

## **Evaluation of The Effect of The Covid-19 Pandemic on The Educational Concerns of Dentistry Students and Clinical Practices**

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### **1. INTRODUCTION**

In December 2019, a coronavirus that had never been seen before in humans was identified in Wuhan, China's Hubei province (Lu et al., 2020). The World Health Organization (WHO) named this pneumonia-causing virus the novel coronavirus (2019-nCoV), and it was later named SARS-CoV-2 due to its taxonomic similarity to the virus that causes Severe Acute Respiratory Syndrome (SARS) (Cascella et al., 2023). As new coronavirus cases increased rapidly and spread across continents, this situation was declared a pandemic by WHO on March 11, 2020. (Who et al., 2020). The first case of COVID 19 diagnosed in our country was officially announced by the Ministry of Health on March 10, 2020.

With the increase in cases, research examining the clinical and epidemiological features of the disease has accelerated. Clinical symptoms and radiographic examinations are similar to the symptoms of infection caused by other respiratory viruses, making it difficult to diagnose COVID 19 cases at an early stage. The fact that the majority of detected cases are in people in the advanced stages of the disease causes the case incidence-fatality rate to be higher than expected. As the number of tests performed increases and data on mild/asymptomatic infections is obtained, the case incidence-fatality rate is expected to decrease further. However, the low mortality rate should not cause one to ignore the fact that the risk of widespread transmission of the disease is serious (Wang et al., 2020).

Current observations show that people of all ages are likely to contract this new infectious disease, and although symptomatic COVID 19 patients are the main source of transmission, asymptomatic patients and those in their incubation period are also carriers of the virus (Chan et al., 2020; Rothe et al., 2020).

Information about the transmission routes, incubation period, and clinical course of the disease is interpreted based on the first data obtained, and research will continue to clarify the COVID 19 process (Cascella et al., 2023). Considering transmission through droplets and aerosols, dentists constitute a high risk group. During the COVID 19 pandemic, necessary precautions should be taken to control the risk of cross-infection that may occur between dentists and patients in dental practice environments and emergency treatment application protocols should be determined.

Since dentists are in the primary risk group in terms of encountering infectious diseases, it is extremely important to provide training to undergraduate dentistry students about the risks of infectious diseases and the use of personal protective equipment (PPE) (Coulthard et al., 2020). The US Occupational Safety and Health Administration has similarly reported that dentists are at very high risk of contracting COVID 19 (Deery et al., 2020). For this reason, during the pandemic period, authorities recommended postponing procedures other than emergency dental treatments. However, during this period, undergraduate education continued online (Deery et al., 2020; Prati et al., 2020).

Studies reporting the impact of the pandemic on undergraduate dental education are limited (Shacham et al., 2020; Iyer et al., 2020; Desai et al., 2020; Bellini et al., 2020). There is no official information regarding the continuity of dental education to protect students, faculty and patients

(Bellini et al., 2020). Therefore, new studies are needed to evaluate the quality of online education during the pandemic period and make suggestions for improvement. This study aims to examine the COVID 19 knowledge levels of 4th and 5th grade students of Abant İzzet Baysal University and Atatürk University Faculty of Dentistry and to obtain information about the educational concerns of the pandemic and its impact on clinical practices.

## **2. MATERIALS AND METHODS**

### **2.1. Survey and Study Design**

This study was approved by the Ethics Committee of Bolu Abant İzzet Baysal University and Erzurum Atatürk University (2022/25, 2022/35). First of all, Turkish and English literature review was conducted. Articles related to the study were collected by typing the keywords 'COVID 19', 'Dentistry' and 'Survey'. A total of 35 questions were prepared online via Google forms from the references obtained. The study material consists of Term 4 and Term 5 students studying at Abant İzzet Baysal University and Atatürk University Faculty of Dentistry, 4 of whom are over the age of 32 and 12 of whom are between the ages of 25-32, the majority of whom are between the ages of 21-25. The faculty of dentistry in Turkey lasts 5 years and consists of a training program in the last 2 years of which students look at patients in the clinic and perform appropriate examination and treatment. Therefore, 4th and 5th year undergraduate dentistry students were included in this study.

The survey was prepared to evaluate the level of knowledge of dental students about COVID 19 and the impact of the pandemic on education and clinical practices. The questions of the study were prepared by compiling from the literature in the field and were presented to the opinion of 20 expert academicians (Boukhobza et al., 2021; Aragao et al., 2022; Mutluay et al., 2022). In this way, the appropriateness of the questions in terms of features such as language, scope and understandability was ensured. In addition, to ensure the validity of the questions, the Content Validity Ratio was calculated for each question with the data obtained from the relevant expert group and these values were found to be within acceptable limits (Table 1) (Yurdugül et al., 2005).

**Table 1.** Content validity ratio (CVR) and index

| Questions                                                                                                            | Necessary | Useful but not | Unnecessary | CVR  |
|----------------------------------------------------------------------------------------------------------------------|-----------|----------------|-------------|------|
| What do you think about COVID 19?                                                                                    | 20        | -              | -           | 1.00 |
| Do you consider COVID 19 infection fatal?                                                                            | 19        | 1              | -           | 0.90 |
| What is the name of the virus responsible for the pandemic?                                                          | 17        | 2              | 1           | 0.70 |
| What is the incubation period of the virus?                                                                          | 19        | 1              | -           | 0.90 |
| What are the main ways of transmission of COVID 19?                                                                  | 18        | 2              | -           | 0.80 |
| What are the main symptoms of the disease?                                                                           | 20        | -              | -           | 1.00 |
| What are your sources of information about COVID 19?                                                                 | 20        | -              | -           | 1.00 |
| Are you worried about getting infected with COVID 19?                                                                | 20        | -              | -           | 1.00 |
| Have you ever been diagnosed with COVID 19 or suspected of having COVID 19?                                          | 20        | -              | -           | 1.00 |
| How would you classify the risk of contracting COVID 19 infection in clinical practices at the Faculty of Dentistry? | 20        | -              | -           | 1.00 |
| Have you been forced to work under conditions that could jeopardize your personal safety?                            | 19        | 1              | -           | 0.90 |
| What are personal protective equipment?                                                                              | 20        | -              | -           | 1.00 |
| In what order should personal protective equipment be worn?                                                          | 20        | -              | -           | 1.00 |

| Questions                                                                                                    | Necessary | Useful but not | Unnecessary | CVR  |
|--------------------------------------------------------------------------------------------------------------|-----------|----------------|-------------|------|
| In what order should personal protective equipment be removed?                                               | 19        | 1              | -           | 0.90 |
| Which mask is included in the N95 mask?                                                                      | 18        | 1              | 1           | 0.80 |
| Do you believe that personal protective equipment will protect against COVID 19?                             | 20        | -              | -           | 1.00 |
| Do you think you might be infected with COVID-19 while performing dental procedures?                         | 20        | -              | -           | 1.00 |
| What do you think about the return to clinical activities in dentistry?                                      | 20        | -              | -           | 1.00 |
| What precautions should be taken to reduce the risk of spreading COVID 19?                                   | 19        | -              | 1           | 0.90 |
| Have you ever received training on biosecurity measures to prevent the spread of COVID 19 in dentistry?      | 19        | 1              | -           | 0.90 |
| Do you have sufficient knowledge about infection control during the pandemic?                                | 20        | -              | -           | 1.00 |
| Which of the following precautions do you apply to your patients against Covid-19 in your professional life? | 19        | 1              | -           | 0.90 |
| As a dentist, do you inform your patients about Covid-19?                                                    | 20        | -              | -           | 1.00 |
| Has the institution you work for changed its patient admission policy due to Covid-19?                       | 20        | -              | -           | 1.00 |
| What are the problems you encountered in the workplace during the Covid-19 outbreak?                         | 18        | 2              | -           | 0.80 |
| How should undergraduate education be implemented during the pandemic period?                                | 19        | 1              | -           | 0.90 |
| Do you think face-to-face education is risky during the pandemic?                                            | 20        | -              | -           | 1.00 |
| Do you find clinical internship training risky during the pandemic period?                                   | 20        | -              | -           | 1.00 |
| How was the quality of the undergraduate education you received affected during the pandemic period?         | 20        | -              | -           | 1.00 |
| Are you worried about the pandemic continuing after you graduate?                                            | 20        | -              | -           | 1.00 |
| Do you plan to continue doing your job if the pandemic continues after graduation?                           | 20        | -              | -           | 1.00 |

Before the study, power analysis (G\*Power 3.1.9.4 software (Heinrich-Heine Dusseldorf University, Dusseldorf, Germany) was applied to determine the number of volunteers to be surveyed. According to the results of the analysis, it was determined that the number of volunteers in each group should be a minimum of 191 people in order for the study to be conducted at 95% power with an effect size of 0.3 and a margin of error of 0.05.

The prepared questions were sent to the dentistry students to whom the survey would be applied via the online survey, WhatsApp social network platform, and the voluntary consent of each participant was obtained. The number of dental students surveyed was greater than the required sample size calculated for this study. A total of 429 responses were obtained. Survey data was collected between 26.01.2022-16.03.2022.

The survey questions were categorized into 3 groups: questions containing sociodemographic characteristics, questions measuring the level of knowledge about COVID 19, and questions measuring the impact of the pandemic on clinical practices. Questions containing sociodemographic characteristics include information about the person's age, gender, the university he/she studied at

and the grade in which he/she studied. Questions measuring the level of knowledge about COVID 19; It includes what he thinks about COVID 19, whether he considers it fatal or not, the name of the responsible virus, the incubation period, the main ways of transmission, the main symptoms of the disease, where he got the information about COVID 19, whether he is worried about being infected, and whether he has previously encountered the COVID 19 virus. Questions measuring the impact of the pandemic on clinical practices are; It covers a number of questions such as how it classifies the risk of contracting COVID 19 infection in clinical practices at the faculty of dentistry, the situation of being forced to work under conditions that may endanger personal safety, the personal protective equipment used when examining patients and the order in which they put on and take off these equipment, and N95 mask information.

## **2.2. Statistical analysis**

The obtained data were analyzed using SPSS 20 (IBM, Chicago, IL, USA) statistical package program. The collected data were taken from Google Forms and converted into Excel (Microsoft, USA) sheets. The frequency distribution of data, were compared using Chi-square or Fisher's exact tests by institution type (two separate universities). The statistical significance level was taken as 5%.

## **3. RESULTS**

A total of 429 valid responses were received from participants at Bolu Abant Izzet Baysal and Atatürk University Faculty of Dentistry within 60 days. Demographic characteristics of dentistry students are given in Table 2. Participants were mostly female (58%) and aged between 21 and 25 (96.3%). 54.1% of the participants were from Atatürk University, 45.9% were from Abant Izzet Baysal University, 62.2% were in the 4th grade and 37.8% were in the 5th grade.

**Table 2.** Demographic characteristics of dentistry students, (n = 429)

| <b>Variables</b>   | <b>n</b> | <b>%</b> |
|--------------------|----------|----------|
| <b>Gender</b>      |          |          |
| Female             | 249      | 58.0     |
| Male               | 180      | 42.0     |
| <b>Age</b>         |          |          |
| 21-25              | 413      | 96.3     |
| 25-32              | 12       | 2.8      |
| >32                | 4        | 0.9      |
| <b>University</b>  |          |          |
| Abant Izzet Baysal | 197      | 45.9     |
| Ataturk            | 232      | 54.1     |
| <b>Class</b>       |          |          |
| Class 4            | 267      | 62.2     |
| Class 5            | 162      | 37.8     |

Results and statistical comparison results regarding students' general knowledge and perceptions about COVID-19 according to university types were given in Table 3. While 40.6% of the respondents see COVID 19 as a serious disease, 4.9% did not consider it as a serious disease. 44.5% of the participants see this disease as fatal, and 11.4% did not see it as a fatal disease. Participants often know the name of the virus responsible for the pandemic as COVID 19 and SARS COV 2, and there was also a segment of 1.9% who do not have any knowledge about it. While 56.2% stated the incubation period of the virus as 1-7 days, 2.3% stated it as 14-21 days. 3% stated that they did not have any information on this subject. While 85.1% of the participants stated the main transmission routes of COVID 19 as air droplets from the infected person, 28.2% stated that it was transmitted

as a result of contact with the blood of the infected person. While the three symptoms known as the main symptoms of the disease, namely fever, dry cough and fatigue, were selected at a higher rate, diarrhea, nausea and vomiting and runny nose were selected at the lowest rates. While a high percentage (80%) of the participants obtained information through the websites and/or social media accounts of official organizations and professional organizations such as the Ministry of Health, DSO, and television, 1.6% stated that they had not received any information about COVID 19 so far.

**Table 3.** General knowledge and perceptions of students about COVID-19 by university types

| Variables                                                         | University  |               | p       |
|-------------------------------------------------------------------|-------------|---------------|---------|
|                                                                   | Abant n (%) | Ataturk n (%) |         |
| What do you think about COVID 19?                                 |             |               |         |
| It is not a serious disease.                                      | 12 (6.1)    | 9 (3.9)       | 0.764a  |
| It is a moderately serious disease.                               | 56 (28.4)   | 66 (28.4)     |         |
| It is a serious disease.                                          | 78 (39.6)   | 96 (41.4)     |         |
| It is a serious disease only in people in the risk group.         | 51 (25.9)   | 61 (26.3)     |         |
| Do you consider COVID 19 infection fatal?                         |             |               |         |
| Yes                                                               | 90 (45.7)   | 101 (43.5)    | 0.862a  |
| No                                                                | 23 (11.7)   | 26 (11.2)     |         |
| Partially                                                         | 84 (42.6)   | 105 (45.3)    |         |
| What is the name of the virus responsible for the pandemic?       |             |               |         |
| 2019 nCoV                                                         | 20 (10.2)   | 28 (12.1)     | 0.835a  |
| Coronavirus                                                       | 40 (20.3)   | 53 (22.8)     |         |
| COVID-19                                                          | 68 (34.5)   | 69 (29.7)     |         |
| SARS COV-2                                                        | 66 (33.5)   | 78 (33.6)     |         |
| I don't know                                                      | 3 (1.5)     | 4 (1.7)       |         |
| What is the incubation period of the virus?                       |             |               |         |
| 1-7 days                                                          | 135 (68.5)  | 106 (45.7)    | 0.000a* |
| 7-14 days                                                         | 55 (27.9)   | 110 (47.4)    |         |
| 14-21 days                                                        | 2 (1.0)     | 8 (3.4)       |         |
| I don't know                                                      | 5 (2.5)     | 8 (3.4)       |         |
| What are the main ways of transmission of COVID 19?               |             |               |         |
| Shaking hands with an infected person                             | 87 (12.6)   | 81 (13.6)     | 0.075a  |
| Through air droplets from an infected person                      | 181 (26.1)  | 184 (31.0)    |         |
| Contact with infected surfaces                                    | 96 (13.9)   | 54 (9.1)      |         |
| Exposure to aerosol (a mixture of air, water and solid particles) | 192 (27.7)  | 158 (26.6)    |         |
| Contact with the blood of an infected person                      | 62 (8.9)    | 59 (9.9)      |         |
| Injury from contaminated sharp objects                            | 75 (10.8)   | 58 (9.8)      |         |
| What are the main symptoms of the disease?                        |             |               |         |
| Fire                                                              | 185 (18.4)  | 210 (17.8)    | 0.727a  |
| Dry cough                                                         | 172 (17.1)  | 201 (17.1)    |         |

| Variables                                                                                                                                                       | University  |               | p       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|---------|
|                                                                                                                                                                 | Abant n (%) | Ataturk n (%) |         |
| Diarrhea                                                                                                                                                        | 55 (5.5)    | 79 (6.7)      |         |
| Tiredness                                                                                                                                                       | 145 (14.4)  | 165 (14)      |         |
| Sore throat                                                                                                                                                     | 135 (13.4)  | 146 (12.4)    |         |
| Nausea and vomiting                                                                                                                                             | 38 (3.8)    | 52 (4.4)      |         |
| Difficulty breathing                                                                                                                                            | 142 (14.1)  | 152 (12.9)    |         |
| Headache                                                                                                                                                        | 99 (9.8)    | 114 (9.7)     |         |
| Runny nose                                                                                                                                                      | 37 (3.7)    | 59 (5)        |         |
| What are your sources of information about COVID 19?                                                                                                            |             |               |         |
| Television                                                                                                                                                      | 139 (23.2)  | 158 (23.3)    | 0.398a  |
| from circle of friends                                                                                                                                          | 83 (13.9)   | 82 (12.1)     |         |
| Websites and/or social media accounts of official organizations and professional organizations such as the Ministry of Health and the World Health Organization | 164 (27.4)  | 179 (26.4)    |         |
| Physicians' personal websites/social media accounts                                                                                                             | 97 (16.2)   | 109 (16.1)    |         |
| From medical books, magazines and articles                                                                                                                      | 38 (6.3)    | 56 (8.2)      |         |
| From events such as seminars/meetings/congresses organized by institutions                                                                                      | 30 (5)      | 44 (6.5)      |         |
| From communication groups such as WhatsApp and Viber                                                                                                            | 47 (7.8)    | 45 (6.6)      |         |
| I have not received any information so far                                                                                                                      | 1 (0.2)     | 6 (0.9)       |         |
| Are you worried about getting infected with COVID 19?                                                                                                           |             |               |         |
| Yes                                                                                                                                                             | 63 (32)     | 71 (30.6)     | 0.890a  |
| No                                                                                                                                                              | 62 (31.5)   | 71 (30.6)     |         |
| Partially                                                                                                                                                       | 72 (36.5)   | 90 (38.8)     |         |
| Have you ever been diagnosed with COVID 19 or suspected of having COVID 19?                                                                                     |             |               |         |
| Just suspected                                                                                                                                                  | 66 (33.5)   | 84 (36.2)     | 0.077a  |
| It was suspected. The test result came back negative.                                                                                                           | 69 (35)     | 97 (41.8)     |         |
| It was suspected. The test result came back positive.                                                                                                           | 62 (31.5)   | 51 (22)       |         |
| How would you classify the risk of contracting COVID 19 infection in clinical practices at the Faculty of Dentistry?                                            |             |               |         |
| Low                                                                                                                                                             | 5 (2.5)     | 11 (4.7)      | 0.233a  |
| Middle                                                                                                                                                          | 42 (21.3)   | 35 (15.1)     |         |
| High                                                                                                                                                            | 84 (42.6)   | 98 (42.2)     |         |
| Very high                                                                                                                                                       | 66 (33.5)   | 88 (37.9)     |         |
| Have you been forced to work under conditions that could jeopardize your personal safety?                                                                       |             |               |         |
| Yes                                                                                                                                                             | 35 (17.8)   | 82 (35.3)     | 0.000a* |
| No                                                                                                                                                              | 105 (53.3)  | 98 (42.2)     |         |

| Variables                                                                            | University  |               | p       |
|--------------------------------------------------------------------------------------|-------------|---------------|---------|
|                                                                                      | Abant n (%) | Ataturk n (%) |         |
| Partially                                                                            | 57 (28.9)   | 52 (22.4)     |         |
| What personal protective equipment do you use when examining patients?               |             |               |         |
| Mask                                                                                 | 191 (23.5)  | 224 (23.9)    | 0.915a  |
| Glove                                                                                | 192 (23.6)  | 223 (23.8)    |         |
| Goggles                                                                              | 62 (7.6)    | 80 (8.5)      |         |
| Visor                                                                                | 188 (23.1)  | 202 (21.6)    |         |
| Apron/ overalls                                                                      | 181 (22.2)  | 207 (22.1)    |         |
| In what order should personal protective equipment be worn?                          |             |               |         |
| Mask-glasses-apron-gloves                                                            | 39 (19.8)   | 57 (24.6)     | 0.008a* |
| Mask-apron-glasses-gloves                                                            | 97 (49.2)   | 78 (33.6)     |         |
| Apron-mask-glasses-gloves                                                            | 53 (26.9)   | 78 (33.6)     |         |
| Apron-glasses-mask-gloves                                                            | 8 (4.1)     | 19 (8.2)      |         |
| In what order should personal protective equipment be removed?                       |             |               |         |
| Gloves-apron-glasses-mask                                                            | 36 (18.3)   | 63 (27.2)     | 0.024a* |
| Gloves-glasses-apron-mask                                                            | 104 (52.8)  | 90 (38.8)     |         |
| Gloves-glasses-mask-apron                                                            | 43 (21.8)   | 56 (24.1)     |         |
| Gloves-mask-glasses-apron                                                            | 14 (7.1)    | 23 (9.9)      |         |
| Which mask is included in the N95 mask?                                              |             |               |         |
| surgical mask                                                                        | 35 (17.8)   | 39 (16.8)     | 0.002a* |
| FFP1                                                                                 | 16 (8.1)    | 11 (4.7)      |         |
| FFP2                                                                                 | 73 (37.1)   | 56 (24.1)     |         |
| FFP3                                                                                 | 12 (6.1)    | 32 (13.8)     |         |
| I don't know                                                                         | 61 (31)     | 94 (40.5)     |         |
| Do you believe that personal protective equipment will protect from COVID 19?        |             |               |         |
| Yes                                                                                  | 107 (54.3)  | 120 (51.7)    | 0.831a  |
| No                                                                                   | 15 (7.6)    | 17 (7.3)      |         |
| Partially                                                                            | 75 (38.1)   | 95 (40.9)     |         |
| Do you think you might be infected with COVID-19 while performing dental procedures? |             |               |         |
| Yes                                                                                  | 133 (67.5)  | 147 (63.4)    | 0.632a  |
| No                                                                                   | 15 (7.6)    | 18 (7.8)      |         |
| Partially                                                                            | 49 (24.9)   | 67 (28.9)     |         |
| What do you think about the return to clinical activities in dentistry?              |             |               |         |
| I'm not worried                                                                      | 132 (67)    | 132 (56.9)    | 0.044a* |
| I'm worried                                                                          | 54 (27.4)   | 90 (38.8)     |         |
| I'm very worried                                                                     | 11 (5.6)    | 10 (4.3)      |         |

| Variables                                                                                                                   | University  |               | p       |
|-----------------------------------------------------------------------------------------------------------------------------|-------------|---------------|---------|
|                                                                                                                             | Abant n (%) | Ataturk n (%) |         |
| What precautions should be taken to reduce the risk of spreading COVID 19?                                                  |             |               |         |
| Hand washing before and after treatment                                                                                     | 182 (17.4)  | 191 (17.7)    | 0.435a  |
| Use of barriers to prevent mucosal contamination                                                                            | 143 (13.7)  | 158 (14.7)    |         |
| Use of disposable aprons                                                                                                    | 158 (15.1)  | 191 (17.7)    |         |
| Rubber dam use                                                                                                              | 136 (13)    | 143 (13.3)    |         |
| Rinsing the patient's mouth with mouthwash before the clinical examination                                                  | 138 (13.2)  | 119 (11)      |         |
| Use of high vacuum suction (saliva and water absorber)                                                                      | 159 (15.2)  | 145 (13.5)    |         |
| Checking patients' body temperatures                                                                                        | 131 (12.5)  | 130 (12.1)    |         |
| Have you ever received training on biosecurity measures to prevent the spread of COVID 19 in dentistry?                     |             |               |         |
| I've never had any training.                                                                                                | 132 (67)    | 132 (56.9)    | 0.044a* |
| I received general information training without application.                                                                | 54 (27.4)   | 90 (38.8)     |         |
| I received practical training.                                                                                              | 11 (5.6)    | 10 (4.3)      |         |
| Do you have sufficient knowledge about infection control during the pandemic?                                               |             |               |         |
| Yes                                                                                                                         | 79 (40.1)   | 81 (34.9)     | 0.534a  |
| No                                                                                                                          | 24 (12.2)   | 32 (13.8)     |         |
| Partially                                                                                                                   | 94 (47.7)   | 119 (51.3)    |         |
| Which of the following precautions do you apply to your patients against COVID 19 in your professional life?                |             |               |         |
| Before the dental procedure, I ask patients if they have complaints such as fever and cough and apply a rubber dam.         | 105 (22.5)  | 114 (25.6)    | 0.003a* |
| Before a dental procedure, I have patients rinse their mouths with an antiseptic mouthwash containing chlorhexidine.        | 65 (13.9)   | 43 (9.7)      |         |
| Before a dental procedure, I have patients rinse their mouths with an antiseptic mouthwash containing 1% hydrogen peroxide. | 22 (4.7)    | 25 (5.6)      |         |
| I use a powerful saliva and water absorbing system (suction) during the procedure.                                          | 142 (30.4)  | 127 (28.5)    |         |
| I follow the 14-day waiting rule for potentially infected patients.                                                         | 122 (26.1)  | 103 (23.1)    |         |
| None                                                                                                                        | 11 (2.4)    | 33 (7.4)      |         |
| As a dentist, do you inform your patients about COVID 19?                                                                   |             |               |         |
| Yes                                                                                                                         | 44 (22.3)   | 50 (21.6)     | 0.525a  |
| No                                                                                                                          | 73 (37.1)   | 98 (42.2)     |         |

| Variables                                                                                            | University  |               | p       |
|------------------------------------------------------------------------------------------------------|-------------|---------------|---------|
|                                                                                                      | Abant n (%) | Ataturk n (%) |         |
| Partially                                                                                            | 80 (40.6)   | 84 (36.2)     |         |
| Has the institution you work for changed its patient admission policy due to COVID 19?               |             |               |         |
| Change has been made.                                                                                | 130 (66)    | 177 (76.3)    | 0.024b* |
| No changes were made.                                                                                | 67 (34)     | 55 (23.7)     |         |
| What problems are you facing in the workplace during the COVID 19 pandemic?                          |             |               |         |
| I have difficulty accessing protective equipment (mask, visor, etc.).                                | 68 (21.2)   | 62 (15.5)     | 0.008a* |
| I do not think that my doctor friends' awareness on this issue has reached a sufficient level yet.   | 44 (13.8)   | 81 (20.3)     |         |
| I think the level of awareness on this issue among healthcare professionals is low.                  | 45 (14.1)   | 81 (20.3)     |         |
| I think patients' awareness of this issue is low.                                                    | 126 (39.4)  | 140 (35.1)    |         |
| I did not encounter any problems                                                                     | 37 (11.6)   | 35 (8.8)      |         |
| How should undergraduate education be implemented during the pandemic period?                        |             |               |         |
| Online                                                                                               | 38 (19.3)   | 77 (33.2)     | 0.004a* |
| Written document                                                                                     | 6 (3)       | 4 (1.7)       |         |
| Clinical internship (face to face)                                                                   | 153 (77.7)  | 151 (65.1)    |         |
| Do you think face-to-face education is risky during the pandemic?                                    |             |               |         |
| Yes                                                                                                  | 70 (35.5)   | 95 (40.9)     | 0.484a  |
| No                                                                                                   | 40 (20.3)   | 46 (19.8)     |         |
| Partially                                                                                            | 87 (44.2)   | 91 (39.2)     |         |
| Do you find clinical internship training risky during the pandemic period?                           |             |               |         |
| Yes                                                                                                  | 39 (19.8)   | 69 (29.7)     | 0.055a  |
| No                                                                                                   | 58 (29.4)   | 64 (27.6)     |         |
| Partially                                                                                            | 100 (50.8)  | 99 (42.7)     |         |
| How was the quality of the undergraduate education you received affected during the pandemic period? |             |               |         |
| Positive                                                                                             | 24 (12.2)   | 20 (8.6)      | 0.010a* |
| Negative                                                                                             | 107 (54.3)  | 159 (68.5)    |         |
| I am not sure                                                                                        | 66 (33.5)   | 53 (22.8)     |         |
| Are you worried about the pandemic continuing after you graduate?                                    |             |               |         |
| Yes                                                                                                  | 92 (46.7)   | 107 (46.1)    | 0.773a  |
| No                                                                                                   | 48 (24.4)   | 63 (27.2)     |         |
| Partially                                                                                            | 57 (28.9)   | 62 (26.7)     |         |
| Do you plan to continue doing your job if the pandemic continues after graduation?                   |             |               |         |
| Yes                                                                                                  | 176 (89.3)  | 200 (86.2)    | 0.389a  |

| Variables | University  |               | p |
|-----------|-------------|---------------|---|
|           | Abant n (%) | Ataturk n (%) |   |
| No        | 7 (3.6)     | 15 (6.5)      |   |
| Partially | 14 (7.1)    | 17 (7.3)      |   |

While 37.8% of the participants feel somewhat worried about being infected with COVID 19, there is only 1 difference between the participants who preferred yes and no options. 38.7% of the respondents were suspected of having COVID 19 but the test result was negative, 35% were only suspected but not tested, and 26.3% were suspected of COVID 19 and the test result was positive. While the majority of students classified the risk of contracting COVID 19 infection in clinical practices at the faculty of dentistry as high (42.4%), 3.7% stated this risk as low. A large percentage of students were not forced to work under conditions that would endanger their personal safety (47.3%), while a group of students stated that they were forced (27.3%).

Among the personal protective equipment, the most used equipment was mask, gloves, visor, apron/overall, and the least used equipment was marked as protective glasses (33.1%). While 30.5% of the participants correctly marked the option of apron-mask-glasses-gloves, which was the correct order of wearing personal protective equipment, 23.1% of the participants correctly marked the option of glove-glasses-mask-apron, which was the correct order of removing personal protective equipment. Although the majority of students did not know which mask group the N95 mask belongs to (36.1%), 30.1% selected the correct option, FFP2. While the majority believe that personal protective equipment will protect from COVID 19 (52.9%), 7.5% do not believe that personal protective equipment will protect from COVID 19. 65.3% of the students think that you could be infected with COVID 19 while performing dental procedures, while 7.7% do not think that you could be infected with COVID 19. While the majority did not feel worried about returning to clinical activities in dentistry (61.5%), 4.9% feel very worried about it.

Among the precautions that should be taken to reduce the risk of spreading COVID 19, the most marked ones were hand washing before and after treatment, use of disposable aprons and use of high vacuum suction (saliva and water absorber). However, the option of rinsing the patient's mouth with mouthwash before the clinical examination was the least marked option. While 49.7% of the participants stated that they received general information training on biosecurity measures to prevent the spread of COVID 19, 47.1% stated that they did not receive any training. While 49.7% of the students think that they have partially sufficient knowledge about infection control, 13.1% do not think that they have sufficient knowledge.

62.7% of the participants chose to use a powerful saliva and water absorber system during dental procedures, while 10.3% of the participants chose not to take any extra precautions. While 39.9% of the students did not inform their patients about COVID 19, 38.2% partially inform their patients and 21.9% inform their patients in detail. 63.6% of the participants stated that patient admissions were partially reduced in the institution where they worked. While 28.4% of the participants considered low awareness of the COVID 19 epidemic to be one of the problems they encountered while working at work during this period, 16.8% stated that they did not encounter any problems at work. While 70.9% of the students wanted their undergraduate education to continue in the form of clinical internships (face-to-face) during the pandemic period, 41.5% thought that partially and 38.5% thought that completely face-to-face education was risky. While 46.4% find clinical internship training partially risky, 25.2% consider it completely risky. In addition, 62% of the participants stated that the quality of the undergraduate education they received during the pandemic period was negatively affected by this process. While 46.4% of the students were worried about the pandemic continuing after graduation, 25.9% stated that they did not have any concerns. At the same time, 87.6% of students stated that they would continue to do their jobs after graduation, even if the pandemic continues, while 5.1% stated that they would prefer not to do their jobs.

#### **4. DISCUSSION**

Dental professionals worldwide were concerned about the safety and well-being of themselves and their patients during the pandemic. COVID 19 has severely impacted the continuity of education worldwide (Boukhobza et al., 2021). Healthcare workers and students have been greatly affected by social distancing and university quarantines (Aragao et al., 2022). Given the high exposure to aerosols and the potential risk of spreading SARS-CoV-2 (Li et al., 2020), the dental school has moved to online education, creating difficulty in delivering practical training (Prati et al., 2020; Wu et al., 2020; Quinn et al., 2020). Some universities have attempted a partial return to face-to-face activities. Addressing students' basic understanding of the disease can be a starting point for dental schools to plan their return (Ataş et al., 2020; Esmaeelinejad et al., 2020). Therefore, in this study, the COVID 19 knowledge levels of 4th and 5th grade students of the Faculty of Dentistry and the impact of the pandemic on educational concerns and clinical practices were examined. Web-based surveys are very advantageous in terms of their low cost and the ability to access large groups of people and collect data easily and at large amounts (Couper et al., 2001). In this regard, in the current study, survey questions were prepared via Google forms.

The results regarding dentistry students' general knowledge about COVID 19 show that the majority of students know the incubation period and main symptoms of the disease, but they have insufficient knowledge about the ways of transmission. 28.2% of the participants stated that contamination occurred as a result of contact with the blood of an infected person. This result is consistent with the study results of Aragao et al (Aragao et al., 2022). For this reason, it has become necessary for schools to prepare educational materials to provide reliable information to students.

Since students are exposed to intense amounts of aerosol during dentistry practices, they need to pay more attention to protective measures, especially since they have less clinical experience (Peng et al., 2020). Although most of the participants in the current study are knowledgeable about protective equipment, they have insufficient knowledge about the order of wearing and removing the equipment. This situation poses a problem in terms of transmission of the disease. It is recommended that patients use mouthwash (1% hydrogen peroxide or 0.2% povidone iodine) and rubber dam during treatment procedures (Samaranayake et al., 20024). In this study, the use of high vacuum suction (saliva and water absorber) was the most frequently marked precaution to reduce the risk of spread, and the option of rinsing the patient's mouth with mouthwash before the clinical examination was the least marked option. In this regard, students should be encouraged to use rubber dam and rinse the patient's mouth with mouthwash before the procedure.

The current study, like other studies in the literature, revealed gaps in dental students' knowledge about COVID 19 (Aragao et al., 2022; Almulhim et al., 2021). 47.1% of the participants stated that they did not receive practical general information training on biosecurity measures to prevent the spread of COVID 19.

Although the theoretical parts of the Dentistry education curriculum were successfully carried out through online distance learning, there were deficiencies in the parts that required clinical experience. In the current study, it was observed that 70.9% of the students wanted their undergraduate education to continue in the form of clinical internships (face-to-face) during the pandemic period. For this reason, after the epidemic, it became necessary for school administrations to organize lessons and/or information meetings for students. 62% of the participants stated that the quality of the undergraduate education they received during the pandemic period was negatively affected by this process. Our results are consistent with previous reports that the COVID 19 pandemic is a major challenge for dental practice and dental education.11, 20

## **5. CONCLUSION**

The impact of the COVID 19 pandemic has greatly affected dental education. To face future challenges, dental educators must be careful, not panic, be flexible and open to changes. The dentistry education model should be renewed to suit different situations and dental education should be open to changes. Although the COVID 19 epidemic has had a devastating impact all over the world, this epidemic should mobilize healthcare professionals to be better prepared for any epidemic that may arise in the future.

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