Determining the COVID-19 Knowledge, Awareness and Anxiety Levels of Intern Dentists

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ABSTRACT

Introduction: COVID-19 is a contagious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The nature of dentistry leads to close contact with patients and exposure to the saliva, blood and other bodily fluids during treatment processes and it is a field where high frequency devices that can make it easier for virus contamination are used. This study aims to determine the knowledge and approaches of COVID-19 infection control of intern dentists who have begun face-to-face education and their COVID-19 related fear and anxiety levels.

Methods: The study comprised 4th and 5th year students who began face-to-face education at the Ankara University Faculty of Dentistry 2020/2021 spring semester. A questionnaire was used as the data collection tool of this study. The data were collected using a knowledge questionnaire and a COVID-19 fear and anxiety scale.

Results: The average COVID-19 knowledge score of the students was 63.65±9.64, their coronavirus fear average score was 17.63±5.57, and their anxiety average score was found to be 2.37±3.32. A positive relationship was found between the anxiety scores and the COVID-19 fear scores. The results of this study show that the COVID-19 knowledge level and fear of dentistry students is moderate and that their COVID-19 anxiety level is low.

Conclusion: It was found that the knowledge and fear of coronavirus levels of intern dentistry students were moderate, and that their coronavirus anxiety level was low.

Keywords: Dentistry, employee safety, pandemic, students.

Introduction

COVID-19 is a contagious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The World Health Organization (WHO) declared the new coronavirus (COVID-19) to be a global pandemic on the 11th of March 2020 (WHO, 2020). It has been reported that the COVID-19 outbreak has caused a public health emergency around the world, with large numbers of healthcare workers contracting the disease while working with infected people.[1] The nature of dentistry leads to close contact with patients and exposure to the saliva, blood and other bodily fluids during treatment processes and it is a field where high frequency devices that can make it easier for virus contamination are used.[2,3]

Therefore, dentistry is known to be one of the highest COVID-19 risk occupational groups.[4] The Centers for Disease Control and Prevention, WHO and Ministry of Health have developed various guidelines to prevent the spread of COVID-19 in the practice of dentistry and to ensure a safe working environment. In this context, it is recommended that the transmission routes of

infection control are determined and the levels of knowledge and awareness of personnel working in this field are evaluated.[5]

Dentistry applications also include education as well as providing health services.[6] Education in dentistry faculties generally consists of the three stages of theoretical courses, preclinical and clinical applications.[7] In order to prevent the spread of the virus at the beginning of the pandemic period, measures were taken in many countries, including Turkey, such as postponing all treatments except for cases requiring urgent intervention and continuing dentistry education online.[8,9] It is stated that these measures have negatively affected the development of motor functions, independent decision making and work experience skills taught to students through clinical applications.[10] It is also said that the uncertainty in the education period during the pandemic has had various psychological effects on students.[11,12] The world returned to face-to-face education when the vaccine begun to be used in the struggle against the pandemic. Intern students of the Faculty of Medicine and Faculty of Dentistry were given priority for vaccinations on 14 January 2021 by the Ministry of Health. In line with the recommendations of the Council of Higher Education and the Ministry of Health in Turkey, 4th and 5th grade dentistry students who conduct clinical practices have been vaccinated and have returned to faculties.[10] During this time, information was posted about the pandemic on the website of the Ankara University Faculty of Dentistry. Additionally, seminars that were open to all students were carried out (http://www.dentistry.ankara.edu.tr). In the national and international literature, many studies have been carried out to determine the knowledge, attitudes and awareness of dentistry students or the levels of stress, fear, anxiety and worry of students during the pandemic.[13-16] However, no studies have been conducted after the transition to face-to-face education. In this study, it was aimed to determine the knowledge and attitudes of intern dentists who started face-to-face training towards the control of COVID-19 infections and to determine their fear and anxiety levels due to COVID-19.

Methods

The study comprised 4th and 5th year students who began face-to-face education at the Ankara University Faculty of Dentistry 2020/2021 spring semester. In this regard, the population of this study consisted of a total of 363 students, of whom 193 were 4th year and 170 were 5th year students. A sample size was not selected and the plan was to reach the whole of the population. The research group consisted of 213 students who volunteered. Therefore, 59% of the study population was reached. Ethical board approval from the Ankara University Faculty of Dentistry was obtained (Issue:36290600/38 No:09/02 Date:28.04.2021). Additional approval was obtained from the Ministry of Health for this study.

A questionnaire was used as the data collection tool of this study. The questionnaires were sent to the participants in May/June 2021 online via WhatsApp classroom groups and email. The questionnaires were prepared on google platforms. The questionnaire consisted of 3 sections. In the first section, there were 10 questions aimed at determining the descriptive characteristics of the participants (age, gender, class, who they lived with, the status of having COVID-19), their education about COVID-19, their perception of the disease, and their sources of information about COVID-19. In the second section, there were 22 questions aimed at evaluating their general knowledge regarding how COVID-19 spreads, its signs and symptoms, preventions and precautions. The questions were prepared by the researchers once the related literature and national/international guides were examined.[5,17-19] The third section of the questionnaire included the Fear of COVID-19 Scale comprised of 7 questions and the COVID-19 Anxiety Scale consisting of 5 questions. The Fear of COVID-19 Scale was developed by Ahorsu et al. to measure the fear levels of individuals during the COVID-19 pandemic.[20] The scale was adapted into Turkish by Haktanir et.al. It is a 5-point Likert scale ranging

from 1 (strongly disagree) to 5 (strongly agree).[21] The minimum score of the scale is 7 and the maximum is 35. The scale is one dimensional and is comprised of 7 items, there are no items that are reverse scored and increased score indicate increased fear of coronavirus. The COVID-19 Anxiety Scale was developed by Lee to measure the anxiety levels of individuals during the pandemic (α=.93).[22] The scale was adapted into Turkish by Evren et al.[23] The research group was asked to answer 5 questions as "Never", "Rarely, "less than one or two days", "A few days", "More than 7 days" and "Almost every day in the last 2 weeks" according to their practices in the previous two weeks. The minimum score for each question is 0 and the maximum is 4. The total score ranges from 0 to 20 and higher scores show that the individual has higher anxiety related to coronavirus. A total score of $\geq$ 7 on the scale indicates dysfunctional thinking associated with coronavirus. High scores on a particular item or high overall scale score ($\geq$ 7) indicate that the individual has problematic symptoms that may require further evaluation and/or treatment.

Confirmatory factor analysis (CFA) was conducted to evaluate the validity of the fear and anxiety scales used in the research for the research group. AMOS 24 statistical software was used for the CFA analysis. The Cronbach's alpha and composite reliability coefficients were used to evaluate consistency.[24]

The total knowledge score was determined by giving a 1 score for the "true" and a score of 0 (zero) score to the "false" and "I don't know" answers. The students' COVID-19 test success level was evaluated on a 0-100 scale. The Bloom's cut-off point was used to categorize the coronavirus knowledge scores. If the knowledge level was above 80% it was considered to be good score, a score between 50-79% it was taken as moderate and below 50% was taken as poor.

Within the scope of the research, descriptive findings are given as frequency, percentage, minimum, maximum, mean and standard deviation. Independent variables that were found

to be statistically significant were analyzed with the multi variable regression analysis. The existence of a multicollinearity problem in the model was evaluated with VIF and tolerance values.[25-26] SPSS 26 statistical software was used to conduct the analysis.

As a result of the confirmatory factor analysis (CFA) conducted in order to evaluate the structural validity of the COVID-19 fear and anxiety scales on the study group, it is found that the values are above the good fit value limits (X^2/sd: 2.34; 0.32, GFI: 0.986; 0.997, NFI: 0.977; 0.995, SRMR: 0.071;0.038, AGFI: 0.972, 0.992).

The Cronbach's alfa coefficient was found to be 0.874, and the composite reliability coefficient was found as 0.878 in the reliability analysis of the fear scale based on which the structural validity was accepted. The Cronbach's alpha coefficient of the anxiety scale was 0.859, and the composite reliability coefficient was 0.866.

Results

The average age of the students in the study group was 22.56 (±1.41) and that 72.8% of them were female. 65.3% of the students were 4th year and 34.7% were 5th year students. When their COVID-19 characteristics were evaluated, 54.9% stated that they had attended lessons or meetings related to COVID-19. 19.2% of the patients had been infected with COVID-19. Additionally, while 49.8% of the students thought that the COVID-19 precautions taken in the workplace were sufficient, 12.2% stated that they were insufficient. The mean score of the students' COVID-19 knowledge level was calculated as 3.73 (±0.86), and the mean of the statement "COVID-19 is a serious disease" was calculated as 4.25 (±0.86).

The COVID-19 knowledge test mean score of the students was found to be 63.65 (±9.64). Lastly, it was found that the students obtained a mean score of 2.37 (±3.32) from the coronavirus anxiety scale and a mean score of 17.63 (±5.57) from the fear of coronavirus scale (Table 1). Accordingly, it can be said that the knowledge and fear of coronavirus levels of intern dentistry students were moderate, and that their coronavirus anxiety level was low.

Table 1. Sociodemographic characteristics and information about COVID-19

Sociodemographic characteristics and information about COVID-19		**n**	**%**
Gender			
	Female	155	72.8
	Male	58	27.2
Living conditions			
	With Family	131	61.5
	With Friends	57	26.8
	Alone	25	11.7
Class			
	4th year	139	65.3
	5th year	74	34.7
Meetings or courses related to COVID-19			
	Participated	117	54.9
	Did not participate	96	45.1
Infected with COVID-19			
	Yes	41	19.2
	No	172	80.8
The COVID-19 precautions taken in the work environment			
	Sufficient	106	49.8
	Not Sufficient	26	12.2
	Indecisive	81	38.0

Attitudes Towards COVID-19, Level of Knowledge, Level of Anxiety and Fear	**Min-Max**	**Avg.**	**(±Ss.)**
Give a value from 1 to 5 for your knowledge on Covid-19.	1-5	3.73	0.73
Give a value from 1 to 5 for the statement "COVID-19 is a serious disease".	1-5	4.25	0.86
Coronavirus Knowledge Level Score (0–100-point scale)	18.18-86.36	63.65	9.64
Coronavirus Anxiety Level	0,0-20.00	2.37	3.32
Coronavirus Fear Level	7.0-35.00	17.63	5.57

When the basic information resources that the research group followed during the pandemic are examined, it is found that the most common one was social media platforms (74.65%) followed by the Ministry of Health (71.36%) and then the World Health Organization (54.46%). This is followed by Television programs (46.95%), Turkish Medical Association (25.35%), Dentistry Association (20.19%), Other (15.96%), FDI (9.86%), European Center for Disease Prevention and Control (7.51%).

It was determined that the regression model applied for students' COVID-19 knowledge achievement levels was statistically significant (F:5,545, p=0.004) and 4.1% of the change in the students' knowledge level was explained by the independent variables. A statistically significant negative (β=-0.156, p=0.022) relationship was found between the ages and the COVID-19 knowledge success levels of the students within the scope of this research. A positive, statistically significant (β=0.141, p=0.039) relationship was found between the COVID-19 knowledge level and their own evaluations (Table 2).

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The regression model applied for the variables affecting the coronavirus fear level was found to be statistically significant (F:16,238, p<0.001). According to the model, 22.3% of the change in students' coronavirus fear level is explained by the independent variables in the model (Table 3).

Table 2. Variables Affecting the COVID-19 Knowledge Level

Dependent Variable: COVID-19 Knowledge Test Level							
Independent Variables	**B**	**Standard Error**	**Standardize β**	**T**	**p**	**Tolerance**	**VIF**
Constant	17.746	2.503	-	7.090	**<0.001**	-	-
Age	-0.234	0.102	-0.156	-2.301	**0.022**	0.982	1.018
COVID-19 Knowledge Level Self Evaluation	0.410	0.197	0.141	2.081	**0.039**	0.982	1.018
F:5.545, p=0.004	Corrected R²: 0.041						

Table 3. Variables Affecting the Coronavirus Fear Levels

Dependent Variable: Coronavirus Fear Level							
Independent Variables	**B**	**Standard Error**	**Standardize β**	**t**	**p**	**Tolerance**	**VIF**
Constant	6.625	1.720	-	3.851	**<0.001**	-	-
Female	1.425	0.784	0.114	1.817	0.071	0.930	1.075
Male (R)	-	-	-	-	-	-	-
"COVID-19 is a serious disease" statement evaluation	2.120	0.412	0.327	5.145	**<0.001**	0.907	1.103
The COVID-19 precautions in the work environment are sufficient (R)	-	-	-	-	**-**	-	-
I am indecisive about the COVID-19 precautions in the work environment	0.979	0.729	0.085	1.343	0.181	0.904	1.106
The COVID-19 precautions in the work environment are insufficient.	4.692	1.089	0.276	4.308	**<0.001**	0.891	1.122
F:16,238, p<0,001	**Corrected R²: 0,223**						

(R): Reference Group

It was found that the regression model applied to determine the independent variables affecting the coronavirus anxiety level was statistically significant (F:5,804, p<0.001) and 10.2% of the change in the coronavirus anxiety level of the

students was explained by the independent variables. A statistically significant positive (β=0.199, p=0.004) relationship was found between the statement *"COVID-19 is a serious disease"* and the students' coronavirus anxiety levels.

Additionally, the fact that the students within the scope of this study have had COVID-19 was observed to statistically significantly positively affect their coronavirus anxiety levels (β=0.174, p=0.009). It was determined that the coronavirus anxiety levels of students who found the measures to protect against COVID-19 at work insufficient were found to be statistically significantly and positively affected compared to those who found the measures sufficient (β=0.212, p=0.002) (Table 4).

A statistically significant moderate positive correlation was found between the students' fear of coronavirus and their anxiety about coronavirus. (r=0.620, p<0.001) (Table 5). When the relationship between the students' coronavirus knowledge scores and their anxiety and fear of coronavirus is examined, it is found that the regression model is not significantly meaningful (F:1.279, p=0.281) (Table 6)

Table 4. Variables Affecting the Coronavirus Anxiety Level

Dependent Variable: Coronavirus Anxiety Level							
Independent Variables	B	Standard Error	Standardize β	t	p	Tolerance	VIF
Constant	-1.800	1.123	-	-1.603	0.111	-	-
Female	0.229	0.502	0.031	0.456	0.649	0.929	1.076
Male (R)	-	-	-	-	-	-	-
"COVID-19 is a serious disease" statement evaluation	0.769	0.265	0.199	2.905	**0.004**	0.901	1.110
Did not have Covid-19 (R)	-	-	-	-	-	-	-
Had C-19ovid	1.462	0.551	0.174	2.654	**0.009**	0.986	1.014
The COVID-19 precautions in the work environment are sufficient (R)	-	-	-	-	**-**	-	-
I am indecisive about the COVID-19 precautions in the work environment	.484	0.468	0.071	1.035	0.302	0.902	1.109
The COVID-19 precautions in the work environment are insufficient.	2.150	0.698	0.212	3.079	**0.002**	0.890	1.123
F: 5.804, p<0.001	**Corrected R²: 0.102**						

(R): Reference Group

Table 5. Evaluation of the Relationship Between Anxiety and the Fear of Coronavirus

Measurements	Coronavirus Anxiety		
	n	R	P
Coronavirus Fear	213	0.620	**<0.001**

r: Spearman Correlation Coefficient

Table 6. Evaluation of the Relationship Between Coronavirus Knowledge Level and Anxiety and Fear

Dependent Variable: COVID-19 Knowledge Questionnaire Level							
Independent Variables	B	Standard Error	Standardize β	T	P	Tolerance	VIF
Constant	13.702	0.537	-	25.520	0.001	-	-
Coronavirus Anxiety	-0.089	0.056	-0.140	-1.592	0.113	0.611	1.638
Fear of Coronavirus	0.029	0.033	0.077	0.872	0.384	0.611	1.638
F:1.279, p=0.281	**Corrected R²:** 0.003						

Discussion

Firstly, in the fight against the pandemic, it is important to evaluate the knowledge and awareness of different populations towards the pandemic.[5,27,28] As the uncertainty reduces and the knowledge level increases, it is expected that the worry and anxiety will also reduce. Additionally, the uncertainty of a COVID-19 prognosis, lifestyle changes, quarantine limitations and education cuts result in fear, worry and anxiety, regardless of the increased knowledge level. The struggle to eliminate the effects of COVID-19 are continuing worldwide. Studies show that community health crises have many psychological effects on university students including worry, fear and anxiety.[29] In this context, this study aims to evaluate the knowledge and approaches as well as the fear and anxiety levels of intern dentists towards COVID-19 and to show the factors that affect them.

The results of the study show that students obtained an average score from the knowledge level questionnaire. Additionally, it was found that the knowledge score increased as the age increased. Students who evaluated their own COVID-19 knowledge level as high obtained higher scores from the knowledge questions. Some studies conducted on dentistry students found that their COVID-19 knowledge level was moderate and others showed that it was high.[14,15,17,30,31] A study conducted on Faculty of Medicine students showed that the rate of correct answers to 10 knowledge questions was 78.3%.[32] In a study conducted on nursing students, it was determined that the levels of anxiety and fear of COVID-19 were high and 51.5% of the students experienced severe anxiety.[33] Studies conducted in different sample groups show that young people have a higher level of knowledge about COVID-19.[34]

The students included in the study stated that they followed social media, the Ministry of Health and the WHO official website as reliable sources of information about COVID-19. The literature also shows that the most common sources of knowledge are social media, WHO and government web sites.[27] The websites of the WHO and Ministry of Health are more commonly followed by medicine and dentistry students, whereas social media platforms have become a basic source of information for many people. This shows that social media can play a huge role in risk perception and the dissemination of reliable information during a pandemic.

Many people experience clinical fear and anxiety during a contagious disease pandemic. With the emergence and rapid spread of the COVID-19 disease, problems such as fear, worry, stress and anxiety are seen in health workers and dentists, especially since they carry a high risk in the society.[31,35] In this study, the students' scores on the coronavirus fear scale (17.63±5.57) were moderate, while the scores they received from the anxiety scale (2.37±3.32) were found to be low. A study conducted on dentistry students in Saudi Arabia showed that returning to face-to-face education during the COVID-19 period caused anxiety and stress in 85% of the participants.[9] A study conducted on 650 participants from 30 different countries showed that over two-thirds (78%) of general dentists stated that they had anxiety and

fear about the destructive effects of COVID-19.[36] Another study showed that 74.9% of students were psychologically affected by COVID-19.[13] It was also found that the female students who thought that the precautions taken were insufficient and that evaluated COVID-19 as a serious disease had higher scores from the fear and anxiety scales. This is supported by the literature.[35] The study conducted by Doshi et al. (2021) showed that females are 1.29 times more likely to fear COVID-19 in comparison to their male colleagues.[37] This can be explained by women being under higher pressure during the pandemic, their increased sense of responsibility or them worrying about their loved ones more. Additionally, our study shows that the fear and anxiety levels of students who thought the precautions taken against COVID-19 were sufficient were low. The data we obtained show that the views and risk situations of the participants related to the pandemic affect their level of anxiety. A study conducted by Yakar et.al (2020) showed that the anxiety levels of students who thought they had sufficient information about COVID-19 and that thought sufficient precautions were taken was higher.[32] In our study, the scores of those who had COVID-19 from the anxiety scale were higher than those who have not had the disease. This can be due to unpredictability, uncertainty, severity of the disease, lack of information and social isolation resulting from the epidemic.[38]

The literature shows that the anxiety and fear levels of people who have increased COVID-19 knowledge is lower.[39] However, in this study, a statistically significant relationship was not found between the knowledge level and the anxiety and fear levels. Similarly, to our study, some research shows that fear of COVID-19 is not related to the level of knowledge, whereas others have shown that the fear of the disease will increase as their COVID-19 knowledge level increases.[40]

The study has certain strong aspects. Firstly, it is the first study to research the effect of COVID-19 on the anxiety levels of intern dentists at university. The findings can be used to further investigate the causes of fear and anxiety, and to determine the strategies to be used in reducing fear and anxiety in students. Secondly, the fact that dentistry students who conduct clinical practices are included in the priority vaccination group makes it necessary to determine their knowledge, attitudes and awareness. The findings of this study fill all these gaps.

Regardless of the important findings of our study, it also has several limitations. The fact that the study was conducted at only one faculty and that the data were collected online via questionnaires reduces the generalizability of the results. However, it must be considered that a quick method is needed to determine the knowledge level of students, evaluate their fear and anxiety levels during this pandemic which is rapidly spreading.

Conclusion

It was found that the knowledge and fear of coronavirus levels of intern dentistry students were moderate, and that their coronavirus anxiety level was low. In addition, the fear and anxiety levels of females, those who have had COVID-19, those who find the measures taken in their working environment inadequate and those with a high-risk perception are higher. Therefore, psychological support and extra precautions can be provided for these groups. The holistic results obtained in this study can be informative for universities when evaluating stress, anxiety and fear levels and can guide the application of psychological health programs. In general, dentists must be aware that the COVID-19 pandemic is a critical period and follow the necessary standard precautions to ensure infection control strategies during this pandemic. It is recommended that the role of tele-dentistry be developed to improve the ability to combat epidemics and similar diseases.

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