04
Clinical guidelines	104	19.62
Media (discussion programs)	383	72.26
Social media	354	66.79
Scientific articles	116	21.29
* More than one answer was given		

Table 2. Knowledge of medical students about COVID-19

Knowledge questions	Preclinical period Correct answer n (%)*	Clinical period Correct answer n (%)*	p value**
What is the cause of COVID-19?	276 (99.98)	253 (100.00)	p=0.477
What is the name of the cause of COVID-19?	211 (76.17)	212 (83.79)	*p=0.019*
What is the most common transmission route of COVID-19?	176 (63.54)	169 (66.79)	p=0.244
How long is the incubation period of COVID-19?	246 (88.81)	232 (91.69)	p=0.166
How does COVID-19 usually progress in humans?	56 (20.21)	119 (47.04)	*P<0.001*
What is the most common symptom of COVID-19?	166 (59.92)	165 (65.22)	p=0.122
What is the primary treatment of COVID-19?	200 (72.20)	236 (93.28)	*P<0.001*
Is there a suitable vaccine to protect COVID-19?	247 (89.17)	243 (96.05)	*p=0.002*
What is the most effective method of preventing COVID-19?	227 (81.94)	189 (74.70)	*p=0.027*
Which age groups are riskier toward COVID-19?	277 (100.00)	253 (100.00)	p=0.477
Knowledge level* ((mean±sd = 7.83±1.27)**	7.51±1.31	8.18±1.13	
Insufficient level of knowledge	59 (21.29)	15 (5.93)	*p<0.001*
Sufficient level of knowledge	218 (78.71)	238 (94.07)	
* Column percentages ** Chi-square test. *** Knowledge questions correct answer average 7.83±1.27. Insufficient level of knowledge <7 correct answer. sufficient level of knowledge ≥7 correct answer			

Table 3. Attitude of medical students toward COVID-19

Features	None	Rarely	Sometimes	Frequently	Always
I wash my hands with water and soap for at least 20 seconds	0 (0.00)	5(0.94)	27(5.09)	297(56.04)	201(37.92)
Search with people put 3-4 steps distance	1(0.18)	13(2.45)	46(8.67)	230(43.39)	239(45.09)
During coughing-sneezing. I use tissue or elbow inside	7(1.32)	3(0.56)	28(5.28)	153(28.86)	339(63.96)
I avoid touching my eyes. my mouth and my nose with my hands	6(1.13)	39(7.36)	191(36.04)	221(41.69)	73(13.77)
I often ventilate my environment	0(0.00)	3(0.57)	62(11.69)	260(49.06)	205(38.67)
I wash my clothes at 60-90 °C	15(2.83)	21(3.96)	108(20.37)	214(40.38)	172(32.45)
Door handles. I clean luminaires every day	10(1.88)	44(8.30)	162(30.56)	203(38.30)	111(20.94)
Old people. I avoid contact with people with chronic disease. I do not go out without a mask	13(2.45)	28(5.28)	65(12.26)	186(35.09)	238(44.91)
I do not share personal items such as towels	18(3.39)	32(6.04)	82(15.47)	147(27.74)	251(47.35)
I drink plenty of fluids. I pay attention to my sleep patterns	16(3.01)	71(13.39)	140(26.42)	184(34.72)	119(22.45)
Attitude and Anxiety scores	**(mean±sd)**				
Attitude questionnaire	45.18±5.12				
Trait anxiety inventory	42.49±7.64				
State scale inventory	43.54±10.31				

Table 4. Comparison of some variables of the participants with the scores of the knowledge survey and attitude survey

Variables	Knowledge score	p* value	Attitude score	p* value	p** value
Gender					
Female (n= 309)	7.73±1.28	t=2.14	45.81±5.02	t=4.41	
Male (n=221)	7.97±1.24	*p= 0.033*	43.81±5.37	*p< 0.001*	
Education level					
Preclinical period (n=277)	7.52±1.31	t=6.16	44.48±5.28	t=2.25	
Clinical period (n=253)	8.18±1.13	*p=<0.001*	45.51±5.22	*p=0.025*	
Which situation do you think COVID-19 mostly affects?					
Education (n=51)	7.67±1.37		44.96±4.39		
social life (n=176)	7.74±1.19	F=1.39	44.80±5.09	F=0.38	
psychological life (n=123)	7.82±1.37	p=0.242	45.42±6.01	p=0.767	
Economy (n=180)	7.98±1.23		44.86±5.11		
Do you have enough information about COVID-19?					
Yes (n=323)	7.88±1.29		45.63±5.08[1]		1-2:0.078
No (n=27)	7.70±1.20	F=0.56	44.10±5.35[2]	F=7.07	1-3: *0.002*
Undecided (n=180)	7.77±1.24	p=0.572	43.01±5.54[3]	*p=0.001*	2-3:0.099
Do you follow the COVID-19 incident / mortality rates in Turkey?					
Yes (n=484)	7.85±0.57		45.12±5.28		
No (n=6)	7.50±0.84	F=0.82	45.01±3.16	F=2.35	
Sometimes (n=40)	7.62±1.53	p=0.442	43.25±3.01	p=0.097	
Are there any individuals at risk for COVID-19 you live with?					
Yes (n=238)	7.91±1.21		45.13±5.01		
No (n=252)	7.80±1.31	F=1.58	44.83±5.50	F=0.21	
I don't know (n=40)	7.55±1.35	p=0.207	44.97±5.54	p=0.815	
Do you have a chronic illness?					
Yes (n=32)	8.00±1.16	t=0.76	44.43±4.85	t=0.59	
No (n=498)	7.82±1.27	p= 0.446	45.01±5.28	p= 0.550	
Can you take sufficient preventions against COVID-19?					
Yes (n=373)	7.89±1.27		45.94±4.99[1]		1-2:*<0.001*
No (n=22)	7.27±1.48	F=2.63	40.23±7.07[2]	F=26.57	1-3:*<0.001*
Undecided (n=135)	7.83±1.27	p=0.073	43.07±4.72[3]	*P<0.001*	2-3:0.043
Would you like to work during the COVID-19 outbreak?					
Yes (n=271)	7.84±1.26		45.09±5.11		
No (n=76)	7.88±1.08	F=0.13	44.75±5.78	F=0.17	
Undecided (n=183)	7.79±1.35	p=0.872	44.89±5.28	p=0.845	
t: Student t test. F: Anova test. * Multiple comparison p value. ** binary comparison p value					

Table 5. Comparison of some features of the participants with State and Trait anxiety scale scores

Variables	Trait anxiety	p* value	p** value	State anxiety	p* value	p** value
Gender						
Female (n= 309)	43.00 (24-73)	Z=3.14		43.00 (20-76)	Z=4.65	
Male (n=221)	41.00 (21-73)	*p=0.002*		40.00 (20-75)	*p<0.001*	
Education level						
Preclinical period (n=277)	42.00 (24-73)	Z=0.83		43.00 (20-76)	Z=0.14	
Clinic period (n=253)	42.00 (21-63)	p=0.406		41.00 (20-68)	p=0.909	
Which situation do you think COVID-19 mostly affects?						
Education (n=51)	43.00 (28-55)[1]			43.00 (27-75)[1]		
social life (n=176)	42.00 (25-73)[2]	KW=9.20	3-2:*<0.001*	42.00 (20-74)[2]	KW=26.21	3-2:*0.001*
psychological life (n=123)	44.00 (21-63)[3]	*p=0.027*	3-4:*<0.001*	46.00 (20-68)[3]	*p<0.001*	*3-4:<0.001*
Economy (n=180)	41.00 (24-61)[4]			40.00 (20-76)[4]		
Do you have enough information about COVID-19?						
Yes (n=323)	41.00 (21-73)[1]		1-2:1.00	41.00 (20-75)[1]		1-2:1.00
No (n=27)	42.00 (29-53)[2]	KW=22.69	1-3:*0.011*	39.00 (27-56)[2]	KW=10.42	1-3:*0.001*
Undecided (n=180)	44.00 (25-63)[3]	*p=0.011*	2-3:0.359	44.00 (20-76)[3]	*p=0.005*	2-3:0.417
Do you follow the COVID-19 incident / mortality rates in Turkey?						
Yes (n=484)	42.00 (21-73)			42.00 (20-76)		
No (n=6)	48.00 (29-58)	KW=1.89		43.00 (32-52)	KW=0.47	
Sometimes (n=40)	43.00 (31-58)	p=0.387		43.00 (23-57)	p=0.790	
Are there any individuals at risk for COVID-19 you live with?						
Yes (n=238)	42.00 (21-63)			43.00 (20-76)[1]		1-2:0.078
No (n=252)	42.00 (24-73)	KW=1.23		41.00 (20-74)[2]	KW=7.29	1-3:*0.045*
I don't know (n=40)	43.00 (28-73)	p=0.541		49.00 (27-71)[3]	*p=0.026*	2-3:*0.011*
Do you have a chronic illness?						
Yes (n=32)	44.00 (31-73)	Z=1.85		44.00 (33-76)	Z=1.04	
No (n=498)	42.00 (21-73)	p=0.064		42.00 (20-75)	p=0.301	
Can you take sufficient preventions against COVID-19?						
Yes (n=373)	42.00 (21-73)[1]		1-2:0.138	40.00 (20-76)[1]		1-2:1.00
No (n=22)	44.00 (24-58)[2]	KW=13.77	1-3:*0.001*	44.00 (25-64)[2]	KW=30.67	1-3:*<0.001*
Undecided (n=135)	44.00 (30-73)[3]	*p=0.001*	2-3:1.00	46.00 (25-75)[3]	*P<0.001*	2-3:0.497
Would you like to work during the COVID-19 outbreak?						
Yes (n=271)	42.00 (21-59)			41.00 (20-76)		
No (n=76)	43.00 (25-59)	KW=1.12		42.00 (20-59)	KW=1.63	
Undecided (n=183)	42.00 (24-73)	p=0.572		43.00 (20-74)	P=0.442	
Z: Mann- Whitney U test. KW: Kruskall Wallis test. * Multiple comparison p value. ** binary comparison p value						

There was a negative correlation between the state anxiety score and the attitude score of the participants (r=-0.2, p = 0.003). Similarly, a negative correlation was found between the participants' trait anxiety score and attitude score (r=-0.45, p <0.001). A positive and significant correlation was found between trait anxiety and state anxiety scores (r=0.71, p <0.001). (Table 6)

Table 6. Correlation between participants' attitude and knowledge scores between state and trait anxiety scores.

Variables	State anxiety	Variables	Trait anxiety
Attitude score	r=-0.21 p**0.003**	Attitude score	r=-0.45 p**<0.001**
Trait anxiety	r=0.71 p**<0.001**	State anxiety	r=0.71 p**<0.001**
Knowledge score	r=-0.04 p=0.292	Knowledge score	r=-0.07 p=0.147
r<0.2: no correlation. r: 0.2-0.4: weak correlation. r: 0.4-0.6: A moderate correlation r: 0.6-0.8: A strong correlation. r> 0.8: A perfect correlation			

Discussion

The awareness and knowledge levels of individuals are important in order to prevent pandemic outbreaks in the world before [13]. In this context, we aimed to investigate the knowledge, attitudes and behaviors of medical students against the new coronavirus pandemic and to investigate the effect of the epidemic on students' anxiety levels. In our study, the average of correct answers of the participants in the information questionnaire consisting of 10 questions was found as 78.3%. Taghrir et al. In their study among Iranian medical faculty students reported that average of correct answers of the participants was 86.9% [14]. In the study conducted by Modi et al in Mumbai among health workers and students, the questionnaire questions reported the correct response rates as 53.6% and 74.1% [15]. According to the literature data, it was thought that our participants' level of knowledge about the COVID-19 outbreak was sufficient. In our study, it was determined that the knowledge levels of the clinical period students were higher than the preclinical period students. A study conducted among healthcare professionals dealing with the MERS epidemic in Saudi Arabia, it was reported that level of knowledge increased as the year spent in the profession increased [16]. Literature data were similar to the findings we obtained. The data we obtained were considered an expected finding, given that the years of clinical students were high in the faculty, that they had more contact with patients in internships, and that they had experience working in risky and patient-contacted environments such as emergency and intensive care units.

In our study, the attitudes of the participants towards COVID-19 were questioned with 10 questions and questionnaire with the highest 50 points. The average attitude questionnaire score of the participants was 45.18 points and it was determined that the participants showed a positive attitude towards the epidemic. Hung et al. reported that the participants showed a sufficient positive attitude towards COVID-19 in their study among healthcare professionals. [17]. Another study conducted among nurses in Iran, it was reported that the awareness and positive attitude levels of the participants were high towards COVID-19 [18]. Our findings were supported by similar studies in the literature, and positive attitude levels of medical students against the epidemic were found sufficient. COVID-19 reported the first cases in Turkey since March 11, 2020 to protect them from disease Ministry of Health has drawn attention to the importance of personal hygiene and social isolation. Reducing the spread of the outbreak and the Republic of Turkey Ministry of Health has proposed 14 rules to follow to all individuals and all citizens to be protected from diseases and public spotlight has talked about the importance of complying with these rules. The high attitude scores of the participants suggested that the rules proposed by the Turkish Ministry of Health were followed.

Due to the importance of individuals' knowledge and positive attitudes towards the epidemic, factors affecting the knowledge and attitudes of individuals also gain importance against the struggle of the pandemic. In this context, when we examine the factors that affect the level of knowledge of the participants, it was found that the level of knowledge was higher in clinical period students and male. In two separate studies conducted among medical students after the Middle East Respiratory Syndrome Coronavirus (Mers-cov) outbreak, it was reported that the knowledge level of the students increased as the year spent at school increased [19,20]. Similar results were obtained with literature data. In a study conducted by medical students in Taghrir et al Iran, it was reported that there was no statistical difference between the knowledge levels of the internship and intern students' COVID-19 knowledge [14]. In our study, it was thought that the internship and intern students constituting the clinical term students caused us to obtain a different result from the studies of Taghrir et al. In their study, Elrgga et al reported that the medical students' knowledge about the MERS-cov epidemic was higher than that of the dentistry students, which may have been due to the fact that medical students were more likely to have clinical rotation and contact with the public [19]. In this context, we believe that the high level of knowledge of clinical term students with more clinical rotation, seminar and disease experience is an expected finding. Another finding of the study was that the level of knowledge in men was higher than in women. In the literature, it was reported that there was no statistical relationship between gender and knowledge level in four separate studies on COVID-19 pandemics [14-17]. In the literature, in two separate studies on MERS-cov epidemic and Covid-19 epidemic, it was reported that the knowledge level was higher in women [20, 21]. The findings and literature data were found to be contradictory. When the findings and literature data we examined were examined, the relationship between gender and knowledge level could not be clarified. It is thought that larger population studies are needed to enlighten the level of gender and knowledge. In the study, it was found that the attitude scores were higher in women, in clinical term students; in those who thought that, they had sufficient knowledge about COVID-19 and who thought that they took adequate measures for COVID-19. It has been reported in literature that positive attitudes increase as the level of knowledge increases [15-17]. In this context, it is an expected finding that the students with high level of knowledge are expected to have high attitude scores, and are similar to the literature. Contrary to the data that the positive attitude increased in the literature as the level of knowledge increased, an unexpected finding in our study was that the attitude scores of women with low knowledge level were higher than men. In the literature, it has been reported that there is no relationship between gender and attitude in general [14, 15, 17, 22, 23]. The relationship between literature data and gender COVID-19 outbreak knowledge and attitude scores could not be elucidated in our study. We believe that further studies are needed to clarify the effect of gender on both knowledge and attitude. In our study, it was found that those who thought that they took adequate measures against COVID-19 and who thought they had enough information were found to have higher attitude scores. Taghrir et al reported that individuals' perceptions of risk and their thoughts about the outbreak are related to their attitude towards the outbreak. It has been reported that individuals who consider themselves more risky take better protective measures [14]. In our study, the attitudes of the participants may be the reason for the high attitude scores of the participants who think that they comply with the rules, since the attitudes of the participants were prepared by considering the 14 rules proposed by the Ministry of Health and that they were able to evaluate whether the participants complied with the rules.

It is usual for outbreaks to cause anxiety and fear in society. Anxiety and fear caused by outbreaks can make it difficult for individuals to combat the outbreak. Identifying and responding to anxiety-related factors can reduce anxiety levels of individuals and contribute to combating the epidemic [24]. In this context, the anxiety levels of the participants were examined in our study. Both persistent and state anxiety scores were higher in women. In the literature, anxiety levels were reported to be higher in women in two separate studies in which participants' anxiety levels were evaluated during the epidemic [25, 26]. In two different studies conducted with the COVID-19 outbreak, it was reported that gender was not associated with anxiety levels [18, 27]. The findings we obtained were supported by literature data. The relationship between gender and anxiety

is contradictory in the literature, but according to the data we obtained, it was thought that women have higher anxiety levels and therefore women may be affected by more epidemic than men may. In order to prevent the negative effects of the epidemic on individuals, it may be important to identify modifiable factors that can reduce anxiety. In our study, "Anxiety levels were found to be high in those who think that they have sufficient information about COVID-19 and take adequate precautions, while those who say they are undecided about the question of whether there is a risky person among the family members with whom they live together. The data we obtained suggested that the opinions and risk situations of the participants about the epidemic affected their anxiety levels.

It may be an expected result that healthcare professionals who are at higher risk during the epidemic are more concerned about the risk of becoming infected and transmitting the infection to their family members. In their study, Mishre et al reported that participants 'and their families' fear of being infected increased anxiety, while their awareness and positive attitudes towards the epidemic decreased anxiety [26]. Stay away from their families the opportunity to fight with the secretory process in which health professionals task during the outbreak in Turkey is provided. This practice can contribute to reducing the levels of anxiety that may occur due to the fear of infecting healthcare workers' families.

Anxiety that may occur during the outbreak may affect individuals' attitudes towards the epidemic negatively. Roy et al reported that panic and anxiety caused by epidemic caused behaviors such as unnecessary food stocks and non-compliance with individuals [28]. Mishra et al reported that individuals with low anxiety levels display more positive attitudes and awareness towards pandemics [26]. In our study, it was found that as both anxiety and state anxiety increased, attitude scores decreased. The data we obtained were similar to the literature data. The literature and the data we obtained have suggested that reducing the anxiety caused by the epidemic is important in combating the epidemic.

Limitations

Since the COVID-19 pandemic was seen for the first time in the world and in our country, and the minority of studies related to this pandemic, the data obtained had to compare with the studies conducted with other pandemics. Since the data we have obtained was done in a single-center, it may not be reflected to the general population. Since the data obtained in the study reflect the opinions of the participants, standardization of the data may not be provided.

Conclusion

Medical students had sufficient knowledge level and positive attitude towards the COVID-19 outbreak caused by the new coronavirus type (MERS-COV-2). It was determined that the knowledge and attitude levels of the clinical period students were higher than the preclinical period students. Anxiety caused by the outbreak may have negative effects on the positive attitudes of the participants. It was found that anxiety levels of individuals who thought that they could not take sufficient prevention against the epidemic increased. In the struggle against the COVID-19, in addition to the suggestions that will increase individuals' knowledge and positive attitude behaviors, prevention should be taken to reduce anxiety caused by the outbreak

Conflict of interest: The authors have no conflict of interest in this study.

Author Contributions		Author Initials
SCD	Study Conception and Design	BY, TOK, EP, EO, YHE
AD	Acquisition of Data	BY, TOK, EO
AID	Analysis and Interpretation of Data	BY, EP
DM	Drafting of Manuscript	BY, TOK, EO, YHE
CR	Critical Revision	BY, EP, YHE

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