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Evaluation of Information Levels of Dentistry Students About Covid-19 Pandemic

Dış Hekimliği Öğrencilerinin Covid-19 Pandemisi ile İlgili Bilgi Düzeylerinin Değerlendirilmesi

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Özet

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| Amaç | Bu çalışmanın amacı; dişhekimliği öğrencilerinin Covid-19 enfeksiyonu ile ilgili bilgilerini tespit etmek, bulaş ve korunma yolları açısından farkındalık oluşturarak hasta bakacakları dönemlerde daha dikkatli ve bilinçli olmalarına katkı sağlamaktır. |
| Yöntem | Bu anket çalışması 782 kişiye uygulanmıştır. Dişhekimliği öğrencilerinin Covid-19 pandemisi ile ilgili bilgi düzeylerini değerlendirmek için online olarak anket yapılmıştır. Bu çalışmada, dişhekimliği öğrencilerinin sosyodemografik bilgileri ve Covid-19 enfeksiyonu hakkındaki bilgi düzeylerini ölçmeyi amaçlayan sorular bulunmaktadır. |
| Bulgular | Dış hekimliği fakültesi öğrencilerinin Covid-19 pandemisiyle ilgili bilgilerini değerlendirmek üzere yaşları 17-37 arasında değişen 32 farklı fakülteden 782 öğrenci (k:470, e:312) çalışmaya dahil edilmiştir. Covid-19 pandemisi ile ilgili bilgi kaynaklarının cinsiyet ve sınıflar düzeyi ile ilişkisi birbirinden bağımsız değildir. Covid-19 enfeksiyonunun bulaş yolu olarak kadınlar ve erkekler arasında sadece parental yolda kadınlar lehine anlamlı farklılık gözlenmiştir ($\chi^2=7.08$; $p<0.05$), diğer bulaş yollarında cinsiyet yönünde farklılık bulunmamıştır. Covid-19 enfeksiyonunun belirtilerinden nefes darlığı, eklem ve kas ağrısı ya da semptomsuz ortaya çıkabileceği cevaplarında kadınlar lehine anlamlı sonuç çıkarken ($p<0.05$) diğer cevaplarda cinsiyetler arası farklılık yoktur ($p>0.05$). |
| Sonuç | Bu çalışmada, diş hekimliği öğrencilerinin dental uygulamalar esnasında enfeksiyon bulaş riskinin farkındalığının artırılması hedeflenmiş ve Covid-19 enfeksiyonunda korunmada dikkat edilmesi gereken önlemler üzerinde durulmuştur. Eğitimlerle öğrencilere Covid-19 enfeksiyonunun yol açtığı hastalık tablosu hakkında doğru ve akılcı bilgiler verilmesi gerektiği düşünülmektedir. |
| Anahtar kelimeler | Covid-19, dişhekimliği öğrencileri, enfeksiyon, inkübasyon periyodu. |

Abstract

| | |
|------------|--|
| Aim | The aims of the study was to evaluate the knowledge levels of dentistry students regarding Covid-19 infection, increase awareness about the infection and protection ways, and encouraging them to be more careful and conscious at work. |
| Methods | This study included 782 dentistry students. An online survey was administered to evaluate the knowledge level of dentistry students about the Covid-19 pandemic. The survey included questions evaluating knowledge levels related with Covid-19 infections and sociodemographic characteristics. |
| Results | For evaluations of dentistry students' knowledge levels about Covid-19 pandemic, 17-37-year-old 782 students (female:470, male:312) from 32 different departments were included in the study. The students' information sources about the Covid-19 pandemic were not independent of gender and school year. In terms of the pathway of transmission of Covid-19, there was a significant difference between women and men only in "parental way", in favor of the women ($\chi^2=7.08$; $p<0.05$). There were no significant differences in other transmission modes. In the symptoms of Covid-19 infection questionnaire (shortness of breath, joint and muscle pain, or no symptoms), there were significant differences between men and women, in favor of women ($p<0.05$), but there were no significance differences in other answers ($p>0.05$). |
| Conclusion | This study aimed to increase the awareness of students about infection risk during dental procedures, and also emphasized the preventive measures against Covid-19 infection. We think that true and rational information about Covid-19 must be given to students by education. |
| Key words | Covid-19, dental student, infection, incubation period. |

INTRODUCTION

Covid-19 infection is a contagious disease caused by coronaviruses, and it is the latest pandemic in the world according to the World Health Organization (WHO).¹ The etiologic agent of this infection is SARS-CoV-2, which causes acute severe respiratory syndrome.^{1,2} It is thought that the virus is isolated from *Rhinolophus affinis* type bats and pangolins are intermediate hosts for the virus.^{2,3,4}

The incubation period of the Covid-19 infection is estimated to be 5-6 days and isolation and follow-up time is accepted as 14 days.⁵

Research studies show that people in every age are susceptible to virus.⁶ It is reported that health officers with close contact to symptomatic and asymptomatic Covid-19 patients have higher risk for getting this infection.⁶

SARS-CoV-2 virus uses Angiotensin Converting Enzyme 2 (ACE 2) receptors for entrance to cells. These receptors are found mostly in type 2 alveolar cells in the lung, stratified epithelium in the esophagus, enterocytes in the ileum, and colon and proximal tubulus cells in kidney; and, these organs are targets for the Covid-19 virus.^{2,7,8} Oral mucosa, tongue, buccal mucosa, gingiva, and salivary glands ducts have ACE 2 receptor-releasing cells, so oral cavity has risk for infection and transmission.^{2,9}

Virus can spread during dental procedures. Due to the close contact of the dentist and the patient, the exposition of the dentist and the clinic to the patients' saliva and body fluids like blood, virus is a big problem for dentists and health personals. Aerosols released during dental procedures can hang in the air and adhere to surfaces. Considering the mode of transmission of SARS-CoV-19, dentist, patients, and other healthcare professionals can be infected easily and cause virus spreading.^{2,6} Therefore, obeying the infection control rules are necessary in dental clinics.²

The aims of the study were the evaluation of knowledge

levels of dentistry students related with Covid-19 infection, making awareness about infection and protection ways and making them more careful and conscious at work.

MATERIALS AND METHODS

Study design

This study included 782 dentistry students in an age range of 17-37 years. The survey used in the present study has not been used elsewhere before. Students who did not complete the survey were excluded. Before the students filled out the survey, informed consent was obtained online from all students. Ethical approval was obtained from the Ministry of Health Research Committee and Kahramanmaraş Sutcu Imam University Dentistry Faculty Ethics Committee (#05, Date:22.07.2020). The survey included questions about the students' level of knowledge regarding Covid-19 as well as about the sociodemographic features of the student.

Statistical analysis

Data were evaluated using SPSS 22.0 (IBM, New York, NY, USA) and R software programs. For the evaluation of the distributions of the groups, frequency analysis was used. For the evaluation of male-female equal distributions, the binomial analysis was used. Differences between groups were evaluated by the Chi-Square test.

RESULTS

To evaluate the dentistry students' knowledge levels about Covid-19 pandemic, 17-37-year-old 782 students (female:470, male:312) from 32 different programs were included in the study. The mean age of the students was 21.8 years. Male-female ratio did not have a significant difference based on class levels in the Chi square test ($\chi^2 = 3.22$; $p > 0.05$). While 54% of the students thought that they had sufficient knowledge about Covid-19, 8% stated that they didn't have sufficient knowledge, and the rest were not sure about their knowledge levels. The question about the knowledge level of the student and students' school year relation was not independent (Table 1).

Table 1: Distribution of the knowledge levels of the participants about Covid-19 pandemic depending on school years

| | Year | | | | | |
|----------------------------|------|-----|-----|-----|-----|-------|
| Sufficient Knowledge Level | 1 | 2 | 3 | 4 | 5 | Total |
| No | 16 | 5 | 8 | 19 | 14 | 62 |
| Yes | 105 | 43 | 84 | 94 | 99 | 425 |
| Not sure | 57 | 58 | 50 | 69 | 61 | 295 |
| Total | 178 | 106 | 142 | 182 | 174 | 782 |

Students' information sources regarding the Covid-19 pandemic were not independent on gender and school year (Table 2). According to the school year, it was reported that, year 5 students mostly received information via online education ($p<0.05$), year 1 students mostly received information mostly from Google and Twitter ($p<0.05$).

Table 2: The distribution of the participants' information sources related with Covid-19 pandemic according to gender

| | | Gender | | | |
|------------------|---|------------|----------|----------|------|
| | | Female (n) | Male (n) | χ^2 | P |
| Instagram | 0 | 227 | 173 | 3.72 | .054 |
| | 1 | 243 | 139 | | |
| WhatsApp | 0 | 335 | 229 | .44 | .506 |
| | 1 | 135 | 83 | | |
| Tv | 0 | 82 | 73 | 4.12 | .042 |
| | 1 | 388 | 239 | | |
| YouTube | 0 | 299 | 160 | 12.03 | .001 |
| | 1 | 171 | 152 | | |
| Newspaper | 0 | 349 | 203 | 7.53 | .006 |
| | 1 | 121 | 109 | | |
| Online Education | 0 | 312 | 228 | 4.01 | .045 |
| | 1 | 158 | 84 | | |
| Google | 0 | 101 | 111 | 19.31 | .001 |
| | 1 | 369 | 201 | | |
| Twitter | 0 | 434 | 284 | .42 | .517 |
| | 1 | 36 | 28 | | |
| Others | 0 | 436 | 267 | 10.60 | .001 |
| | 1 | 34 | 45 | | |

According to the pathway of transmission of Covid-19, there was a significant difference between women and men only in parental way, which was in favor of women

($\chi^2=7.08$; $p<0.05$), and there was no significant differences in other transmission modes. In year 1 students, there was a significant difference regarding fecal-oral route ($\chi^2=23.35$; $p<0.05$). Infection route with eyes had significant difference in year 5 students compared to the students from other years ($\chi^2=13.72$; $p<0.05$). There were not significant differences between years in terms of fecal-oral route, infection with blood and saliva, and direct contact and indirect contact ($p>0.05$).

Regarding the symptoms of the Covid-19 infection (shortness of breath, joint and muscle pain, or no symptoms), there were significant differences between women and men ($p<0.05$), but there were no significant differences between genders in other answers ($p>0.05$). The relationship between symptoms and years are presented in Table 3.

Table 3: An evaluation of the knowledge levels of the students about Covid-19 symptoms in terms of school year

| Symptom | | Year | | | | | χ^2 | p |
|-----------------------|---|------|-----|-----|-----|-----|----------|------|
| | | 1 | 2 | 3 | 4 | 5 | | |
| Fever | 0 | 2 | 1 | 0 | 2 | 1 | 1.79 | .775 |
| | 1 | 176 | 105 | 142 | 180 | 173 | | |
| Cough | 0 | 7 | 6 | 6 | 7 | 4 | 2.13 | .711 |
| | 1 | 171 | 100 | 136 | 175 | 170 | | |
| Shortness of Breath | 0 | 10 | 1 | 5 | 4 | 4 | 6.41 | .171 |
| | 1 | 168 | 105 | 137 | 178 | 170 | | |
| Diarrhea | 0 | 83 | 56 | 73 | 88 | 68 | 7.08 | .132 |
| | 1 | 95 | 50 | 69 | 94 | 106 | | |
| Vomiting | 0 | 124 | 76 | 101 | 108 | 111 | 8.21 | .084 |
| | 1 | 54 | 30 | 41 | 74 | 63 | | |
| Nasal Discharge | 0 | 132 | 76 | 97 | 123 | 113 | 4.12 | .390 |
| | 1 | 46 | 30 | 45 | 59 | 61 | | |
| Sore Throat | 0 | 55 | 32 | 42 | 54 | 57 | .54 | .97 |
| | 1 | 123 | 74 | 100 | 128 | 117 | | |
| Conjunctivitis | 0 | 119 | 66 | 100 | 102 | 107 | 8.47 | .076 |
| | 1 | 59 | 40 | 42 | 80 | 67 | | |
| Skin Rashes | 0 | 152 | 98 | 131 | 151 | 144 | 11.42 | .022 |
| | 1 | 26 | 8 | 11 | 31 | 30 | | |
| Joint and Muscle Pain | 0 | 71 | 41 | 55 | 64 | 59 | 1.92 | .750 |
| | 1 | 107 | 65 | 87 | 118 | 115 | | |
| No Symptoms | 0 | 28 | 8 | 16 | 24 | 18 | 5.09 | .278 |
| | 1 | 150 | 98 | 126 | 158 | 156 | | |

According to χ^2 test result, gender and the knowledge regarding the incubation period were not associated with each other. Although majority of both men and women stated that the incubation period was 14 days, the number of women reported incubation periods as 3 days were 3 times more than that of men, and the number of women reported incubation period as 21 days were twice more than that of men. Therefore, it could be said that there were significant differences in terms of incubation period between genders ($\chi^2=11.42$; $p<0.05$). Incubation period and the school year were independent ($\chi^2=19.20$; $p>0.05$). It was found that 96% of the participants declared that using mask was not protective enough but there were no significant differences between genders ($\chi^2=0.77$; $p>0.05$). The relationship between using personal protective equipment during patient examination/therapy and gender were not independent. Significantly more women preferred using galosh and surgical bonnet than men ($p<0.05$). The relationship between school year and using personal protective equipment is on Table 4.

It was found that 95% of the participants declared that transmission risk was higher in people with chronic diseases than healthy people. It was observed that 68% of the participants declared that they would not get vaccinated and wait, 29% declared that they would get vaccinated. Men were mostly affirmative in terms vaccination (36%), and women were mostly against it (73%) ($p<0.05$). School years and vaccine preferences were independent to each other ($\chi^2=11.37$; $p>0.05$).

Fifty-nine percent of the students declared that they would take drugs specifically developed for Covid-19. Significantly more men stated that they would take such a drug than women ($\chi^2=9.34$; $p<0.05$). School year and using prophylactic drug was independent based on the Chi-square test ($\chi^2=8.25$; $p>0.05$).

Ninety-eight percent of the students thought that Covid-19 pandemic increased anxiety levels and caused psychologi-

cal problems. School year, gender, and anxiety levels were independent to each other ($p>0.05$).

| Table 4: Students' preferences about using personal protective equipment based on school year | | | | | | | | |
|---|---|------|-----|-----|-----|-----|----------|------|
| Personal Protective Equipment | | Year | | | | | χ^2 | P |
| | | 1 | 2 | 3 | 4 | 5 | | |
| Shield | 0 | 18 | 2 | 3 | 4 | 4 | 22.91 | .001 |
| | 1 | 160 | 104 | 139 | 178 | 170 | | |
| High Filtered Masks Like N 95 | 0 | 43 | 21 | 26 | 18 | 17 | 20.62 | .001 |
| | 1 | 135 | 85 | 116 | 164 | 157 | | |
| Protective Glasses | 0 | 53 | 21 | 25 | 33 | 19 | 20.82 | .001 |
| | 1 | 125 | 85 | 117 | 149 | 155 | | |
| Galosh | 0 | 80 | 38 | 44 | 73 | 56 | 9.53 | .049 |
| | 1 | 98 | 68 | 98 | 109 | 118 | | |
| Gloves | 0 | 12 | 3 | 8 | 1 | 3 | 14.09 | .007 |
| | 1 | 166 | 103 | 134 | 181 | 171 | | |
| Scrubs | 0 | 74 | 25 | 46 | 45 | 52 | 15.62 | .004 |
| | 1 | 104 | 81 | 96 | 137 | 122 | | |
| Surgical Mask | 0 | 68 | 44 | 62 | 72 | 76 | 1.66 | .797 |
| | 1 | 110 | 62 | 80 | 110 | 98 | | |
| Coveralls | 0 | 66 | 26 | 49 | 72 | 44 | 13.17 | .010 |
| | 1 | 112 | 80 | 93 | 110 | 130 | | |
| Disposable Uniform | 0 | 52 | 17 | 32 | 15 | 25 | 30.67 | .001 |
| | 1 | 126 | 89 | 110 | 167 | 149 | | |
| Surgical Bonnet | 0 | 72 | 20 | 26 | 13 | 14 | 84.92 | .001 |
| | 1 | 106 | 86 | 116 | 169 | 160 | | |

More than half of the students (51%) declared that they would inform the Ministry of Health via the Covid-19 phone line when they suspected to have Covid-19 infection. Thirty percent of the students declared that they would ignore it and go on life, and 19% declared that they would stay at home for isolation. When the patients they examined were Covid-19 positive, 51% of the patients declared they would inform the Ministry of Health via the Covid-19 phone-line, 35% would not suspect to get Covid-19 infection due to enough protective equipment, and 14% would isolate themselves at home.

Majority of participants (97%) thought that dentists had a higher risk for Covid-19 infection than other health care

workers. Majority of the participants (80%) thought that negative polymerase chain reaction (PCR) result was not sufficient in the diagnosis of Covid-19 infection, and 16% declared that they did not have sufficient information. Sufficiency of negative PCR test in diagnosis, school year, and gender relation were independent ($p>0.05$).

DISCUSSION

This study aimed to determine dentistry students' knowledge levels about Covid-19 infection, to raise their awareness about transmission ways and protective measures, to encourage them to practice protective measures during patient examination, and to lead them to be more conscious dentists.

Taking the temperature of healthcare providers and patients must be a routine procedure in dentistry clinics during the Covid-19 pandemic¹⁰. If a person enters into a country after staying in another country where pandemic outbreak is severe, that person should be isolated for 14 days¹⁰. Dentistry guidelines suggest delaying elective procedures and provide treatment for urgent cases involving pain, edema, bleeding, trauma, etc.^{6,11}. Dentists must use personal protective equipment during urgent treatments and they must plan the treatment considering the least amount of aerosol and droplet formation¹⁰.

Cagetti et al. (2020) reported that more than 2/3 of the dentists participating in their study had enough knowledge about Covid-19. They reported that 1/3 of dentists received up-to-date information about Covid-19 from education programs. In our study, 53% of the students think that they have enough knowledge about Covid-19. Year 1 students remarked that they had more knowledge about Covid-19 than the rest of the student.

During the pandemic, there has been an increase in the habit of following social media and tv for news about Covid-19. Most dentists declared that the information they received were from websites, social media accounts, the

WHO website, and the social media accounts of the Ministry of Health¹⁹. In our study, we showed that 79% of the students received information from TV, 75% from Google, and 48% from Instagram.

Coronavirus can be received from infected people by droplets, coughing, and via the respiratory canal¹². Also, it is shown that the virus can infect by contact to oral, nasal, and orbital mucosa^{12,13}. There exist no evidence based data about the fecal-oral transmission of viruses¹². In our study, 98% of the participants declared that viruses infect by coughing and breathing, and 61% declared the fecal-oral route for transmission. Year 5 students declared that the virus infects mostly by eyes and year 1 students declared mostly that virus infects by the fecal-oral route.

The incubation period of Covid-19 is 14 days^{5,10,14}. In a survey study amongst dentists, more than 30% indicated the incubation period of Covid-19 infection as 1-14 days¹⁰. In our study, 81% of the participants indicated the incubation period as 14 days, 10% as 5-6 days, 5% as 3 days, and 4% as 21 days. Because contagiousness may occur with no symptoms, 82% of the dentists indicated that they did not prefer the examination of patients with high Covid-19 risk¹⁰. In a survey study, if patients are coughing and sneezing, 43% of the dentists declared that they would refer the patients to a hospital before providing treatment and 49.5% declared that they would treat the patients and then refer them to a hospital after treatment¹⁰.

Guidelines suggest using water-proof coverall, face shield, FFP3 breathing mask, and gloves during dental procedures spreading aerosol¹². Researchers have shown that the awareness of health care professionals about using personal protective equipment is high¹⁵. This study also shows that a small percentage of dentists use face shield although they know that face shield is very important protective equipment during dental procedures¹⁵. It is suggested for dentists to use N95 masks for patients with high Covid-19 risk and using at least surgical masks for other patients^{11,16}.

There must be at least 1-meter distance between dentist and patient¹¹. In our study, 96% of the participants declared that using a mask is insufficient and they suggested using face shield and gloves as well as masks. More women suggested using galosh and surgical bonnet than men.

Studies have shown that Covid-19 infection causes more severe symptoms in patients with cardiovascular problems. Studies have also shown that mortality is more common in patients with chronic diseases like hypertension and diabetes than other patients^{3,12,17}. In our study, 95% of the students declared that contagiousness risk is more common in patients with chronic diseases.

Vaccine studies have been going on in multiple countries. Virus vaccine, recombinant protein subunit vaccine, and nucleic acid vaccine are different vaccine producing techniques, and their effectiveness and safety are being tested^{12,18}. Important milestones have been achieved in current vaccine studies. In our study, most of the students (68%) declared that they would not get vaccinated immediately when it is made available, and 29% of the students declared that they would get vaccinated.

Some drugs like antimalarials and antivirals are suggested for prophylaxis before and after exposure to Covid-19 infection but there exist no certain data about their efficiency¹⁵. In vitro studies showed that hydroxychloroquine, an antimalarial drug, can be used for chemoprophylaxis in health care personnel¹⁵. In our study, 59% of the students declared that they would want to use a specific drug for prophylaxis when it is made available.

Many dentists have increased anxiety and fear about working during the Covid-19 pandemic due to the infection risk¹¹. There exist no vaccine and a specific proven treatment, which are the two reasons increasing anxiety¹¹. A survey study showed that 80% of the dentist were affected psychologically because of Covid-19, and 95% of the dentists had anxiety about transmitting virus to their fa-

milies¹⁹. In our study, 98% of the students declared that the pandemic increased their anxiety and caused some psychological problems.

Dentists and their patients are under risk because Covid-19 infection spreads by inhalation, its incubation period is between 7-24 days, and there exist no symptoms in some cases. Any contact to blood, saliva, body fluids, and aerosols due to devices with high-rotation speeds increase the risk of infection in dental procedures^{12,20}. In our study, 97% of the participants think that infection risk of Covid-19 is higher in dentists than that in other health workers.

Clinical symptoms can vary from case to case but fever, cough, myalgia, or fatigue are common symptoms. In computerized tomography, bilateral/peripheral frosted glass sign are seen in severe cases^{12,21}. In the diagnosis of this virus, a sample is taken from the back side of nose or mouth and the RNA of SARS Cov-2 is sought by the PCR technic. Although this technic is sensitive and specific, its accuracy can change depending on the quality of the sample. A disadvantage of the PCR technique is that it can be positive only in patients with active infection but it cannot detect the virus in patients during the healing period^{12,22}. A negative PCR test result does not mean that the patient does not have the virus. In our study, 80% of the students declared that a negative PCR is not enough for diagnosis, and 16% declared that they had no information about the test.

CONCLUSION

This study aimed increasing the awareness of students about infection risk during dental procedures and it also emphasized the preventive measures which must be taken for protection from Covid-19 infection. We think that true and rational information about Covid-19 must be given to students by education.

Conflict of interest

No conflict of interest.

Source of funding

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Kaynaklar

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